DFI®

SB102-D
Mini-ITX Industrial Motherboard
User's Manual

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FCC and DOC Statement on Class B

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

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

Notice:

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

Table of Contents

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 SB102-D motherboard
- One USB port cable (with bracket)
- Two Serial ATA data cables
- 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
- 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.

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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
	• Intel® Advanced Vector Extensions (Intel® AVX) Instructions
	• Intel® Turbo Boost Technology

Chipset	• Intel® H61 Express Chipset

System Memory	• Two 204-pin DDR3 SODIMM sockets
	• Supports DDR3 1333/1600MHz (3rd generation processors)
	  Supports DDR3 1066/1333MHz (2nd generation processors)
	• Supports up to 16GB system memory
	• Supports dual channel memory interface
	• 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 Mini PCIe slot
	  - Supports USB and PCIe signals
	  - Supports half size Mini PCIe card

Graphics	• Intel® HD Graphics • Display ports: HDMI and DVI-I • HDMI and DVI-I display resolution up to 1920x1200 @60Hz • VGA display resolution up to 2048x1536 pixels with 32-bit color at 75Hz • Supports 6 Graphics Execution Units (EUs) • Intel® Clear Video Technology • DirectX Video Acceleration (DXVA) support for accelerating video processing
Audio	• Realtek ALC886 5.1-channel High Definition Audio • Supports audio amplifier • High performance DACs with 97dB SNR • ADCs with 90dB SNR • 8 stereo DACs support 24-bit PCM format for stereo audio playback • 2 stereo ADCs support 24-bit PCM format for multiple input streaming
LAN	• Intel® 82579LM Gigabit Ethernet Phy • Intel® 82574L PCI Express Gigabit Ethernet controller • 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 (RS232 and/or Power)
	  - 1 RS232
	• 1 HDMI port
	• 1 DVI-I port
	• 2 RJ45 LAN ports
	• 4 USB 2.0/1.1 ports
	• Mic-in, Line-in and Line-out jacks

I/O Connectors	• 2 connectors for 4 external USB 2.0/1.1 ports • 1 SDVO connector for the optional SDVO-LVDS daughterboard • 1 8-bit Digital I/O connector • 1 Digital I/O power connector • 1 front audio connector for line-out and mic-in jacks • 1 audio amplifier connector • 4 Serial ATA ports • 1 20-pin ATX power connector • 1 4-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
Power Consumption	• 138.74 W with i7-2600 at 3.4GHz and 2x 2GB DDR3 SODIMM
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	• 0℃ to 60℃
Humidity	• 10% to 90%
PCB	• Mini-ITX form factor • 170mm (6.7") x 170mm (6.7")
Certification	• CE, FCC Class B, RoHS, UL

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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 outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. Supports HDMI and DVI-I interfaces for display outputs.

- **DVI**

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

- **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. The bandwidth of the SATA 3.0 will be limited by carrier board design.

- **Gigabit LAN**

One Intel® 82579LM and one Intel® 82574L Gigabit LAN controllers support up to 1Gbps data transmission.

- **Audio**

The Realtek ALC886 audio codec provides 5.1-channel High Definition audio output.

- **USB**

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

- **Wake-On-PS/2**

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

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

- **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.

- **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.

- **ACPI STR**

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

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

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

Chapter 2 - Hardware Installation

Board Layout

Board layout labels:
USB 0-1/8-9 Power select (JP4)
PS/2 MS PS/2 KB
LAN 1 USB 2.0 (0-1)
LAN 2 USB 2.0 (8-9)
DVI-I HDMI
COM 2 COM 1
Line-in Line-out Mic-in
PS2 KS/MS Power Select (JP2)
DIO 8
Chassis intrusion
SDVO
Intel WG82574L
ATX 12V
ASmedia ASM1442
ASmedia ASM1442
COM1 RS232/Power select (JP3)
COM1 RS232/422/485 Select (JP1)
Front audio
Audio Amplifier
Front audio/ Audio Amplifier (JP5)
ALC886
CPU FAN
DIO Power
SATA 0
SATA 1
SATA 4
SATA 5
Battery
Fintek F71879F
Clear CMOS Data (JP9)
Intel H61
SPI Flash BIOS
USB 2-3
USB 2-3/10-11 power select (JP7)
LGA 1155
DDR3_1 SODIMM
DDR3_2 SODIMM
PCIe x16
Buzzer
Standby power LED
Mini PCIe
Power-on Select (JP8)
System_Fan2
ATX power
System_Fan1
Front Panel
USB 10-11
Standby power LED

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.

Standby Power LED
DDR3-1
DDR3-2
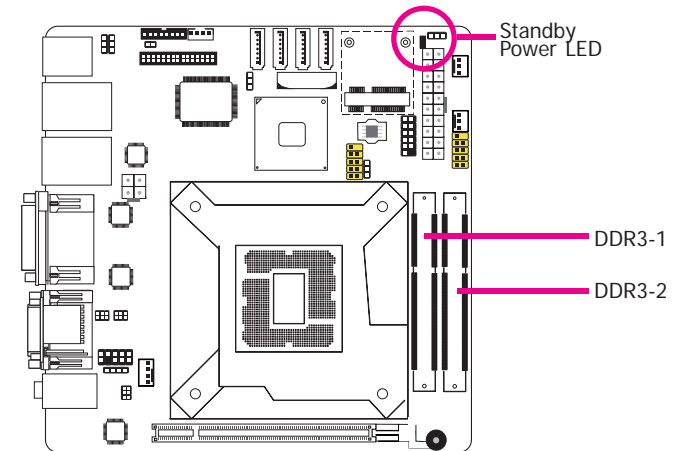
Features

- Two 204-pin DDR3 SODIMM sockets
- Supports 1066/1333/1600MHz DDR3 SDRAM
- Dual channel memory interface
- Supports maximum of 16GB system memory

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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.

Installing the DIMM Module

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

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

2. Disconnect all power cords and cables.

3. Locate the DIMM socket on the system board.

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

Ejector tab — Ejector tab

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

Notch

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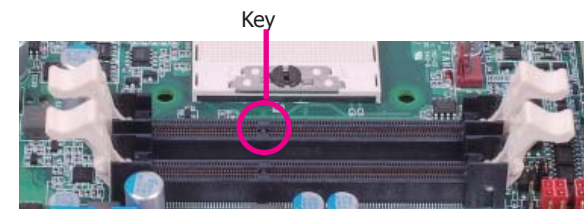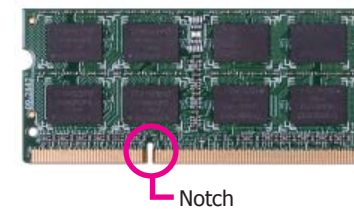
6. Grasping the module by its edges, position the module above the socket with the "notch" in the module aligned with the "key" on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.

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.

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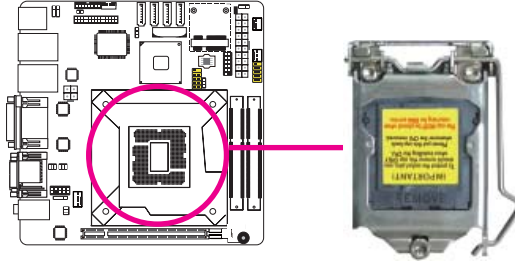
> ⚠️ **Important**:
> The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

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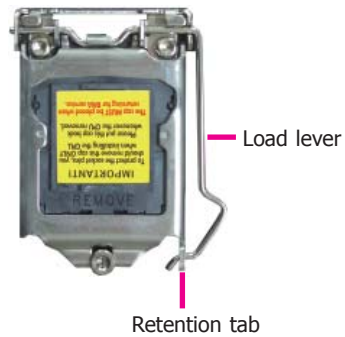
5. Lifting the load lever will at the same time lift the load plate.

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

Load lever

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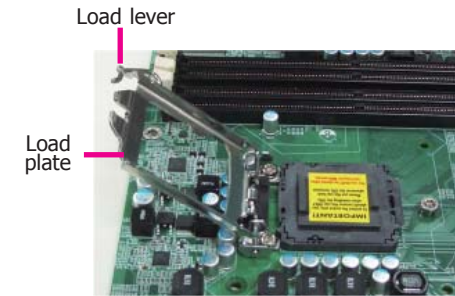
6. Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.

Protective cap

12
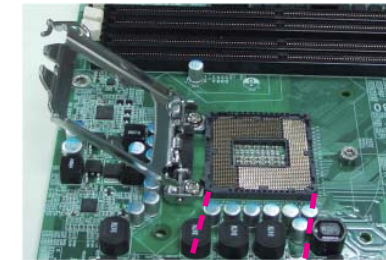
7. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.
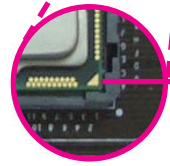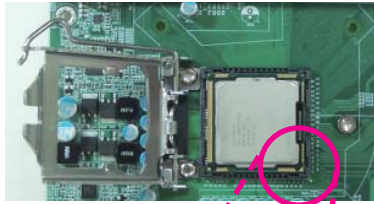
Gold triangular mark

The CPU's notch will at the same time fit into the socket's alignment key.
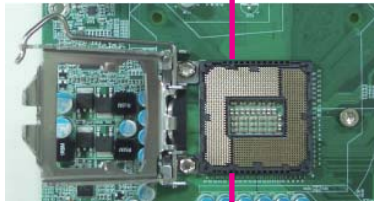
Alignment key

Alignment key

> **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
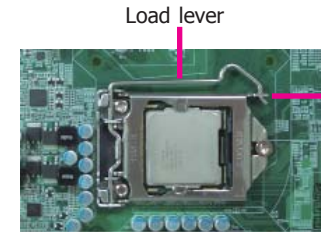
Installing the Fan and Heat Sink

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

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

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

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

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

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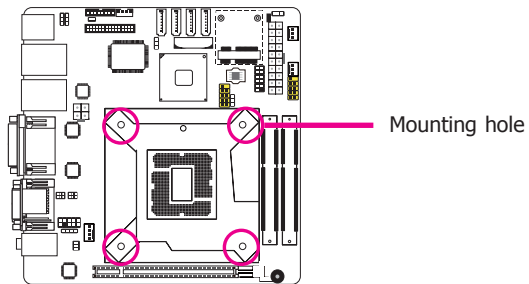
3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan connector.

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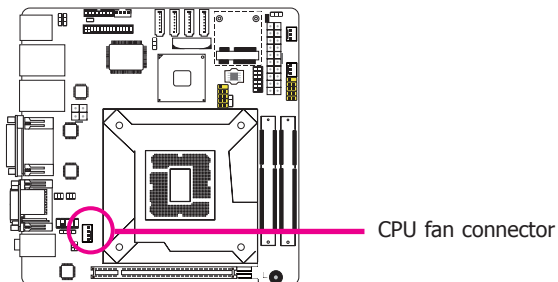
4. Rotate each push-pin according to the direction of the arrow shown on top of the pin.

