DFI®

DT122-HD
Desktop Box PC
User's Manual

FCC and DOC Statement on Class A

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

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

Notice:

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

Table of Contents

About this Manual

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

Warranty

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

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

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

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

Static Electricity Precautions

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

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

2. Wear an antistatic wrist strap.

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

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

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

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

Safety Measures

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

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

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

Safety Precautions

• Use the correct DC input voltage range.

• 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.

• 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.

• Keep this system away from humidity.

• Place the system on a stable surface. Dropping it or letting it fall may cause damage.

• The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.

• Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.

• If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

• If one of the following occurs, consult a service personnel:

  - The power cord or plug is damaged.

  - Liquid has penetrated the system.

  - The system has been exposed to moisture.

  - The system is not working properly.

  - The system dropped or is damaged.

  - The system has obvious signs of breakage.

• The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.

• Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

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.

• 1 DT122-HD system unit
• 1 HDD drive bay kit
• 1 CD disk includes
  - Manual
  - Drivers
• 1 Quick Installation Guide

Optional Items

• Power Cord

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

Before powering-on the system, prepare the basic system components.

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

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

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

Chapter 1 - Introduction

Overview

Front View

Rear View

Key Features

Model Name	DT122-HD
Processor	4th Generation Intel® Core™ processors
Chipset	Intel® H81 Express chipset
LAN	2 LAN ports
COM	2 COM ports
Displays	1 HDMI, 1 DVI-I
USB	4 USB 2.0 ports 2 USB 3.0 ports
Audio	Mic-in, Line-in, Line-out

Specifications

Processor System	• Processors:
	  - 4th Generation Intel® Core™ processors (22nm process technology)
	  : Intel® Core™ i7-4790S (8M Cache, up to 4.0 GHz); 65W
	  : Intel® Core™ i7-4770S (8M Cache, up to 3.9 GHz); 65W
	  : Intel® Core™ i7-4770TE (8M Cache, up to 3.3 GHz); 45W
	  : Intel® Core™ i5-4590S (6M Cache, up to 3.7 GHz); 65W
	  : Intel® Core™ i5-4590T (6M Cache, up to 3.0 GHz); 35W
	  : Intel® Core™ i5-4570S (6M Cache, up to 3.6 GHz); 65W
	  : Intel® Core™ i5-4570TE (4M Cache, up to 3.3 GHz); 35W
	  : Intel® Core™ i3-4360 (4M Cache, 3.7 GHz); 54W
	  : Intel® Core™ i3-4350T (4M Cache, 3.1 GHz); 35W
	  : Intel® Core™ i3-4340TE (4M Cache, 2.6 GHz); 35W
	  : Intel® Core™ i3-4330 (4M Cache, 3.5 GHz); 54W
	  : Intel® Core™ i3-4330TE (4M Cache, 2.4 GHz); 35W
	  : Intel® Pentium® G3420 (3M Cache, 3.2 GHz); 53W
	  : Intel® Pentium® G3320TE (3M Cache, 2.3 GHz); 35W
	  : Intel® Celeron® G1820 (2M Cache, 2.7 GHz); 53W
	  : Intel® Celeron® G1820TE (2M Cache, 2.2 GHz); 35W
	• Intel® H81 Express chipset

Memory	• Two 204-pin DDR3 SODIMM sockets • Supports DDR3 1333/1600MHz • Supports up to 16GB system memory • Supports dual channel memory interface
Graphics	• Intel® HD Graphics • Display ports: 1 HDMI, 1 DVI-I • HDMI: resolution up to 4096x2304 @ 24Hz or 2560x1600 @ 60Hz • DVI-I, VGA: resolution up to 1920x1200 @ 60Hz
Storage	• Up to 2x 2.5" or 1x 3.5" SATA drive bay - SATA 3.0 port with data transfer rate up to 6Gb/s
Ethernet	• Intel® I210 PCI Express Gigabit Ethernet controller • Intel® I217 Gigabit Ethernet Phy • Integrated 10/100/1000 transceiver • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

Expansion Slots	• 1 expansion slot
	  - 1 PCIe x16 or PCI slot
	• 1 Mini PCIe slot
	  - Supports USB and PCIe signals
	  - Supports mSATA
	  - Supports half size or full size Mini PCIe card

Audio	• Realtek ALC886 5.1-channel High Definition Audio

Power	• Power type
	  - Flex ATX
	• Power input voltage
	  - AC 100-240V, 250W

Cooling System	• 1 CPU cooler

I/O Ports	• Front Panel
	  - 1 Power button
	  - 1 Reset button
	  - 2 LED indicators: Power, HDD
	• Rear Panel
	  - 1 mini-DIN-6 for PS/2 mouse/keyboard
	  - 2 USB 3.0
	  - 4 USB 2.0
	  - 2 DB-9 RS232 COM
	  - 1 HDMI
	  - 1 DVI-I
	  - 2 RJ45 LAN
	  - Mic-in, line-in and line-out jacks

Environment	• Temperature
	  - Operating: 0°C~45°C
	  - Storage: -20°C~60°C
	• Humidity
	  - 85% RH at 45°C, 1 week
	• Operating Vibration
	  - IEC68-2-64
	• Operating Shock
	  - Operating: 3G peak acceleration (11 msec. duration)
	  - Non-operating: 5G peak acceleration (11 msec. duration)

Construction	• Front panel: aluminum • Rear chassis: sheet metal
Mounting	• 2 types of wall mount bracket - Type A - Type B • Brackets and screws (optional)
Dimensions	• 300mm x 75mm x 217mm (W x H x D)
Weight	• 3.7 kg
OS Support	• Windows 7, WES 7, Windows 8, WES 8 • Linux (Distribution available upon request)
Certification	• CE • FCC Class A • RoHS • UL
Other Features	• Watchdog Timer function

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Getting to Know the DT122-HD

Front View

Reset Button
Power LED

Power Button
HDD LED
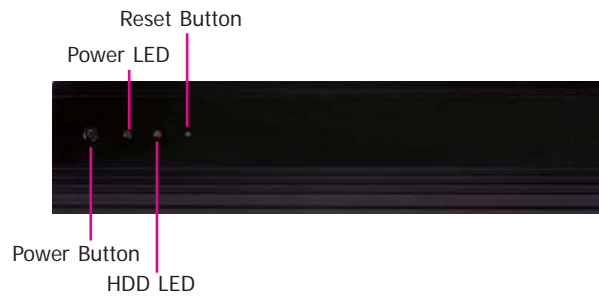
Power Button
Press to power-on or power-off the system.

Reset Button
Press to reset the system.

HDD LED
Indicates the status of the hard drive.

Power LED
Indicates the power status of the system.

Rear View

LAN 1   DVI-I
LAN 2   COM 2   Line-in

PS/2 KB/MS

USB 3.0   COM 1   Mic-in
USB 2.0 USB 2.0   HDMI   Line-out
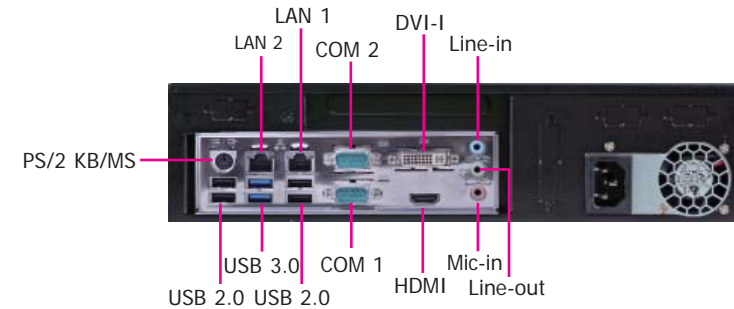
DVI-I Port
Used to connect a DVI device.

HDMI
Used to connect an HDMI device.

COM Ports
Used to connect serial devices.

USB Ports
Used to connect USB 3.0/2.0/1.1 devices.

LAN Ports
Used to connect the system to a local area network.

Line-out
Used to connect to a speaker.

Line-in
Used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

Mic-in
Used to connect an external microphone.

PS/2 KB/Mouse
Used to connect a PS/2 keyboard and PS/2 mouse.

Mechanical Dimensions

Rear View

Left View

217.20

Right View

300.00

74.00
78.00

Front View
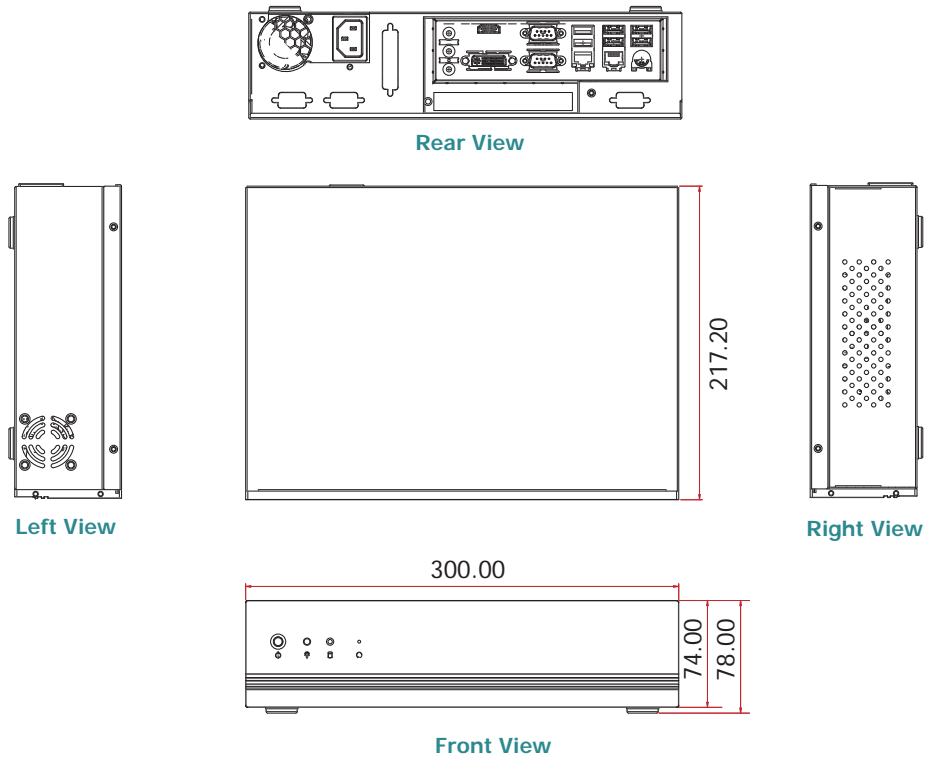
Motherboard Dimensions

0.00
1.56
18.23
45.88
83.42
111.09
132.42
151.76
157.48

10.16
0.00

22.86

39.32

46.97
49.47

64.32

83.89

107.88

124.47

140.94
153.29
154.94
159.84

154.94

0.00
15.92
17.13
92.14
100.63
111.51
137.63
157.48
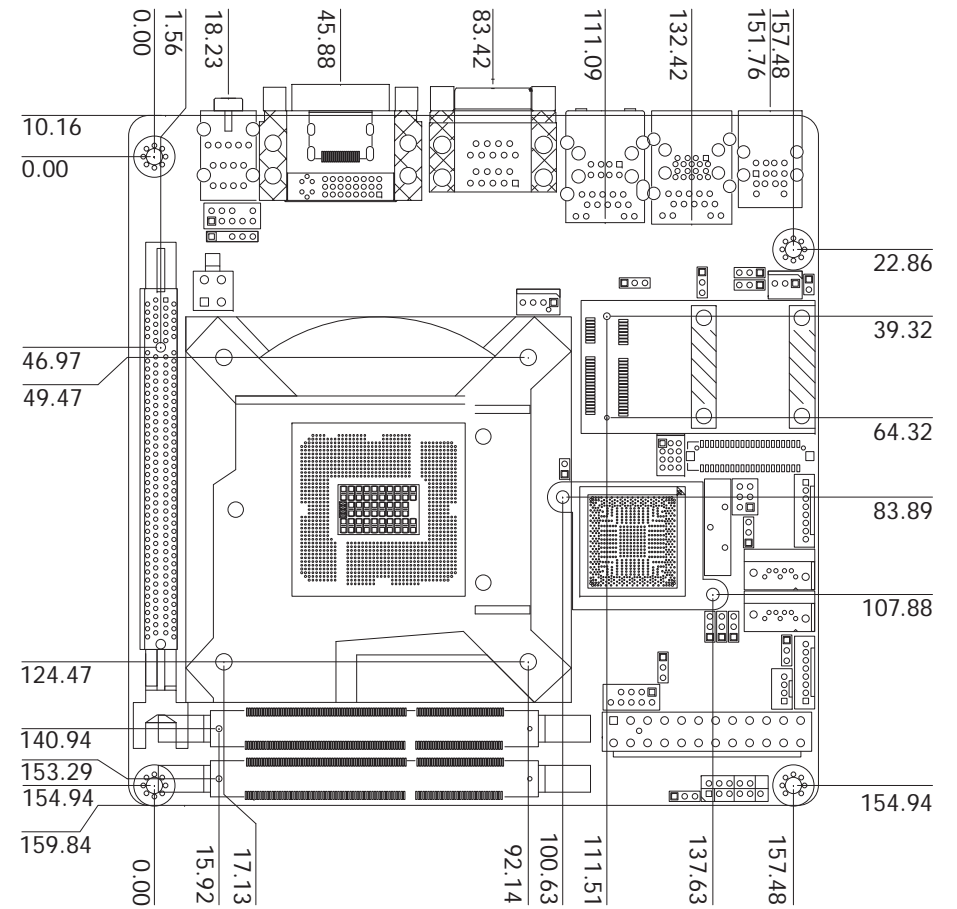
Chapter 2 - Getting Started

Preparing the System

Before you start using the system, you need the following items:

- SATA hard drive
- AC power adapter
- PS/2 or USB keyboard
- PS/2 or USB mouse
- CD-ROM drive (for installing software/drivers)
- Screwdriver
- Memory module (optional)

Installing Devices

The following are devices that can be installed in the system.

- Memory module
- SATA hard drive

Configuring the BIOS

To get you started, you may need to change configurations such as the date, time and the type of hard disk drive.

1. Power-on the system.
2. After the memory test, the message "Press DEL to run setup" will appear on the screen. Press the Delete key to enter the AMI BIOS setup utility.

Installing the Operating System

Most operating system software are provided in a CD therefore you need to install a CD-ROM drive in order to use the CD.

Make sure a SATA drive is already installed.

1. Refer to the following chapters for information on connecting a CD-ROM drive and installing a SATA drive.
2. Refer to your operating system manual for instructions on installing the operating system.

Installing the Drivers

The system package includes a CD disk. The CD includes drivers that must be installed to provide the best system performance. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing Devices

1. Make sure the system and all other peripheral devices connected to it has been powered-off.

2. Disconnect all power cords and cables.

3. The 4 mounting screws on the sides of the system are used to secure the cover to the chassis. Remove these screws and then put them in a safe place for later use.

Mounting screw

Mounting screw

4. After removing the mounting screws, slide the cover backwards.

Slide the Cover Backward

5. The DIMM sockets and SATA drive bay are readily accessible after removing the chassis cover.

2.5"/3.5" SATA drive bay

DIMM socket

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Installing a 2.5" or 3.5" SATA Drive

Installing a 2.5″ SATA Drive

1. Remove the 4 mounting screws that secure the drive bay to the chassis and then remove the drive bay.

Mounting screw

Drive bay
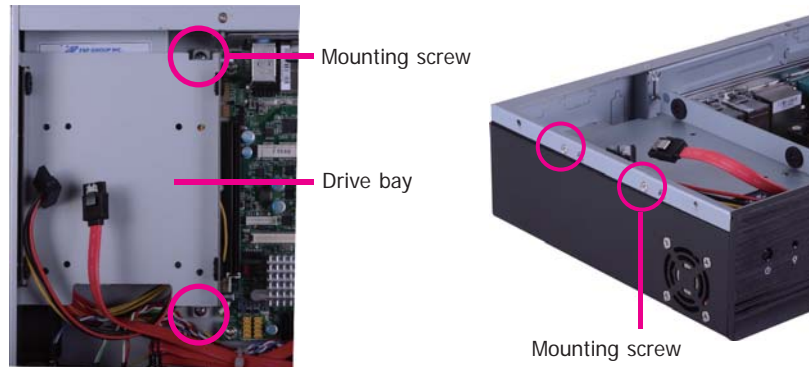
Mounting screw

2. Turn to the other side of the drive bay and remove the 4 mounting screws that secure the HDD brackets to the drive bay.

Drive bay
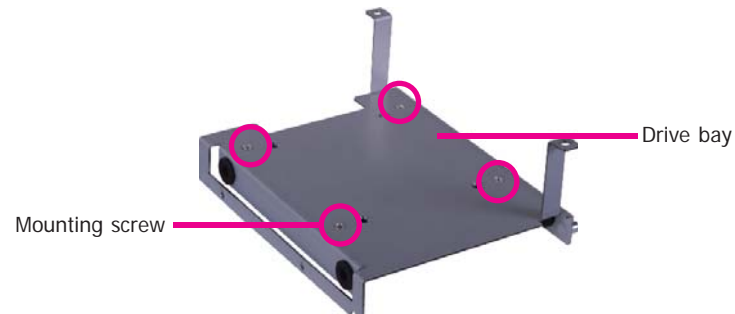
Mounting screw

3. Align the mounting holes of the SATA drive with the mounting holes on the HDD bracket and then use the provided mounting screws to secure the drive in place.

