LR102 SERIES

System Board
User's Manual

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Changes after the publication's first release will be based on the product's revision. The website will always provide the most updated information.

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FCC and DOC Statement on Class B

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

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

Notice:

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

Table of Contents

About this Manual

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

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or consequencial damages to the product that has been modified or altered.

Static Electricity Precautions

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

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.

2. Wear an antistatic wrist strap.

3. Do all preparation work on a static-free surface.

4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.

5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

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

Safety Measures

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

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

About the Package

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

- ☑ One system board
- ☑ Two USB cables
- ☑ One Serial ATA cable
- ☑ One bracket mounted with a COM port
- ☑ One I/O shield
- ☑ One CD
- ☑ One QR

Optional Items

- ☑ USB port cable
- ☑ COM port cable
- ☑ Serial ATA data cable
- ☑ Serial ATA power cable
- ☑ I/O shield
- ☑ IDE cable
- ☑ Heat sink

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.

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

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

Chapter 1 - Introduction

Specifications

Processor	• Intel® Atom™ D525 (Dual-Core) - LR102-B18D Intel® Atom™ N455 (Single-Core) - LR102-B18M Intel® Atom™ D425 (Single-Core) - LR102-B18S • 1.66GHz core frequency - LR102-B18M 1.8GHz core frequency - LR102-B18D, LR102-B18S • Cooling option: heat sink with cooling fan - LR102-B18D, LR102-B18S heat sink (fanless solution) - LR102-B18M
Southbridge	• Intel® ICH8M I/O Controller Hub
System Memory	• Two 204-pin SODIMM sockets • Single channel memory interface • LR102-B18D/LR102-B18S - Supports DDR3 800MHz only - Supports up to 4GB system memory. - - - - - - - - - LR102-B18M - Supports DDR3 667MHz only - Supports up to 2GB system memory.
Graphics	• Intel® GMA 3150 - Contains a refresh of the 3rd generation graphics core • DirectX 9 compliant Pixel Shader 2.0 • LR102-B18D/LR102-B18S - 400MHz render clock frequency - Display ports: LVDS and VGA - LVDS: Chrontel CH7036; 18/24-bit single channel; resolution up to 1366x768, 18bpp - Analog VGA: resolution up to 2048x1536 @ 60Hz - - - - - - - - - • LR102-B18M - 200MHz render clock frequency - Display ports: LVDS and VGA - LVDS: Chrontel CH7036; 18/24-bit single channel; resolution up to 1280x800 or 1366x768, 24bpp - Analog VGA: resolution up to 1400x1050 @ 60Hz

Audio	• Realtek ALC262 2-channel High Definition Audio • High performance DACs with 100dB SNR • ADCs with 90dB SNR • Two stereo DACs support 24-bit PCM format for stereo audio playback • Three stereo ADCs support 20-bit PCM format for multiple input streaming • S/PDIF audio interface
LAN	• Intel 82567V Gigabit Ethernet Phy • Supports 10Mbps, 100Mbps and 1Gbps data transmission • IEEE 802.3 (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant
Serial ATA	• 3 Serial ATA ports compliant with SATA 1.0 specification • SATA speed up to 3Gb/s (SATA 2.0)
Rear Panel I/O Ports	• 1 mini-DIN-6 port for PS/2 mouse and PS/2 keyboard ports • 1 DB-9 RS232/422/485 serial port - Pins 1 and 9 of RS232 function as RS232 signal or power (selectable via jumper) • 1 DB-15 VGA port • 1 RJ45 LAN port • 2 USB 2.0/1.1 ports • 1 Line-out jack
I/O Connectors	• 3 connectors for 6 external USB 2.0/1.1 ports • 1 connector for an external RS232/422/485 serial port • 1 LVDS LCD panel connector • 1 LCD/inverter power connector • 1 8-bit DIO connector • 1 DIO power connector • 1 SMBus connector • 1 front audio connector for line-out and mic-in jacks • 1 CD-in connector • 1 S/PDIF connector • 3 Serial ATA connectors • 1 24-pin ATX power connector • 1 front panel connector • 1 chassis intrusion connector • 2 fan connectors
BIOS	• AMI BIOS • SPI BIOS

Expansion Slots	• 1 PCIe x1 slot
	• 1 mini PCIe slot
	  - Supports half size and/or full size Mini PCIe card
	• 1 PCI slot
	• 1 CompactFlash socket
	• 1 connector for daughterboard expansion
	  - 3 PCIe x1
	  - 2 USB 2.0
	  - 1 LPC
	  - 1 HDMI TMDS 1366x768 (max)
	  - 3.3V, 5V, 12V, 3.3V standby, 5V standby, 3V battery

TPM (optional)	• Provides a Trusted PC for secure transactions • Provides software license protection, enforcement and password protection

Energy Efficient Design	• ACPI v1.0a specification
	• System Power Management
	• Wake-On-Events include:
	  - Wake-On-USB Keyboard/Mouse
	  - Wake-On-LAN
	  - Wake-On-Ring
	  - RTC timer to power-on the system
	• AC power failure recovery

Damage Free Intelligence	• Monitors CPU/system temperature and overheat alarm • Monitors 5V/1.05V/1.5V/12V/3VSB/VBAT/VCORE voltages and failure alarm • Monitors system fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function
Power Consumption	• 12.48 W with N455 at 1.66GHz and 1x 2GB DDR3 SODIMM
Temperature	• 0°C to 60°C
Humidity	• 10% to 90%

Dimensions	• Mini-ITX form factor
	  - 170mm (6.7") x 170mm (6.7")
	• Heat sink
	  - LR102-B18M: 68mm x 50mm x 30mm
	• Heat sink
	  - LR102-B18D/B18S: 68mm x 50mm x 40mm

Certification	• CE, FCC Class B, UL, RoHS

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.

CompactFlash

The system board is equipped with the CompactFlash™ socket for inserting a CompactFlash™ card. CompactFlash™ card is a small removable mass storage device designed with flash technology - a non-volatile storage solution that does not require a battery to retain data indefinitely. The CompactFlash™ technology is widely used in products such as portable and desktop computers, digital cameras, handheld data collection scanners, PDAs, Pocket PCs, handy terminals and personal communicators.

DDR3

DDR3 delivers increased system bandwidth and improved performance. The advantages of DDR3 are its higher bandwidth and its increase in performance at a lower power than DDR2.

Integrated Graphics

The integrated Intel Gen3.5 graphics engine delivers an excellent video and 3D graphics for large display applications. Graphics interfaces such as VGA, DVI and LVDS support multiple graphics display options.

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

HDMI

HDMI (High-Definition Multimedia Interface) is a compact audio/video connector interface for transmitting uncompressed digital streams. It delivers multi-channel audio and uncompressed digital video signals for full HD 1080p visuals through a single cable. Connect a LCD monitor or digital TV that has the HDMI port.

Note:
Both, HDMI and LVDS, use Chrontel CH7036; therefore, they will have the same graphic output display.

PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x1 PCI Express lane supports transfer rate of 2.5 Gigabytes (250MBbps) per second which is nearly 4 times faster than the traditional PCI.

Audio

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

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 3GB/s, it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

Gigabit LAN

The Intel 82567V Gigabit Ethernet Phy controller 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-LAN

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

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

Wake-On-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 ≥720mA.

Wake-On-USB

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

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

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 ≥720mA.

Power Failure Recovery

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

Chapter 2 - Hardware Installation

System Board Layout
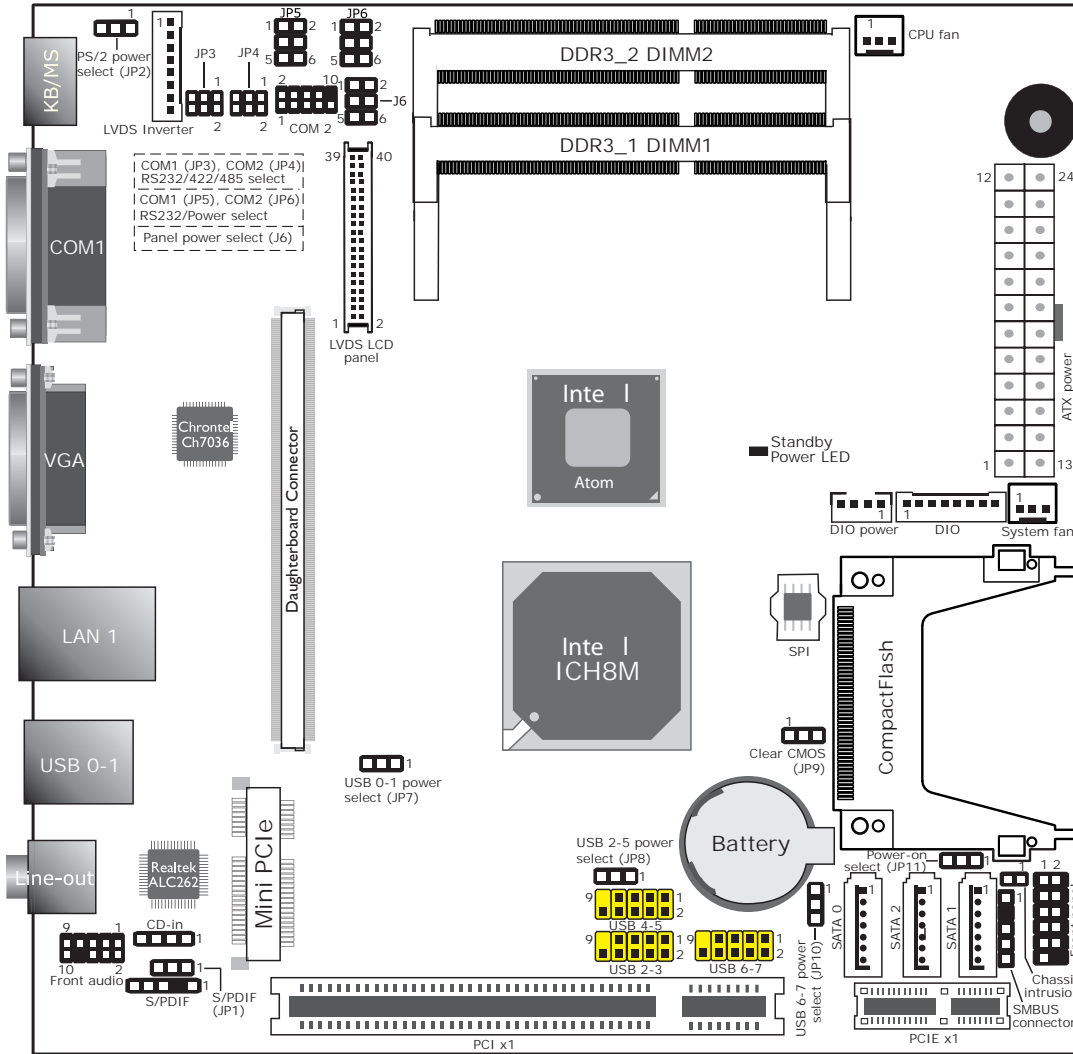
Important:

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

System Memory

Important:

When the Standby Power LED lit yellow, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.
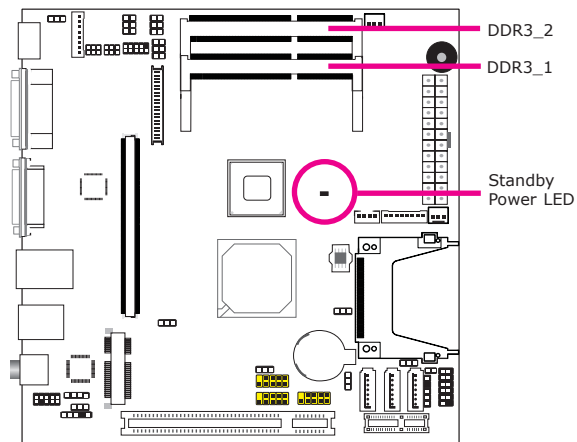
The system board supports two DDR3 SODIMM sockets.

Note:

The system board supports maximum of 4GB (for LR102-B18D/S) and 2GB (for LR102-B18M) system memory however you can install maximum of 1GB only per SODIMM socket.

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Installing the DIM Module

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

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

2. Disconnect all power cords and cables.

3. Locate the SODIMM socket on the system board.

4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one direction.
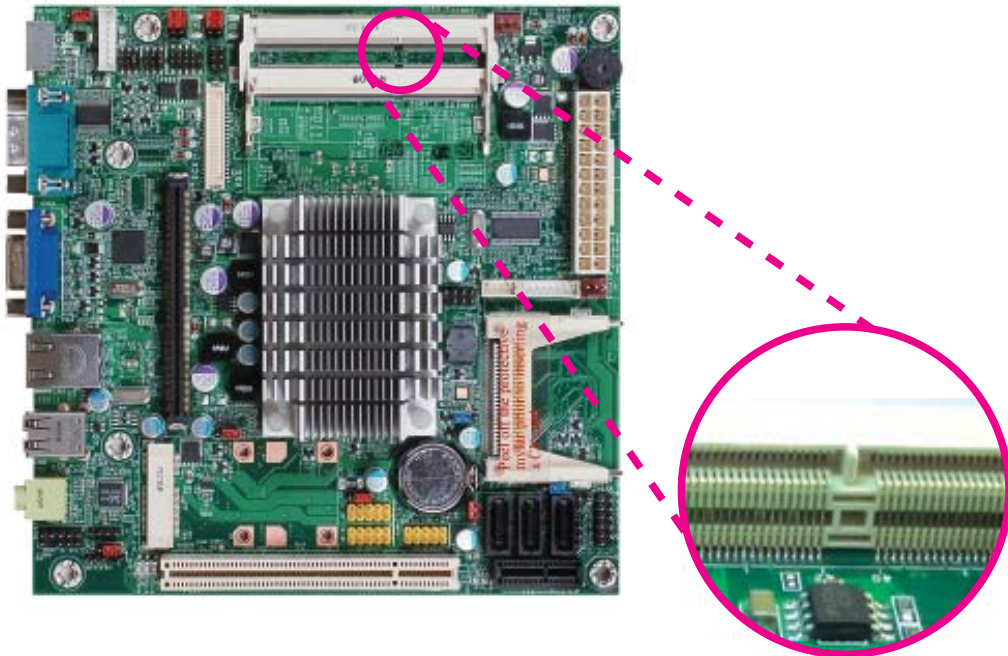
5. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.
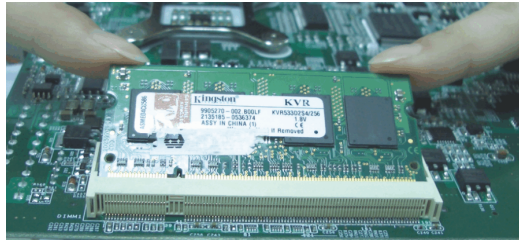
6. Push down the module until the clips at each end of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.

Clip

Clip
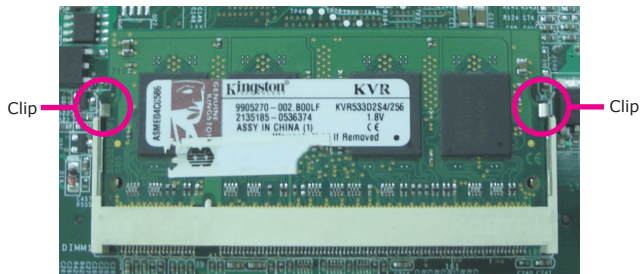
Jumper Settings

Clear CMOS Data

1 2 3
1-2 On: Normal
(default)

JP9

1 2 3
2-3 On:
Clear CMOS Data
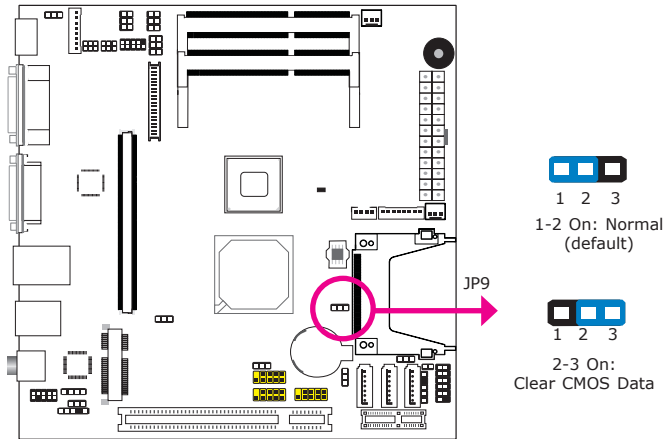
If you encounter the following,

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

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

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

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

2. Set JP9 pins 2 and 3 to On. Wait for a few seconds and set JP8 back to its default setting, pins 1 and 2 On.

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

PS/2 Power Select

JP2

3 2 1
1-2 On: 5V
(default)

3 2 1
2-3 On:
5V_standby
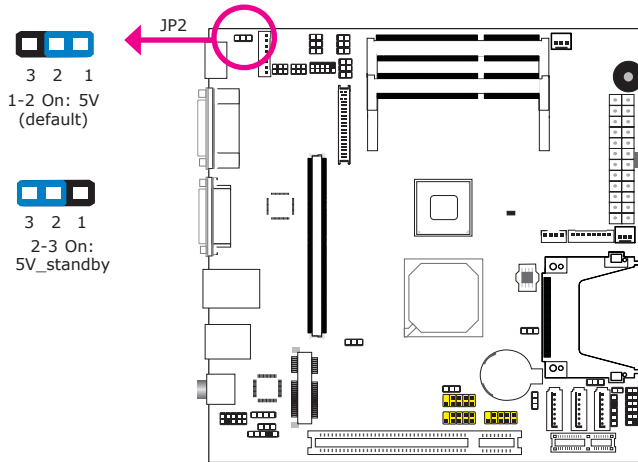
JP2 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

USB Power Select

3 2 1

2-3 On:
5V_standby

3 2 1

1-2 On: 5V
(default)

USB 0-1 power
select (JP7)

USB 2-5 power
select (JP8)

USB 6-7 power
select (JP10)

1
2
3

1-2 On: 5V
(default)

1
2
3

2-3 On:
5V_standby
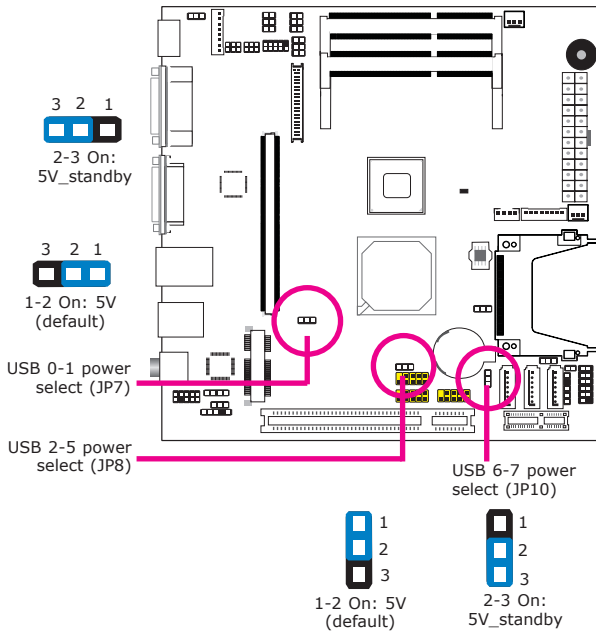
JP7 (for USB 0-1), JP8 (for USB 2-5) and JP10 (for USB 6-7) are used to select the power of the USB ports. Selecting 5V_standby will allow you to use a USB device to wake up the system.

