MODEL:

IMBA-Q670

ATX LGA1155 Motherboard for Intel® Core™ i7/i5/i3 Quad/Dual Core CPU, Intel® Q67 Chipset, DDR3, VGA/DVI/HDMI, Dual Intel® PCIe GbE, Intel® AMT 7.0 Support, Two USB 3.0 Ports, Five COM Ports, Two SATA 6Gb/s Ports and RoHS

User Manual

Rev. 3.01 – 21 April, 2014

RoHS Lead Free

Revision

Date	Version	Changes
21 April, 2014	3.01	Modified Table 3-23: LAN Pinouts
9 December, 2013	3.00	Updated for R30 version.
1 October, 2012	2.10	Updated for R21 version.
24 February, 2012	2.01	Modified Table 3-16: RS-422/485Connector Pinouts
9 September, 2011	2.00	Modified for R20 version
16 August, 2011	1.02	Modified Section 4.3.1: AT/ATX Power Select Jumper Added Section 4.6: Intel® AMT Setup Procedure Added Chapter 6: Software Drivers
30 June, 2011	1.01	Modified Section 4.2.2 Socket LGA1155 Cooling Kit Installation warning
25 May, 2011	1.00	Initial release

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TRADEMARKS

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Introduction

1.1 Introduction

Figure 1-1: IMBA-Q670

The IMBA-Q670 is an ATX motherboard. It accepts a Socket LGA1155 Intel® Core™ i3/i5/i7 processor and supports four 240-pin 1333/1066 MHz dual-channel DDR3 DIMM modules up to 16.0 GB maximum. The IMBA-Q670 includes a VGA, HDMI, and DVI-D port. Expansion and I/O include four PCI card slots, one PCIe x16 card slot, one PCIe x4 card slot, one PCIe x1 slot, two USB 3.0 ports on the rear panel by ASMedia ASM1042, four USB 2.0 by rear panel, eight USB 2.0 by pin header, four SATA 3Gb/s connectors, two SATA 6Gb/s connectors, six COM ports, and two keyboard/mouse connectors.

1.2 Benefits

Some of the IMBA-Q670 motherboard benefits include:

- Powerful graphics with multiple monitors
- Staying connected with both wired LAN connections
- Speedy running of multiple programs and applications

1.3 Features

Some of the IMBA-Q670 motherboard features are listed below:

- ATX form factor
- RoHS compliant
- LGA1155 CPU socket
- Four PCI card expansion slots
- One PCIe x16 card expansion slot
- One PCIe x4 card expansion slot
- One PCIe x1 card expansion slot
- Supports four dual-channel DDR3 DIMMs
- One external RS-232 serial port
- Four internal RS-232 serial port connectors
- One internal RS-422/485 serial port connector
- Two Intel® PCIe Gigabit Ethernet connectors (LAN2 with Intel® AMT 7.0 support)
- Four SATA 3Gb/s connectors
- Two SATA 6Gb/s connectors
- High Definition audio
- Intel® Q67 Chipset

1.4 Connectors

The connectors on the IMBA-Q670 are shown in the figure below.
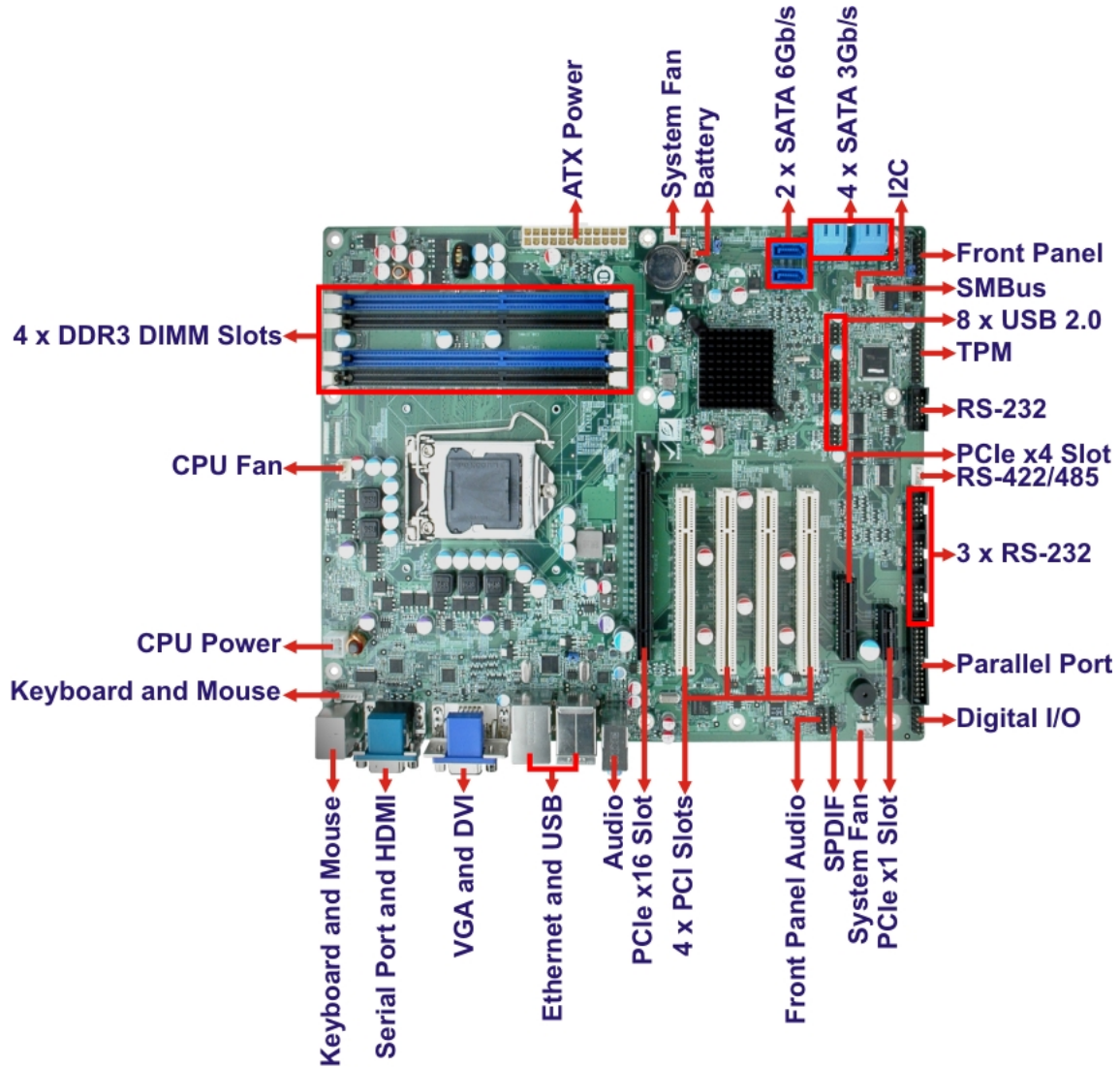
Figure 1-2: Connectors

1.5 Dimensions

The main dimensions of the IMBA-Q670 are shown in the diagram below.
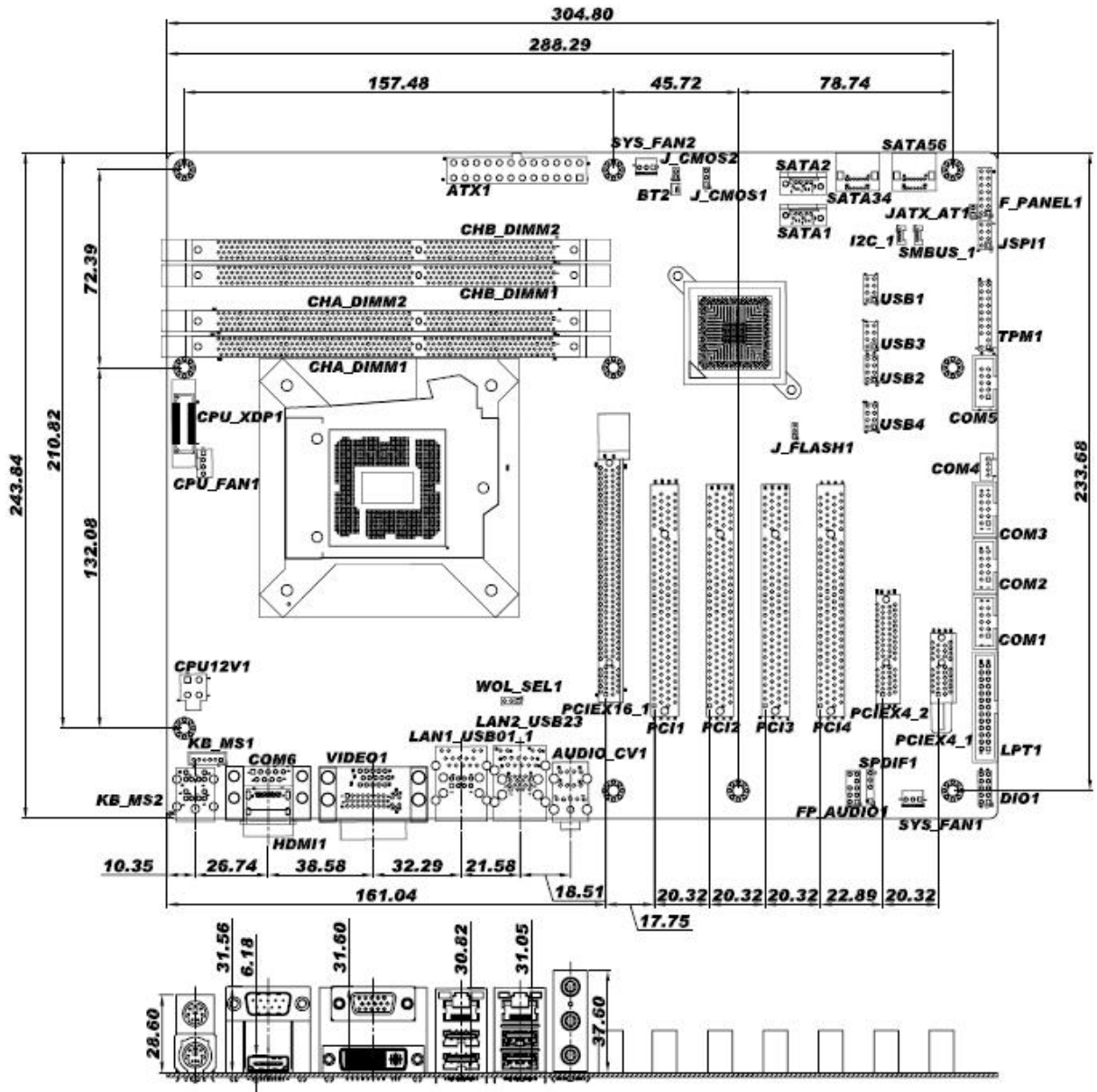
Figure 1-3: IMBA-Q670 Dimensions (mm)