Mounting screw

Mounting screw

SATA drive

HDD bracket

12
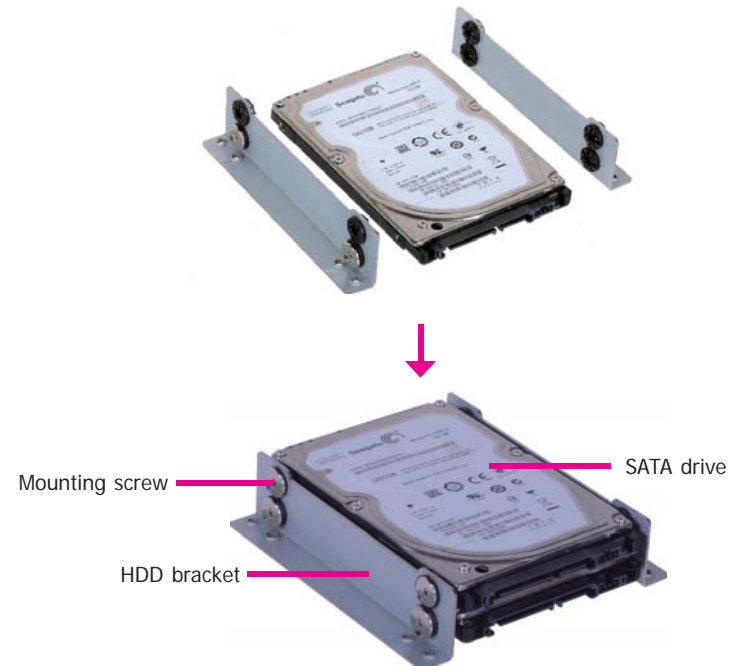
4. Turn to the other side of the drive bay. Use the provided mounting screws from step 2 to secure the SATA drive (with HDD bracket) onto the drive bay.
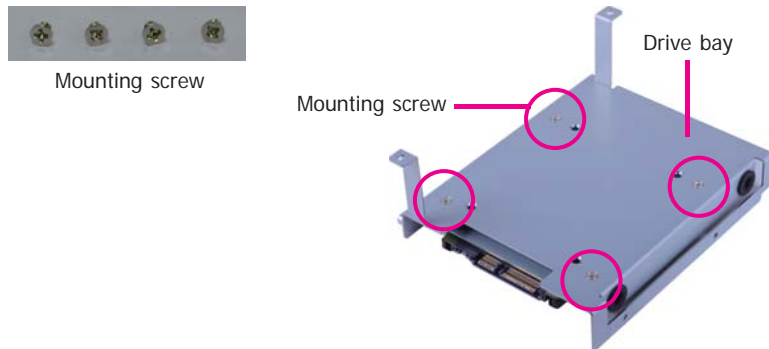
Mounting screw

Drive bay
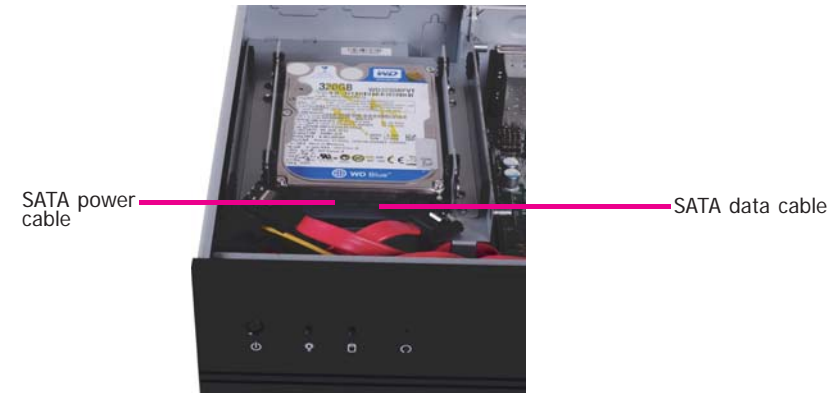
Mounting screw

5. Place the SATA drive bay assembly into the chassis. Secure the SATA drive bay with the mounting screws you removed in step 1.

Mounting screw

Mounting screw

6. Connect the SATA data cable and SATA power cable to the connectors on the SATA drive.

SATA power cable

SATA data cable

13
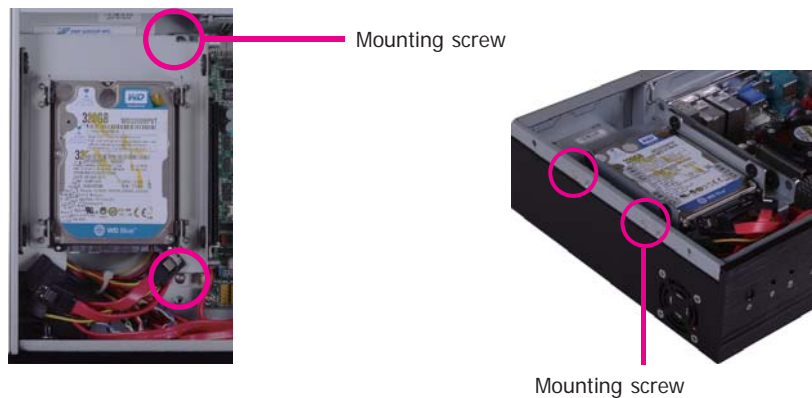
Installing a 3.5" SATA Drive

1. Remove the 4 mounting screws that secure the drive bay to the system.

Mounting screw

Drive bay

Mounting screw
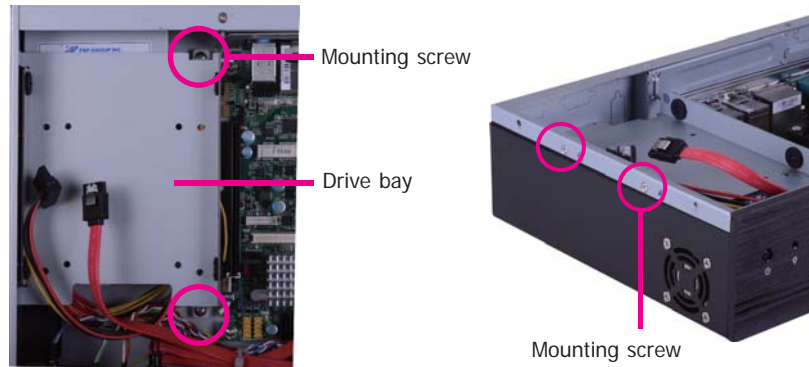
2. Insert the spacer into the anti-shock bumper. You will find the spacers in the HDD drive bay kit that comes with the DT122 package.

spacer

spacer
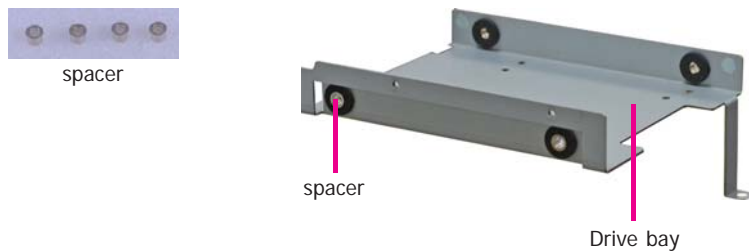
Drive bay

3. Place the SATA drive on the drive bay. Align the mounting holes of the SATA drive with the mounting holes on the drive bay.

SATA drive

Drive bay

4. Use the provided mounting screws to secure the SATA drive onto the drive bay.

Mounting screw

Mounting screw

Drive bay

5. Place the drive bay into the chassis. Secure the drive bay with the mounting screws you removed in step 1.
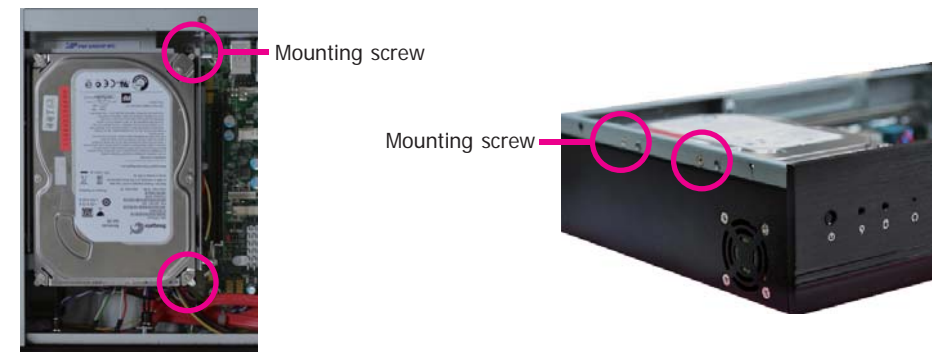
Mounting screw

Mounting screw

6. Connect the SATA data cable and SATA power cable to the connectors on the SATA drive.

SATA data cable

SATA power cable

14
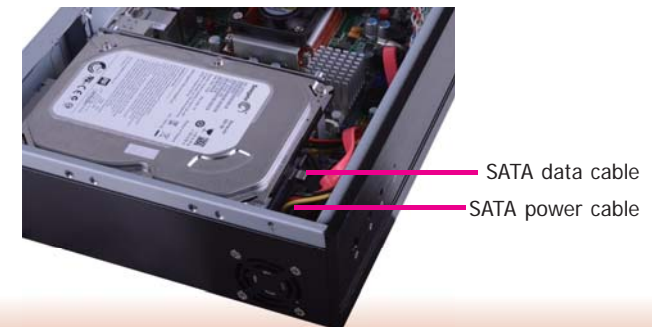
Installing the PCI or PCIe x16 Expansion Card

Important:
When inserting the riser card, please select a card within 175mm (as shown on the next picture).

1. The PCIe x16 on the motherboard is used to insert a TS200-1P or TS200-1E riser card.

   To install the expansion card, you need to remove the mounting bracket and the mounting screw that secure the bracket to the chassis and then remove the bracket. Put the screw and the brackets in a safe place for later use.

Mounting screw

Mounting bracket

Bracket

Mounting bracket and mounting screw

T200-1P

PCI slot

T200-1E
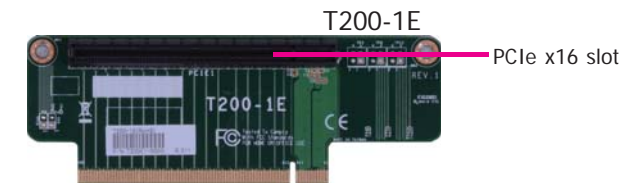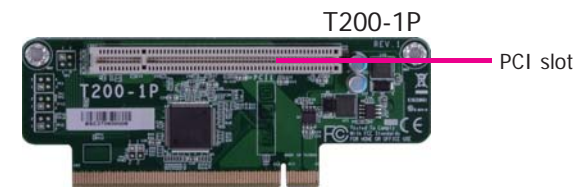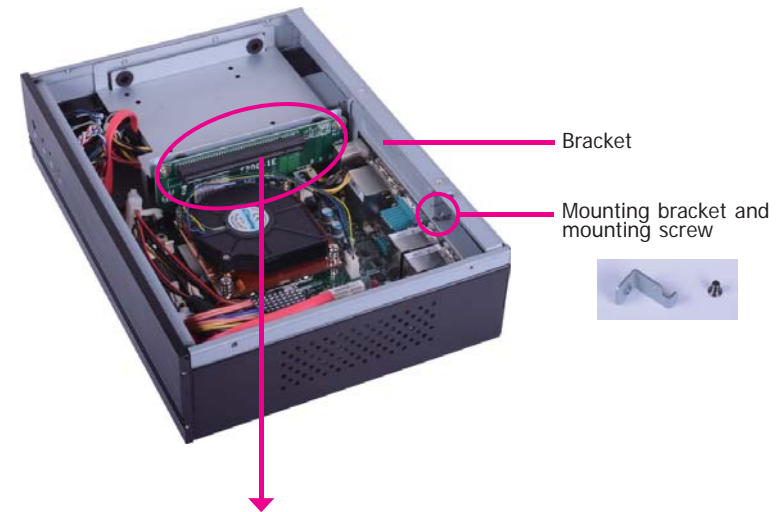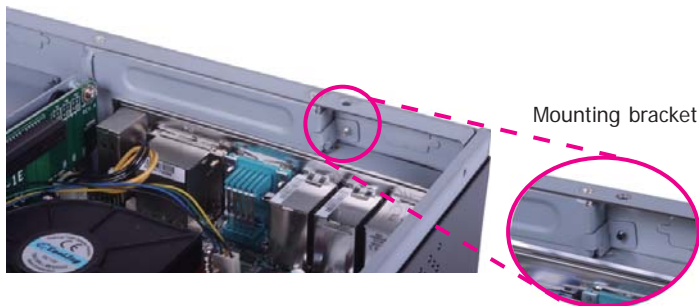
PCIe x16 slot

2. Insert the Expansion card with a bracket into the PCI or PCIe x16 slot that is on the riser card. Replace the screw you removed in step 1 to secure the bracket in place.

Bracket

Mounting bracket and mounting screw

PCI

Expansion card

Rear view
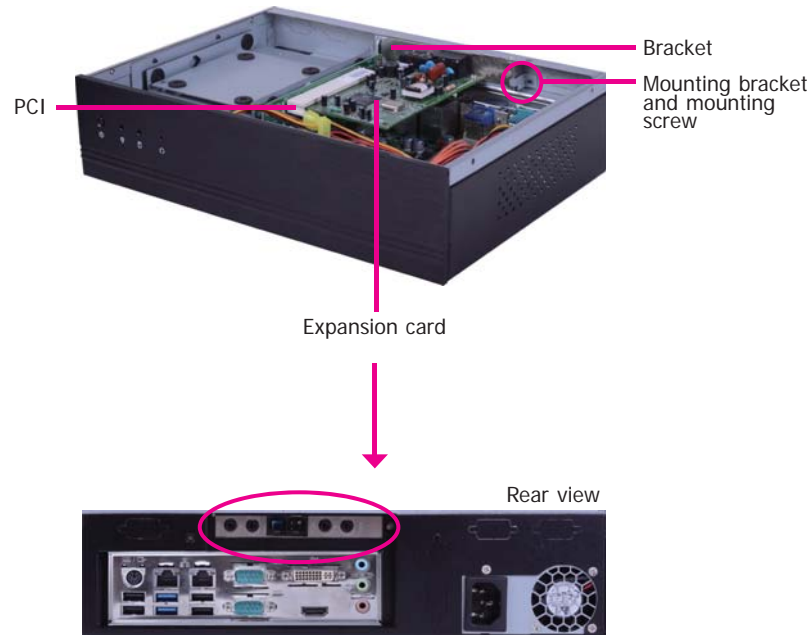
> **Note:**
> The Expansion card used in the above illustrations may not resemble the actual cards. These illustrations are for reference only.