BIOS Setting

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

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥0.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥1A.

LVDS Panel Power Select

1 2
3 4
5 6
1-2 On: 12V

1 2
3 4
5 6
3-4 On: 5V

1 2
3 4
5 6
5-6 On: 3.3V
(default)

J6
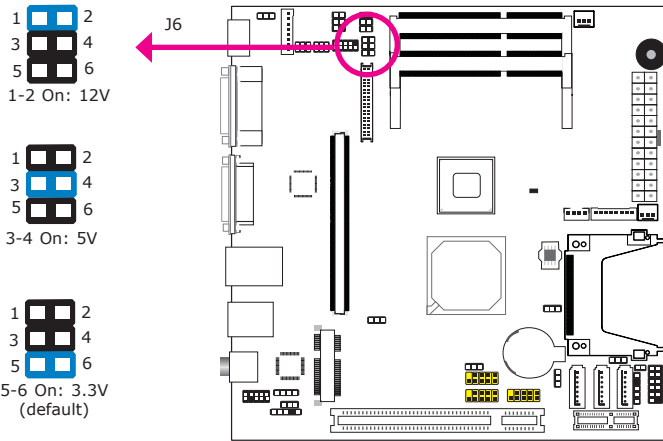
J6 is used to select the power supplied to the LCD panel.

Important:
Before powering-on the system, make sure the J6 setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

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Hardware Installation

S/PDIF

3 2 1

2-3 On: S/PDIF to HDMI

3 2 1

1-2 On: S/PDIF to Audio

JP1
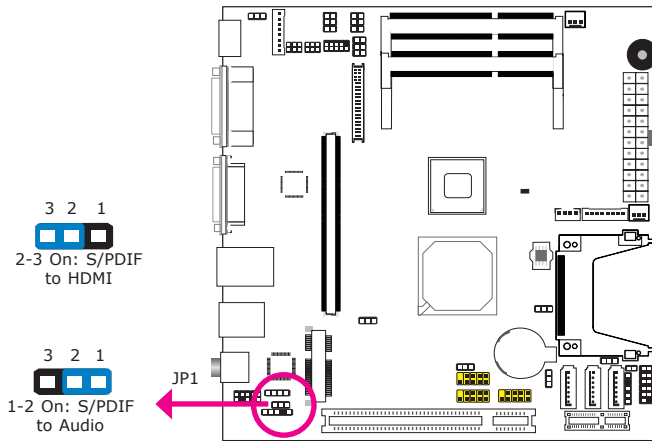
JP1 is used to set the S/PDIF to HDMI or to Audio mode.

COM 1 and COM 2 RS232/RS422/RS485 Select
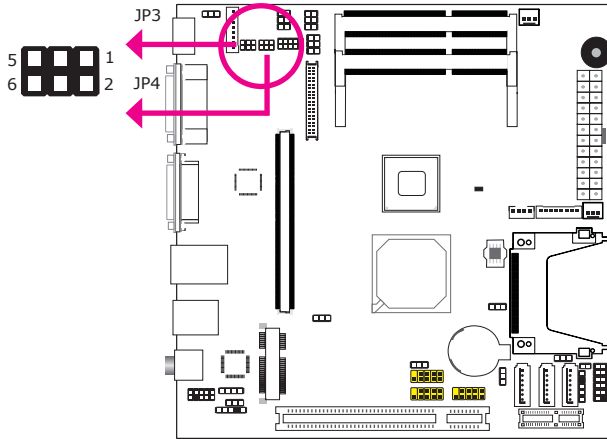
JP3 and JP4 are used to configure COM 1 and COM 2 to RS232, RS422 (Half Duplex) or RS485.

The pin function of COM 1 and COM 2 will vary according to their jumper's setting.

JP3 / JP4		
5 3 1	5 3 1	5 3 1
6 4 2	6 4 2	6 4 2
1-2 On: RS232 (default)	3-4 On: RS422 Half Duplex	5-6 On: RS485

COM 2		
RD DTR- DSR- CTS-	RXD- N.C. N.C. N.C.	DATA- N.C. N.C. N.C.
2 1 ... 9	2 1 ... 9	2 1 ... 9
DCD- TD GND RTS- RI-	RXD+ N.C. N.C. N.C. N.C.	DATA+ N.C. N.C. N.C. N.C.

25
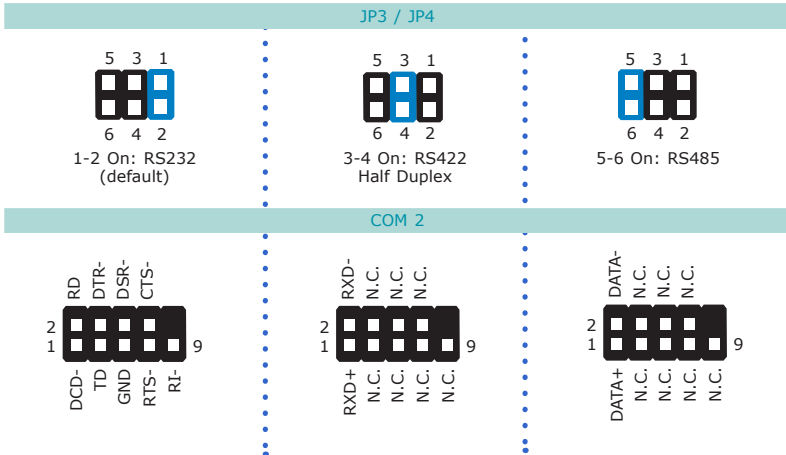
COM 1 and COM 2 RS232/Power Select

JP5

1 2
3 4
5 6

JP6
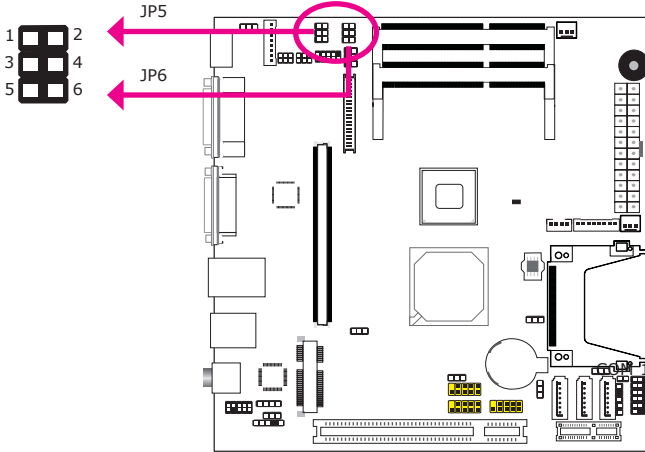
JP5 / JP6	
1 2 3 4 5 6	1 2 3 4 5 6
1-3, 2-4 On: RS232 (default)	3-5 (12V), 4-6 (5V) On: RS232 with power

COM 1 and COM 2

RD   DTR- DSR- CTS-
2
1   9
DCD- TD GND RTS- RI-

RD   DTR- DSR- CTS-
2
1   9
+5V TD GND RTS- +12V

Power-on Select

3 2 1

1-2 On:
Power-on via
power button
(default)

3 2 1

2-3 On:
Power-on via
AC power
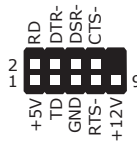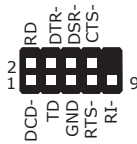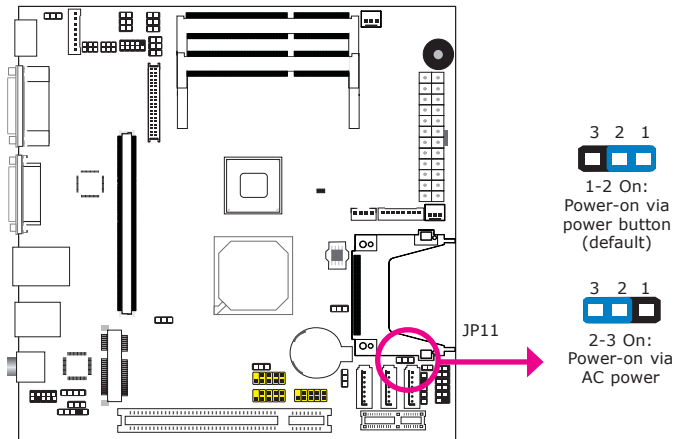
JP11

JP11 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 JP11 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP11 "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 re-covers within a 5 second period, JP11 must be set to pins 2-3 and the "PWRON After PWR-Fail" in CMOS is set to "On".

Jumper Settings - XLT0-2C1G2U (optional)

COM 3 and COM 4 RS232/Power Select

JP2

JP1

JP1 / JP2

1   2
3   4
5   6

1-3, 2-4 On:
RS232
(default)

1   2
3   4
5   6

3-5 (+5V), 4-6 (+12V) On:
RS232 with power

COM 4 and COM 3

RD   DTR-   DSR-   CTS-
2
1   9
DCD-   TD   GND   RTS-   RI-

RD   DTR-   DSR-   CTS-
2
1   9
+5V   TD   GND   RTS-   +12V
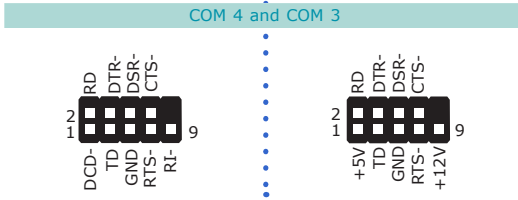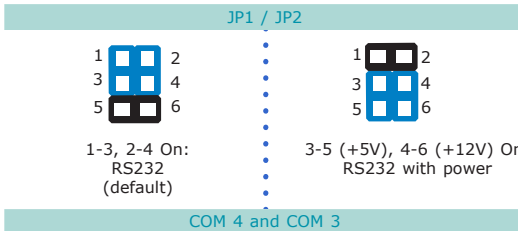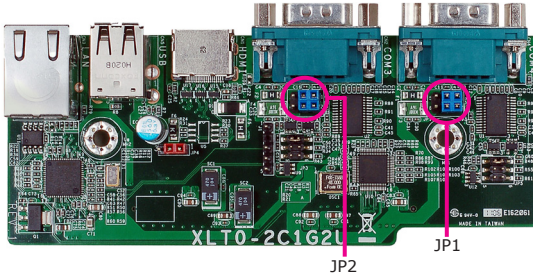
COM 3 and COM 4 RS232/RS422/RS485 Select

JP3

JP5
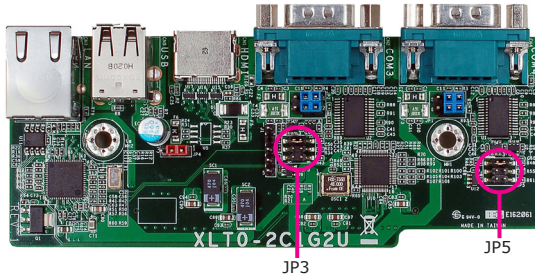
COM 3 (JP3) and COM 4 (JP5) are used to configure COM 3 and COM 4 to RS232, RS422 (Half Duplex) or RS485.

The pin function of COM 3 and COM 4 will vary according to their jumper's setting.

JP3 / JP5		
5 3 1 6 4 2 1-2 On: RS232 (default)	5 3 1 6 4 2 3-4 On: RS422 Half Duplex	5 3 1 6 4 2 5-6 On: RS485
COM 3 and COM 4		
RD DTR- DSR- CTS- 2 1　　　　　　　　9 DCD- TD GND RTS- RI-	RXD- N.C. N.C. N.C. 2 1　　　　　　　　9 RXD+ N.C. N.C. N.C. N.C.	DATA- N.C. N.C. N.C. 2 1　　　　　　　　9 DATA+ N.C. N.C. N.C. N.C.
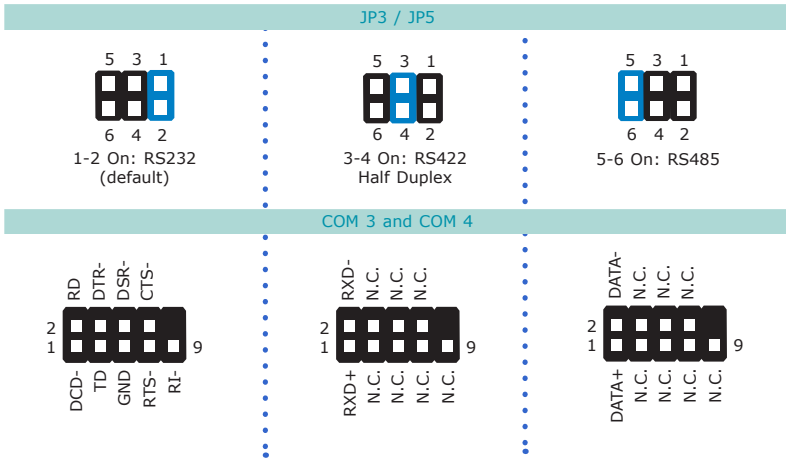
USB Power Select

USB power
select (JP4)

3 2 1
2-3 On: +5V_
standby

3 2 1
1-2 On: +5V
(default)
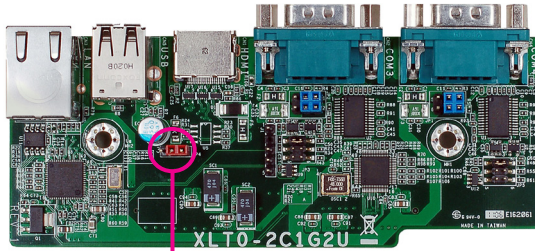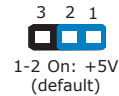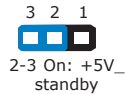
JP4 is used to select the power of the USB port. Selecting +5V_standby will allow you to use a USB device to wake up the system.

BIOS Setting

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

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥0.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥1A.

Rear Panel I/O Ports

PS/2   COM 1   VGA   LAN   USB 1   Line-out

USB 0

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

- PS/2 port
- COM port
- VGA port
- LAN port
- 2 USB ports
- Line-out jack

XLT0-2C1G2U I/O Ports

COM 4   COM 3   HDMI   USB 2.0   LAN

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

- 2 COM ports
- HDMI
- 2 USB ports
- LAN port

PS/2 Port
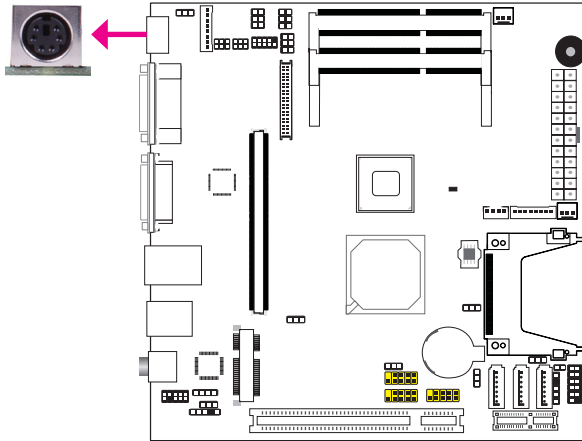
The PS/2 port is used to connect a PS/2 keyboard and a PS/2 mouse by means of the provided cable.

PS/2 mouse port

PS/2 keyboard port

Connect to the board's PS/2 port
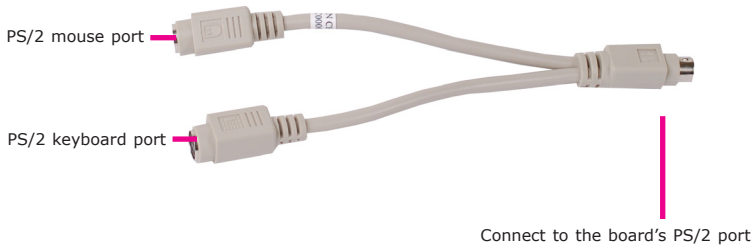
Important:
Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.

COM1 and COM2 Port
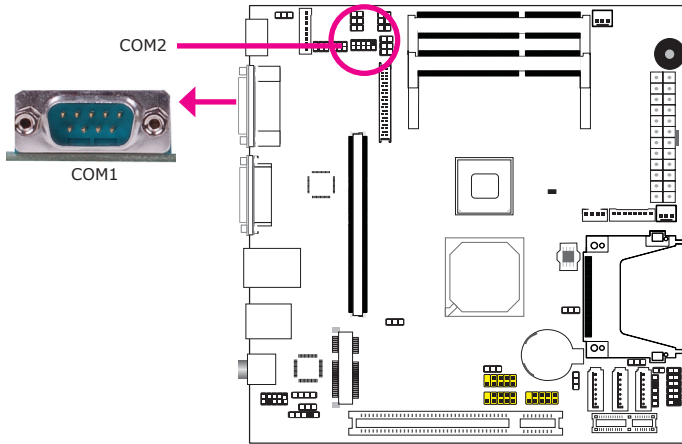
COM2

COM1

COM1 and COM2 are fixed at RS232.

COM 1 and COM 2

COM 4
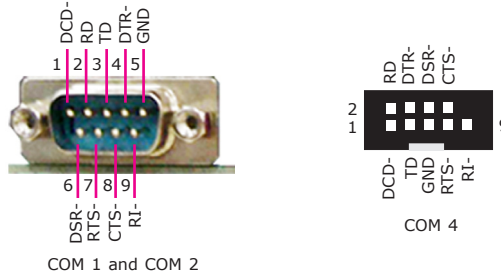
COM1 and COM2's pin definition will vary according to JP3 and JP4's settings. Refer to "COM1 and COM2 RS232/RS422/RS485 Select" in this chapter for more information.

