DFI®

KS150-BT
15" Touch Panel PC
User's Manual

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Trademarks

Product names or tr ademarks appearing in this manual are f or identification purpose only and are the properties of the respectiv e owners.

FCC and DOC Statement on Class A

This equipment has been tested and f ound to comply with the limits f or a Class A digital device, pursuant to P art 15 of the FCC rules. These limits are designed to pro vide reason-able protection against harmf ul interf erence when the equipment is oper ated in a residential installation. This equipment gener ates, uses and can r adiate radio frequency energy and, if not installed and used in accordance with the instruction manual, ma y cause harmf ul interf erence to radio communications. Howev er, there is no guar antee that interf erence will not occur in a particular installation. If this equipment does cause harmf ul interf erence to r adio or television reception, which can be determined by turning the equipment of f and on, the user is encour -aged to try to correct the interf erence by one or more of the f ollowing measures:

• Reorient or relocate the receiving antenna.
• Increase the separ ation between the equipment and the receiv er.
• Connect the equipment into an outlet on a circuit dif ferent from that to which the receiv er is connected.
• Consult the dealer or an experienced r adio TV technician f or help.

Notice:

1. The changes or modifications not expressly appro ved by the part y responsible f or compli-ance could v oid the user's authority to oper ate 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 can be obtained from the DFI website at www.dfi.com.
To download the user's manual from our website, please go to "Support" > "Download Center."
On the Download Center page, select your product or type the model name and click "Search"
to find all technical documents including the user's manual for a specific product.

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 15" Touch Panel PC
- 1 Poron foam
- 1 Chassis Panel Mount Bracke
- 1 Quick Installation Guide

Optional Items

- Wall Mount kit
- Panel Mount kit
- 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.

Chapter 1 - Introduction

Overview

KS150-BT

Side View

Bottom View

Key Features

Model Name	KS150-BT
Processor	Intel® Atom™ E3800 Series
LAN	2 LAN ports
COM	4 COM ports
Display	1 DVI-I port
USB	2 USB 2.0 ports 1 USB 3.0 port
Audio	Realtek ALC888 5.1-channel High Def nition Audio

Specifications

Processor	• Intel® Atom™ E3845, Quad Core, 2M Cache, 1.91GHz, 10W • Intel® Atom™ E3825, Dual Core, 1M Cache, 1.33GHz, 6W • BGA 1170 packaging technology • 22nm process technology

Memory	• Two 204-pin DDR3L SODIMM sockets (E3845)
	  - up to 8GB system memory
	  - dual channel memory interface
	  One 204-pin DDR3L SODIMM socket (E3825)
	  - up to 4GB system memory
	  - single channel memory interface
	• Supports DDR3L 1333MHz (E3845)
	  Supports DDR3L 1066MHz (E3825)

LCD and Touch Screen	• 15" 1024x768 TFT LCD panel with touch screen • Supports capacitive touch screen • Supports 5-wire resistive touch screen • 50,000 MTBF LED backlight • Brightness (cd/m²): 250
Storage	• 1 2.5" SATA drive bay - SATA 2.0 port with data transfer rate up to 3Gb/s
Graphics	• Intel® HD Graphics • Display port: DVI-I • DVI-I: resolution up to 1920x1080 @ 60Hz
LAN	• 2 Intel® I210AT PCI Express Gigabit Ethernet controllers • Integrated 10/100/1000 transceiver • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
Audio	• Realtek ALC888 5.1-channel High Def nition Audio

I/O Ports	• Bottom
	  - 1 12V DC-in jack
	  - 1 DVI-I port
	  - 2 RJ45 LAN ports
	  - 2 USB 2.0 ports
	  - 1 USB 3.0 port
	  - 1 Line-out jack
	  - 1 Power switch
	  - 3 DB-9 RS232 COM ports
	  - 1 DB-9 RS232/422/485 COM ports (RS232 and/or power)

Expansion	• 1 Mini PCIe slot
	  - Supports USB and PCIe signals
	  - Supports mSATA or Wi-Fi* (optional)
	  - Supports full size Mini PCIe card

Power	• Power input voltage: 12V DC-in

Environment	• Temperature
	  - Operating: -10°C ~ 60°C (with SSD)
	  - Operating: 0°C ~ 45°C (with HDD)
	  - Storage: -20°C ~ 70°C
	• Relative Humidity
	  - 85% RH at 60°C (with SSD)
	  - 85% RH at 45°C (with HDD)

Vibration	• Operating: 1G, 5~500Hz • Non-operating: 3G, 10~500Hz
Shock	• Operating: 3G peak acceleration • Non-operating: 5G peak acceleration
Front Panel Protection	• IP65 (Dust Tight; Water Proof protection) (TBD)
Construction	• Aluminum front bezel • Rear panel: aluminum and SGCC
Mounting	• Wall mount (VESA 75x75 or 100x100) • Panel mount (Mounting clamp)
Dimensions	• 373mm x 297mm x 46.10mm (W x H x D)
Weight	• 3.8 kg
OS Support	• Windows 7, Windows 8 • Linux (Project base upon request only, with 3 months lead time)
Certification	• CE, FCC Class A, RoHS

Note:
*Optional and is not supported in standard model. Please contact y our sales represen-tative for more information.

Getting to Know the KS150-BT

Bottom View

Power Switch
DVI-I
LAN 1
LAN 2
COM 1
COM 3
DC-in
USB 3.0
USB 2.0
Line-out
COM 2
COM 4

Mechanical Dimensions

KS150-BT

Top View

373.00

46.10

297.00

209.00

277.00

Left View

Front View

Right View

Bottom View
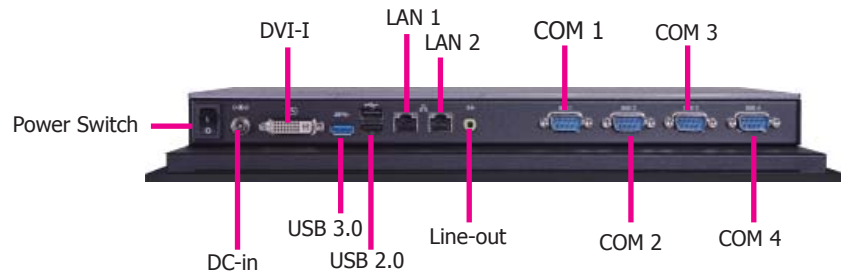
COM Ports
Used to connect a serial device.

USB Ports
Used to connect USB 2.0/1.1 devices.

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

DVI-I Port
Used to connect a DVI -I device.

Line-out
Used to connect to a speak er.

DC-in
Used to plug a power adapter .

Power Switch
Press to power -on or power-off the system.

8

Motherboard Dimensions
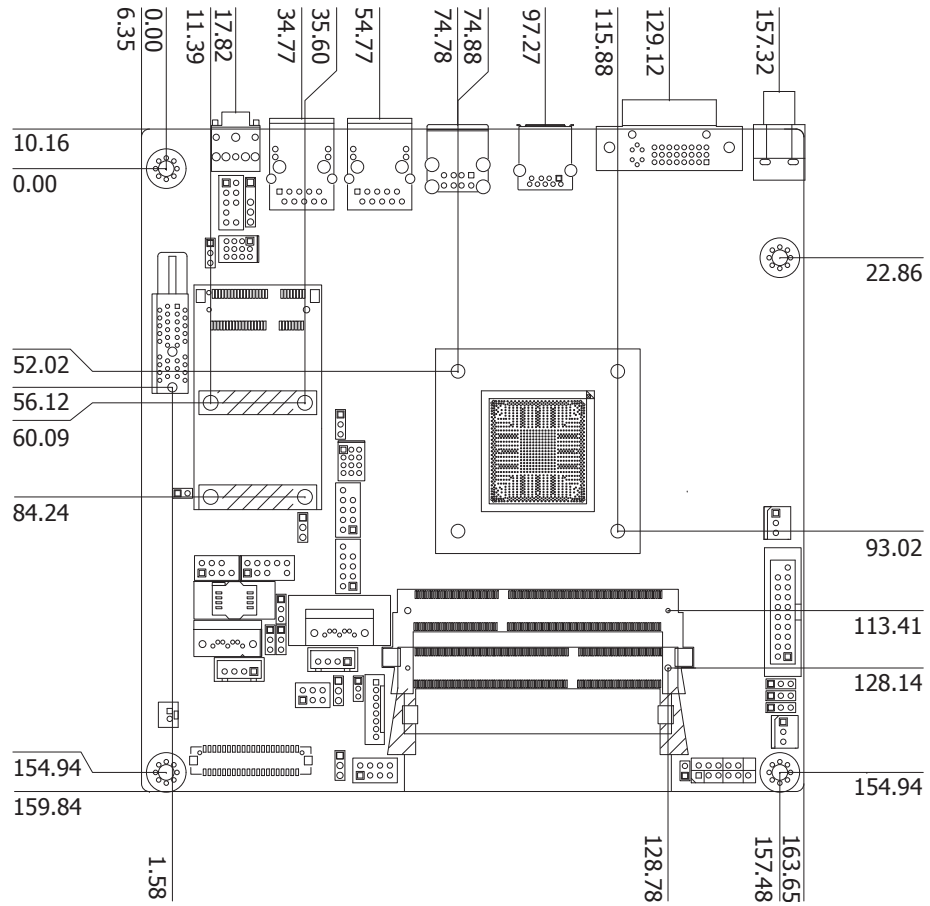
Chapter 2 - Getting Started

Preparing the System

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

- SATA hard drive
- AC power adapter
- CD-ROM drive (for installing software/drivers)
- Memory module

Installing Devices

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

- Memory module
- SATA hard drive
- Mini PCIe card

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 can be installed using a DVD (and DVD burner) or bootable USB drive.
Please refer to your operating system manual for instructions on installing an operating system.

Installing the Drivers

The system requires you to install drivers for some devices to operate properly. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing Devices

Removing the Chassis Cover

1. Make sure the system and all other peripher al devices connected to it ha ve been powered-off.

2. Disconnect all power cords and cables.

3. The 8 mounting screws on the back side of the system are used to secure the co ver to the chassis. Remove these screws and then put them in a saf e place for later use.
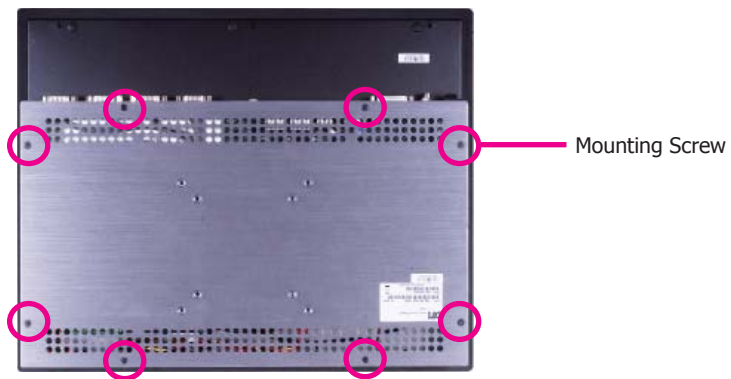
Mounting Screw

4. After removing the mounting screws, lift the co ver up.

Lift the Cover Upward

5. The SODIMM sock ets, Mini PCI e slot and S ATA drive bay are readily accessible after remo v-ing the chassis co ver.

Mini PCIe slot

SATA drive bay

SODIMM sockets

11
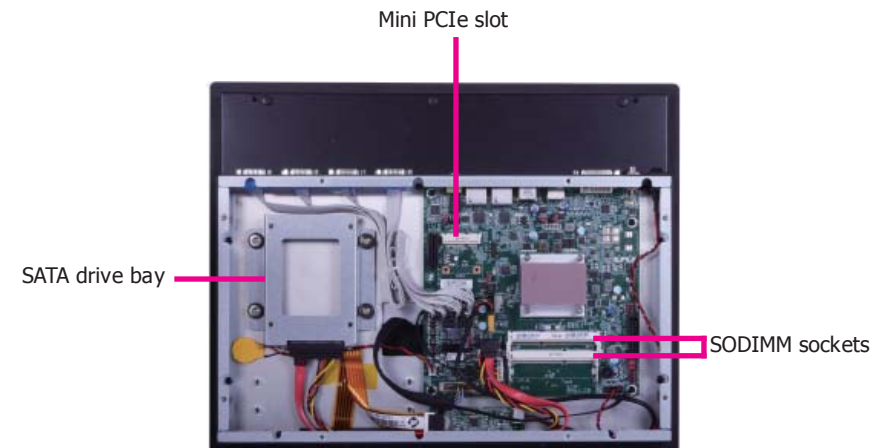
Installing the SODIMM

> ⚠️ **Important**:
> When installing one DDR3L SODIMM only, make sure to install it into the SODIMM 1 socket.

1. The SODIMM sockets are located on the system board.

SODIMM socket 2
SODIMM socket 1
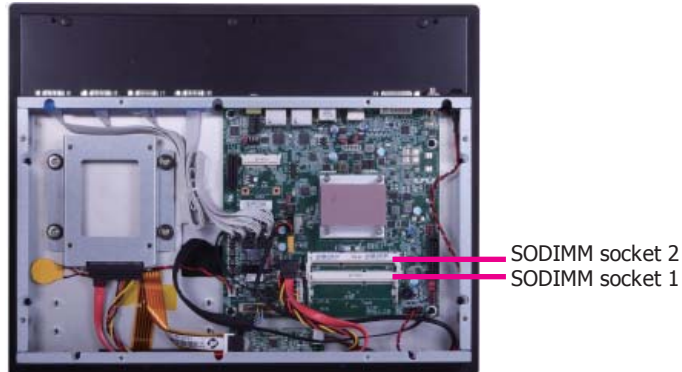
2. Note the key on the socket. The key ensures the module can be plugged into the socket in only one direction.
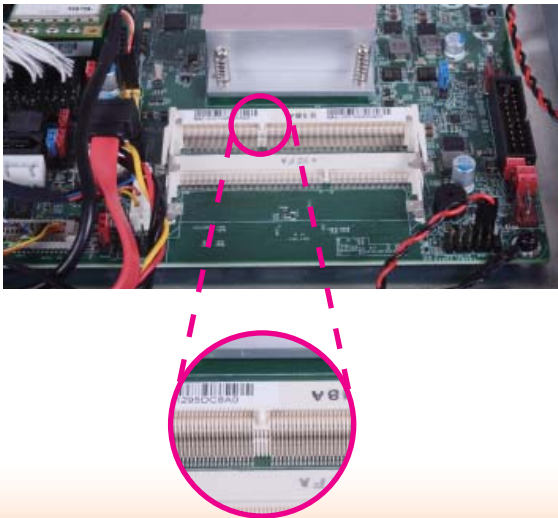
3. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

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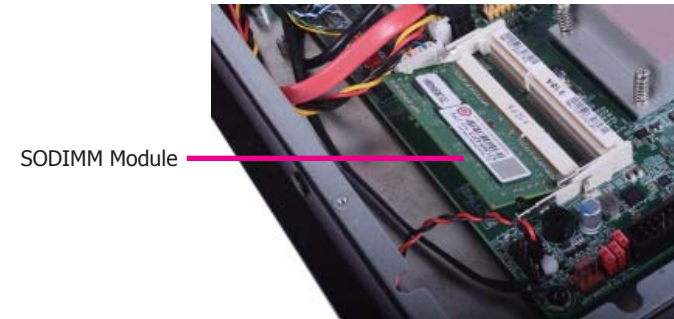
4. Push the module down until the clips at each end of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.

Clip Clip

Clip Clip

12
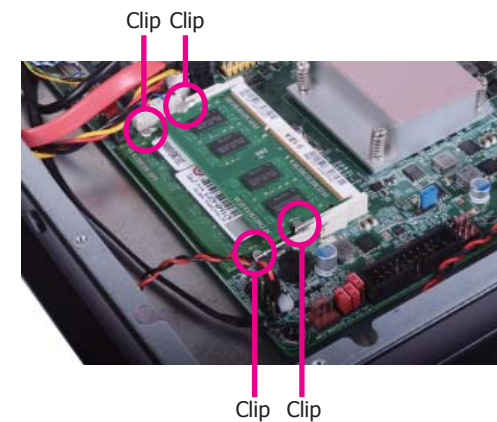
Installing the SATA Drive

1. The SATA drive bay is located on the system.
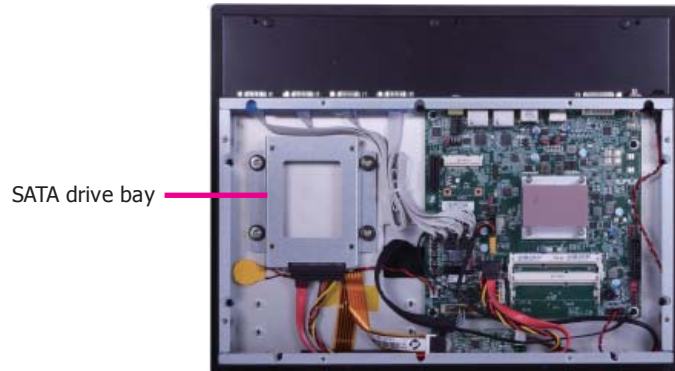
SATA drive bay

2. Remove the 4 mounting screws on the HDD br acket and then put them in a saf e place f or later use.

Mounting screw
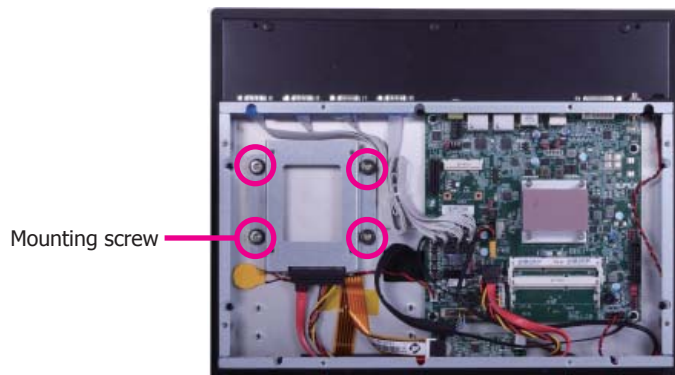
3. Insert the S ATA drive into the HDD br acket and connect the S ATA power/data connector on the SATA drive to the S ATA power/data cable secured on the HDD br acket.

SATA drive
HDD bracket
SATA power/data cable
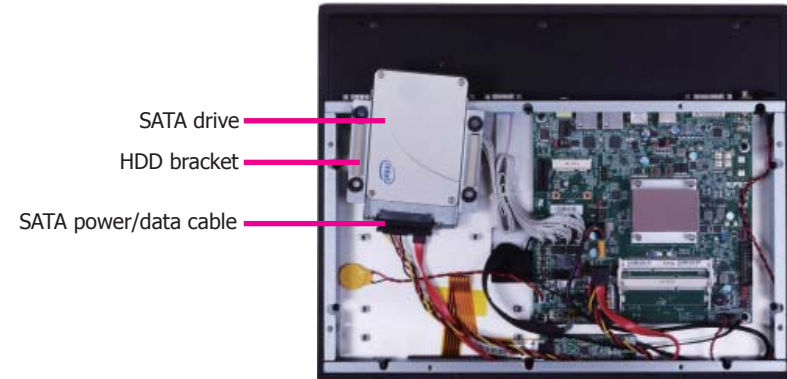
4. Then, align mounting holes of the S ATA drive with mounting holes on the back side of the HDD bracket and use the pro vided mounting screws to secure the driv e in place.