Chapter 4 - Jumper Settings

Clear CMOS Data

JP9

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

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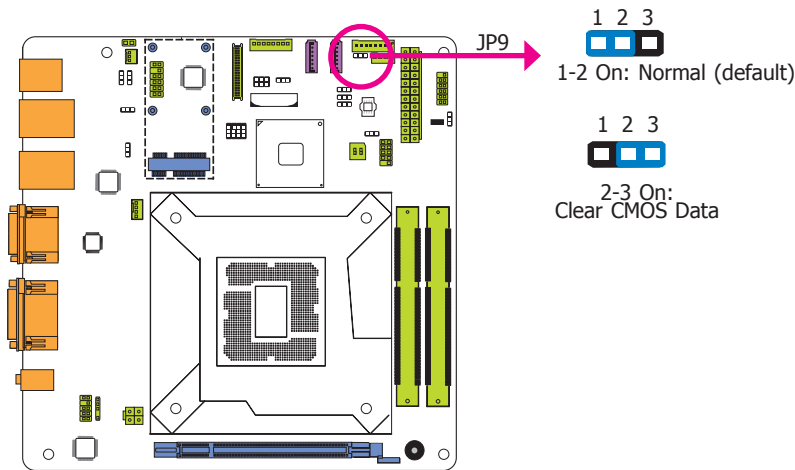
If you encounter the followings,

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 Keyboard/Mouse Power Select

JP1

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

1
2
3
2-3 On:
+5V_standby
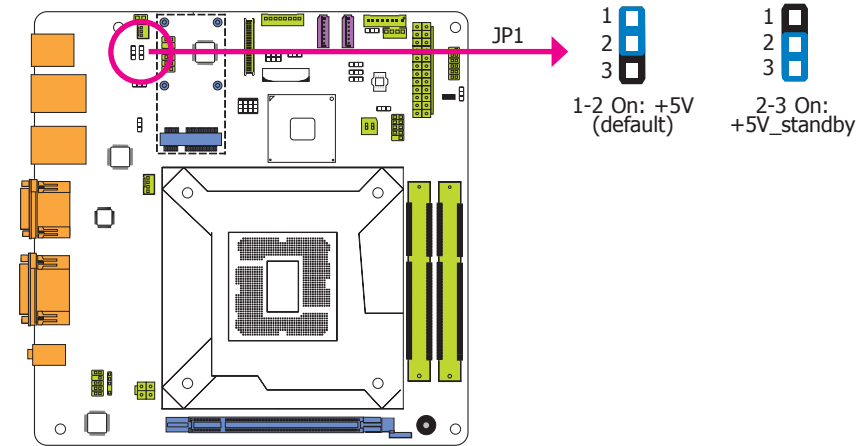
JP1 is used to select the power of the PS/2 keyboard/mouse port. Selecting +5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

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

USB Power Select

1-2 On: +5V (default)

2-3 On: +5V_standby

USB 10-11 (JP13)

1-2 On: +5V (default)

2-3 On: +5V_standby

1-2 On: +5V (default)

USB 0-1 (JP5)

2-3 On: +5V_standby

USB 2-3 (JP8)

USB 4-5 (JP6)
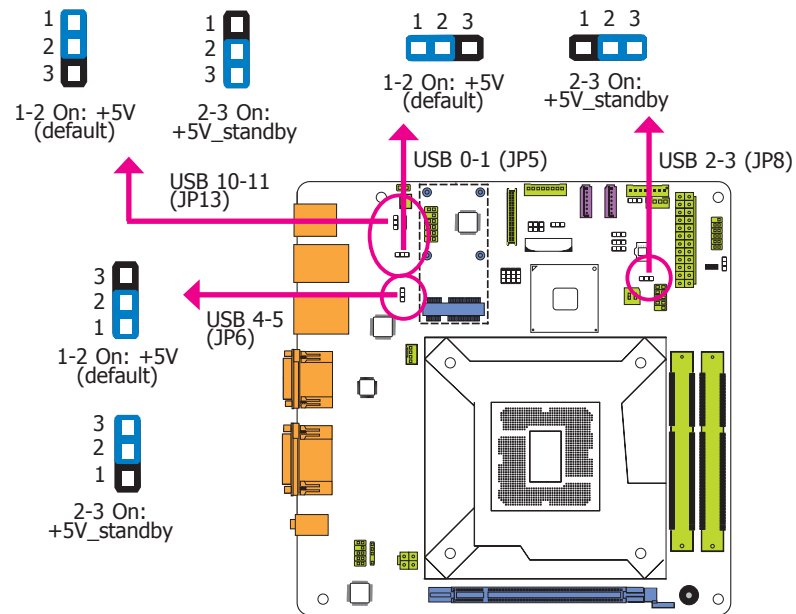
These jumpers are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.

> **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

JP10

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

2-3 On:
Power-on via AC power
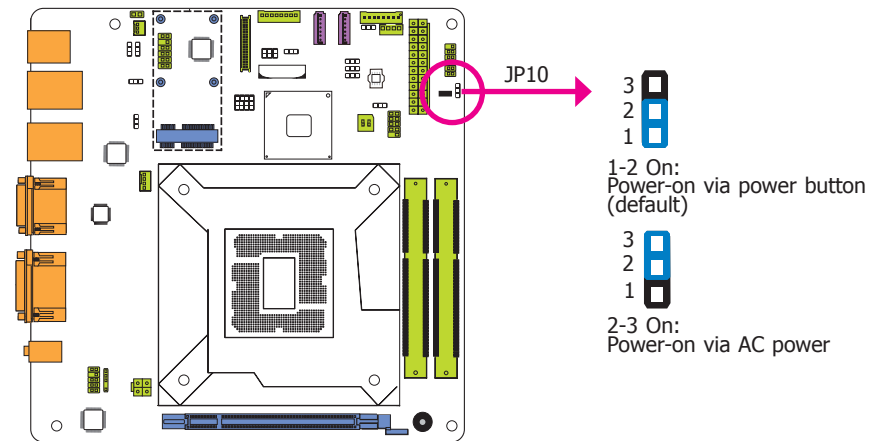
JP10 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP10 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using JP10 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

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Mini PCIe Signal Select

JP12

```
3  ▢▢▢▢  12
1  ▢▢▢▢  10
```

1-4-7-10, 2-5-8-11 On:
PCIe (default)

```
3  ▢▢▢▢  12
1  ▢▢▢▢  10
```

2-5-8-11, 3-6-9-12 On:
mSATA
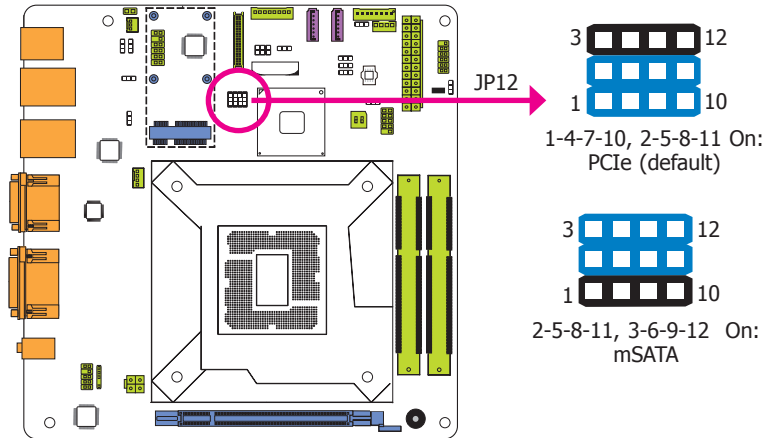
JP12 is used to select the Mini PCIe signal.

LCD/Inverter Power Select

JP2

```
3  2  1
▢▢▢
```
1-2 On: +12V

```
3  2  1
▢▢▢
```
2-3 On:
+5V (default)
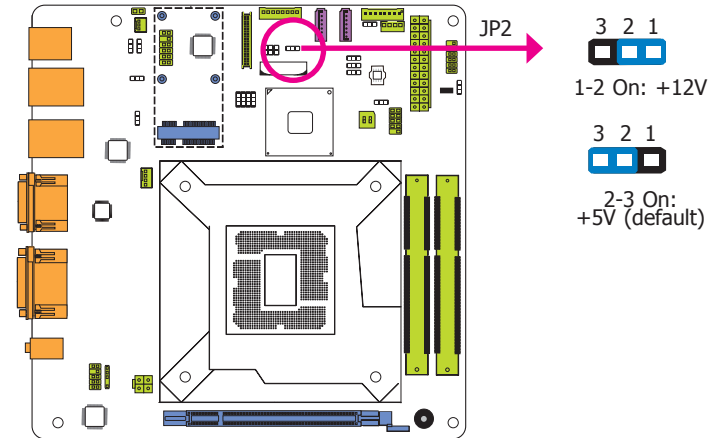
JP2 is used to select the power level of LVDS LCD inverter connector.

19

Panel Power Select

JP11

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

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

5 3 1
6 4 2
5-6 On: +3.3V
(default)
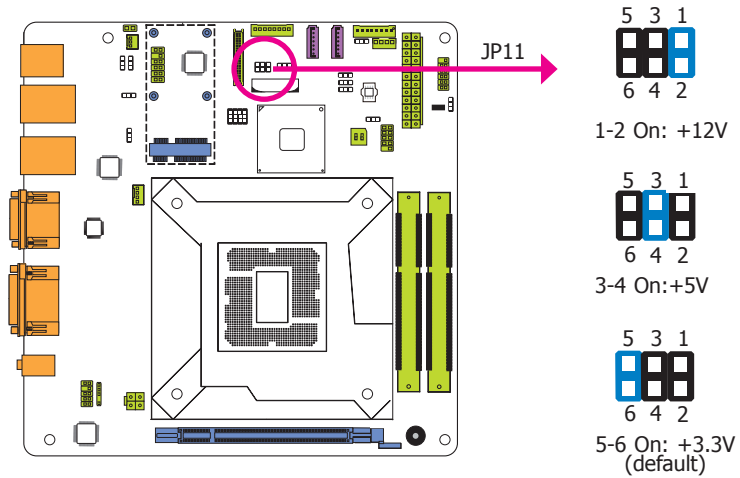
JP11 is used to select the power supplied with the LCD panel.

Important:
Before powering-on the system, make sure that the power settings of JP11 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

LVDS Channel and bpp Select

SW1

2 1 ON
1 On: Single LVDS

2 1 OFF
1 Off: Dual LVDS

2 1 ON
2 On: VESA (24bpp)

2 1 OFF
2 Off: JEIDA or VESA (18bpp)
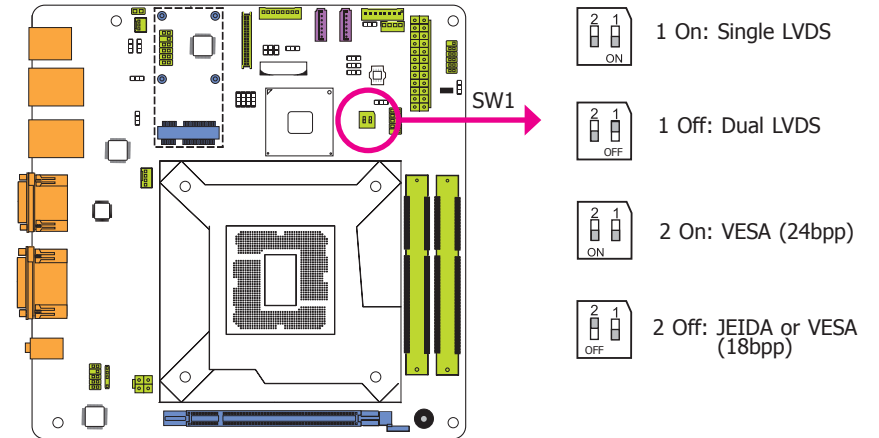
Switch 1 is designed to select the LVDS channel and the color of bits per pixel on the system.

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Digital I/O Power Select

JP15

3 2 1

1-2 On: +5V_standby
(default)

3 2 1

2-3 On: +5V
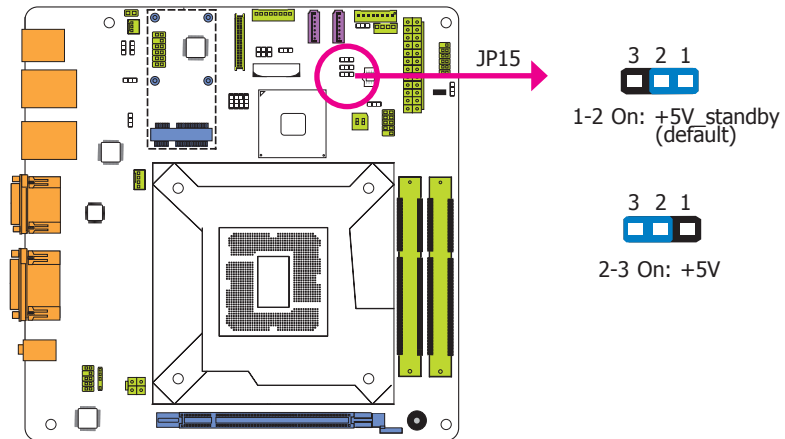
JP15 is used to select the power of DIO (Digital I/O) signal.

Digital I/O Output State

DIO 0-3
(JP16)

DIO 4-7
(JP17)

3 2 1

1-2 On: +5V or +5V_standby
(default)

3 2 1

2-3 On: GND
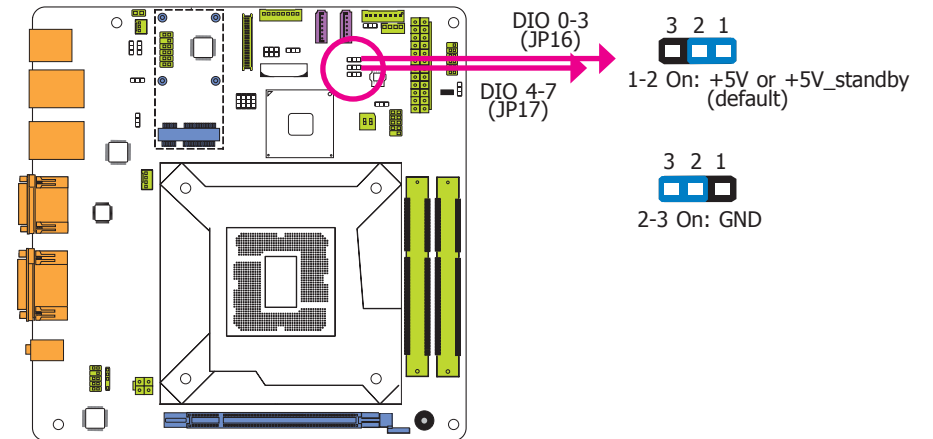
Based on the power level of DIO (Digital I/O) selected on JP15, JP16 (DIO pin 0-3) and JP17 (DIO pin 4-7) are used to select the output state of Digital I/O: pull high or pull low. When selecting pull high, the power selection will be the same as the JP15's setting.

21

Chapter 5 - Ports and Connectors

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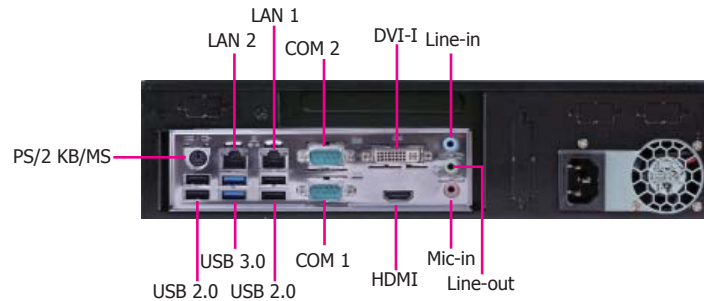
The rear panel I/O ports consist of the following:

- 1 PS/2 keyboard/mouse port
- 2 COM ports
- 1 DVI-I port
- 1 HDMI port
- 2 RJ45 LAN ports
- 4 USB 2.0 ports
- 2 USB 3.0 ports
- Line-out jack
- Line-in jack
- Mic-in jack

PS/2 Keyboard/Mouse Port
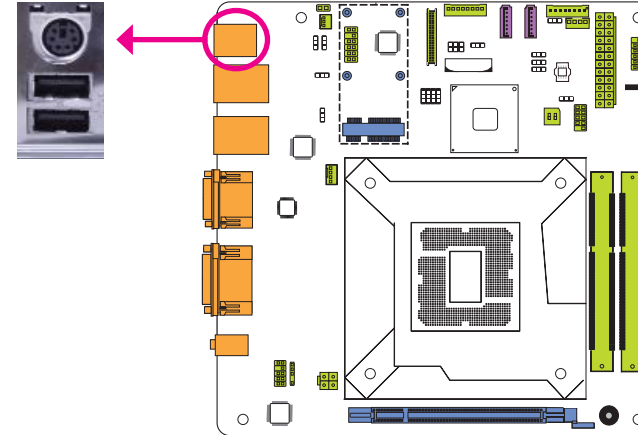
This rear I/O port is used to connect a PS/2 keyboard/mouse.

Wake-On-PS/2 Keyboard/Mouse

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

- **Jumper Setting**

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

- **BIOS Setting**

Configure the wake-up function of PS/2 keyboard/mouse in the Advanced menu ("ACPI Power Management Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

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

22

RJ45 LAN Ports

LAN 2   LAN 1

LAN 2
LAN 1
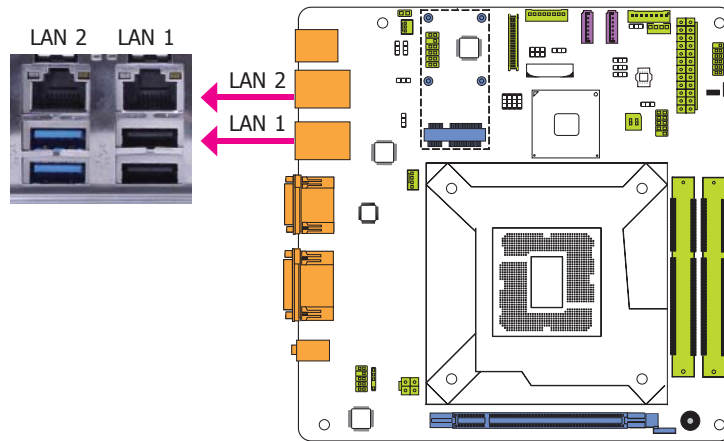
Features

- Intel® I210 PCI Express Gigabit Ethernet controller
- Intel® I217 Gigabit Ethernet Phy

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

BIOS Setting

Configure the onboard LAN ports in the Chipset menu ("PCH-IO Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Driver Installation

Install the LAN drivers. Refer to the chapter 8 for more information.

