SB332-C
Micro-ATX Industrial Motherboard
User's Manual

Copyright

This publication contains information that is protected by copyright. No part of it may be reproduced in any form or by any means or used to make any transformation/adaptation without the prior written permission from the copyright holders.

This publication is provided for informational purposes only. The manufacturer makes no representations or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. The user will assume the entire risk of the use or the results of the use of this document. Further, the manufacturer reserves the right to revise this publication and make changes to its contents at any time, without obligation to notify any person or entity of such revisions or changes.

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

© 2014. All Rights Reserved.

Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

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

This manual can be downloaded from the website, or acquired as an electronic file included in the optional CD/DVD. The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

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.

About the Package

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

- One SB332-C board
- One USB port cable (with bracket)
- One COM port cable (with bracket)
- One Serial ATA data cable
- One I/O shield
- One QR (Quick Reference)

The 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.

Optional Items

- USB port cable
- COM port cable
- Serial ATA data cable
- Serial ATA power cable
- I/O shield

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

Before Using the System Board

Before using the system board, prepare basic system components.

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

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

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

Chapter 1 - Introduction

Specifications

Processor	• LGA 1155 socket for:
	  - 3rd generation Intel® Core™ processors (22nm process technology)
	    : Intel® Core™ i7-3770 (8M Cache, up to 3.9GHz); 77W
	    : Intel® Core™ i5-3550S (6M Cache, up to 3.7GHz); 65W
	    : Intel® Core™ i3-3220 (3M Cache, 3.3GHz); 55W
	    : Intel® Pentium® G2120 (3M Cache, 3.1 GHz); 65W
	  - 2nd generation Intel® Core™ processors (32nm process technology)
	    : Intel® Core™ i7-2600 (8M Cache, up to 3.8 GHz); 95W
	    : Intel® Core™ i5-2400 (6M Cache, up to 3.4 GHz); 95W
	    : Intel® Core™ i3-2120 (3M Cache, 3.3 GHz); 65W
	    : Intel® Pentium® G850 (3M Cache, 2.9 GHz); 65W

Chipset	• Intel® H61 Express Chipset
System Memory	• Two 240-pin DDR3 DIMM sockets • Supports DDR3 1333/1600MHz (3rd generation processors) Supports DDR3 1066/1333MHz (2nd generation processors) • Supports dual channel memory interface • Supports up to 16GB system memory • DRAM device technologies: 1Gb, 2Gb and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC

Expansion Slots	• 1 PCIe x16 slot
	  - Supports Gen 3.0 (3rd generation processors)
	  - Supports Gen 2.0 (2nd generation processors)
	• 1 PCIe x4 slot
	• 2 PCI slots (PCI 2.3: supports universal PCI card)

Graphics	• Intel® HD Graphics • Display output: HDMI and VGA • HDMI: resolution up to 1920x1200 @ 60Hz • VGA: resolution up to 2048x1536 @ 75Hz, 32-bit • Supports 6 Graphics Execution Units (EUs) • Intel® Clear Video Technology • DirectX Video Acceleration (DXVA) support for accelerating video processing
Audio	• Realtek ALC262 2-channel High Definition Audio • DACs with 100dB SNR; two stereo DACs support 24-bit PCM format for stereo audio playback • ADCs with 90dB SNR; three stereo ADCs support 20-bit PCM format for multiple input streaming • S/PDIF audio interface
LAN	• 2 Intel 82574L Gigabit Ethernet controllers • Integrated 10/100/1000 transceiver • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Serial ATA	• 4 SATA 2.0 ports with data transfer rate up to 3Gb/s
BIOS	• AMI BIOS - 32Mbit SPI BIOS

Rear Panel I/O Ports	• 1 mini-DIN-6 PS/2 mouse port
	• 1 mini-DIN-6 PS/2 keyboard port
	• 2 DB-9 serial ports
	  - 1 RS232/422/485
	  - 1 RS232
	• 1 HDMI port (optional)
	• 1 DB-15 VGA port
	• 2 RJ45 LAN ports
	• 4 USB 2.0/1.1 ports
	• Mic-in, line-in and line-out jacks

I/O Connectors	• 3 connectors for 6 external USB 2.0/1.1 ports • 8 connectors for 8 external RS232 serial ports • 1 8-bit Digital I/O connector • 1 front audio connector for line-out and mic-in jacks • 1 S/PDIF connector • 4 SATA 2.0 ports • 1 parallel port • 1 24-pin ATX power connector • 1 8-pin 12V power connector • 1 chassis intrusion connector • 1 front panel connector • 3 fan connectors

Energy Efficient Design	• Supports ErP Lot6 power saving (optional)
	• Supports ACPI
	• System Power Management
	• Wake-On-Events include:
	  - Wake-On-PS/2 KB/Mouse
	  - Wake-On-USB KB/Mouse
	  - Wake-On-LAN
	  - RTC timer to power-on the system
	• CPU stopped clock control
	• AC power failure recovery

Damage Free Intelligence	• Monitors CPU/system temperature and overheat alarm • Monitors VCORE/5V/3.3V/V_DIMM/12V/5VSB voltages and failure alarm • Monitors CPU/system fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function
OS Support	• Windows XP Professional x86 & SP3 (32-bit) • Windows XP Professional x64 & SP2 (64-bit) • Windows 7 Ultimate x86 & SP1 (32-bit) • Windows 7 Ultimate x64 & SP1 (64-bit) • Windows 8 Enterprise x86 (32-bit) • Windows 8 Enterprise x64 (64-bit)
Temperature	• Operating: 0°C to 60°C • Storage: -20°C to 85°C
Humidity	• 10% to 90%
Dimensions	• microATX form factor • 244mm (9.6") x 244mm (9.6")
Certification	• CE, FCC Class B, RoHS

6

Features

- ### Watchdog Timer

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

- ### DDR3

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

- ### Graphics

The integrated Intel® HD graphics engine delivers an excellent blend of graphics performance and features to meet business needs. It provides excellent video and 3D graphics with out-standing graphics responsiveness. These enhancements deliver the performance and com-patibility needed for today's and tomorrow's business applications. Supports HDMI and VGA interfaces for display outputs.

- ### PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x4 PCI Express lane supports transfer rate of 4 Gigabyte per second (2 directions). The PCI Express architecture also supports high performance graphics infrastructure by enhancing the capability of a PCIe x16 Gen 3 at 32GB/s bandwidth (16GB/s in each direction) and Gen 2 at 16GB/s bandwidth (8GB/s in each direction).

- ### Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 3Gb/s (SATA 2.0), it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

- ### Gigabit LAN

Two Intel 82574L Gigabit LAN controllers support up to 1Gbps data transmission.

- ### Audio

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

- ### USB

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

- ### Wake-On-LAN

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

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

- ### Wake-On-USB

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

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

- ### 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 Manage-ment 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 ses-sion 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

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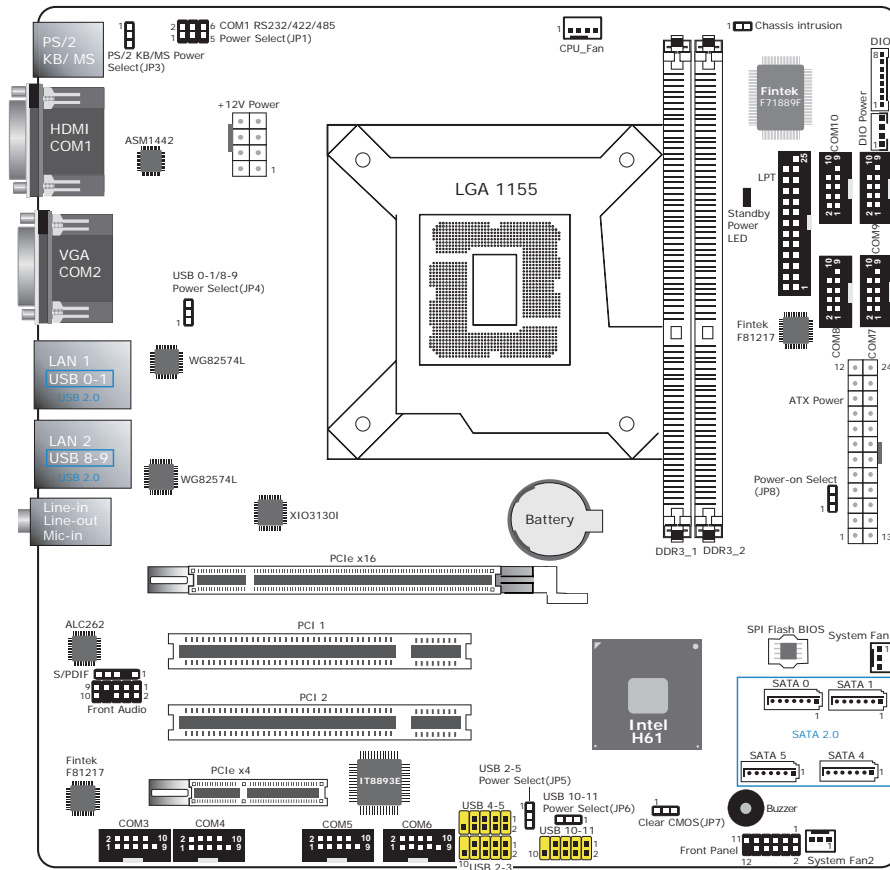
> **Important:**
> Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perform installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap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

System Memory

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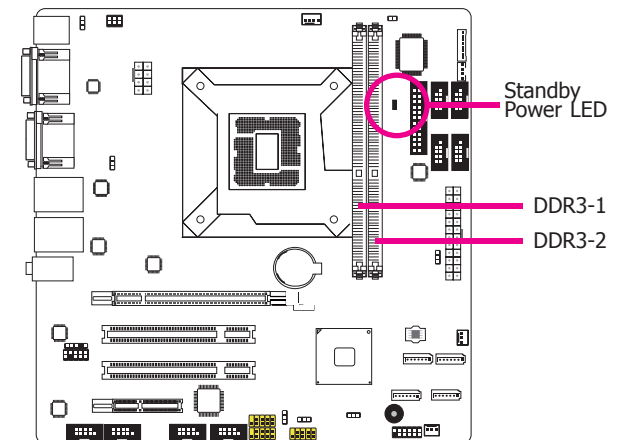
Features

- Two 240-pin DDR3 DIMM sockets
- Supports 1066/1333/1600MHz DDR3 SDRAM
- Dual channel memory interface
- Supports maximum of 16GB system memory

9

The system board supports the following memory interface.

Single Channel (SC)

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

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel	DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs. Not all slots need to be populated.
Dual Channel	DIMMs of the same memory configuration are on different channels.

Important:
You can populate either Channel A or Channel B first.

Installing the DIM Module

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

2. Disconnect all power cords and cables.

3. Locate the DIMM socket on the system board.

4. Push the "ejector tabs" which are at the ends of the socket to the side.

Ejector tab   Ejector tab

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

Notch

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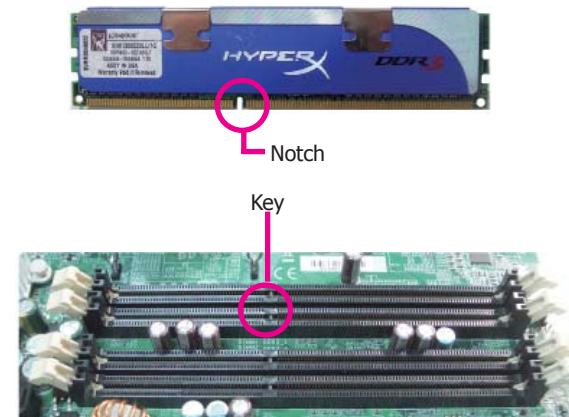
6. Grasping the module by its edges, position the module above the socket with the "notch" in the module aligned with the "key" on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.

7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.
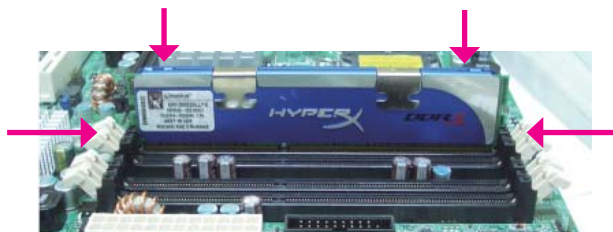
CPU

The system board is equipped with a surface mount LGA 1155 socket. This socket is exclusively designed for installing a LGA 1155 packaged Intel CPU.

Important:
1. Before you proceed, make sure (1) the LGA 1155 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA 1155 socket comes with the protective cap.

Protective cap

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

Installing the CPU

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

2. Disconnect all power cords and cables.

3. Locate the LGA 1155 CPU socket on the system board.
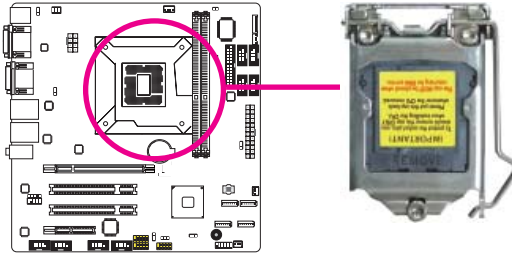
> **Important**:
> The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

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

Load lever

Retention tab

5. Lifting the load lever will at the same time lift the load plate.

   Lift the load lever up to the angle shown on the photo.

Load lever

Load plate
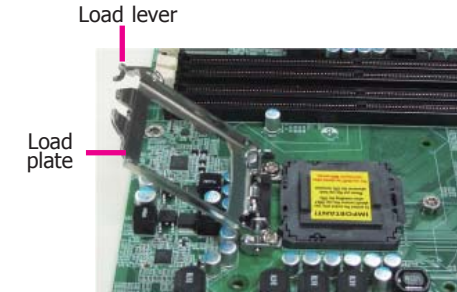
6. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.

Protective cap

12
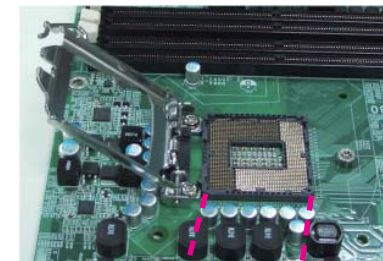
7. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.
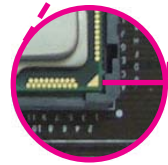
The CPU's notch will at the same time fit into the socket's alignment key.

Alignment key

Alignment key

Gold triangular mark
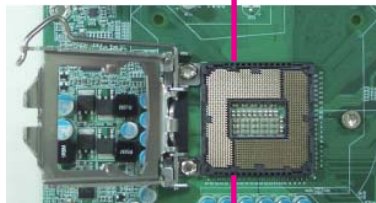
Important:
The CPU will fit in only one orientation and can easily be inserted without exerting any force.

8. Close the load plate then push the load lever down.

While closing the load plate, make sure the front edge of the load plate slides under the retention knob.

Retention knob

9. Hook the load lever under the retention tab.

Load lever

Retention tab

13

Installing the Fan and Heat Sink

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

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

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

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

2. Place the heat sink on top
   of the CPU. The 4 push-
   pins around the heat sink,
   which are used to secure
   the heat sink onto the sys-
   tem board, must match the
   4 mounting holes around
   the socket.