1.6 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.
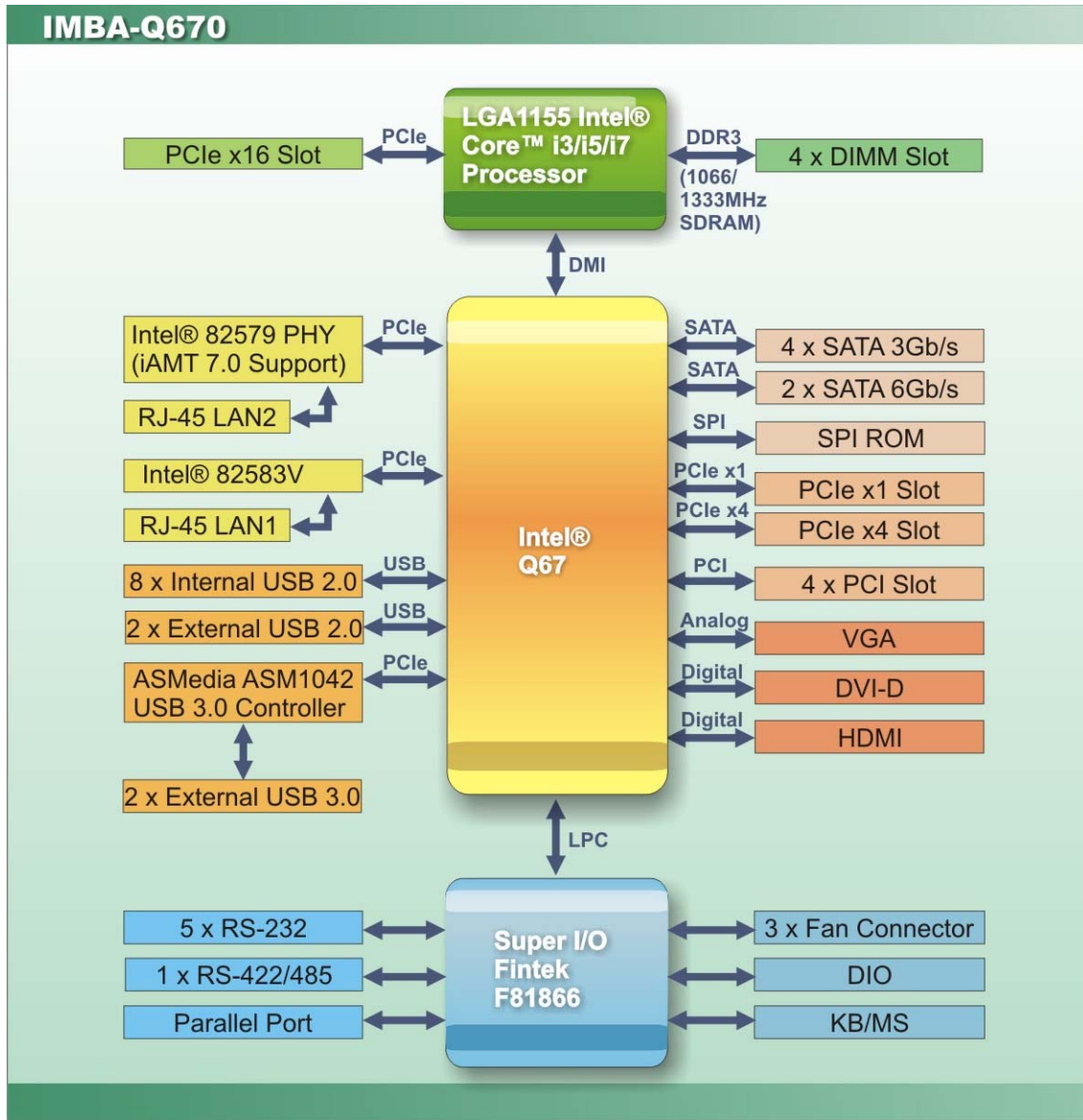
Figure 1-4: Data Flow Diagram

1.7 Technical Specifications

IMBA-Q670 technical specifications are listed below.

Specification/Model	IMBA-Q670
Form Factor	ATX
CPU Supported	LGA1155 Intel® Core™ i7/i5/i3 quad/dual core CPU
Chipset	Intel® Q67
Integrated Graphics	Supports DirectX 10.1/OpenGL 3.0 Full MPEG2, VC1, AVC Decode
Memory	Four 240-pin 1333/1066 MHz dual-channel DDR3 SDRAM unbuffered DIMMs support (system max. 16.0 GB)
Graphic Engine	Support for DX10.1 and OpenGL3.0 Full MPEG2, VC1, AVC Decode
Audio	Realtek ALC662 HD Audio codec (Line-in, Line-out, Mic)
BIOS	UEFI BIOS
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	Intel® 82583V PCIe Ethernet controller Intel® 82579 PHY with Intel® AMT 7.0 support (LAN2)
Super I/O Controller	Fintek F81866
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCI	Four PCI slots
PCIe	One PCIe x4 slot One PCIe x1 slot One PCIe x16 slot
I/O Interface Connectors	
Audio Connectors	Three external audio jacks (line-in, line-out, mic-in) One internal front panel audio connector (10-pin header)

Specification/Model	IMBA-Q670
Display port	One VGA Integrated in the Intel® Q67 One HDMI Integrated in the Intel® Q67 One DVI-D Integrated in the Intel® Q67
Ethernet	Two RJ-45 GbE ports
Keyboard/Mouse	Dual PS/2 port One internal keyboard and mouse connector via 6-pin wafer
TPM	One via 20-pin header
Serial Ports	One external RS-232 serial port Four RS-232 via internal box headers One RS-422/485 via internal 4-pin wafer
Parallel Port	One parallel port via internal 26-pin box header
USB ports	Two external USB 3.0 ports on rear IO by ASMedia ASM1042 Two external USB 2.0 ports on rear IO Eight internal USB 2.0 ports by four pin headers
Serial ATA	Four SATA 3Gb/s channels with 3Gb/s data transfer rates Two SATA 6Gb/s channels with 6Gb/s data transfer rates
Environmental and Power Specifications	
Power Supply	ATX power supported
Power Consumption	3.3V@1.65A, 5V@6.31A , 12V@0.18A, Vcore@7.88A, 5VSb@0.15 (3.10 GHz Intel® Core™ i5 2400 CPU with four 1333 MHz 4GB DDR3 memory)
Operating temperature	-10ºC ~ 60ºC
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	244 mm x 305 mm
Weight GW/NW	1200 g / 700 g

Table 1-1: IMBA-Q670 Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions

⚠ WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband**: Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding**: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad**: When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB**: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the IMBA-Q670 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

> ![NOTE icon] **NOTE:**
>
> If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-Q670 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.tw.

The IMBA-Q670 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-Q670 motherboard	
4	SATA cable (**P/N**: 32000-062800-RS)	
1	I/O shielding (**P/N**: 45014-0028C0-01-RS)	
1	Mini jumper pack (2.54mm) (**P/N**: 33101-000656-RS)	
1	Utility CD	
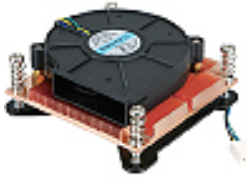
Quantity	Item and Part Number	Image
1	One Key Recovery CD (P/N: IEI-7B000-000478-RS)	
1	Quick Installation Guide	

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Dual ports USB cable with bracket (**P/N**: 19800-003100-300-RS)	
SATA Power Cable (**P/N**: 32102-000100-100-RS)	
LGA1155/LGA1156 cooler kit (1U Chassis compatible, 73W) (**P/N**: CF-1156A-RS-R11)	
LGA1155/LGA1156 cooler kit (45W) (**P/N**: CF-1156C-RS)	
LGA1155/LGA1156 cooler kit (65W) (**P/N**: CF-1156D-RS)	

Item and Part Number	Image
LGA1155/LGA1156 cooler kit (95W) (**P/N**: CF-1156E-R11)	
RS-422/485 cable (**P/N**: 32205-003800-300-RS)	
Parallel port cable (**P/N**: 19800-000049-RS)	
Dual RS-232 cable (**P/N**: 19800-000051-RS)	
20-pin Infineon TPM module, S/W management tool (**P/N**: TPM-IN01-R11)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 IMBA-Q670 Layout

The figures below show all the connectors and jumpers.
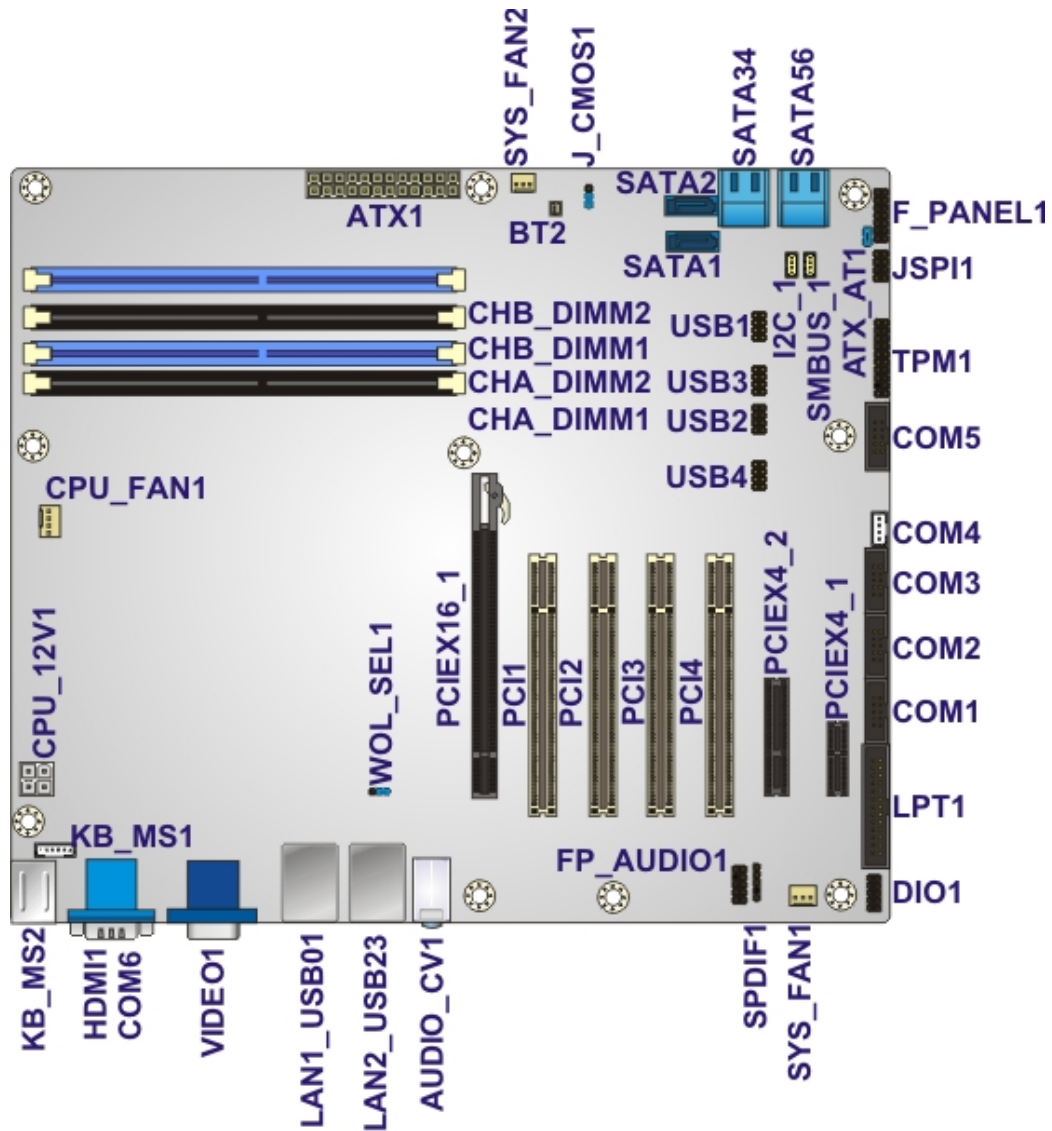
Figure 3-1: Connectors and Jumpers