USB Ports

USB 2.0

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

USB 2-3

USB 11
USB 10

USB 2.0

USB 1
USB 0

USB 3.0   USB 5
USB 4
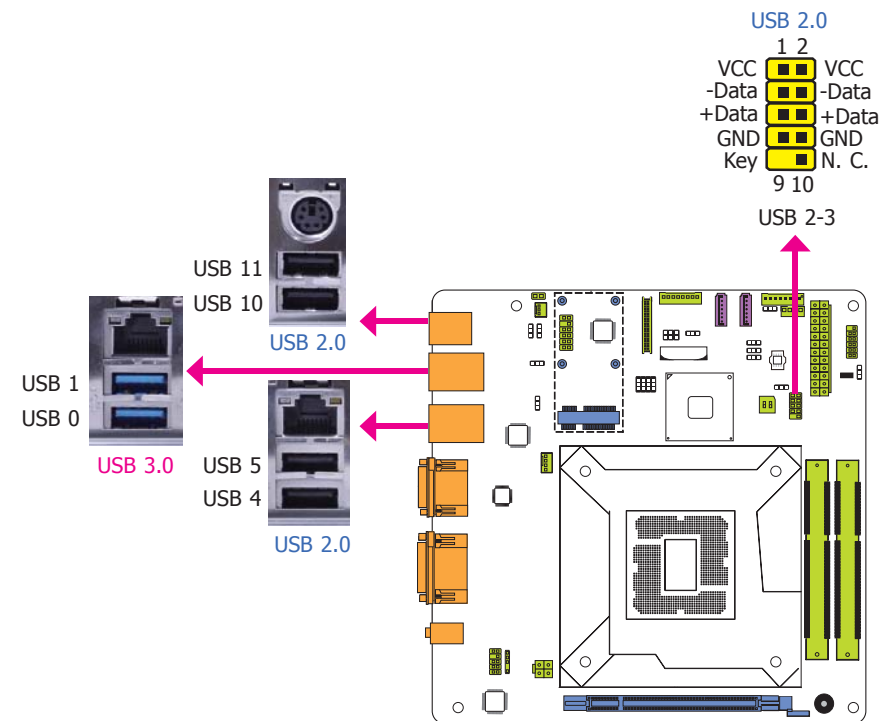
USB 2.0

The USB device allows data exchange between your computer and a wide range of simultane-ously accessible external Plug and Play peripherals.

The system board is equipped with two onboard USB 3.0 ports (USB 0-1) and four onboard USB 2.0 ports (USB 4-5/10-11). The 10-pin connector allows you to connect 2 additional USB 2.0/1.1 ports (USB 2-3). 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 these onboard USB devices in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Driver Installation

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

23

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**

JP5, JP6, JP8 and JP13 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:

- 1 DVI-I port
- 1 HDMI port
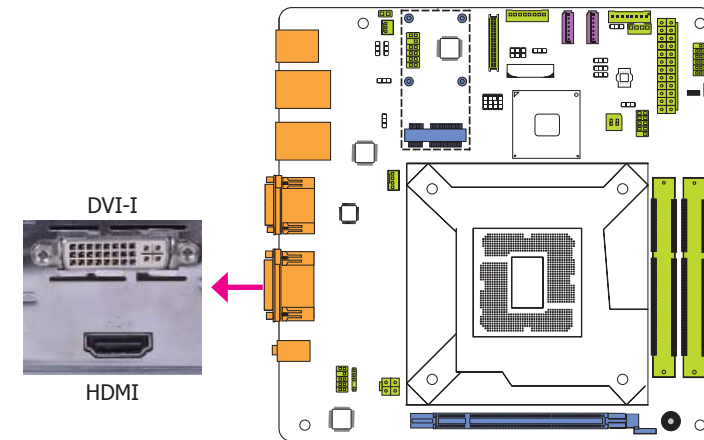
DVI-I

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. This port supports DVI-D signal only.
Connect the display device's cable connector to the DVI-I port. After plugging the cable connector into the port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display devices in the Chipset menu ("System Agent Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

COM (Serial) Ports

COM 2

COM 1/COM 2:
RS232

COM 1

DCD-
RD
TD
DTR-
GND

1 2 3 4 5

6 7 8 9

DSR-
RTS-
CTS-
RI-
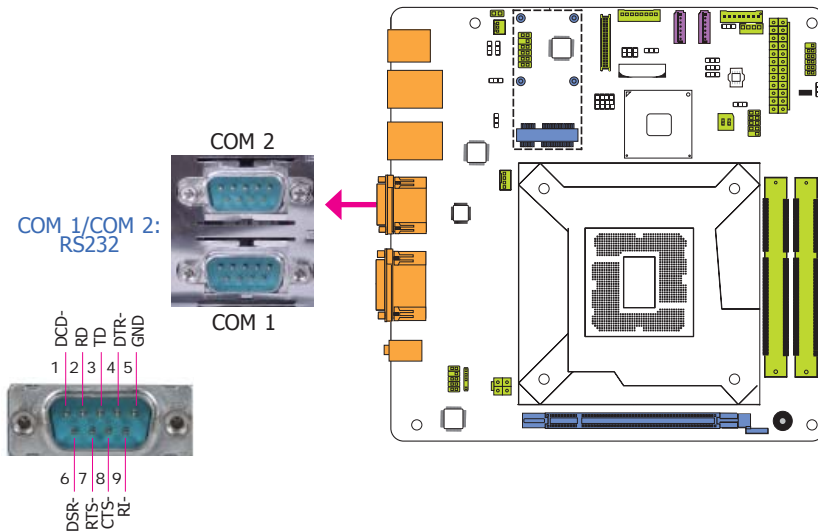
COM 1 and COM 2 are fixed at RS232.

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 COM ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Audio

Rear audio

Line-in

Line-out

Mic-in

Front audio

10 9

Line2-JD   Line2-L
Key   Front_IO_Sense
Mic2-JD   Line2-R
Presence Signal   Mic2-R
GND   Mic2-L

2 1
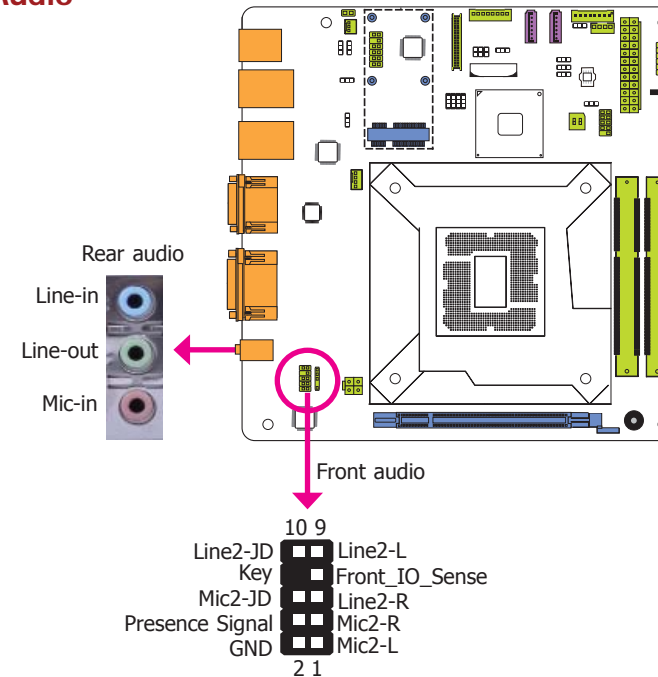
Rear Audio

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

- 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.

- Mic-in Jack (Pink)
  This jack is used to connect an external microphone.

Front Audio

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

Driver Installation

Install the audio driver. Refer to the chapter 8 for more information.

Chapter 5

I/O Connectors

SATA (Serial ATA) Connectors

SATA 3.0 6Gb/s — SATA 1, SATA 0

Pin 1–7: GND, TXP, TXN, GND, RXN, RXP, GND
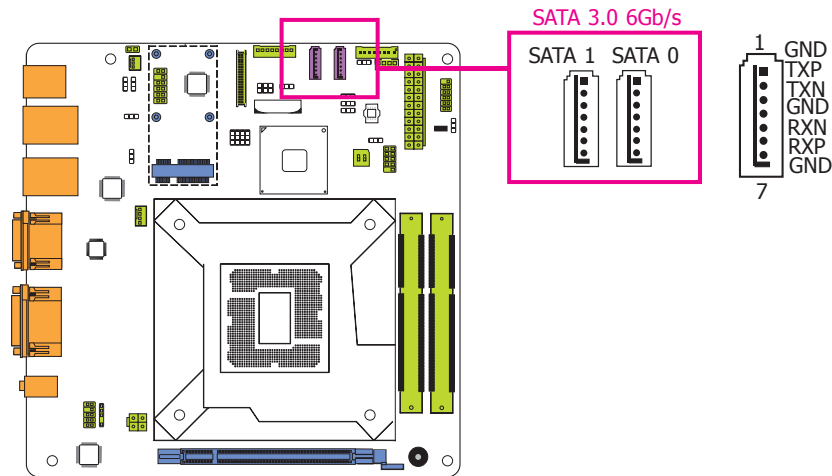
Features

• 2 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s (SATA 0 and SATA 1)

The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA data 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 the chapter 7 for more information.

Note:
Some 3rd party SATA Gen 2 speed device controllers used on the system board paired with the Intel® 8 series chipset are intermittently detected. Before using SSD devices or mSATA SSD devices, please check whether the device and the cable which are used on the system board conform to Intel's official regulations.

Digital I/O Connector

Digital I/O Power Connector

Digital I/O

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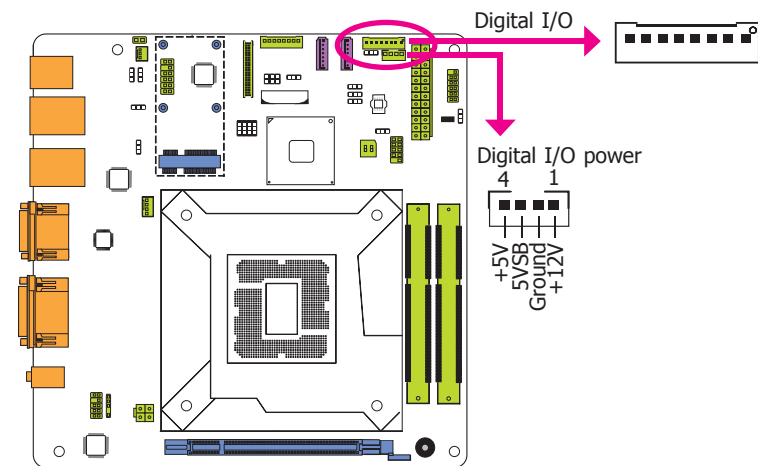
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

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

26

Cooling Fan Connectors

Ground — 1
Power —
Sense — 3
System Fan

Ground — 1
Power —
Sense —
Speed Control — 4
CPU Fan
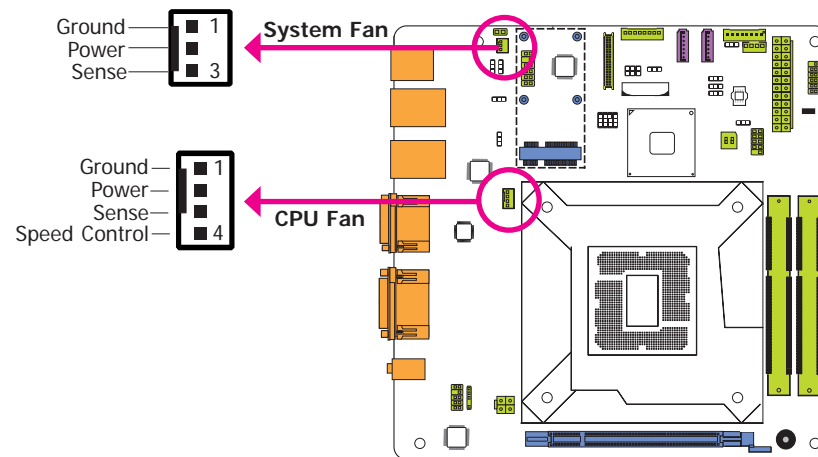
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("PC Health Status" submenu) of the BIOS will display the current speed of the cooling fans. Refer to the chapter 7 for more information.

Power Connectors

ATX power

	12 24	
+3.3V		GND
+12V		+5V
+12V		+5V
+5VSB		+5V
PWR_OK		-5V
GND		GND
+5V		GND
GND		GND
+5V		PS_ON#
GND		GND
+3.3V		-12V
+3.3V		+3.3V
	1 13	

+12V Power

4   2
+12V — ● ● — Ground
+12V — ● ● — Ground
3   1
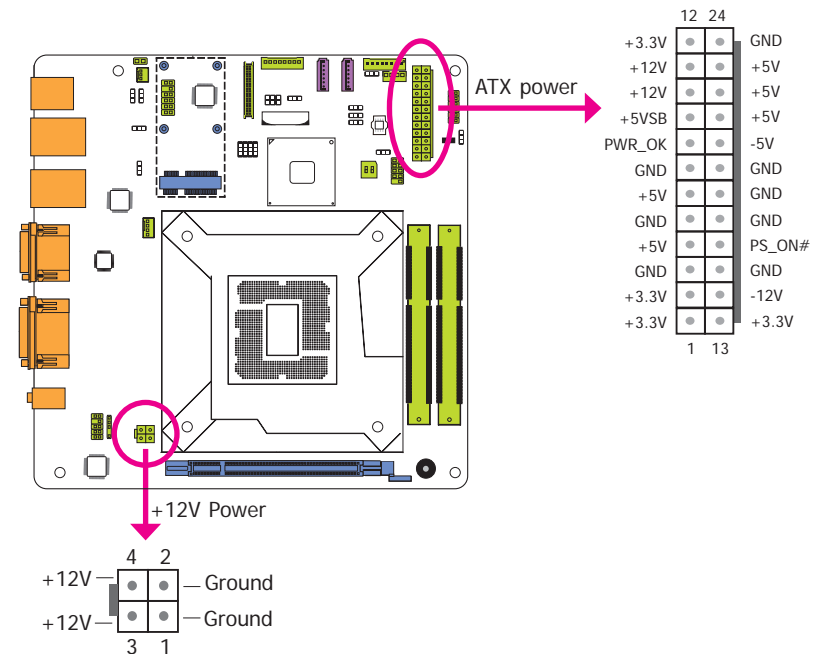
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

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

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

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

27

LVDS LCD Panel Connector

LCD/Inverter Power Connector

LCD/Inverter power

39 40
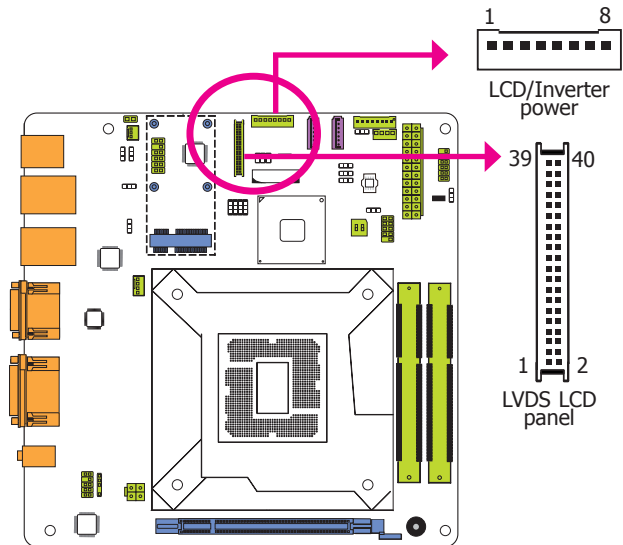
LVDS LCD panel

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.

Refer to the right side for the pin functions of these connectors.

BIOS Setting

Configure the LCD panel in the Advanced Chipset Features submenu of the BIOS. Refer to the chapter 7 for more information.

LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	GND	2	GND
3	LVDS_Out3+	4	LVDS_Out7+
5	LVDS_Out3-	6	LVDS_Out7-
7	GND	8	GND
9	LVDS_Out2+	10	LVDS_Out6+
11	LVDS_Out2-	12	LVDS_Out6-
13	GND	14	GND
15	LVDS_Out1+	16	LVDS_Out5+
17	LVDS_Out1-	18	LVDS_Out5-
19	GND	20	GND
21	LVDS_Out0+	22	LVDS_Out4+
23	LVDS_Out0-	24	LVDS_Out4-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	LVDS_DDCCLK	34	N.C.
35	LVDS_DDCDTA	36	+3.3V
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	LCD/Inverter Power
8	LCD/Inverter Power

28

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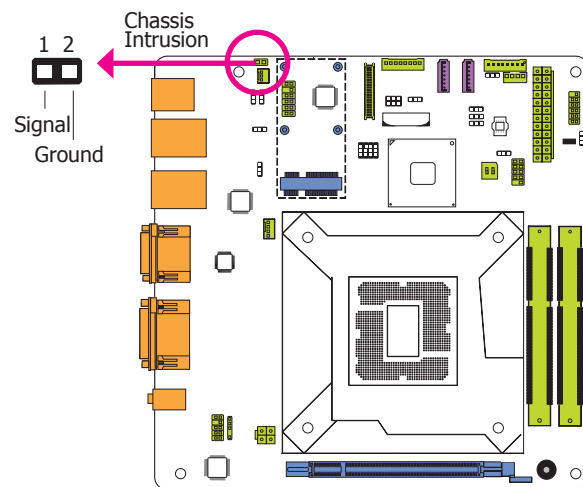
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will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

Front Panel Connector
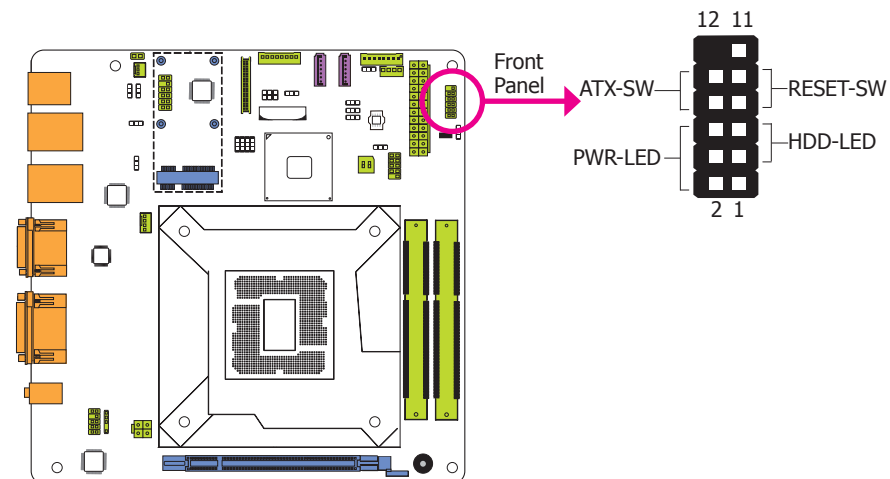
HDD-LED - HDD LED

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.

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

Standby Power LED

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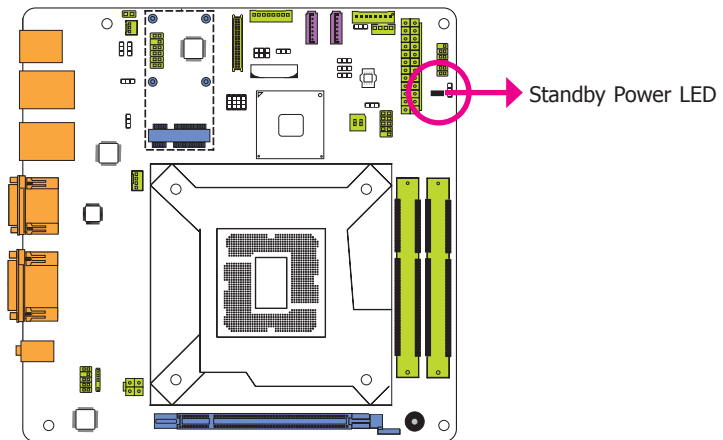
This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

S/PDIF Connector

5
SPDIF in
Ground
SPDIF out
Key
+5V
1
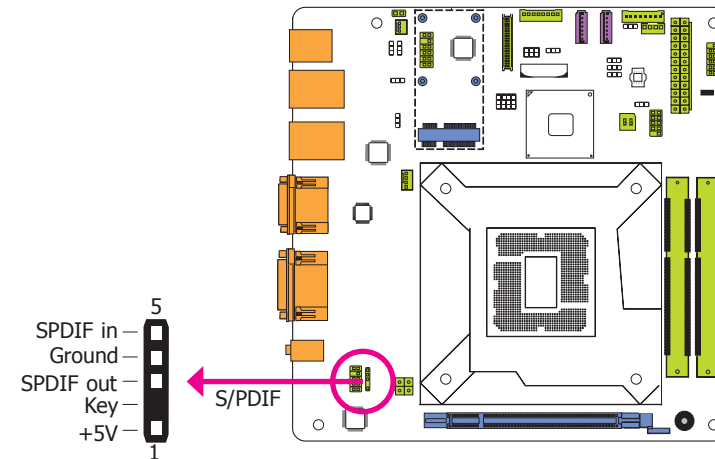
S/PDIF

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

Expansion Slots

Mini PCI Express
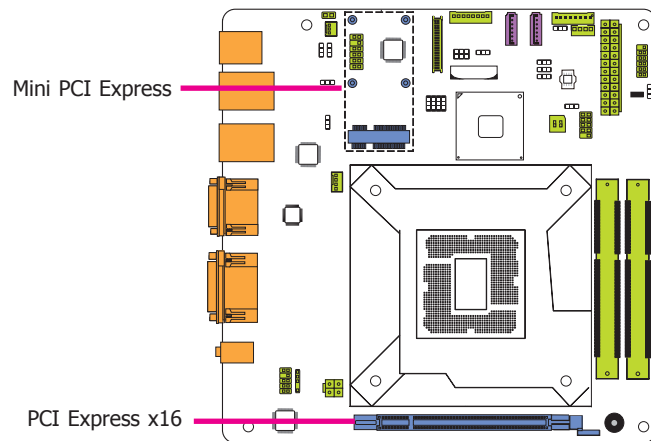
PCI Express x16

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 PCI Express Slot

The Mini PCIe socket is used to install a 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.

Battery
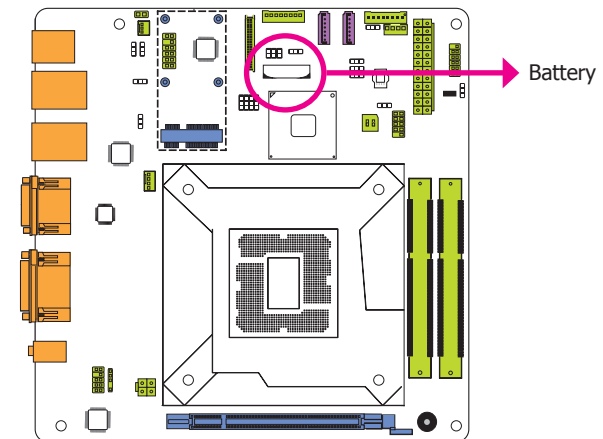
Battery

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.

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Chapter 6 - Mounting Options

Wall Mount

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

There are 2 types of wall mount brackets:
- Type A

- Type B

Type A wall mount kit include:
- 2 type A wall mount brackets

1. If the mounting screw has been previously attached to the top cover of the system, please remove them first.

Mounting screw

Mounting screw

2. At the sides of the system, use the mounting screws removed in step 1 to secure the wall mount brackets on each side of the system.

Wall mount bracket

Wall mount bracket

Mounting screw

319.00

28.60

160.00
120.00
80.00
180.00

2
16
16
2

4-#6-32
Ø4.00

Ø8.50

Ø5.00
Ø3.60

74.00
78.00

300.00

4.00

32
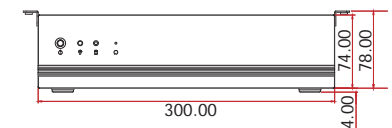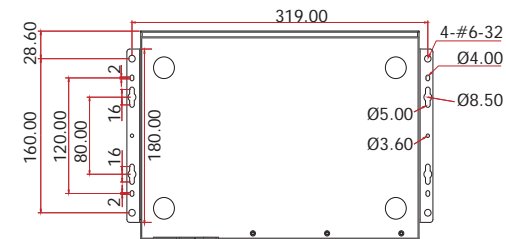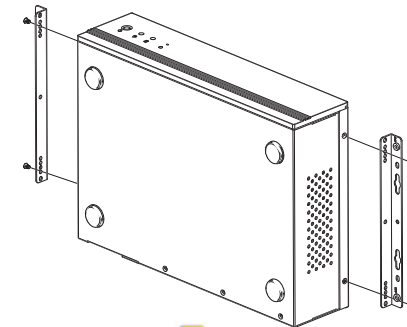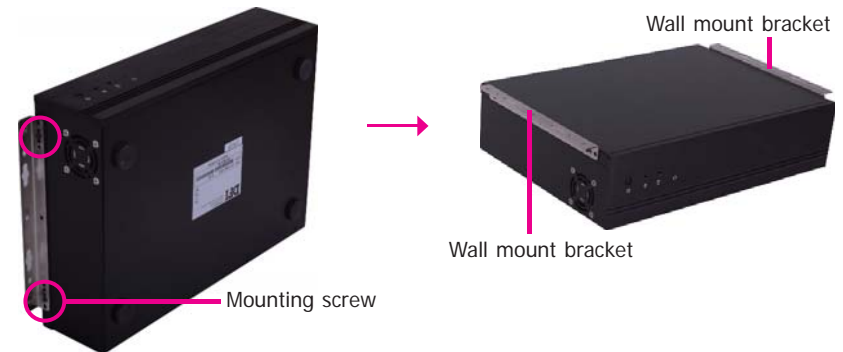
Type B wall mount kit include:
- • 2 type B wall mount brackets
- • Bracket screws

1. The 4 mounting holes on the sides of the system are used to mount the type B wall mount bracket.
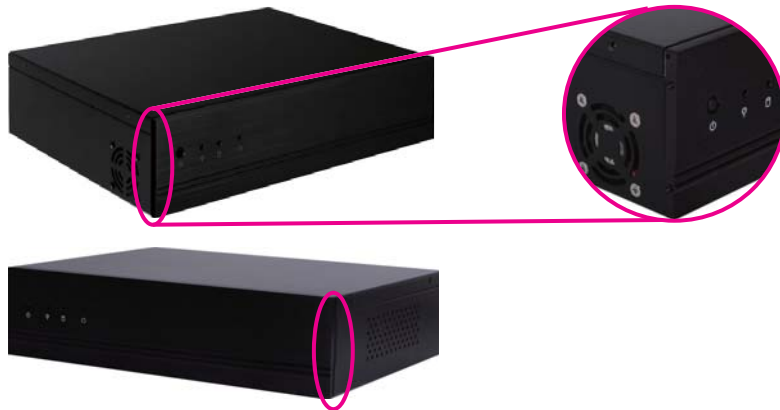
2. Use the provided mounting screws to secure the type B wall mount brackets on each side of the system.

Wall mount bracket

Wall mount bracket

Ø8.50   16
5.00   5.00   R2.50
55.00 40.00   37 40.00 55.00 78.00
R2.50   4.00
300.00
335.00
360.00
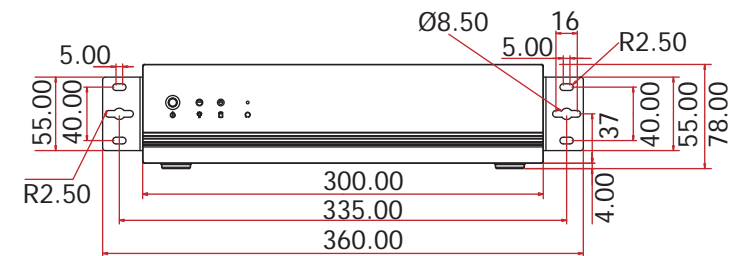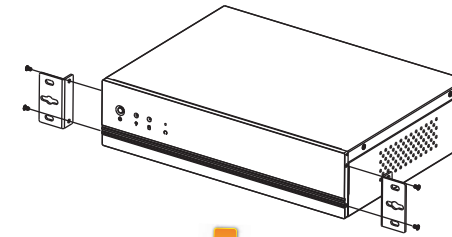
Chapter 7 - BIOS Setup

Overview

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

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

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

Default Configuration

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

Entering the BIOS Setup Utility

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

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

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the hightlight up or down between submenu or fields.
<Esc>	Exit to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Select a field.
<F1>	Displays general help
<F2>	Pervious values
<F3>	Optimized defaults
<F4>	Saves and resets 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) 2012 American Megatrends, Inc.
   Main    Advanced    Chipset    Boot    Security    Save & Exit

   BIOS Information                                          Choose the system default
   BIOS Vendor                 American Megatrends           language
   Core Version                4.6.5.4
   Compliancy                  UEFI 2.3.1; PI 1.2
   Project Version             1AQQW 0.25 x64
   Build Date and Time         08/07/2013  10:31:14

   System Language             [English]

   System Date                 [Fri 08/30/2013]
   System Time                 [14:13:29]                    → ←:  Select Screen
                                                             ↑↓:   Select Item
   Access Level                Administraor                  Enter: Select
                                                             +/-:   Change Opt.
                                                             F1:    General Help
                                                             F2:    Previous Values
                                                             F3:    Optimized Defaults
                                                             F4:    Save & Reset
                                                             ESC:   Exit

              Version 2.15.1236. Copyright (C) 2012 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) 2012 American Megatrends, Inc.
   Main    Advanced    Chipset    Boot    Security    Save & Exit

   ▶ ACPI Power Management Configuration                    ACPI Power Management
   ▶ Trusted Computing                                      Configuration
   ▶ CPU Configuration
   ▶ SATA Configuration
   ▶ PCH-FW Configuration
   ▶ USB Configuration
   ▶ Super IO Configuration
   ▶ PC Health Status
   ▶ Network Stack

   ▶ Intel(R) Ethernet Network Connection i217-LM - 88:88:88:......
   ▶ Intel(R) I210 Gigabit Network Connection - 00:01:29:26:......
                                                            → ←:  Select Screen
                                                            ↑↓:   Select Item
                                                            Enter: Select
                                                            +/-:   Change Opt.
                                                            F1:    General Help
                                                            F2:    Previous Values
                                                            F3:    Optimized Defaults
                                                            F4:    Save & Reset
                                                            ESC:   Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

35

ACPI Power Management Configuration

This section is used to configure the ACPI Power Management.

```
                 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced

  ACPI Power Management Configuration                          About Resume by PME
                                                               (PCI, PCIE, LAN).
  Resume by PME                        [Disabled]
  Resume by Ring                       [Disabled]
  Resume by RTC Alarm                  [Disabled]



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

                 Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Resume by PME

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

Resume by Ring

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

Resume by RTC Alarm

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

Trusted Computing

This section configures settings relevant to Trusted Computing innovations.

```
                 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced

  Configuration                                                Enables or Disables
     Security Device Support           [Disable]               BIOS support for security
                                                               device. O.S will not show
  Current Status Information                                   Security Device. TCG
     No Security Device Found                                  EFI protocol and INT1A
                                                               interface will not be
                                                               available.


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

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```

Security Device Support

This field is used to enable or disable BIOS supporting for the security device. O.S will not show the security device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

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

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced

  CPU Configuration                                            ▲   Enabled for Windows XP
                                                                   and Linux (OS optimized
  Intel(R) Core(TM)  i5-4570TE CPU @ 2.70GHz                       for Hyper-Threading
  CPU Signature                    306c3                           Technology) and Disabled
  Processor Family                 6                                for other OS (OS not
  Microcode Patch                  9                               optimized for
  FSB Speed                        100 MHz                         Hyper-Threading
  Max CPU Speed                    2700 MHz                        Technology). When
  Min CPU Speed                    800 MHz                         Disabled only one thread
  CPU Speed                        2700 MHz                        per enabled core is
  Processor Cores                  2                               enabled.
  Intel HT Technology              Supported
  Intel VT-X Technology            Supported                   →←:  Select Screen
  Intel SMX Technology             Supported                   ↑↓:   Select Item
  64-bit                           Supported                   Enter: Select
  EIST Technology                  Supported                   +/-:   Change Opt.
  CPU C3 State                     Supported                   F1:   General Help
  CPU C6 State                     Supported                   F2:   Previous Values
  CPU C7 State                     Supported                   F3:   Optimized Defaults
                                                               F4:   Save & Reset
  L1 Data Cache                    32 KB x2                    ESC:  Exit
  L1 Code Cache                    32 KB x2
  L2 Cache                         256 KB x2
  L3 Cache                         4096 KB

  Hyper-threading                  [Enabled]
  Active Processor Cores           [All]
  Intel Virtualization Technology  [Enabled]
  EIST                             [Enabled]                   ▼
                Version 2.15.1236. Copyright (C) 2012 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.

EIST

This field is used to enable or disable the Intel Enhanced SpeedStep Technology.

SATA Configuration

This section is used to configure the settings of SATA device.

```
                Aptio Setup Utility - Copyright (C) 2012 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

                                                               →←:  Select Screen
                                                               ↑↓:   Select Item
                                                               Enter: Select
                                                               +/-:   Change Opt.
                                                               F1:   General Help
                                                               F2:   Previous Values
                                                               F3:   Optimized Defaults
                                                               F4:   Save & Reset
                                                               ESC:  Exit
                Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

SATA Controller(s)

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

SATA Mode Selection

The mode selection determines how the SATA controller(s) operates.

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

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

When IDE mode is selected in the SATA Mode Selection, it will display the following information:

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Advanced

  SATA Controller(s)              [Enabled]           Determines how SATA
  SATA Mode Selection             [IDE]               controller(s) operate.

  Serial ATA Port 0               Empty
    Software Preserve             Unknown
  Serial ATA Port 1               Empty
    Software Preserve             Unknown
  Serial ATA Port 4               Empty
    Software Preserve             Unknown




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

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

When AHCI mode is selected in the SATA Mode Selection, it will display the following information:

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Advanced

  SATA Controller(s)              [Enabled]           Determines how SATA
  SATA Mode Selection             [AHCI]              controller(s) operate.
  SATA Controller Speed           [Default]

  Serial ATA Port 0               Empty
    Software Preserve             Unknown
    Port 0                        [Enabled]
    Hot Plug                      [Disabled]
  Serial ATA Port 1               Empty
    Software Preserve             Unknown
    Port 1                        [Enabled]
    Hot Plug                      [Disabled]
  Serial ATA Port 4               Empty
    Software Preserve             Unknown
    Port 4                        [Enabled]        →←:  Select Screen
    Hot Plug                      [Disabled]       ↑↓:   Select Item
                                                   Enter: Select
                                                   +/-:    Change Opt.
                                                   F1:    General Help
                                                   F2:    Previous Values
                                                   F3:    Optimized Defaults
                                                   F4:    Save & Reset
                                                   ESC:  Exit

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```

SATA Controller Speed

Indicates the maximum speed that the SATA controller can support.

Port 0, Port 1 and Port 4

Enables or disables the SATA port.

Hot Plug

Designates the SATA port as hot pluggable.

PCH-FW Configuration

This section is used to configure the parameters of Management Engine Technology.