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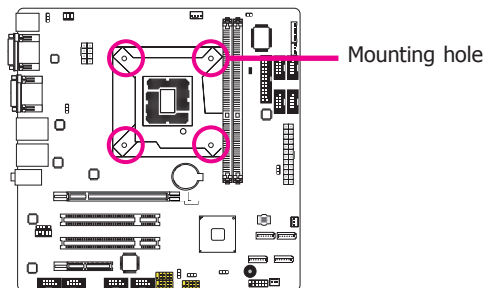
3. Orient the heat sink such
   that the CPU fan's cable is
   nearest the CPU fan con-
   nector.

   CPU fan connector
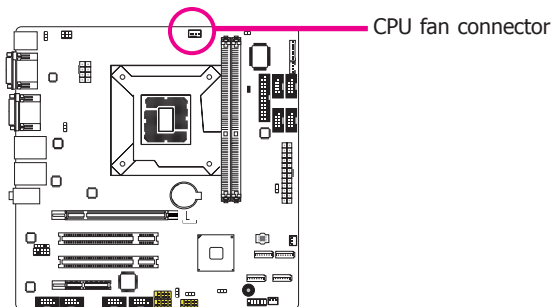
4. Rotate each push-pin ac-
   cording to the direction of
   the arrow shown on top of
   the pin.

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

   Heat sink

   "Unlocked" position
   of push-pin

   "Locked" position of
   push-pin
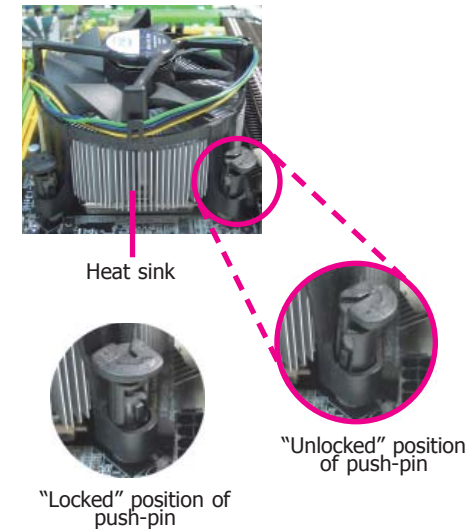
5. Connect the CPU fan's
   cable to the CPU fan
   connector on the system
   board.

   CPU fan connector

14
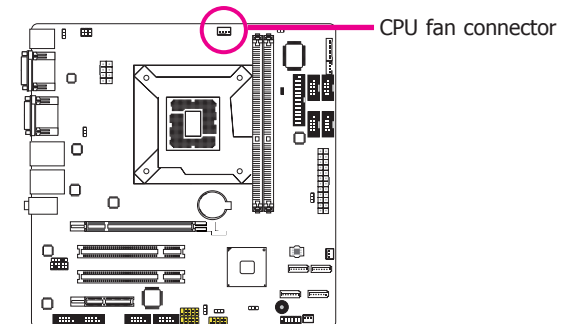
Jumper Settings

Clear CMOS Data

JP7

1 2 3

1-2 On: Normal
(default)

1 2 3

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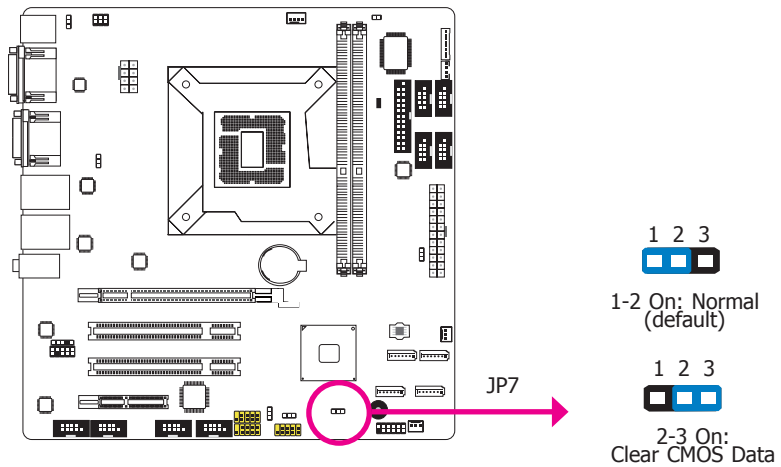
If you encounter the following,

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 JP7 pins 2 and 3 to On. Wait for a few seconds and set JP7 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

JP3

1
2
3

1-2 On: +5V
(default)

1
2
3

2-3 On:
+5V_standby
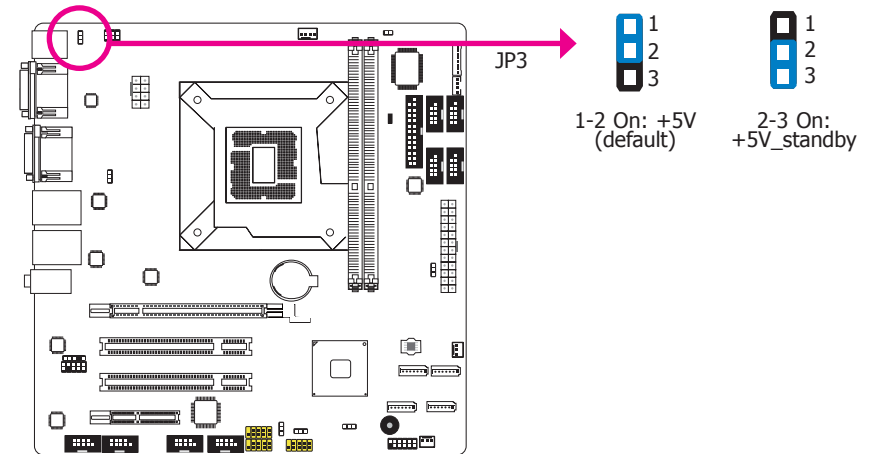
JP3 is used to select the power of the PS/2 keyboard and PS/2 mouse ports. Selecting +5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

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

USB Power Select

USB 0-1/8-9 (JP4)

3
2
1

1-2 On: +5V (default)

3
2
1

2-3 On: +5V_standby

USB 2-3/4-5 (JP5)

1
2
3

1-2 On: +5V (default)

1
2
3

2-3 On: +5V_standby

USB 10-11 (JP6)

3 2 1

1-2 On: +5V (default)

3 2 1
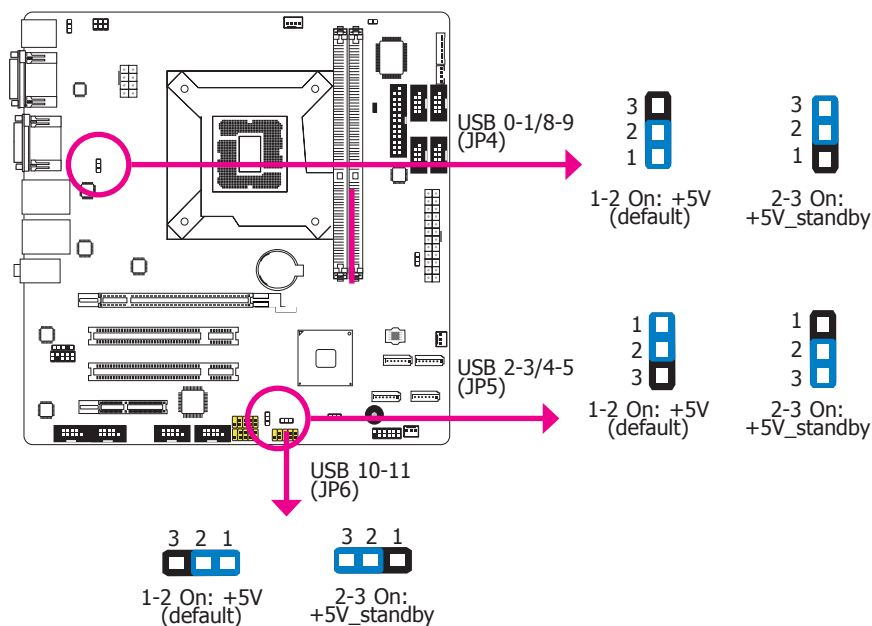
2-3 On: +5V_standby

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

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

Power-on Select

JP8

3
2
1

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

3
2
1

2-3 On:
Power-on via AC power; or
Power-on via WOL after G3
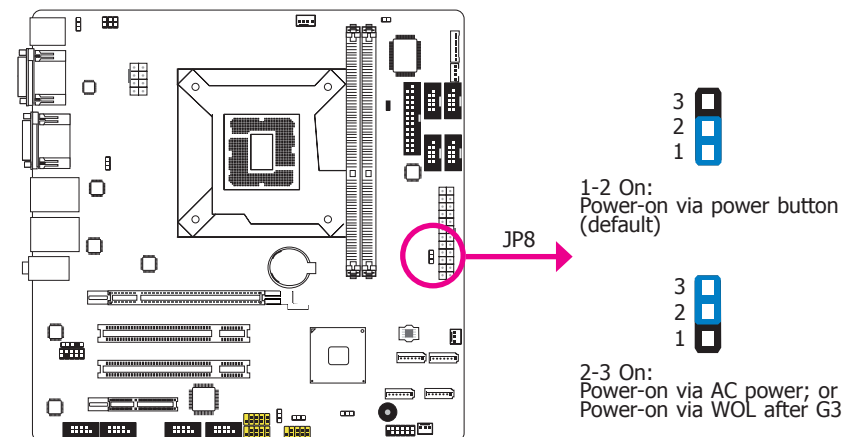
To power-on via WOL after G3:

1. Set JP8 pins 2 and 3 to On.

2. Set the "After G3" field to **Power Off/WOL**.

3. Set the "GbE Wake Up From S5" to **Enabled**.

The BIOS fields are in the "South Bridge" submenu (Chipset menu) of the AMI BIOS utility.

To power-on via AC Power:

1. Set JP8 pins 2 and 3 to On.

2. Set the "After G3" field to **Power On**.

COM1 RS232/RS422/RS485 Select

JP1
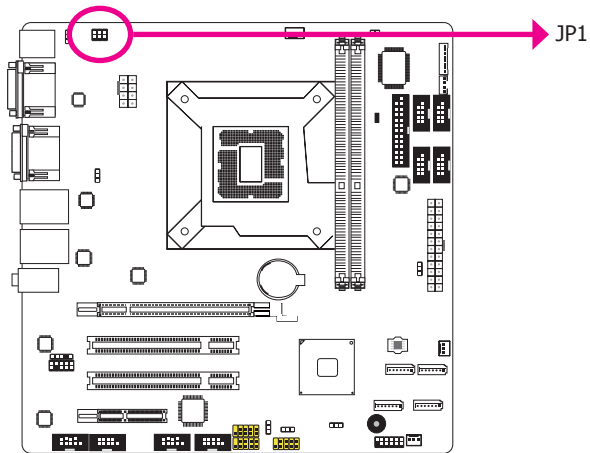
JP1 (for COM1) is used to configure the COM ports to RS232, RS422 (Full Duplex) or RS485. The pin function of the COM ports will vary according to the jumper's setting.

JP1

2 4 6	2 4 6	2 4 6
1 3 5	1 3 5	1 3 5
1-2 On: RS232 (default)	3-4 On: RS422 Full Duplex	5-6 On: RS485

COM 1

RS232	RS422 Full Duplex	RS485
1 DCD- 2 RD 3 TD 4 DTR- 5 GND	1 RXD+ 2 RXD- 3 TXD+ 4 TXD- 5 N.C.	1 DATA+ 2 DATA- 3 N.C. 4 N.C. 5 N.C.
6 DSR- 7 RTS- 8 CTS- 9 RI-	6 N.C. 7 N.C. 8 N.C. 9 N.C.	6 N.C. 7 N.C. 8 N.C. 9 N.C.
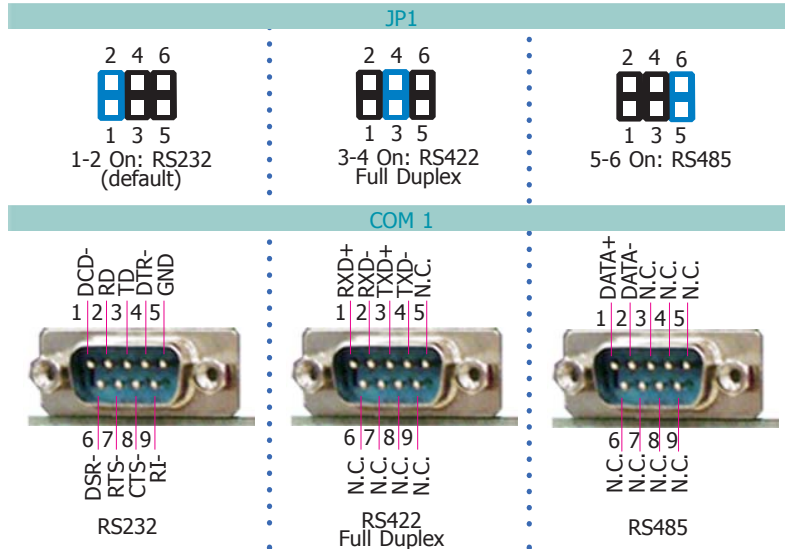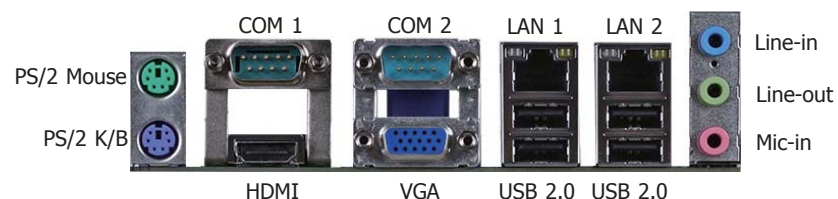
Rear Panel I/O Ports

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

• PS/2 mouse/ keyboard port
• 2 LAN ports
• 4 USB 2.0 ports
• VGA port
• HDMI port
• 2 COM ports
• Mic-in jack
• Line-in jack
• Line-out jack

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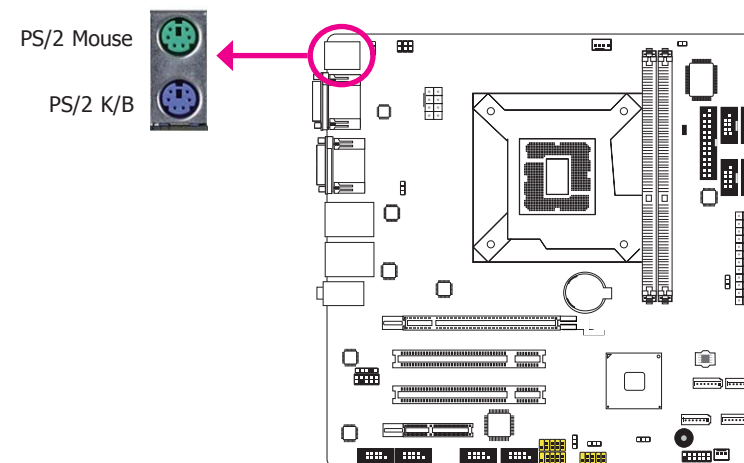
These ports are used to connect a PS/2 mouse and a PS/2 keyboard.

Wake-On-PS/2 Keyboard/Mouse

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

• **Jumper Setting**

JP3 must be set to "2-3 On: +5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.