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

Connecting External Serial Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to 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
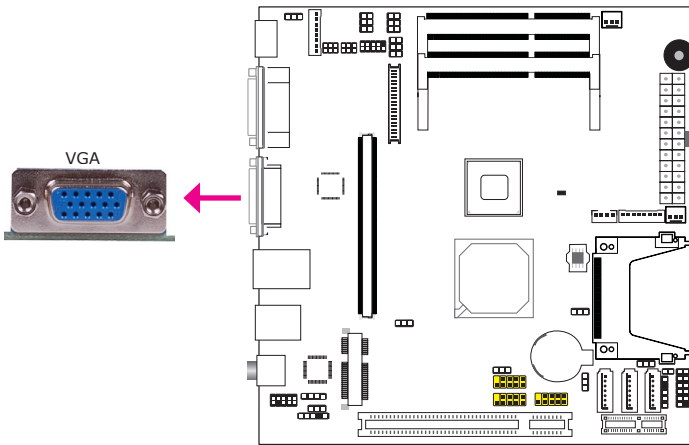
The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

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

Driver Installation

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

Note:
Refer to Configuring Display Devices in chapter 5 for more information.

RJ45 LAN Ports

LAN 1
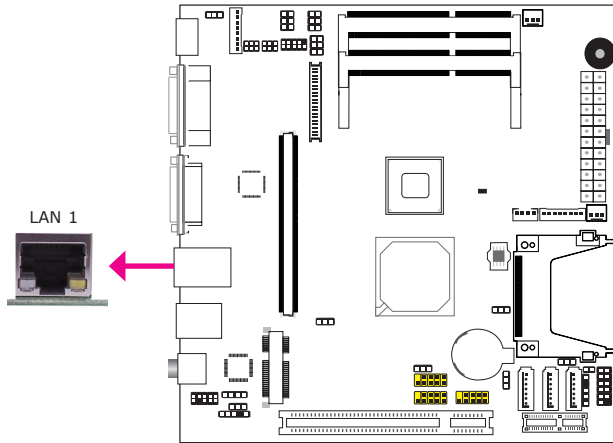
The LAN ports allow the system board to connect to a local area network by means of a network hub.

BIOS Setting

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

Driver Installation

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

USB Ports

USB 1

USB 0

USB 4-5　　　USB 6-7

USB 2-3

Key
GND
+Data
-Data
VCC

9　　　　　　1
10　　　　　2

N. C.
GND
+Data
-Data
VCC
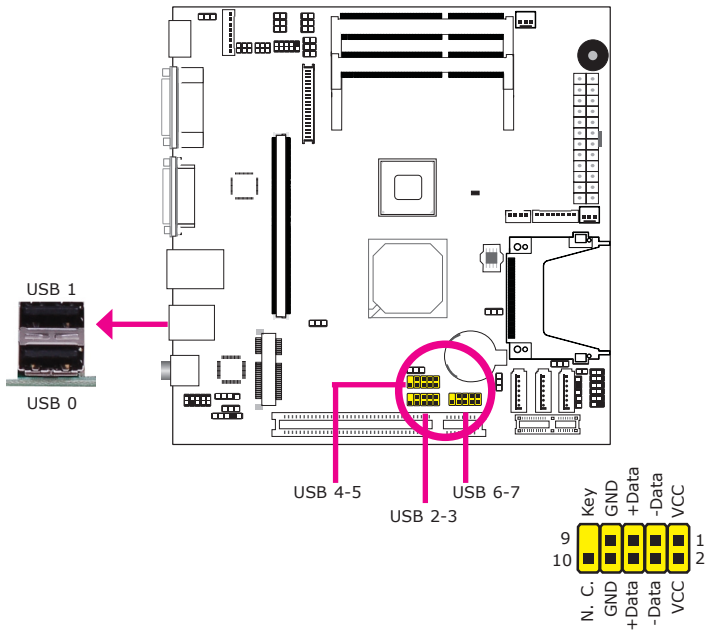
USB allows data exchange between your computer and a wide range of simulta-neously accessible external Plug and Play peripherals.

The system board is equipped with 6 onboard USB 2.0/1.1 ports. The 10-pin con-nector allows you to connect 2 additional USB 2.0/1.1 ports. The 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 the con-nector.

BIOS Setting

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

Driver Installation

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

Wake-On-USB Keyboard/Mouse

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

- Jumper Setting

  JP7, JP8 and/or JP10 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 ("ACPI Configuration" submenu) of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

  Important:
  If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support ≥0.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥1A.

Audio

Line-out

Front_IO_Sense
Line2-R Mic2-R Mic2-L
Line2-L

9 1
10 2

Line2-JD Key Mic2-JD N.C. GND

Front audio
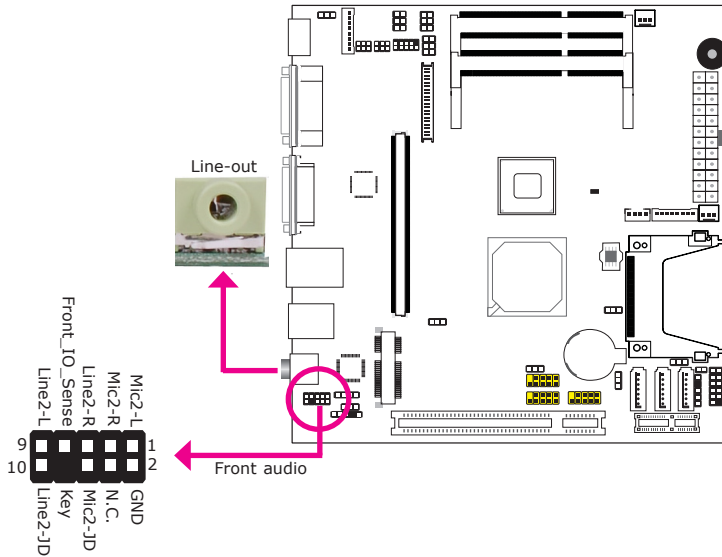
Rear Audio

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.

BIOS Setting

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

Driver Installation

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

I/O Connectors

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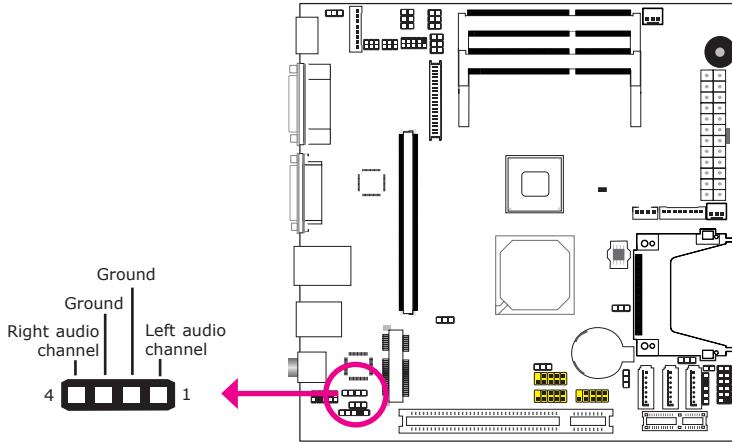
The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

S/PDIF Connector

SPDIF out
Ground | Key
SPDIF in | +5V
5 1
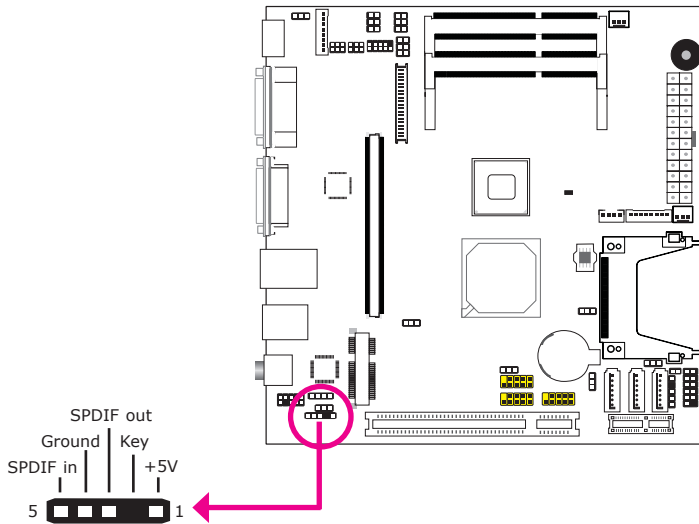
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

LVDS LCD Panel Connector
LVDS/Inverter Power Connector

1

8

LVDS/Inverter
power

39   40

1   2
24-bits
LVDS LCD
panel
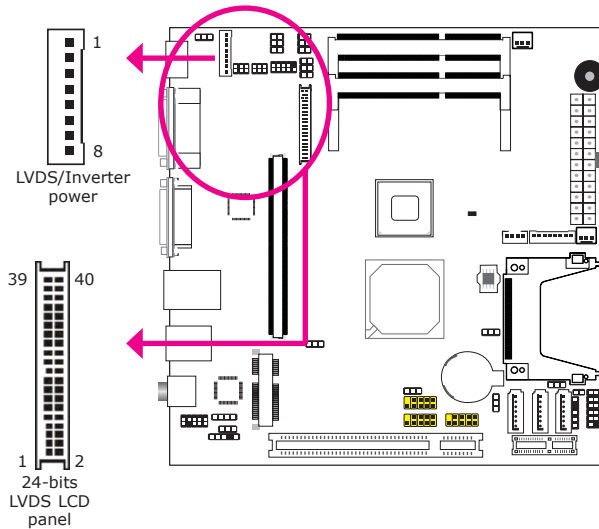
The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LVDS/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

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

BIOS Setting

Configure the LCD panel in the Chipset menu ("North Bridge Configuration" sub-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	N. C.
5	LVDS_Out3-	6	N. C.
7	GND	8	GND
9	LVDS_Out2+	10	N. C.
11	LVDS_Out2-	12	N. C.
13	GND	14	GND
15	LVDS_Out1+	16	N. C.
17	LVDS_Out1-	18	N. C.
19	GND	20	GND
21	LVDS_Out0+	22	N. C.
23	LVDS_Out0-	24	N. C.
25	GND	26	GND
27	LVDS_CLK1+	28	N. C.
29	LVDS_CLK1-	30	N. C.
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

LVDS/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

DIO connector

+5V   +12V
       Ground
5VSB

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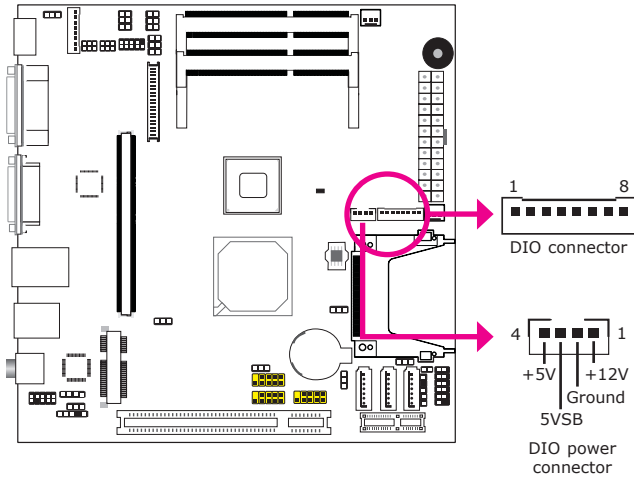
The Digital I/O connector provides powering-on function to an external device that is connected to this connector.

Digital I/O Connector

Pins	Function
1	DIO0
2	DIO1
3	DIO2
4	DIO3
5	DIO4
6	DIO5
7	DIO6
8	DIO7

SATA (Serial ATA) Connectors

SATA 2
SATA 1
SATA 0

1 — GND
TXP
TXN
GND
RXN
RXP
7 — GND
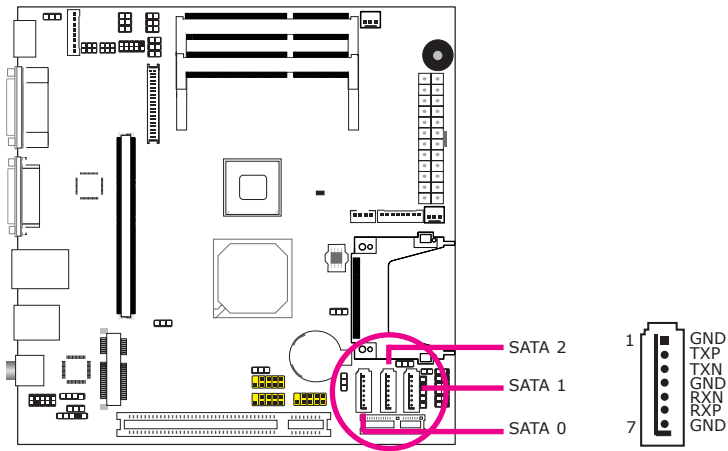
The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

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

Cooling Fan Connectors

1 ▪▪▪ 3

Ground | Sense
Power
CPU fan

1 ▪▪▪ 3

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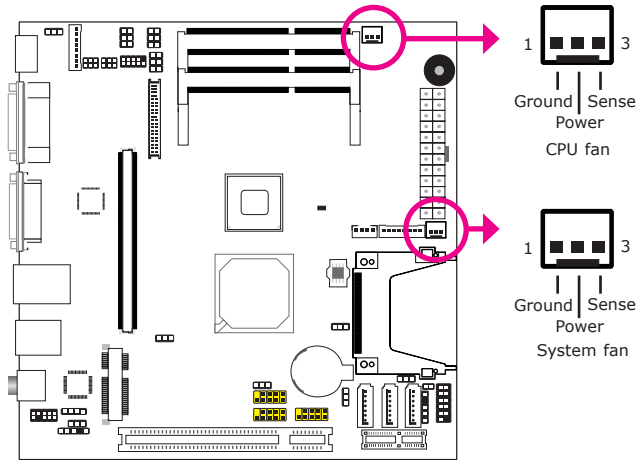
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

Chassis Instrusion Connector

2 ▮▮▮ 1

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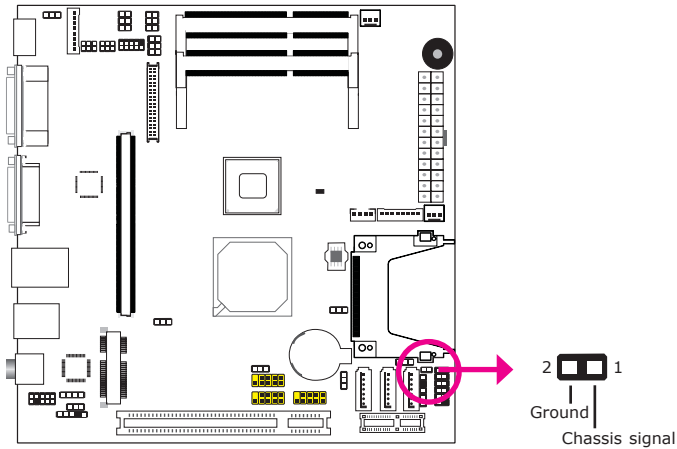
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

Front Panel Connectors
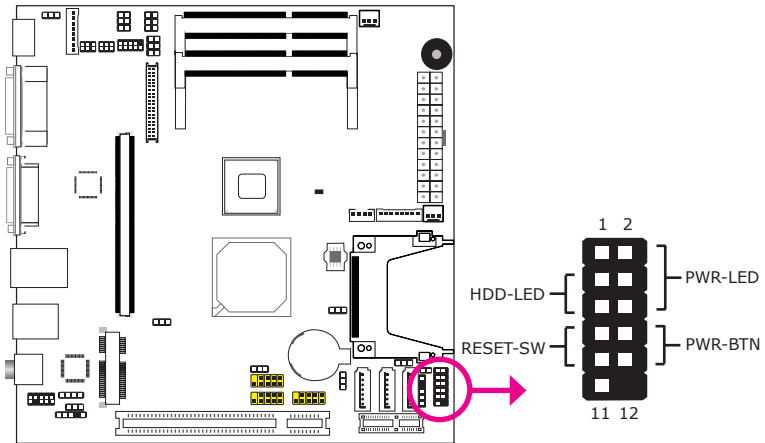
HDD-LED - HDD LED

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

RESET SW - Reset Switch

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

PWR-BTN - Power Switch

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

PWR-LED - Power/Standby LED

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

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

Expansion Slots

Mini PCIe

PCI
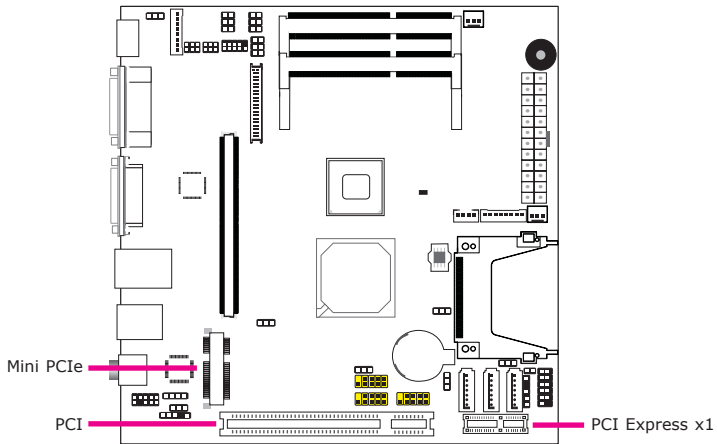
PCI Express x1

PCI Express x1

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

PCI Slot

The PCI slot supports expansion cards that comply with PCI specifications. You can install a PCI expansion card or a customized riser card designed for 1, 2 or 3 PCI slots expansion (for low profile PCI card only) into the PCI slot.

Mini PCIe Slot

The Mini PCIe slot is used to install a Mini PCIe card. Mini PCIe card is a small form factor PCIe card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCIe.