Mounting screw

13
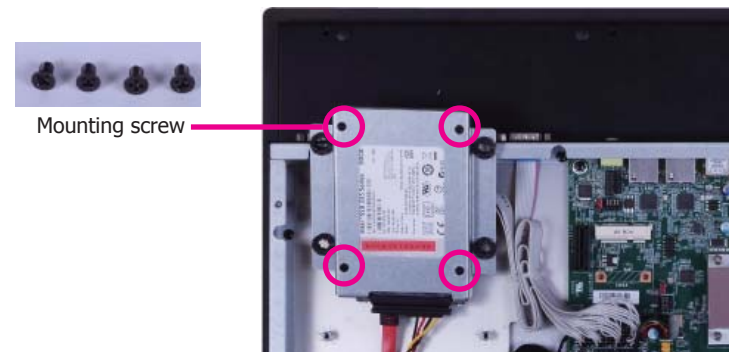
5. Place the SATA drive with the HDD br acket into the system. Tighten the 4 mounting screws
    you removed in step 2.

Mounting screw
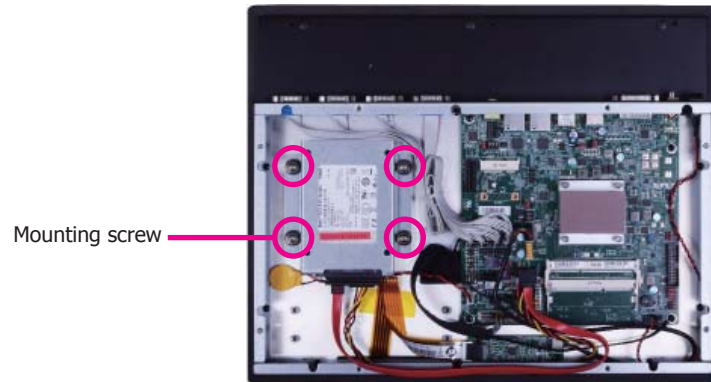
Chapter 4 - Jumper Settings

Clear CMOS Data

JP7

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

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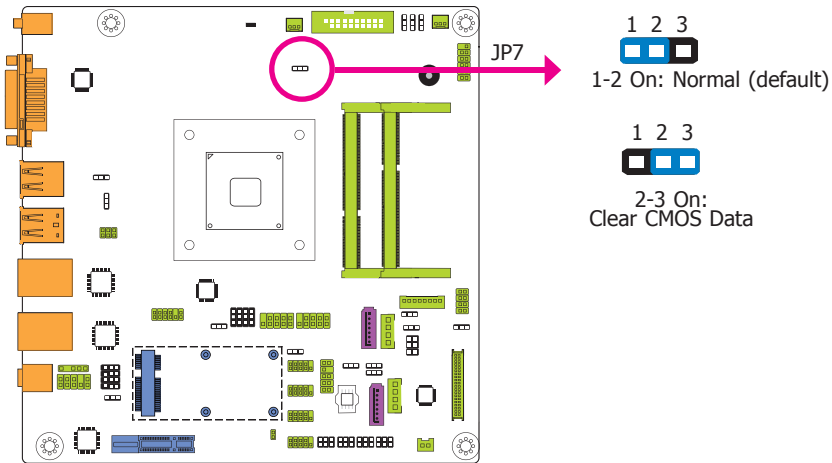
If you encounter the followings,

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 JP7 pins 2 and 3 to On. Wait for a few seconds and set JP7 back to its default setting, pins 1 and 2 On.

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

PS/2 Keyboard/Mouse Power Select

JP6

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

1 2 3
2-3 On: +5V_standby
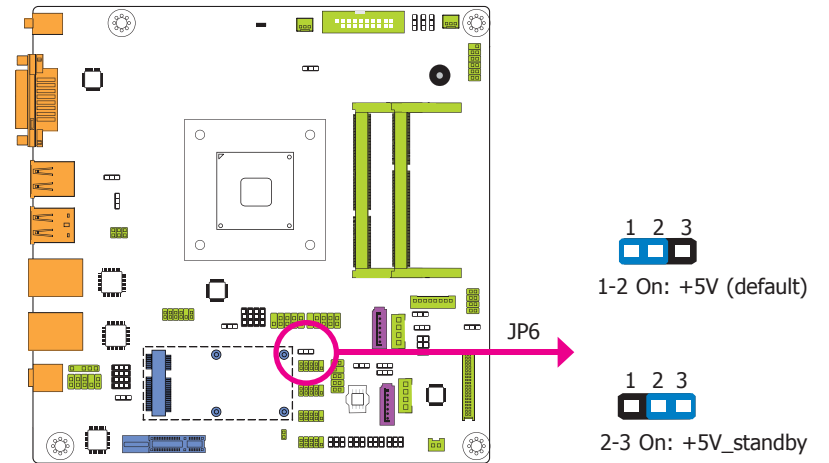
JP6 is used to select the power of the PS/2 keyboard/mouse port. Selecting +5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

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

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USB Power Select

3
2
1

1-2 On: +5V

3
2
1

2-3 On:
+5V_standby
(default)

USB 0-1
(JP4)

USB 3
(JP3)

USB 4-5
(JP5)

USB 6-7
(JP10)

1 2 3

1-2 On: +5V

1 2 3

2-3 On:
+5V_standby
(default)
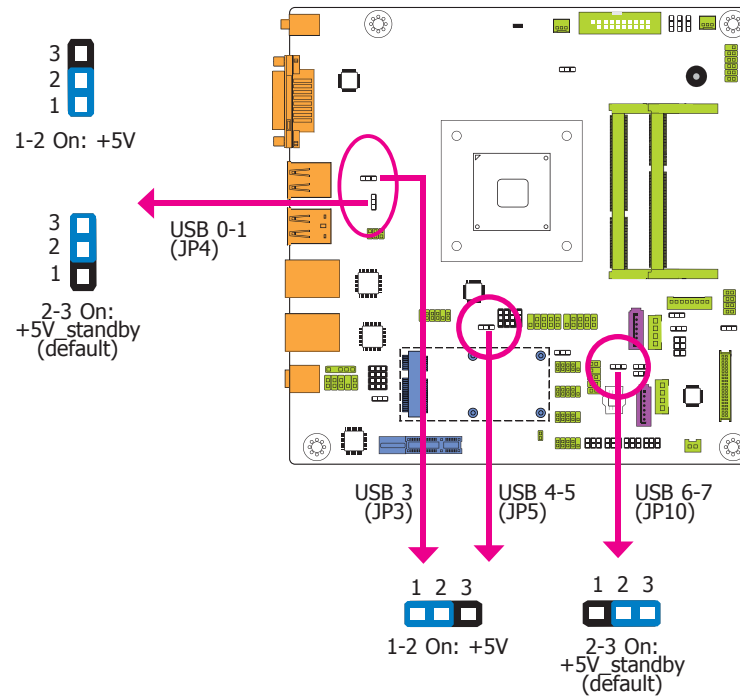
JP3, JP4, JP5 and JP10 are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.

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.

LCD/Inverter Power Select

1 2 3

1-2 On: +12V
(default)

JP21

1 2 3

2-3 On: +5V
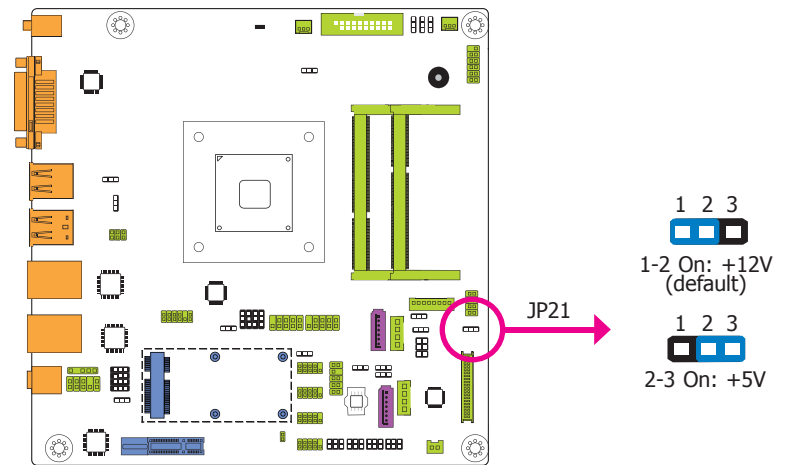
JP21 is used to select the power level of LVDS LCD inverter connector.

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Panel Power Select

6 □ 5
4 □ 3
2 □ 1
1-2 On: +12V

6 □ 5
4 □ 3
2 □ 1
3-4 On: +5V

6 □ 5
4 □ 3
2 □ 1
5-6 On: +3.3V
(default)
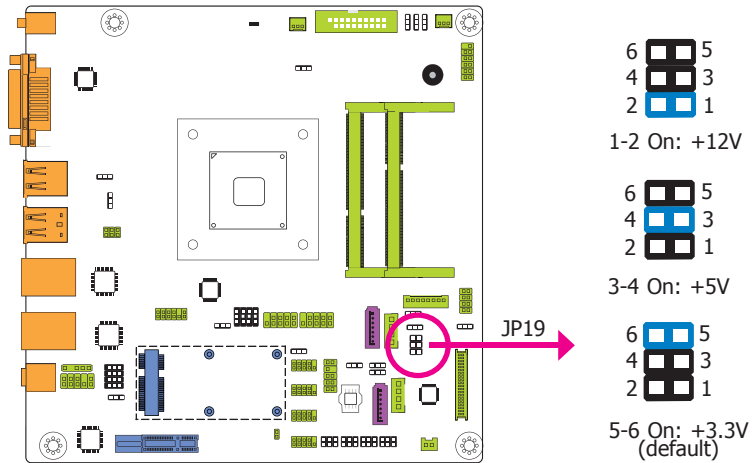
JP19

JP19 is used to select the power supplied with the LCD panel.

> **Important**:
> Before powering-on the system, make sure that the power settings of JP19 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

Backlight Power Select

1 2 3
1-2 On: +3.3V
(default)

1 2 3
2-3 On: +5V
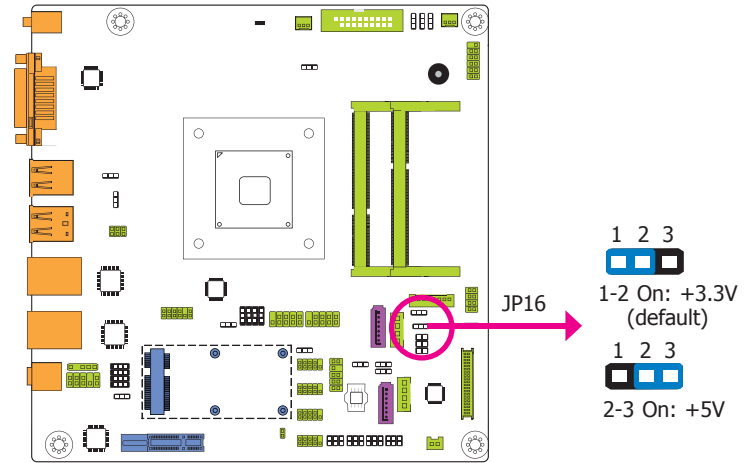
JP16

JP16 is used to select the power level of backlight control: +3.3V (default) or +5V.

> **Important**:
> Before powering-on the system, make sure that the power settings of JP16 match the power specification of backlight control. Selecting the incorrect voltage will seriously damage the backlight.

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Auto Power-on Select

1 2 3

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

1 2 3

2-3 On:
Power-on via AC power
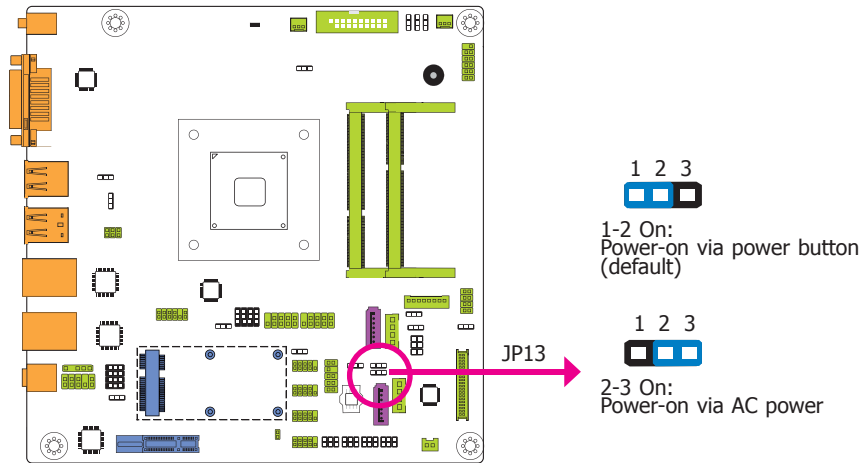
JP13

JP13 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 JP13 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using JP13 "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).

SATA DOM Power Select

1 2 3

1-2 On: GND (default)

SATA 0

JP12

1 2 3

2-3 On: +5V
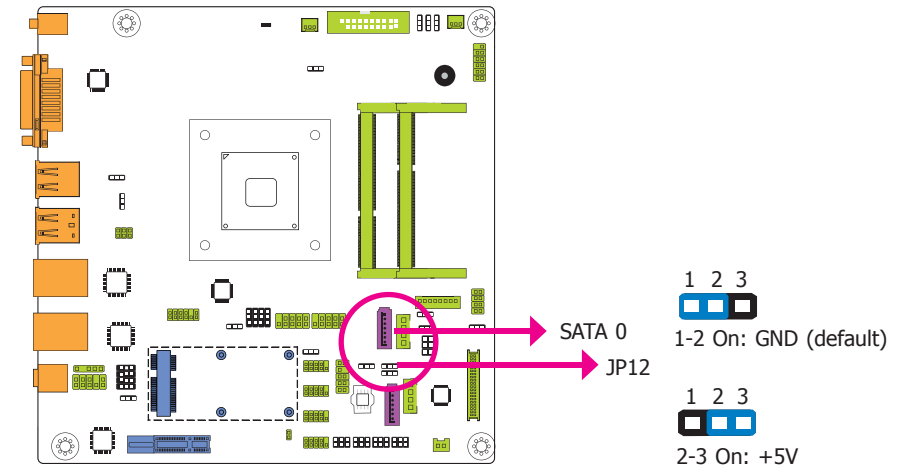
JP12 is used to select the power level of SATA DOM.

Note:
SATA port 0 provides adequate space for SATA DOM.

COM 1 RS232/422/485 Select
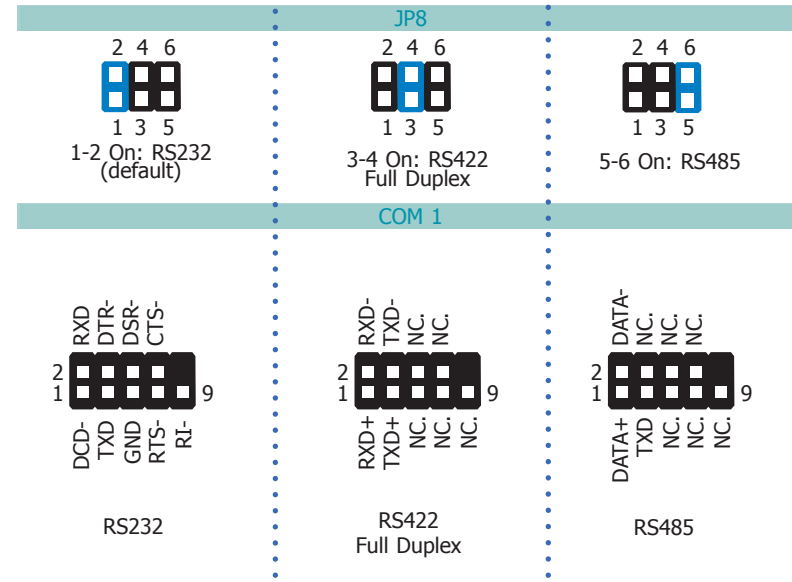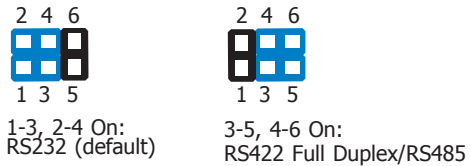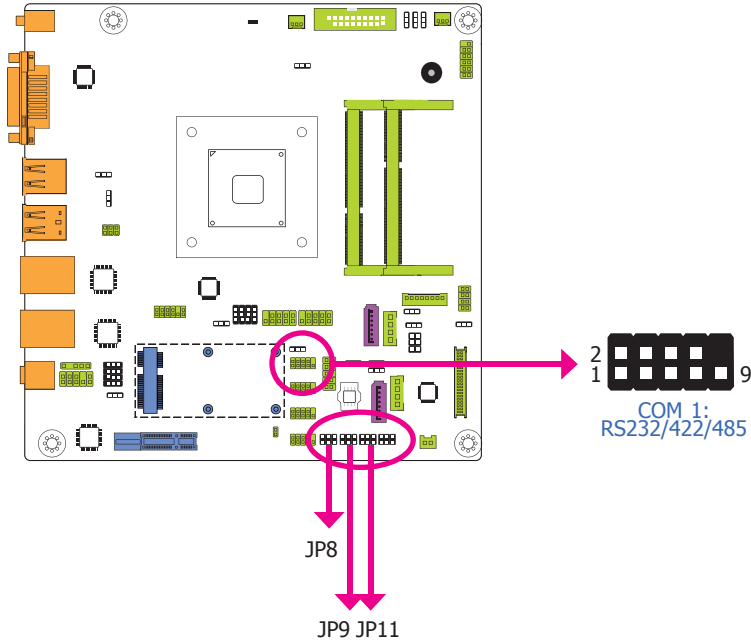
COM 1:
RS232/422/485

2 9
1

JP8

JP9 JP11

2 4 6

1 3 5

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

2 4 6

1 3 5

3-5, 4-6 On:
RS422 Full Duplex/RS485

JP8, JP9 and JP11 are used to configure the Serial COM port 1 to RS232, RS422 (Full Duplex) or RS485. The pin functions of the Serial COM port 1 will vary according to these jumpers' setting.
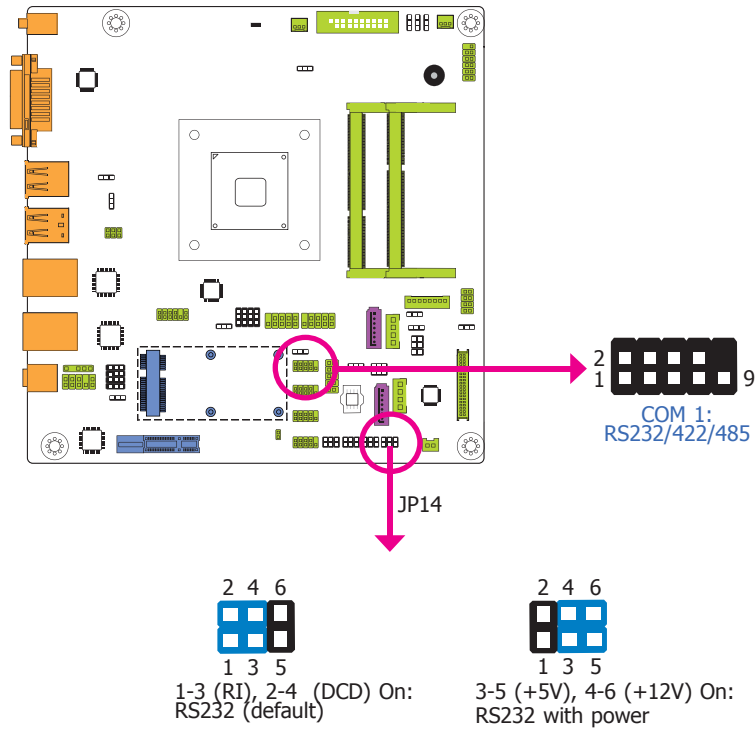
JP8

2 4 6

1 3 5

1-2 On: RS232
(default)

2 4 6

1 3 5

3-4 On: RS422
Full Duplex

2 4 6

1 3 5

5-6 On: RS485

COM 1

RXD   DTR- DSR- CTS-

2
1   9

DCD- TXD   GND   RTS- RI-

RS232

RXD- TXD- NC. NC.