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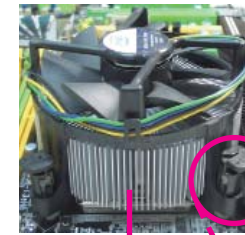
   Heat sink

   "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
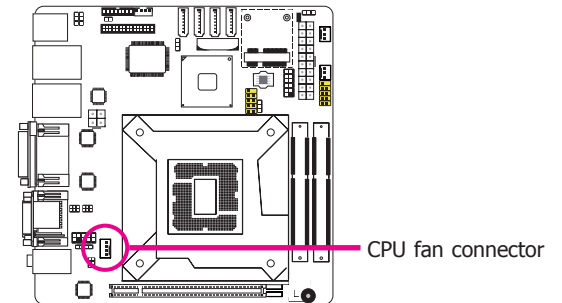
Jumper Settings

Clear CMOS Data

JP9

1
2
3

1-2 On: Normal
(default)

1
2
3

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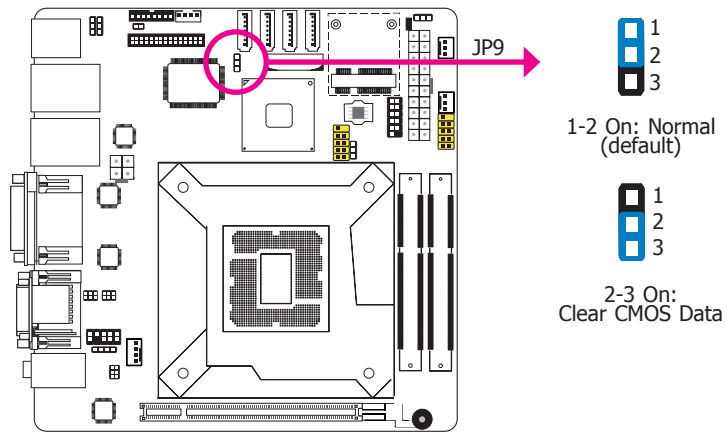
If you encounter the following,

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

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

PS/2 KB/MS Power Select

JP2

1
2
3

1-2 On: +5V
(default)

1
2
3

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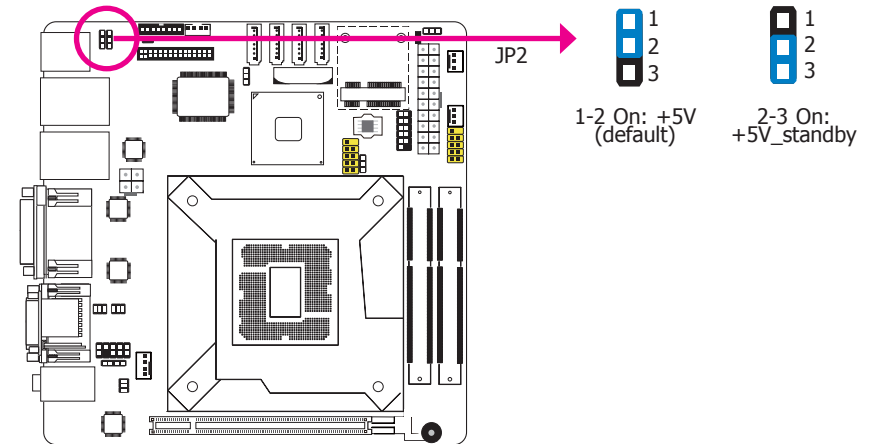
JP2 is used to select the power of the PS/2 keyboard and PS/2 mouse ports. Selecting +5V_ standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

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

USB Power Select

USB 0-1/8-9
(JP4)

1
2
3

1
2
3

1-2 On: +5V
(default)

2-3 On:
+5V_standby

USB 2-3/10-11
(JP7)

1
2
3

1
2
3

1-2 On: +5V
(default)

2-3 On:
+5V_standby
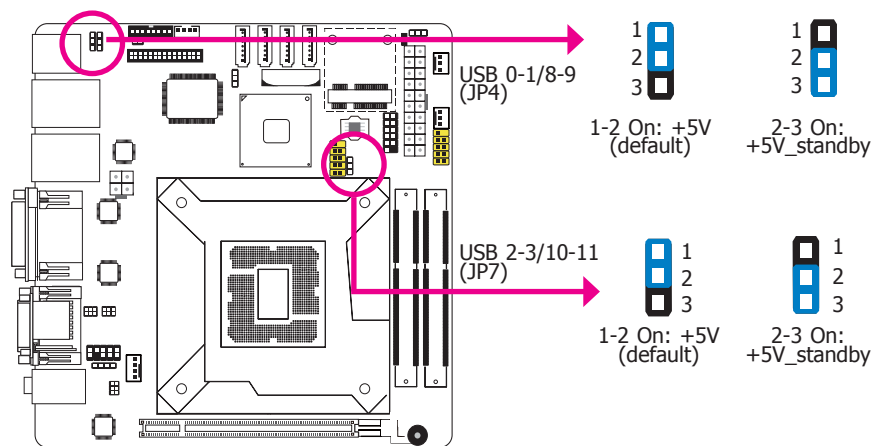
These jumpers are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.

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

1 2 3

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

1 2 3

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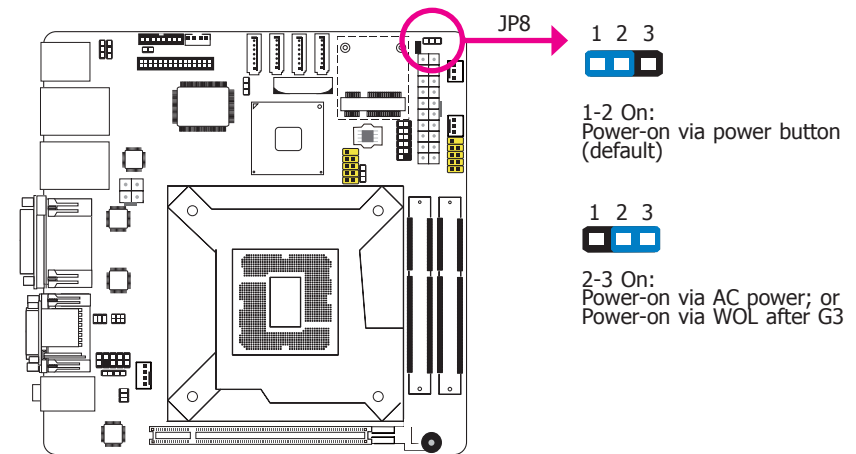
To power-on via WOL after G3:

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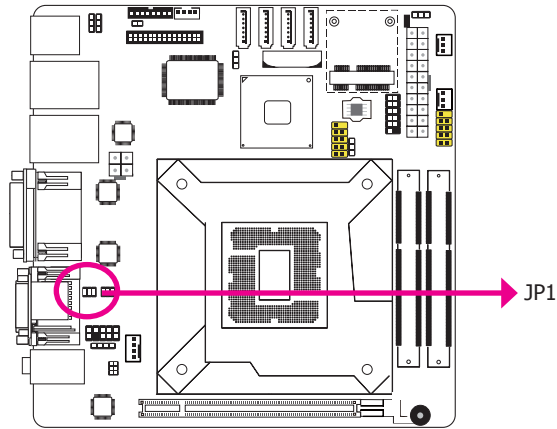
JP1 (for COM1) is used to configure the COM ports to RS232, RS422 (Full Duplex) or RS485. The pin function of the COM ports will vary according to the jumper's setting.

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

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

COM1 RS232/Power Select

JP3

2 4 6 / 1 3 5
1-3 (RI), 2-4 (DCD) On: RS232 (default)

2 4 6 / 1 3 5
3-5 (+5V), 4-6 (+12V) On: RS232 with power
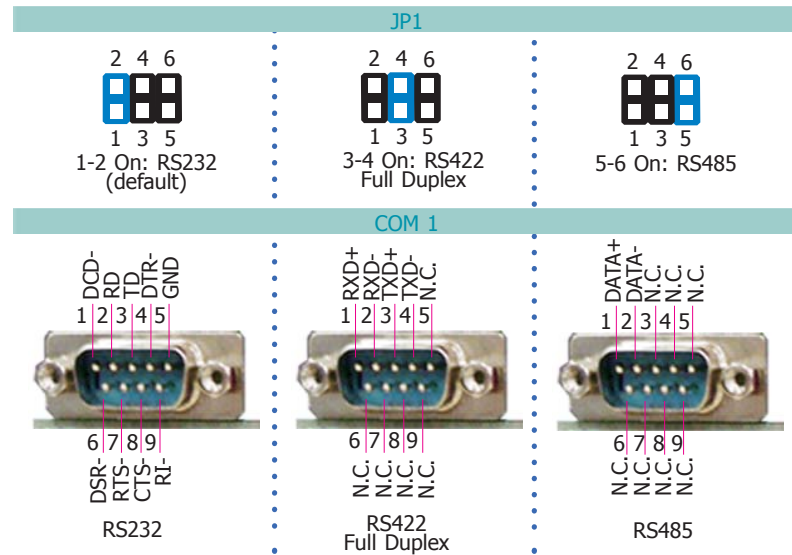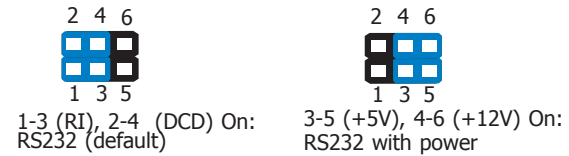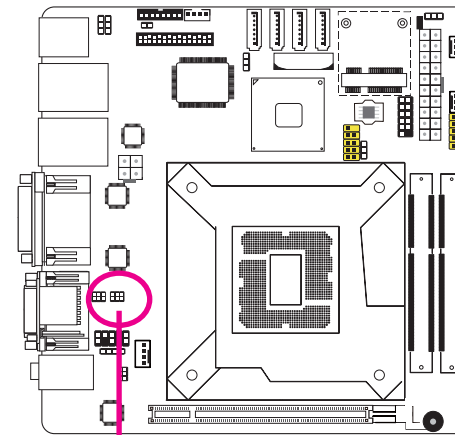
JP3 (for COM1) is used to configure Serial COM port to pure RS232 or RS232 with power.

Front Audio or Audio Amplify Select

JP5

1 2
3 4
5 6

1-3,2-4 On:
Front audio
(default)

1 2
3 4
5 6

3-5,4-6 On:
Audio Amplify
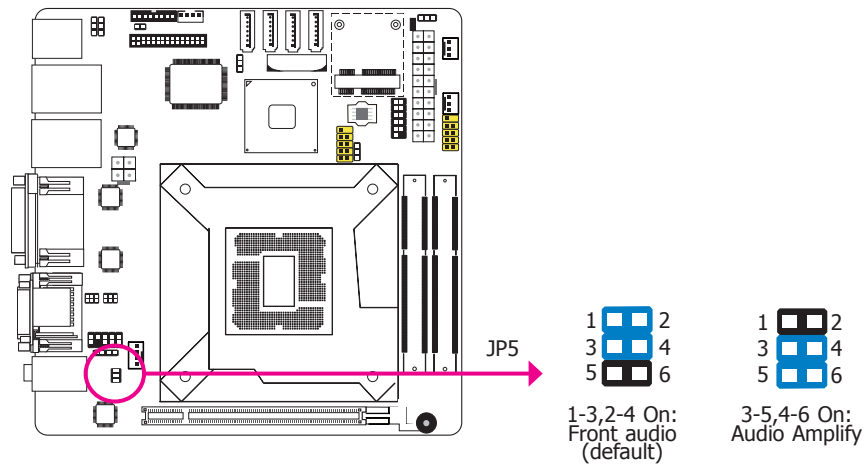
JP5 is used to configure front audio or audio amplify select.