• **BIOS Setting**

Configure the PS/2 keyboard/mouse wake up function in the Advanced menu ("ACPI Power Management Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

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

RJ45 LAN Ports

LAN 1   LAN 2
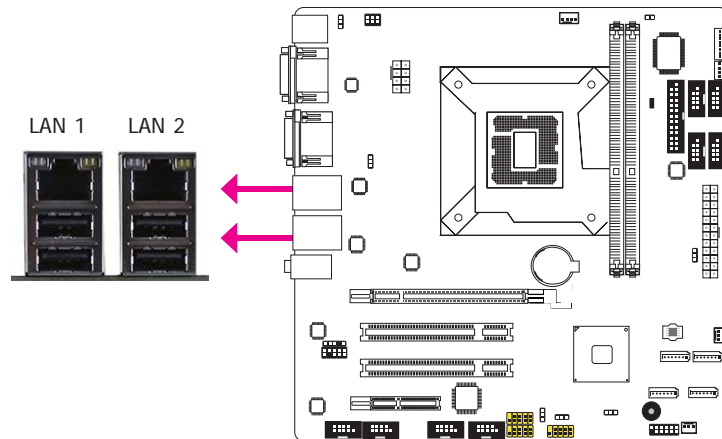
Features

• Two Intel W82574L Gigabit Ethernet controllers

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

BIOS Setting

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

Driver Installation

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

USB Ports

USB 1
USB 0
USB 8
USB 9

USB 2.0

USB 2-3   USB 4-5

USB 10-11

USB 2.0

Key GND +Data -Data VCC
9 ... 1
10 ... 2
N. C. GND +Data -Data VCC
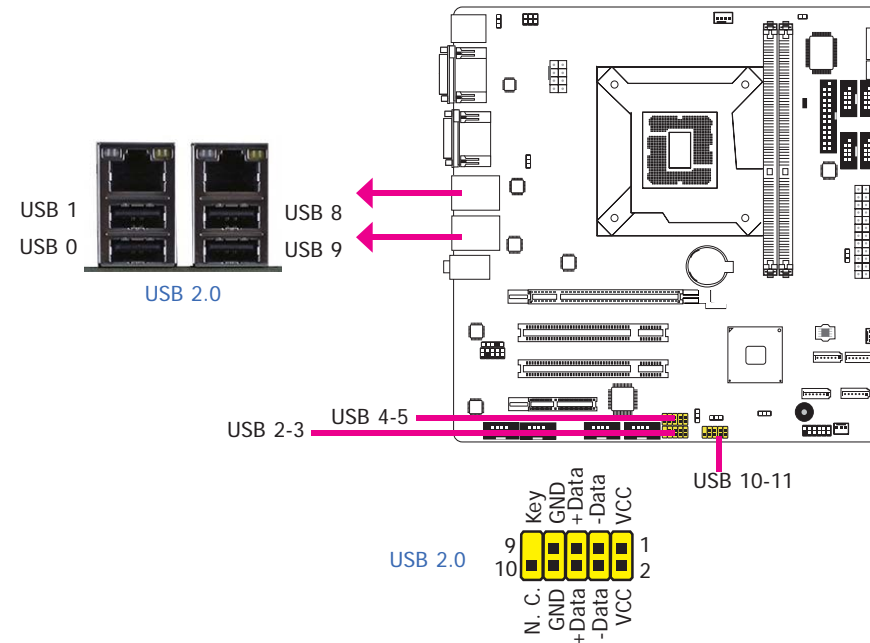
USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 2.0/1.1 ports (USB 0-1/ 8-9). The two 10-pin connectors allow you to connect 4 additional USB 2.0/1.1 ports (USB 2-3/ 10-11). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

Configure the onboard USB in the Advanced menu ("USB 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**

JP6 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.

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

Graphics Interface

The display ports consist of the following:

- HDMI
- DVI-I port

HDMI   VGA
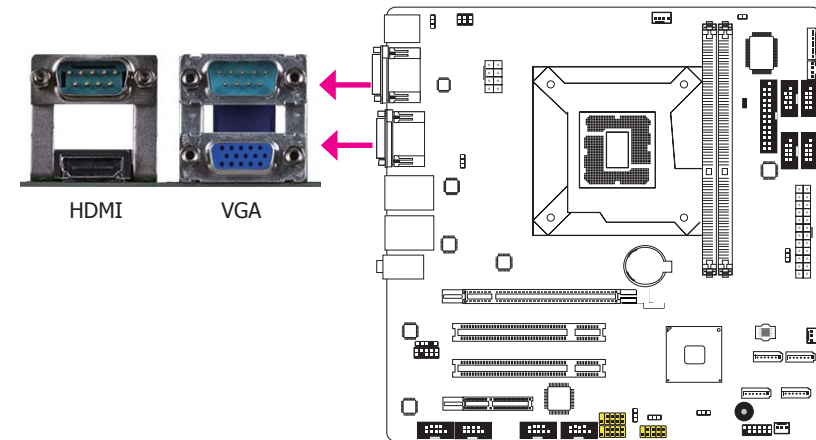
HDMI Port

The HDMI port which carries both digital audio and video signals is used to connect a LCD monitor or digital TV that has the HDMI port.

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

COM (Serial) Ports

COM 1   COM 2

COM 1:
RS232/422/485

COM 10 COM 9

COM 8 COM 7

2 ▢▢▢▢▢ 10
1 ▢▢▢▢▢ 9

COM 2-COM 10:
RS232

COM 3 COM 4 COM 5 COM 6
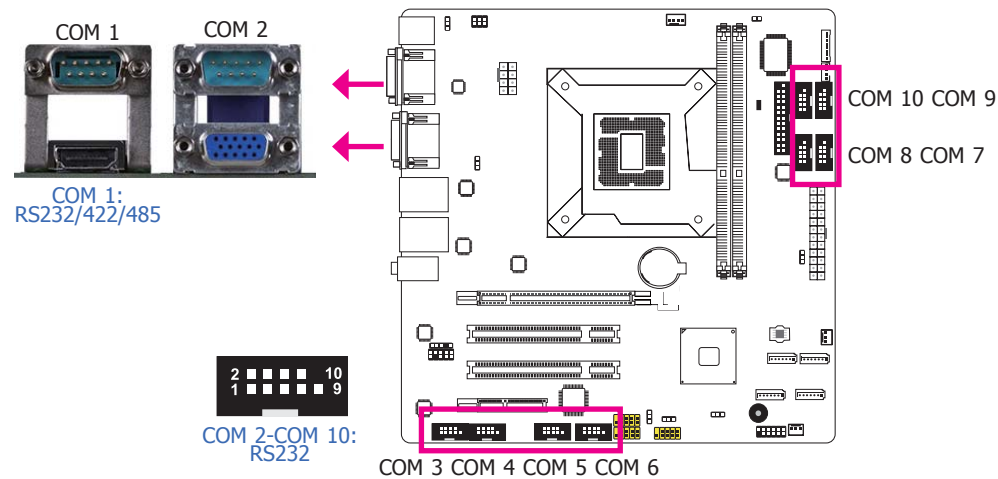
The pin function of COM 1 port will vary according to JP1's setting. Refer to "COM1 RS232/RS422/RS485 Select" in this chapter for more information.

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

Connecting External Serial Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

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

Audio

Rear audio

Line-in

Line-out

Mic-in

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

9   1
10   2

Line2-JD
Key
Mic2-JD
Presence Signal
GND

Front audio
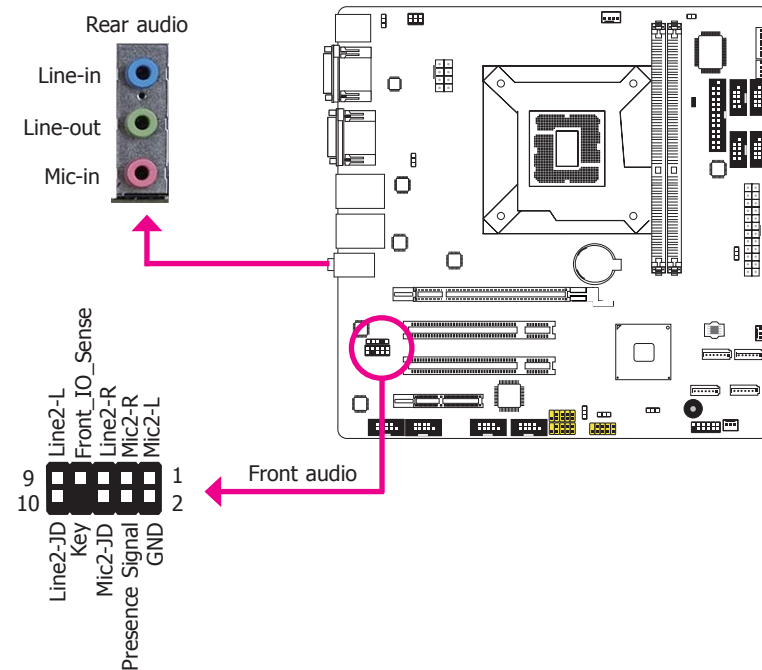
Rear Audio

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.

21

BIOS Setting

Configure the onboard audio in the Chipset menu ("South Bridge" 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

SATA (Serial ATA) Connectors

SATA 2.0 3Gb/s

SATA 0   SATA 1

SATA 5   SATA 4
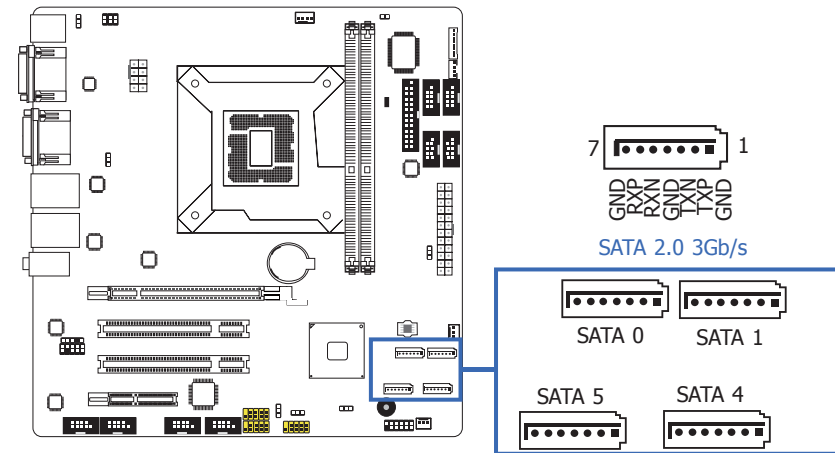
Features

- 4 Serial ATA ports
  - 2 SATA2 ports with data transfer rate up to 3Gb/s

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 ("SATA Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

22

Digital I/O Connector

Digital I/O Power Connector

Digital I/O

8

1

Digital I/O power

+5V — 4
5VSB
Ground
+12V — 1
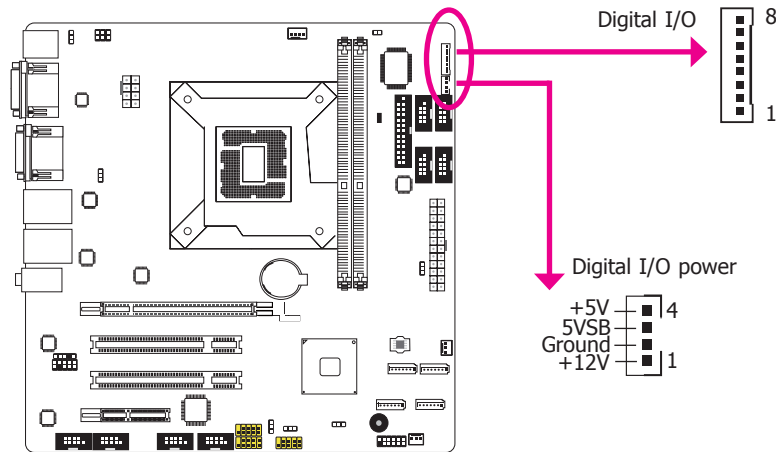
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

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

Cooling Fan Connectors

CPU fan

1   4

Ground   Speed Control
Power
Sense

System_fan 1

1
3

Ground
Power
Sense

System_fan 2

3   1

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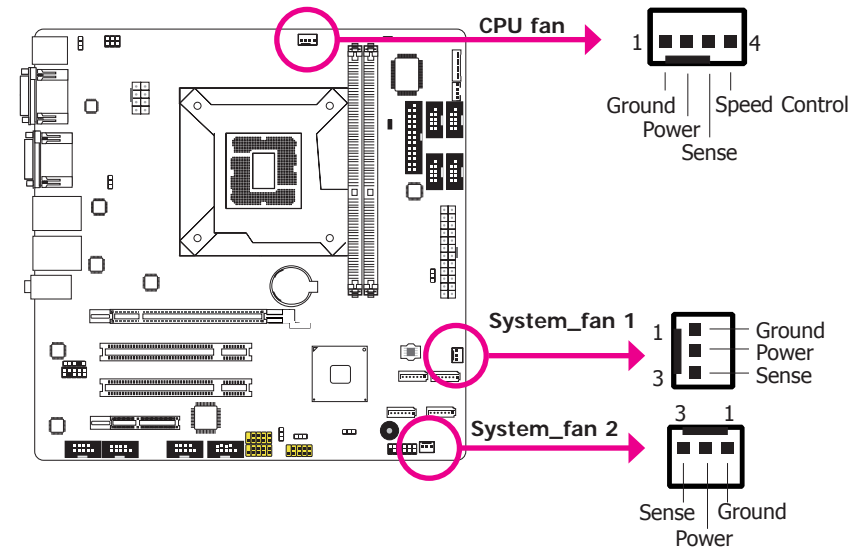
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

23

Chassis Intrusion Connector

1 2

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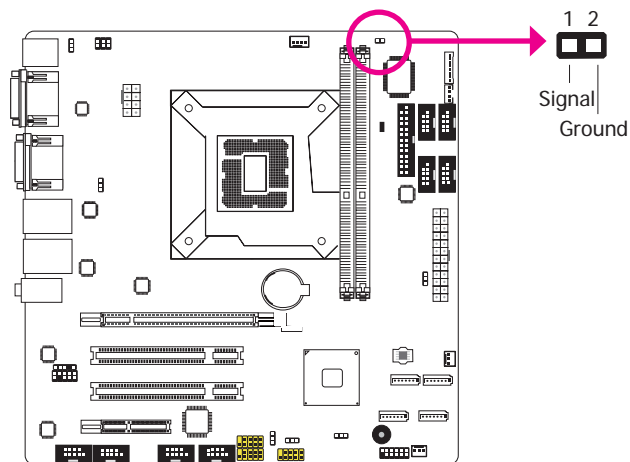
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

MyGuard Hardware Monitor

Install the "MyGuard Hardware Monitor" 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 "MyGuard Hardware Monitor" section in chapter 4 for more information.

Power Connectors

ATX 12V

+12V   Ground

8   4

5   1

ATX power

	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	
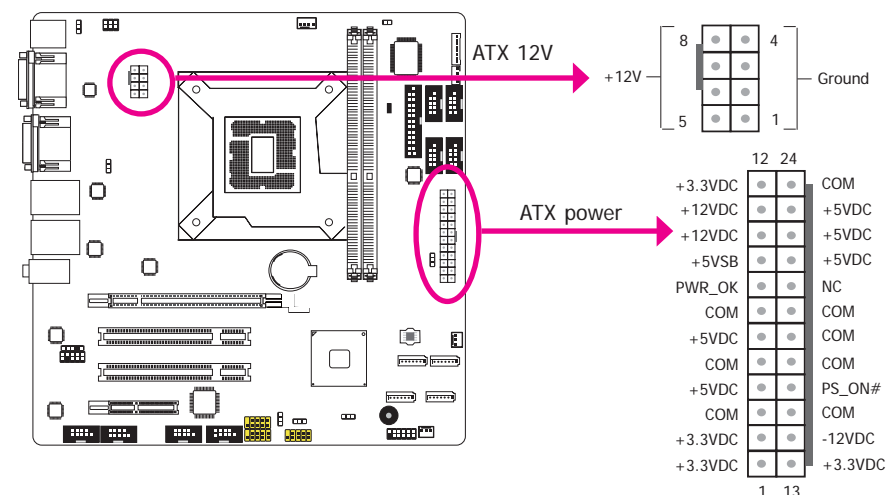
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's 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.