2
1   9

RXD+ TXD+ NC. NC. NC.

RS422
Full Duplex

DATA- NC. NC. NC.

2
1   9

DATA+ TXD   NC. NC. NC.

RS485

Note:
When COM 1 RS232/422/485 is selected, JP9 and JP11 must be set in accordance to JP8.

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COM 1 RS232/Power Select

Digital I/O Power Select

COM 1:
RS232/422/485

JP14

2 4 6

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

2 4 6

1 3 5
3-5 (+5V), 4-6 (+12V) On:
RS232 with power

JP14 is used to configure the Serial COM port 1 to pure RS232 or RS232 with power.

JP17

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

3
2
1
2-3 On: +5V
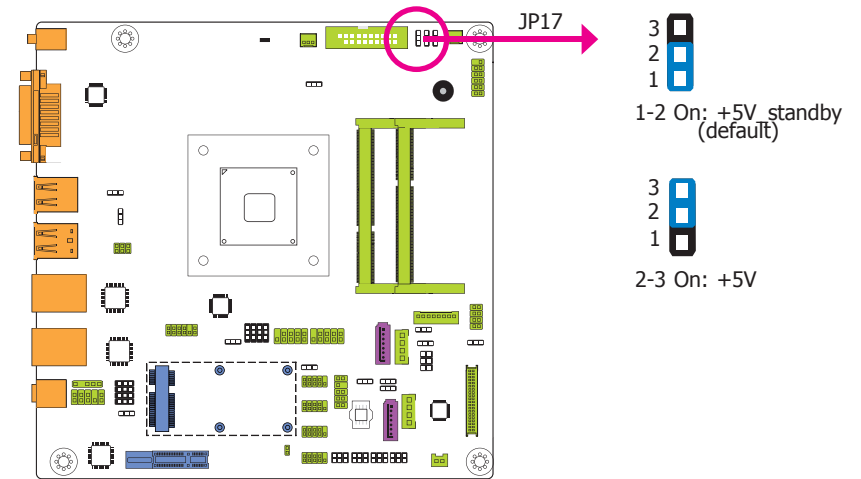
JP17 is used to select the power of Digital I/O signal.

Digital I/O Output State

DIO 3/5/7/9 (JP18)

DIO 11/13/15/17 (JP20)

3
2
1

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

3
2
1

2-3 On: GND
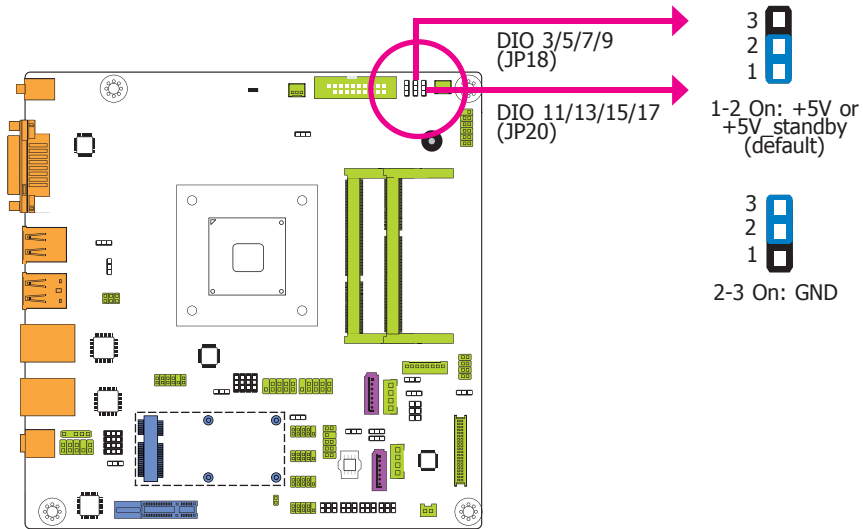
Based on the power level of DIO (Digital I/O) selected on JP17, JP18 (DIO pin 3/5/7/9) and JP20 (DIO pin 11/13/15/17) are used to select the output state of Digital I/O: pull high or pull low. When selecting pull high, the power selection will be the same as the JP17's setting.

Mini PCIe/mSATA Signal Select

JP2

1   3

10   12

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

1   3

10   12

2-5-8-11, 3-6-9-12 On: mSATA
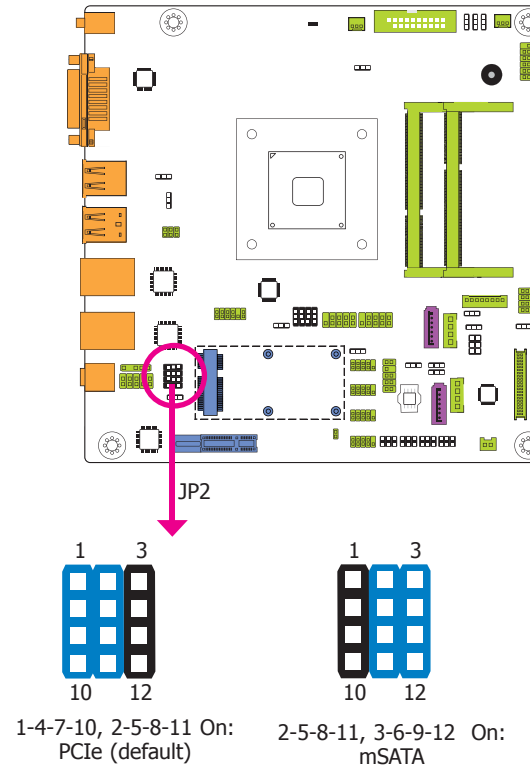
JP2 is used to select the Mini PCIe signal.

21

Mini PCIe/mSATA Power Select

JP1

1 2 3

1-2 On: +3.3V_standby (Mini PCIe) (default)

1 2 3

2-3 On: +3.3V (mSATA)
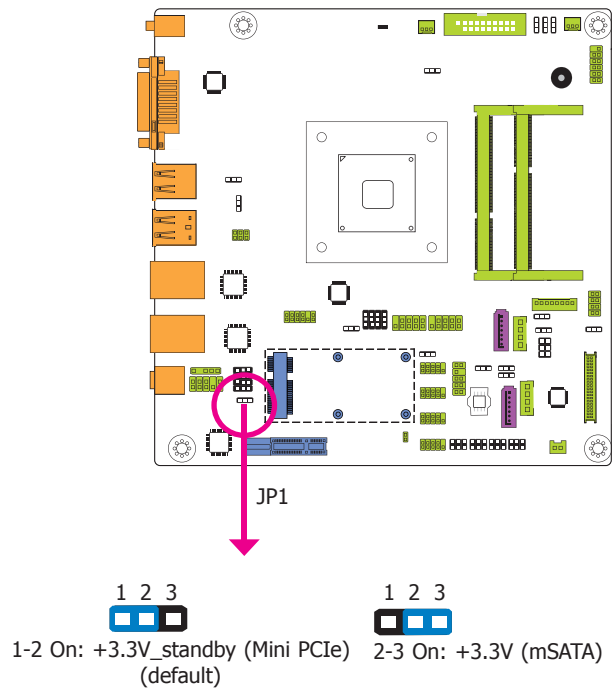
JP1 is used to select the power supplied with the Mini PCIe.

SATA 1/mSATA Signal Select

JP22

3 [ ] 12
1 [ ] 10

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

3 [ ] 12
1 [ ] 10

2-5-8-11, 3-6-9-12 On: mSATA
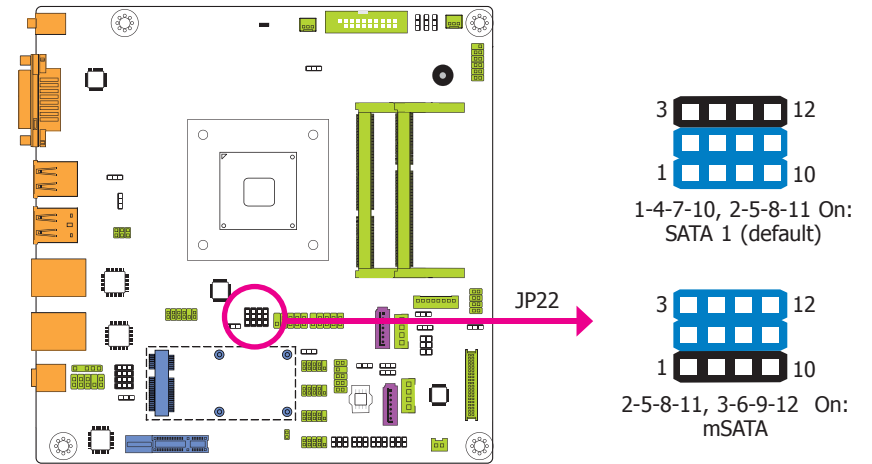
JP22 is designed to select the SATA or mSATA signal.

22

Dimming Mode Select

1 2 3

1-2 On: PWM Mode
(default)

JP15

1 2 3
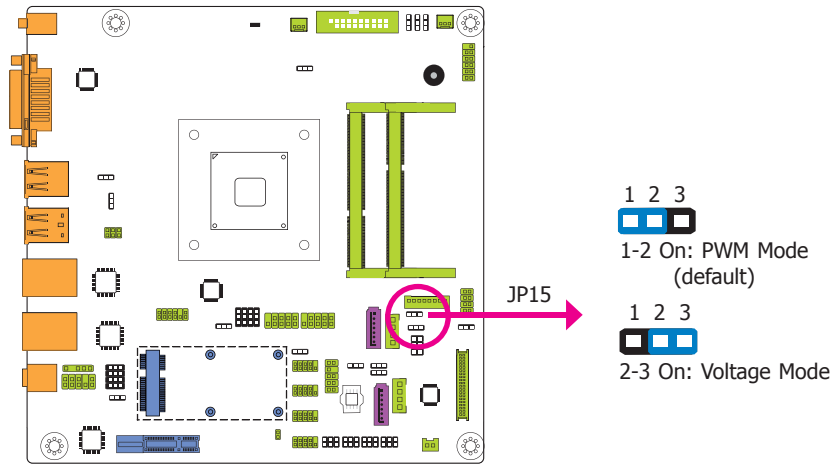
2-3 On: Voltage Mode

JP15 allows you to select the mode for the lightness control of the LVDS panel.

> **Important**:
> You need to refer to your panel's user guide to determine the type of mode (PWM or Voltage) most appropriate for your panel.

23

Chapter 5 - Ports and Connectors

Bottom Panel I/O Ports
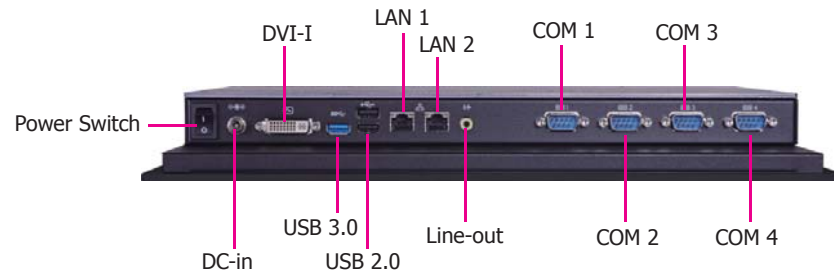
The bottom panel I/O ports consist of the following:

- 1 12V DC-in jack
- 1 DVI-I port
- 2 RJ45 LAN ports
- 2 USB 2.0 ports
- 1 USB 3.0 port
- 1 Line-out jack
- 1 Power switch
- 4 COM ports

12V DC-in
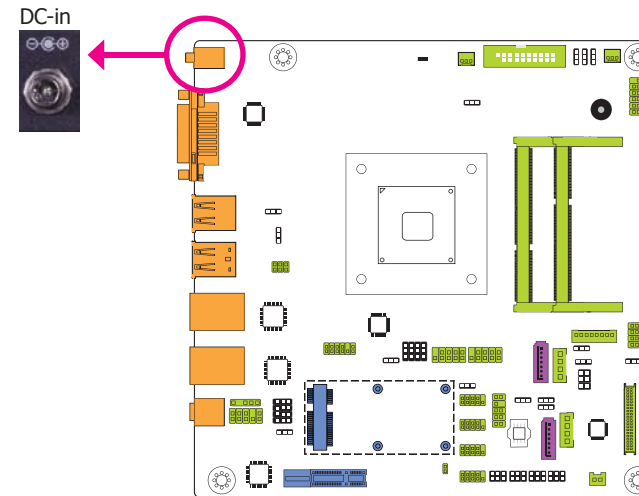
This jack provides maximum of 60W power and is considered a low power solution. Connect a DC power cord to this jack. Use a power adapter with 12V DC output voltage. Using a voltage higher than the recommended one may fail to boot the system or cause damage to the system board.

24

Graphics Interface

The display port consists of the following:

- 1 DVI-I port
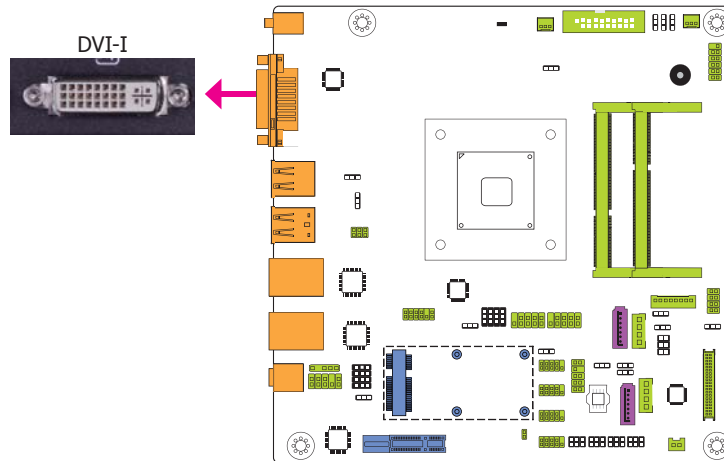
DVI-I

DVI-I Port

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

Connect the display device's cable connector to the DVI-I port. After 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.

RJ45 LAN Ports

LAN 2 LAN 1 LAN 1

LAN 2
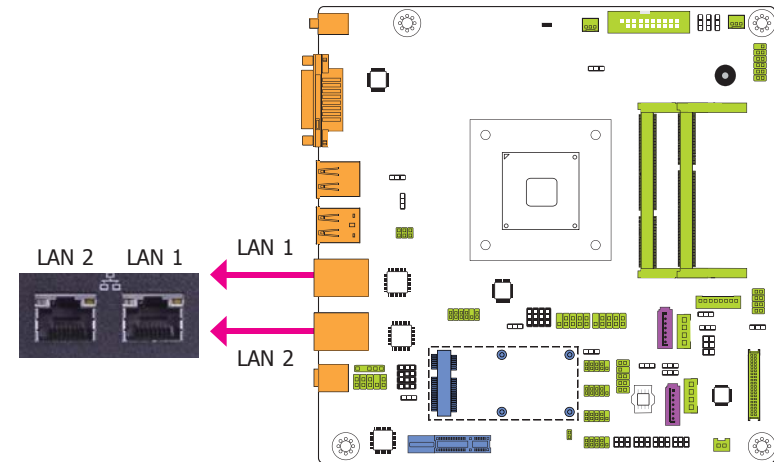
Features

- Two Intel® I210AT PCI Express Gigabit Ethernet controllers

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.

25

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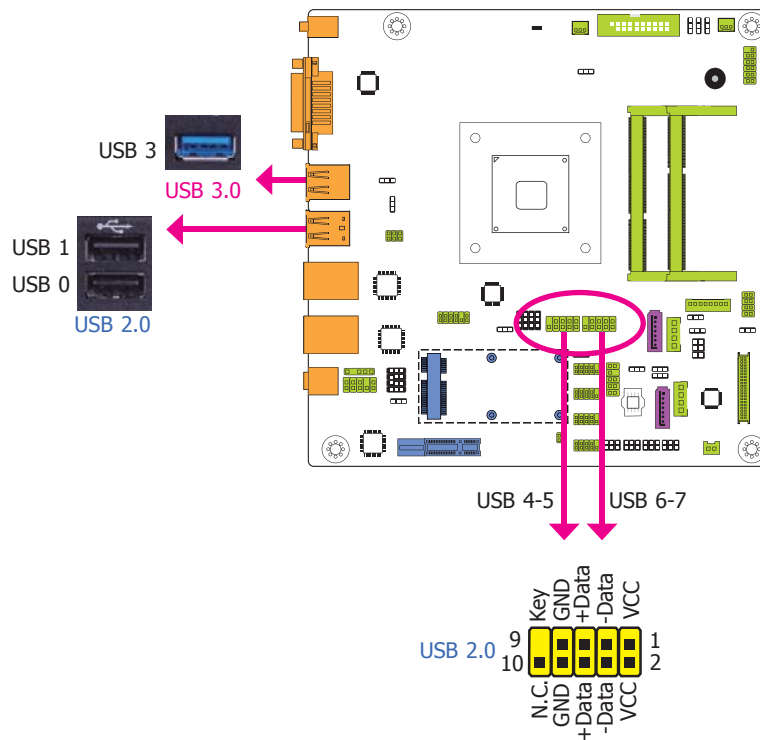
The USB device allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with one onboard USB 3.0 port (USB 3) and two onboard USB 2.0 ports (USB 0-1) at the rear panel I/O ports. The 10-pin connectors allow you to connect 4 additional USB 2.0/1.1 ports (USB 4-5/6-7). 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.

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**

JP3, JP4, JP5 and JP10 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.

> **Important:**
> 1. 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.
> 2. When installing Windows 7, only native USB 2.0 devices (USB port 0 to USB port 3) can operate under DOS mode. Please refer to the following tables for more infomation on the type of USB ports.

Table 1. OS Selection

Operation Environment for Customers	DOS	Windows 7	Windows 8.x	Linux
OS Selection in the BIOS Advanced Menu	Windows 8.x	Windows 7	Windows 8.x	Windows 8.x
Available USB ports	All	When installing Windows 7 first time, only native USB 2.0 ports can work. Please refer to the USB type in table 2 below.	All	All

Table 2. The Type of USB Ports

Model Name	KS150-BT
USB 3.0	Native
USB 0	Native
USB 1	Native
USB 2	Native (share with USB 3.0 port)
USB 3	Native
USB 4	HSIC port 0
USB 5	HSIC port 1
USB 6	HSIC port 2
USB 7	HSIC port 3

Audio

Line-out

Front Audio

GND
NC
Mic2-JD
Key
Line2-JD

2 ... 10
1 ... 9

Mic2-L
Mic2-R
Line2-R
GND
Line2-L

Rear Audio

The system board is equipped with 1 audio jack. This jack is a one-hole connecting interface for inserting a plug.

- Line-out Jack (Lime)
  This jack is used to connect a headphone or external speakers.