Rear Panel I/O Ports

PS/2 Mouse LAN 1 LAN 2 DVI-I COM 2 Line-in Line-out Mic-in
PS/2 KB USB 2.0 USB 2.0 HDMI COM 1
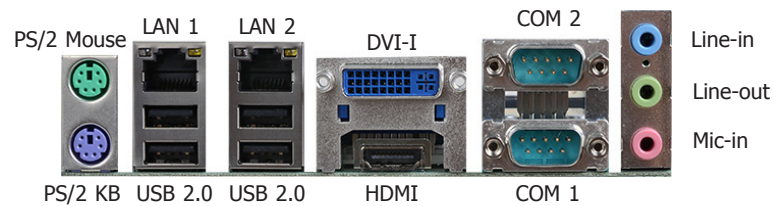
The rear panel I/O ports consist of the following:

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

PS/2 Mouse and PS/2 Keyboard Ports

PS/2 Mouse

PS/2 KB
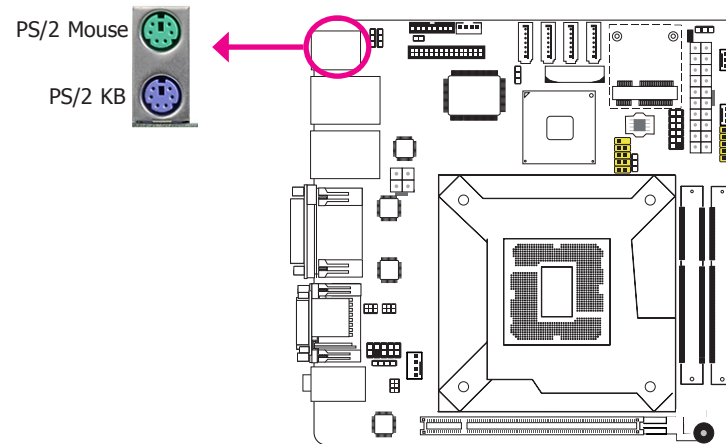
These ports are used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12.

Wake-On-PS/2 Keyboard/Mouse

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

● **Jumper Setting**

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

● **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
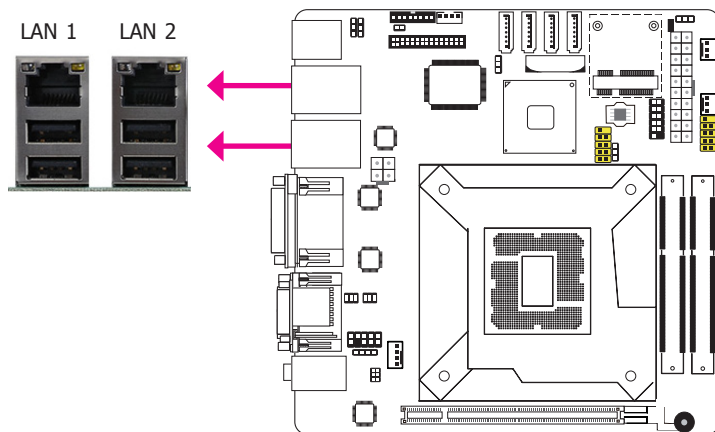
Features

- Intel 82579LM Gigabit Ethernet Phy

- Intel 82574L PCI Express Gigabit Ethernet controller

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

BIOS Setting

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

Driver Installation

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

USB Ports

USB 1
USB 0
USB 2.0

USB 10-11
USB 2-3

```
        10 9
N. C.  [  ]  Key
GND    [  ]  GND
+Data  [  ]  +Data
-Data  [  ]  -Data
VCC    [  ]  VCC
        2 1
```

USB 9
USB 8
USB 2.0
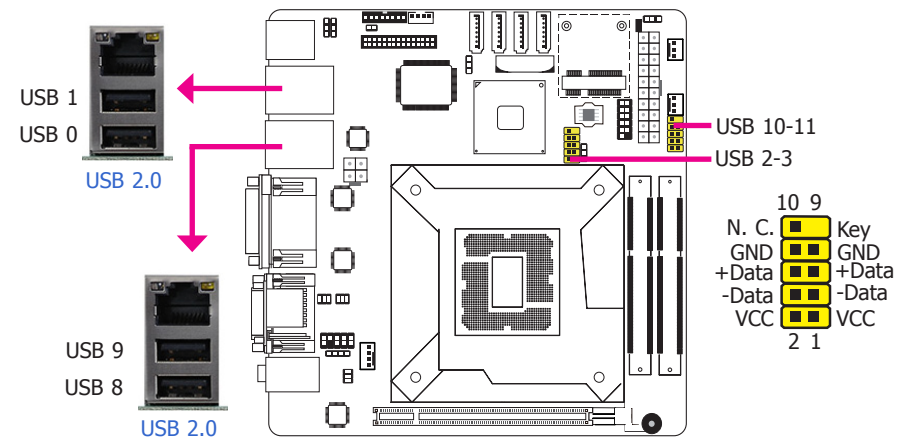
USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

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 Interfaces

The display ports consist of the following:

- HDMI port
- DVI-I port
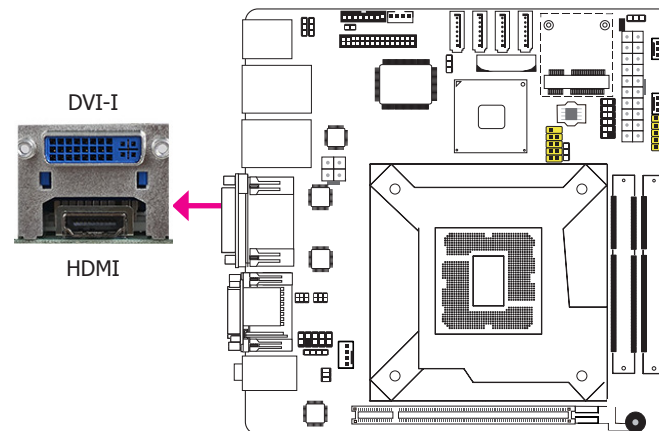
DVI-I

HDMI

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.

DVI-I Port

The DVI-I port is used to connect an LCD monitor.

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

BIOS Setting

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

COM (Serial) Ports

COM 2: RS232
COM 2

COM 1
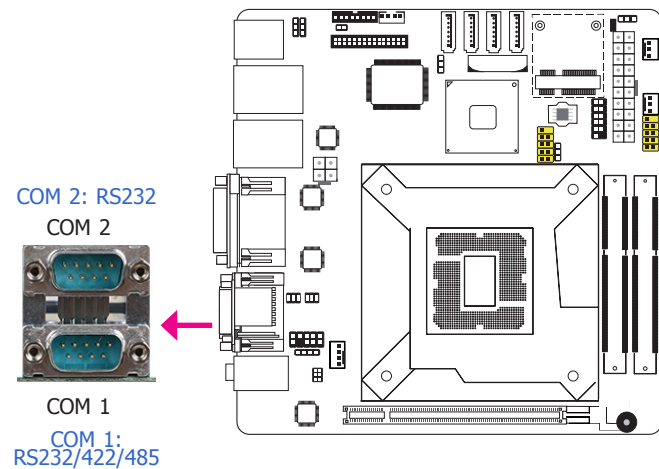
COM 1:
RS232/422/485

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

10 9
Line2-JD   Line2-L
Key   Front_IO_Sense
Mic2-JD   Line2-R
Presence Signal Mic2-R
GND   Mic2-L
2 1
Front audio
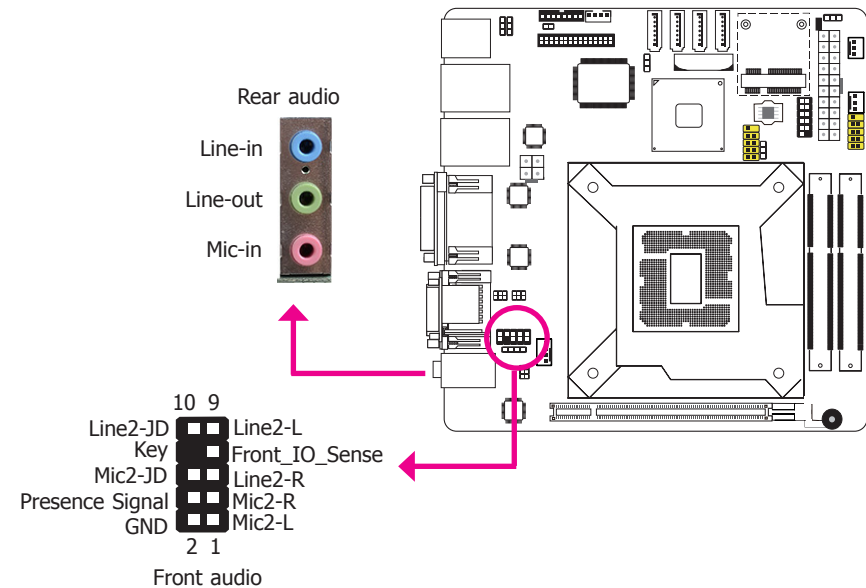
Rear Audio

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.

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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
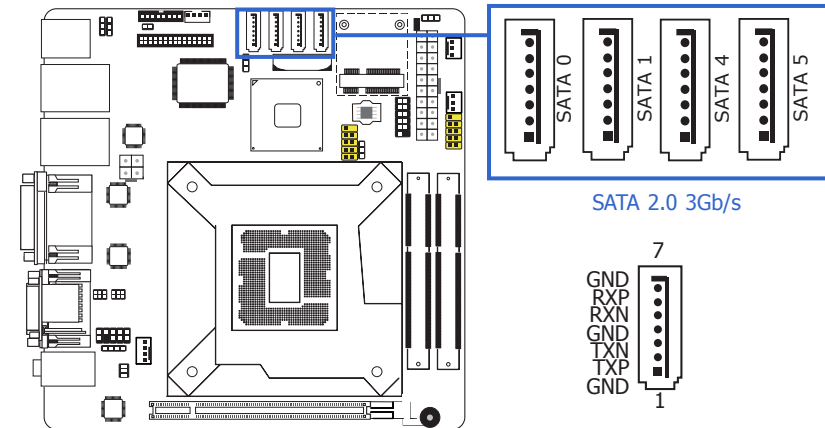
Features

- 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.