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX Power connector	24-pin ATX	ATX1
Battery connector	2-pin wafer	BT2
Battery holder	CR2032 battery holder	BAT1
CPU power connector	4-pin Molex	CPU12V1
DDR3 DIMM slots	DDR3 DIMM slot	CHA_DIMM1 CHA_DIMM2 CHB_DIMM1 CHB_DIMM2
Digital I/O	10-pin header	DIO1
Fan connector (system 1)	3-pin wafer	SYS_FAN1
Fan connector (system 2)	3-pin wafer	SYS_FAN2
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Front panel audio connector	10-pin header	FP_AUDIO1
Front panel connector	14-pin header	F_PANEL1
I2C connector	4-pin wafer	I2C_1
Keyboard and mouse connector	6-pin wafer	KB_MS1
Parallel port connector	26-pin box header	LPT1
PCI slots	PCI slots	PCI1, PCI2, PCI3, PCI4
PCIe x1 slot	PCIe x4 slot	PCIEX4_1
PCIe x4 slot	PCIe x4 slot	PCIEX4_2
PCIe x16 slot	PCIe x16 slot	PCIEX16_1
SATA 3Gb/s drive connector	14-pin SATA connector	SATA34, SATA56
SATA 6Gb/s drive connector	7-pin SATA connector	SATA1, SATA2

Connector	Type	Label
Serial port, RS-422/485	4-pin wafer	COM4
Serial port, RS-232	10-pin box header	COM1, COM2, COM3, COM5
SMBus connector	4-pin wafer	SMBUS_1
SPDIF connector	5-pin header	SPDIF1
SPI ROM connector	8-pin header	JSPI1
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB1, USB2, USB3, USB4

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Audio connector	Audio jack	AUDIO_CV1
Ethernet and USB 2.0 ports	RJ-45, USB	LAN1_USB01
Ethernet and USB 3.0 ports	RJ-45, USB	LAN2_USB23
HDMI connector	HDMI port	HDMI1
Keyboard and mouse connector	Dual PS/2	KB_MS2
Serial Port connector	9-pin male D-sub 9	COM6
VGA and DVI connector	15-pin female, 24-pin header	VIDEO1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IMBA-Q670.

3.2.1 ATX Power Connector

CN Label:	**ATX1**
CN Type:	24-pin ATX
CN Location:	See **Figure 3-2**
CN Pinouts:	See **Table 3-3**

The ATX power connector connects to an ATX power supply.
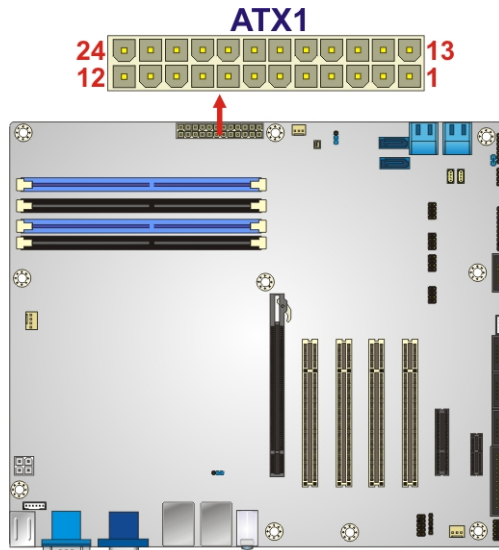
Figure 3-2: ATX Power Connector Pinout Location

Pin	Description	Pin	Description
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON-
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND

Pin	Description	Pin	Description
8	NC	20	NC
9	+5V	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 3-3: ATX Power Connector Pinouts

3.2.2 Battery Connectors

![Caution icon] **CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label: **BAT1, BT2**

CN Type: Battery holder and 2-pin wafer

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.
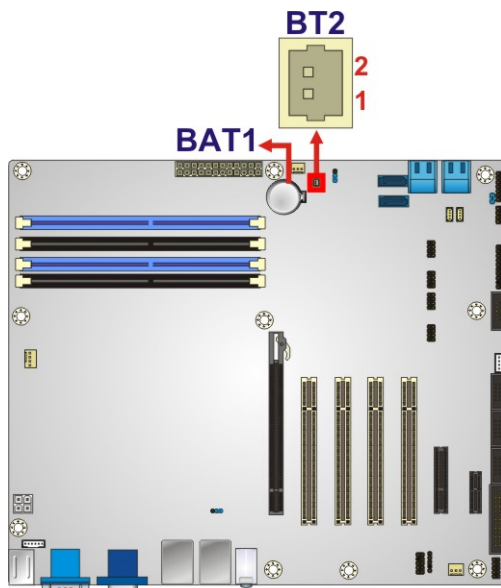
Figure 3-3: Battery Connector Locations

Pin	Description
1	GND
2	Battery+

Table 3-4: Battery Connector (BT2) Pinouts

3.2.3 CPU Power Connector

CN Label: **CPU12V1**

CN Type: 4-pin Molex

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

The CPU power input connector provides power to the CPU.
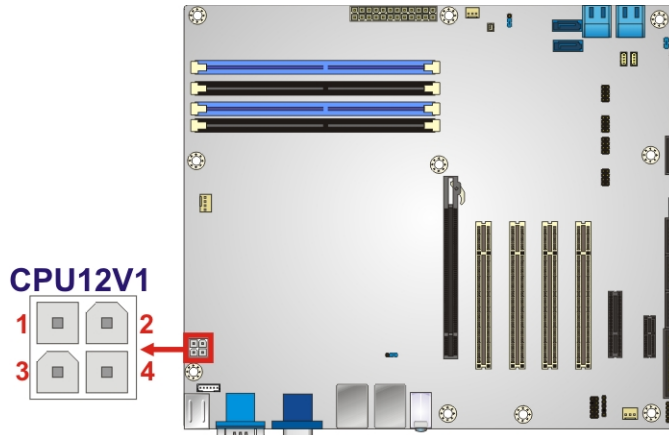
Figure 3-4: CPU Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 3-5: CPU Power Connector Pinouts

3.2.4 DDR3 DIMM Slots

CN Label:　　CHA_DIMM1, CHA_DIMM2, CHB_DIMM1, CHB_DIMM2

CN Type:　　DDR3 DIMM slot

CN Location:　See **Figure 3-5**

The DIMM slots are for DDR3 DIMM memory modules.
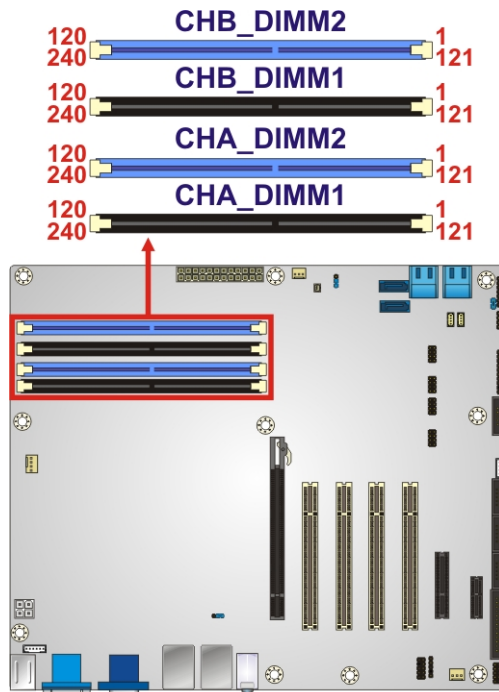
Figure 3-5: DDR3 DIMM Slot Locations

3.2.5 Digital I/O Connector

CN Label: DIO1

CN Type: 10-pin header

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-6**

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.
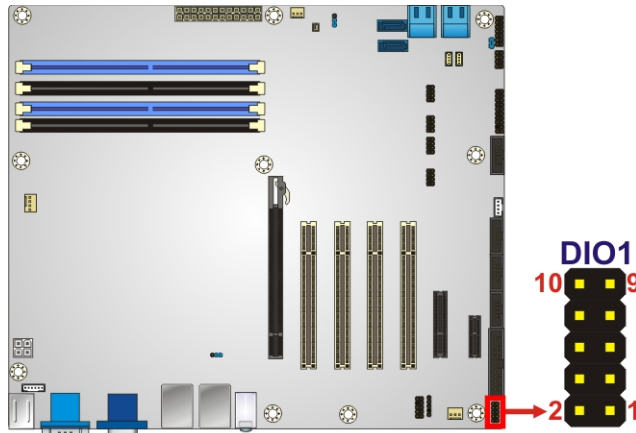
Figure 3-6: Digital I/O Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-6: Digital I/O Connector Pinouts

3.2.6 Fan Connector (CPU)

CN Label:	**CPU_FAN1**
CN Type:	4-pin wafer
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-7**

The fan connector attaches to a CPU cooling fan.
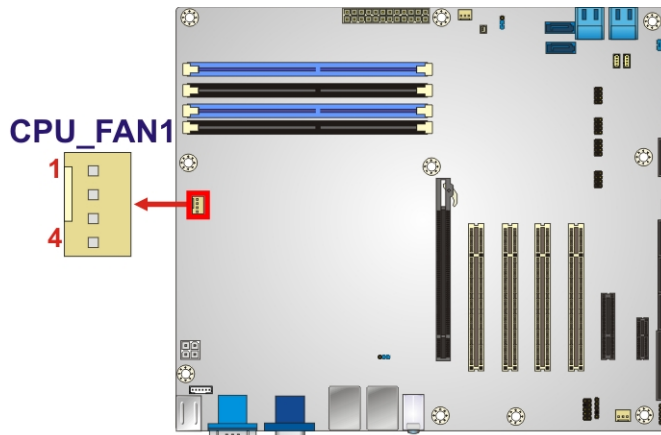
Figure 3-7: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12 V
3	FANIO1
4	PWM

Table 3-7: CPU Fan Connector Pinouts

3.2.7 Fan Connector (System)

CN Label: **SYS_FAN1, SYS_FAN2**

CN Type: 3-pin wafer

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The fan connector attaches to a cooling fan.
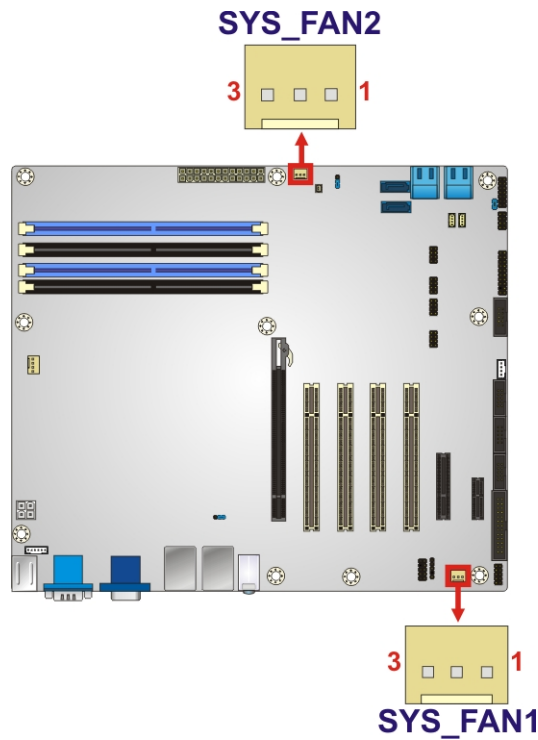
Figure 3-8: System Fan Connector Locations