Standby Power LED

Standby Power LED
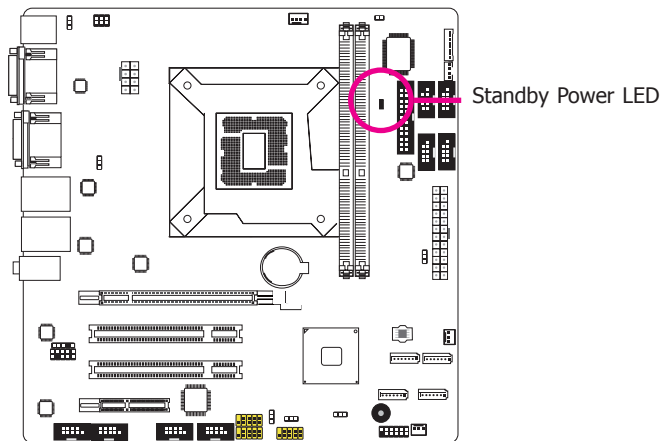
This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

Front Panel Connectors

HDD-LED
RESET-SW
11
12
1
2
PWR-LED
PWR-BTN
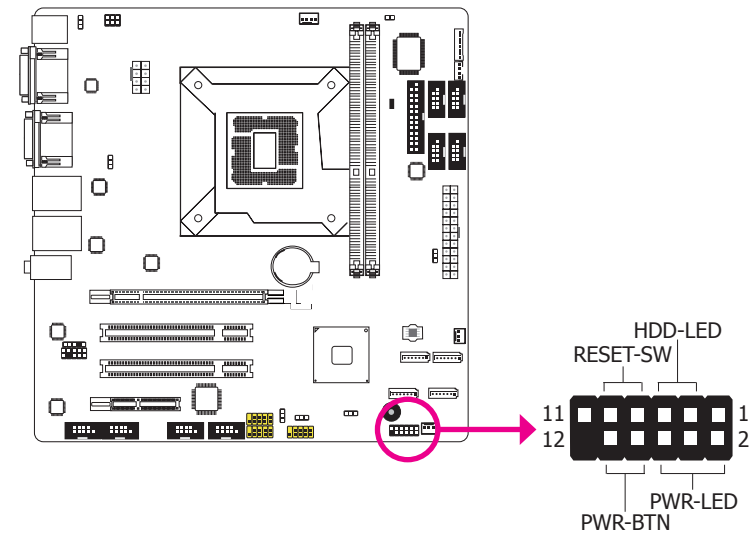
HDD-LED - HDD LED

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

25

Expansion Slots
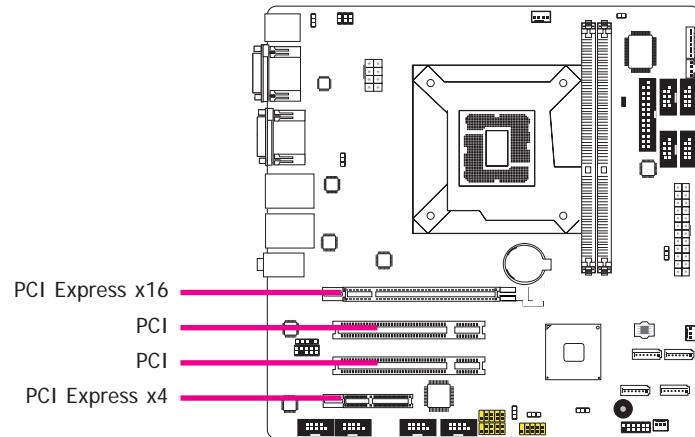
PCI Express x16 Slot

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

PCI 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 only 2 PCI slots expansion (for low profile PCI card only) into the PCI slot.

PCI Express x4 Slot

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

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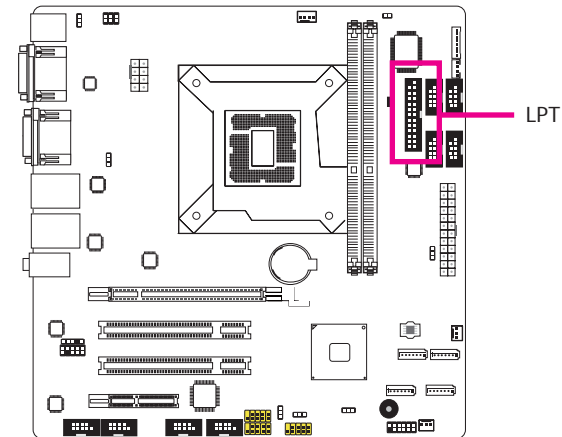
The LPT port is for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP.

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

26

S/PDIF Connector

5 ☐☐☐☐ 1

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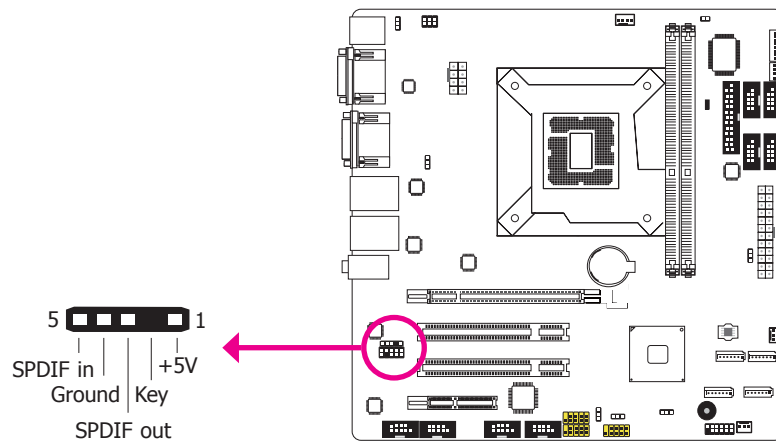
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned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

Battery
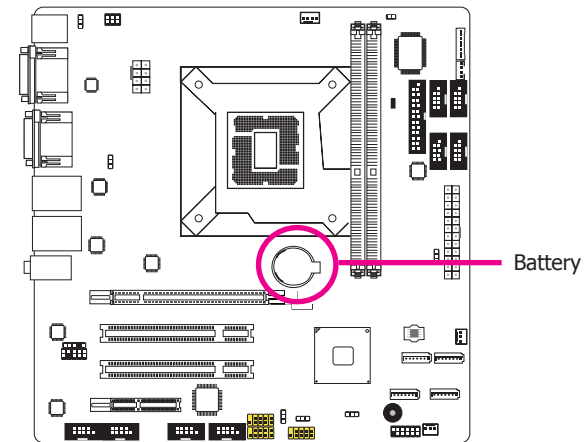
Battery

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.

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 hightlight up or down between submenu or fields.
<Esc>	Exit 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	Select a field.
<F1>	Displays General Help
<F4>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

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

Submenu

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

28

Chapter 3 BIOS Setup · www.dfi.com

AMI BIOS Setup Utility

Main

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

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main    Advanced    Chipset    Boot    Security    Save & Exit

BIOS Information                                        Choose the system default
BIOS Vendor                  American Megatrends        language
Core Version                 4.6.5.3
Compliancy                   UEFI 2.3; PI 1.2
Project Version              1APTC 0.20 x64
Build Date and Time          12/12/2012  18:11:29

System Language              [English]

System Date                  [Sun 10/21/2012]
System Time                  [00:04:53]                 → ←:  Select Screen
                                                         ↑↓:    Select Item
Access Level                 Administraor                Enter: Select
                                                         +/-:    Change Opt.
                                                         F1:     General Help
                                                         F2:     Previous Values
                                                         F3:     Optimized Defaults
                                                         F4:     Save & Exit
                                                         ESC:  Exit

           Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

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.

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.

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.

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main    Advanced    Chipset    Boot    Security    Save & Exit

▶ ACPI Power Management Configuration              ACPI power management
▶ PC Health Status                                 configuration
▶ CPU Configuration
▶ SATA Configuration
▶ USB Configuration
▶ Super IO Configuration
▶ Second Super IO Configuration
▶ Third Super IO Configuration
▶ Network Stack
                                                   → ←:  Select Screen
                                                   ↑↓:    Select Item
                                                   Enter: Select
                                                   +/-:    Change Opt.
                                                   F1:     General Help
                                                   F2:     Previous Values
                                                   F3:     Optimized Defaults
                                                   F4:     Save & Exit
                                                   ESC:  Exit

           Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

ACPI Power Management Configuration

This section is used to configure the ACPI Power Management.

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

ACPI Power Management Configuration              Select the highest ACPI
                                                 Sleep state the system will
ACPI Sleep State            [S1 (CPU Stop Clock)]  enter, when the SUSPEND
                                                 button is pressed.
Resume by PME               [Disabled]
Resume by Ring              [Disabled]
Resume by RTC Alarm         [Disabled]




                                                 → ←: Select Screen
                                                 ↑↓:   Select Item
                                                 Enter: Select
                                                 +/-:   Change Opt.
                                                 F1:    General Help
                                                 F2:    Previous Values
                                                 F3:    Optimized Defaults
                                                 F4:    Save & Exit
                                                 ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the Suspend button is pressed.

S1(POS)   Enables the Power On Suspend function.

S3(STR)   Enables the Suspend to RAM function.

Resume by PME

Enable this field to use the PME signal to wake up the system.

Resume by Ring

Enable this field to use the Ring signal to wake up the system.

Resume by RTC Alarm

When Enabled, the system uses the RTC to generate a wakeup event.

PC Health Status

This section displays the SIO hardware health monitor.

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

▶ Smart Fan Function                             Smart Fan Function
  Case Open               [Disabled]

  System Hardware Monitor
  CPU Temperature         : +54 C
  System Temperature      : +32 C
  CPU FAN Speed           : 5300 RPM
  System FAN Speed        : N/A
  VCore                   : +0.984 V
  +5.0V                   : +5.072 V
  +12V                    : +11.968 V
  VDIMM                   : +1.520 V
  +3.3V                   : +3.352 V           → ←: Select Screen
  VSB5V                   : +4.992 V           ↑↓:   Select Item
  VSB3V                   : +3.376 V           Enter: Select
  VBAT                    : +3.312 V           +/-:   Change Opt.
                                               F1:    General Help
                                               F2:    Previous Values
                                               F3:    Optimized Defaults
                                               F4:    Save & Exit
                                               ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Smart Fan Function

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

Smart Fan Function                               Enable CPU SmartFan
CPU Smart Fan Control       [Automatic]
Boundary 1                  60
Boundary 2                  50
Boundary 3                  40
Boundary 4                  30
Speed Count 1               100
Speed Count 2               75
Speed Count 3               50
Speed Count 4               40
Speed Count 5               30

                                                 → ←: Select Screen
                                                 ↑↓:   Select Item
                                                 Enter: Select
                                                 +/-:   Change Opt.
                                                 F1:    General Help
                                                 F2:    Previous Values
                                                 F3:    Optimized Defaults
                                                 F4:    Save & Exit
                                                 ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

CPU Smart Fan Control

When this feature is set to Automatic, the CPU's fan speed will rotate according to the CPU's temperature. The higher the temperature, the faster the speed of rotation.

Boundary 1 to Boundary 4

The range is from 0-127.

Speed Count 1 to Speed Count 5

The range is from 1-100.

Case Open Beep

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

CPU Configuration

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

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced

CPU Configuration                                    Enabled for Windows XP
                                                     and Linux (OS optimized
Intel (R)  Core (TM)  i7-3770  CPU @ 3.40GHz         for Hyper-Threading
CPU Signature              306a8                      Technology) and Disabled
Microcode Patch            10                         for other OS (OS not
Max CPU Speed              3400 MHz                    optimized for
Min CPU Speed              1600 MHz                    Hyper-Threading
CPU Speed                  3400 MHz                    Technology). When
Processor Cores            4                           Disabled only one thread
Intel HT Technology        Supported                   per enabled core is
Intel VT-x Technology      Supported                   enabled.
Intel SMX Technology       Supported
64-bit                     Supported                  →←:  Select Screen
                                                     ↑↓:   Select Item
L1 Data Cache              32 kB x 4                 Enter: Select
L1 Code Cache              32 kB x 4                 +/-:   Change Opt.
L2 Cache                   256kB x 4                 F1:    General Help
L3 Cache                   8192 kB                   F2:    Previous Values
                                                     F3:    Optimized Defaults
Hyper-threading            [Enabled]                 ESC:  Exit
Active Processor Cores     [All]
Intel Virtualization Technology  [Disabled]

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Hyper-threading

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.

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

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

SATA Configuration

This section is used to configure SATA functions.

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

 SATA Controller(s)           [Enabled]              Enable or disable SATA
 SATA Mode Selection          [IDE]                  Device.

 Serial ATA Port 0            Empty
   Software Preserve          Unknown
 Serial ATA Port 1            Empty
   Software Preserve          Unknown
 Serial ATA Port 4            Empty
   Software Preserve          Unknown
 Serial ATA Port 5            Empty
   Software Preserve          Unknown
                                                →←: Select Screen
                                                ↑↓:  Select Item
                                                Enter: Select
                                                +/-:   Change Opt.
                                                F1:   General Help
                                                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                ESC:  Exit

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

SATA Controller(s)

This field is used to enable or disable the Serial ATA channels.

SATA Mode Selection

IDE Mode

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

USB Configuration

This section is used to configure USB.

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

 USB Configuration                                   Enables Legacy USB
                                                     support. AUTO option
 USB Devices:                                        disables legacy support if
        1 keyboard, 2 Hubs                           no USB devices are
                                                     connected. DISABLE
 Legacy USB Support           [Enabled]              option will keep USB
 EHCI Hand-off                [Disabled]             devices available only for
 Port 60/64 Emulation         [Enabled]              EFI applications.

                                                →←: Select Screen
                                                ↑↓:  Select Item
                                                Enter: Select
                                                +/-:   Change Opt.
                                                F1:   General Help
                                                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                ESC:  Exit

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

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.