Power Connectors


```
                        12  24
           +3.3VDC  [ •    • ]  COM
            +12VDC  [ •    • ]  +5VDC
            +12VDC  [ •    • ]  +5VDC
             +5VSB  [ •    • ]  +5VDC
            PWR_OK  [ •    • ]  NC
               COM  [ •    • ]  COM
             +5VDC  [ •    • ]  COM
               COM  [ •    • ]  COM
             +5VDC  [ •    • ]  PS_ON#
               COM  [ •    • ]  COM
           +3.3VDC  [ •    • ]  -12VDC
           +3.3VDC  [ •    • ]  +3.3VDC
                        1   13
                   ATX power
```
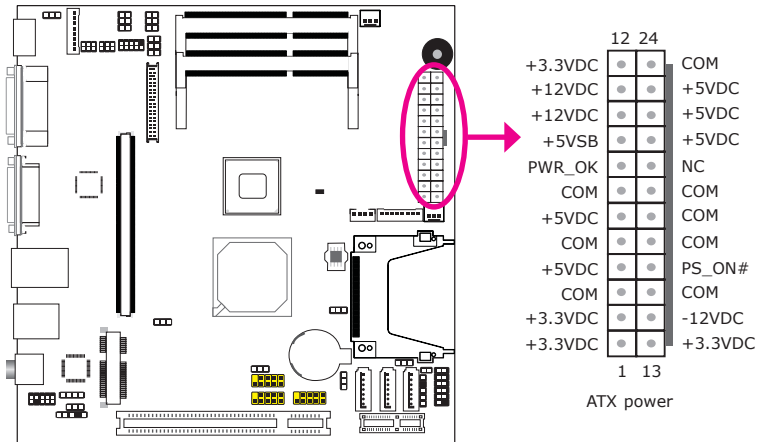
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

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

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

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

Battery
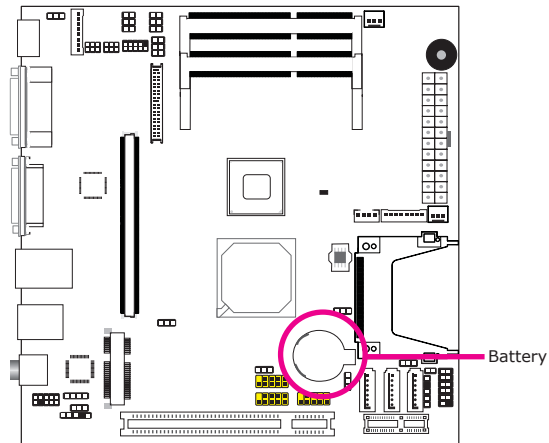
Battery

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.

SMBus Connector
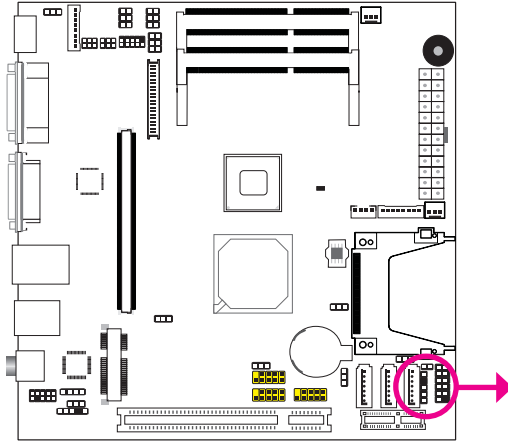
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

SMBus Connector

Pins	Function
1	3VSB
2	N.C.
3	SMBus CLK
4	SMBus Data
5	Ground

Standby Power LED
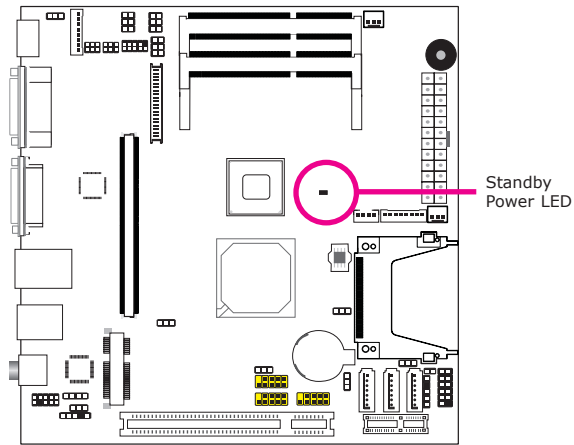
Standby
Power LED

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

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

CompactFlash Socket

CompactFlash
socket
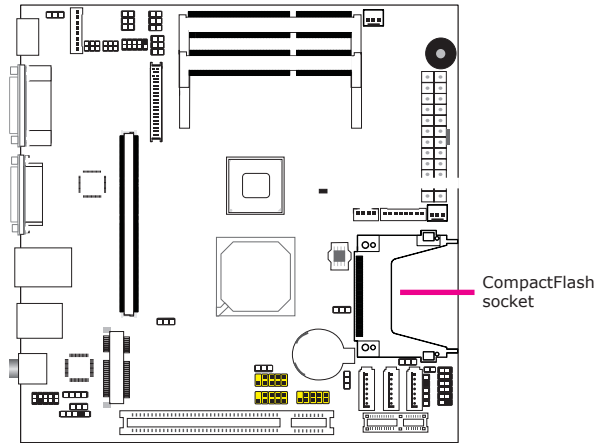
The CompactFlash™ socket is used for inserting a CompactFlash™ card. Compact-Flash™ card is a small removable mass storage device designed with flash technology - a non-volatile storage solution that does not require a battery to retain data indefinitely. The CompactFlash™ technology is widely used in products such as portable and desktop computers, digital cameras, handheld data collection scanners, PDAs, Pocket PCs, handy terminals and personal communicators.

Important:
We do not recommend using IDE devices and CF card at the same time.

Daughterboard Connector

Daughterboard Connector
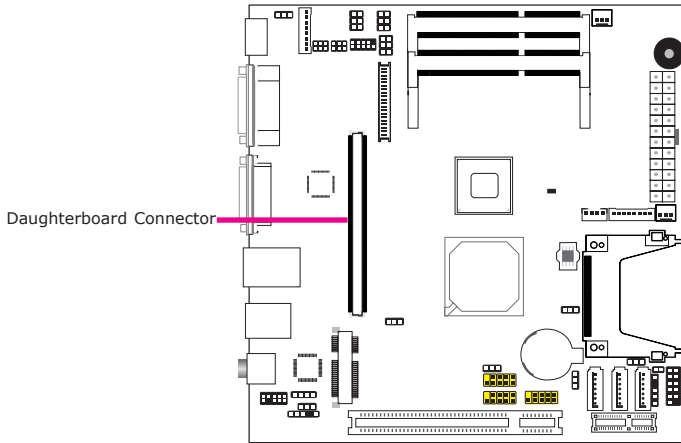
The Daughterboard Connector is used to insert the daughterboard XLT0-2C1G2U.

Installing the XLT0-2C1G2U onto the LR102 (op-tional)

> ⚠️ **Important:**
> The carrier board used in this section is for reference purpose only. These illustrations are mainly to guide you on how to install the XLT0-2C1G2U onto the LR102 of your choice.

1. The photo below shows the locations of the mounting holes.
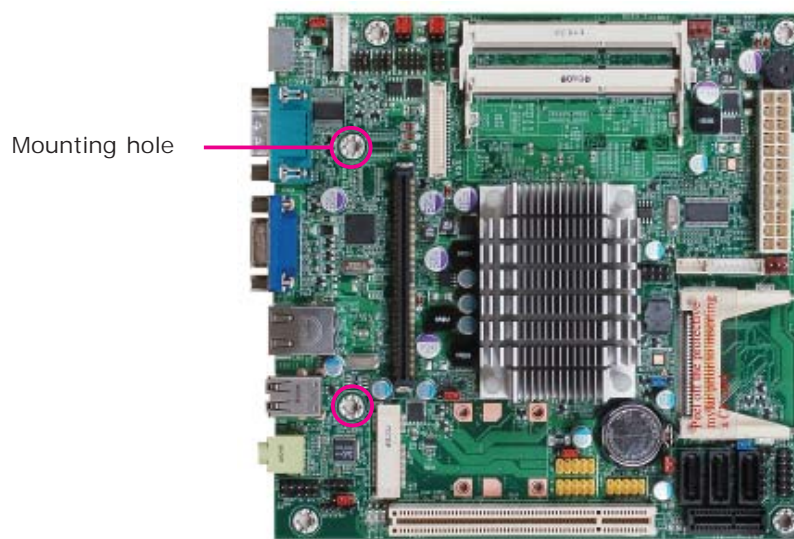
Mounting hole

2. Insert the provided mounting screws into the mounting holes - from the bottom through the top of the carrier board.
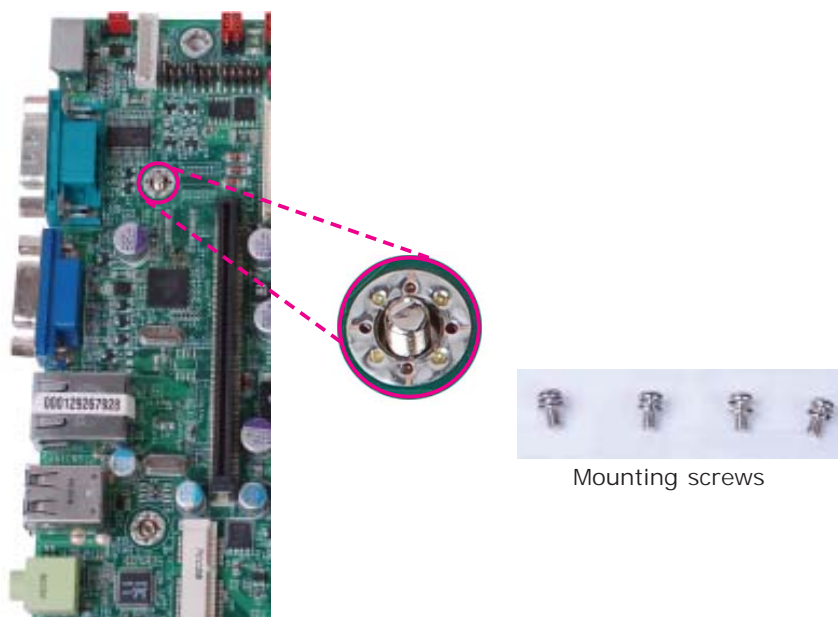
Mounting screws

3. While supporting the mounting screw at the bottom, from the top side of the board, fasten a bolt into the screw.
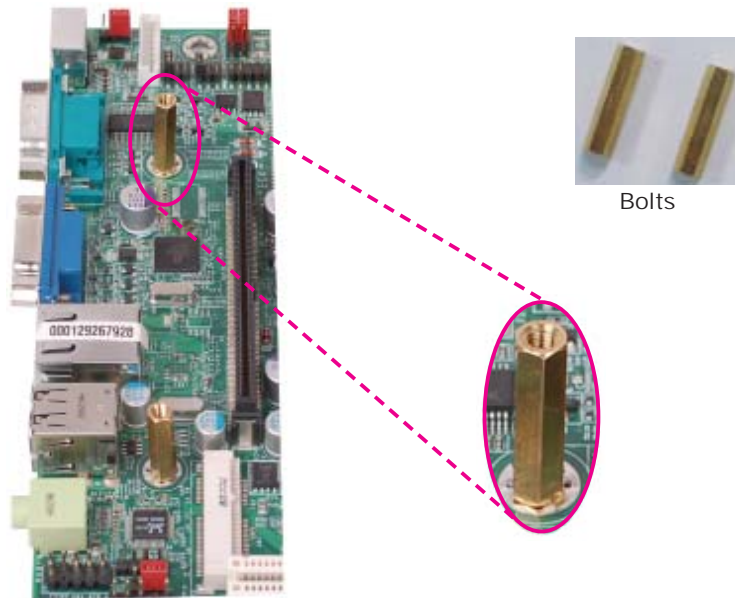
Bolts

4. Grasping the XLT0-2C1G2U by its edges, position it on top of the LR102 board with its mounting holes aligned with the bolts on the LR102. This will also align the two boards to each other.

Daughterboard Connector
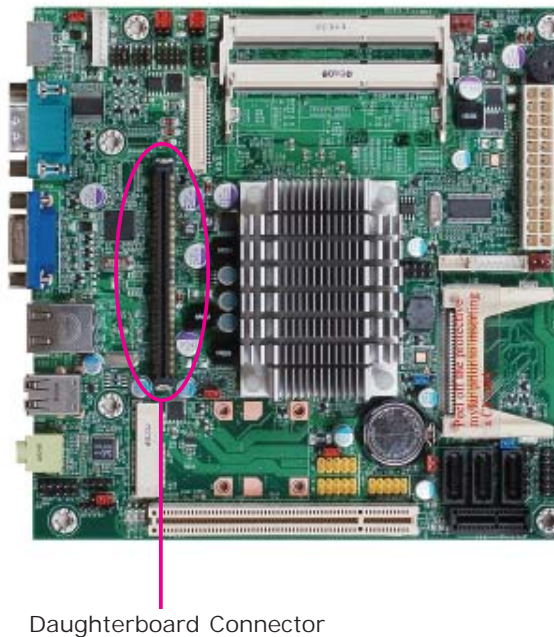
5. Press the XLT0-2C1G2U down firmly until it is completely seated on the daughterboard connector of the LR102.

XLT0-2C1G2U

LR102 Series
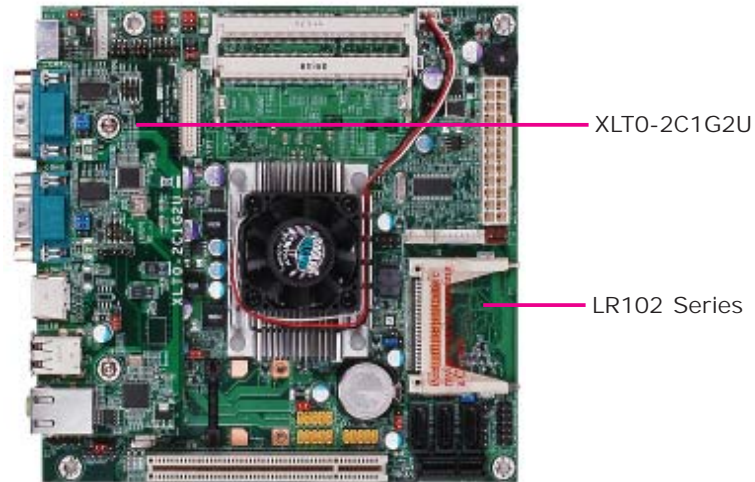
Chapter 3 - BIOS Setup

Overview

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

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

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

Legends

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

AMI BIOS Setup Utility

Main

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

```
                         BIOS SETUP UTILITY
   Main      Advanced     PCIPnP     Boot     Security    Chipset     Exit

  System Overview                                    Use [ENTER], [TAB]
                                                     or [SHIFT-TAB] to
  AMIBIOS                                            select a field.
  Version      :08.00.15
  Build Date:  :03/11/10                             Use [+] or [-] to
  ID           :AE0HCO21                             configure system Time.

  Processor
  Intel(R) Atom(TM) CPU D525          @ 1.80GHz
  Speed        :1800MHz
  Count        :1

  System Memory
  Size         :2038MB                               ←→     Select Screen
                                                     ↑↓     Select Item
  System Time                     [16:00:09]         +-     Change Field
  System Date                     [Wed 05/12/2010]   Tab    Select Field
                                                     F1     General Help
                                                     F10    Save and Exit
                                                     ESC    Exit

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```

AMI BIOS

Displays the detected BIOS information.

Processor

Displays the detected processor information.

System Memory

Displays the detected system memory information.

System Time

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

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

3

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.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit

Advanced Settings

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

► CPU Configuration
► IDE Configuration
► Super IO Configuration
► Hardware Health Configuration
► ACPI Configuration
► AHCI Configuration
► Trusted Computing
► USB Configuration

Configure CPU.

←→   Select Screen
↑↓   Select Item
Enter   Go to Sub Screen
F1   General Help
F10   Save and Exit
ESC   Exit

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CPU Configuration

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

```
                        BIOS SETUP UTILITY
        Advanced

  Configure advanced CPU settings                    Disabled for WindowsXP
  Module Version:3F.1A

  Manufacturer   : Intel
  Intel(R) Atom(TM) CPU D525      @ 1.80GHz
  Frequency      :  1.80GHz
  FSB Speed      :  800MHz
  Cache L1       :  48 KB
  Cache L2       :  1024 KB
  Ratio Actual Value:9

  Max CPUID Value Limit        [Disabled]
  Execute-Disable Bit Capability   [Enabled]           ←  →   Select Screen
  Hyper Threading Technology   [Enabled]               ↑↓     Select Item
                                                       +−     Change Option
                                                       F1     General Help
                                                       F10    Save and Exit
                                                       ESC    Exit

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```

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.

Hyper Threading Technology

Enable this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology. When disabled, only one thread per enabled core is enabled.

IDE Configuration

This section is used to configure the IDE drives.

```
                      BIOS SETUP UTILITY
          Advanced

  IDE Configuration                                          Options

  ATA/IDE Configuration          [Enhanced]          Disabled
     Configure SATA as           [IDE]               Compatible
                                                     Enhanced
  ► Primary IDE Master          : [Not Detected]
  ► Primary IDE Slave           : [Not Detected]
  ► Secondary IDE Master        : [Not Detected]
  ► Third IDE Master            : [Not Detected]
  ► Third IDE Slave             : [Not Detected]


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

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```

ATA/IDE Configuration

This field is used to configure the IDE drives. The options are Disabled, Compatible and Enhanced.

Configure SATA as

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

AHCI
This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).

Primary IDE Master to Third 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                                    Select the type
                                                       of device connected
 Device      :Not Detected                             to the system.

 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 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

If the device supports LBA mode, the LBA mode will automatically be enabled, that is, if the device was not previuosly formatted with the LBA mode disabled.

   Disabled

Disables the LBA mode.

Block (Multi-Sector Transfer)

   Auto

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

   Disabled

Data transfer from and to 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. 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.

32Bit Data Transfer

Enables or disables 32-bit data transfer.

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 Win627DHG-P Super IO Chipset              Allows BIOS to select
                                                      Serial Port 1 Base
  Serial Port1 Address                [3F8/IRQ4]      Addresses.
  Serial Port2 Address                [2F8/IRQ3]
  PWRON After PWR-Fail                 [Former-Sts]

  Configure Secondary Fintek F81217U Super IO Chipset

  Serial Port3 Address                [3E8]
    Serial Port3 IRQ                  [11]
  Serial Port4 Address                [2E8]
    Serial Port4 IRQ                  [10]

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

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```

Serial Port1 Address to Serial Port4 Address

Auto
Automatically selects a base address for the COM port.

3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4
Selects the COM port's base address.

Disabled
Disables the COM 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.

This field is used to select the time interval of the Watchdog timer. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

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.

Hardware Health Configuration

This section is used to configure the hardware monitor function.