```
                   Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced

      ME FW Version              9.0.10.1372               Configure Management
      ME Firmware Mode           Normal Mode               Engine Technology
      ME Firmware Type           Full Sku Firmware         Parameters
      ME Firmware SKU            1.5MB
   ▶  Firmware Update Configuration


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

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Firmware Update Configuration

Enables or disables Me FW Image Re-Flash function.

```
                   Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced

                                                           Enable/Disable Me FW
      Me FW Image Re-Flash         [Disabled]              Image Re-Flash function.




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

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

USB Configuration

This section is used to configure the parameters of the USB device.

```
                   Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
         Advanced

      USB Configuration                                    Enables Legacy USB
                                                           support. AUTO option
      USB Module Version           8.10.27                 disables legacy support if
                                                           no USB devices are
      USB Devices:                                         connected. DISABLE
            1 keyboard, 2 Hubs                             option will keep USB
                                                           devices available only for
      Legacy USB Support           [Enabled]               EFI applications.
      USB 3.0 Support              [Enabled]
      XHCI Hand-off                [Enabled]
      EHCI Hand-off                [Disabled]

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

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Legacy USB Support

Enabled

Enables legacy USB.

Auto

Disables support for legacy when no USB devices are connected.

Disabled

Keeps USB devices available only for EFI applications.

USB 3.0 Support

Enables or disables USB 3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

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

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) 2012 American Megatrends, Inc.
   Advanced

   Super IO Configuration                                   Restore AC Power Loss
                                                            Help.
   Super IO Chip                   NCT6102D

   Restore AC Power Loss           [Power Off]

   WatchDog Timer Unit             [Second]
      Super IO Watchdog Timer      0
 ▶ Serial Port 0 Configuration
 ▶ Serial Port 1 Configuration

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

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```

Restore AC Power Loss

Power 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.

Power 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 Unit

Selects the watchdog timer unit: second or minute.

Super IO Watchdog Timer

Sets the timeout value of the super IO watchdog timer. 0 means disabled.

Serial Port 0 Configuration to Serial Port 1 Configuration

Sets the parameters of serial port 0 (COM A) and serial port 1 (COM B).

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Advanced

   Serial Port 0 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
                                                            F4:    Save & Reset
                                                            ESC:  Exit

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Advanced

   Serial Port 1 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
                                                            F4:    Save & Reset
                                                            ESC:  Exit

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Serial Port

Enables or disables the serial port (COM).

Change Settings

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

PC Health Status

This section displays the hardware health monitor.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced

   PC Health Status                               Smart Fan Function Setting
►  Smart Fan Function

   Case Open                  [Disabled]

   CPU Temperature            : +32.0 C
   System Temperature         : +36.5 C
   CPU Fan Speed              : 1274 RPM
   System Fan Speed           : N/A
   VCORE                      : +1.728 V
   +5V                        : +5.077 V
   +12V                       : +11.968 V        →←:  Select Screen
   +1.5V                      : +1.520 V          ↑↓:    Select Item
   +3.3V                      : +3.328 V          Enter: Select
   3VSB                       : +3.376 V          +/-:   Change Opt.
   VBAT                       : +3.040 V          F1:    General Help
                                                  F2:    Previous Values
                                                  F3:    Optimized Defaults
                                                  F4:    Save & Reset
                                                  ESC:  Exit

        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Smart Fan Function

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced

   Smart Fan Function                             Enable CPU Smart Fan

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

   System Smart Fan Control   [Enabled]           →←:  Select Screen
     Boundary 4               60                   ↑↓:    Select Item
     Boundary 3               50                   Enter: Select
     Boundary 2               40                   +/-:   Change Opt.
     Boundary 1               30                   F1:    General Help
     Speed Count 5            100                  F2:    Previous Values
     Speed Count 4            75                   F3:    Optimized Defaults
     Speed Count 3            50                   F4:    Save & Reset
     Speed Count 2            40                   ESC:  Exit
     Speed Count 1            30

        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

CPU Smart Fan Control

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

System Smart Fan Control

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

Boundary 1 to Boundary 4

The range is 0-127.

Speed Count 1 to Speed Count 5

The range is 1-100%.

Case Open

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

Network Stack

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Advanced

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

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

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
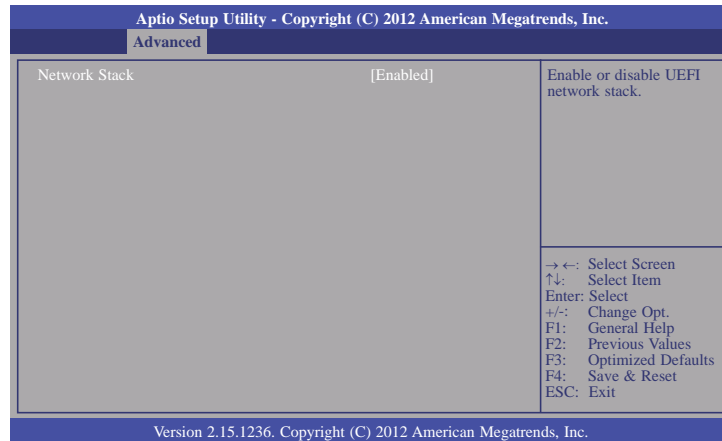
Network Stack

Enables or disables UEFI network stack.

Aptio Setup Utility - Copyright (C) 2012 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
F4:   Save & Reset
ESC: Exit

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Ipv4 PXE Support

When enabled, Ipv4 PXE boot supports. When disabled, Ipv4 PXE boot option will not be created.

Ipv6 PXE Support

When enabled, Ipv6 PXE boot supports. When disabled, Ipv6 PXE boot option will not be created.

42

Intel(R) Ethernet Network Connection i217-LM - 88:88:88:...
(Only for reference)

This section is used to configure the parameters of Gigabit Ethernet device.

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

                                                              Click to configure the
   PORT CONFIGURATION MENU                                    network device port.
 ► NIC Configuration

   Blink LEDs (range 0-15 seconds)              0

   PORT CONFIGURATION INFORMATION
   UEFI Driver:                           Intel(R) 1GbE DEV 5.1.00
   Adapter PBA:                           FFFFFF-OFF
   Chip Type:                             Intel PCH LPT
   PCI Device ID                          153A
   PCI Bus: Device: Function:             0:25:0
   Link Status                            [Disconnected]        → ←:  Select Screen
   Factory MAC Address:                   88:88:88:88:87:88     ↑↓:   Select Item
                                                                Enter: Select
                                                                +/-:   Change Opt.
                                                                F1:    General Help
                                                                F2:    Previous Values
                                                                F3:    Optimized Defaults
                                                                F4:    Save & Reset
                                                                ESC:  Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
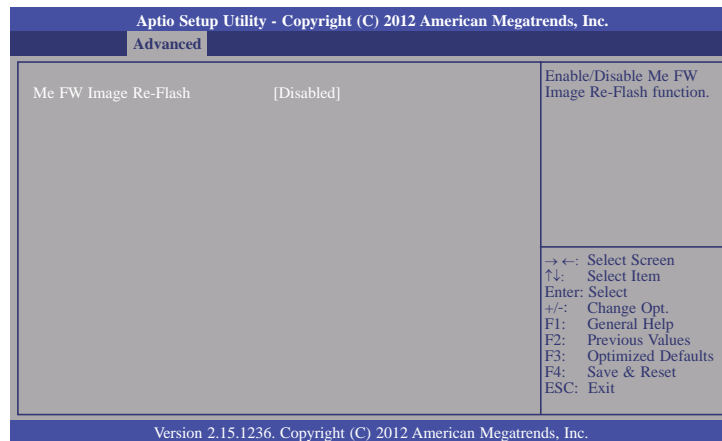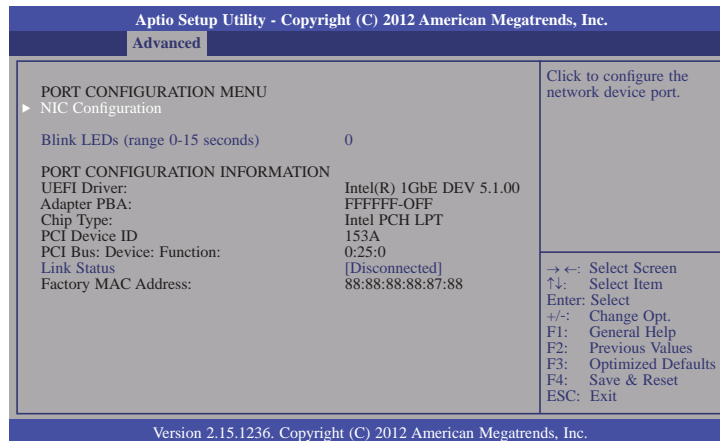
NIC Configuration

This field is used to configure the network device.

Blink LEDs

Blink LEDs for the specified duration (up to 15 seconds).

Link Status

This field indicates the link status of the network device.

Intel(R) I210 Gigabit Network Connection - 00:01:29:26...
(Only for reference)

This section is used to configure the parameters of Gigabit Ethernet device.

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

                                                              Click to configure the
   PORT CONFIGURATION MENU                                    network device port.
 ► NIC Configuration

   Blink LEDs (range 0-15 seconds)              0

   PORT CONFIGURATION INFORMATION
   UEFI Driver:                           Intel(R) 1GbE DEV 5.1.00
   Adapter PBA:                           001300-000
   Chip Type:                             Intel i210
   PCI Device ID                          1533
   PCI Bus: Device: Function:             2:0:0
   Link Status                            [Disconnected]        → ←:  Select Screen
   Factory MAC Address:                   00:01:29:26:70:2D     ↑↓:   Select Item
   Alternate MAC Address:                 00:01:29:26:70:2D     Enter: Select
                                                                +/-:   Change Opt.
                                                                F1:    General Help
                                                                F2:    Previous Values
                                                                F3:    Optimized Defaults
                                                                F4:    Save & Reset
                                                                ESC:  Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

NIC Configuration

This field is used to configure the network device.

Blink LEDs

Blink LEDs for the specified duration (up to 15 seconds).

Link Status

This field indicates the link status of the network device.

Alternate MAC Address

Alternates assigned MAC address of Ethernet port.

Chipset

This section configures relevant chipset functions.

```
                  Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main    Advanced    Chipset    Boot    Security    Save & Exit

  ▶ System Agent (SA) Configuration                          System Agent (SA)
  ▶ PCH-IO Configuration                                     Parameters



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

                  Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

System Agent (SA) Configuration

This section is used to configure the parameters of System Agent.

```
                  Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                      Chipset

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

  VT-d                              [Enabled]

  ▶ Graphics Configuration
  ▶ NB PCIe Configuration
  ▶ Memory Configuration


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

                  Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

VT-d

Checks to enable VT-d function on MCH.