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.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

32

Super IO Configuration

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

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
         Advanced

      Super IO Configuration                                    Restore AC Power Loss
                                                                help.
      Super IO Chip                    Fintek F71879
      Restore AC Power Loss            [Power Off]
      Watchdog Timer                   [Disabled]
        SuperIO Watchdog Timer         10
    ▶ Serial Port 1 Configuration
    ▶ Serial Port 2 Configuration
    ▶ Parallel Port Configuration


                                                                → ←:  Select Screen
                                                                ↑↓:    Select Item
                                                                Enter: Select
                                                                +/-:    Change Opt.
                                                                F1:     General Help
                                                                F2:     Previous Values
                                                                F3:     Optimized Defaults
                                                                ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
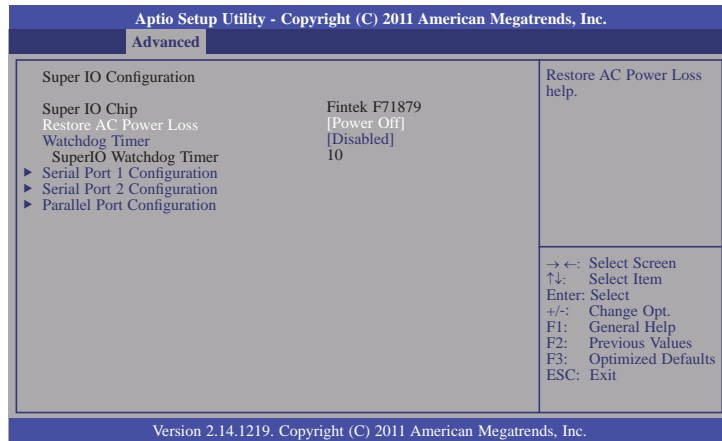
Restore AC Power Loss

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.

Last State

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.

Watchdog Timer

Enable or disable Super I/O watchdog timer.

Serial Port 1 Configuration to Serial Port 2 Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
         Advanced

      Serial Port 1 Configuration                              Enable or Disable Serial
                                                                Port (COM)
      Serial Port                      [Enabled]
      Device Settings                  IO=3F8h; IRQ=4;

      Change Settings                  [Auto]




                                                                → ←:  Select Screen
                                                                ↑↓:    Select Item
                                                                Enter: Select
                                                                +/-:    Change Opt.
                                                                F1:     General Help
                                                                F2:     Previous Values
                                                                F3:     Optimized Defaults
                                                                ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
         Advanced

      Serial Port 2 Configuration                              Enable or Disable Serial
                                                                Port (COM)
      Serial Port                      [Enabled]
      Device Settings                  IO=2F8h; IRQ=3;

      Change Settings                  [Auto]




                                                                → ←:  Select Screen
                                                                ↑↓:    Select Item
                                                                Enter: Select
                                                                +/-:    Change Opt.
                                                                F1:     General Help
                                                                F2:     Previous Values
                                                                F3:     Optimized Defaults
                                                                ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Serial Port

Enables or disables the serial port.

Change Settings

Selects the IO/IRQ setting of the I/O device.

33

Parellel Port Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Advanced

   Parellel Port Configuration                                    Enable or Disable Parellel
                                                                  Port (LPT/LPTE)
   Parellel Port                        [Enabled]
   Device Settings                      IO=378h; IRQ=7;

   Change Settings                      [Auto]
   Device Mode                          [STD Printer Mode]


                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Change Settings

Selects the IO/IRQ setting of the I/O device.

Device Mode

Change the printer port mode.

Second Super IO Configuration

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

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

   Second Super IO Configuration                                  Set parameters of Serial
                                                                  Port 3(COMC).
   Super IO Chip                    Fintek F81217
 ► Serial Port 3 Configuration
 ► Serial Port 4 Configuration
 ► Serial Port 5 Configuration
 ► Serial Port 6 Configuration


                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Serial Port 3 Configuration to Serial Port 6 Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

   Serial Port 3 Configuration                                    Enable or Disable Serial
                                                                  Port (COM)
   Serial Port                       [Enabled]
   Device Settings                   IO=3F8h; IRQ=5;

   Change Settings                   [Auto]



                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Serial Port 4 Configuration

Serial Port   [Enabled]
Device Settings   IO=2F8h; IRQ=5;

Change Settings   [Auto]

Enable or Disable Serial Port (COM)

→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Serial Port 5 Configuration

Serial Port   [Enabled]
Device Settings   IO=3F0h; IRQ=10;

Change Settings   [Auto]

Enable or Disable Serial Port (COM)

→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Serial Port 6 Configuration

Serial Port   [Enabled]
Device Settings   IO=2F0h; IRQ=10;

Change Settings   [Auto]

Enable or Disable Serial Port (COM)

→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Serial Port

Enables or disables the serial port.

Change Settings

Selects the IO/IRQ setting of the I/O device.

Third Super IO Configuration

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

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

  Second Super IO Configuration                              Set parameters of Serial
                                                             Port 7(COMG).
  Super IO Chip                Fintek F81217
▶ Serial Port 7 Configuration
▶ Serial Port 8 Configuration
▶ Serial Port 9 Configuration
▶ Serial Port 10 Configuration


                                                             → ←:  Select Screen
                                                             ↑↓:   Select Item
                                                             Enter: Select
                                                             +/-:   Change Opt.
                                                             F1:    General Help
                                                             F2:    Previous Values
                                                             F3:    Optimized Defaults
                                                             ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
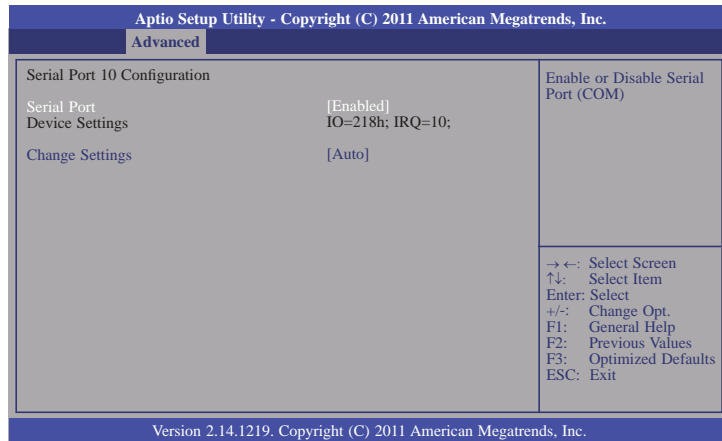
Serial Port 7 Configuration to Serial Port 10 Configuration

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

  Serial Port 7 Configuration                               Enable or Disable Serial
                                                            Port (COM)
  Serial Port              [Enabled]
  Device Settings          IO=200h; IRQ=11;

  Change Settings          [Auto]


                                                            → ←:  Select Screen
                                                            ↑↓:   Select Item
                                                            Enter: Select
                                                            +/-:   Change Opt.
                                                            F1:    General Help
                                                            F2:    Previous Values
                                                            F3:    Optimized Defaults
                                                            ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
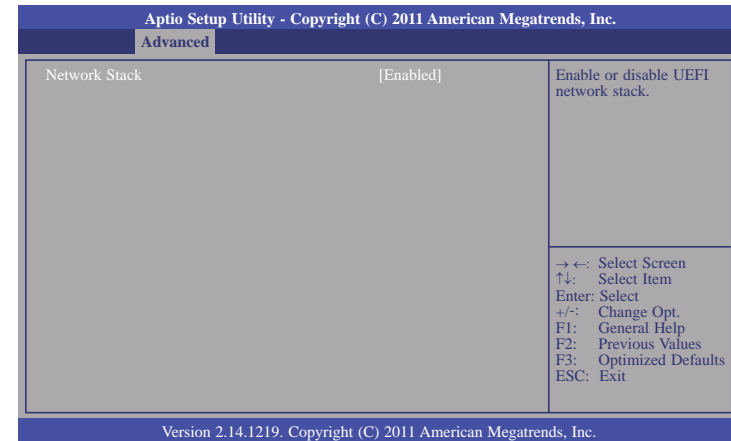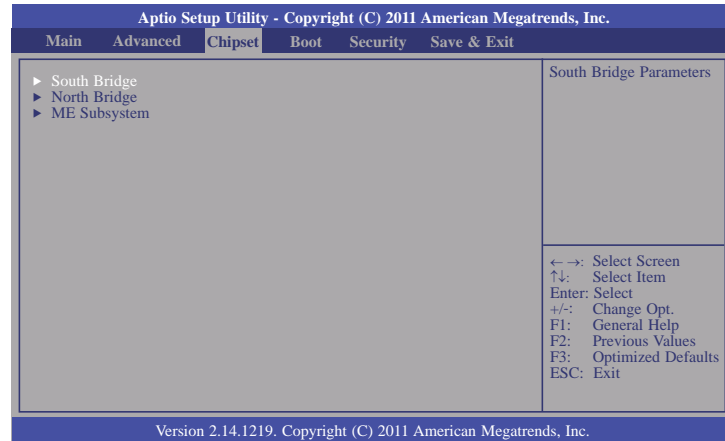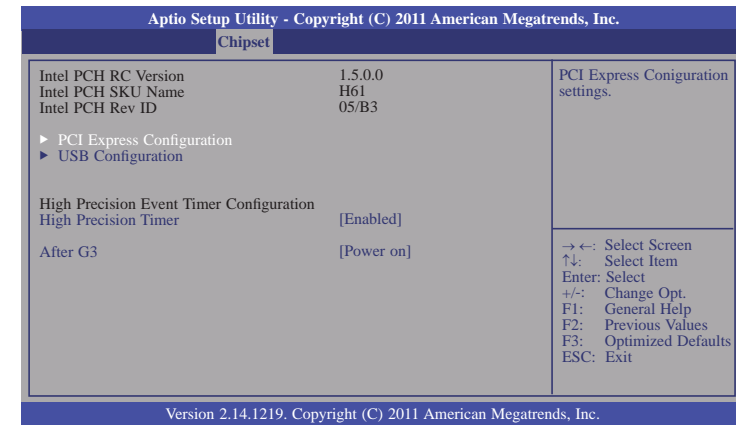
```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

  Serial Port 8 Configuration                               Enable or Disable Serial
                                                            Port (COM)
  Serial Port              [Enabled]
  Device Settings          IO=208h; IRQ=11;

  Change Settings          [Auto]


                                                            → ←:  Select Screen
                                                            ↑↓:   Select Item
                                                            Enter: Select
                                                            +/-:   Change Opt.
                                                            F1:    General Help
                                                            F2:    Previous Values
                                                            F3:    Optimized Defaults
                                                            ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Advanced

  Serial Port 9 Configuration                               Enable or Disable Serial
                                                            Port (COM)
  Serial Port              [Enabled]
  Device Settings          IO=210h; IRQ=10;

  Change Settings          [Auto]


                                                            → ←:  Select Screen
                                                            ↑↓:   Select Item
                                                            Enter: Select
                                                            +/-:   Change Opt.
                                                            F1:    General Help
                                                            F2:    Previous Values
                                                            F3:    Optimized Defaults
                                                            ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Serial Port 10 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=218h; IRQ=10;	
Change Settings	[Auto]	

→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Serial Port

Enables or disables the serial port.

Change Settings

Selects the IO/IRQ setting of the I/O device.

Network Stack

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Network Stack	[Enabled]	Enable or disable UEFI network stack.

→ ←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Chipset

Configures relevant chipset functions.

```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Main    Advanced    Chipset    Boot    Security    Save & Exit

   ▶ South Bridge                                    South Bridge Parameters
   ▶ North Bridge
   ▶ ME Subsystem



                                                   ←→: Select Screen
                                                   ↑↓:    Select Item
                                                   Enter: Select
                                                   +/-:   Change Opt.
                                                   F1:    General Help
                                                   F2:    Previous Values
                                                   F3:    Optimized Defaults
                                                   ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

South Bridge

```
             Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                                Chipset

   Intel PCH RC Version              1.5.0.0          PCI Express Coniguration
   Intel PCH SKU Name                H61              settings.
   Intel PCH Rev ID                  05/B3

   ▶ PCI Express Configuration
   ▶ USB Configuration


   High Precision Event Timer Configuration
   High Precision Timer              [Enabled]
                                                      →←:  Select Screen
   After G3                          [Power on]       ↑↓:    Select Item
                                                      Enter: Select
                                                      +/-:   Change Opt.
                                                      F1:    General Help
                                                      F2:    Previous Values
                                                      F3:    Optimized Defaults
                                                      ESC:  Exit

              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

High Precision Timer

Enable or disable the High Precision Timer.

After G3

Power Off / WOL

Power-on the system via WOL after G3.

Power On

Power-on the system after G3.

PCI Express Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Chipset

    PCI Express Configuration                          PCI Express Root Port 1
                                                       Settings.
  ▶  PCI Express Root Port 1
  ▶  PCI Express Root Port 2
  ▶  PCI Express Root Port 3
  ▶  PCI Express Root Port 4
  ▶  PCI Express Root Port 5
  ▶  PCI Express Root Port 6


                                                       → ←:  Select Screen
                                                       ↑↓:    Select Item
                                                       Enter: Select
                                                       +/-:    Change Opt.
                                                       F1:     General Help
                                                       F2:     Previous Values
                                                       F3:     Optimized Defaults
                                                       ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

PCI Express Root Port 1 Configuration to PCI Express Root Port 4 Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Advanced

    PCI Express Root Port 1                [Enabled]   Control the PCI Express
                                                       Root Port.




                                                       → ←:  Select Screen
                                                       ↑↓:    Select Item
                                                       Enter: Select
                                                       +/-:    Change Opt.
                                                       F1:     General Help
                                                       F2:     Previous Values
                                                       F3:     Optimized Defaults
                                                       ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

PCI Express Root Port 5

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Advanced

    PCI Express Root Port 5                [Enabled]   Control the PCI Root Port.




                                                       → ←:  Select Screen
                                                       ↑↓:    Select Item
                                                       Enter: Select
                                                       +/-:    Change Opt.
                                                       F1:     General Help
                                                       F2:     Previous Values
                                                       F3:     Optimized Defaults
                                                       ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

PCI Express Root Port 6

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Advanced

    PCI Express Root Port 6                [Enabled]   Enable or disable LAN.




                                                       → ←:  Select Screen
                                                       ↑↓:    Select Item
                                                       Enter: Select
                                                       +/-:    Change Opt.
                                                       F1:     General Help
                                                       F2:     Previous Values
                                                       F3:     Optimized Defaults
                                                       ESC:  Exit

                Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

USB Configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                                    Chipset

 USB Configuration                                      Control the USB EHCI
                                                        (USB 2.0) functions.
 EHCI1                          [Enabled]               One EHCI controller must
                                                        always be enabled.
 EHCI2                          [Enabled]

 USB Ports Per-Port Disable Controller   [Disabled]


                                                        → ←:  Select Screen
                                                        ↑↓:   Select Item
                                                        Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        ESC:  Exit

            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

EHCI1 and EHCI2

These fields are used to enable or disable USB 2.0.

USB Ports Per-Port Disable Controller

Control each of the USB ports (0~13) disabling.

North Bridge

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                                    Chipset

 System Agent Bridge Name        Ivy Bridge            Check to enableVT-d
 System Agent RC Version         1.5.0.0               function on MCH.
 VT-d Capability                 Supported

 VT-d                            [Enalbed]

 ▶  Graphics Configuration
 ▶  NB PCIe Configuration
 ▶  Memory Configuration


                                                        → ←:  Select Screen
                                                        ↑↓:   Select Item
                                                        Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        ESC:  Exit

            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Graphics Configuration

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                                    Chipset

 Graphics Configuration                                 Select which of IGFX/
 IGFX VBIOS Version              2137                   PEG/PCI Graphics device
 IGfx Frequency                  350 MHz                should be primary delay
                                                        or select SG for switch-
 Primary Display                 [Auto]                 able Gfx.
 Internal Graphics               [Auto]
 DVMT Pre-Allocated              [64M]
 DVMT Total Gfx Mem              [256M]


                                                        → ←:  Select Screen
                                                        ↑↓:   Select Item
                                                        Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        ESC:  Exit

            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Primary Display

Auto	When the system boots, it will auto detects the display device.
IGFX	When the system boots, it will first initialize the onboard VGA.
PEG	When the system boots, it will first initialize the PCI Express x16 graphics card.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

This field is used to select the graphics memory size used by DVMT mode.

NB PCIe Configuration

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                              Chipset

NB PCIe Configuration                                          Configure PEG B0:D1:F0
PEG                                  Not Present              Gen1-Gen3.
   PEG-Gen X                         [Gen1]

Enable PEG                           [Auto]



                                                              → ←:  Select Screen
                                                              ↑↓:    Select Item
                                                              Enter: Select
                                                              +/-:    Change Opt.
                                                              F1:     General Help
                                                              F2:     Previous Values
                                                              F3:     Optimized Defaults
                                                              ESC:  Exit


              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

Enabled PEG

To enable or disable the PEG.

Memory Information

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                              Chipset

Memory Information

Memory RC Version                    1.5.0.0
Memory Frequency                     1333 Mhz
Total Memory                         2048 MB (DDR3)
DIMM#1                               Not Present
DIMM#2                               2048 MB (DDR3)
CAS Latency (tCL)                    9
Minimum delay time
     CAS to RAS (tRCDmin)            9
     Row Precharge (tRPmin)          9                        → ←:  Select Screen
     Active to Precharge (tRASmin)   24                       ↑↓:    Select Item
XMP Profile 1                        Not support              Enter: Select
XMP Profile 2                        Not support              +/-:    Change Opt.
                                                              F1:     General Help
                                                              F2:     Previous Values
                                                              F3:     Optimized Defaults
                                                              ESC:  Exit


              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

ME Subsystem

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                              Chipset

Intel ME Subsystem Configuration
ME FW Version                        8.0.4.1441




                                                              → ←:  Select Screen
                                                              ↑↓:    Select Item
                                                              Enter: Select
                                                              +/-:    Change Opt.
                                                              F1:     General Help
                                                              F2:     Previous Values
                                                              F3:     Optimized Defaults
                                                              ESC:  Exit


              Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

41

Boot

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

| Main | Advanced | Chipset | Boot | Security | Save & Exit |

Boot Configuration
Setup Prompt Timeout   1
Bootup NumLock State   [On]

Quiet Boot   [Disabled]

CSM16 Module Version   07.69

Boot Option Priorities

▶ CSM Parameters

Number of seconds to wait for setup activation key.
65535(0xFFFF) means indefinite waiting.

←→: Select Screen
↑↓:   Select Item
Enter: Select
+/-:   Change Opt.
F1:   General Help
F2:   Previous Values
F3:   Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Setup Prompt Timeout

Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.

Bootup NumLock State

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.

Quiet Boot

Enables or disables the quiet boot function.

CSM Parameters

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

| Main | Advanced | Chipset | Boot | Security | Save & Exit |

Launch CSM   [Enabled]
Boot option filter   [UEFI and Legacy]
Launch PXE OpROM policy   [Do not launch]
Launch Storage OpROM policy   [Legacy only]

Other PCI device ROM priority   [UEFI OpROM]

This option controls if CSM will be launched.

←→: Select Screen
↑↓:   Select Item
Enter: Select
+/-:   Change Opt.
F1:   General Help
F2:   Previous Values
F3:   Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Boot option filter

This option controls what devices system can be boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and legacy PXE OpROM.

Launch Storage OpROM policy

Controls the execution of UEFI and legacy storage OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass Storage, or Video defines which OpROM to launch.

Security

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit

Password Description

If ONLY the Administrator's password is set,
then this only limits access to Setup and is only
asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will have
Administrator rights.
The password length must be
in the following range:
Minimum length   3
Maximum length   20

Administrator Password
User Password

    UEFI Secure Boot Management

Set Administrator
Password.

→ ←: Select Screen
↑↓:   Select Item
Enter: Select
+/-:   Change Opt.
F1:   General Help
F2:   Previous Values
F3:   Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit

Save Changes and Reset
Discard Changes and Reset

Restore Defaults

Boot Override

Launch EFI Shell from filesystem device

Reset the system after
saving the changes.

← →: Select Screen
↑↓:   Select Item
Enter: Select
+/-:   Change Opt.
F1:   General Help
F2:   Previous Values
F3:   Optimized Defaults
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

Discard Changes and Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values of all the setup options.

Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

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

then press <Enter>.