Digital I/O Connector

Digital I/O Power Connector

Digital I/O power

4   1
+12V
Ground
5VSB
+5V

Digital I/O

8   1
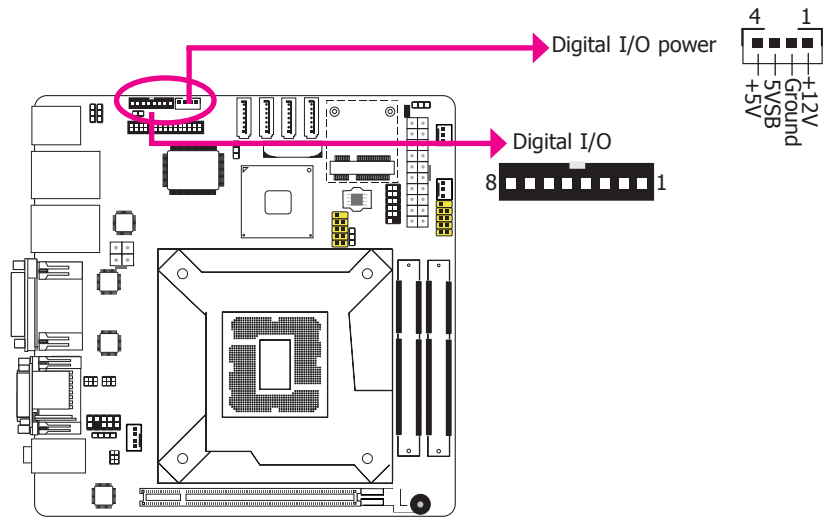
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

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

Amplify Connector

Out L-
Out R+
Amplify   4   1
Out R-
Out L+
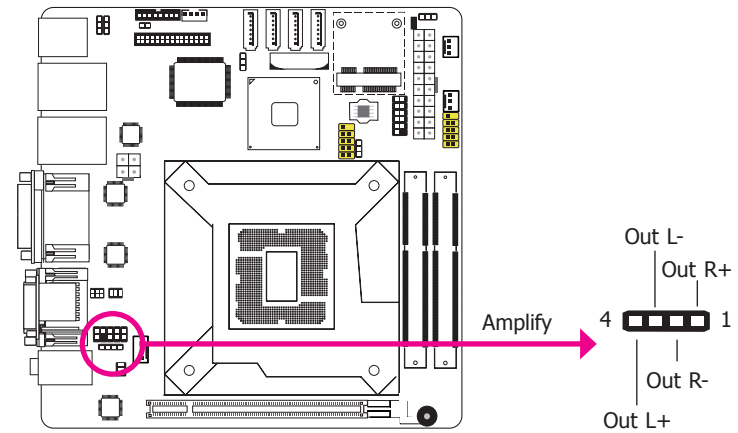
The amplify connector which has amplifying feature is used to connect external speakers. Using the same signal cable to connect with external speaker.

Chassis Intrusion Connector

1 2

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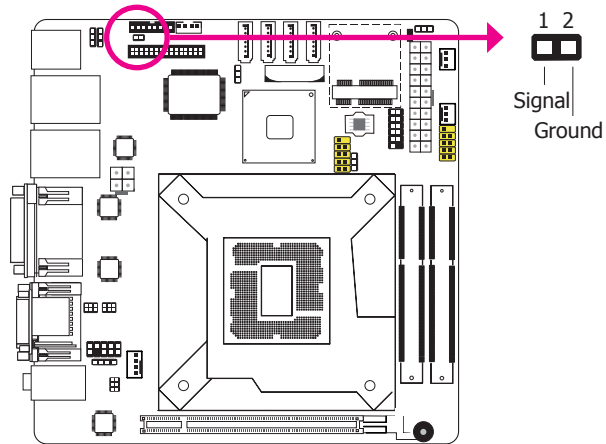
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

Cooling Fan Connectors

1
Ground
Power
3
Sense

System_fan 2

1
Ground
Power
3
Sense

System_fan 1

4
Speed Control
Sense
Power
Ground

CPU fan

1
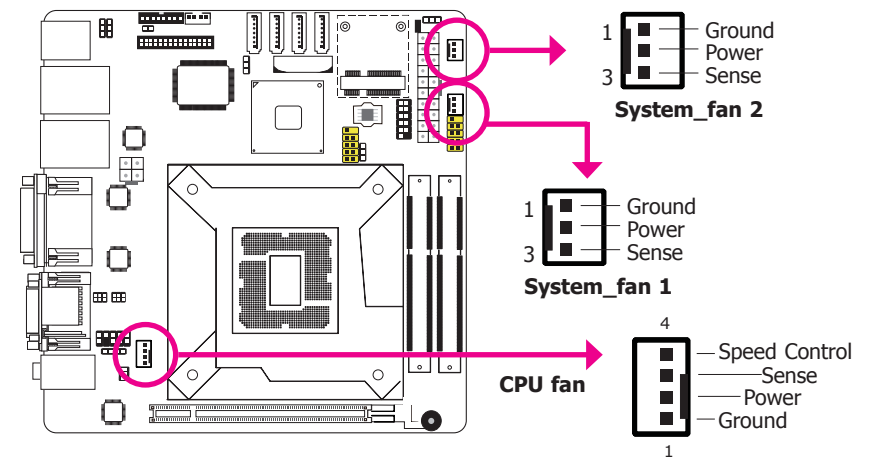
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

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.

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Standby Power LED

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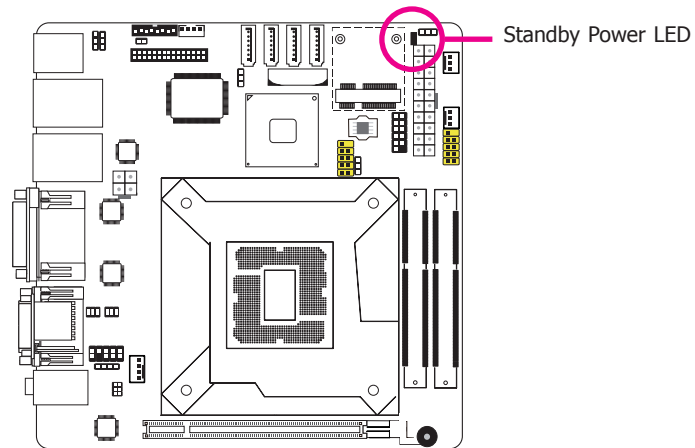
This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

Power Connectors

	10 20	
+12V	● ●	+5V
5VSB	● ●	+5V
PW-OK	● ●	-5V
GND	● ●	GND
+5V	● ●	GND
GND	● ●	GND
+5V	● ●	PS-ON
GND	● ●	GND
3.3V	● ●	-12V
3.3V	● ●	3.3V
	1 11	

ATX power

Ground
Ground

2 ● ● 1
4 ● ● 3

+12V
+12V
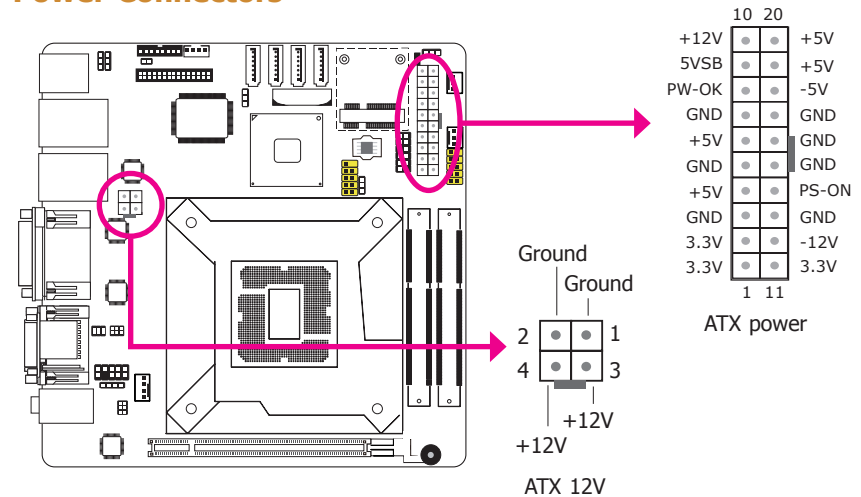
ATX 12V

Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 20-pin ATX main power connector that must be inserted into the 20-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The power connectors from the power supply unit are designed to fit the 20-pin and 4-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

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

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

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Expansion Slots

Mini PCI Express
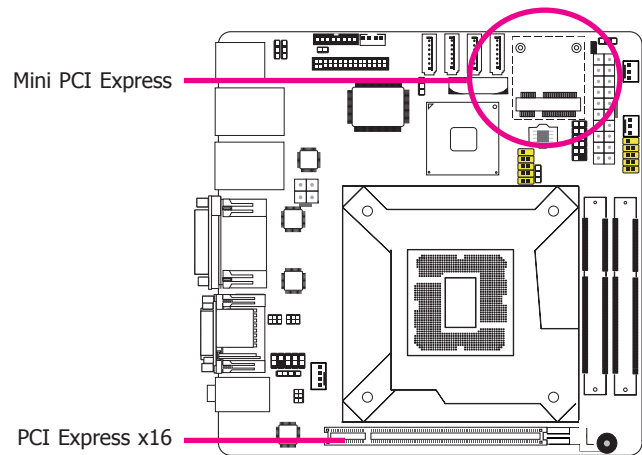
PCI Express x16

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.

Mini PCIe Slot

The Mini PCIe socket is used to install a half size Mini PCIe card. Mini PCIe card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI. It supports PCIe and USB signals. The Mini PCIe slot does not support mSATA.

Front Panel Connector

HDD-LED
RESET-SW
PWR-LED
PWR-BTN
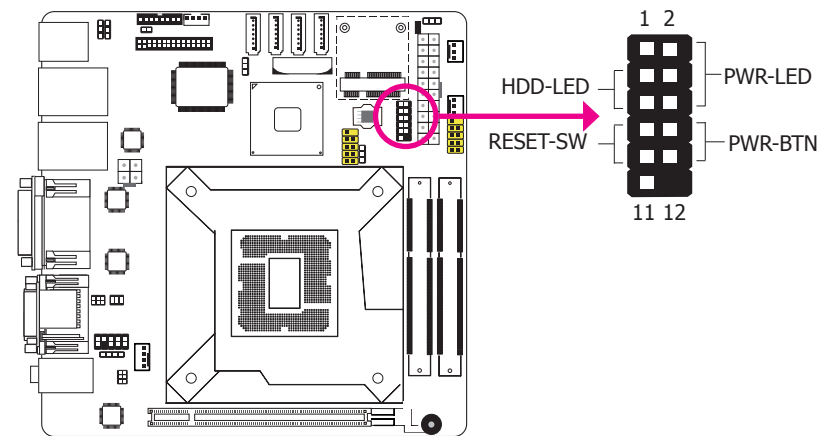
HDD-LED - HDD LED

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

Battery
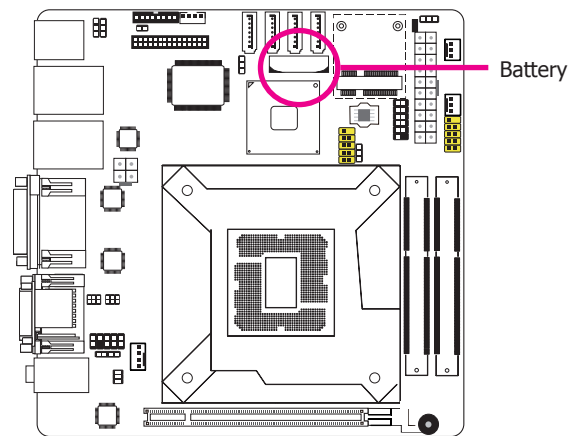
Battery

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.

SDVO Connector
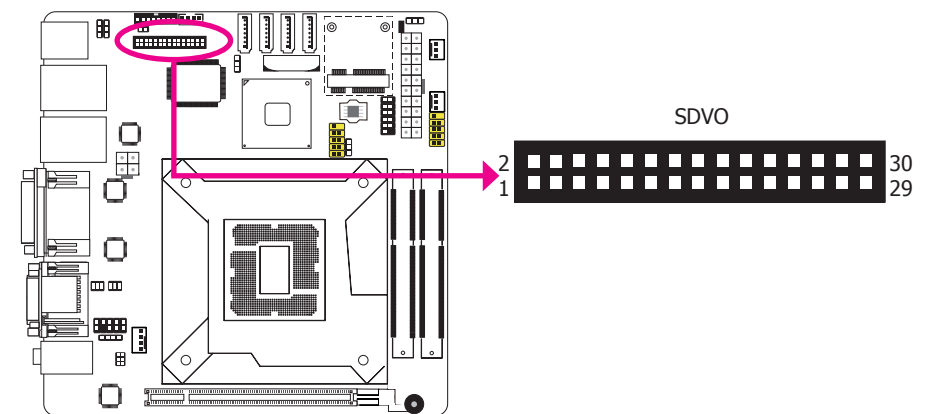
SDVO

The SDVO connector is used to connect the optional SDVO-LVDS daughterboard.