```
                         BIOS SETUP UTILITY
          Advanced

 Hardware Health Configuration                          Enabled for Case Open
                                                        Detection. If Case is
 Case Open Detection             [Disabled]             open, system will show
 System Temperature              :48°C/118°F            warning message and beep
 CPU Temperature                 :60°C/140°F            warning.

 SYSFAN Speed                    :NA
 CPUFAN Speed                    :6250 RPM

 Vcore                           :1.184 V
 5V                              :5.222 V
 1.05V                           :1.056 V
 1.5V                            :1.840 V
 12V                             :12.355 V              ←→      Select Screen
 VSB                             :3.440 V               ↑↓      Select Item
 VBAT                            :3.088 V               +-      Change Option
 CPUFAN Mode Setting                                    F1      General Help
   CPUFAN PWM Control            [Manual Mode]          F10     Save and Exit
                                 [255]                  ESC     Exit


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```

Case Open Detection

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

System Temperature to VBAT (V)

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

CPU Fan Mode Setting

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

CPU Fan 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.

BIOS SETUP UTILITY	
Advanced	

ACPI Settings | General ACPI configuration settings

▶ General ACPI Configuration
▶ Advanced ACPI Configuration
▶ Chipset ACPI Configuration

←→   Select Screen
↑↓   Select Item
Enter Go to Sub Screen
F1   General Help
F10   Save and Exit
ESC   Exit

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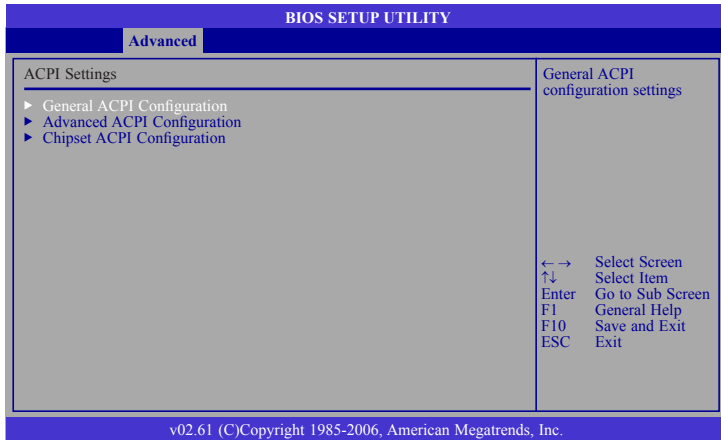
General ACPI Configuration

Configures the general ACPI settings.

BIOS SETUP UTILITY	
Advanced	

General ACPI Configuration

Suspend mode   [Auto]
Repost Video on S3 resume [No]

←→   Select Screen
↑↓   Select Item
F1   General Help
F10   Save and Exit
ESC   Exit

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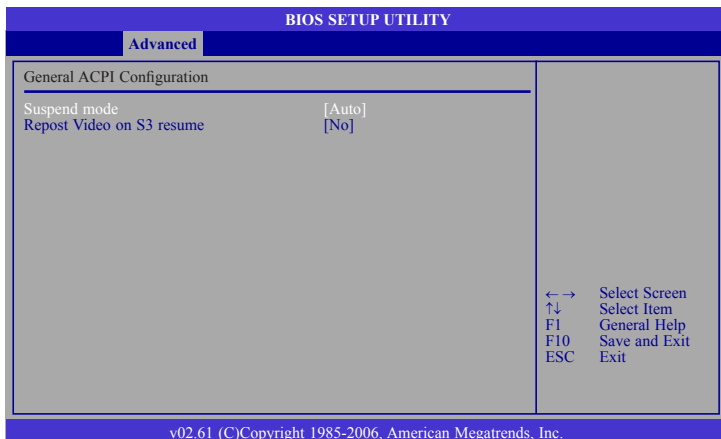
Suspend Mode

S3(STR)
Enables the Suspend to RAM function.

Repost Video on S3 Resume

When this field is set to Yes, 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)".

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 v3.0]	Different ACPI version has some addition.
	←→ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.	
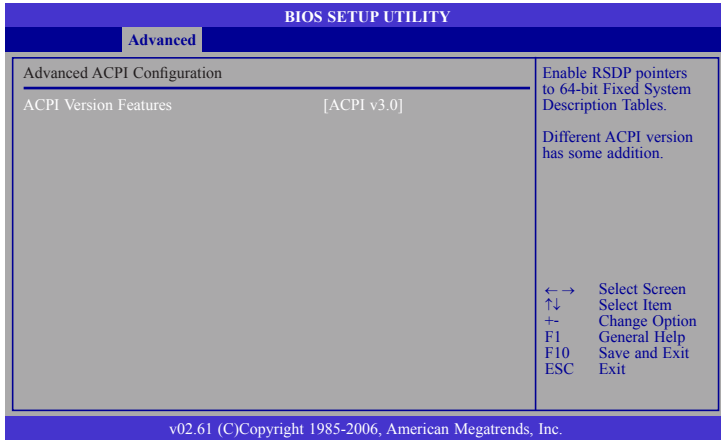
ACPI Version Features

Selects the ACPI version. The options are ACPI v1.0, ACPI v2.0 and ACPI v3.0.

Chipset ACPI Configuration

Configures relevant chipset ACPI functions.

```
                           BIOS SETUP UTILITY
        Advanced

 South Bridge ACPI Configuration                        Enable/Disable
                                                        APIC ACPI SCI IRQ.
 USB Device Wakeup From S3/S4          [Disabled]




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


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```
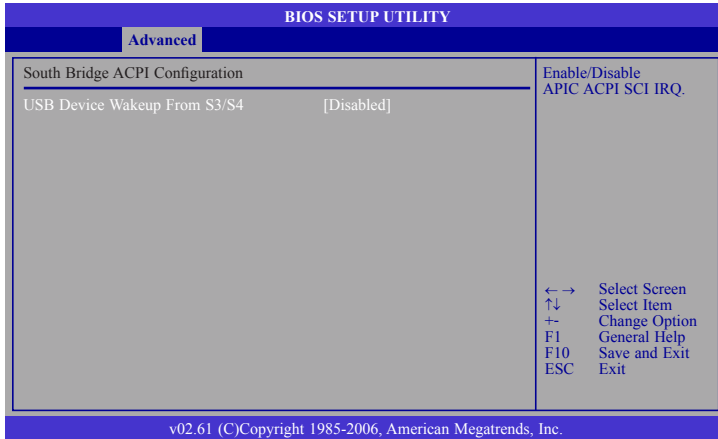
APIC ACPI SCI IRQ

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) and S4 state.

AHCI Configuration

This section is used to configure AHCI.

```
                        BIOS SETUP UTILITY
            Advanced

 AHCI Settings                                    While entering setup,
                                                  BIOS auto detects the
 ▶  AHCI Port0 [Not Detected]                     presence of IDE devices.
 ▶  AHCI Port1 [Not Detected]                     This displays the status
 ▶  AHCI Port2 [Not Detected]                     of auto detection of IDE
                                                  devices.




                                                  ←→      Select Screen
                                                  ↑↓      Select Item
                                                  Enter   Go to Sub Screen
                                                  F1      General Help
                                                  F10     Save and Exit
                                                  ESC     Exit

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```

AHCI Port0 to AHCI Port2

Configures the AHCI port.

```
                      BIOS SETUP UTILITY
         Advanced

  AHCI Port0                                      Select the type
                                                  of device connected
  Device      :Not Detected                       to the system.

  SATA Port0                    [Auto]
  S.M.A.R.T.                    [Enabled]




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

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```
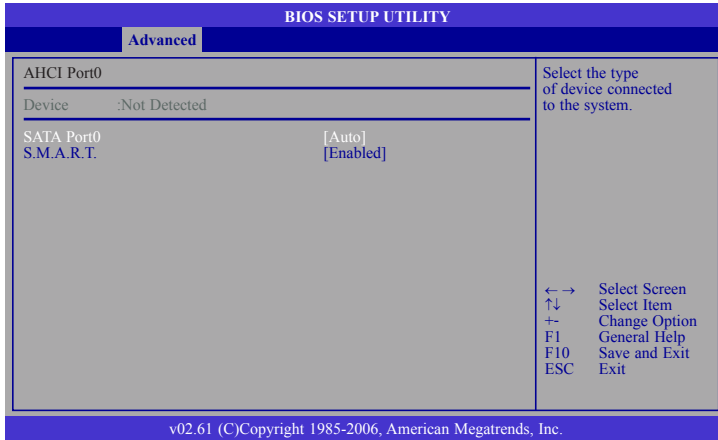
SATA Port0

Selects 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.

Trusted Computing

This section configures settings relevant to Trusted Computing innovations.

```
                         BIOS SETUP UTILITY
      Advanced

  Trusted Computing                                     Enables support for
                                                        legacy USB. AUTO
  TCG/ TPM Support                  [No]                option disables
                                                        legacy support if
                                                        no USB devices are
                                                        connected.




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

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```

USB Configuration

This section is used to configure USB devices.

```
                        BIOS SETUP UTILITY
        Advanced

  USB Configuration                                    Enables support for
                                                       legacy USB. AUTO
  Module Version - 2.24.5-14.4                         option disables
                                                       legacy support if
  USB Devices Enabled :                                no USB devices are
        None                                           connected.

  Legacy USB Support              [Enabled]
  USB 2.0 Controller Mode         [HiSpeed]
  BIOS EHCI Hand-Off              [Enabled]


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

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```

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                              Clear NVRAM during
                                                         System Boot.
  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  Clear NVRAM                          [No]
  Plug & Play O/S                      [No]
  PCI Latency Timer                    [64]

  IRQ3                                 [Available]
  IRQ4                                 [Available]
  IRQ5                                 [Available]
  IRQ7                                 [Available]
  IRQ9                                 [Available]
  IRQ10                                [Available]
  IRQ11                                [Available]
  IRQ14                                [Available]
  IRQ15                                [Available]

                                                         ←→   Select Screen
                                                         ↑↓   Select Item
                                                         +-   Change Option
                                                         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 configures Plug and Play (PnP) devices that are not re-
quired 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 im-
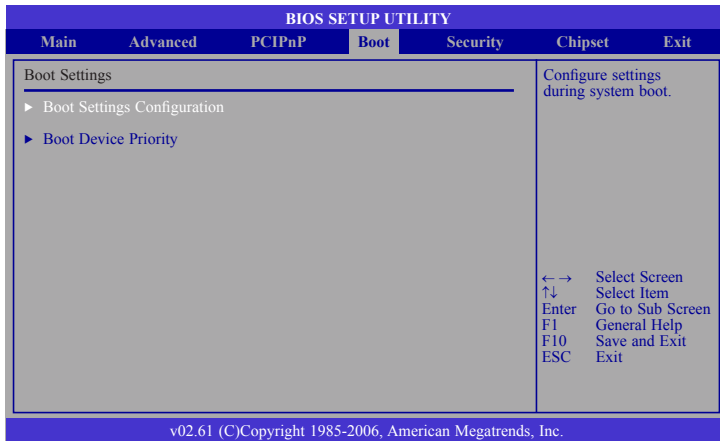prove it.

IRQ3 to IRQ15

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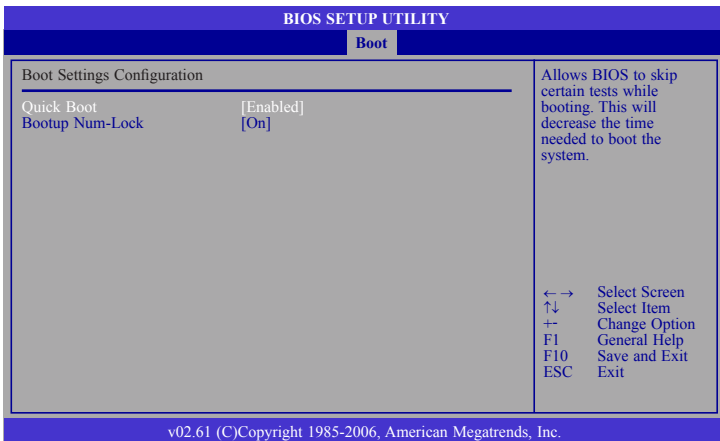The specified IRQ is available for PCI/PnP devices.

Reserved
The specified IRQ is reserved for Legacy ISA devices.

Boot

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]
Bootup Num-Lock   [On]

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.

Bootup Num-Lock

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

Boot Device Priority

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

```
                        BIOS SETUP UTILITY
                                      Boot

    Boot Device Priority                          Specifies the boot
                                                  sequence from the
    1st Boot Device         [Network: IBA GE Slo] 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

Selects the drive to boot first in the "1st Boot Device" field. The BIOS will boot the operating system according to the sequence of the drive selected.
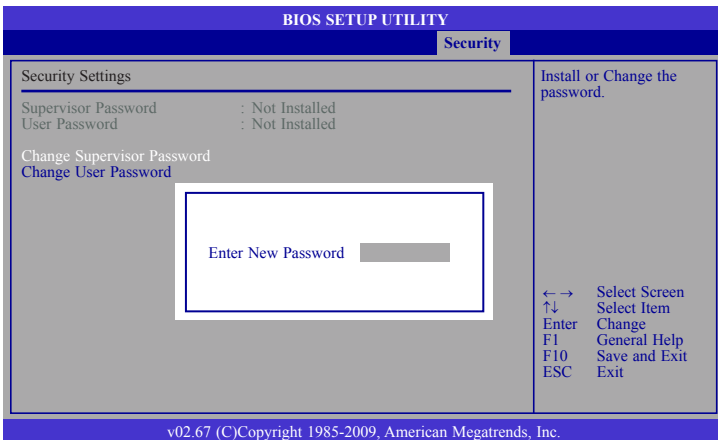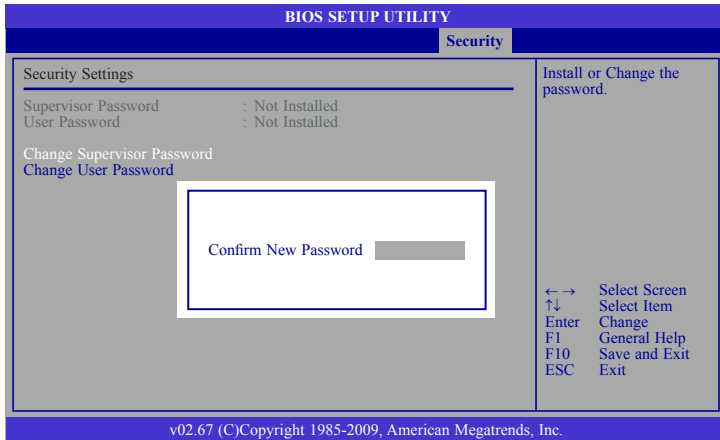
Security

```
                       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




                                                      ←→      Select Screen
                                                      ↑↓      Select Item
                                                      Enter   Change
                                                      F1      General Help
                                                      F10     Save and Exit
                                                      ESC     Exit

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```
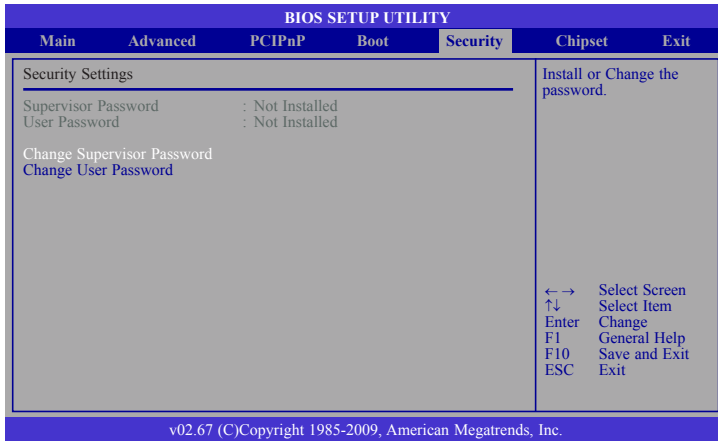
Change Supervisor Password

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
                                                     Security

  Security Settings                                   Install or Change the
                                                      password.
  Supervisor Password          : Not Installed
  User Password                : Not Installed

  Change Supervisor Password
  Change User Password

        ┌─────────────────────────────────┐
        │                                 │
        │   Enter New Password   [      ] │
        │                                 │          ←→      Select Screen
        │                                 │          ↑↓      Select Item
        └─────────────────────────────────┘          Enter   Change
                                                      F1      General Help
                                                      F10     Save and Exit
                                                      ESC     Exit

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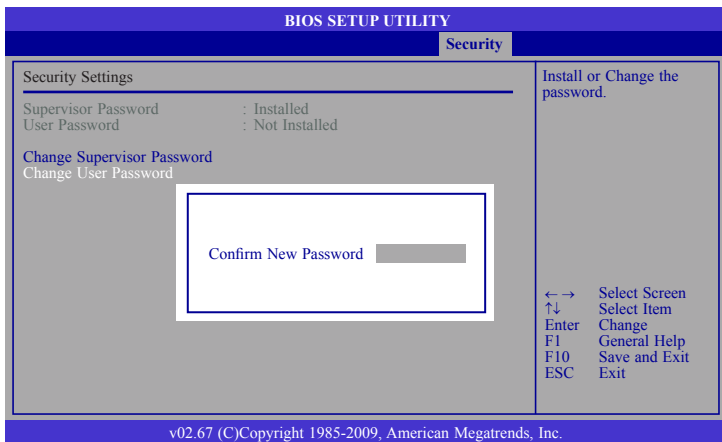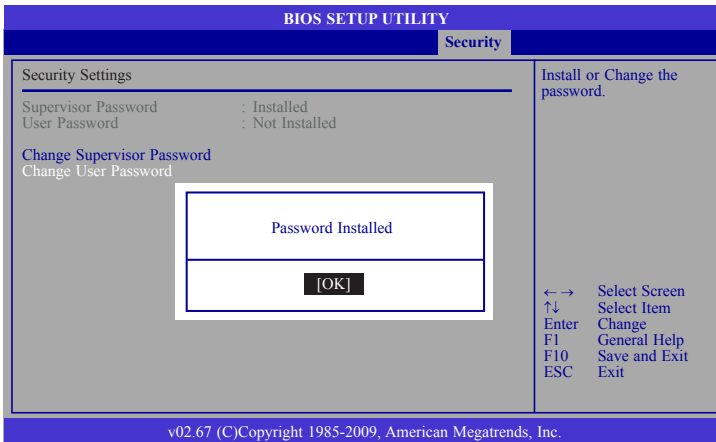
3. Press <Enter> to confirm the new password.