```
C:\AFU\AFUDOS>afudos filename /B /P /N

   +----------------------------------------------------------------------------+
   |                    AMI Firmware Update Utility(APTIO) v2.25                 |
   |          Copyright (C)2008 American Megatrends Inc. All Rights Reserved.    |
   +----------------------------------------------------------------------------+

      Reading file .............................    done
      Erasing flash ............................    done
      Writing flash ............................    done
      Verifying flash ..........................    done
      Erasing BootBlock ....................    done
      Writing BootBlock ....................    done
      Verifying BootBlock .................    done

   C:\AFU\AFUDOS>
```

Notice: BIOS SPI ROM

1. The Intel® Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.

2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.

3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.

Note:
a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.
b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.

44

Chapter 4 - Supported Software

Install drivers, utilities and software applications that are required to facilitate and enhance the performance of the system board. You may acquire the software from your sales representatives, from an optional DVD included in the shipment, or from the website download page at https://www.dfi.com/DownloadCenter.
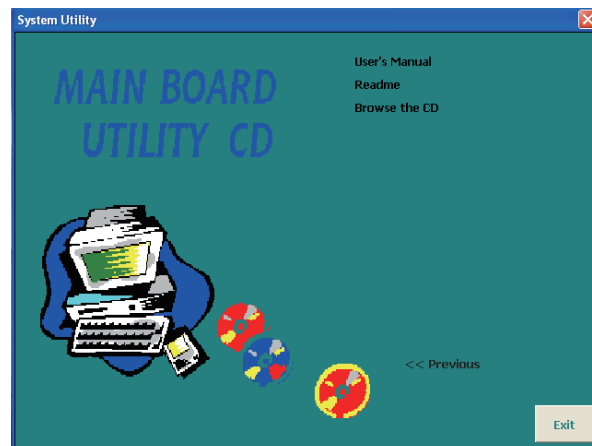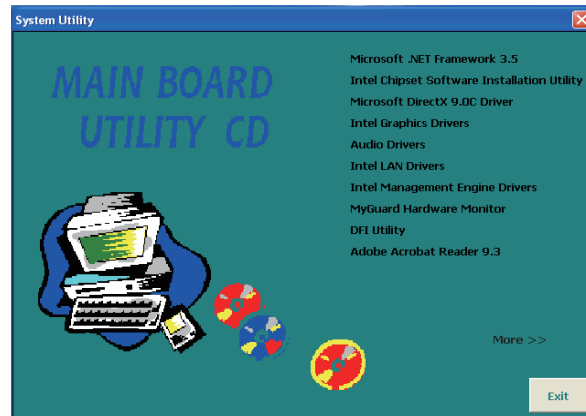
Microsoft .NET Framework 3.5

(for Windows XP only)

> **Note:**
> Before installing Microsoft .NET Framework 3.5, make sure you have updated your Windows XP operating system to Service Pack 3.

To install the driver, click "Microsoft .NET Framework 3.5" on the main menu.

1. Read the license agreement carefully.

    Click "I have read and accept the terms of the License Agreement" then click Install.
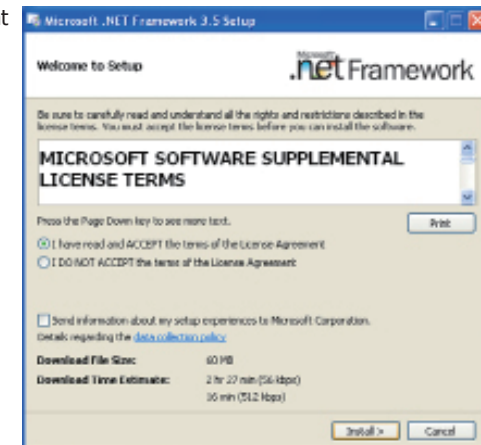
2. Setup is now installing the driver.

45
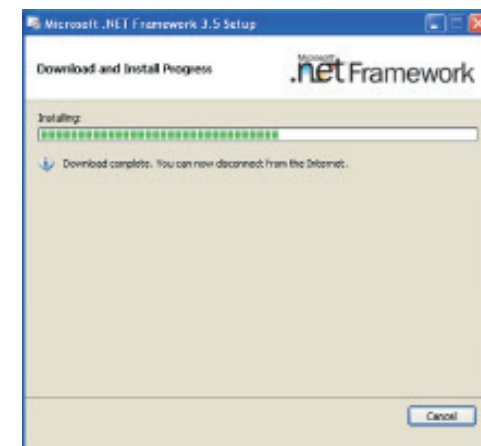
3. Click Exit.
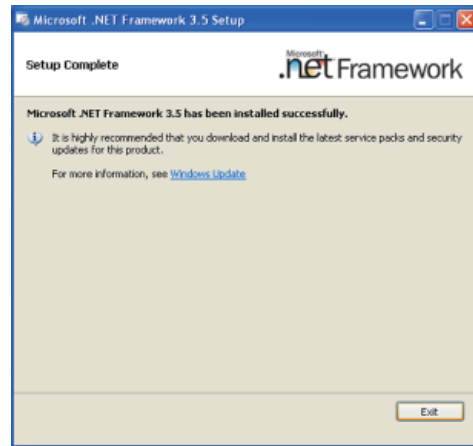
Intel Chipset Software Installation Utility

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

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

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

2. Read the license agreement then click Yes.

46

3. Go through the readme document for more installation tips then click Next.
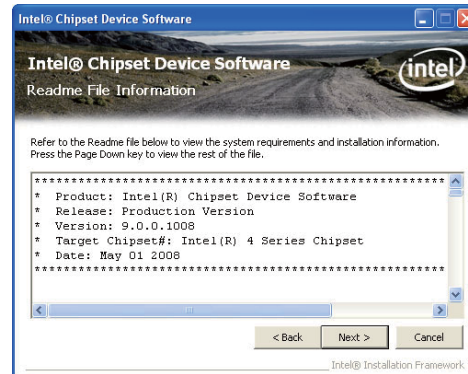
4. Click Finish to exit setup.

Microsoft DirectX 9.0C (for Windows XP only)

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

1. Click "**I** accept the agreement" then click Next.
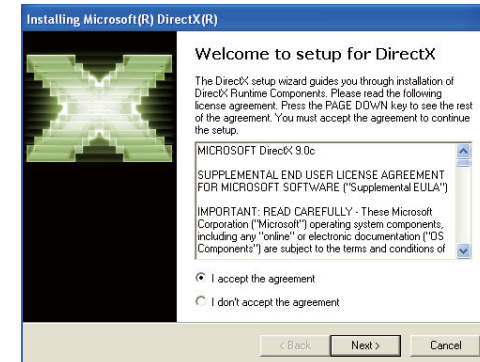
2. To start installation, click Next.
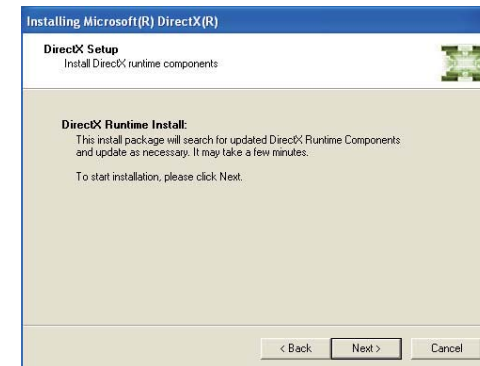
3. Click Finish. Reboot the system for DirectX to take effect.
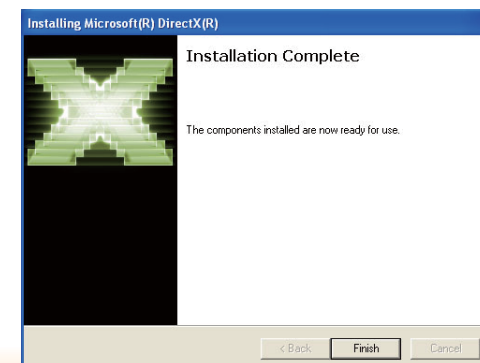
Intel Graphics Drivers

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 Vista desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

2. Read the license agreement then click Yes.

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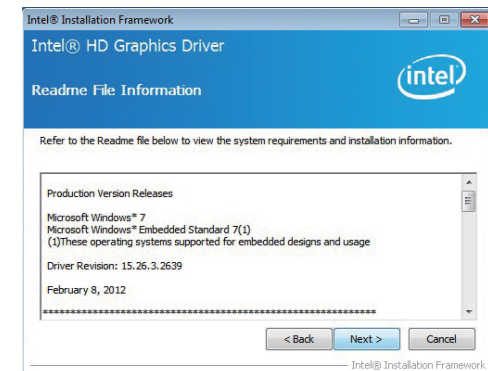
4. Setup is now installing the driver. Click Next to continue.
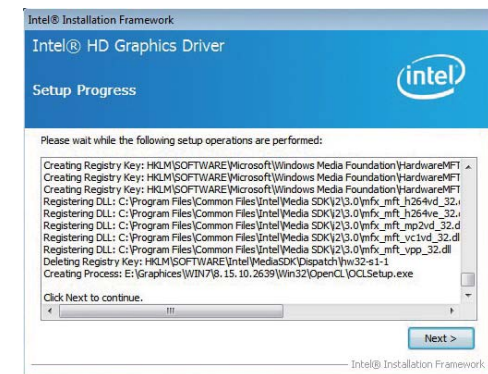
5. Click "Yes, I want to restart this computer now" then click Finish.

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

48
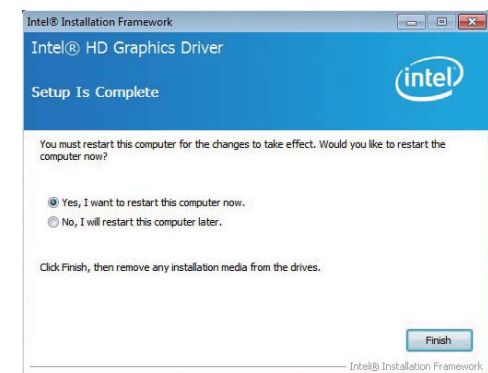
Audio Drivers

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

1. Setup is ready to install the driver. Click Next.
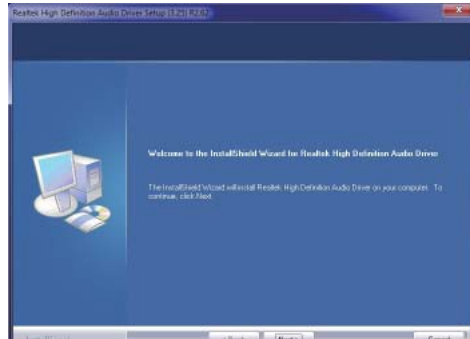
2. Click "Yes, I want to restart my computer now" then click Finish.

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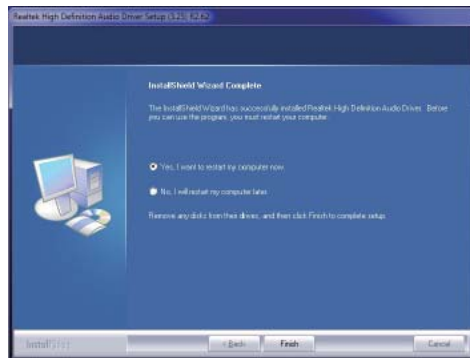
Intel LAN Drivers

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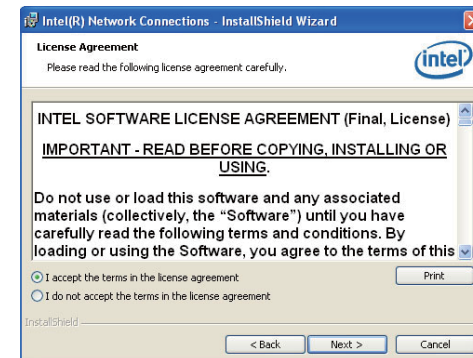
3. Select the program featuers you want installed then click Next.

49
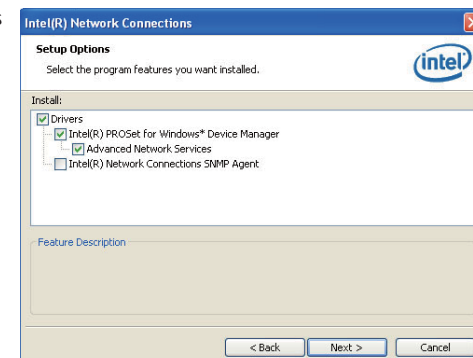
4. Click Install to begin the installation.
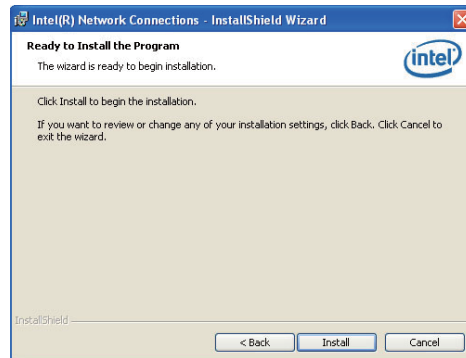
5. After completing installation, click Finish.
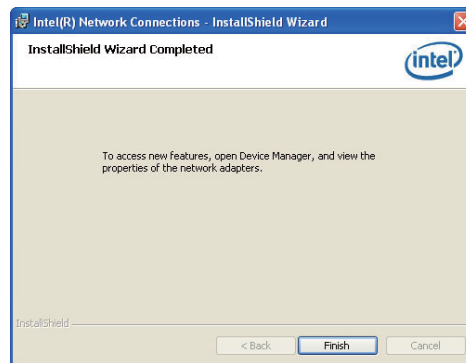
Intel Management Engine Drivers

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

1. Setup is ready to install the driver. Click Next.
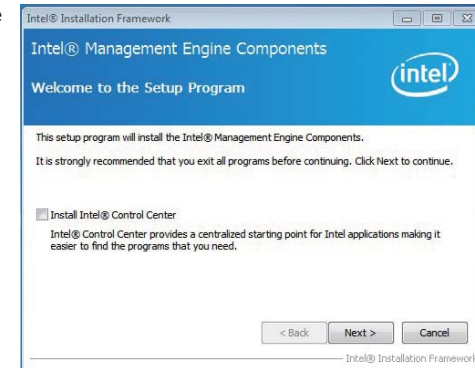
2. Read the license agreement then click Yes.
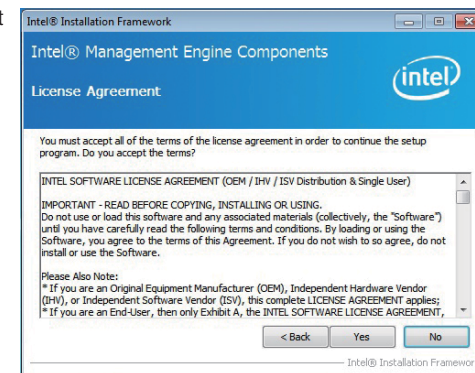
3. Setup is currently installing the driver. After installation has completed, click Next.
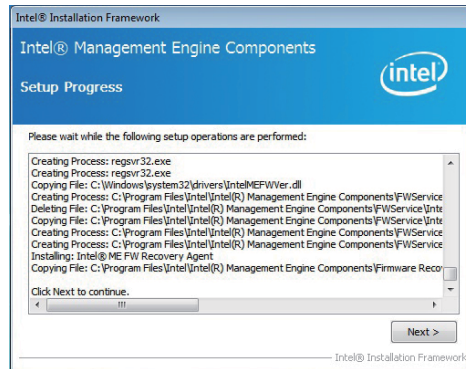
4. After completing installation, click Finish.
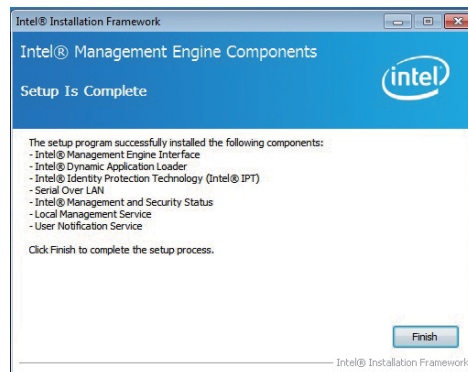
MyGuard Hardware Monitor

1. Locate for the MyGuard folder in the provided disc.

2. In the MyGuard folder, right-click on the "setup" file.

3. Select Run As Administrator.

4. Double-click Setup.
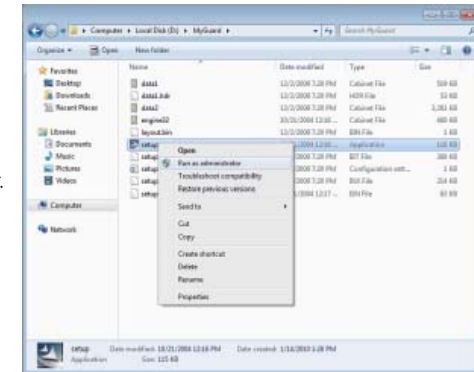
> **Important:**
> Perform steps 1-3 only when using Windows 7 or Windows Vista.

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

51
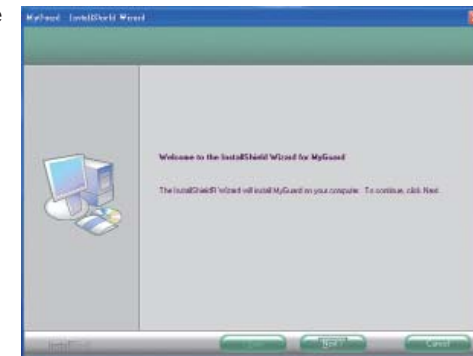