PIN NO.	DESCRIPTION
1	FANIO
2	+12 V (PWM)
3	GND

Table 3-8: System Fan Connector Pinouts

3.2.8 Front Panel Audio Connector

CN Label: FP_AUDIO1

CN Type: 10-pin header

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-9**

This connector connects to speakers, a microphone and an audio input.
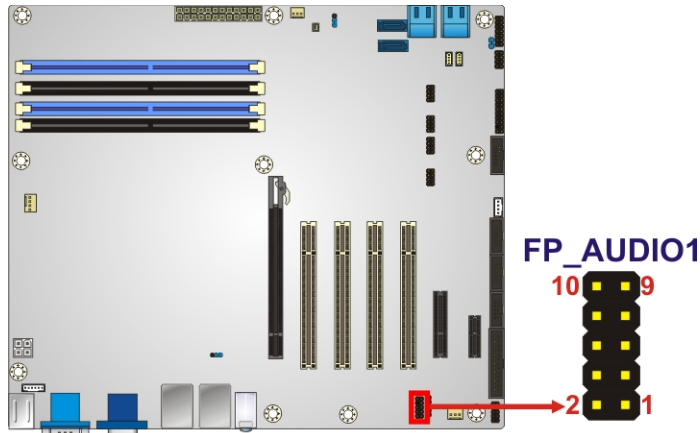
Figure 3-9: Front Panel Audio Connector Location

Pin	Description	Pin	Description
1	LMIC2_L	2	AUD GND
3	LMIC2_R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	F_SENSE	8	NC
9	LLINE2-L	10	LINE2-JD

Table 3-9: Front Panel Audio Connector Pinouts

3.2.9 Front Panel Connector

CN Label: F_PANEL1

CN Type: 14-pin header

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-10**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.
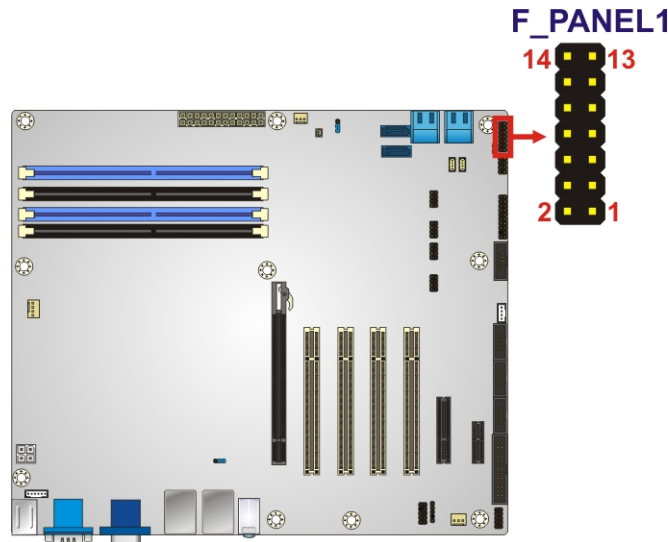
Figure 3-10: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	ACPILED	Speaker	2	Beep Power
	3	NC		4	NC
	5	GND		6	NC
Power Button	7	PWRBT_SW#_C		8	PC Beep
	9	GND	Reset	10	NC
HDD LED	11	HDDLED		12	EXTRST-
	13	HDDLED-		14	GND

Table 3-10: Front Panel Connector Pinouts

3.2.10 I2C Connector

CN Label:	**I2C_1**
CN Type:	4-pin wafer
CN Location:	See **Figure 3-11**
CN Pinouts:	See **Table 3-11**

The I2C connector is for system debug.
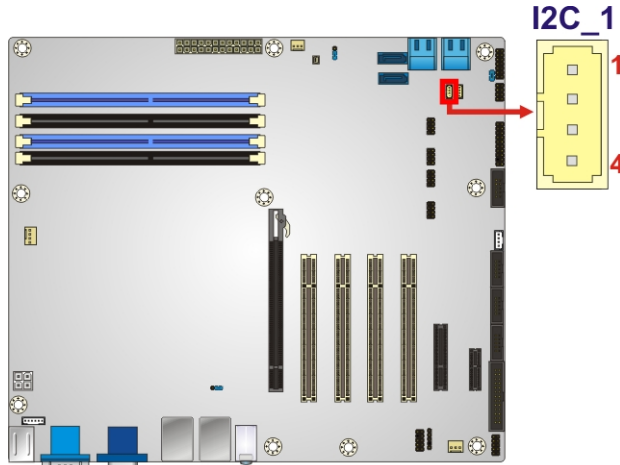
Figure 3-11: I2C Connector Location

Pin	Description
1	+5V_DUAL
2	PCH_GP38_PU
3	PCH_GP39_PU
4	GND

Table 3-11: I2C Connector Pinouts

3.2.11 Keyboard/Mouse Connector

CN Label: **KB_MS1**

CN Type: 6-pin wafer

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-12**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.
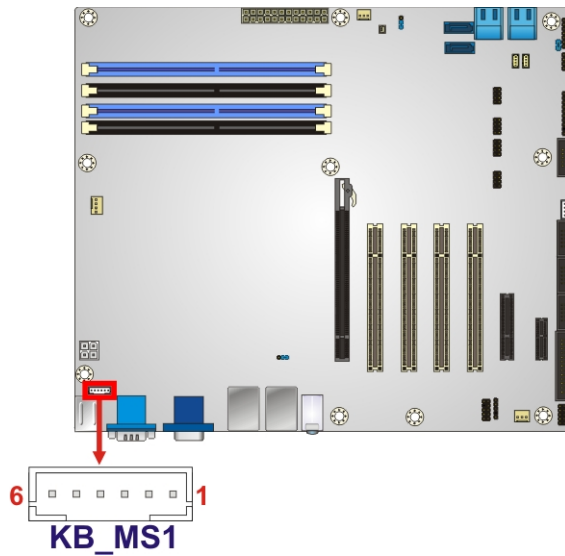
Figure 3-12: Keyboard/Mouse Connector Location

Pin	Description
1	+5 V KB DATA
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 3-12: Keyboard/Mouse Connector Pinouts

3.2.12 Parallel Port Connector

CN Label: **LPT1**

CN Type: 26-pin box header

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-13**

The parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.
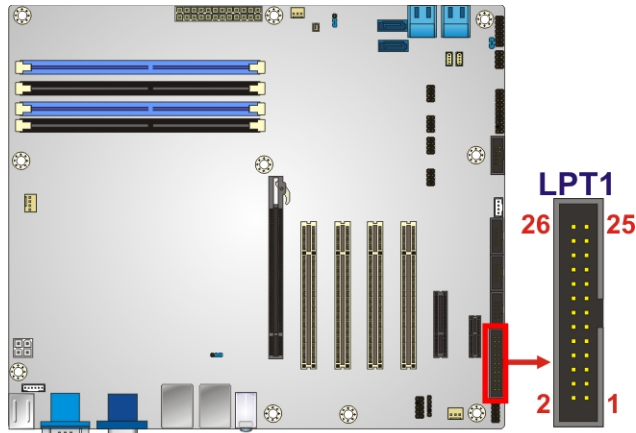
Figure 3-13: Parallel Port Connector Location

Pin	Description	Pin	Description
1	RSTROBE#	2	RPD0
3	RPD1	4	RPD2
5	RPD3	6	RPD4
7	RPD5	8	RPD6
9	RPD7	10	SIO_ACK#
11	SIO_BUSY	12	SIO_PE
13	SIO_SLCT	14	SIO_AFD#
15	SIO_ERR#	16	SIO_INIT#
17	SIO_SLIN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	NC

Table 3-13: Parallel Port Connector Pinouts

3.2.13 PCI Slots

CN Label: **PCI1, PCI2, PCI3, PCI4**

CN Type: PCI Slot

CN Location: See **Figure 3-14**

The PCI slot enables a PCI expansion module to be connected to the board.
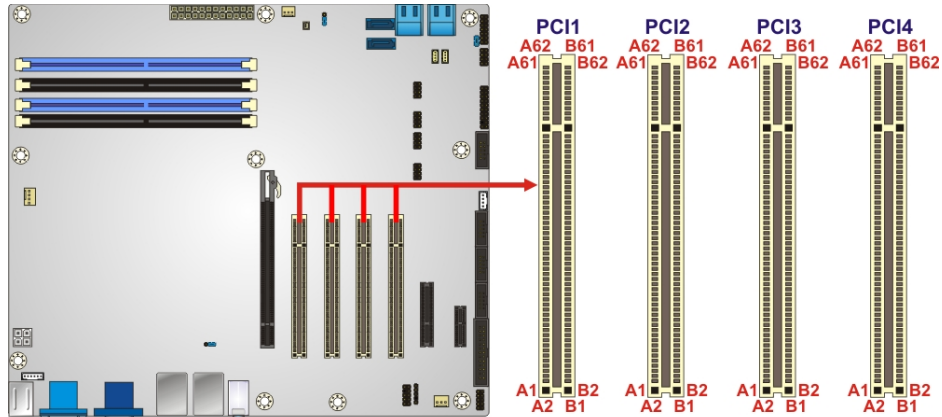
Figure 3-14: PCI Slot Locations

3.2.14 PCIe x1 Slot

CN Label:	**PCIEX4_1**
CN Type:	PCIe x1 slot
CN Location:	See **Figure 3-18**

The PCIe x1 slot provides PCIe x1 signal for PCIe expansion cards.
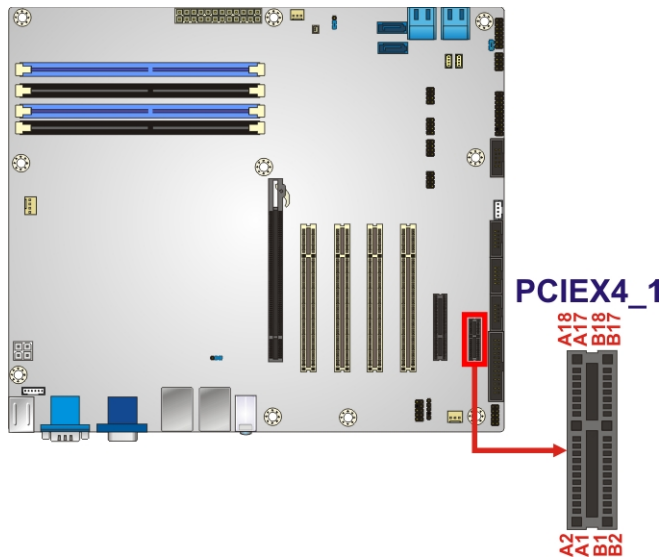
Figure 3-15: PCIe x1 Slot Location

3.2.15 PCIe x4 Slot

CN Label: **PCIEX4_2**

CN Type: PCIe x4 slot

CN Location: See **Figure 3-18**

The PCIe x4 slot is for PCIe x4 expansion cards.
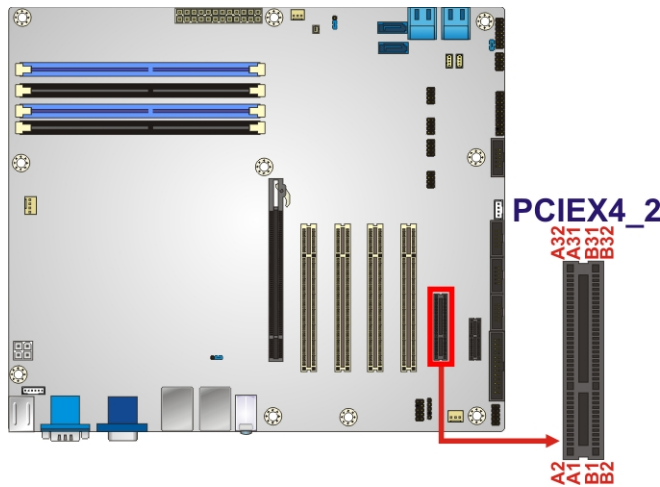
Figure 3-16: PCIe x4 Slot Location