```
                        BIOS SETUP UTILITY
                                            Security

  Security Settings                               Install or Change the
                                                  password.
  Supervisor Password          : Not Installed
  User Password                : Not Installed

  Change Supervisor Password
  Change User Password


                Confirm New Password  [          ]

                                                  ← →      Select Screen
                                                  ↑↓       Select Item
                                                  Enter    Change
                                                  F1       General Help
                                                  F10      Save and Exit
                                                  ESC      Exit

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```

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

```
                        BIOS SETUP UTILITY
                                            Security

  Security Settings                               Install or Change the
                                                  password.
  Supervisor Password          : Not Installed
  User Password                : Not Installed

  Change Supervisor Password
  Change User Password

                       Password Installed

                           [OK]

                                                  ← →      Select Screen
                                                  ↑↓       Select Item
                                                  Enter    Change
                                                  F1       General Help
                                                  F10      Save and Exit
                                                  ESC      Exit

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```
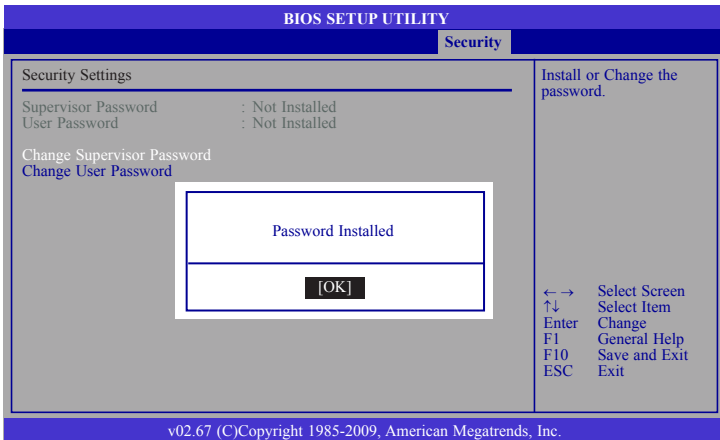
To change the password, repeat the same steps above.

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
                                            Security

  Security Settings                                  Limited: allows only
                                                     limited fields to be
  Supervisor Password      : Installed               changed such as Date
  User Password            : Not Installed            and Time.
                                                     No Access: prevents
  Change Supervisor Password                         User access to the
  User Access Level        [Full Access]             Setup Utility.
  Change User Password                               View Only: allows ac-
  Password Check           [Setup]                   cess to the Setup Utility
                                                     but the fields can not be
                                                     changed.

                                                     ← →    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 limited change to some fields such as Date and Time.

No Access
Prevents user 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.

BIOS SETUP UTILITY

Security

Security Settings

Supervisor Password   : Installed
User Password   : Not Installed

Change Supervisor Password
Change User Password

Enter New Password

Install or Change the 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.

BIOS SETUP UTILITY

Security

Security Settings

Supervisor Password   : Installed
User Password   : Not Installed

Change Supervisor Password
Change User Password

Confirm New Password

Install or Change the password.

←→   Select Screen
↑↓   Select Item
Enter   Change
F1   General Help
F10   Save and Exit
ESC   Exit

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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>. Click OK.
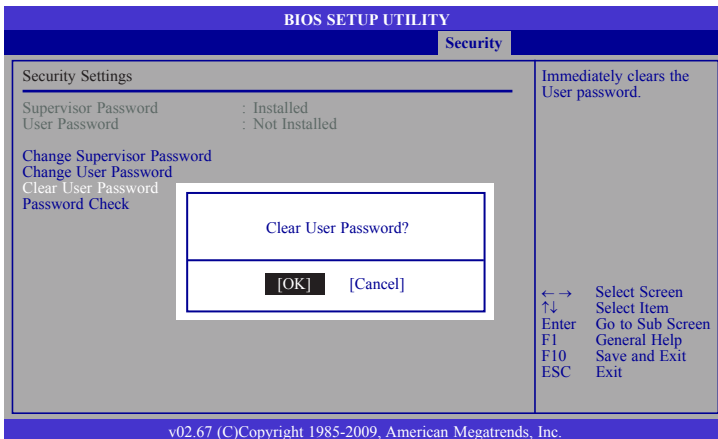
Password Check

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.

Chipset

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

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

Advanced Chipset Settings

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

▶ North Bridge Configuration
▶ South Bridge Configuration

Configure North Bridge features.

← →   Select Screen
↑↓   Select Item
Enter   Go to Sub Screen
F1   General Help
F10   Save and Exit
ESC   Exit

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North Bridge Configuration

BIOS SETUP UTILITY

Chipset

North Bridge Chipset Configuration

PCI MMIO Allocation: 4GB to 3072MB

Initiate Graphic Adapter   [IGD]
Internal Graphics Mode Select   [Enabled, 8MB]

▶ Video Function Configuration

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

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

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Initiate Graphics Adapter

Selects the 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.

Video Function Configuration

```
                         BIOS SETUP UTILITY
                                                    Chipset

  Video Function Configuration                        Options

  DVMT Mode Select           [DVMT Mode]         Fixed Mode
     DVMT/FIXED Memory       [256MB]             DVMT Mode

  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.

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.

South Bridge Configuration

```
                    BIOS SETUP UTILITY
                                              Chipset

 South Bridge Chipset Configuration                   Options

 USB Functions            [10 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
 HDA Controller           [Enabled]            10 USB Ports




                                               ←→   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 GbE 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 simulta- neously 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.

HDA Controller

Enables or disables the High Definition audio controller.

Exit

```
                       BIOS SETUP UTILITY
   Main      Advanced     PCIPnP      Boot      Security     Chipset     Exit

  Exit Options                                    Exit system setup
                                                  after saving the
  Save Changes and Exit                           changes.
  Discard Changes and Exit
  Discard Changes                                 F10 key can be used
                                                  for this operation.
  Load Optimal Defaults
  Load Failsafe Defaults


                                                  ←→      Select Screen
                                                  ↑↓      Select Item
                                                  Enter   Go to Sub Screen
                                                  F1      General Help
                                                  F10     Save and Exit
                                                  ESC     Exit

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```

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.

```
                       BIOS SETUP UTILITY
   Main      Advanced     PCIPnP      Boot      Security     Chipset     Exit

  Exit Options                                    Exit system setup
                                                  after saving the
  Save Changes and Exit                           changes.
  Discard Changes and Exit
  Discard Changes                                 F10 key can be used
                                                  for this operation.
  Load Optimal D
  Load Failsafe D
             Save configuration changes and exit setup?

                [Ok]              [Cancel]            Select Screen
                                                  ↑↓      Select Item
                                                  Enter   Go to Sub Screen
                                                  F1      General Help
                                                  F10     Save and Exit
                                                  ESC     Exit

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```

3

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.

```
                    BIOS SETUP UTILITY
  Main      Advanced     PCIPnP      Boot      Security      Chipset      Exit

  Exit Options                                     Exit system setup
                                                   without saving any
  Save Changes and Exit                            changes.
  Discard Changes and Exit
  Discard Changes                                  ESC key can be used
                                                   for this operation.
  Load Optimal Defaul
  Load Failsafe Defaul
                     ┌─────────────────────────────┐
                     │  Discard changes and exit setup? │
                     │                             │
                     │   [Ok]          [Cancel]    │
                     └─────────────────────────────┘
                                            →       Select Screen
                                            ↑↓      Select Item
                                            Enter   Go to Sub Screen
                                            F1      General Help
                                            F10     Save and Exit
                                            ESC     Exit

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```

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.

```
                    BIOS SETUP UTILITY
  Main      Advanced     PCIPnP      Boot      Security      Chipset      Exit

  Exit Options                                     Discards changes
                                                   done so far to any of
  Save Changes and Exit                            the setup questions.
  Discard Changes and Exit
  Discard Changes                                  F7 key can be used
                                                   for this operation.
  Load Optimal Defaults
  Load Failsafe Defaults
              ┌──────────────────────┐
              │                      │
              │   Discard Changes?   │
              │                      │
              │   [Ok]     [Cancel]  │
              │                      │
              └──────────────────────┘
                                            ←→      Select Screen
                                            ↑↓      Select Item
                                            Enter   Go to Sub Screen
                                            F1      General Help
                                            F10     Save and Exit
                                            ESC     Exit

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```

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BIOS Setup

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.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit

Exit Options

Save Changes and Exit
Discard Changes and Exit
Discard Changes

Load Optimal Defaults
Load Failsafe Defaults

Load Optimal Defaults?

[Ok]   [Cancel]

Load Optimal Default values for all the setup questions.

F9 key can be used for this operation.

← →   Select Screen
↑↓   Select Item
Enter   Go to Sub Screen
F1   General Help
F10   Save and Exit
ESC   Exit

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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.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit

Exit Options

Save Changes and Exit
Discard Changes and Exit
Discard Changes

Load Optimal Defaults
Load Failsafe Defaults

Load Failsafe Defaults?

[Ok]   [Cancel]

Load Failsafe Default values for all the setup questions.

F8 key can be used for this operation.

← →   Select Screen
↑↓   Select Item
Enter   Go to Sub Screen
F1   General Help
F10   Save and Exit
ESC   Exit

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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 /p /n /c

then press <Enter>.