Pins	Pin Assignment	Pins	Pin Assignment
1	Ground	2	DPB_AUXP
3	DPB_LANE0_P	4	DPB_AUXN
5	DPB_LANE0_N	6	SDVO_STALLP
7	Ground	8	SDVO_STALLN
9	DPB_LANE1_P	10	SDVO_INTP
11	DPB_LANE1_N	12	SDVO_INTN
13	Ground	14	PCIE_RST
15	DPB_LANE2_P	16	DPB_CTRLCLK
17	DPB_LANE2_N	18	DPB_CTRLDATA
19	Ground	20	DPB_HPD
21	DPB_LANE3_P	22	GPIO15/SMBCLK
23	DPB_LANE3_N	24	GPIO27/SMBDATA/L_BKLTCTL
25	+3V3	26	+3V3
27	+5V	28	+5V
29	+12V	30	+12V

SDVO-LVDS Daughterboard (optional)

Features

- Chrontel CH7308B
- Supports 18/24-bit 1600x1200 LVDS panel (default 1280x1024)
- 1 LVDS LCD panel connector
- 1 LCD/Inverter power connector
- SDVO interface
- Supports dimming control via hot keys or AP tool

Dimensions

- 45mm (1.77") x 38mm (1.49")

Power Select for the LCD Panel

1-2 On: +12V

3-4 On: +5V

5-6 On: +3.3V
(default)
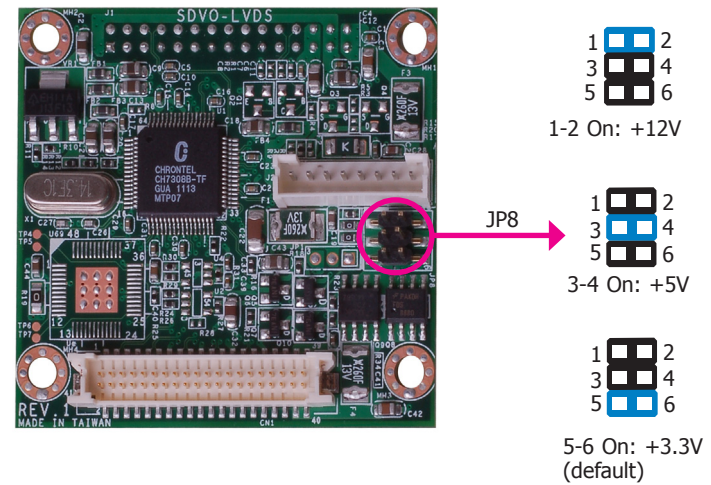
JP8 is used to select the power supplied to the LCD panel.

Important:
Before powering-on the system, make sure JP8's setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

LVDS LCD Panel and LCD Inverter Power Connectors

LCD/Inverter power
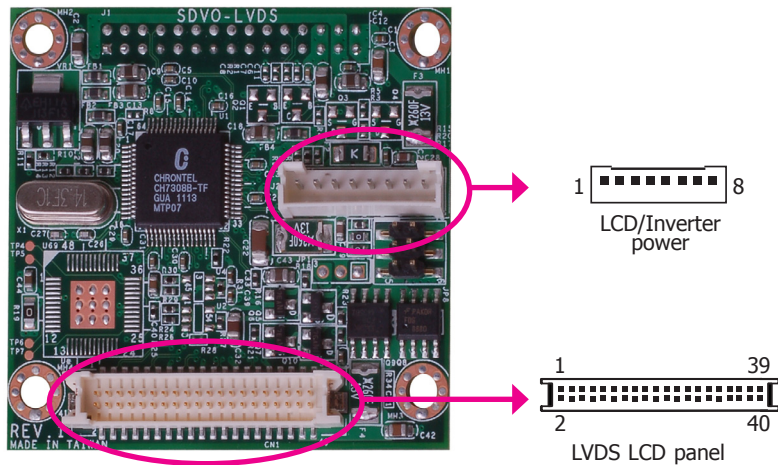
LVDS LCD panel

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

LVDS LCD Panel Connector

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

LCD/Inverter Power Connector

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

Installing the SDVO-LVDS Daughterboard onto the Motherboard (optional)

> **Important:**
> The motherboard used in this section is for reference purpose only and may not resemble your motherboard. These illustrations are mainly to guide you on how to install SDVO-LVDS onto the motherboard of your choice.

1. The photo below shows the location of the mounting hole on the motherboard.
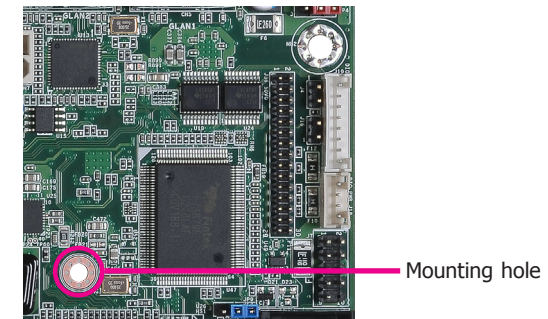
Mounting hole

2. Insert the provided mounting screw into the mounting hole - from the bottom through the top of the motherboard.

Mounting screw

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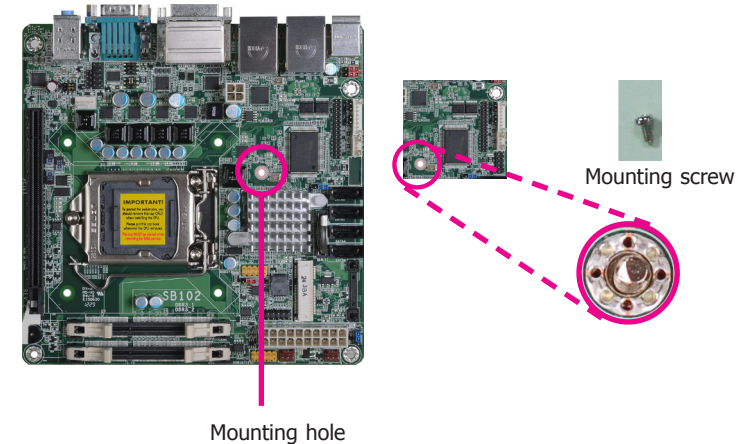
3. While supporting the mounting screw at the bottom, from the top side of the board, fasten a bolt into the screw.
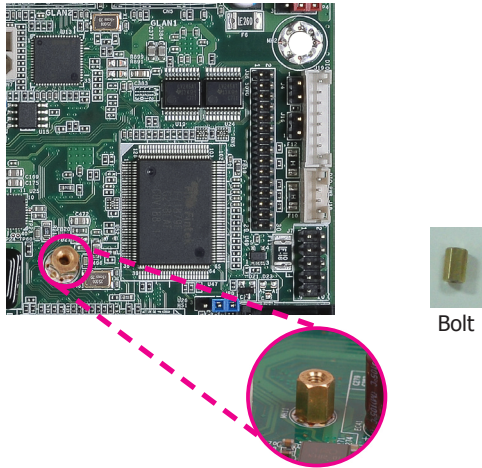
Bolt

4. The SDVO connector is located at the bottom of the daughterboard. Grasping the daughterboard by its edges, position it on top of the motherboard's SDVO connector with its mounting holes aligned with the bolt on the motherboard. This will also align the SDVO connector of the two boards to each other.

SDVO connector at the bottom side of the daughterboard

SDVO connector on the motherboard
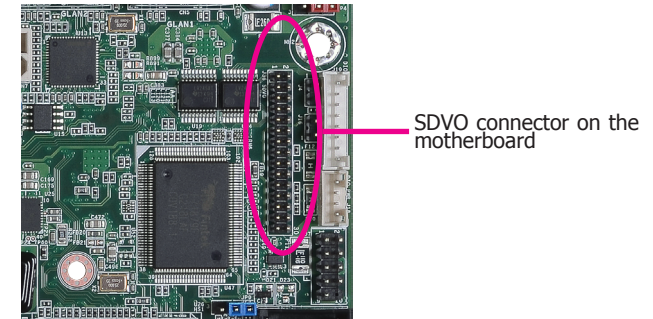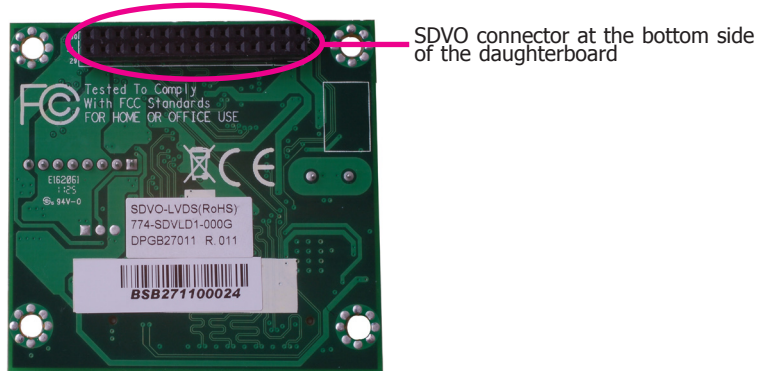
5. Press the daughterboard down firmly until it is completely seated on the SDVO connector of the motherboard.

Daughterboard
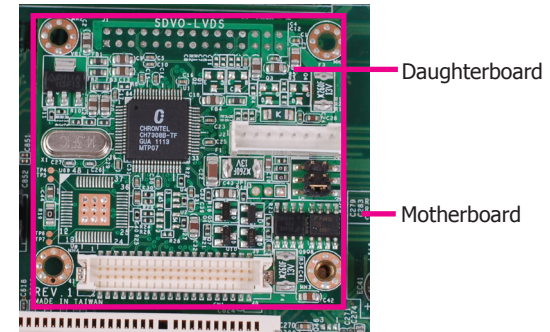
Motherboard

6. Use the provided mounting screw to secure the daughterboard to the motherboard.

Mounting screw

32
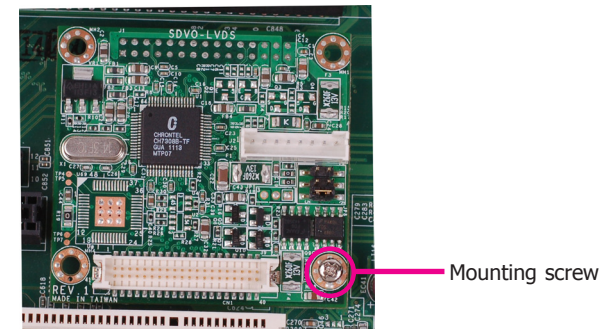
Chapter 3 - BIOS Setup

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 key-board 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>.

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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
  Compliency                    UEFI 2.3; PI 1.2
  Project Version               1APTC 0.20 x64
  Build Date and Time           08/31/2012  15:48:35

  System Language               [English]

  System Date                   [Fri 08/31/2012]
  System Time                   [16:29:48]
                                                        → ←:  Select Screen
  Access Level                  Administraor            ↑↓:   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.
```

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
  ► F71879 Super IO Configuration
  ► 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.
```

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                            About resume by PME
                                                              (PCI, PCIE, LAN)
ACPI Sleep State                     [S1 (CPU Stop Clock)]

Resume by PME                        [Enabled]
Resume by PS2 KB (S1, S3)            [Disabled]
Resume by PS2 MS (S1, S3)            [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
                                                              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 PS2 KB (S1, S3)

About resume by PS2 KB (S1, S3); Options are enabled or disabled.