3.2.16 PCIe x16 Slot

CN Label: **PCIEX16_1**

CN Type: PCIe x16 slot

CN Location: See **Figure 3-17**

The PCIe x16 expansion cards slot is for PCIe x16 expansion cards.
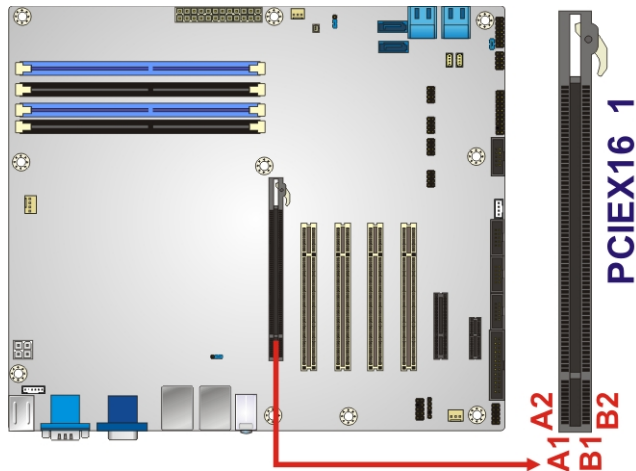
Figure 3-17: PCIe x16 Slot Location

3.2.17 SATA 3Gb/s Drive Connector

CN Label: **SATA34, SATA56**

CN Type: 14-pin SATA connector

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-14**

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.
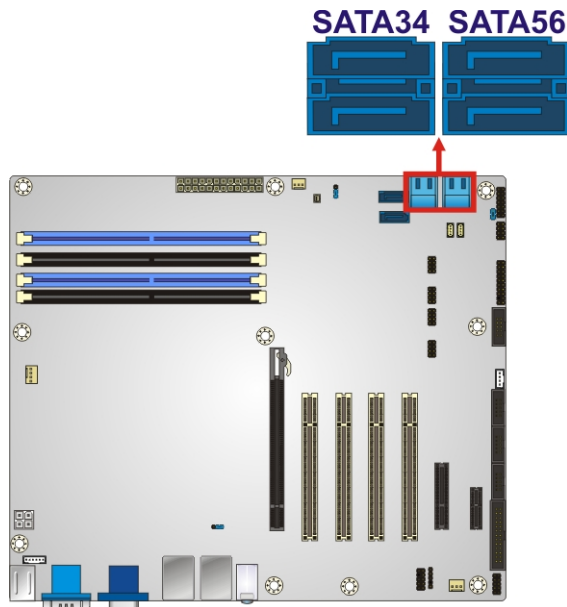
Figure 3-18: SATA 3Gb/s Drive Connector Location

Pin	Description	Pin	Description
1	GND	8	GND
2	SATATXP_A	9	SATATXP_B
3	SATATXN_A	10	SATATXN_B
4	GND	11	GND
5	SATARXN_A	12	SATARXN_B
6	SATARXP_A	13	SATARXP_B
7	GND	14	GND

Table 3-14: SATA 3Gb/s Drive Connector Pinouts

3.2.18 SATA 6Gb/s Drive Connector

CN Label: **SATA1, SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-15**

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

SATA2

SATA1
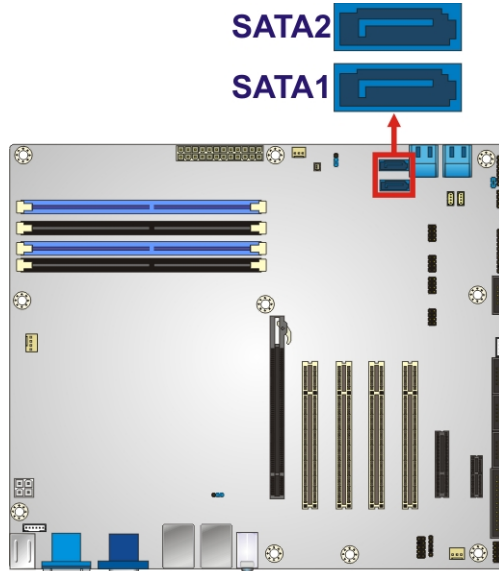
Figure 3-19: SATA 6Gb/s Drive Connector Location

Pin	Description
1	GND
2	SATATXP
3	SATATXN
4	GND
5	SATARXN
6	SATARXP
7	GND

Table 3-15: SATA 6Gb/s Drive Connector Pinouts

3.2.19 Serial Port Connector, RS-422/485

CN Label: COM4

CN Type: 4-pin wafer

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-16**

![yellow star icon] **NOTE:**

> These pins are shared with those on the main serial port. Use either the pins on the main connector, or on this connector, but not both.

This connector provides RS-422 or RS-485 communications.
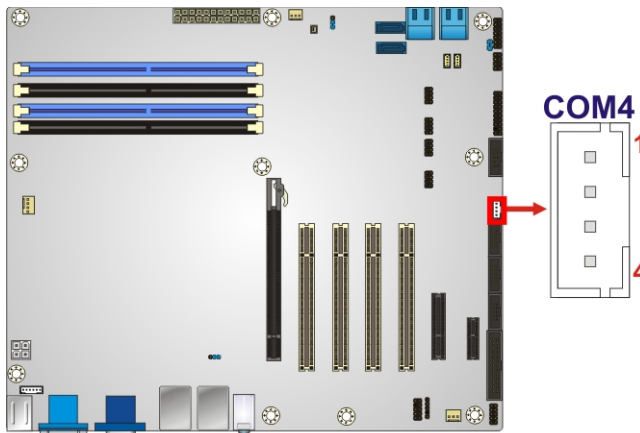
Figure 3-20: RS-422/485 Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	3	TXD485+
2	RXD485+	4	TXD485#

Table 3-16: RS-422/485Connector Pinouts

3.2.20 Serial Port Connectors, RS-232

CN Label:	**COM1, COM2, COM3, COM5**
CN Type:	10-pin box header
CN Location:	See **Figure 3-21**
CN Pinouts:	See **Table 3-17**

Each of these connectors provides RS-232 connections.
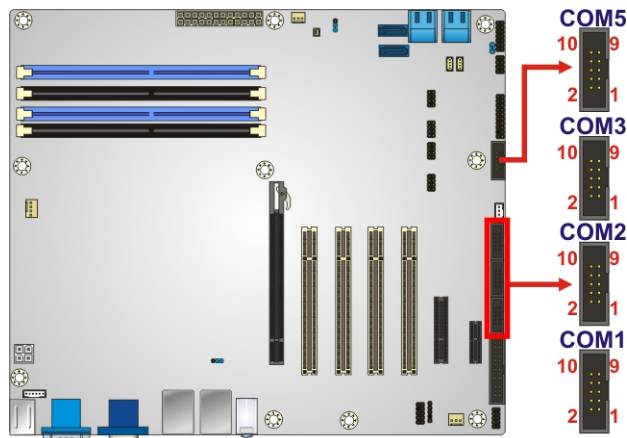
Figure 3-21: Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	-NDCD1	6	-NCTS1
2	-NDSR1	7	-NDTR1
3	NSIN1	8	-XRI1
4	-NRTS1	9	GND
5	NSOUT1	10	GND

Table 3-17: Serial Port Connector Pinouts

3.2.21 SMBus Connector

CN Label: SMBUS_1

CN Type: 4-pin wafer

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-18**

The SMBus (System Management Bus) connector provides low-speed system management communications.
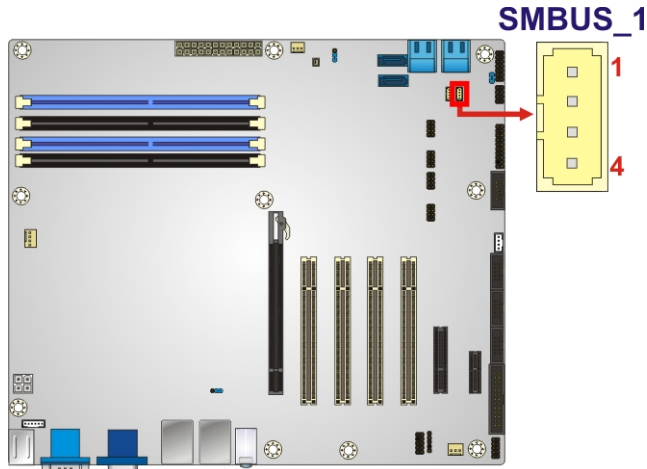
Figure 3-22: SMBus Connector Location

Pin	Description
1	+5V_DUAL
2	SMBCLK
3	SMBDATA
4	GND

Table 3-18: SMBus Connector Pinouts

3.2.22 SPDIF Connector

CN Label: SPDIF1

CN Type: 5-pin header

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-19**

Use the SPDIF connector to connect digital audio devices to the system.
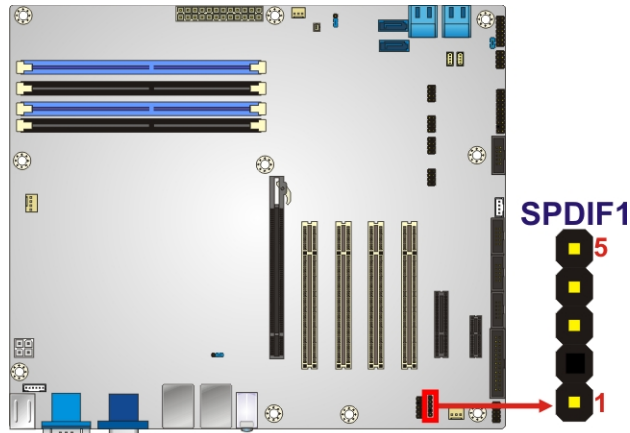
Figure 3-23: SPDIF Connector Location

PIN	DESCRIPTION
1	+5V
2	NC
3	SPDIFOUT
4	GND
5	SPDIFIN

Table 3-19: SPDIF Connector Pinouts

3.2.23 SPI ROM Connector

CN Label:	JSPI1
CN Type:	8-pin header
CN Location:	See **Figure 3-8**
CN Pinouts:	See **Table 3-8**

The SPI connector is used to flash the BIOS.
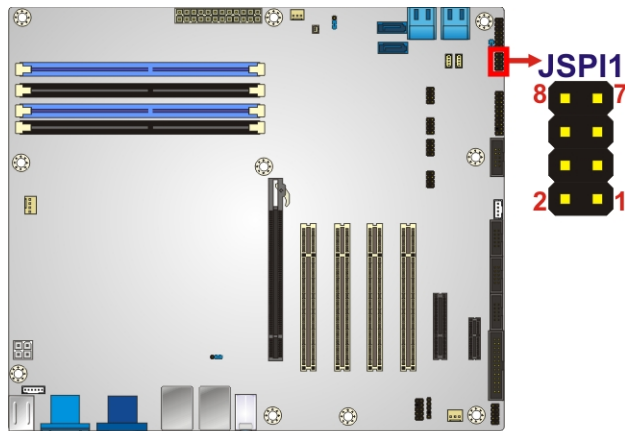
Figure 3-24: SPI Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SPI_CS0	4	SPI_CLK
5	SPI_SO0	6	SPI_SI
7	NC	8	NC

Table 3-20: SPI Connector Pinouts

3.2.24 TPM Connector

CN Label: TPM1

CN Type: 20-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The TPM connector connects to a TPM module.
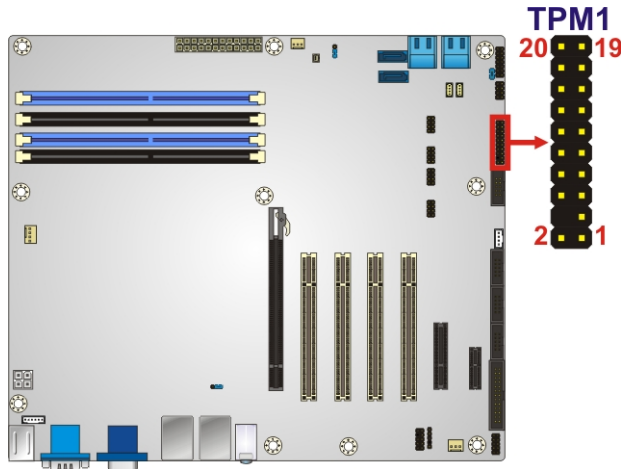
Figure 3-25: TPM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LERAME#	4	KEY
5	LRESRT#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-21: TPM Connector Pinouts