Front Audio

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

Driver Installation

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

I/O Connectors

SATA (Serial ATA) Connectors

SATA 2.0 3Gb/s

SATA 0

SATA 1

GND
TXP
TXN
GND
RXN
RXP
GND

1

7
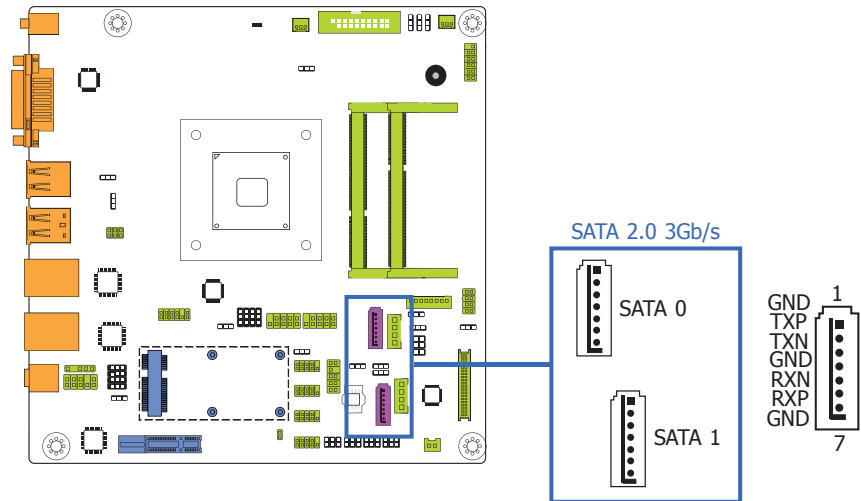
Features

- 2 Serial ATA 2.0 ports with data transfer rate up to 3Gb/s (SATA 0 and SATA 1)

- Integrated Advanced Host Controller Interface (AHCI) controller

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:
SATA port 0 provides adequate space for SATA DOM.

SATA (Serial ATA) Power Connectors

SATA Power 0

SATA Power 1

1 +12V
Ground
Ground
4 +5V
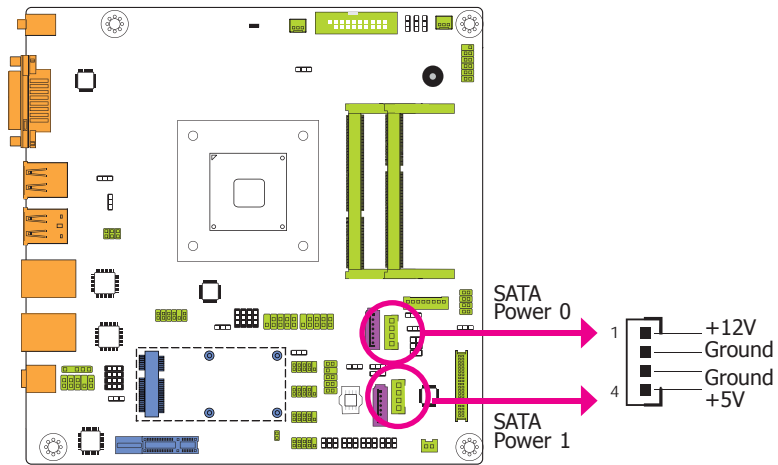
The SATA power connectors supply power to the SATA drive. Connect one end of the provided power cable to the SATA power connector and the other end to your storage device.

Digital I/O and/or Power Connector

Digital I/O

19
1
2
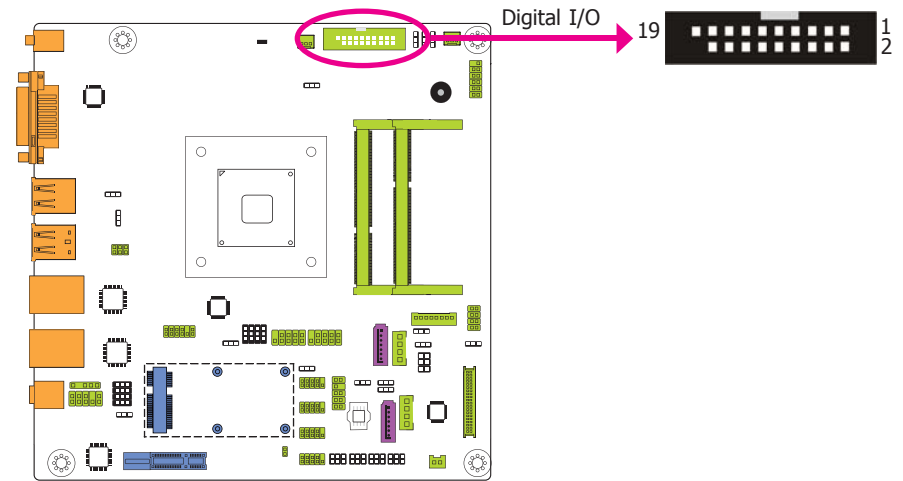
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors. The pin functions of the 8-bit digital I/O connector are listed below.

Digital I/O Connector

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

28

Cooling Fan Connectors

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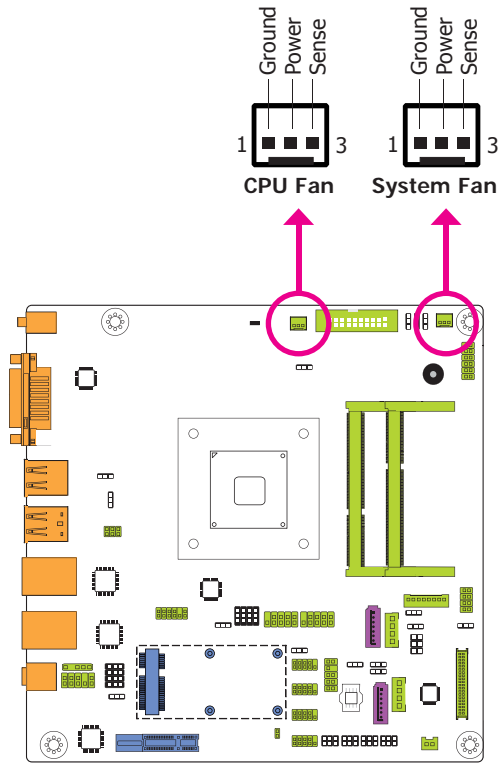
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

Front Panel Connector

Front Panel

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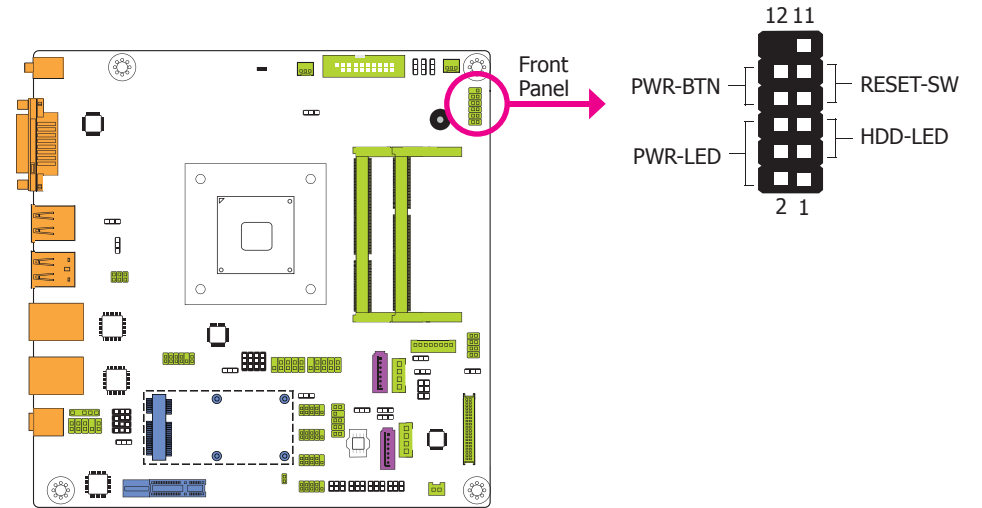
HDD-LED - HDD LED

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

RESET-SW - Reset Switch

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

PWR-BTN - Power Switch

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

PWR-LED - Power/Standby LED

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

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

COM (Serial) Ports
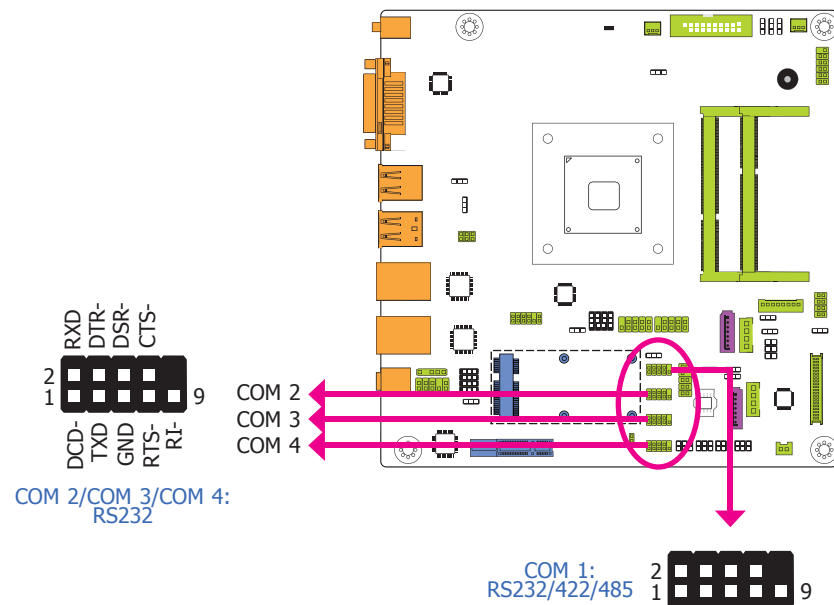
Important:
When COM 1 RS232/422/485 is selected, JP9 and JP11 must be set in accordance to JP8.

COM 2 to COM 4 are fixed at RS232.

The pin functions of COM port 1 will vary according to JP8's, JP9's and JP11's setting. JP14 is used to configure the Serial COM port 1 to pure RS232 or RS232 with power. Refer to "COM 1 RS232/422/485 Select" and "COM 1 RS232/Power Select" in this chapter for more information.

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

Connecting External Serial Ports

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

BIOS Setting

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

LVDS LCD Panel Connector
LCD/Inverter Power Connector

LCD/Inverter power

39 40

1 2
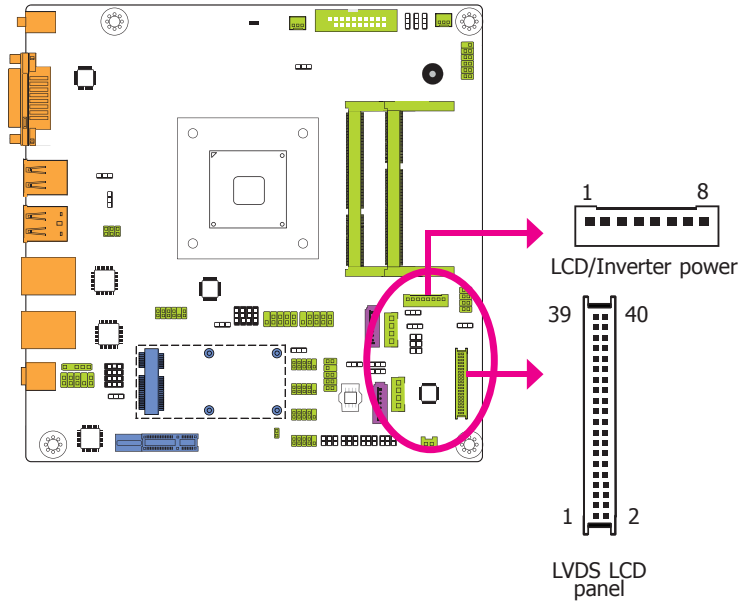
LVDS LCD panel

The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connectors and the LCD/Inverter power connectors. 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.

- **Jumper Settings**

Refer to the "Jumper Settings" section in this chapter for settings relevant to the LCD panel.

Note:
DFI board's LVDS connector: Hirose DF13-40DP-1.25V(91)/40P/1.25mm; cable side connector: Hirose DF13-40DS-1.25C.

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

PS/2 Keyboard/Mouse Connector

PS/2 KB/MS

```
        10 9
  +5V   [■ ■]  +5V
  GND   [■ ■]  NC
  GND   [■ ■]  GND
MS DATA [■ ■]  KB DATA
 MS CLK [■ ■]  KB CLK
         2 1
```

The Keyboard/Mouse connector is used to connect PS/2 keyboard and PS/2 mouse by means of a PS/2 cable. Connect one end of the cable to the Keyboard/Mouse connector. The other ends are used to connect a PS/2 keyboard and a PS/2 mouse.

PS/2 mouse port

PS/2 keyboard port

Connect to the board's Keyboard/Mouse connector
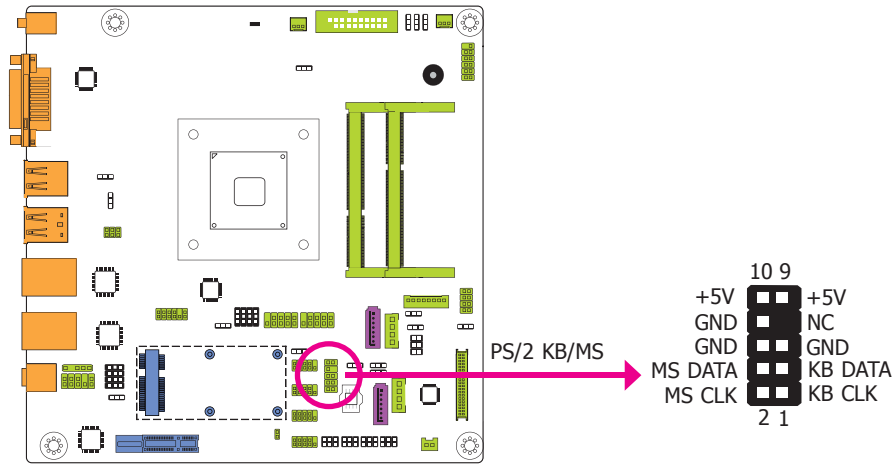
Wake-On-PS/2 Keyboard/Mouse

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**

JP6 must be set to "2-3 On: 5V_standby". Refer to "PS/2 Keyboard/Mouse Power Select" in this chapter for more information.

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

SMBus Connector (optional)

SMBUS Data
GND | NC
2 | 6
1 | 5
+3.3V_standby | SMBUS_Alert
SMBUS Clock
SMBus
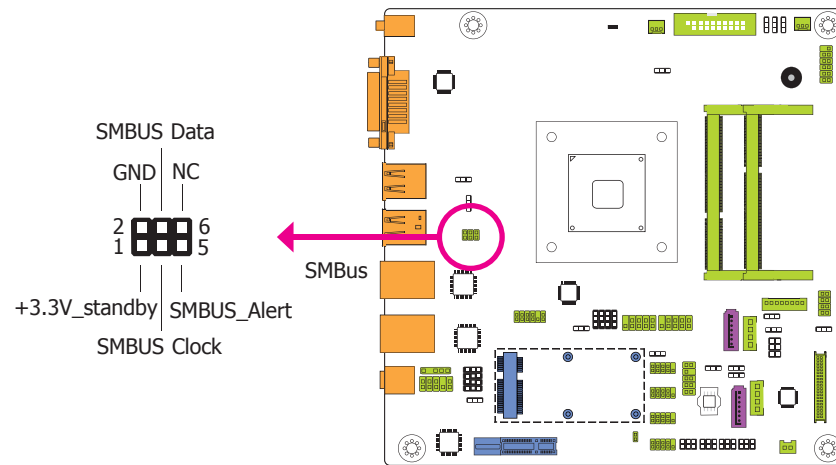
The SMBus (System Management Bus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

Expansion Slots

Mini PCI Express
PCI Express x1
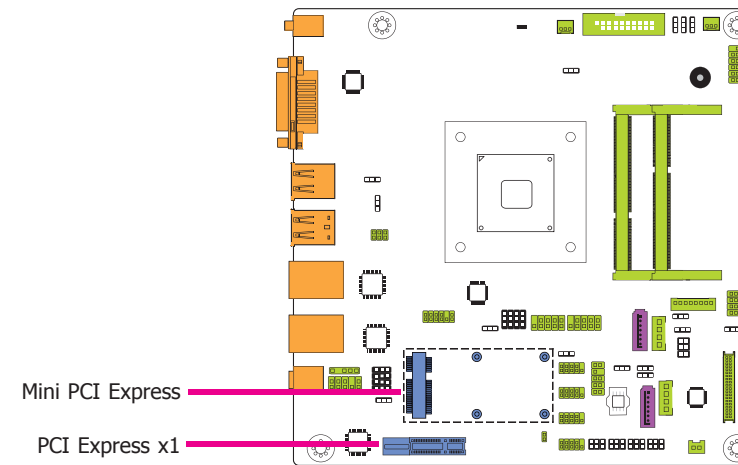
PCI Express x1 Slot

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

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.

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S/PDIF Connector

LAN LED Connector
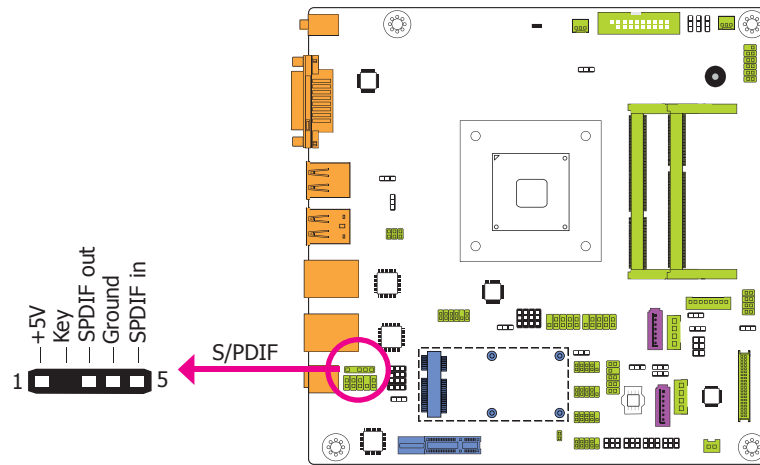
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.
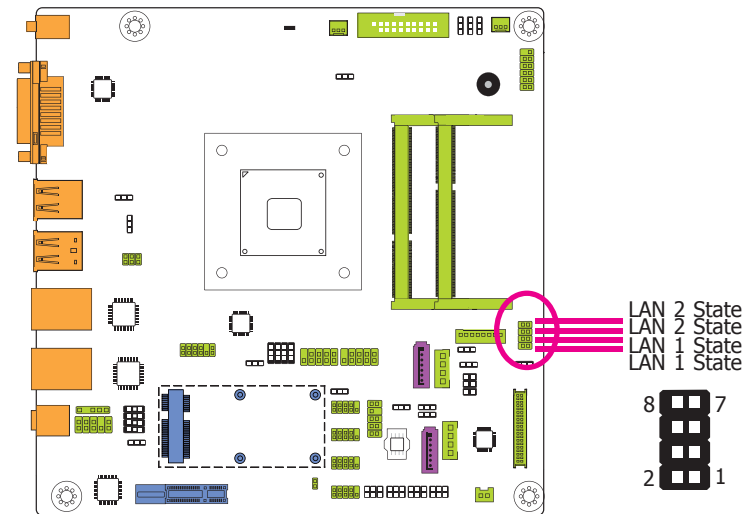
The LAN LED connector is used to detect the connection state of RJ45 LAN ports when the connection is made to an active network via a cable. The pin functions of the LAN LED connector are listed below.

Pins	Pin Assignment	Pins	Pin Assignment
1	LAN0_LED_1000-	2	LAN0_LED_100-
3	LAN0_LED_LINK_ACT-	4	+3.3V_standby
5	LAN1_LED_1000-	6	LAN1_LED_100-
7	LAN1_LED_LINK_ACT-	8	+3.3V_standby

34

Chassis Intrusion Connector

2 — Ground
1 — Signal
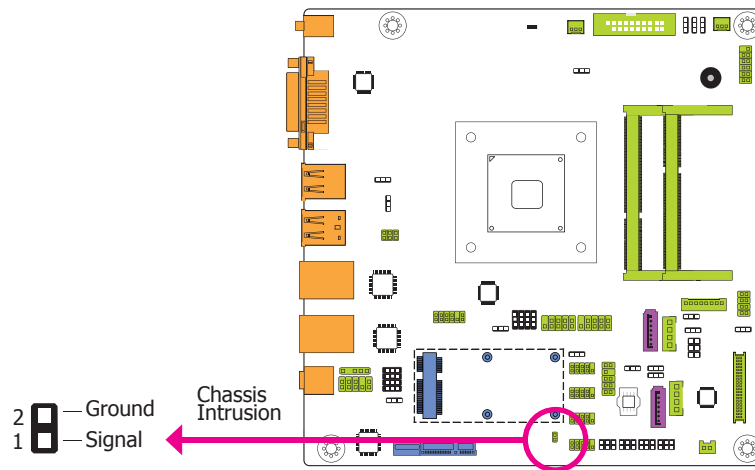
Chassis
Intrusion

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.