6. Click Install to begin instal-
   lation.
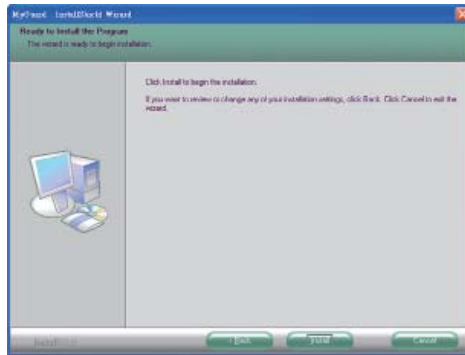
7. Setup is currently installing
   the utility.
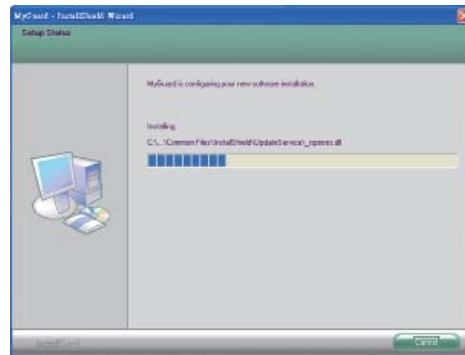
8. After completing instal-
   lation, click Finish to exit
   setup.
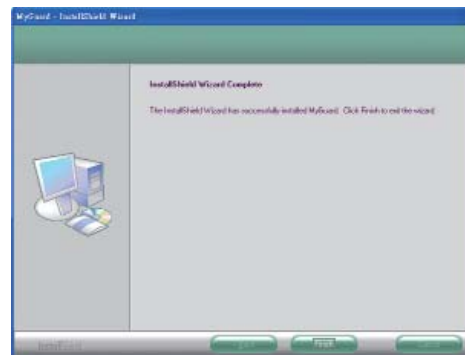
DFI Utility

DFI Utility provides information about the board, Watchdog,and DIO. To access the utility, click "DFI Utility" on the main menu.

Note:
If you are using Windows 7, you need to access the operating system as an administrator to be able to install the utility.

1. Setup is ready to instal
   the DFI Utility driver
   Click "Next".

2. Click "I accept the terms in
   the license agreement" then
   click "Next".
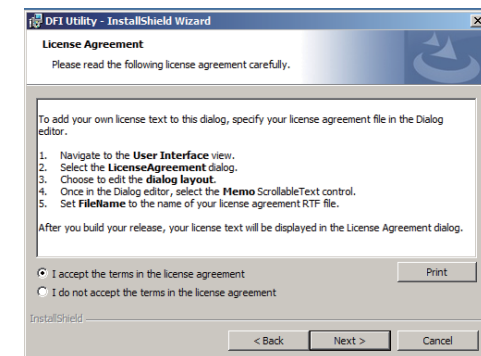
3. Enter "User name" (SB102) and "Organization" information then click "Next".
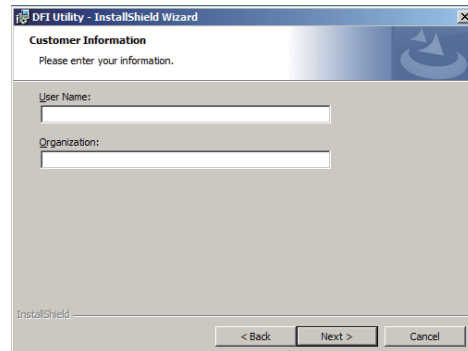
4. Click "Install" to begin the installation.
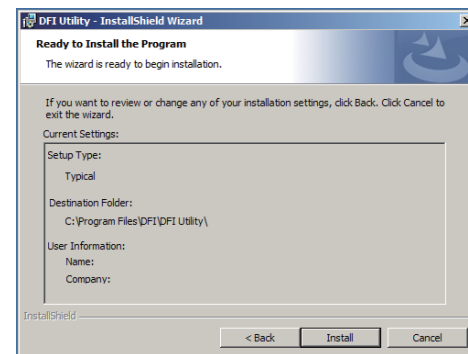
5. After completing installation, click "Finish".
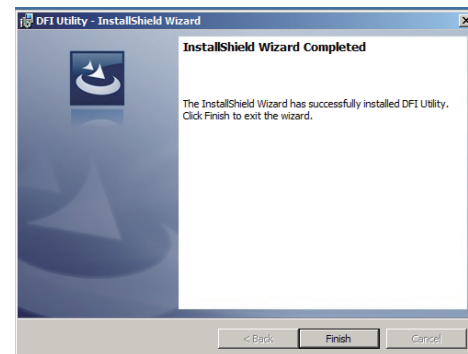
The DFI Utility icon will appear on the desktop. Double-click the icon to open the utility.
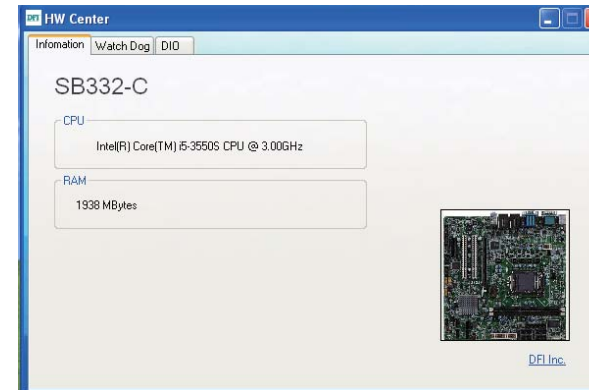
Adobe Acrobat Reader 9.3

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

1. Click Next to install or click Change Destination Folder to select another folder.
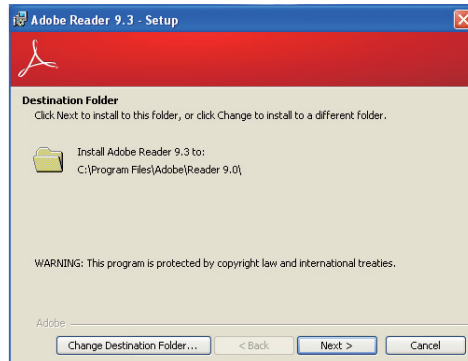
2. Click Install to begin installation.
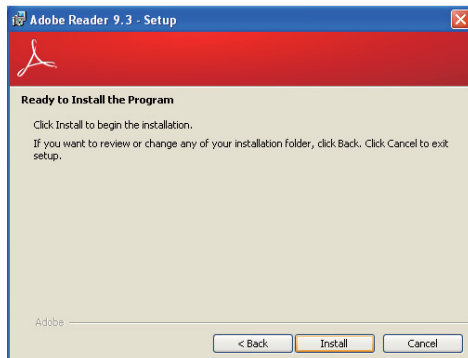
3. Click Finish to exit installation.

54
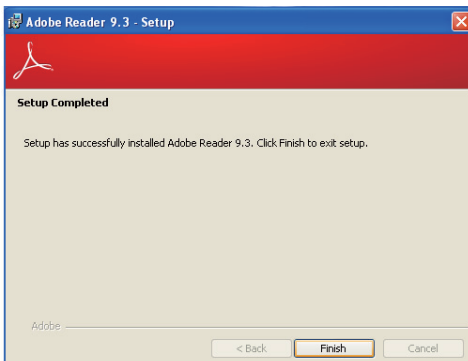
Appendix A - NLITE and AHCI Installation Guide

nLite

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

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

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

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

2. Install nLite.

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

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

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

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

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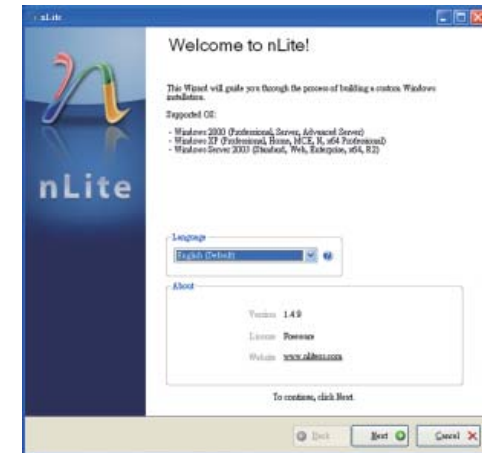
6. Click **Next** to temporarily save the Windows installation files to the designated default folder.

    If you want to save them in another folder, click **Browse**, select the folder and then click **Next**.
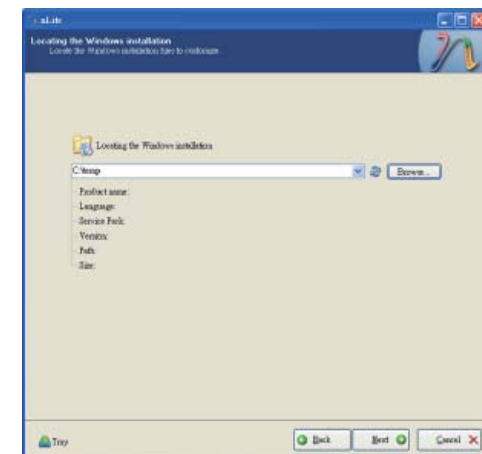
7. Click **Next**.
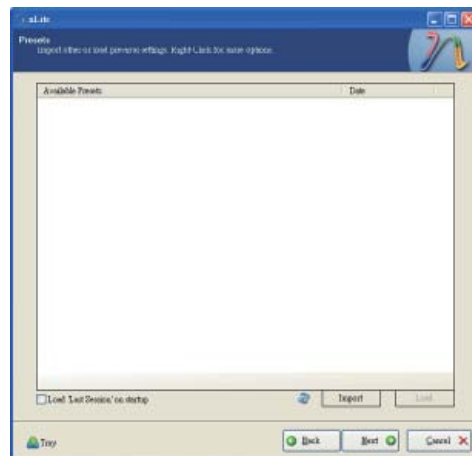
8. In the Task Selection dialog box, click **Drivers** and **Bootable ISO**. Click **Next**.

9. Click **Insert** and then select **Multiple driver folder** to select the drivers you will integrate. Click **Next**.
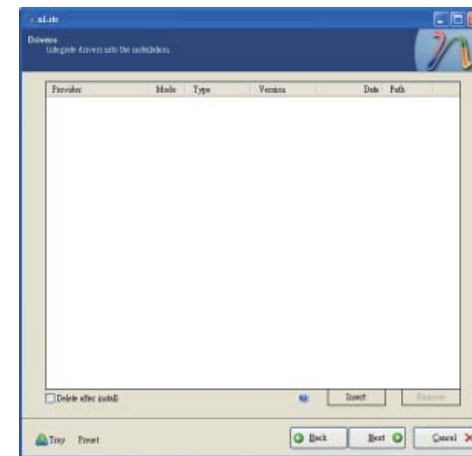
10. Select only the drivers appropriate for the Windows version that you are using and then click **OK**.

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

56

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**.

57

15. To create an image, select the **Create Image** mode under the General section and then click **Next**.
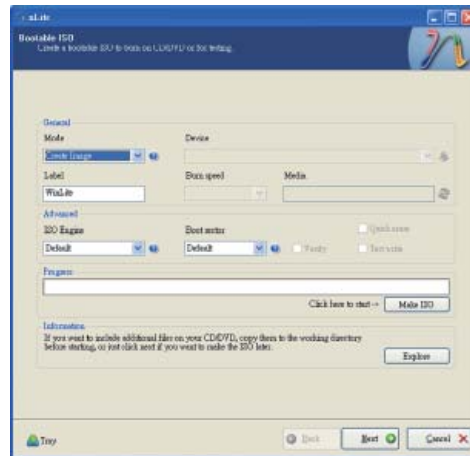
16. Or you can choose to burn it directly to a disc by selecting the **Direct Burn** mode under the General section.

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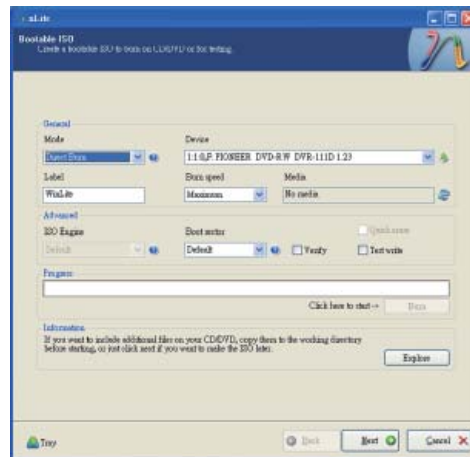
17. You have finished customizing the Windows XP installation disc. Click **Finish**.

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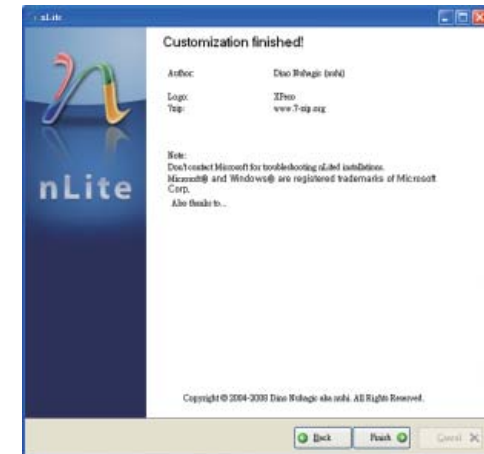
AHCI

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

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

2. Install Windows XP but do not press F6.

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

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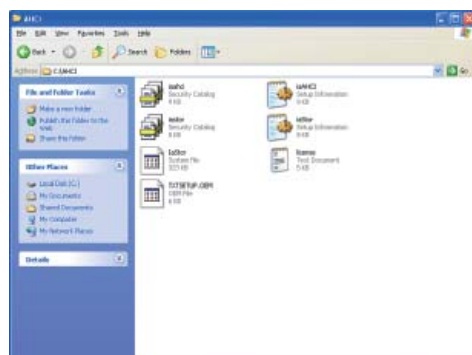
4. Open Device Manager and right click on one of the Intel Serial ATA Storage Controllers, then select **Update Driver**.

   If the controller you selected did not work, try selecting another one.
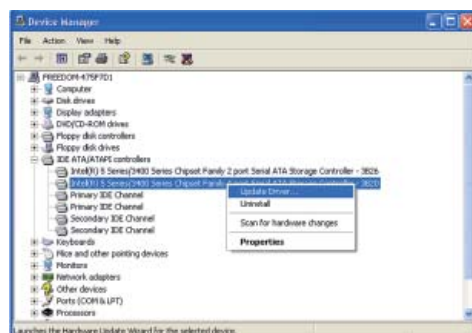
5. In the Hardware Update Wizard dialog box, select **"No, not this time"** then click **Next**.
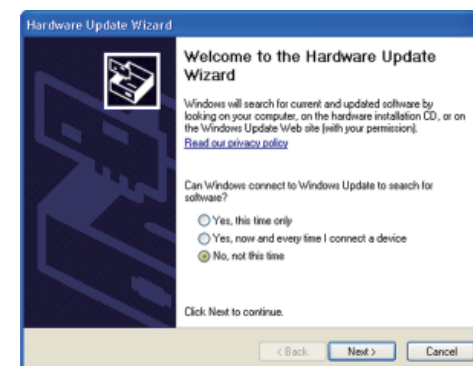
6. Select **"Install from a list or specific location (Advanced)"** and then click **Next**.
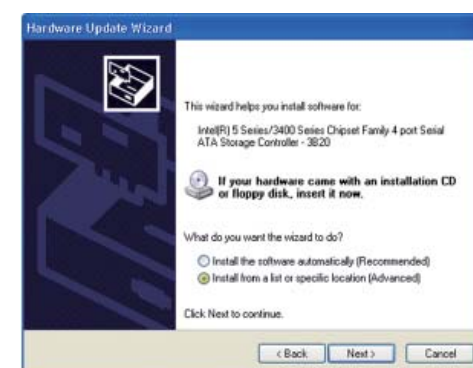
7. Select **"Don't search. I will choose the driver to install"** and then click **Next**.

59
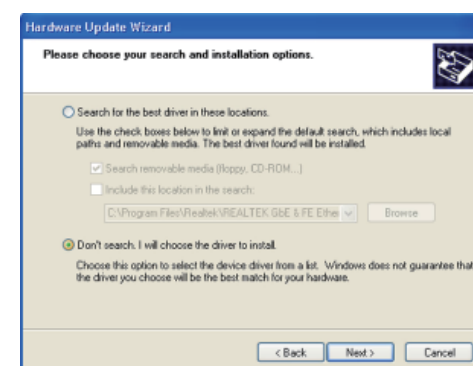
8. Click **"Have Disk"**.
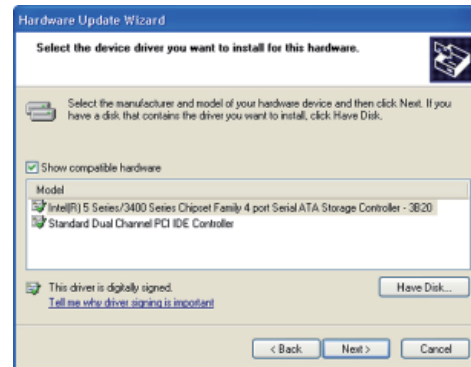
9. Select C:\AHCI\iaAHCI.inf and then click **Open**.
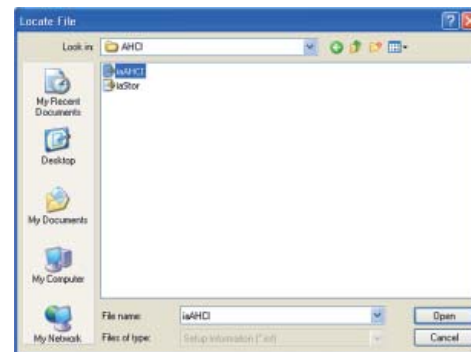
10. Select the appropriate AHCI Controller of your hardware device and then click **Next**.
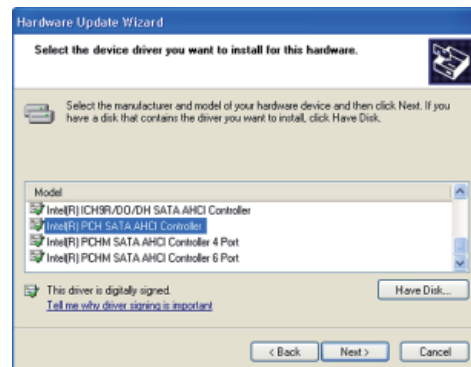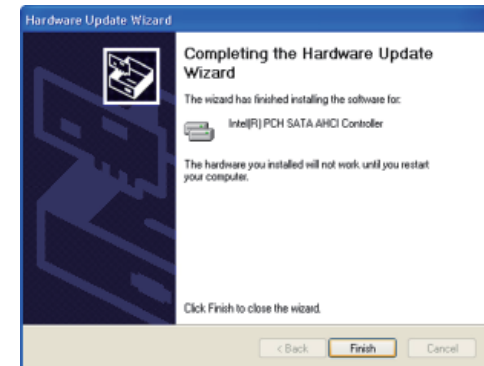

11. A warning message appeared because the selected SATA controller did not match your hardware device.
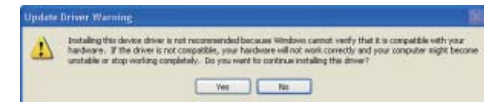
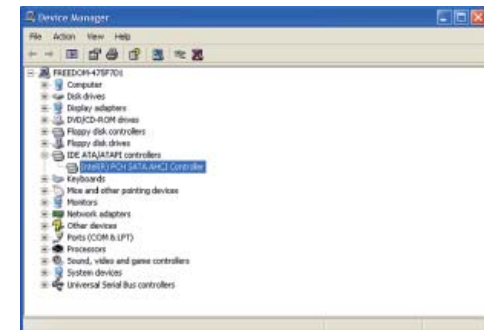   Ignore the warning and click **Yes** to proceed.

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 Sample Code