```
[C:\LANID\INTEL]>AFUDOS filename.ROM /B /P /N /C

 +----------------------------------------------------------------------------+
 |                          AMI Firmware Update Utility v4.33                  |
 |            Copyright (C) 2009 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:\LANID\INTEL]>
```

Chapter 4 - Supported Software

The CD that came with the 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, 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 now ready to in-stall the utility. Click Next.

2. Read the license agreement then click Yes.
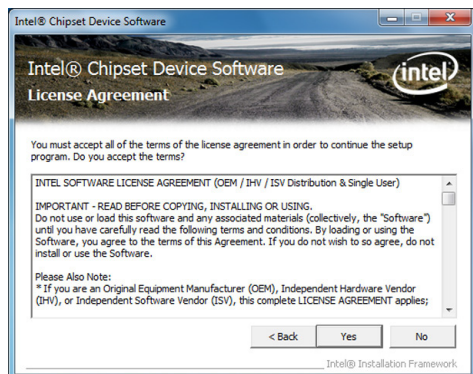
3. Go through the readme document for system requirements and installation tips then click Next.
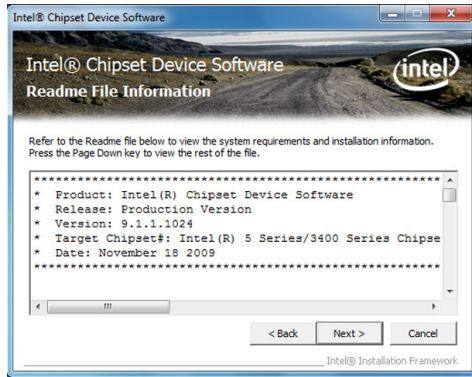
5. After completing installation, click Finish to exit setup.

CH7036 Control Center

To install the driver, click "CH7036 Control Center" on the main menu.

1. Read the license agreement. Click "I Agree" then click Next.
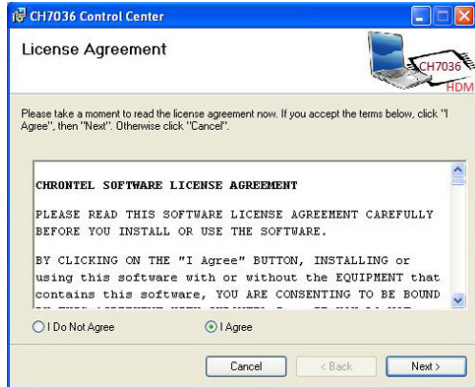
2. Setup is now ready to guide you through the setup. Click Next.
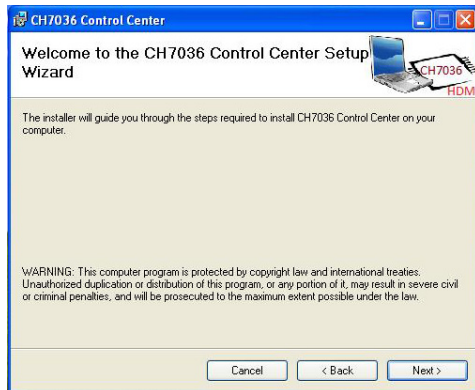
3. Select a folder to install the driver then click Next.
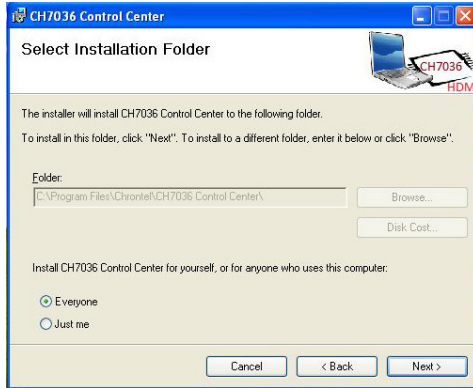
4. Setup is ready for the installation. Click Next to continue.
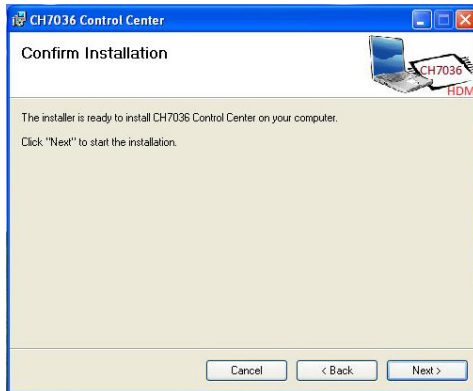
4. Installation in process, please wait. Click Next to continue.
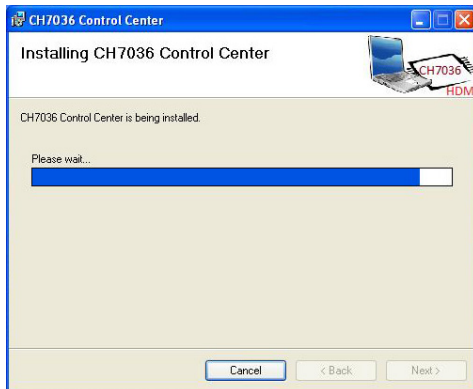
5. After completing instal-
   lation, click Close to exit
   setup.

Supported Software ····································
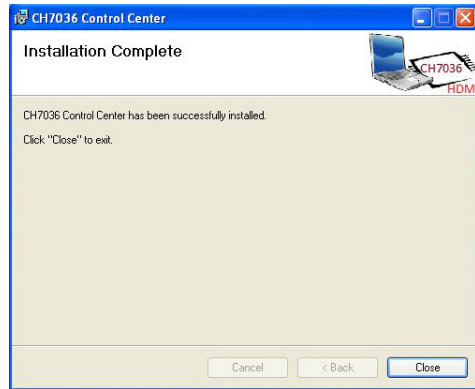
Intel Graphics Drivers

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

1. Setup is now ready to install the graphics driver. Click Next.
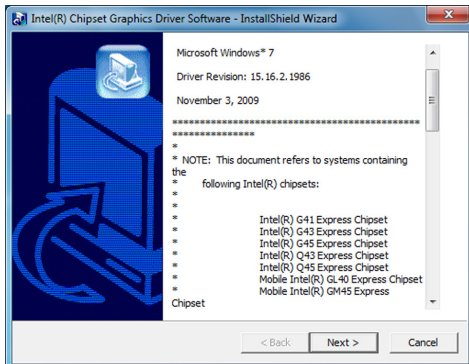
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 7 / Windows Vista desktop appears. 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.
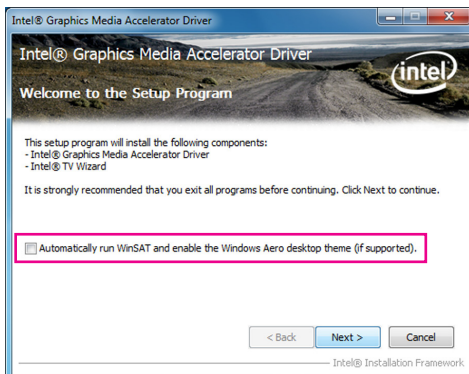
2. Read the license agreement then click Yes.

3. Go through the readme document for system requirements and installation tips then click Next.
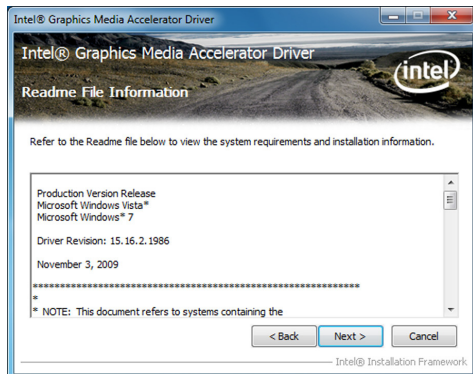
4. Setup is now installing the driver. Click Next to continue.
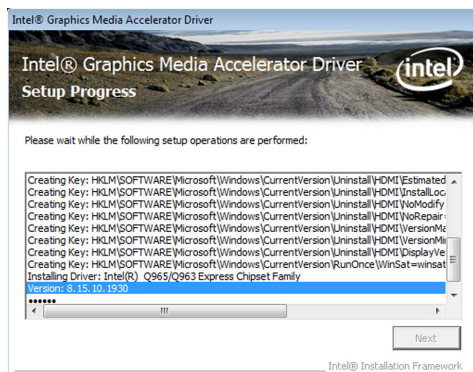
5. Click "Yes, I want to restart this computer now" then click Finish.

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

Audio Drivers

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

1. Setup is now ready to in-
   stall the driver. Click Next.

2. Follow the remainder of the
   steps on the screen; click-
   ing "Next" each time you
   finish a step.

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

   Restarting the system will
   allow the new software in-
   stallation to take effect.

Supported Software ································

Intel LAN Drivers

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

1. Setup is ready to install the driver. Click Next.
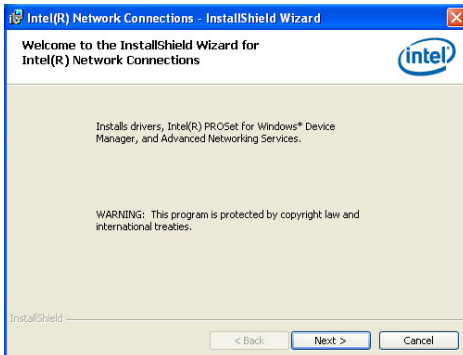
2. Click "I accept the terms in the license agreement" then click "Next".
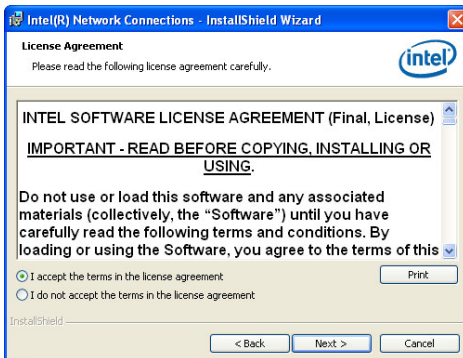
3. Select the program featuers you want installed then click Next.
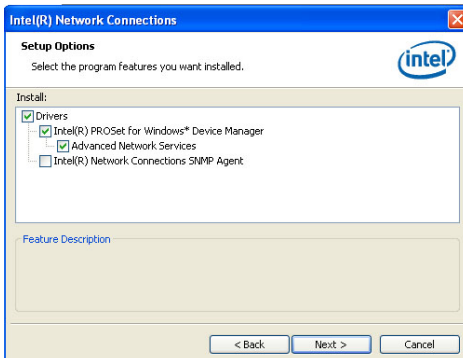
4. Click Install to begin the installation.

5. After completing installation, click Finish.

Supported Software ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪
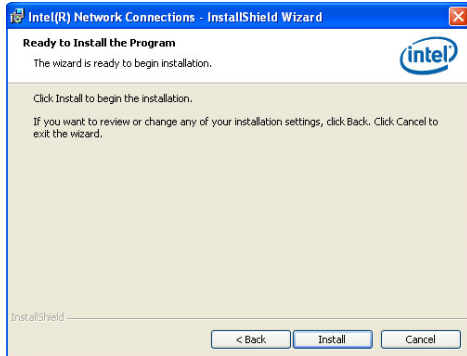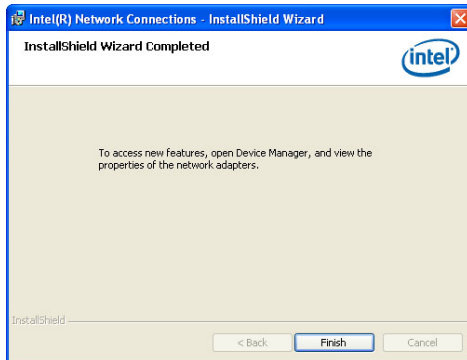
Hardware Monitor for Windows

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

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

1. Setup is now ready to in-
    stall the utility. Click Next.
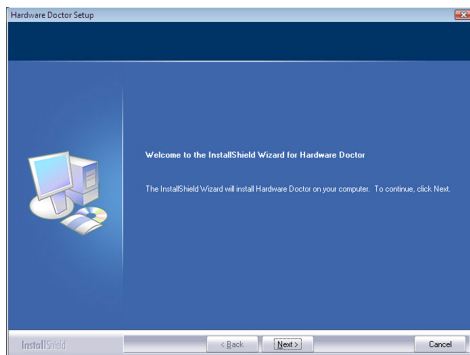
2. Click Next to install or click
    Browse to select another
    folder.
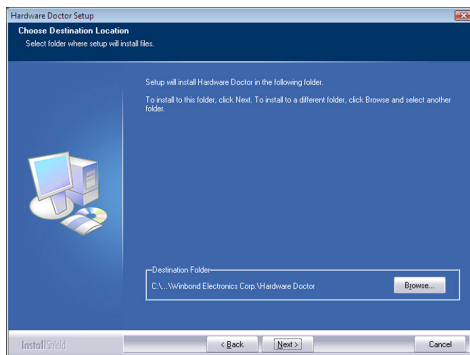
3. Click Next to add the pro-
gram icon to the Program
Folder.
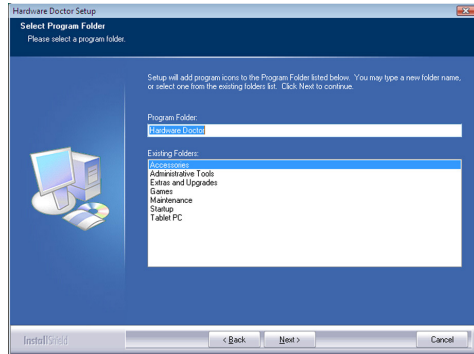
4. After completing instal-
lation, click Finish to exit
setup.
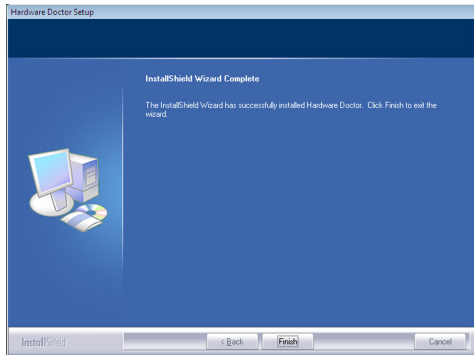
5. Click Yes if you want to
create a Hardware Doctor
shortcut at your desktop.

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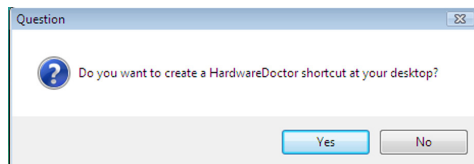
6. Click "Yes, I want to restart my computer now" then click Finish.

    Restarting the system will allow the utility to take effect.
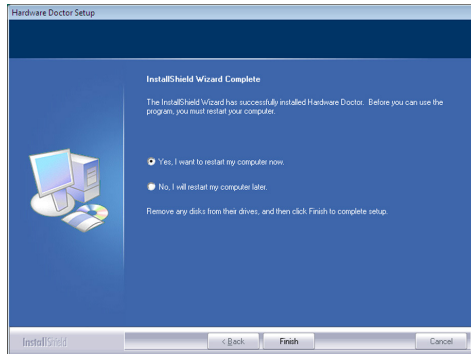
Using the Hardware Monitor for Windows Utility

1. On your desktop, right-click the Hardware Doctor icon and then select Properties.
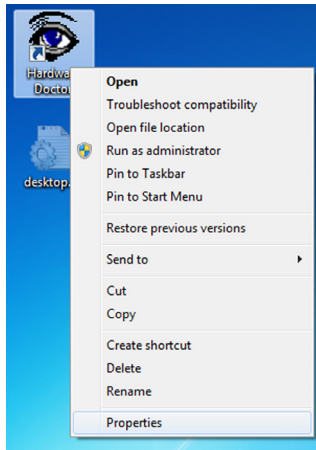
2. Select the Compatibility tab, click "Run this program as an administrator" then click OK.
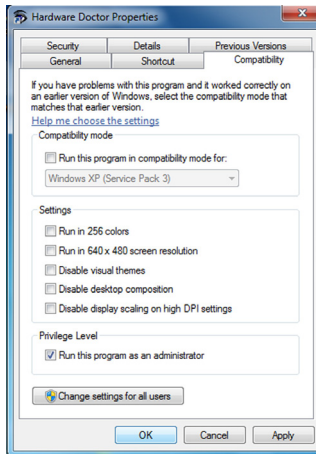
4. You can now access the utility.
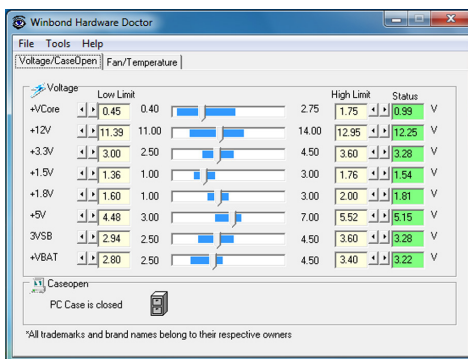
Intel Matrix Storage Manager Utility

Intel Matrix Storage Manager is a utility that allows you to monitor the current status of the SATA drives. It enables enhanced performance and power management for the storage subsystem.

To install the utility, click "Intel Matrix Storage Manager Utility" on the main menu.
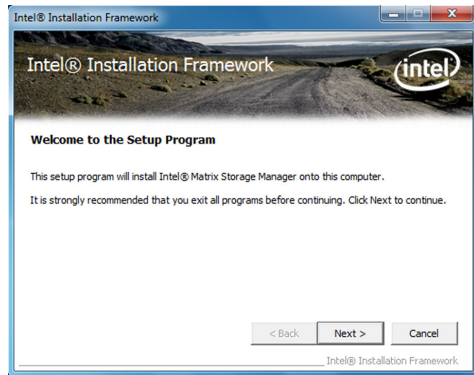
1. Setup is now ready to install the utility. Click Next.

2. Read the license agreement then click Yes.

Supported Software
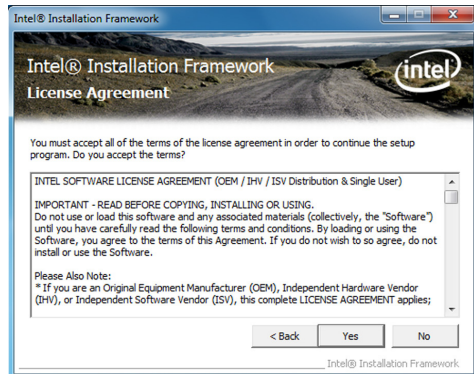
3. Go through the readme document for system requirements and installation tips then click Next.
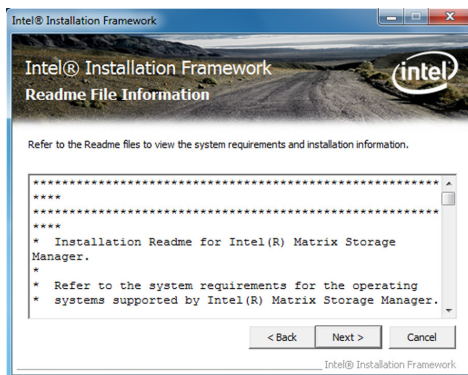
4. Setup is now installing the utility. Click Next to continue.
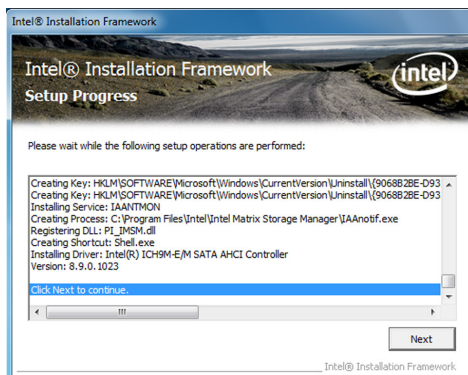
5. Click "Yes, I want to restart my computer now" then click Finish.

   Restarting the system will allow the new software installation to take effect.
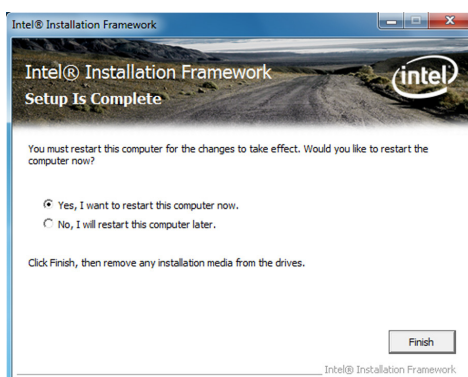
6. Run the Intel Matrix Storage Console utility to view the hard drives' configuration.
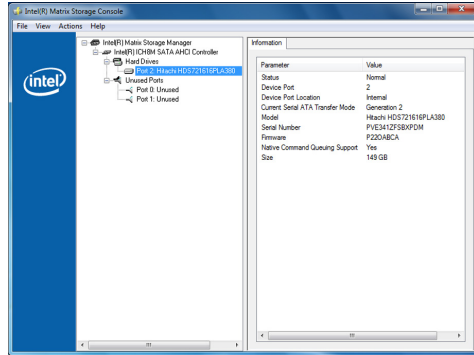
F6 Floppy Configuration Utility

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

1. Insert a blank floppy diskette.

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

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

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

Adobe Acrobat Reader 9.3

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

1. Click Next to install to the destination folder or click Change Destination folder to select another folder.
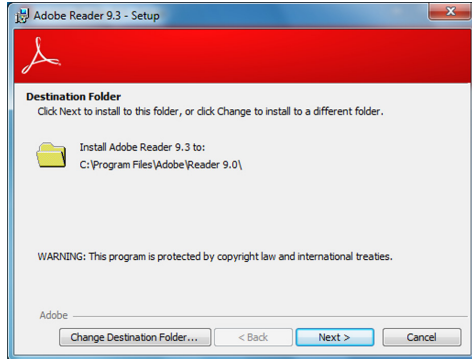
2. Click Install to begin instal-lation.

3. Click Finish to exit instal-laion.
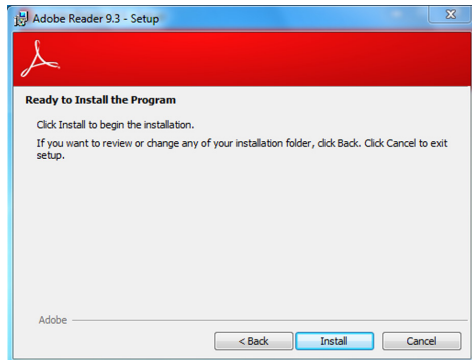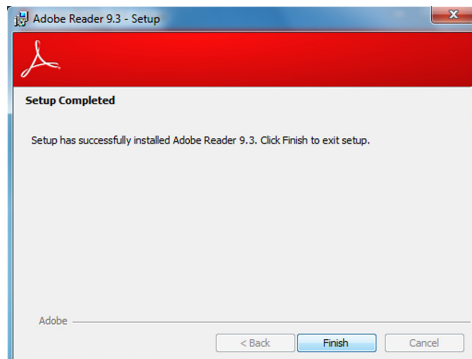
3. Click Finish to exit installation.
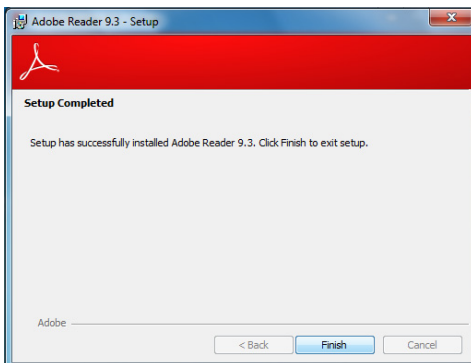
Appendix A - NLITE and AHCI Installation Guide

nLite

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

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

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

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

2. Install nLite.

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

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

   The downloaded driver files should include iaahci.cat, iaAHCI.inf, iastor.cat, iaStor. inf, IaStor.sys, license.txt and TXTSETUP.OEM.
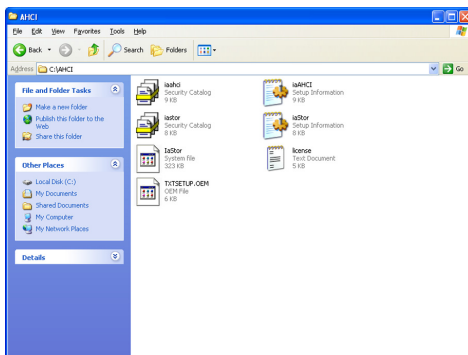
4. Insert the XP installation disc into an optical drive.

5. Launch nLite. The Welcome screen will appear. Click **Next**.
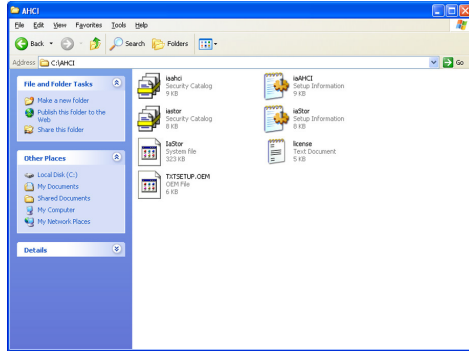
6. Click **Next** to temporarily save the Windows installa- tion files to the designated default folder.

   If you want to save them in another folder, click **Browse**, select the folder and then click **Next**.
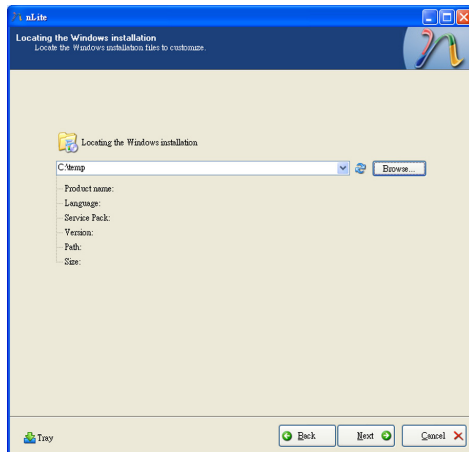
7. Click **Next**.
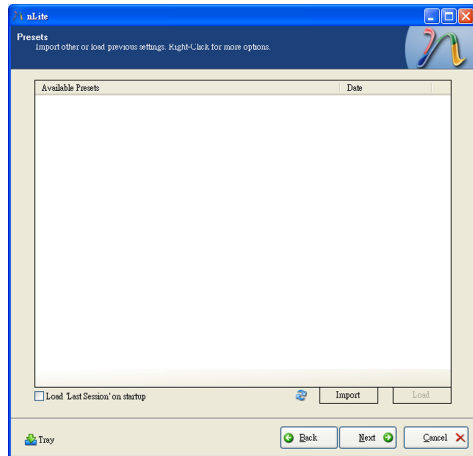
8. In the Task Selection dialog box, click **Drivers** and **Bootable ISO**. Click **Next**.
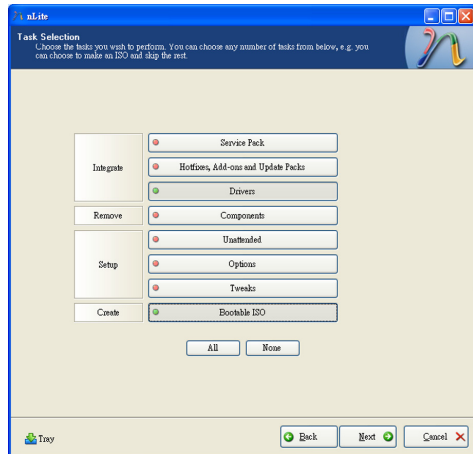
9. Click **Insert** and then se-
   lect **Multiple driver folder**
   to select the drivers you
   will integrate. Click **Next**.
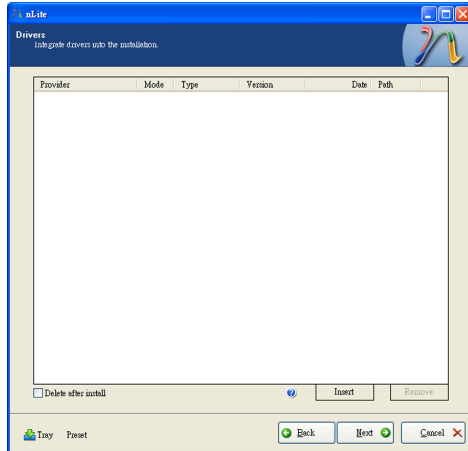
10. Select only the drivers
    appropriate for the Win-
    dows version that you are
    using and then click **OK**.

    Integrating 64-bit driv-
    ers into 32-bit Windows
    or vice versa will cause
    file load errors and failed
    installation.
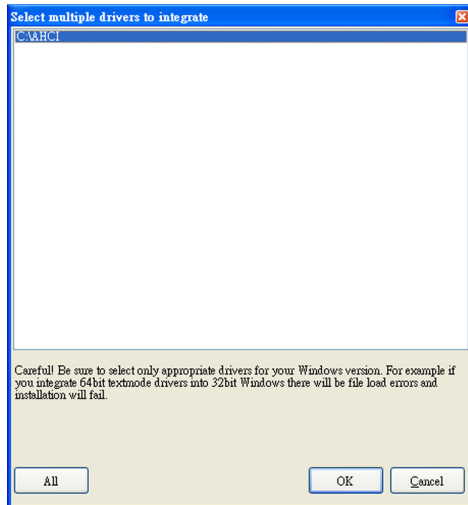
11. If you are uncertain of the southbridge chip used on your motherboard, select all RAID/AHCI controllers and then click **OK**.
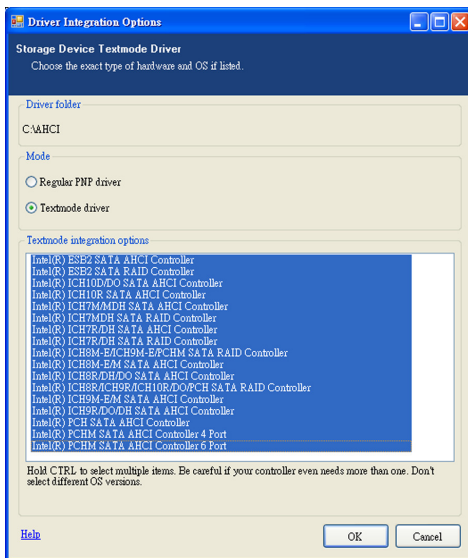
12. Click **Next**.
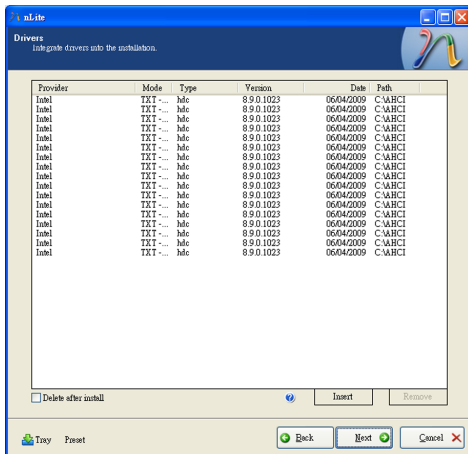
13. The program is currently integrating the drivers and applying changes to the installation.
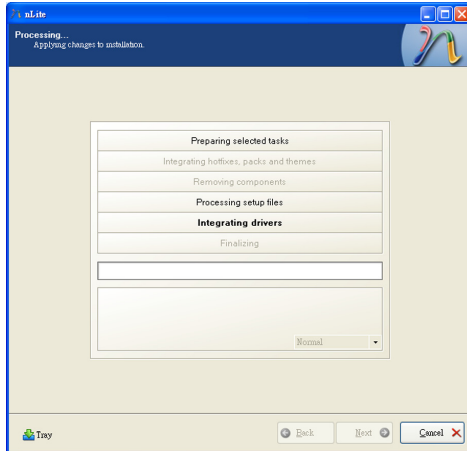
14. When the program is finished applying the changes, click **Next**.
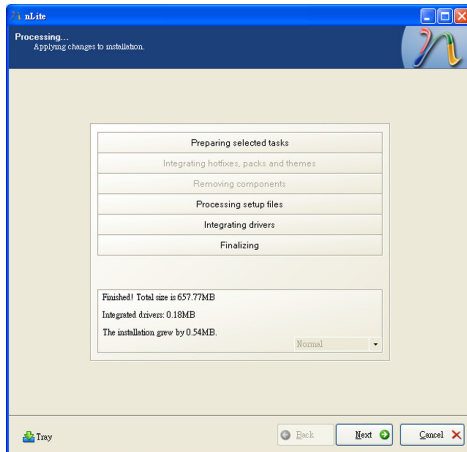
15. To create an image, se-
lect the **Create Image**
mode under the General
section and then click
Next.
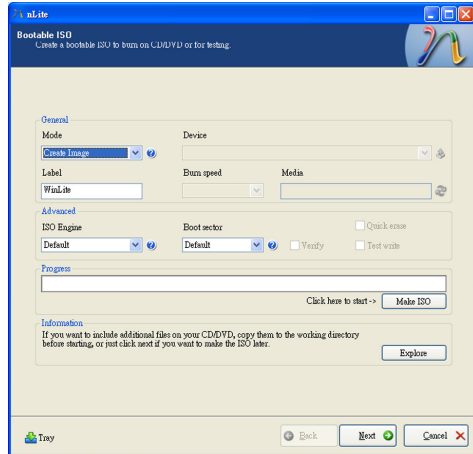
16. Or you can choose to
burn it directly to a disc
by selecting the **Direct
Burn** mode under the
General section.

Select the optical device
and all other necessary
settings and then click
Next.
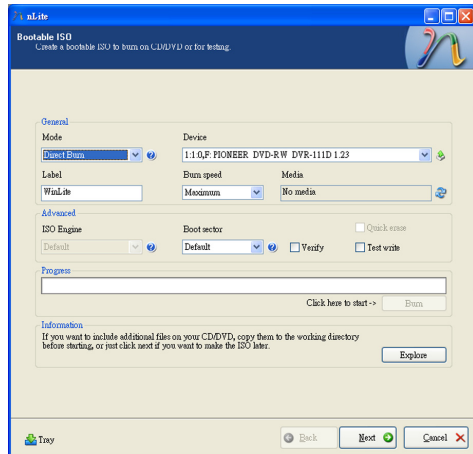
17. You have finished cus-
tomizing the Windows
XP installation disc. Click
Finish.

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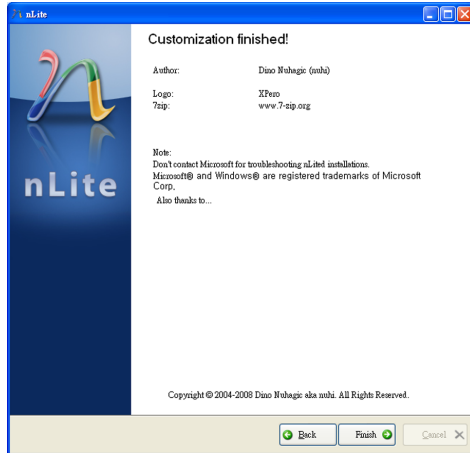
AHCI

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

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

2. Install Windows XP but do not press F6.

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

    Transfer the downloaded driver files to C:\AHCI.
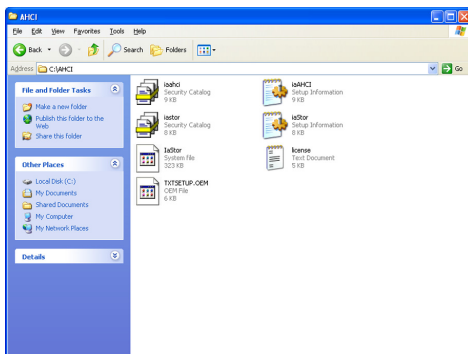
4. Open Device Manager and right click on one of the Intel Serial ATA Storage Controllers, then select **Update Driver**.

    If the controller you se-lected did not work, try selecting another one.
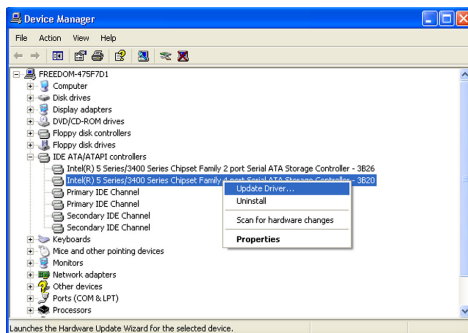
5. In the Hardware Update Wizard dialog box, select **"No, not this time"** then click **Next**.

6. Select **"Install from a list or specific location (Advanced)"** and then click **Next**.
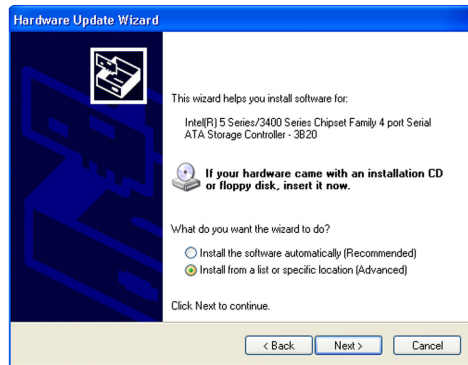
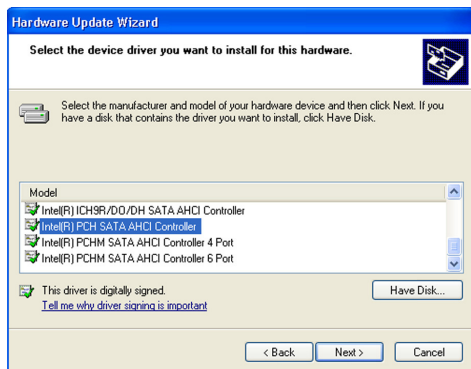7. Select **"Don't search. I will choose the driver to install"** and then click **Next**.
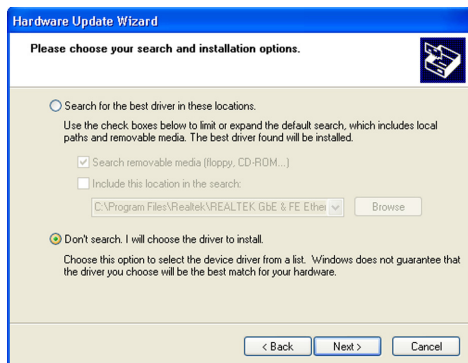
8. Click **"Have Disk"**.
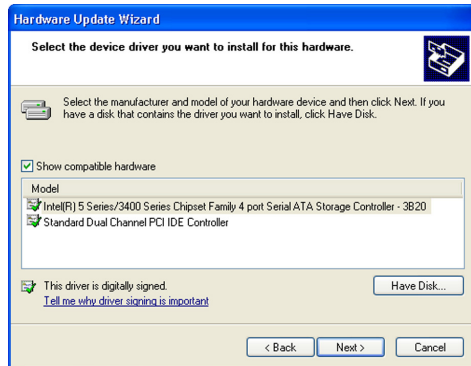
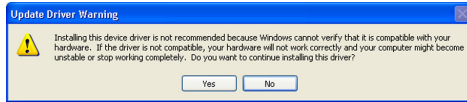9. Select C:\AHCI\iaAHCI.inf and then click **Open**.
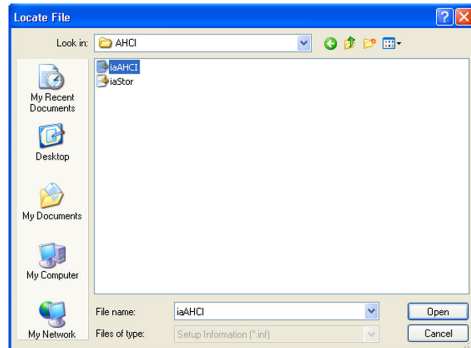
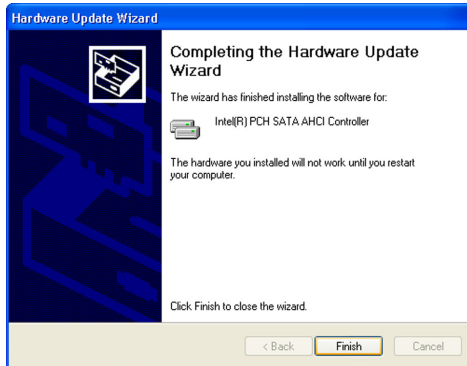10. Select the appropriate AHCI Controller of your hardware device and then click **Next**.

11. A warning message appeared because the selected SATA controller did not match your hardware device.
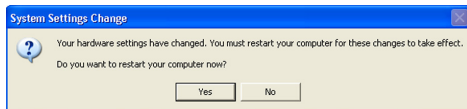
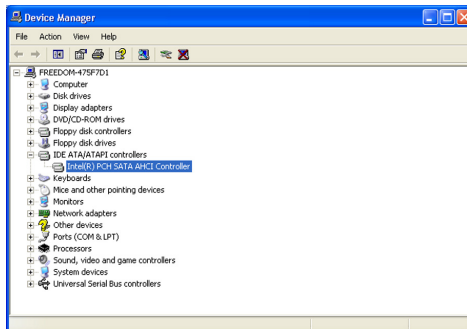Ignore the warning and click **Yes** to proceed.

12. Click **Finish**.

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

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

Appendix B - Watchdog Timer

Watchdog Timer

The following parameters are references for setting the time interval of the Watchdog Timer function. The system will regularly be "cleared" according to the set time interval. If the system hangs or fails to function, it will also reset according to the time interval so that your system will continue to operate.