3.2.25 USB Connectors

CN Label: **USB1, USB2, USB3, USB4**

CN Type: 8-pin header

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-22**

The USB connectors connect to USB devices. Each pin header provides two USB ports.
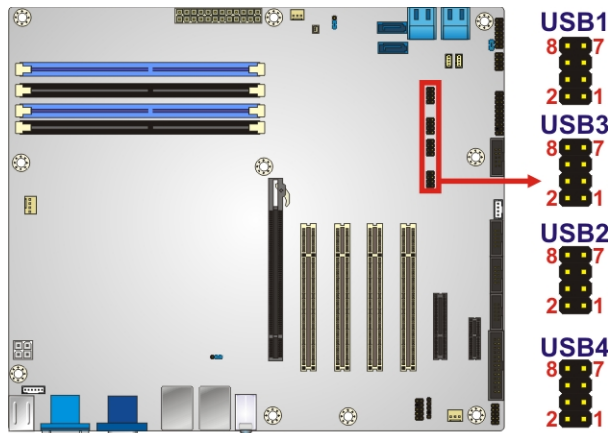
Figure 3-26: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	+5V

Table 3-22: USB Port Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:
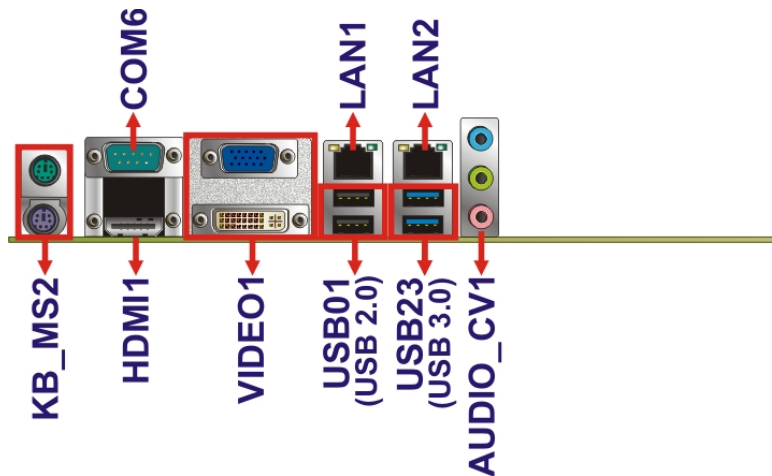
Figure 3-27: External Peripheral Interface Connector

3.3.1 Audio Connector

CN Label:	**AUDIO_CV1**
CN Type:	Audio jack
CN Location:	See **Figure 3-27**

The audio jacks connect to external audio devices.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.
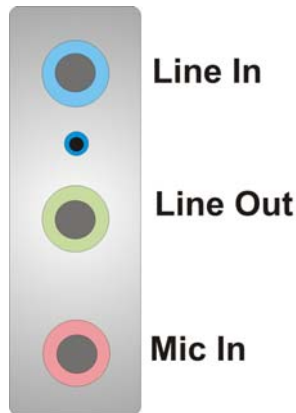
Figure 3-28: Audio Connector

3.3.2 Ethernet and USB Connector

CN Label:	**LAN1_USB01, LAN2_USB23**
CN Type:	RJ-45, USB 2.0 and USB 3.0 connectors
CN Location:	See **Figure 3-27**
CN Pinouts:	See **Table 3-23**

The LAN connector connects to a local network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	2	MDIA3+

The HDMI port connects to an HDMI device.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

Table 3-26: HDMI Connector Pinouts

3.3.4 Keyboard/Mouse Connector

CN Label: **KB_MS2**

CN Type: Dual PS/2

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-27**

The PS/2 ports are for connecting a PS/2 mouse and a PS/2 keyboard.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Keyboard Data	7	Mouse Data
2	NC	8	NC
3	GND	9	GND
4	VCC	10	VCC
5	Keyboard Clock	11	Mouse Clock
6	NC	12	NC

Table 3-27: PS/2 Connector Pinouts

3.3.5 Serial Port Connectors (COM6)

CN Label: **COM6**

CN Type: D-sub 9 connector

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-28** and **Figure 3-30**

The serial port connects to a RS-232 serial communications device.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	6	NDSR
2	NRXD	7	NRTS
3	NTXD	8	NCTS
4	NDTR	9	NRI
5	GND		

Table 3-28: Serial Port Connector Pinouts
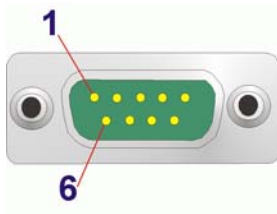
Figure 3-30: Serial Port Connector Pinouts

3.3.6 VGA and DVI Connector

CN Label: **VIDEO1**

CN Type: 15-pin Female, 24-pin header

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-29** and **Table 3-30**

The VGA connector connects to a monitor that accepts a standard VGA input.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	CRT_RED	2	CRT_GREEN
3	CRT_BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V CRT	10	CRT_PLUG#
11	NC	12	CRT_DDC_DATA
13	CRT_HSYNC	14	CRT_VSYNC
15	CRT_DDC_CLK		

Table 3-29: VGA Connector Pinouts
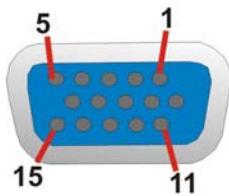
Figure 3-31: VGA Connector

The DVI connector connects to a monitor that supports DVI video input.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DVI_TMDS_C_DATA2#	2	DVI_TMDS_C_DATA2
3	GND	4	NC
5	NC	6	DVI_DDC_SCLK
7	DVI_DDC_SDATA	8	NC
9	DVI_TMDS_C_DATA1#	10	DVI_TMDS_C_DATA1
11	GND	12	NC
13	NV	14	+5V_DVI
15	GND	16	DVI_HPD
17	DVI_TMDS_C_DATA0#	18	DVI_TMDS_C_DATA0
19	GND	20	NC
21	NC	22	GND
23	DVI_TMDS_C_CLK	24	DVI_TMDS_C_CLK#

Table 3-30: DVI Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

⚡ **WARNING:**

Failure to take ESD precautions during the installation of the IMBA-Q670 may result in permanent damage to the IMBA-Q670 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-Q670. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-Q670 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- *Wear an anti-static wristband*: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- *Self-grounding*:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- *Use an anti-static pad*: When configuring the IMBA-Q670, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-Q670.
- *Only handle the edges of the PCB*:-: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

✓ **NOTE:**

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

⚠️ **WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - ○ The user manual provides a complete description of the IMBA-Q670 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - ○ Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-Q670 on an antistatic pad:
  - ○ When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-Q670 off:
  - ○ When working with the IMBA-Q670, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-Q670 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.1 Socket LGA1155 CPU Installation

![WARNING icon] **WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

To install the CPU, follow the steps below.

Step 1:   **Disengage the load lever** by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-1**.
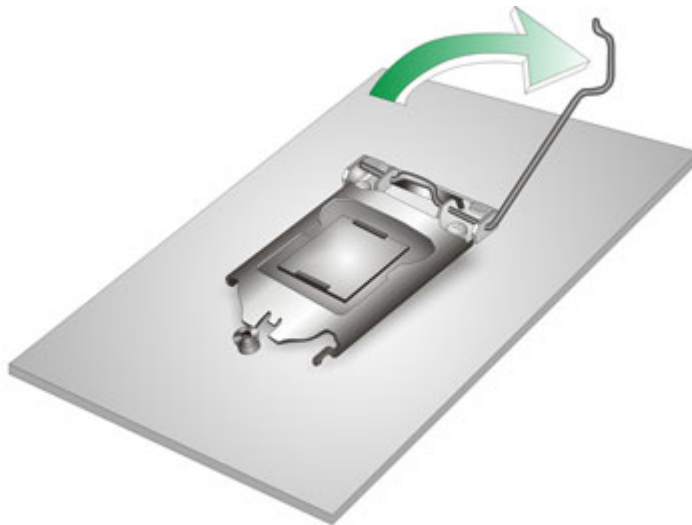
Figure 4-1: Disengage the CPU Socket Load Lever

Step 2:   **Open the socket and remove the protective cover.** The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.
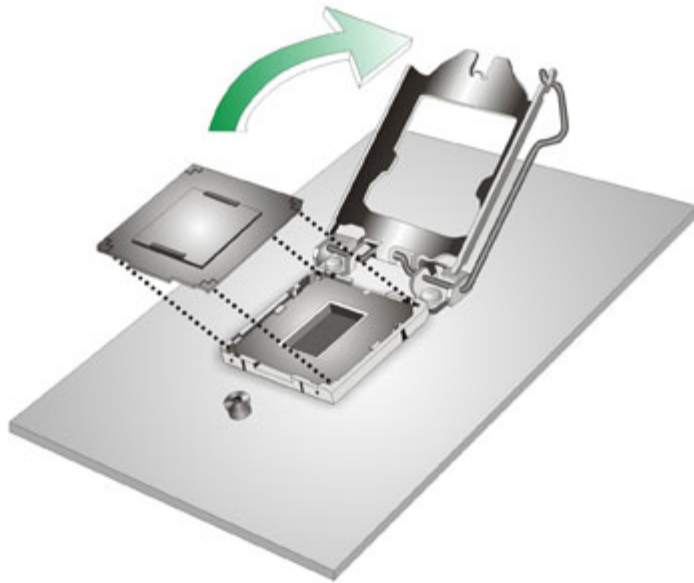
　　Figure 4-2: Remove Protective Cover

Step 3: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly.** The contact array should be facing the CPU socket.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-3**.
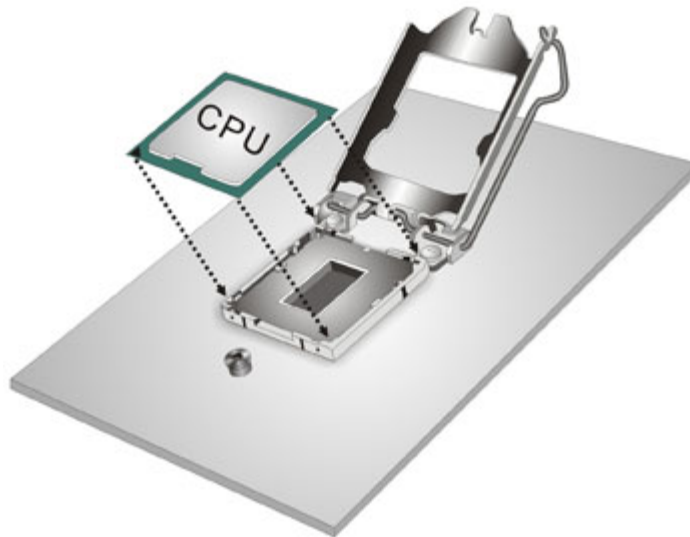
Figure 4-3: Insert the Socket LGA1155 CPU

Step 8: **Close the CPU socket.** Close the load plate and pull the load lever back a little to have the load plate be able to secure to the knob. Engage the load lever by pushing it back to its original position (**Figure 4-4**). There will be some resistance, but will not require extreme pressure.
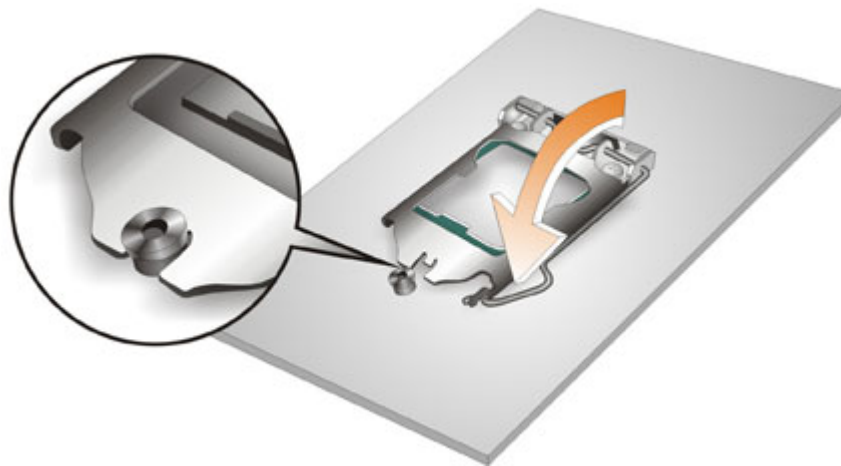
Figure 4-4: Close the Socket LGA1155

Step 9: **Connect the 12 V power to the board.** Connect the 12 V power from the power supply to the board.