```
;Software programming example:

;-------------------------------------------
;(1) Enter Super IO Configuration mode
;-------------------------------------------
MOV        DX,2EH
MOV        AL,87H
OUT        DX,AL
OUT        DX,AL


;-----------------------------------------------------------------------------------
;(2) Configuration  Logical  Device  7,  register  CRF5/CRF6  (WDT  Control  /WDT
timer)
;-----------------------------------------------------------------------------------
MOV        DX,2EH
MOV        AL,07H              ;Ready to Program Logical Device
OUT        DX,AL

MOV        DX,2FH
MOV        AL,07H              ;Select Logical Device 7
OUT        DX,AL

MOV        DX,2EH
MOV        AL, F6H             ;Select watchdog timer register
OUT        DX,AL

MOV        DX,2FH
MOV        AL,10H              ;Set watchdog timer value
OUT        DX,AL

MOV        DX,2EH
MOV        AL, F5H             ;Select watchdog Control Register
OUT        DX,AL

MOV        DX,2FH
MOV        AL,61H              ;Set Watchdog Control Value
OUT        DX,AL

;-----------------------------------------------------------
;(1) Exit extended function mode
;-----------------------------------------------------------
MOV        DX,2EH
MOV        AL,AAH
OUT        DX,AL
```

Appendix C - System Error Message

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

Error Messages

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

CMOS BATTERY HAS FAILED

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

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

CMOS CHECKSUM ERROR

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

DISPLAY SWITCH IS SET INCORRECTLY

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

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

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

Keyboard error or no keyboard present

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

Manufacturing POST loop

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

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

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

Appendix D - Troubleshooting Checklist

Troubleshooting Checklist

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

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

1. The power switch of each peripheral device is turned on.

2. All cables and power cords are tightly connected.

3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.

4. The monitor is turned on.

5. The display's brightness and contrast controls are adjusted properly.

6. All add-in boards in the expansion slots are seated securely.

7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

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

1. Make sure that the monitor's power switch is on.

2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.

3. Check that the video input cable is properly attached to the monitor and the system's display adapter.

4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.

2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.

3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

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

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.

2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.

3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.

2. The diskette may be write-protected. Use a diskette that is not write-protected.

3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.

4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.

2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

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

Serial Port

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

characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.

2. Verify that the device is plugged into the correct serial port on the rear of the computer.

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

4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.

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

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.

2. Check the jumper settings to ensure that the jumpers are properly set.

3. Verify that all memory modules are seated securely into the memory sockets.

4. Make sure the memory modules are in the correct locations.

5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.

6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.

Appendix E - BIOS Status Code

Status Code Ranges

Status Code Range	Description
0x01 – 0x0F	SEC Status Codes & Errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0xCF	DXE execution up to BDS
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

Standard Status Codes

SEC Status Codes

Status Code	Description
0x0	Not used
Progress Codes	
0x1	Power on. Reset type detection (soft/hard).
0x2	AP initialization before microcode loading
0x3	North Bridge initialization before microcode loading
0x4	South Bridge initialization before microcode loading
0x5	OEM initialization before microcode loading
0x6	Microcode loading
0x7	AP initialization after microcode loading
0x8	North Bridge initialization after microcode loading
0x9	South Bridge initialization after microcode loading
0xA	OEM initialization after microcode loading
0xB	Cache initialization
SEC Error Codes	
0xC – 0xD	Reserved for future AMI SEC error codes
0xE	Microcode not found
0xF	Microcode not loaded

PEI Status Codes

Status Code	Description
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)

0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F-0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started

PEI Error Codes

0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error.
0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	reset PPI is not available
0x5C-0x5F	Reserved for future AMI error codes

S3 Resume Progress Codes

0xE0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4-0xE7	Reserved for future AMI progress codes
0xE0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)

S3 Resume Error Codes

0xE8	S3 Resume Failed in PEI
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC-0xEF	Reserved for future AMI error codes

Recovery Progress Codes

0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started

0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5-0xF7	Reserved for future AMI progress codes

Recovery Error Codes

0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
7	Reset PPI is not available
4	Recovery failed
4	S3 Resume failed

DXE Status Codes

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)

0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module specific)
0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)

0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes

DXE Error Codes

0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

67

Appendix E

DXE Beep Codes

# of Beeps	Description
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
1	Invalid password
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

ACPI/ASL Status Codes

Status Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

OEM-Reserved Status Code Ranges

Status Code	Description
0x5	OEM SEC initialization before microcode loading
0xA	OEM SEC initialization after microcode loading
0x1D – 0x2A	OEM pre-memory initialization codes
0x3F – 0x4E	OEM PEI post memory initialization codes
0x80 – 0x8F	OEM DXE initialization codes
0xC0 – 0xCF	OEM BDS initialization codes

68

Appendix E BIOS status code

www.dfi.com