Graphics Configuration

This field configures the graphics settings.

```
                  Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                      Chipset

  Graphics Configuration                                Select which of IGFX/
  IGFX VBIOS Version               2171                 PEG/PCI Graphics device
  IGfx Frequency                   700 MHz              should be Primary Display
                                                        or select SG for Switch-
  Primary Display                  [Auto]               able Gfx.
  Internal Graphics                [Auto]
  ▶ LCD Control


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

                  Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
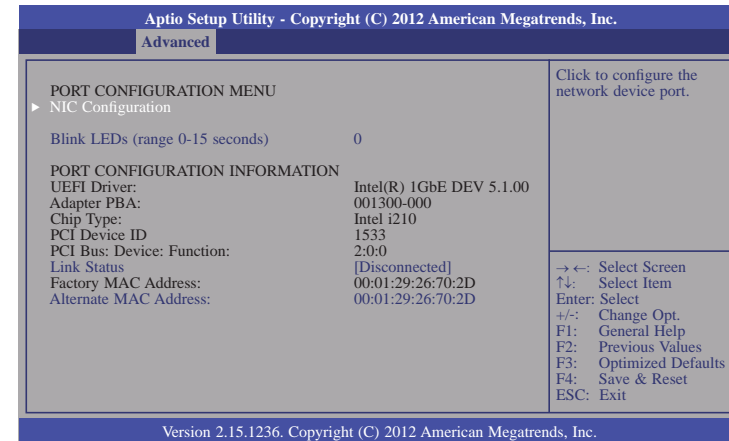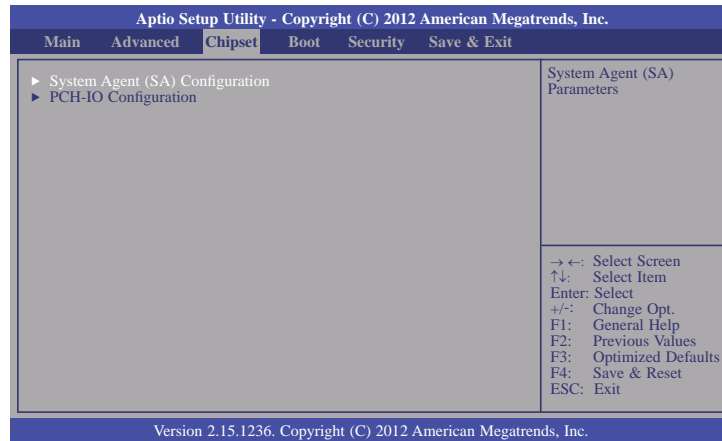
Primary Display

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

Keeps IGD enabled based on the setup options.

LCD Control

This field configures the LCD control.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                          Chipset

LCD Control                                        Select the Video Device
                                                   which will be activated
Primary IGFX Boot Display        [VBIOS Default]   during POST. This has no
LCD Panel Type                   [VBIOS Default]   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
                                                   F4:    Save & Reset
                                                   ESC:  Exit

         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
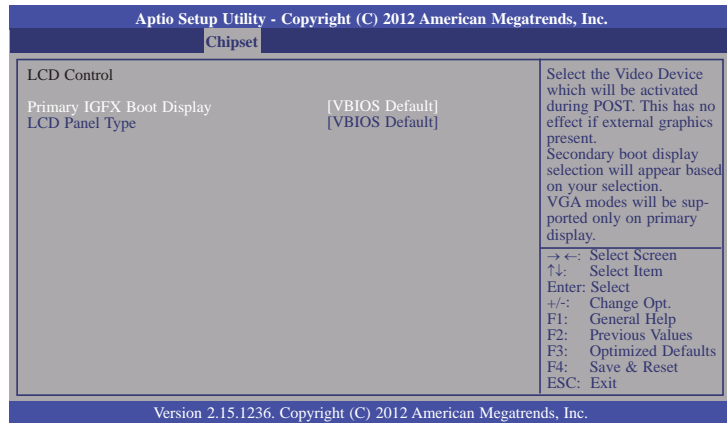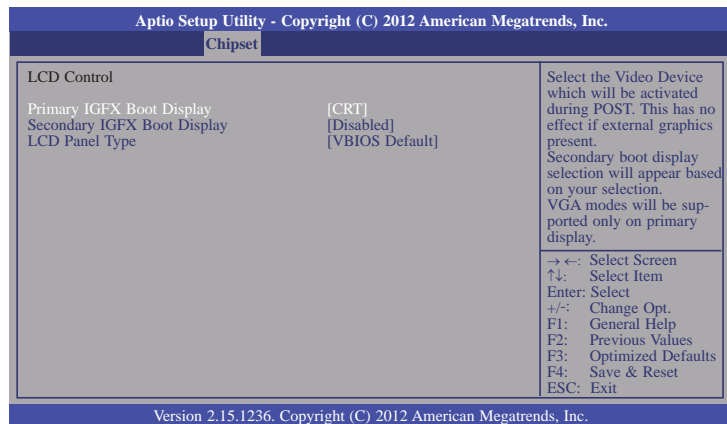
When any device is selected in the Primary IGFX Boot Display, it will display the following information:

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                          Chipset

LCD Control                                        Select the Video Device
                                                   which will be activated
Primary IGFX Boot Display        [CRT]             during POST. This has no
Secondary IGFX Boot Display      [Disabled]        effect if external graphics
LCD Panel Type                   [VBIOS Default]   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
                                                   F4:    Save & Reset
                                                   ESC:  Exit

         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
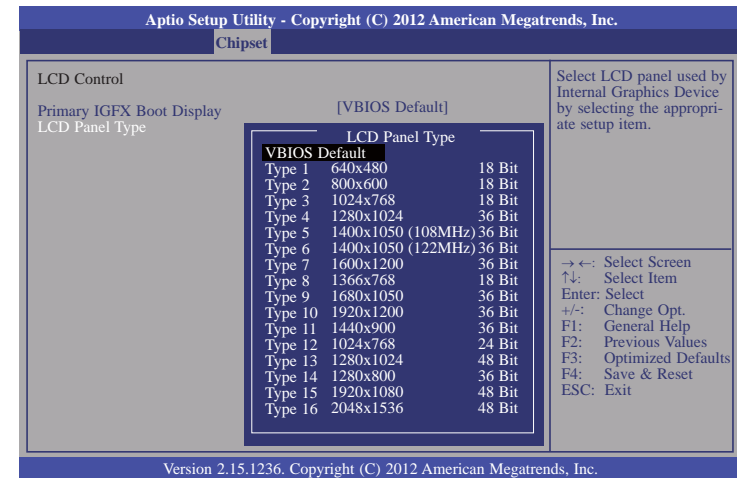
Secondary IGFX Boot Display

Selects secondary display device.

LCD Panel Type

Selects LCD panel used by Internal Graphics Device via selecting the appropriate setup item.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                          Chipset

LCD Control                                              Select LCD panel used by
                                                         Internal Graphics Device
Primary IGFX Boot Display        [VBIOS Default]         by selecting the appropri-
LCD Panel Type                                           ate setup item.
                          ┌──── LCD Panel Type ────┐
                          │ VBIOS Default           │
                          │ Type 1  640x480    18 Bit
                          │ Type 2  800x600    18 Bit
                          │ Type 3  1024x768   18 Bit
                          │ Type 4  1280x1024  36 Bit
                          │ Type 5  1400x1050 (108MHz) 36 Bit
                          │ Type 6  1400x1050 (122MHz) 36 Bit   → ←: Select Screen
                          │ Type 7  1600x1200  36 Bit           ↑↓:    Select Item
                          │ Type 8  1366x768   18 Bit           Enter: Select
                          │ Type 9  1680x1050  36 Bit           +/-:   Change Opt.
                          │ Type 10 1920x1200  36 Bit           F1:    General Help
                          │ Type 11 1440x900   36 Bit           F2:    Previous Values
                          │ Type 12 1024x768   24 Bit           F3:    Optimized Defaults
                          │ Type 13 1280x1024  48 Bit           F4:    Save & Reset
                          │ Type 14 1280x800   36 Bit           ESC:  Exit
                          │ Type 15 1920x1080  48 Bit
                          │ Type 16 2048x1536  48 Bit

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```

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NB PCIe Configuration

This field is used to configure the settings of NB PCI Express.

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                Chipset

NB PCIe Configuration                              Configure PEG0
   PEG0 - Gen X              [Auto]                B0:D1:F0 Gen1-Gen2.

Enable PEG                   [Auto]



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

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Enable PEG

Enables or disables the PEG.

Memory Configuration

This field only displays the memory configuration.

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                Chipset

Memory Information

Memory RC Version               1.5.0.0
Memory Frequency                1333 Mhz
Total Memory                    2048 MB (DDR3)
Memory Voltage                  1.50V
DIMM#1                          Not Present
DIMM#2                          2048 MB (DDR3)
CAS Latency (tCL)               9
Minimum delay time
      CAS to RAS (tRCDmin)      9          → ←:  Select Screen
      Row Precharge (tRPmin)    9          ↑↓:    Select Item
      Active to Precharge (tRASmin)  24    Enter: Select
                                           +/-:   Change Opt.
                                           F1:    General Help
                                           F2:    Previous Values
                                           F3:    Optimized Defaults
                                           F4:    Save & Reset
                                           ESC:  Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

PCH-IO Configuration

This section illustrates the PCH parameters.

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
            Chipset

   Intel PCH RC Version            1.5.0.0              PCI Express Configuration
   Intel PCH SKU Name              H81                  settings.
   Intel PCH Rev ID                04/C1

 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ PCH Azalia Configuration

   Onboard I217 LAN Controller     [Enabled]
   Onboard I210 LAN Controller     [Enabled]
                                                        → ←:  Select Screen
 High Precision Event Timer Configuration               ↑↓:    Select Item
 High Precision Timer              [Enabled]            Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        F4:    Save & Reset
                                                        ESC:  Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Onboard I217 LAN Controller

Enables or disables the onboard I217 LAN controller.

Onboard I210 LAN Controller

Enables or disables onboard I210 LAN controller

High Precision Timer

Enables or disables the the High Precision Event Timer.

PCI Express Configuration

This field is used to configure the PCI Express settings.

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                        Chipset

   PCI Express Configuration                            PCI Express Root Port 1
                                                        Settings.
 ▶ PCI Express Root Port 1

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

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                        Chipset

   PCI Express Root Port 1          [Enabled]           Control the PCI Express
   PCIe Speed                       [Auto]               Root port.

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

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

PCI Express Root Port 1

Controls the PCI Express Root Port.

PCIe Speed

Selects the speed of PCI Express port.

USB Configuration

This field is used to configure the USB settings.

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                    Chipset

  USB Configuration                                        Precondition work on
                                                           USB host controller
  USB Precondition                   [Disabled]            and root ports for faster
  XHCI Mode                          [Auto]                enumeration.

  USB Ports Per-Port Disable Control [Disabled]


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

           Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

USB Precondition

Precondition works on USB host controller and root ports for faster enumeration.

XHCI Mode

Selects the operation mode of XHCI controller. These options are Auto, Enabled, and Disabled. When Disabled is selected in the XHCI Mode, it will display the following information:

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                                    Chipset

  USB Configuration                                        Mode of operation of
                                                           XHCI controller.
  USB Precondition                   [Disabled]
  XHCI Mode                          [Disabled]

  EHCI1                              [Enabled]
  EHCI2                              [Enabled]

  USB Ports Per-Port Disable Control [Disabled]


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

           Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

EHCI 1 and EHCI 2

These fields are used to control the functions of USB EHCI (USB 2.0) controllers. One EHCI controller must always be enabled.

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USB Ports Per-Port Disable Control

This field is used to control each of the USB ports(0~13) disabling. When enabled, it will display the following information:

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
USB Configuration		Control each of the USB ports (0~13) disabling.
USB Precondition	[Disabled]	
XHCI Mode	[Auto]	
USB Ports Per-Port Disable Control	[Enabled]	
USB Port #0	[Enabled]	
USB Port #1	[Enabled]	
USB Port #2	[Enabled]	
USB Port #3	[Enabled]	
USB Port #4	[Enabled]	
USB Port #5	[Enabled]	→←: Select Screen
USB Port #8	[Enabled]	↑↓: Select Item
USB Port #10	[Enabled]	Enter: Select
USB Port #11	[Enabled]	+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Reset
		ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

USB Port #0/1/2/3/4/5/8/10/11

Enables or disables these USB ports.

PCH Azalia Configuration

This field is used to configure the PCH Azalia settings.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Chipset		
PCH Azalia Configuration		Control detection of the Azalia device.
Azalia	[Auto]	Disable= Azalia will be unconditionally disabled Enabled= Azalia will be unconditionally enabled Auto=Azalia will be enabled if present, disabled otherwise.
		→←: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Reset
		ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

Boot

```
                    Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main     Advanced    Chipset    Boot    Security    Save & Exit

    Boot Configuration                                            Number of seconds to
    Setup Prompt Timeout              1                           wait for setup activation
    Bootup NumLock State              [On]                        key.
                                                                  65535(0xFFFF) means
    Quiet Boot                        [Disabled]                  indefinite waiting.



    Boot Option Priorities

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

                    Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Setup Prompt Timeout

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

Bootup NumLock State

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

Quiet Boot

Enables or disables the quiet boot function.

CSM Parameters

```
                    Aptio Setup Utility - Copyright (C) 2012 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     [Legacy OpROM]



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

                    Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Launch CSM

This option controls if CSM will be launched.

Boot option filter

This option controls what devices system can 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) 2012 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
                                                 F2:    Previous Values
                                                 F3:    Optimized Defaults
                                                 F4:    Save & Reset
                                                 ESC:  Exit

             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Administrator Password

Sets the administrator's password.

User Password

Sets the user's password.

Save & Exit

```
             Aptio Setup Utility - Copyright (C) 2012 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

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

             Version 2.15.1236. Copyright (C) 2012 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.

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Updating the BIOS

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

To execute the utility, type:

A:> AFUDOS BIOS_File_Name /b /p /n

then press <Enter>.