Standby Power LED

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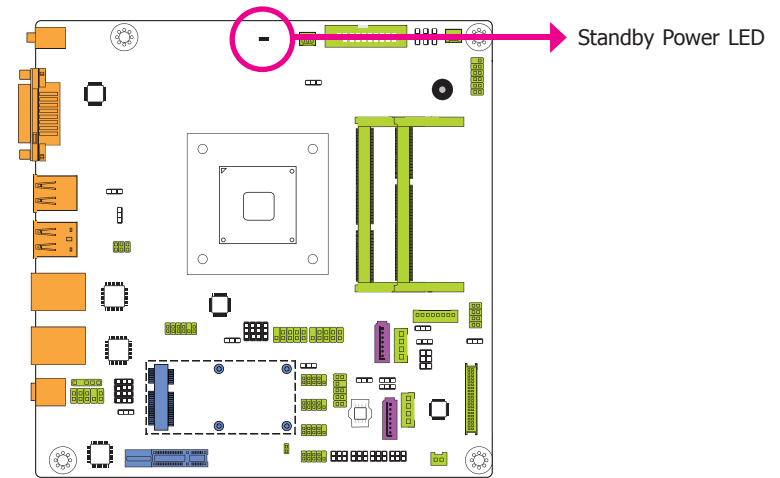
This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

Battery

GND
+3.3V
Battery
1 2

Battery

Connect to the
battery connector
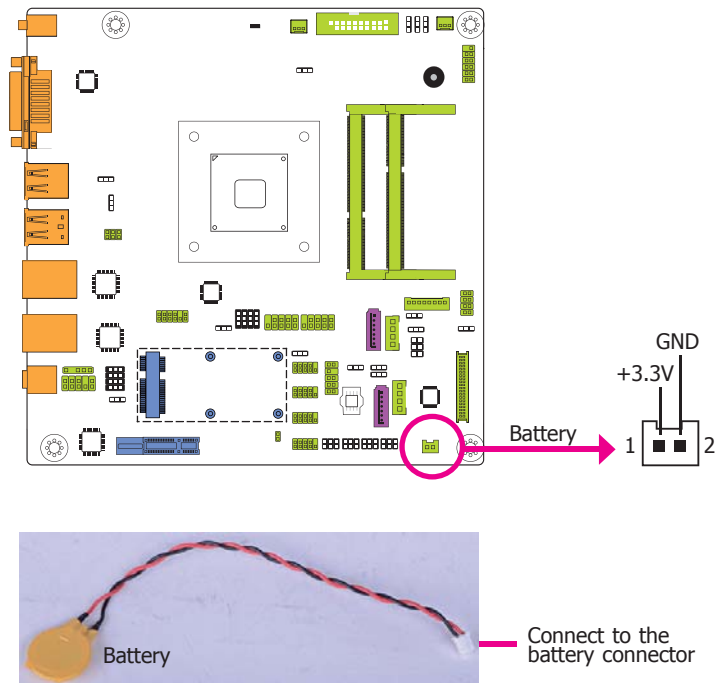
The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

• Danger of explosion if battery incorrectly replaced.

• Replace only with the same or equivalent type recommend by the manufacturer.

• Dispose of used batteries according to local ordinance.

Chapter 6 - Mounting Options

Wall Mount

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

The wall mount kit includes the following:

- 2 Wall mount brackets
- Br acket screws
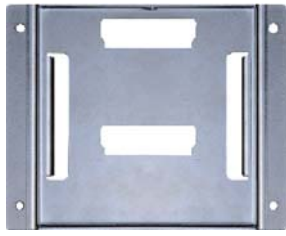
Wall mount bracket 1   Wall mount bracket 2

1. Select a place on the wall where you will mount the Panel PC.

2. Use the provided mounting screws to attach "wall mount bracket 1" to the wall.

Mounting screw

Wall mount bracket 1
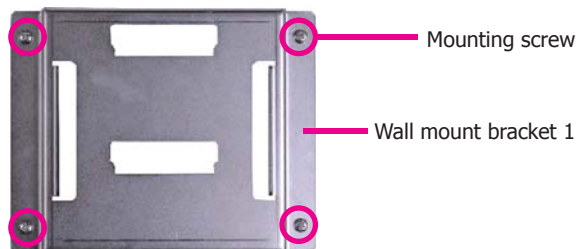
3. Attach the other bracket (wall mount bracket 2) to the rear of the Panel PC.

Mounting screw

Wall mount bracket 2
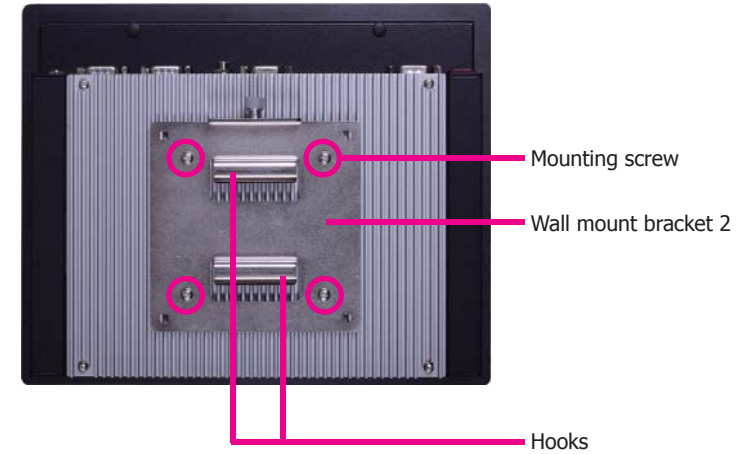
Hooks

4. Using the hooks on "bracket 2", slide the Panel PC to "bracket 1".

Wall mount bracket 2

Wall mount bracket 1

37
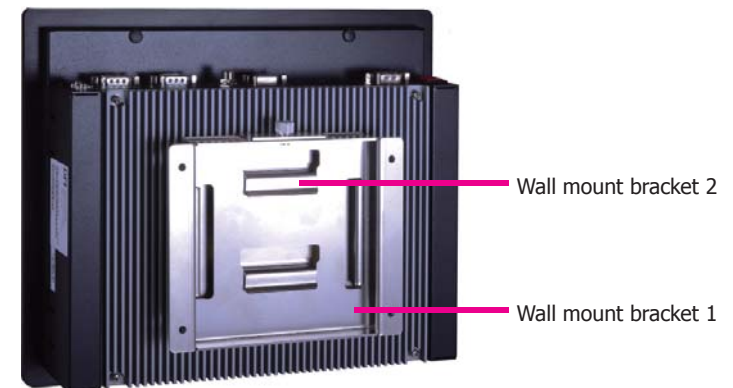
5. Tighten the screw to hold the assembly in place.

Mounting screw
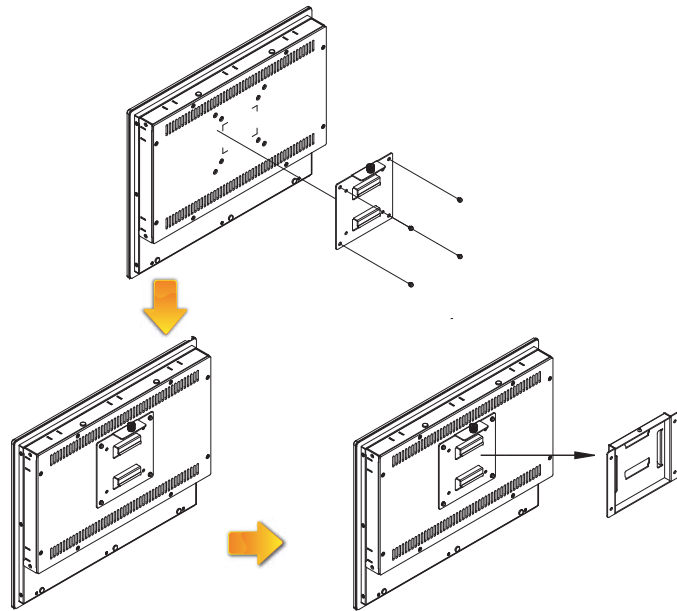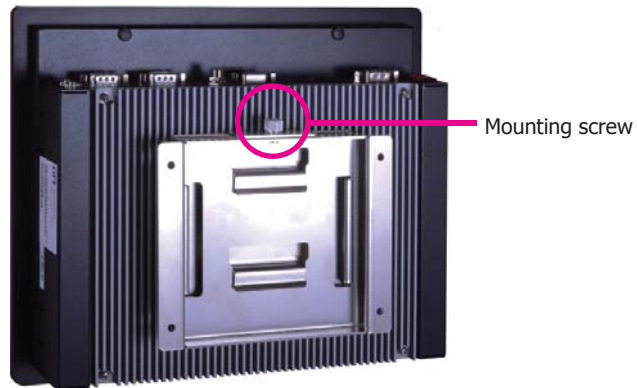
Panel Mount

Note:
The system unit used in the f ollowing illustrations may not resemble the actual one. These illustrations are f or reference only.

The panel mounting kit includes the following:
•   6 mounting clamps

1.   Select a place on the panel where you will mount the Panel PC.

2.   Cut out a shape on the panel that corresponds to the Panel PC's rear dimensions (359mm x 283mm).

283.00

359.00
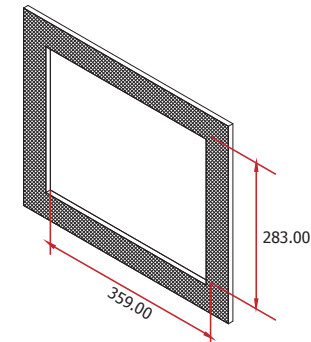
3. Stick the poron foam on the rear panel.
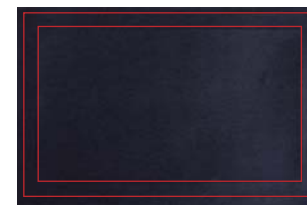
Poron foam

Poron foam

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4. Slide the Panel PC through the hole until it is properly f tted against the panel.

5. Position the mounting clamps along the rear edges of the Panel PC, f tting them into the slits that are around the Panel PC.

Mounting
clamp

White plastic
cap

Slit for mounting
the clamp

6. The f rst and second clamps must be positioned and secured diagonally prior to mounting the rest of the clamps. Tighten the clamp's screw using an electric screwdriv er until the white plastic cap touches the panel. Do not o ver tighten the screws to prev ent damaging the P anel PC. The illustration below shows all clamps properly mounted.

Panel wall

283.00

359.00

39
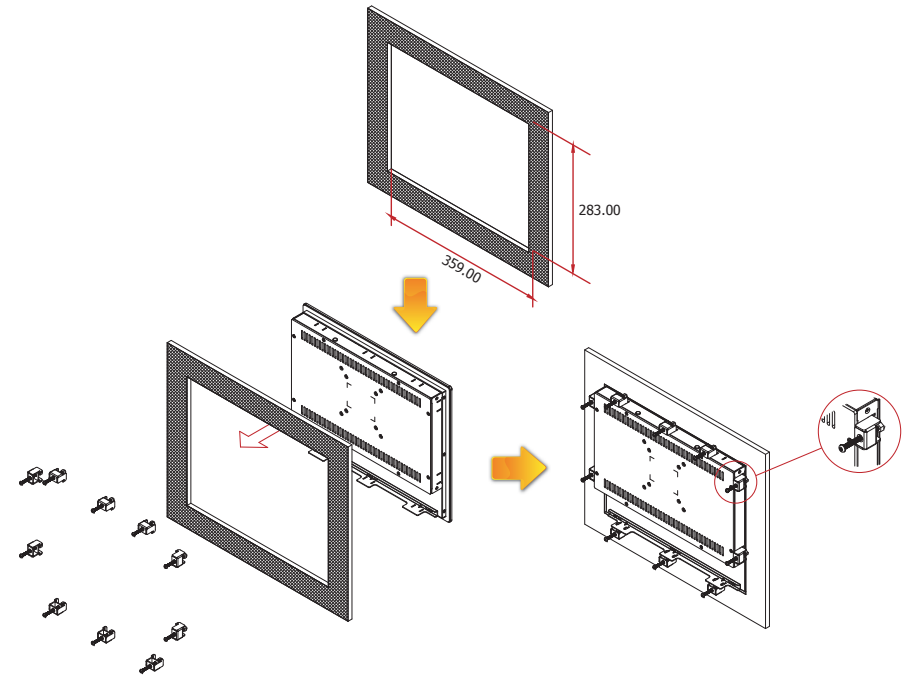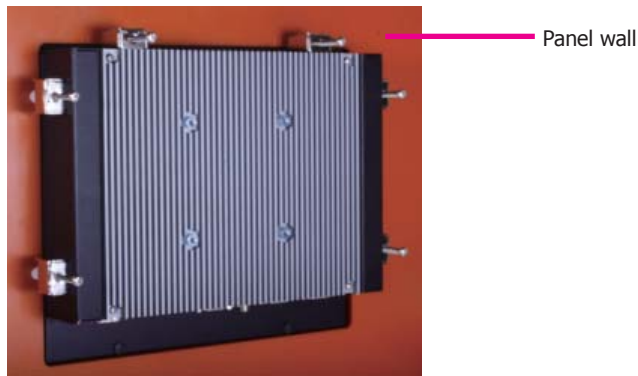
Chapter 7 - BIOS Setup

Overview

The BIOS is a progr am that tak es care of the basic lev el of communication between the CPU and peripher als. It contains codes f or v arious adv anced f eatures f ound in this system board. The BIOS allows y ou to configure the system and sa ve the configur ation in a bat tery-backed CMOS so that the data retains ev en when the power is of f. In gener al, the inf ormation stored in the CMOS RAM of the EEPROM will sta y unchanged unless a configur ation change has been made such as a hard driv e replaced or a device added.

It is possible that the CMOS bat tery will f ail causing CMOS data loss. If this happens, y ou need to install a new CMOS bat tery and reconfigure the BIOS set tings.

> **Note:**
> The BIOS is constantly updated to impro ve the perf ormance of the system board; therefore the BIOS screens in this chapter ma y not appear the same as the actual one. These screens are f or reference purpose only.

Default Configuration

Most of the configur ation settings are either predefined according to the Load Optimal Def aults settings which are stored in the BIOS or are automatically detected and configured without re-quiring any actions. There are a f ew settings that y ou may need to change depending on y our system configuration.

Entering the BIOS Setup Utility

The BIOS Setup Utilit y can only be oper ated from the k eyboard and all commands are k ey-board commands. The commands are a vailable at the right side of each setup screen.

The BIOS Setup Utilit y does not require an oper ating system to run. After y ou 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 bef ore y ou respond, restart the system or press the "R eset" but ton. You ma y also restart the system by pressing the <Ctrl> <Alt> and <Del> k eys 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 f elds.
<Esc>	Exit to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted f eld.
- (minus key)	Scrolls backward through the values or options of the highlighted f eld.
<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 k eys 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 a vailable f or that field. T o displa y the submenu, mo ve the highlight to that field and press <Enter>.

AMI BIOS Setup Utility

Main

The Main menu is the first screen that y ou will see when y ou enter the BIOS Setup Utilit y.

```
                Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced    Chipset    Boot    Security    Save & Exit

                                                          Set the Date. Use Tab
   BIOS Information                                       to switch between Date
   BIOS Vendor                  American Megatrends       elements.
   Project Version              BT10x 0.11 x64
   Build Date and Time          08/21/2015  12:58:55
   EC Version                   2014.07.30 v1.0

   System Date                  [Fri 08/21/2015]
   System Time                  [14:02:54]

   Access Level                 Administraor

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

                Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

System Date

The date format is <day>, <month>, <date>, <y ear>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December . Date displays the date, from 1 to 31. Y ear 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 displa ys hours from 00 to 23. Minute displays minutes from 00 to 59. Second displa ys seconds from 00 to 59.

Advanced

The Advanced menu allows y ou to configure y our system f or basic oper ation. Some entries are defaults required by the system board, while others, if enabled, will impro   ve the perf ormance of your system or let y ou set some f eatures according to y our preference.

> **Important**:
> Setting incorrect field v alues may cause the system to malf unction.

```
                Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced    Chipset    Boot    Security    Save & Exit

   OS Selection                            [Windows 7]     OS Selection
 ▶ Super IO Configuration
 ▶ PC Health Status
 ▶ CPU Configuration
 ▶ SATA Configuration
 ▶ Network Stack Configuration
 ▶ CSM Configuration
 ▶ USB Configuration
 ▶ Security Configuration

 ▶ Intel(R) I210 Gigabit Network Connection - 00:01:29:5D......   → ←:  Select Screen
 ▶ Intel(R) I210 Gigabit Network Connection - 00:01:29:5D......   ↑↓:    Select Item
                                                          Enter: Select
                                                          +/-:   Change Opt.
                                                          F1:    General Help
                                                          F2:    Previous Values
                                                          F3:    Optimized Defaults
                                                          F4:    Save & Reset
                                                          ESC:  Exit

                Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

OS Selection

Select the OS support: Windows 7 or Windows 8.X.

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Super IO Configuration

This section is used to configure the parameters of the super IO chip .

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced

Super IO Configuration                                    WatchDog Timer Unit
                                                          Selection.
Super IO Chip                    NCT6106D

WatchDog Timer Unit              [Second]
   Super IO WatchDog Timer       0

▶  Serial Port 1 Configuration
▶  Serial Port 2 Configuration
▶  Serial Port 3 Configuration
▶  Serial Port 4 Configuration

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

         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

WatchDog Timer Unit

Select the WatchDog Timer Unit: second or minute.

Super IO WatchDog Timer

Enter the value to set the Super IO WatchDog timer. 0 means disabled.

Serial Port 1 Configuration to Serial Port 4 Configuration

Sets the parameters of serial port 1 (COM A) and serial port 4 (COM D).

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                    Advanced

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

Change Settings                  [Auto]

RS485 Auto Flow                  [Disabled]

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

         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                    Advanced

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

Change Settings                  [Auto]

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

         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

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```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced

Serial Port 3 Configuration                              Enable or Disable Serial
                                                          Port (COM)
Serial Port                         [Enabled]
Device Settings                     IO=3E8h; IRQ=10;

Change Settings                     [Auto]




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

              Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced

Serial Port 4 Configuration                              Enable or Disable Serial
                                                          Port (COM)
Serial Port                         [Enabled]
Device Settings                     IO=2E8h; IRQ=11;

Change Settings                     [Auto]




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

              Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Serial Port

Enable or disable the serial COM port.

Change Settings

Select the IO/IRQ settings for the super I/O device.