Resume by PS2 MS (S1, S3)

About resume by PS2 MS (S1, S3); Options are enabled or disabled.

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

System Hardware Monitor                                       Smart Fan Function
▶ Smart Fan Function
   Case Open Beep                    [Disabled]

   CPU Temperature                   : +50 C
   System Temperature                : +32 C
   CPU FAN Speed                     : 1045 RPM
   System FAN Speed                  : N/A
   System FAN2 Speed                 : N/A
   VCore                             : +0.976 V
   +5.0V                             : +4.920V
   +12V                              : +11.968V            →←: Select Screen
   VDIMM                             : +1.536 V            ↑↓:    Select Item
   +3.3V                             : +3.224 V            Enter: Select
   VS5V                              : +5.032 V            +/-:   Change Opt.
                                                           F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           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

CPU Smart Fan Control             [Automatic]     ▲          Enable CPU SmartFan
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
System Smart Fan(1) Control       [Automatic]
Boundary 1                        60
Boundary 2                        50
Boundary 3                        40                        →←: Select Screen
Boundary 4                        30                        ↑↓:    Select Item
Speed Count 1                     100                       Enter: Select
Speed Count 2                     75                        +/-:   Change Opt.
Speed Count 3                     50                        F1:    General Help
Speed Count 4                     40                        F2:    Previous Values
Speed Count 5                     30                        F3:    Optimized Defaults
System Smart Fan(2) Control       [Automatic]               ESC:   Exit
Boundary 1                        60
Boundary 2                        50
Boundary 3                        40                                       nds, Inc.
Boundary 4                        30
Speed Count 1                     100
Speed Count 2                     75
Speed Count 3                     50
Speed Count 4                     40
Speed Count 5                     30     ▼
```

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.

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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

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```

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
      2 Hubs                                        no USB devices are
                                                    connected. DISABLE
   Legacy USB Support           [Enabled]           option will keep USB
   EHCI Hand-off                [Disabled]          devices available only for
                                                    EFI applications.


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

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```

Legacy USB Support

Enabled

Enables legacy USB.

Auto

Disables support for legacy when no USB devices are connected.

Disabled

Keeps USB devices available only for EFI applications.

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.

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F71879 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

   F71879 Super IO Configuration                          Restore AC Power Loss
                                                          help.
   F71879 Super IO Chip              F71879

   Restore AC Power Loss             [Power Off]

   Watchdog Timer                    [Disabled]
      SuperIO Watchdog Timer         10
 ► Serial Port 1 Configuration
 ► Serial Port 2 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.

Network Stack

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

  Network Stack                          [Enabled]              Enable or disable UEFI
  Ipv4 PXE Support                       [Enabled]              network stack.
  Ipv6 PXE Support                       [Enabled]




                                                                →←:  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.
```
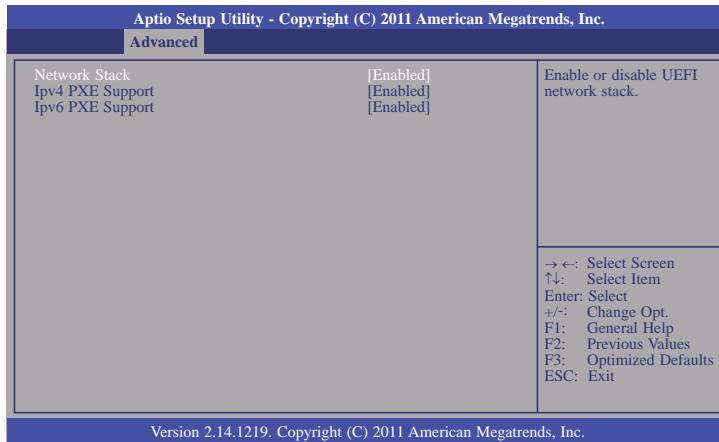
Ipv4 PXE Support

Enable Ipv4 PXE Boot Support. If disabled Ipv4 PXE boot option will not be created.

Ipv6 PXE Support

Enable Ipv6 PXE Boot Support. If disabled Ipv6 PXE boot option will not be created.

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.
```

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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

 Onboard 82579 LAN Controller         [Enabled]
    Wake on LAN                       [Enabled]

 High Precision Event Timer Configuration
 High Precision Timer                 [Enabled]          →←:  Select Screen
                                                         ↑↓:    Select Item
 After G3                             [Power on]         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.
```

Onboard LAN 82579 LAN Controller

Enabled or disable LAN.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake on LAN cannot be disabled if ME is on at Sx state.)

High Precision Timer

Enable or disable the High Precision Timer.
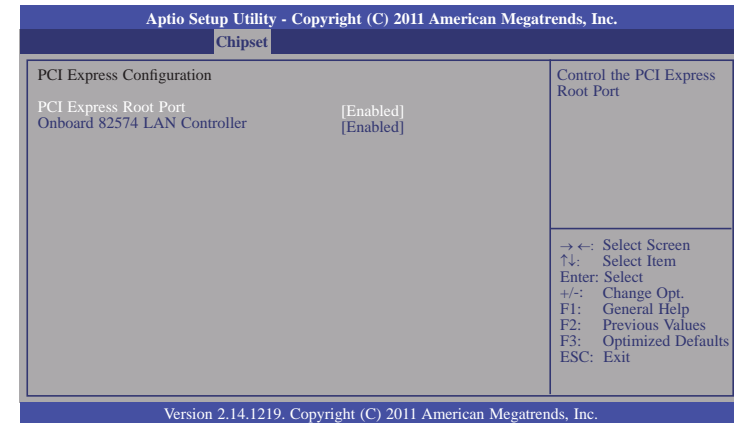
After G3

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                              Control the PCI Express
                                                        Root Port
 PCI Express Root Port                [Enabled]
 Onboard 82574 LAN Controller         [Enabled]




                                                         →←:  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.
```

Onboard 82574 LAN Controller

Enables or disables onboard 82574 LAN controller.

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

VT-d

► 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.
```

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Graphics Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
Graphics Configuration IGFX VBIOS Version IGfx Frequency Primary Display Internal Graphics DVMT Pre-Allocated DVMT Total Gfx Mem ▶ LCD Control	2137 350 MHz [Auto] [Auto] [64M] [256M]	Select which of IGFX/ PEG/PCI Graphics device should be primary delay or select SG for switch- able Gfx. → ←: 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.

LCD Control

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
LCD Control Primary IGFX Boot Display SDVO-LFP Panel Type	 [VBIOS Default] [1280x1024 48bit]	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be sup- ported only on primary display. → ←: 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 IGFX Boot Display

The options are VBIOS Default, CRT, EFP2, LFP, EFP.

SDVO-LFP Panel Type

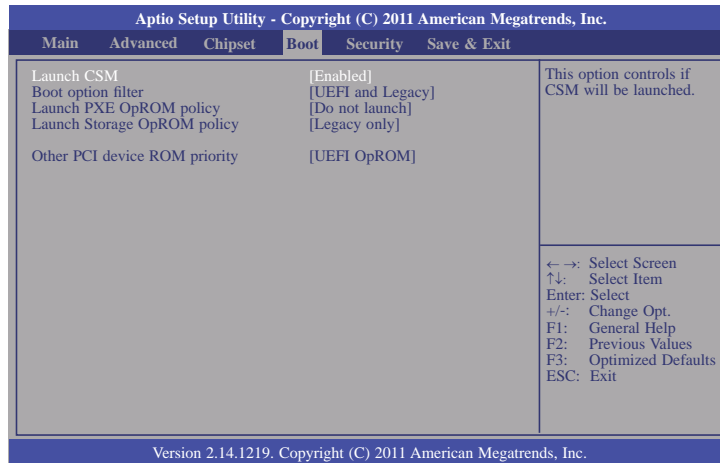Select SDVO panel used by the internal graphics device by selecting the appropriate setup item.

Note:
EFP2 means HDMI, LFP means LVDS and EFP means DVI.

NB PCIe Configuration

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Chipset		
NB PCIe Configuration PEG PEG-Gen X Enable PEG	 Not Present [Gen1] [Enabled]	Configure PEG B0:D1:F0 Gen1-Gen3. → ←: 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	4096 MB (DDR3)
DDR3 slot 1	Not Present
DDR3 slot 2	4096 MB (DDR3)
CAS Latency (tCL)	9
Minimum delay time	
CAS to RAS (tRCDmin)	9
Row Precharge (tRPmin)	9
Active to Precharge (tRASmin)	24
XMP Profile 1	Not support
XMP Profile 2	Not support

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

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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.

Boot

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

Boot Configuration		Number of seconds to wait for setup activation key.
Setup Prompt Timeout	1	
Bootup NumLock State	[On]	65535(0xFFFF) means indefinite waiting.
Quiet Boot	[Disabled]	
CSM16 Module Version	07.69	
Boot Option Priorities		
▶ CSM Parameters		

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

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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.

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CSM Parameters

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

 Launch CSM                         [Enabled]              This option controls if
 Boot option filter                [UEFI and Legacy]      CSM will be launched.
 Launch PXE OpROM policy            [Do not launch]
 Launch Storage OpROM policy        [Legacy only]

 Other PCI device ROM priority      [UEFI OpROM]



                                                           ← →:  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                                       Set Administrator
                                                            Password.
 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                     → ←:  Select Screen
                                                            ↑↓:   Select Item
 Administrator Password                                     Enter: Select
 User Password                                              +/-:   Change Opt.
                                                            F1:    General Help
     UEFI Secure Boot Management                            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                          Reset the system after
 Discard Changes and Reset                       saving the changes.