4.2.2 Socket LGA1155 Cooling Kit Installation

![WARNING icon] **WARNING:**

DO NOT attempt to install a push-pin cooling fan.

The pre-installed support bracket prevents the board from bending and is ONLY compatible with captive screw type cooling fans.

Figure 4-5: Cooling Kits (CF-1156A-RS-R11 and CF-1156E-R11)

The cooling kit can be bought from IEI. The cooling kit has a heatsink and fan.

![WARNING icon] **WARNING:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-6.**
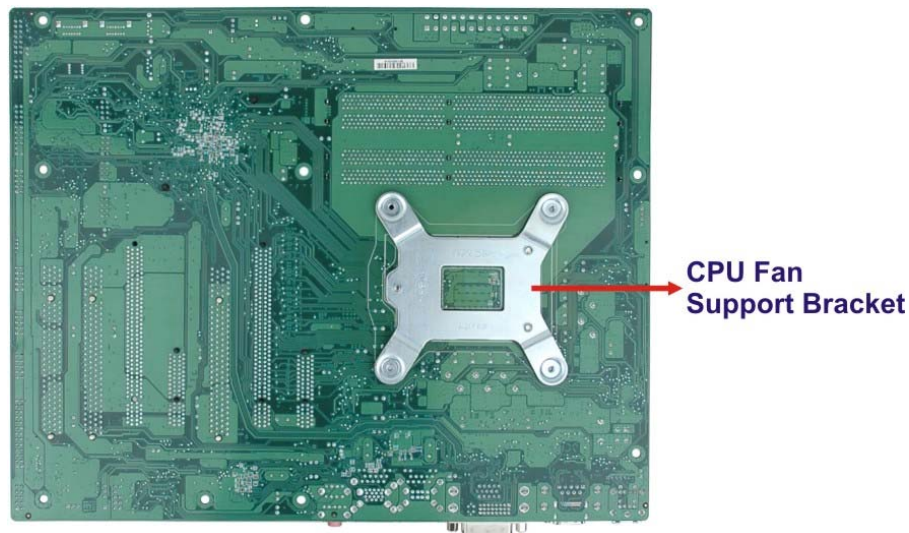
Figure 4-6: Cooling Kit Support Bracket

Step 2: **Place the cooling kit onto the socket LGA1155 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.

Step 4: **Secure the cooling kit** by fastening the four retention screws of the cooling kit.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the IMBA-Q670. Carefully route the cable and avoid heat generating chips and fan blades.

4.2.3 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-7**.
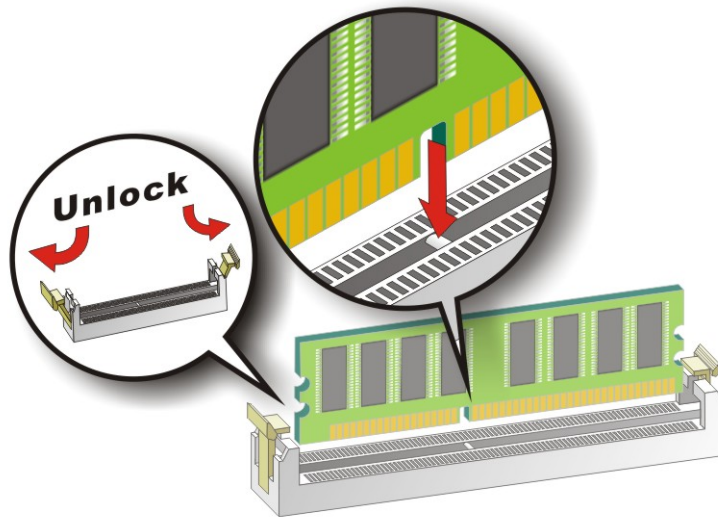
Figure 4-7: DIMM Installation

Step 1: **Open the DIMM socket handles**. Open the two handles outwards as far as they can. See **Figure 4-7**.

Step 2: **Align the DIMM with the socket**. Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-7**.

Step 3: **Insert the DIMM**. Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-7**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.3 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.
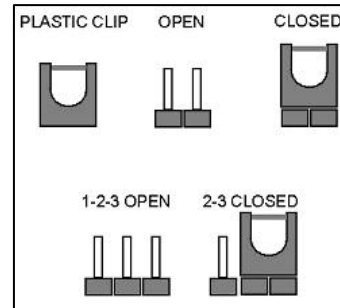
The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AT/ATX power select	ATX_AT1	2-pin header
Clear CMOS jumper	J_CMOS1	3-pin header
Wake-on LAN	WOL_SEL1	3-pin header

Table 4-1: Jumpers

4.3.1 AT/ATX Power Select Jumper

Jumper Label:	ATX_AT1
Jumper Type:	2-pin header
Jumper Settings:	See **Table 4-2**
Jumper Location:	See **Figure 4-8**

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX.

Setting	Description
Closed	ATX power (Default)
Open	AT power

Table 4-2: AT/ATX Power Mode Jumper Settings
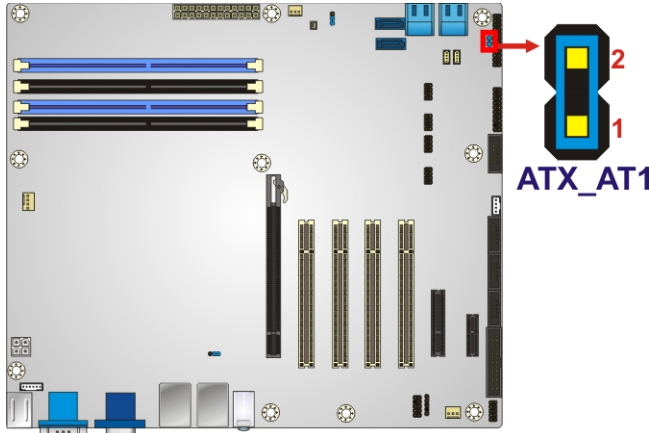
Figure 4-8: AT/ATX Power Mode Jumper Location

4.3.2 Clear CMOS Jumper

Jumper Label:	**J_CMOS1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-9**

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, and then move back to the default position.

Setting	Description
Short 1-2	Normal
Short 2-3	Clear BIOS

Table 4-3: Clear BIOS Jumper Settings
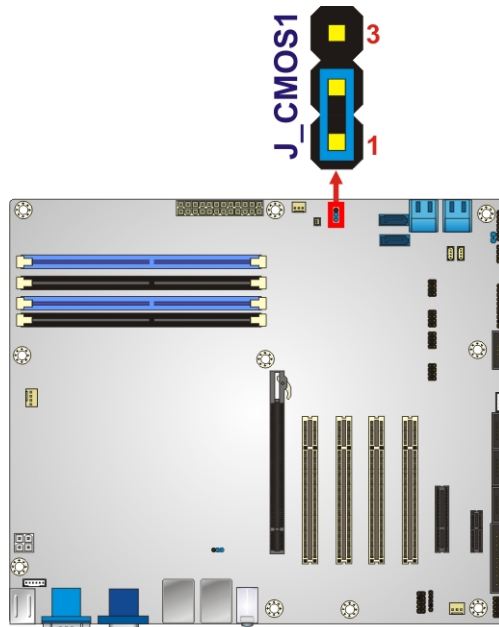
Figure 4-9: Clear BIOS Jumper Location

4.3.3 Wake-on LAN Jumper

CN Label: **WOL_SEL1**

CN Type: 3-pin header

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-4**

The Wake-on LAN connector allows the user to enable or disable the Wake-on LAN (WOL) function.

PIN NO.	DESCRIPTION
Short 1-2	Enable Wake-on LAN (Default)
Short 2-3	Disable Wake-on LAN

Table 4-4: Wake-on LAN Connector Pinouts
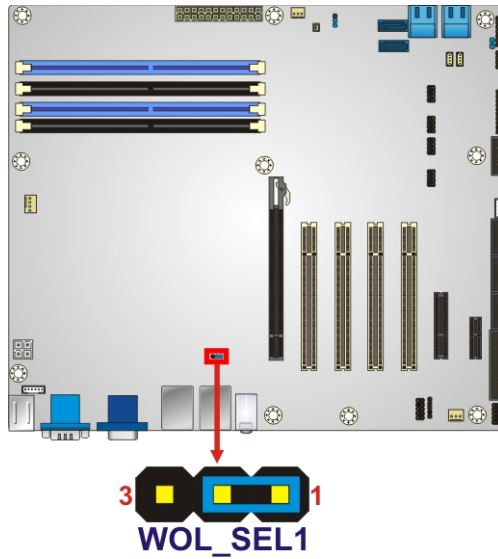
Figure 4-10: Wake-on LAN Connector Pinout Locations

4.4 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.4.1 SATA Drive Connection

The IMBA-Q670 is shipped with four SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the on-board SATA drive connector. See **Figure 4-11**.
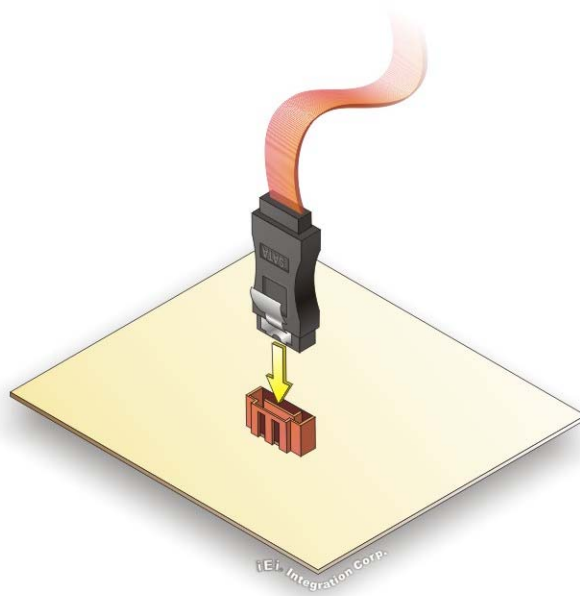
Figure 4-11: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-12**.