RS485 Auto Flow

Set the RS485 auto flow of the serial COM port.
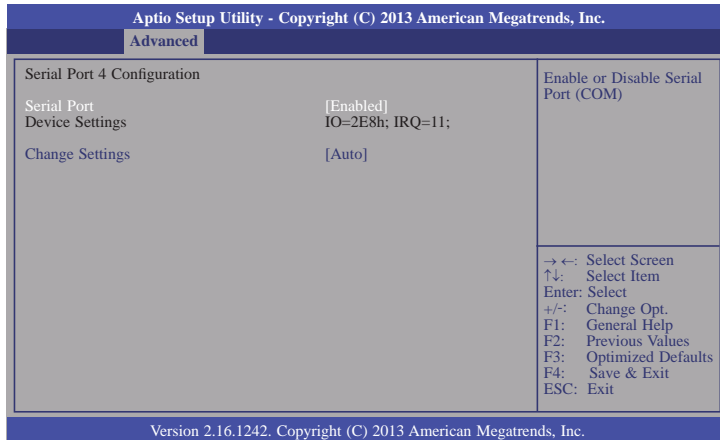
PC Health Status

This section is used to monitor the hardw are status.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
         Advanced

         PC Health Status                              Smart Fan Function Setting
      ▶  Smart Fan Function

         Case Open                    [Disabled]
         Restore AC Power Loss        [Power Off]

         System Temperature           : +28 ºC
         CPU Temperature              : +29 ºC
         System Fan Speed             : N/A
         CPU Fan Speed                : N/A
         VCORE                        : +0.896 V          → ←: Select Screen
         5V                           : +5.116 V          ↑↓:  Select Item
         12V                          : +12.000 V         Enter: Select
         VDDQ                         : +1.348 V          +/-:  Change Opt.
         VSB3                         : +3.232 V          F1:   General Help
                                                          F2:   Previous Values
                                                          F3:   Optimized Defaults
                                                          F4:   Save & Reset
                                                          ESC:  Exit

              Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Smart Fan Function

```
            Aptio Setup Utility - Copyright (C) 2013 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 (1) 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

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```

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 temper ature, the faster the speed of rotation.

System Smart Fan Control

Enable or disable the S ystem's smart fan speed.

Boundary 1 to Boundary 4

The range is 0-127.

Speed Count 1 to Speed Count 5

The range is 1-100%.

Case Open

Set this field to Enabled to allow the system to alert y ou of a chassis intrusion ev ent.

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 f ailure, the system will automatically power -on.

Last State
When power returns after an AC power f ailure, 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 of f when power returns. If the system's power is on when AC power f ailure occurs, the system will power -on when power returns.

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CPU Configuration

This section is used to configure the CPU . It will also displa y the detected CPU inf ormation.

```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

 CPU Configuration                                        When enabled, a VMM can
                                                          utilize the additional hard-
 Intel(R) Atom(TM)  CPU E3845 @ 1.91GHz                   ware capabilities provided
 CPU Signature                30679                        by Vanderpool Technology.
 Microcode Patch              901
 CPU Speed                    1918 MHz
 64-bit                       Supported
 Processor Cores              4
 Intel VT-x Technology        Supported

 L1 Data Cache                24 KB x4
 L1 Code Cache                32 KB x4              → ←:  Select Screen
 L2 Cache                     1024 KB x2            ↑↓:    Select Item
                                                   Enter: Select
 Intel Virtualization Technology    [Enabled]      +/-:   Change Opt.
 EIST                                [Enabled]      F1:    General Help
                                                   F2:    Previous Values
                                                   F3:    Optimized Defaults
                                                   F4:    Save & Reset
                                                   ESC:  Exit

              Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Intel Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardw are capabili-
ties provided by Vanderpool Technology.

EIST

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

SATA Configuration

This section is used to enable or disable S ATA devices.

```
              Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Advanced

 SATA Configuration                                       Enable / Disable Serial
                                                          ATA.
 Serial-ATA (SATA)            [Enabled]

 SATA Mode                    [AHCI Mode]

 Serial-ATA port 0           [Enabled]

 Serial-ATA port 1           [Enabled]

 SATA Port 0
 Not Present                                        → ←:  Select Screen
                                                   ↑↓:    Select Item
 SATA Port 1                                        Enter: Select
 Not Present                                        +/-:   Change Opt.
                                                   F1:    General Help
                                                   F2:    Previous Values
                                                   F3:    Optimized Defaults
                                                   F4:    Save & Reset
                                                   ESC:  Exit

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```

Serial-ATA (SATA)

This field is used to enable or disable Serial A TA devices.

Serial-ATA port 0 and port 1

Enable or disable Serial A TA port 0 and port 1.

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Network Stack Configuration

This section is used to enable or disable network stack set tings.

```
                 Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Advanced

  Network Stack                         [Disabled]              Enable/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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
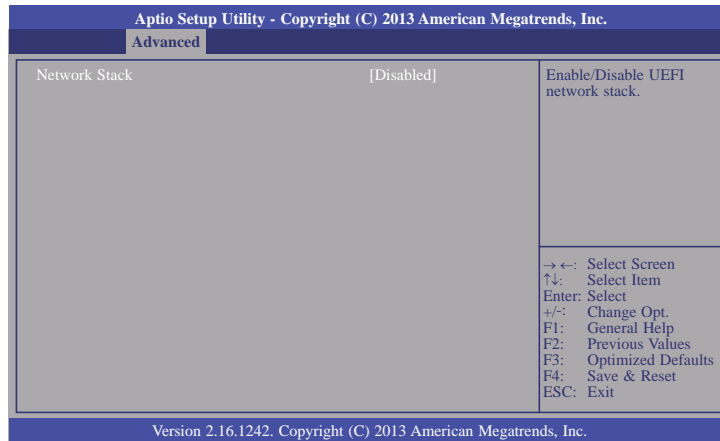
When Network Stack is set to enabled, it will displa y the following information:

```
                 Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Advanced

  Network Stack                         [Enabled]               Enable/Disable UEFI
  Ipv4 PXE Support                      [Enabled]               network stack.
  Ipv6 PXE Support                      [Enabled]
  PXE boot wait time                    0

                                                                → ←:  Select Screen
                                                                ↑↓:     Select Item
                                                                Enter: Select
                                                                +/-:    Change Opt.
                                                                F1:     General Help
                                                                F2:     Previous Values
                                                                F3:     Optimized Defaults
                                                                F4:     Save & Reset
                                                                ESC:  Exit
                 Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

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.

PXE boot wait time

Enter the wait time value to abort the PXE boot.

CSM Configuration

This section configures the CSM set tings.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
              Advanced

   Compatibility Support Module Configuration          Enable/Disable CSM
                                                       support
   CSM Support                         [Enabled]

   CSM16 Module Version                07.71

   Boot option filter                  [UEFI and Legacy]

   Option ROM execution order

   Network                             [Do not launch]
   Storage                             [Legacy only]       → ←:  Select Screen
   Video                               [Legacy only]       ↑↓:   Select Item
   Other PCI devices                   [UEFI only]         Enter: Select
                                                           +/-:   Change Opt.
                                                           F1:   General Help
                                                           F2:   Previous Values
                                                           F3:   Optimized Defaults
                                                           F4:    Save & Reset
                                                           ESC:  Exit

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

CSM Support

This field is used to enable or disable the CSM support.

Boot option filter

This option controls Legacy/UEFI ROMs priorit y.

Network

This field controls the ex ecution of UEFI and Legacy PXE OpROM.

Storage

This field controls the ex ecution of UEFI and Legacy Stor age OpROM.

Video

This field controls the ex ecution of UEFI and Legacy Video OpROM.

Other PCI devices

This field determines OpROM ex ecution policy f or devices other than network, stor age or video.

USB Configuration

This section is used to configure the par ameters of USB device.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
              Advanced

   USB Configuration                               Enables Legacy USB
                                                   support. AUTO option
   USB Module Version            8.11.01           disables legacy support if
                                                   no USB devices are
   USB Devices:                                    connected. DISABLE
        1 Keyboard, 1 Hub                          option will keep USB
                                                   devices available only for
   Legacy USB Support            [Enabled]         EFI applications.
   USB Mass Storage Driver Support [Enabled]

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

            Version 2.16.1242 Copyright (C) 2013 American Megatrends, Inc.
```

Legacy USB Support

Enabled
Enable legacy USB .

Disabled
Keep USB devices a vailable only f or EFI applications.

Auto
Disable support f or legacy when no USB devices are connected.

USB Mass Storage Driver Support

Enable or disable the support of the USB Mass Stor age Driver.

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Important:
When installing Windows 7 , only nativ e USB 2.0 devices (USB port 0 to USB port 3) can operate under DOS mode. Please ref er to the f ollowing tables f or more infomation on the t ype of USB ports.

Table 1. OS Selection

Operation Environment for Customers	DOS	Windows 7	Windows 8.x	Linux
OS Selection in the BIOS Advanced Menu	Windows 8.x	Windows 7	Windows 8.x	Windows 8.x
Available USB ports	All	When installing Windows 7 f rst time, only native USB 2.0 ports can work. Please refer to the USB type in table 2 below.	All	All

Table 2. The Type of USB Ports

Model Name	KS150-BT
USB 3.0	Native
USB 0	Native
USB 1	Native
USB 2	Native (share with USB 3.0 port)
USB 3	Native
USB 4	HSIC port 0
USB 5	HSIC port 1
USB 6	HSIC port 2
USB 7	HSIC port 3

Security Configuration

This section only displa ys the set ting relevant to the Intel(R) Anti- Theft Technology.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
  Advanced

Intel(R) TXE Configuration
TXE FW Version                    01.01.00.1089

TXE HMRFPO                  [Disabled]

                                              →←:  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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```

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Intel(R) I210 Gigabit Network Connection - 00:01:29:5D...

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

```
           Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Advanced

                                                      Configure Boot Protocol,
    PORT CONFIGURATION MENU                           Wake on LAN, Link
  ▶ NIC Configuration                                 Speed, and VLAN.

    Blink LEDs                        0

    PORT CONFIGURATION INFORMATION
    UEFI Driver:                      Intel(R) PRO/1000 5.5.19
    Adapter PBA:                      000300-000
    Chip Type                         Intel i210
    PCI Device ID                     1533
    Bus: Device: Function:            01:00:00
    Link Status                       [Disconnected]    → ←: Select Screen
    MAC Address                       00:01:29:5D:E4:69 ↑↓:   Select Item
    Virtual MAC Address               00:01:29:5D:E4:69 Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        F4:    Save & Reset
                                                        ESC:  Exit

           Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Blink LEDs

Identify the ph ysical network port by blinking the associated LED .

Link Status

This field indicates the link status of the network device.

Virtual MAC Address

This field indicates progr ammatically assignable MAC address f or the network port.

NIC Configuration

This field is used to configure the network device.

```
           Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Advanced

                                                      Specifies the port speed
    Link Speed                        [Auto Negotiated] used for the selected
    Wake on LAN                       [Enabled]         boot protocol.






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

           Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Link Speed

Specify the port speed which is used f or the selected boot protocol.

Wake on LAN

Enables the server to be powered on using an in-band magic packet.

Intel(R) I210 Gigabit Network Connection - 00:01:29:5D...

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

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
     Advanced

                                                      Configure Boot Protocol,
     PORT CONFIGURATION MENU                          Wake on LAN, Link
  ▶  NIC Configuration                                Speed, and VLAN.

     Blink LEDs                      0

     PORT CONFIGURATION INFORMATION
     UEFI Driver:                    Intel(R) PRO/1000 5.5.19
     Adapter PBA:                    000300-000
     Chip Type                       Intel i210
     PCI Device ID                   1533
     Bus: Device: Function:          02:00:00
     Link Status                     [Disconnected]       → ←:  Select Screen
     MAC Address                     00:01:29:5D:E4:68    ↑↓:    Select Item
     Virtual MAC Address             00:01:29:5D:E4:68    Enter: Select
                                                          +/-:   Change Opt.
                                                          F1:    General Help
                                                          F2:    Previous Values
                                                          F3:    Optimized Defaults
                                                          F4:    Save & Reset
                                                          ESC:  Exit

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Blink LEDs

Identify the ph ysical network port by blinking the associated LED .
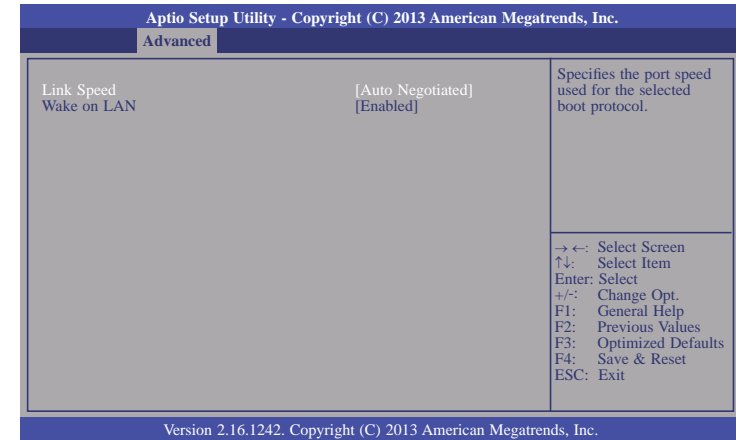
Link Status

This field indicates the link status of the network device.

Virtual MAC Address

This field indicates progr ammatically assignable MAC address f or the network port.

NIC Configuration

This field is used to configure the network device.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
     Advanced

     Link Speed                      [Auto Negotiated]    Specifies the port speed
     Wake on LAN                     [Enabled]            used for the selected
                                                          boot protocol.

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

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
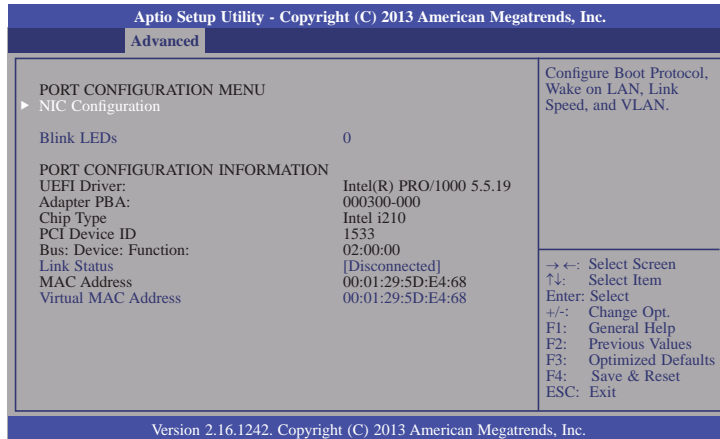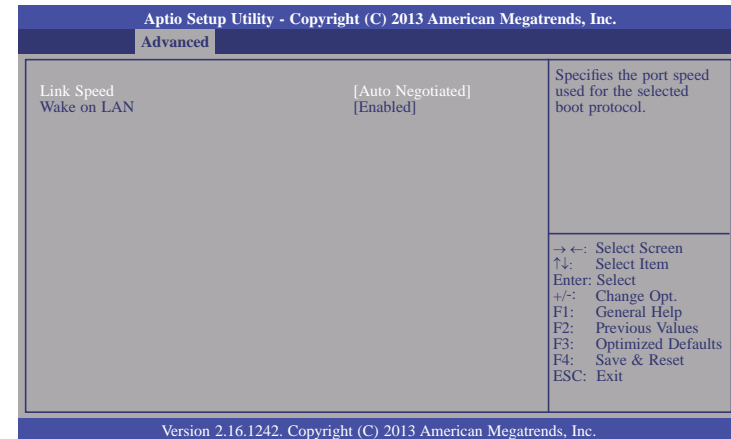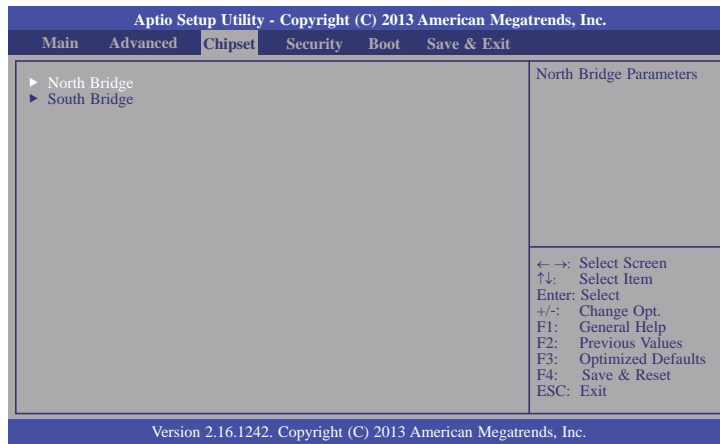
Link Speed

Specify the port speed which is used f or the selected boot protocol.

Wake on LAN

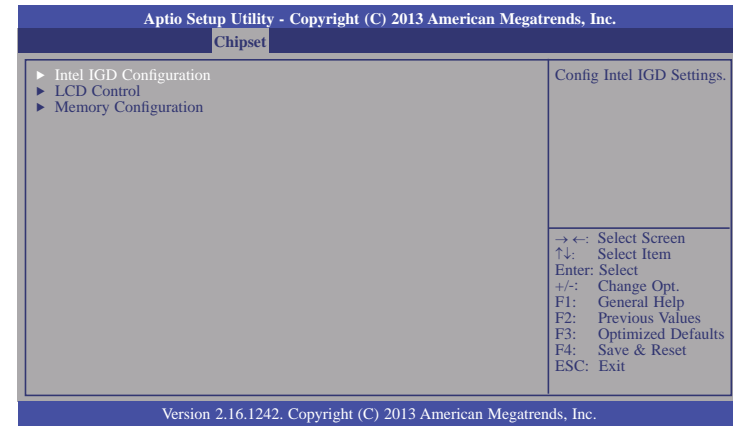Enables the server to be powered on using an in-band magic packet.

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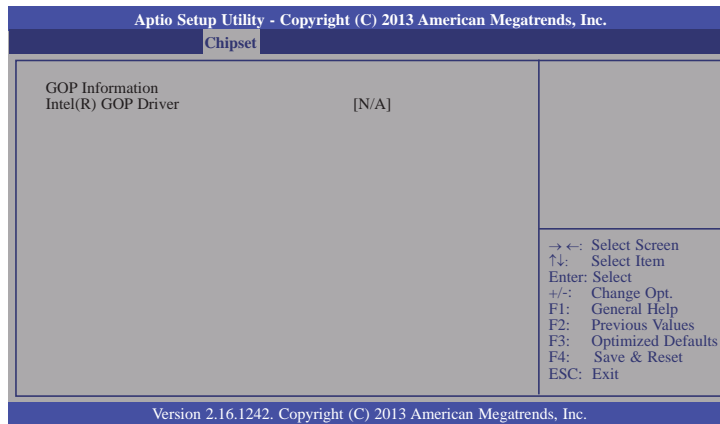# Chipset
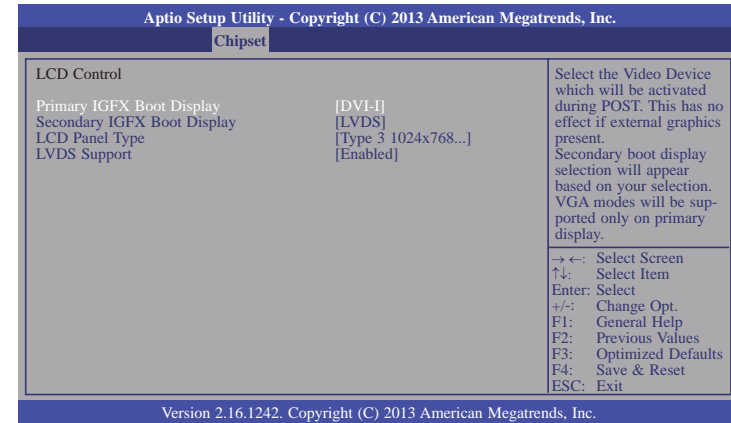
This section configures relevant chipset functions.

```
                 Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
     Main     Advanced    Chipset    Security    Boot    Save & Exit

 ▶  North Bridge                                    North Bridge Parameters
 ▶  South Bridge




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

               Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

North Bridge

This section configures the North bridge parameters.