 Restore Defaults

 Boot Override

 Launch EFI Shell from filesystem device

                                                 ← →:  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>
```

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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.

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.
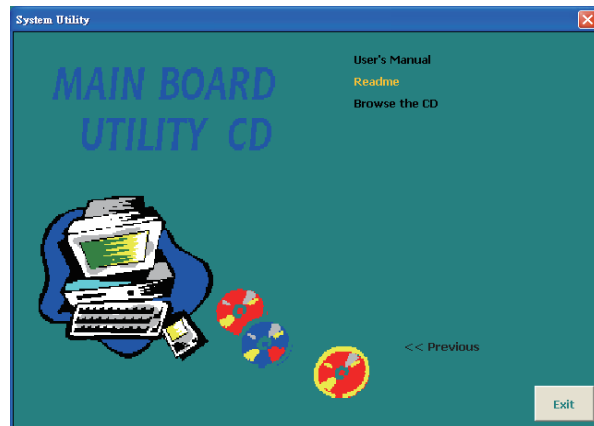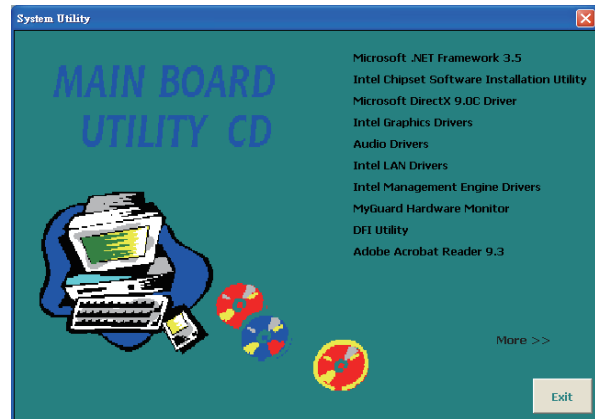
Auto Run Pages (for Windows 7)
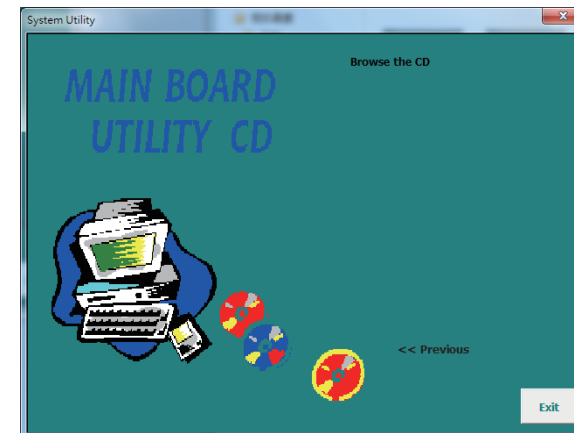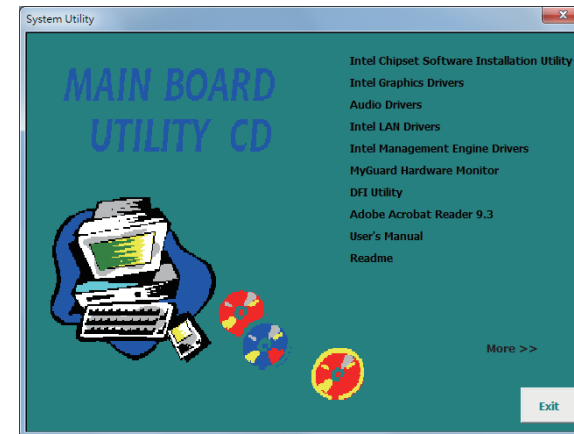
Note:

This step can be ignored if the applications are standalone files.

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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.
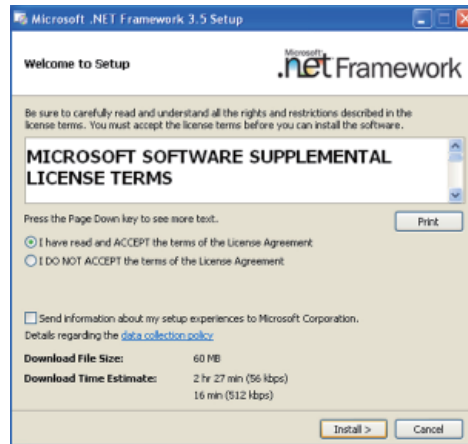
2. Setup is now installing the driver.
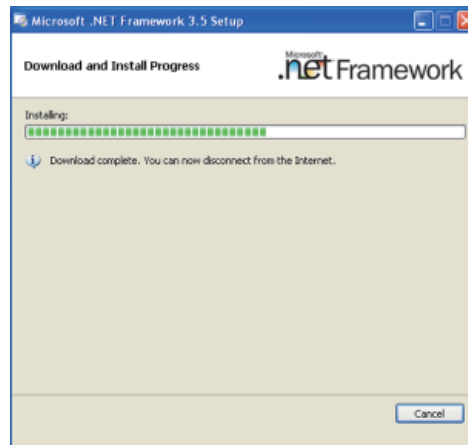
3. Click Exit.
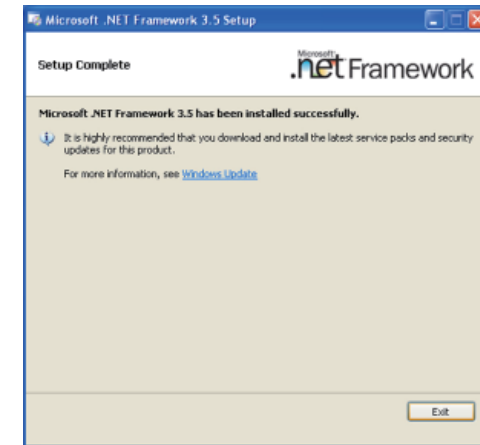
Intel Chipset Software Installation Utility

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.

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

4. Click Finish to exit setup.

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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 agree-
    ment" then click Next.

2. To start installation, click
    Next.
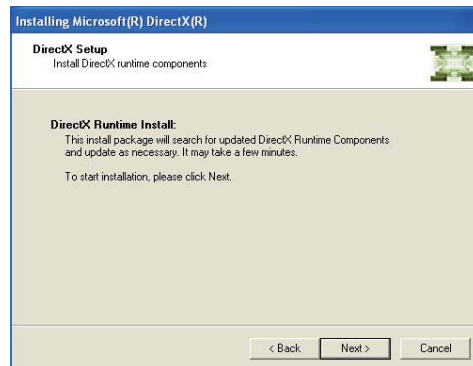
3. Click Finish. Reboot the
    system for DirectX to take
    effect.
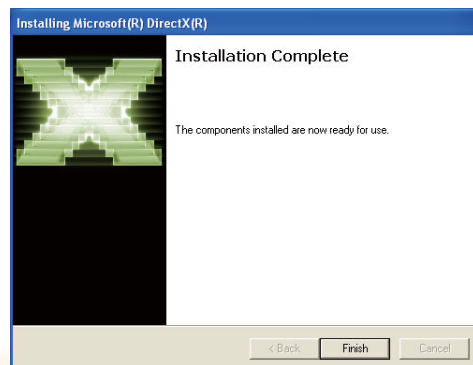
Intel Graphics Drivers

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

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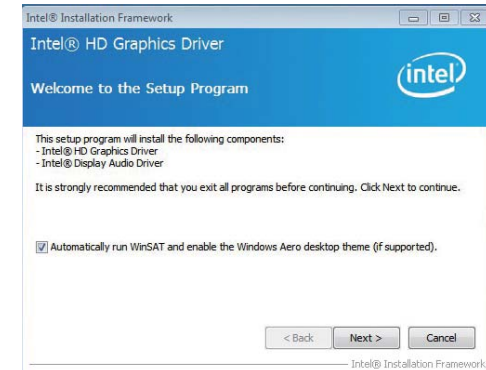
By default, the "Automatically run WinSAT and enable the Windows Aero
desktop theme" is enabled. With this enabled, after installing the graphics
driver and the system rebooted, the screen will turn blank for 1 to 2 minutes
(while WinSAT is running) before the Windows Vista desktop appears. The
"blank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

2. Read the license agreement
    then click Yes.

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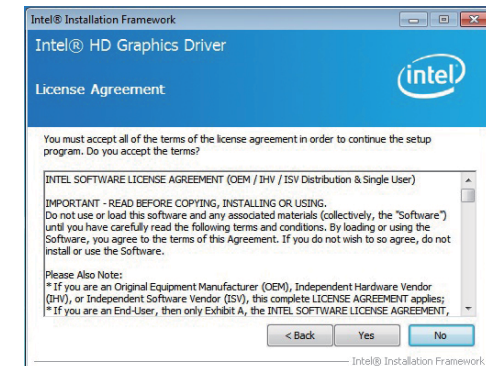
3. Go through the readme document for system requirements and installation tips then click Next.
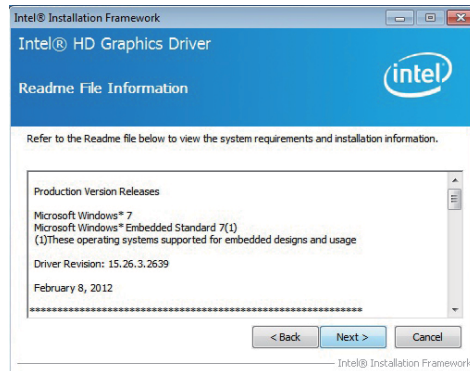
4. Setup is now installing the driver. Click Next to continue.
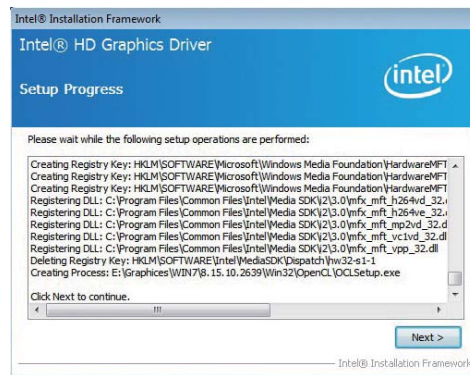
5. Click "Yes, I want to restart this computer now" then click Finish.

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

Audio Drivers

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

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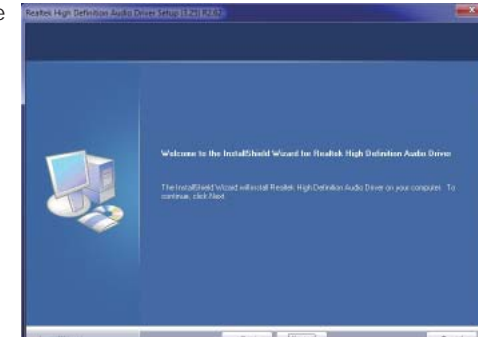
2. Click "Yes, I want to restart my computer now" then click Finish.

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

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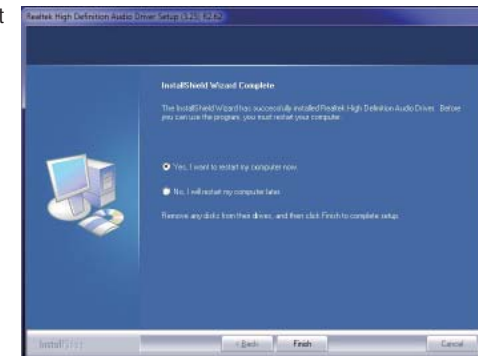
Intel LAN Drivers

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

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

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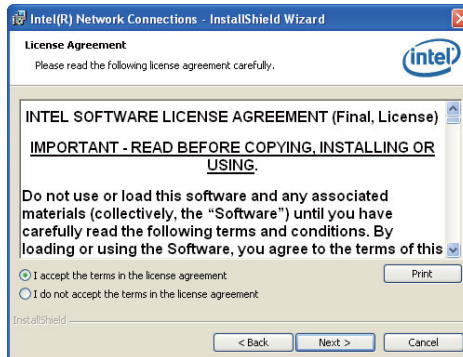
3. Select the program featuers you want installed then click Next.
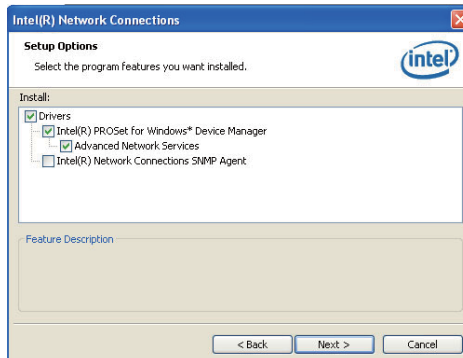