```
.model small
.386

;-------------------
;Port defination
;-------------------
SuperIo_CFG_Port  EQU      2Eh        ;Super I/O Config port. (2Eh/4Eh)
SuperIo_DAT_Port  EQU      SuperIo_CFG_Port + 1

WDT_Counter       EQU      10         ; 1 to 255 (Sec./Min), 0 means disabled

mSuperio_Enter_Config      Macro
        mov     dx, SuperIo_CFG_Port
        mov     al, 87h
        out     dx, al
        NEWIODELAY
        out     dx, al
endM

mSuperio_Exit_Config       Macro
        mov     dx, SuperIo_CFG_Port
        mov     al, 0AAh
        out     dx, al
endM

mSuperio_GetSet_Reg        Macro RegIndex, AndMask, OrValue
        mov     dx, SuperIo_CFG_Port
        mov     al, RegIndex
        out     dx, al
        NEWIODELAY
        mov     dx, SuperIo_DAT_Port
        in      al, dx
        NEWIODELAY
        mov     ah, al
        and     al, AndMask
        or              al, OrValue
        out     dx, al
        NEWIODELAY
endM
mSuperio_Get_Reg Macro RegIndex
        mov     dx, SuperIo_CFG_Port
        mov     al, RegIndex
        out     dx, al
```

```
            NEWIODELAY
            mov     dx, SuperIo_DAT_Port
            in                  al, dx
            NEWIODELAY
    endM

    mSuperio_LDN_Select         Macro    LDN
            mSuperio_Set_Reg 07h, LDN
    endM

    mSuperio_Set_Reg Macro RegIndex, SetValue
            mov     dx, SuperIo_CFG_Port
            mov     al, RegIndex
            out     dx, al
            NEWIODELAY
            mov     dx, SuperIo_DAT_Port
            mov     al, SetValue
            out     dx, al
            NEWIODELAY
    endM

    NEWIODELAY      Macro
            out     0EBh, al  ;Dummy I/O output for delay
    endM

    .code

    start:
            call                W83627Hx_WDT

            mov     ah, 4ch
            int     21h

    W83627Hx_WDT    Proc    near
    ;LDN8
    ;CRF5[3]  :RW 0/1 = WDTO Second/Minute
    ;CRF5[2]  :RW 0/1 = Keyboard Reset Low/High when WDTO Timeout

    ;CRF6[7:0]:RW 00h = Disable , 01h~0FFh = 1~255 Sec/Min.

    ;CRF7[7]  :RW 0/1 = Disable/Enable Mouse interrupt reset WDTO counting.

    ;CRF7[6]  :RW 0/1 = Disable/Enable Keyboard interrupt reset WDTO counting.

    ;CRF7[5]  :WO 1   = Force WDTO time out(Auto clear).

    ;CRF7[4]  :RW 0/1 = WDTO time status TimeOut/Counting.

    ;CRF7[3:0]:RW 0~7 = Low IRQ for WDTO (Typical is 2, means SMI).

            mSuperio_Enter_Config

            mSuperio_LDN_Select 08h
```

; PLED mode register, WDTO time unit as second, Keyboard reset when WDTO time out

        mSuperio_GetSet_Reg 0F5h, 11110111b, 00000100b

; , Disable MS/KB interrupt reset WDTO counting, IRQ2 for WDTO

        mSuperio_GetSet_Reg 0F7h, 11111111b, 11000010b

; , WDTO Time out Value

        mSuperio_Set_Reg 0F6h, WDT_Counter

mSuperio_Exit_Config

@@:

        ret

W83627Hx_WDT   endP

end start

Appendix C - System Error Message

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

Error Messages

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

CMOS BATTERY HAS FAILED

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

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

CMOS CHECKSUM ERROR

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

DISPLAY SWITCH IS SET INCORRECTLY

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

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

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

Keyboard error or no keyboard present

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

Manufacturing POST loop

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

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

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

Appendix D - 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.

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.