```
                 Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                                    Chipset

 ▶  Intel IGD Configuration                         Config Intel IGD Settings.
 ▶  LCD Control
 ▶  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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Intel IGD Configuration

```
                Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                                    Chipset

  GOP Information
  Intel(R) GOP Driver                      [N/A]


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

          Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

LCD Control

```
                Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                                    Chipset

  LCD Control                                         Select the Video Device
                                                      which will be activated
  Primary IGFX Boot Display        [DVI-I]            during POST. This has no
  Secondary IGFX Boot Display      [LVDS]             effect if external graphics
  LCD Panel Type                   [Type 3 1024x768...] present.
  LVDS Support                     [Enabled]          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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Primary IGFX Boot Display

Select the Video Device which will be activ ated during POST. This has no ef fect if the external graphics presents. The selection of secondary boot displa y will appear based on your selection. VGA modes will be supported only on primary displa y.

Secondary IGFX Boot Display

Select the secondary displa y device: LVDS or DVI -I. LVDS is the def ault setting.

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LCD Panel Type

Select the L CD panel used by Internal Gr aphics Device by selecting the appropriate setup item. Please ref er to the screen shown below .

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
LCD Control		Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.
Primary IGFX Boot Display	[CRT]	
Secondary IGFX Boot Display		
LCD Panel Type		
LVDS Support		

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
Type 7   1600x1200   36 Bit
Type 8   1366x768   18 Bit
Type 9   1680x1050   36 Bit
Type 10   1920x1200   36 Bit
Type 11   1440x900   36 Bit
Type 12   1024x768   24 Bit
Type 13   1280x1024   48 Bit
Type 14   1280x800   36 Bit
Type 15   1920x1080   48 Bit
Type 16   2048x1536   48 Bit

→ ←: 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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LVDS Support

Enable or disable the onboard L VDS function.

Memory Configuration

This section only displa ys the par ameter of memory configur ation.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Chipset	
Memory Information	
Total Memory	1024 MB (LPDDR3)
Memory Slot1	1024 MB (LPDDR3)
Memory Slot2	Not Present

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

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
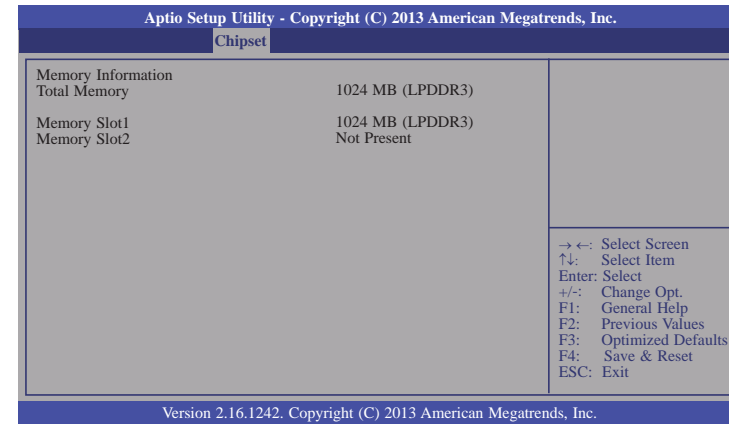
South Bridge

This field is used to configure the par ameters of the South Bridge.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                              Chipset

  ▶  Azalia HD Audio                                      Azalia HD Audio Options
  ▶  PCI Express Configuration

     Intel(R) I210 Controller 1          [Enabled]
     Intel(R) I210 Controller 2          [Enabled]




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

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Intel(R) I210 Controller 1 and 2

Enable the Intel(R) I210 ethernet controller .

Azalia HD Audio

This section configues Azalia HD Audio options.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                              Chipset

  Audio Configuration                                     Control Detection of the
  Audio Controller                    [Enabled]           Azalia device. Disabled =
     Azalia HDMI Codec                [Enabled]           Azalia will be uncondition-
     DP/HDMI Port B                   [Disabled]          ally disabled. Enabled =
                                                          Azalia will be uncondition-
                                                          ally 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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Audio Controller

This item controls the detection of the Azalia device.

Disabled
Azalia will be unconditionally disabled.
Enabled
Azalia will be unconditionally enabled.

Azalia HDMI Codec

Enable or disable the internal HDMI codec f or Azalia.

DP/HDMI Port B

Enable or disable the DP/HDMI P ort B.

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PCI Express Configuration

This section configues set tings relevant to PCI Express devices.

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                                    Chipset

PCI Express Configuration                               Enable or Disable the
PCI Express Port 0              [Enabled]                PCI Express Port 0 in the
   Speed                        [Auto]                   Chipset

PCI Express Port 1             [Enabled]
   Speed                        [Auto]

PCI Express Port 2             [Enabled]
   Speed                        [Auto]

PCI Express Port 3             [Enabled]
   Speed                        [Auto]                   → ←:  Select Screen
                                                         ↑↓:     Select Item
                                                         Enter: Select
                                                         +/-:    Change Opt.
                                                         F1:     General Help
                                                         F2:     Previous Values
                                                         F3:     Optimized Defaults
                                                         F4:      Save & Reset
                                                         ESC:  Exit

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

PCI Express Port 0-3

Enable or disable the PCI Express port in the chipset.

Speed

Select the speed f or the PCI Express devices. The option is Auto , Gen1 or Gen2.

Security

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Main      Advanced     Chipset     Security     Boot    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

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

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```

Administrator Password

Set the administrator password.

User Password

Set the user password.

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Boot

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced    Chipset    Security    Boot    Save & Exit

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




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

            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Setup Prompt Timeout

Select the number of seconds to w ait for the setup activ ation key. 65535(0xFFFF)
denotes indefinite waiting.

Bootup NumLock State

This allows you to determine the def ault state of the numeric k eypad. By default, the
system boots up with NumLock on wherein the f unction of the numeric k eypad is the
number keys. When set to Of f, the function of the numeric k eypad is the arrow k eys.