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

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

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

C:\AFU\AFUDOS>
```

Notice: BIOS SPI ROM

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

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

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

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

Chapter 8 - Supported Software

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".

For Windows 8
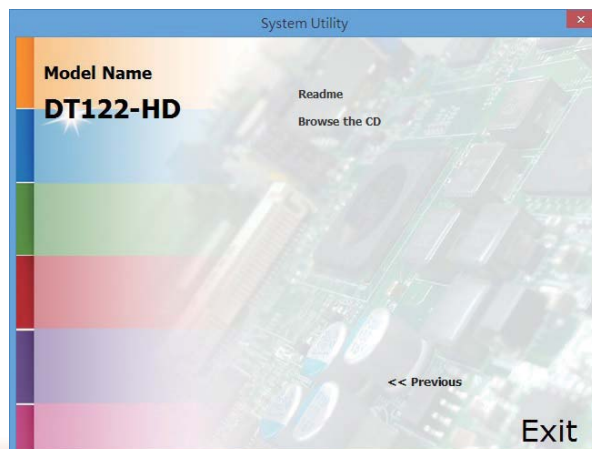
For Windows 7
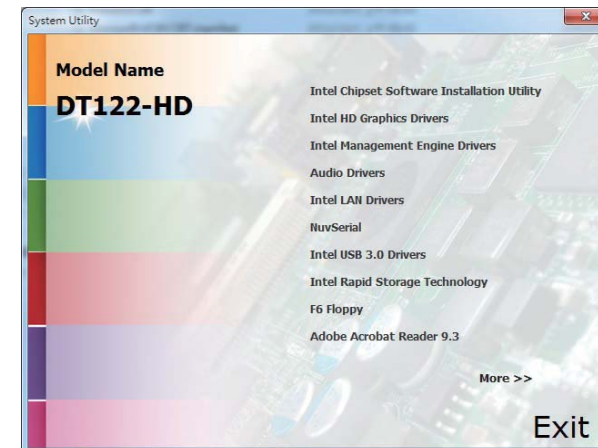
Intel Chipset Software Installation Utility

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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Intel HD Graphics Drivers

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

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

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

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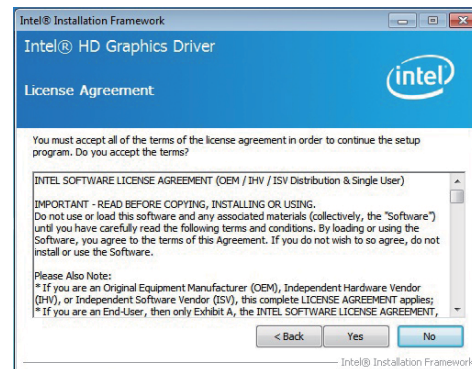
3. Go through the readme document for system requirements and installation tips then click Next.
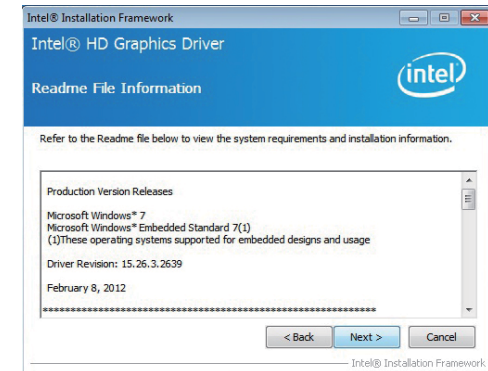
4. Setup is now installing the driver. Click Next to continue.
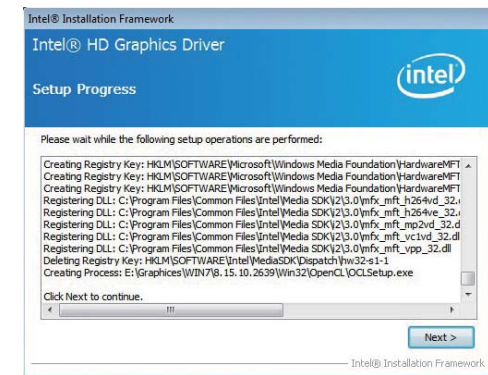
5. Click "Yes, I want to restart this computer now" then click Finish.

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

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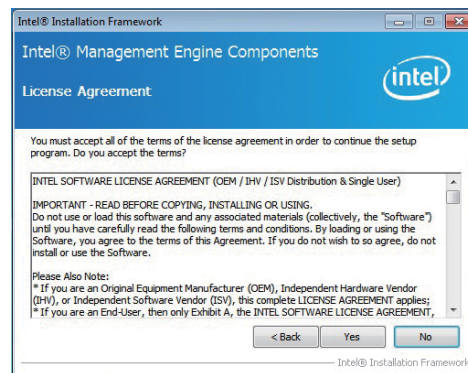
3. Setup is currently installing the driver. After installation has completed, click Next.
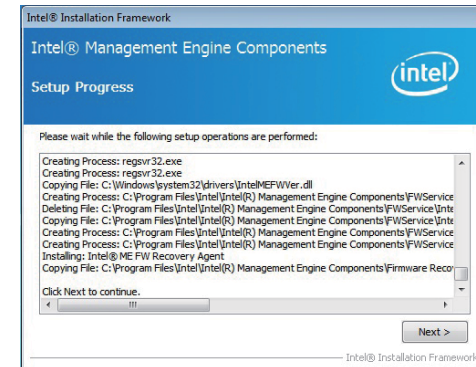
4. After completing installation, click Finish.

56
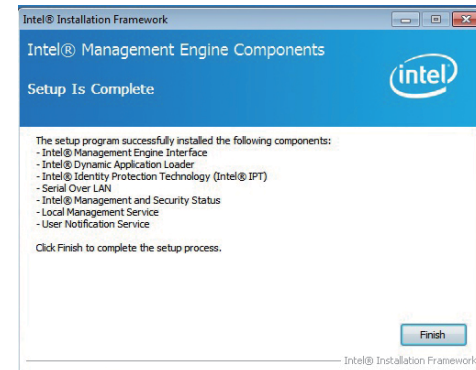
Audio Drivers

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

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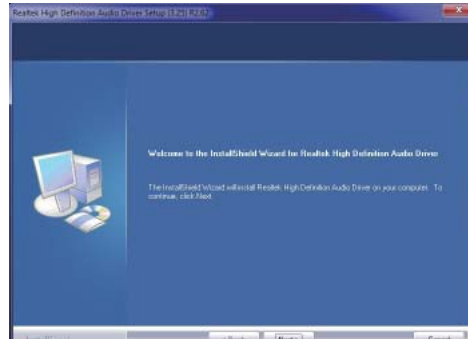
2. Click "Yes, I want to restart my computer now" then click Finish.

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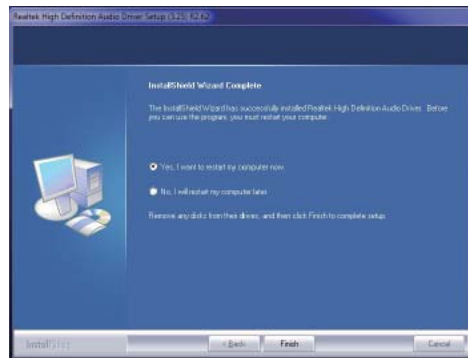
Intel LAN Drivers

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

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

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

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

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Chapter 8
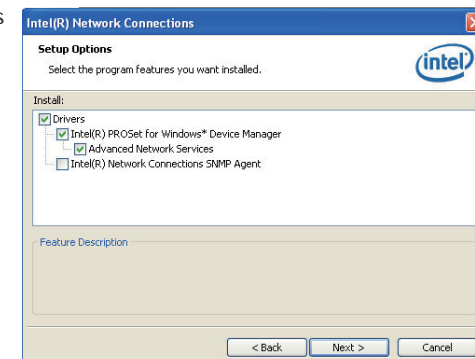
4. Click Install to begin the installation.
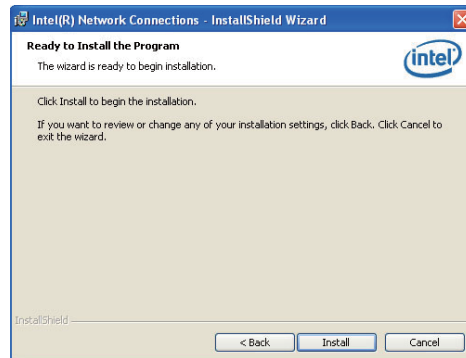
5. After completing installation, click Finish.
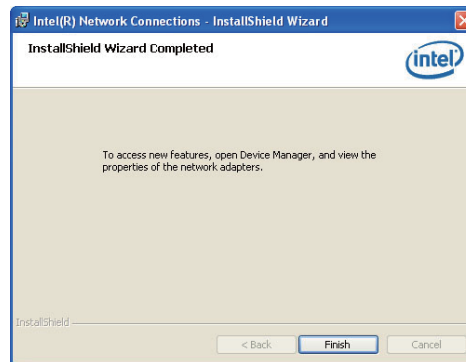
NuvSerial

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

1. The setup program is preparing to install the driver.
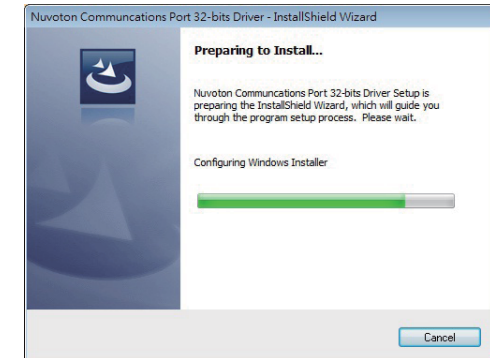
2. The setup program is now ready to install the utility. Click Next.

3. Click "Install" to begin the installation.

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Chapter 8 Supported Software

www.dfi.com
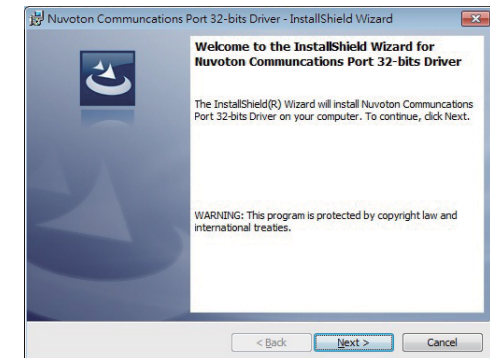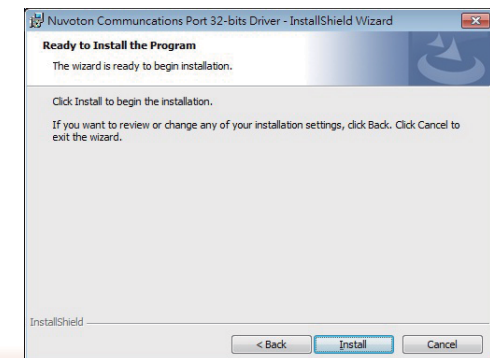
4. Installing status.
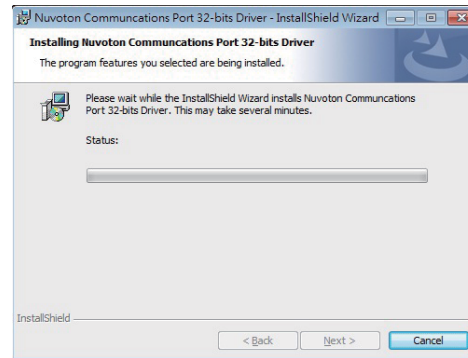
5. Click "Finish" to exit the wizard after the installation is completed.
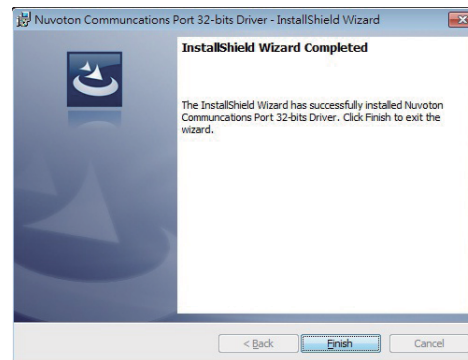
Intel USB 3.0 Drivers (For Windows 7)

To install the driver, click "Intel USB 3.0 Driver" on the main menu.

1. Setup is ready to install the driver. Click Next.
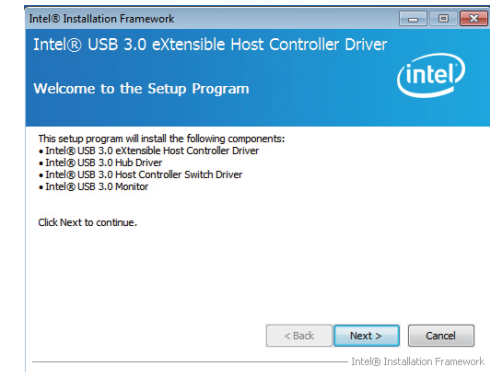
2. Read the license agreement then click Yes.

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3. Go through the readme docu-
ment for more installation tips
then click Next.
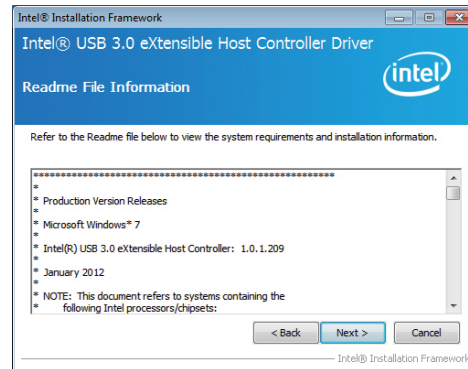
4. Setup is currently installing the
driver. After installation has com-
pleted, click Next.
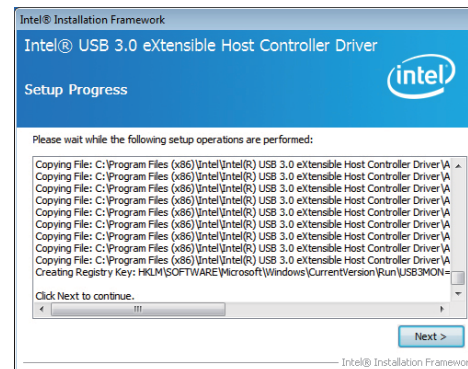
5. After completing installation, click
Finish.

Intel Rapid Storage Technology

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

To install the driver, click "Intel Rapid Storage Technology" on the main menu.

1. Setup is now ready to install
the utility. Click Next.
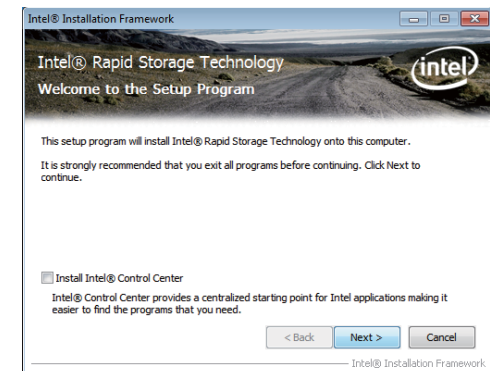
2. Read the warning then click
Yes.

60
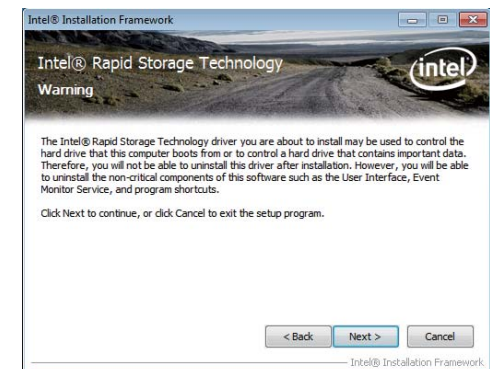
3. Read the license agreement then click Yes.
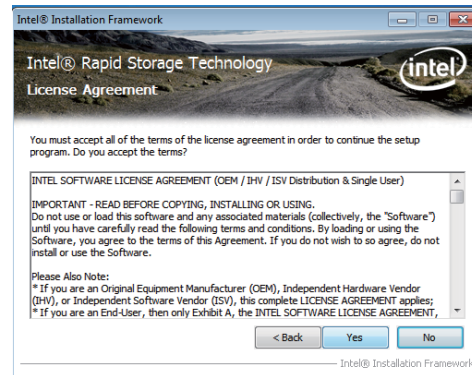
4. Go through the readme document for system requirements and instal-lation tips then click Next.
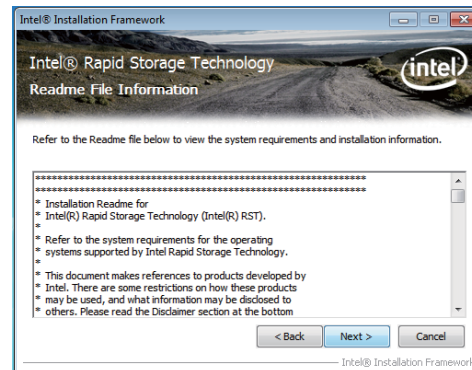
5. Setup is now installing the utility. Click Next to continue.
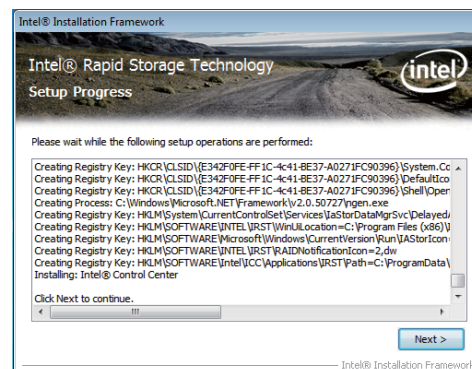
6. Click "Yes, I want to restart my computer now" then click Finish.

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

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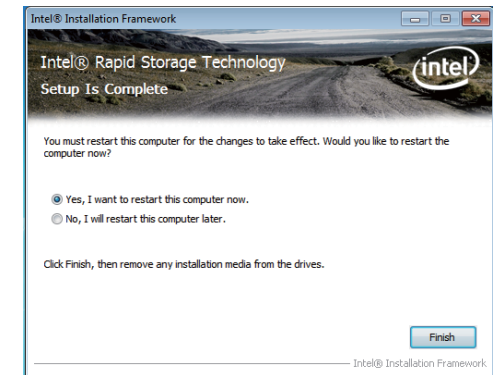
Adobe Acrobat Reader 9.3

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.
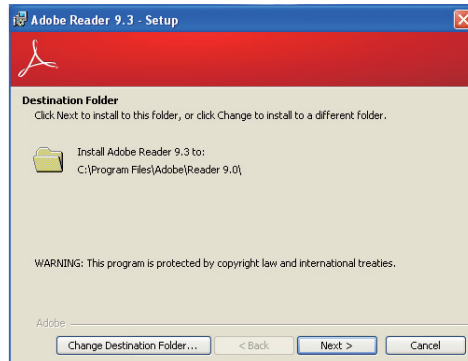
2. Click Install to begin installation.
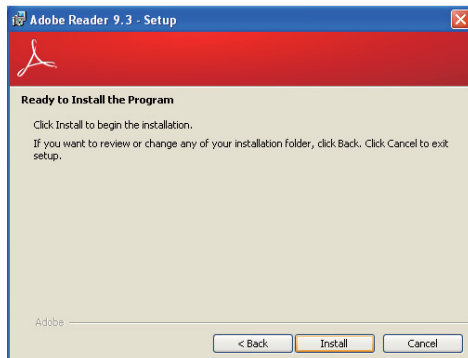
3. Click Finish to exit installation.

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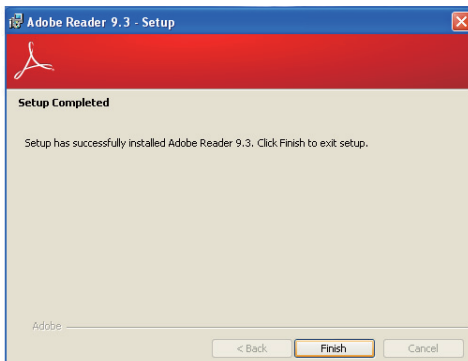
Chapter 9 - Digital I/O Programming Guide

Register Description

The Input Port Register (register 0) reflects the incoming logic levels of the pins, regardless of whether the pin if defined as an input or output by the Configuration Register. They act only on the red operation. Writes to this register have no effect. The default value (X) is determined by the externally applied logic level. Before a red operation, a write transmission is sent with the command byte to indicate to the I²C device that the Input Port Regiser will be accessed next.

Register 0 (Input Port Register)

BIT	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
DEFAULT	X	X	X	X	X	X	X	X

The Onput Port Register (register 1) shows the outgoing logic levels of the pins defined as outputs by the Configuration Register. Bit values in this register have no effect on pins defined as inputs. In turns, reads from this register reflect the value that is in the flip-flop contolling the output selection, not the actual pin value.

Register 1 (Onput Port Register)

BIT	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
DEFAULT	1	1	1	1	1	1	1	1

The Polarity Inversion Register (register 2) allows polarity inversion of the pins defined as inputs by the Configuration Register. If a bit in this register is set (written with 1), the corresponding port pin's polarity is inverted. If a bit in this register is clear (written with a 0), the corresponding port pin's original polarity is retained.

Register 2 (Polarity Inversion Register)

BIT	N-7	N-6	N-5	N-4	N-3	N-2	N-1	N-0
DEFAULT	0	0	0	0	0	0	0	0

The Configuration Register (register 3) configures the direction of the I/O pins. If a bit in this register is set to 1, the corresponding port pin is enabled as an input with a high-impedence output driver. If a bit in this register is cleared to 0, the corresponding port is enabled as an input.

Register 3 (Configuration Register)

BIT	C-7	C-6	C-5	C-4	C-3	C-2	C-1	C-0
DEFAULT	1	1	1	1	1	1	1	1

Function Description

I2CWriteByte(SlaveAddr, SubAddr, Data):
Write a Byte data to a specified I2C Device.

I2CReadByte(SlaveAddr, SubAddr, *Data):
Read a Byte data from a specified I2C Device.

SetBit(*Data, Bit) :
Set Data bit n as "1".

ClrBit(*Data, Bit) :
Set Data bit n as "0".

GetBit(Data, Bit) :
Return the value of data bit n.

Sample Code

GPIO Configuration

```
#define SLAVE_ADDR          0x42
#define INPUT_PORT          0x00
#define OUTPUT_PORT         0x01
#define INVERSION_PORT      0x02
#define COMFIG_PORT         0x03

GpioConfig(int PinNum, int Mode)
{
    BYTE Data;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7 Input/Output Configuration
    I2C_ReadByte(SLAVE_ADDR, CONFIG_PORT, &Data);
    if(Mode == 1){SetBit(&Data, TempPinNum);} //Input
    else          {ClrBit(&Data, TempPinNum);} //Output
    I2C_WriteByte(SLAVE_ADDR, CONFIG_PORT, Data);

    return 1;
}
```

GPIO Output Process

```
#define SLAVE_ADDR          0x42
#define INPUT_PORT          0x00
#define OUTPUT_PORT         0x01
#define INVERSION_PORT      0x02
#define COMFIG_PORT         0x03

GpioOut(int PinNum, int Level)
{
    BYTE Data;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7
    I2C_ReadByte(SLAVE_ADDR, OUTPUT_PORT, &Data);
    if(Level == 0){ClrBit(&Data, TempPinNum);}
    else          {SetBit(&Data, TempPinNum);}
    I2C_WriteByte(SLAVE_ADDR, OUTPUT_PORT, Data);

    return 1;
}
```

GPIO Iutput Process

```
#define SLAVE_ADDR          0x42
#define INPUT_PORT          0x00
#define OUTPUT_PORT         0x01
#define INVERSION_PORT      0x02
#define COMFIG_PORT         0x03

GpioIn(int PinNum, int *Status)
{
    BYTE Data;
    BYTE Group = PinNum/8;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7
    I2C_ReadByte(SLAVE_ADDR, INPUT_PORT, &Data);
    *Status = GetBit(Data, TempPinNum);

    return 1;
}
```

Appendix A - Watchdog Sample Code

```
;Software programming example:

;-------------------------------------------
;(1) Enter Super IO Configuration mode
;-------------------------------------------
MOV        DX,4EH
MOV        AL,87H
OUT        DX,AL
OUT        DX,AL


;-------------------------------------------------------------------------------------
;(2) Configuration Logical Device 8, register CRF0/CRF1 (WDT Control/WDT
timer)
;-------------------------------------------------------------------------------------
MOV        DX,4EH
MOV        AL,07H           ;Ready to Program Logical Device
OUT        DX,AL

MOV        DX,4FH
MOV        AL,08H           ;Select Logical Device 8
OUT        DX,AL

MOV        DX,4EH
MOV        AL, F1H          ;Select watchdog timer register
OUT        DX,AL

MOV        DX,4FH
MOV        AL,10H           ;Set watchdog timer value
OUT        DX,AL

MOV        DX,4EH
MOV        AL, F0H          ;Select watchdog Control Register
OUT        DX,AL

MOV        DX,4FH
MOV        AL,02H           ;Set Watchdog Control Value
OUT        DX,AL

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

Appendix B - System Error Message

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

Error Messages

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

CMOS BATTERY HAS FAILED

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

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

CMOS CHECKSUM ERROR

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

DISPLAY SWITCH IS SET INCORRECTLY

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

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

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

Keyboard error or no keyboard present

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

Manufacturing POST loop

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

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.