4. Click Install to begin the installation.

5. After completing installation, click Finish.

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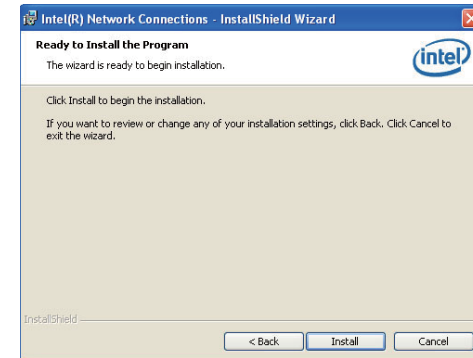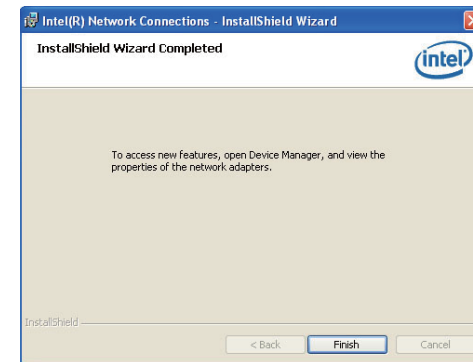
Intel Management Engine Drivers

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.
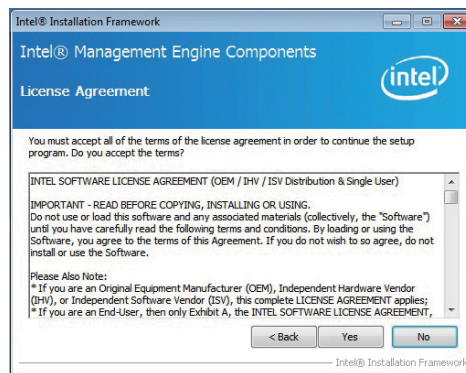
3. Setup is currently installing the driver. After installation has completed, click Next.
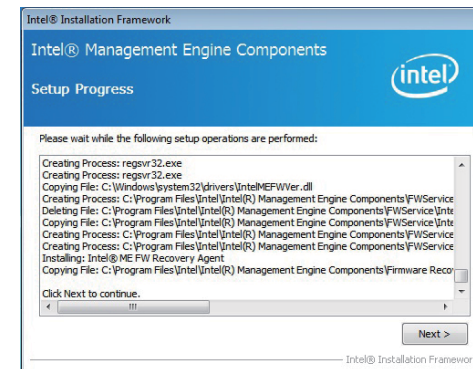
4. After completing installation, click Finish.
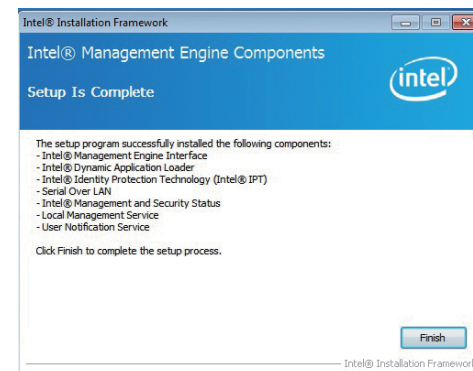
MyGuard Hardware Monitor

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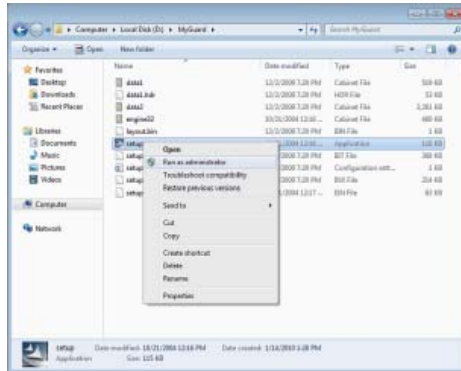
> **Important:**
> Perform steps 1-3 only when using Windows 7 or Windows Vista.

5. Setup is ready to install the utility. Click Next.
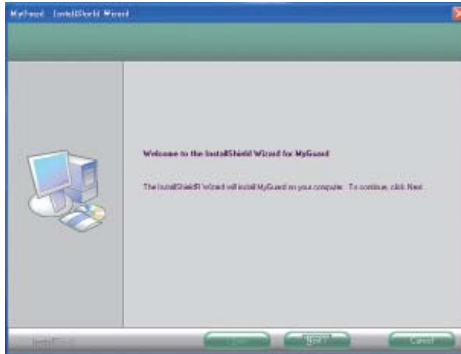
6. Click Install to begin installation.
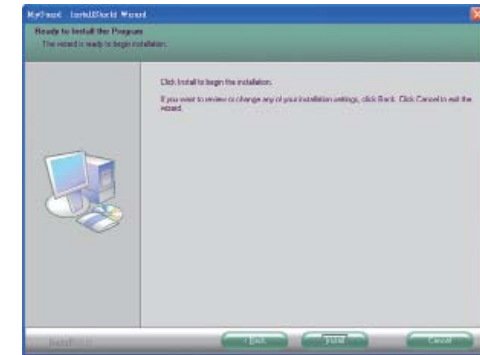
7. Setup is currently installing the utility.
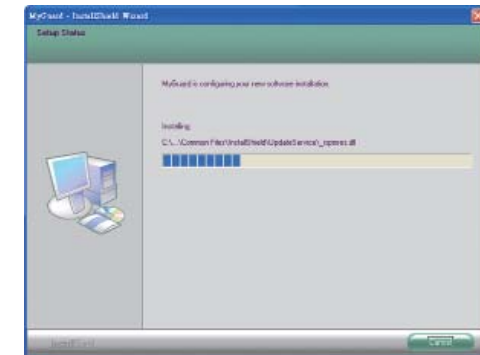
8. After completing installation, click Finish to exit setup.

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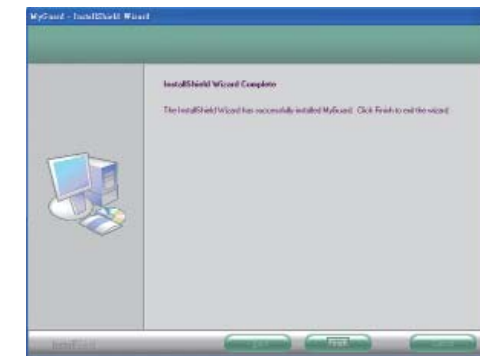
DFI Utility

DFI Utility provides information about the board, Watchdog, DIO, and Backlight.
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".
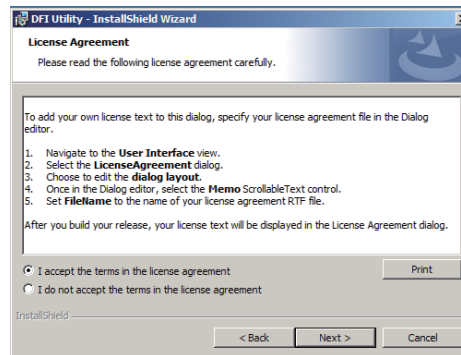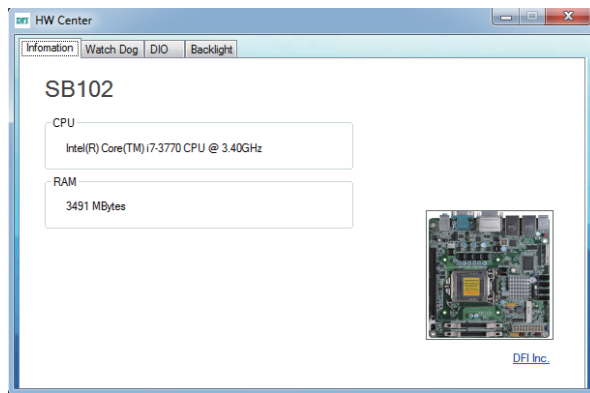
3. Enter "User name" (SB102) and "Organization" information then click "Next".
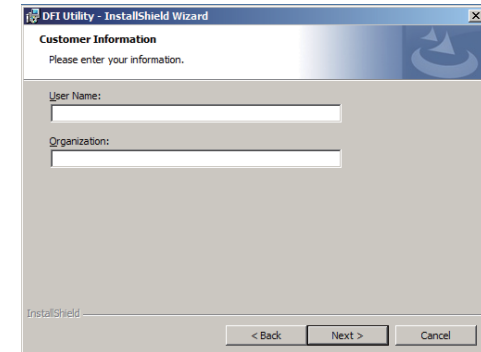
4. Click "Install" to begin the installation.
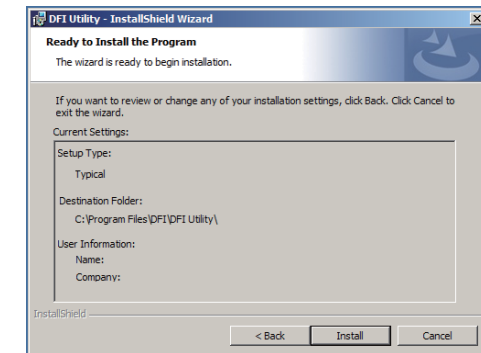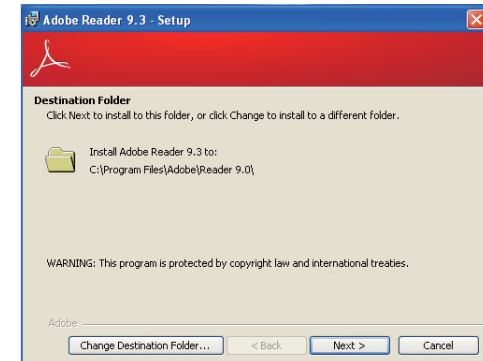
5. After completing installation, click "Finish".
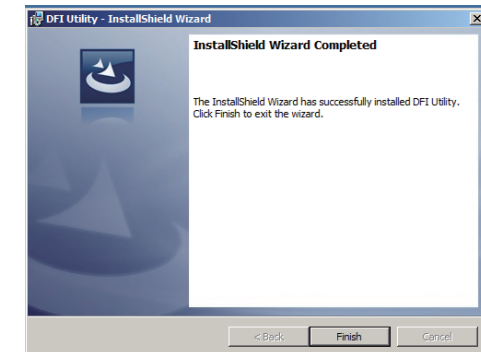
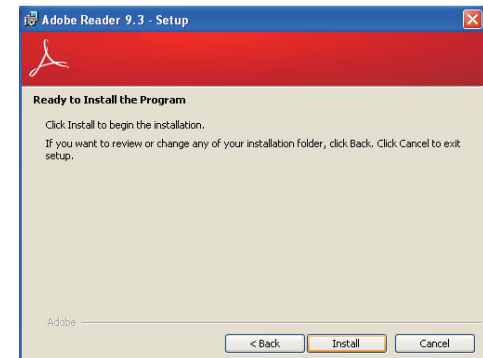The DFI Utility icon will appear on the desktop. Double-click the icon to open the utility.

Adobe Acrobat Reader 9.3

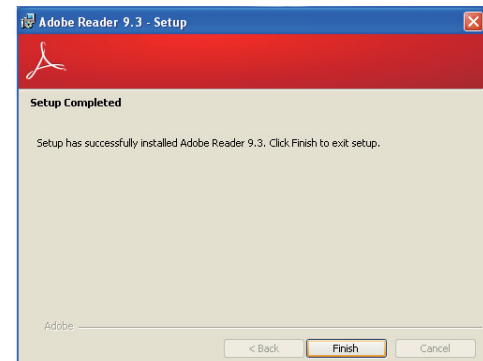To install the reader, click "Adobe Acrobat Reader 9.3" on the main menu.

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.

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Appendix A - 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 B - System Error Message

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

Error Messages

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

CMOS BATTERY HAS FAILED

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

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

CMOS CHECKSUM ERROR

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

DISPLAY SWITCH IS SET INCORRECTLY

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

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

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

Keyboard error or no keyboard present

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

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is 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 C - 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.

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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.