Save & Exit

```
            Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced    Chipset    Security    Boot    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 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

Save Changes and Reset

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

Discard Changes and Reset

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

Restore Defaults

To restore and load the optimized def ault values, select this field and then press
<Enter>. A dialog bo x will appear. Select Yes to restore the def ault 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 utilit y, AFUDOS. EXE. Please contact technical support or y our sales representativ e for the files.

To execute the utilit y, 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 integr ated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be remo ved 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 f actory and cannot be used to replace one which has been utilized on other system boards.

3. If y ou do not f ollow the methods abo ve, the Intel® Management Engine will not be updated and will cease to be ef fective.

Note:
a. You can take advantage of flash tools to update the def ault configuration of the BIOS (SPI ROM) to the latest v ersion anytime.
b. When the BIOS IC needs to be replaced, y ou have to populate it properly onto the system board after the EEPROM progr ammer has been burned and f ollow the technical person's instructions to confirm that the MAC address should be burned or not.

Chapter 8 - Supported Software

Some devices of the system require drivers from hardware manufactures to operate properly. The system may come with a CD/DVD that contains drivers, utilities and software applications. Insert the CD into a CD-ROM drive. The auto-run screen (Mainboard Utility CD) will appear. If the "Autorun" does not automatically start, please go to the root directory of the CD and double-click "Setup".

If your product package does not include a CD/DVD, you can download the latest drivers from the DFI Download Center:

http://www.dfi.com/DownloadCenter

Once you are in the Download Center page, select your product or type the model name and click "Search" to find product-related resources such as documentation and drivers.

For Windows 8.1
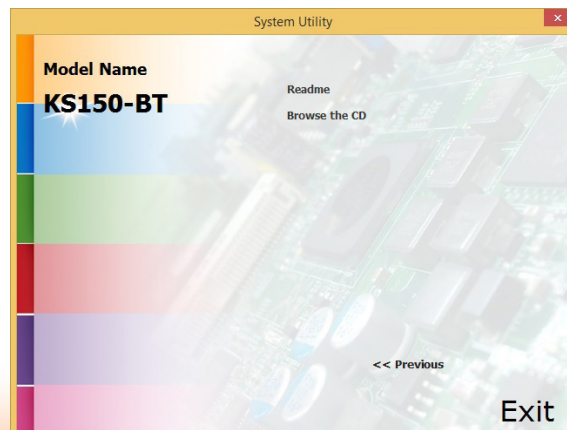
For Windows 7

Intel Chipset Software Installation Utility

The Intel Chipset Device Softw are is used f or updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utilit y, click "Intel Chipset Softw are Installation Utilit y" 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 docu- ment for more installation tips then click Next.

4. After all setup oper ations are done, click Next.
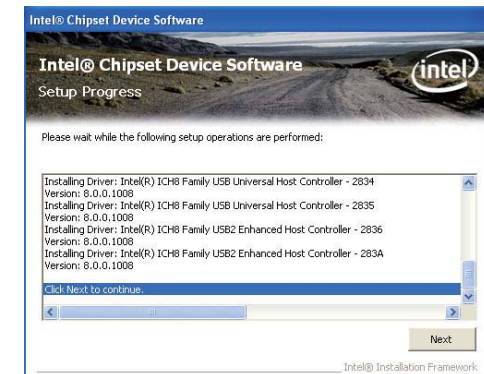
5. Click "Yes, I w ant to restart this computer now" then click Finish.

Restarting the system will allow the new software installation to tak e effect.

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Intel HD Graphics Drivers

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

1. Setup is now ready to install
   the graphics driver. Click
   Next.
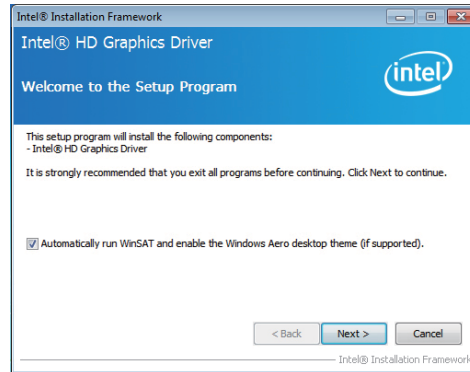
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the gr aphics driver and the system rebooted, the screen will turn blank f or 1 to 2 minutes (while WinS AT is running) bef ore the Windows 7/ Windows 8 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

We recommend that y ou skip this process by disabling this f unction then click Next.

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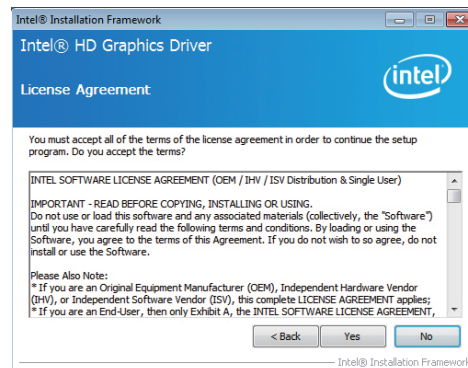
3. Go through the readme docu-
   ment for system requirements
   and installation tips then click
   Next.
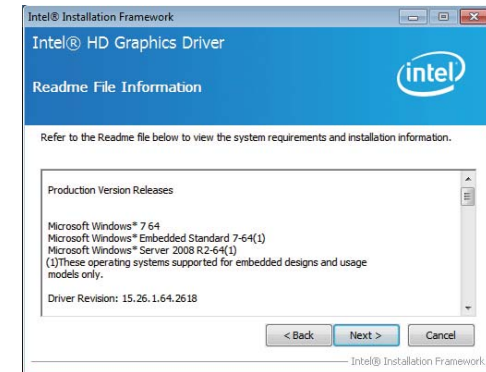
4. Setup is now installing the
   driver. Click Next to continue .
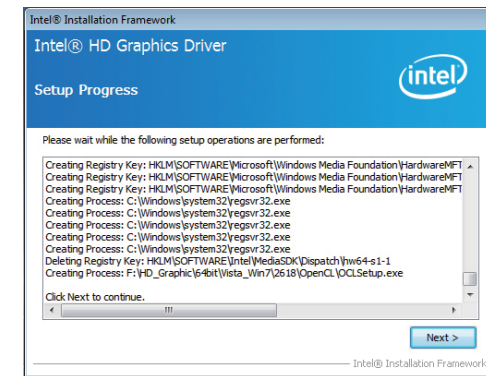
5. Click "Yes, I want to restart this
   computer now" then click Finish.

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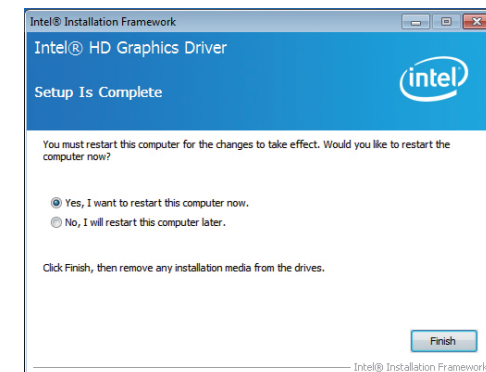
Intel LAN Drivers

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".
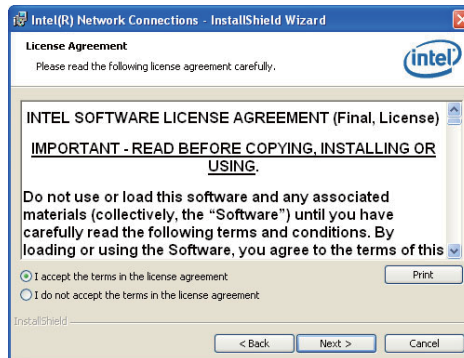
3. Select the program featuers you want installed then click Next.
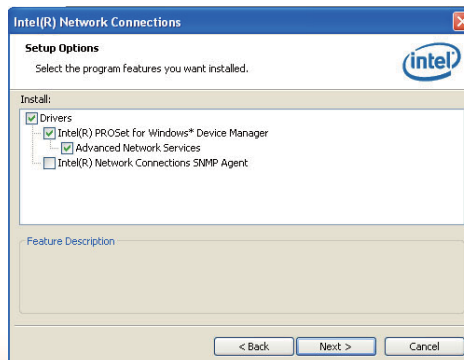
4. Click Install to begin the installation.

5. After completing installation, click Finish.

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www.df .com
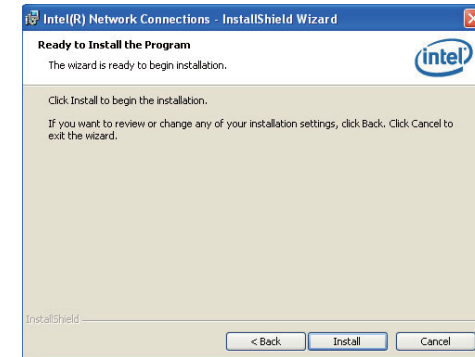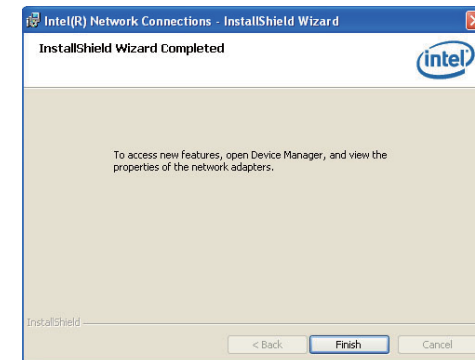
Kernel Mode Driver Framework (For Windows 7 only)

To install the driver, click "Kernel Mode Driver Framework" on the main menu.

1. Click "Yes" to install the update.
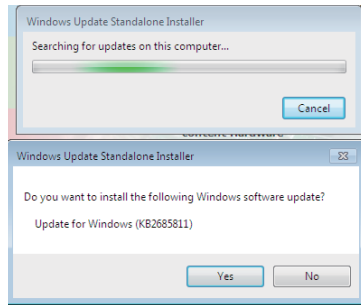
2. The update is installed now.
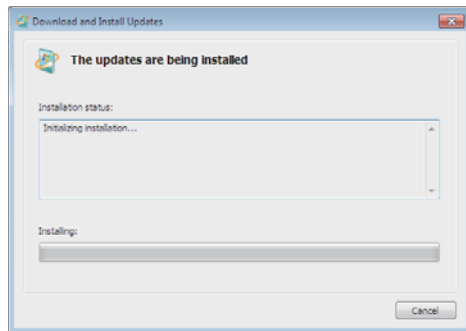
3. Click "Restart Now" to restart your computer when the installation is complete.
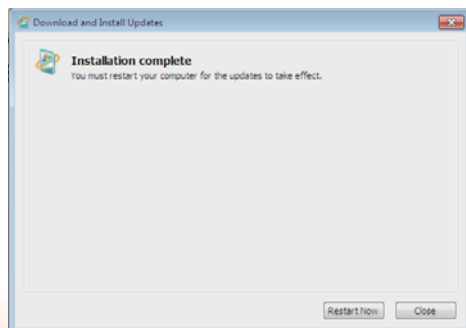
Intel Trusted Execution Engine Driver

To install the driver, click "Intel Trusted Execution Engine Driver" on the main menu.

1. Tick "I accept the terms in the License Agreement" and then click "Next."
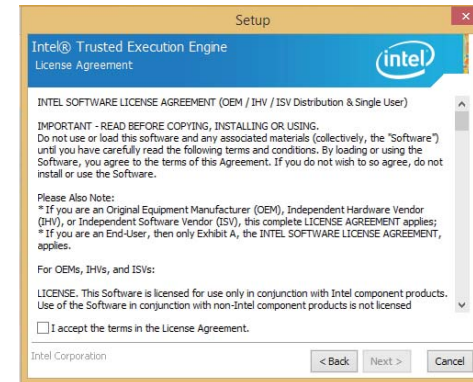
2. The step shows the components which will be installed. Then, Click Next.
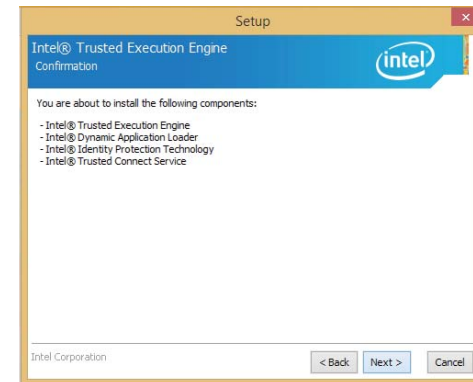
3. The step displays the installing status in the progress.
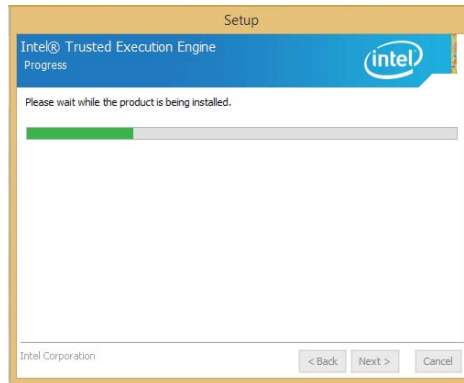
4. Click "Finish" when the installation is complete.
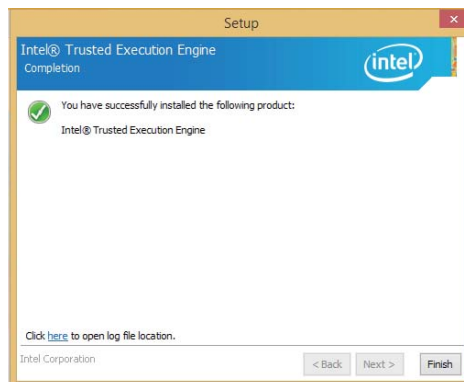
Realtek Audio Drivers

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

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

2. Follow the remainder of the steps on the screen; clicking "Next" each time you finish a step .
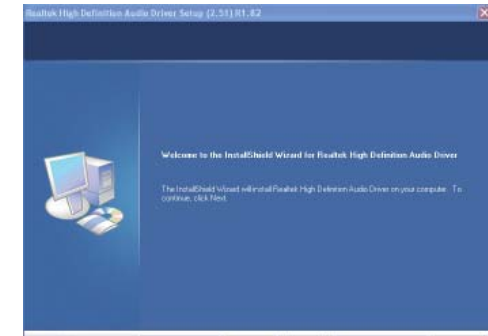
3. Click "Yes, I want to restart my computer now" then click Finish.

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

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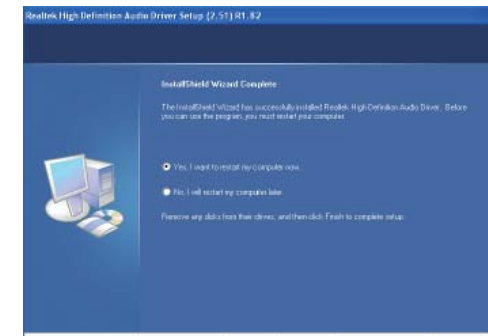
Intel Sideband Fabric Device (MBI) Driver (For Windows 8 only)

To install the driver, click "Intel Sideband Fabric Device (MBI) Driver" on the main menu.

1. The setup program will be installed. Click "Next" to continue.
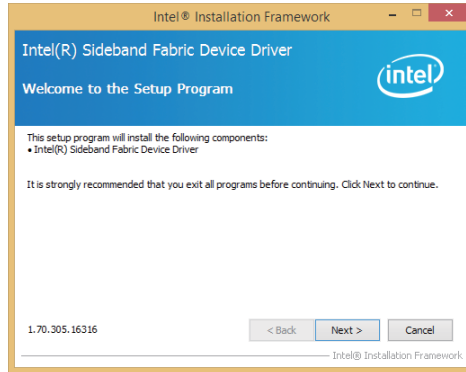
2. Click "Yes" to accept the License Agreement.
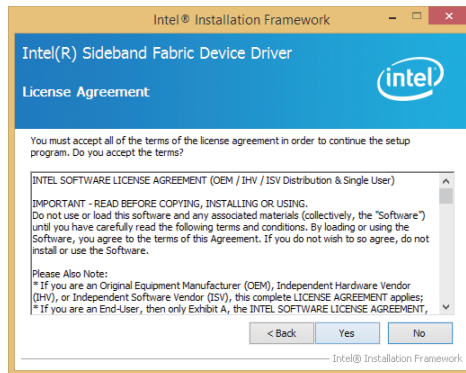
3. The step performs setup operations. Click "Next" to continue.
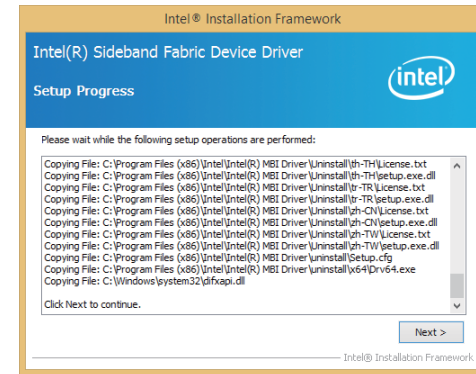
4. Click "Finish" to restart the computer when the setup is completely installed.
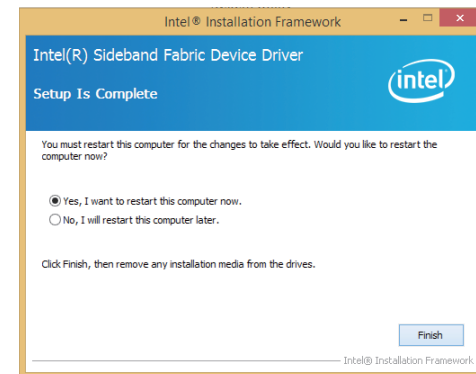
HW Utility

HW Utility provides information about the board, HW Health, W atchdog, DIO, and Backlight. To access the utilit y, click "HW Utilit y" on the main menu.

Note:
If you are using Windows 7 , you need to access the oper ating system as an administrator to be able to install the utilit y.

1. Setup is ready to install the HW Utility drifer. Click Next.

2. Click "I accept the terms in the license agreement" and then click Next.
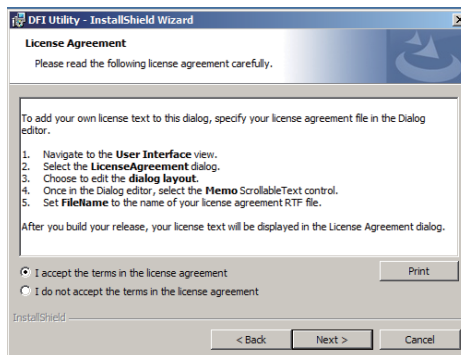
3. Click Install to begin the installation.
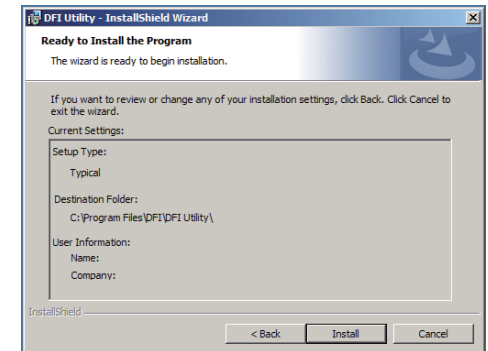
4. After completing installation, click Finish.

65
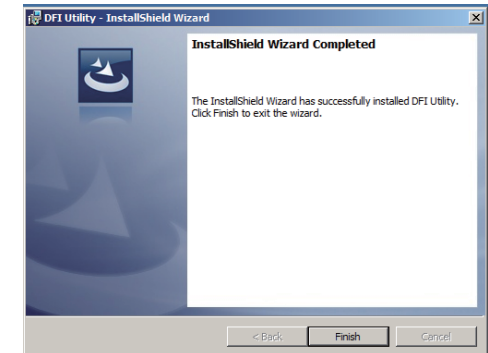
The HW Utility icon will appear on the desktop . Double-click the icon to open the utilit y.

Information

HW Health Set

HW Health

WatchDog

DIO

Backlight

eGalax Touch (Resistive Touch Panel)

To install the driver, click "eGalax Touch (Resistive Touch Panel)" on the main menu.

1. Click "Next" to install eGalax Touch on your computer.

2. Read the license agreement and click "I accept the terms of the license agreement." Then, click "Next".
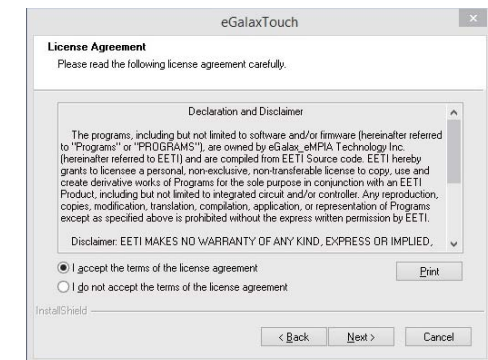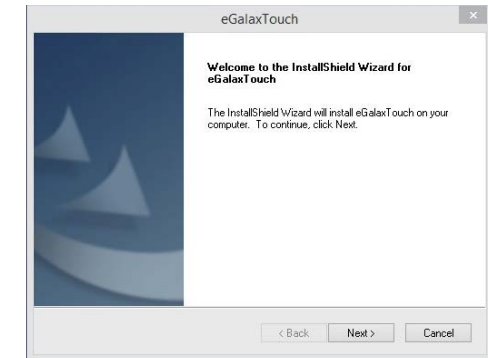
3. Select the setup type and click "Next".

67
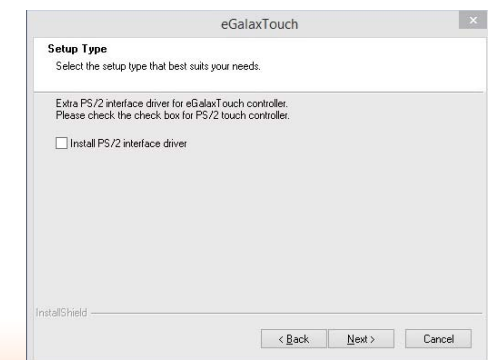
4. Select the setup t ype and click "Next".

5. Click "OK" to continue the installa-tion procedure.

6. Select the setup t ype and click "Next".
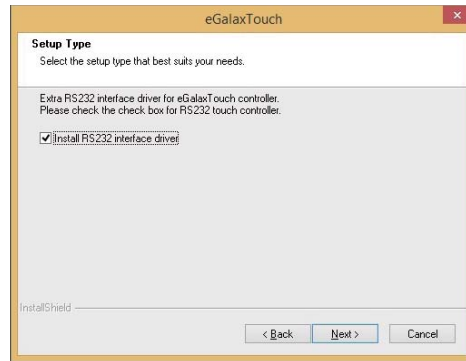
7. Select the f older where the setup will install files and click "Next."

8. Select a progr am folder and click "Next."
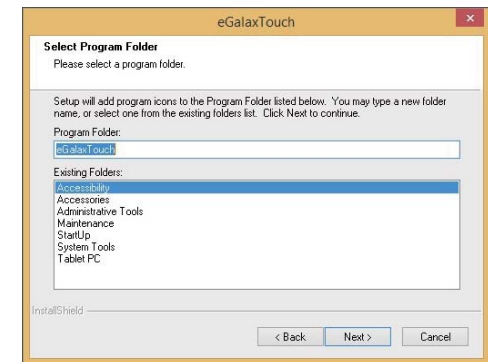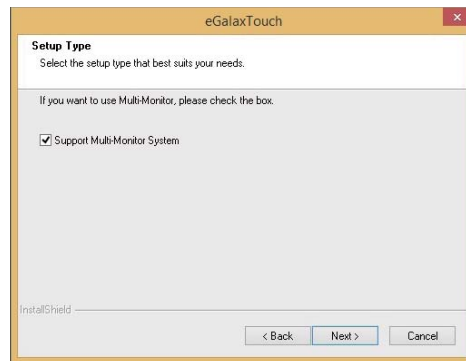
9. Select the setup t ype and click "Next".

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10. Select the setup t ype and click "Next ".
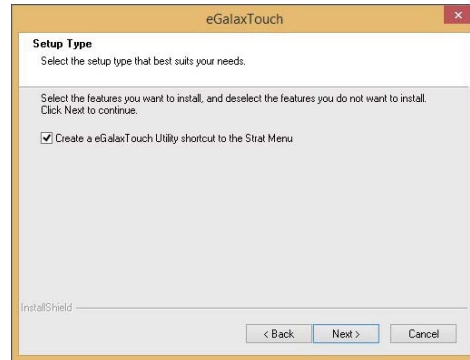
11. After completing the installation, the USB controller will displa y on your computer.
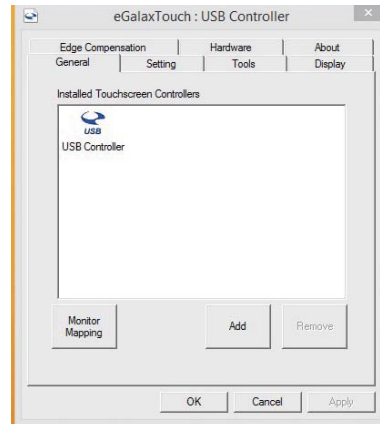
Intel USB 3.0 Drivers (For Windows 7 Only)

To install the driv er, click "Intel USB 3.0 Driv er" on the main menu.

1. Setup is ready to install the driv er. Click Next.
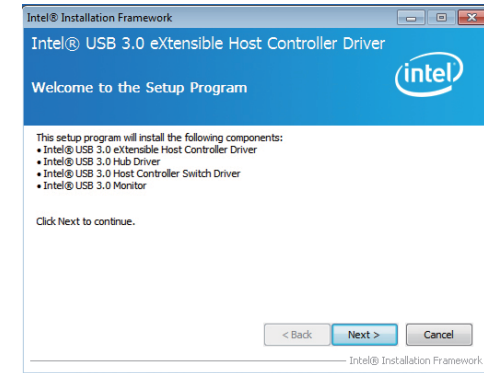
2. Read the license agreement then click Yes.
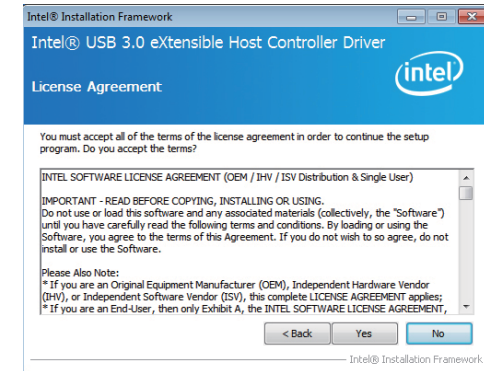
3. Go through the readme document for more installation tips then click Next.
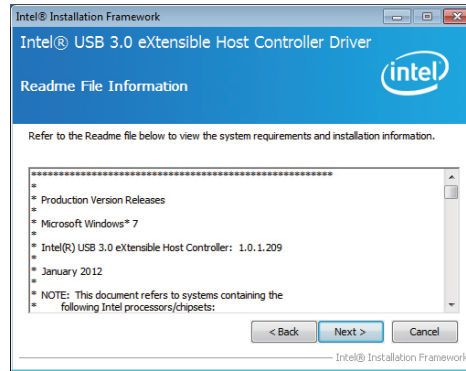
4. Setup is currently installing the driver. After installation has completed, click Next.
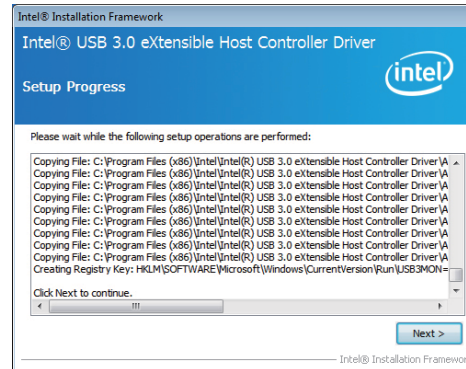
5. After completing installation, click Finish.

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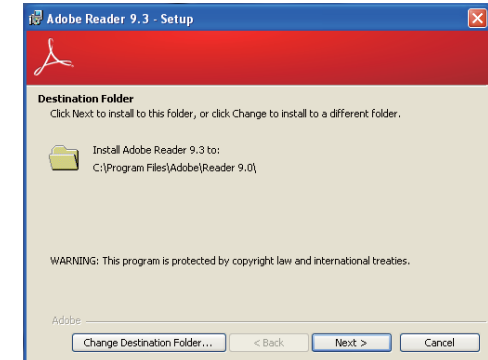
2. Click Install to begin installation.
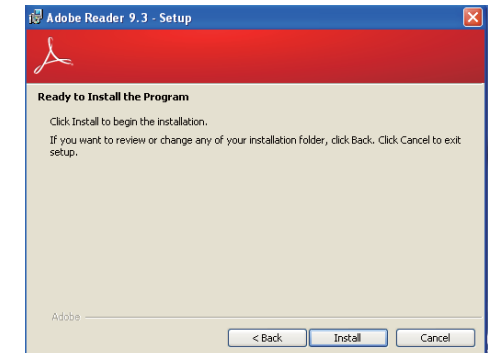
3. Click Finish to exit installation.

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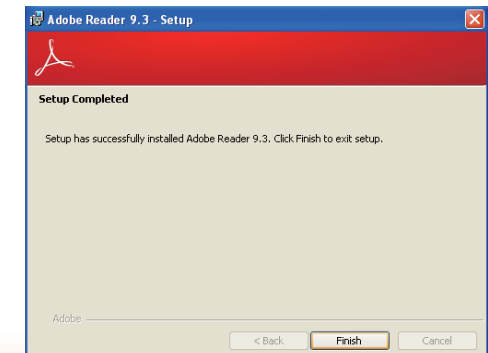
Chapter 9 - Digital I/O Programming Guide

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

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

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

    //Pin0-7 Input/Output Conf guration
    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

```
#def ne SLAVE_ADDR          0x42
#def ne INPUT_PORT          0x00
#def ne OUTPUT_PORT         0x01
#def ne INVERSION_PORT      0x02
#def ne 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

```
#def ne SLAVE_ADDR          0x42
#def ne INPUT_PORT          0x00
#def ne OUTPUT_PORT         0x01
#def ne INVERSION_PORT      0x02
#def ne 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 Con f guration mode
;--------------------------------------------
MOV        DX,2EH
MOV        AL,87H
OUT        DX,AL
OUT        DX,AL


;-----------------------------------------------------------------------------------
;(2) Con f guration Logical Device 7  , register CRF5/CRF6 (WD  T Control /WD  T
timer)
;-----------------------------------------------------------------------------------
MOV DX,2EH
MOV        AL,07H            ;Ready to Program Logical Device
OUT DX,AL

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

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

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

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

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

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

Appendix B - System Error Message

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

Error Messages

One or more of the f ollowing messages ma y be displa yed if the BIOS detects an error during the POST. This list indicates the error messages f or all Aw ards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS bat tery is no longer f unctional. It should be replaced.

> **Important**:
> Danger of explosion if bat tery incorrectly replaced. R eplace only with the same or equivalent type recommended by the manuf acturer. Dispose of used bat teries accord-ing to the bat tery 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 bat tery. Check the bat tery and replace if necessary .

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color . This indi-cates the switch is set to a dif ferent setting than indicated in Setup . Determine which set ting is correct, either turn of f the system and change the jumper or enter Setup and change the VIDEO selection.

Standard Status Codes

PEI Status Codes

0x11	Pre-memory CPU initialization is started
0x15	Pre-memory North Bridge initialization is started
0x19	Pre-memory South Bridge initialization is started
0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).

PEI Error Codes

0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected

DXE Phase Codes

0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xAE	Legacy Boot event
0xB4	USB hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)

DXE Error Codes

0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password

ACPI Checkponts

0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Beep Code

6 beeps	Flash update is failed

Appendix C - Troubleshooting Checklist

Troubleshooting Checklist

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

Some of the most common things to check when y ou encounter problems while using y our system are listed below.

1. The power switch of each peripher al device is turned on.

2. All cables and power cords are tightly connected.

3. The electrical outlet to which y our peripheral devices are connected is working. T est the outlet by plugging in a lamp or other electrical device.

4. The monitor is turned on.

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

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

7. Any add-in board y ou have installed is designed f or 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 at tached 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 at tached to the monitor and the system' s display adapter.

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

The picture seems to be constantly moving.

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

2. Move away any objects, such as another monitor or f an, that may be creating a magnetic field around the displa y.

3. Make sure y our 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 ma y need to be turned of f. Fluorescent lights adjacent to the monitor ma y also cause screen w avering.

Power Supply

When the computer is turned on, nothing happens.

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

2. Make sure that the v oltage selection switch on the back panel is set f or the correct t ype of voltage you are using.

3. The power cord ma y 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 f ormatted. Format the diskette and try again.

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

3. You may be writing to the wrong driv e. Check the path statement to mak e sure y ou are writing to the targeted driv e.

4. There is not enough space left on the disk ette. Use another disk ette with adequate stor age space.

Hard Drive

Hard disk failure.

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

2. If the system is configured with two hard driv es, make sure the bootable (first) hard driv e is configured as Master and the second hard driv e is configured as Sla ve. The master hard drive must ha ve an active/bootable partition.

Excessively long formatting period.

If your hard driv e takes an ex cessively long period of time to f ormat, it is lik ely a cable con-nection problem. Howev er, if y our hard driv e has a large capacit y, it will tak e 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 at tached serial device works by at taching 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 ma y be due to the onboard I/O or the address set ting.

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

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the k eyboard is properly connected.

2. Make sure there are no objects resting on the keyboard and that no k eys are pressed dur -ing 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 of f the system, re-install the card and power up the system.

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

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

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

5. If the board f ails to f unction, place the board on a flat surf ace and seat all sock eted com-ponents. Gently press each component into the sock et.

6. If you made changes to the BIOS set tings, re-enter setup and load the BIOS def aults.