Step 4: **Connect the SATA power cable (optional)**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-12**.
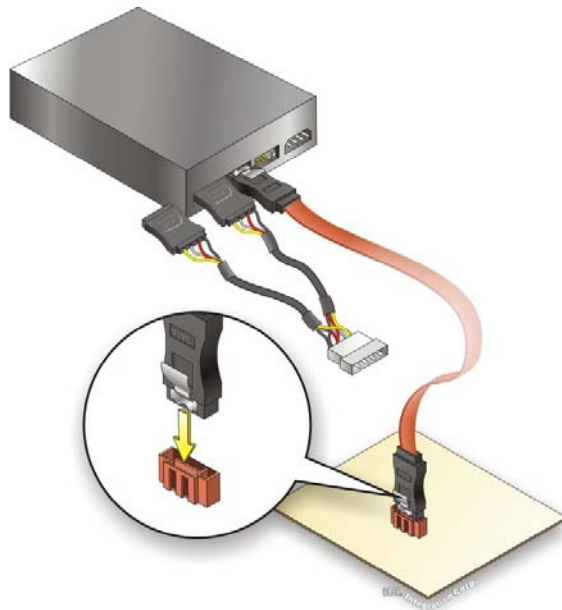
Figure 4-12: SATA Power Drive Connection

The SATA power cable can be bought from IEI. See Optional Items in Section 2.4.

4.5 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the IMBA-Q670.

4.5.1 Audio Connector

The audio jacks on the external audio connector enable the IMBA-Q670 to be connected to a stereo sound setup. Each jack supports both input and output. When connecting a device, the High Definition Audio utility will automatically detect input or output.   The lime green (top) audio jack does not support input from a microphone.   To install the audio devices, follow the steps below.

Step 1:   Identify the audio plugs. The plugs on your home theater system or speakers may not match the colors on the rear panel.

Step 2:   Plug the audio plugs into the audio jacks. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.
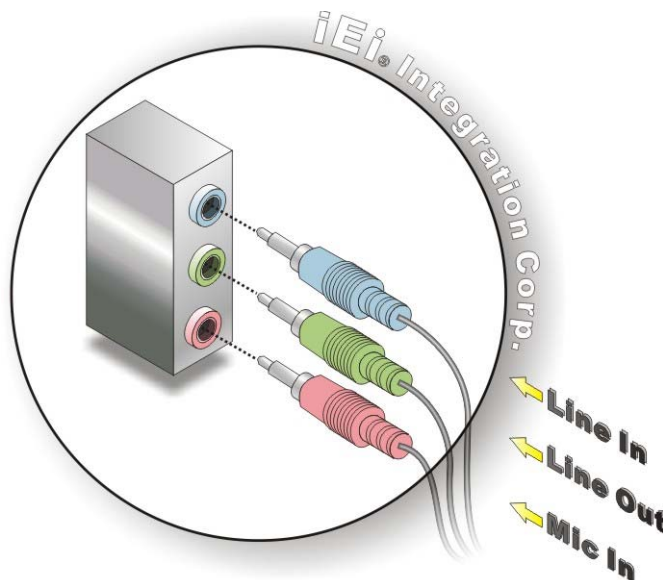
Figure 4-13: Audio Connector

Step 3:   Check audio clarity. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

4.5.3 HDMI Connection

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. To connect the HDMI cable to the IMBA-Q670, follow the steps below.

Step 1: **Locate the HDMI connector**. The location is shown in a previous section.

Step 2: **Align the connector.** Align the HDMI connector with the HDMI port. Make sure the orientation of the connector is correct

Step 3: **Insert the HDMI connector.** Gently insert the HDMI connector. The connector should engage with a gentle push. If the connector does not insert easily, check again that the connector is aligned correctly, and that the connector is being inserted with the right way up.
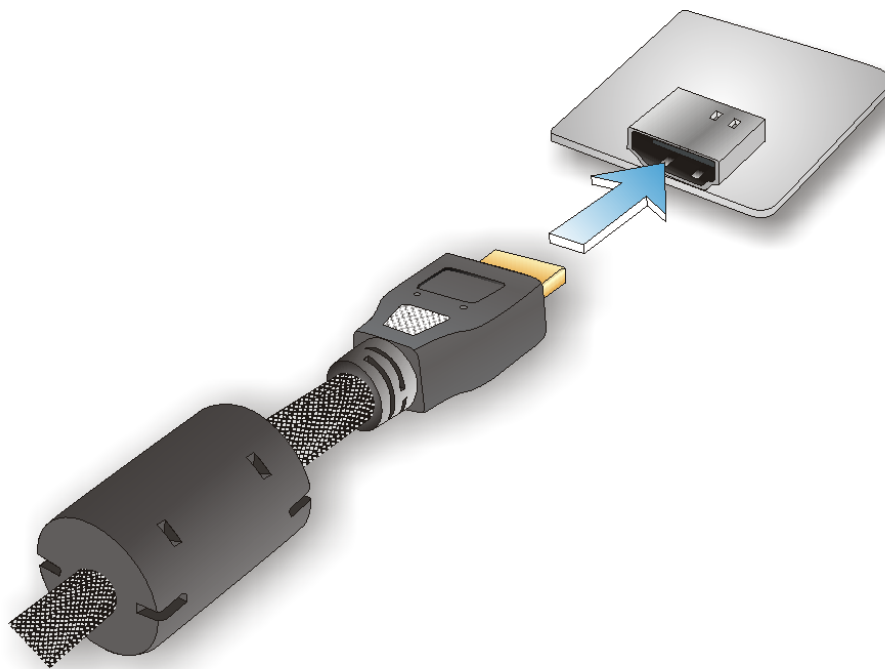
Figure 4-15: HDMI Connection

4.5.4 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the RJ-45 connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-Q670. See **Figure 4-16**.
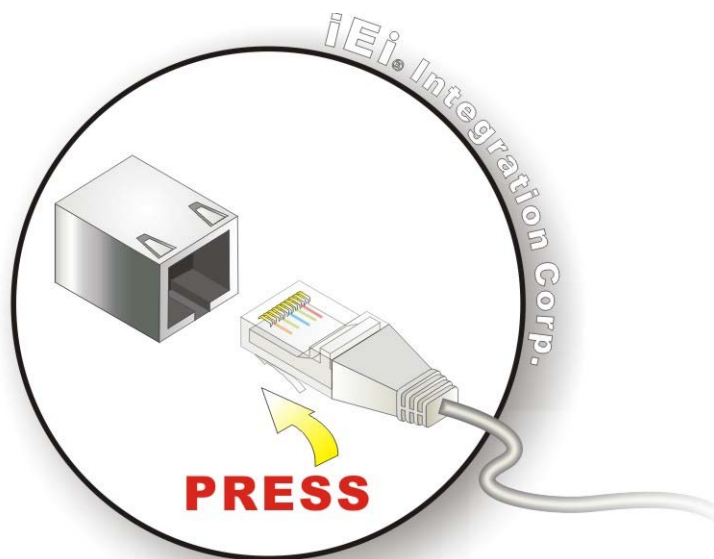
Figure 4-16: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.5.5 PS/2 Keyboard and Mouse Connection

The IMBA-Q670 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-Q670.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 4-17**.
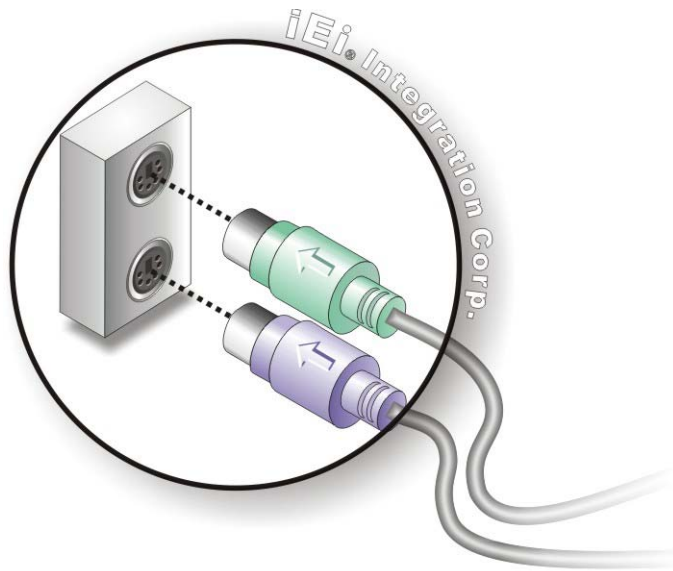
Figure 4-17: PS/2 Keyboard/Mouse Connector

4.5.6 Serial Device Connection

The IMBA-Q670 has a single female D-sub 9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-Q670.

Step 1: **Locate the D-sub 9 connector**. The location of the D-sub 9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the D-sub 9 connector of a serial device into the D-sub 9 connector on the external peripheral interface. See **Figure 4-18**.
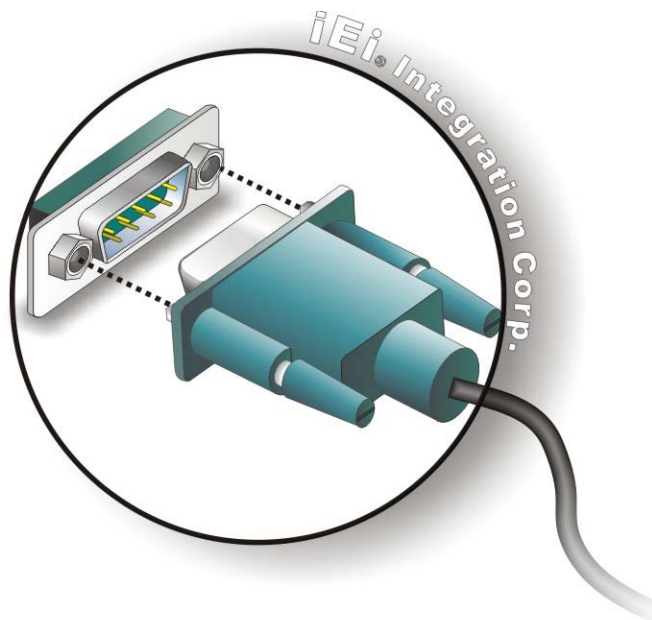
Figure 4-18: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external

interface by tightening the two retention screws on either side of the connector.

4.5.7 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-Q670.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB

Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into

the USB Series "A" receptacle on the external peripheral interface. See

Figure 4-19.
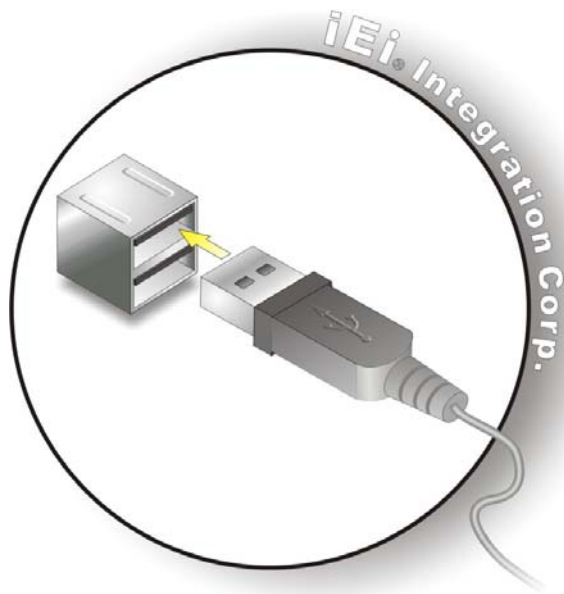
Figure 4-19: USB Connector

4.5.8 VGA Monitor Connection

The IMBA-Q670 has a single female D-sub 15 connector on the external peripheral interface panel. The D-sub 15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-Q670, please follow the instructions below.

Step 1: **Locate the female D-sub 15 connector**. The location of the female D-sub 15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male D-sub 15 connector on the VGA screen cable with the female D-sub 15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the IMBA-Q670. See **Figure 4-20**.
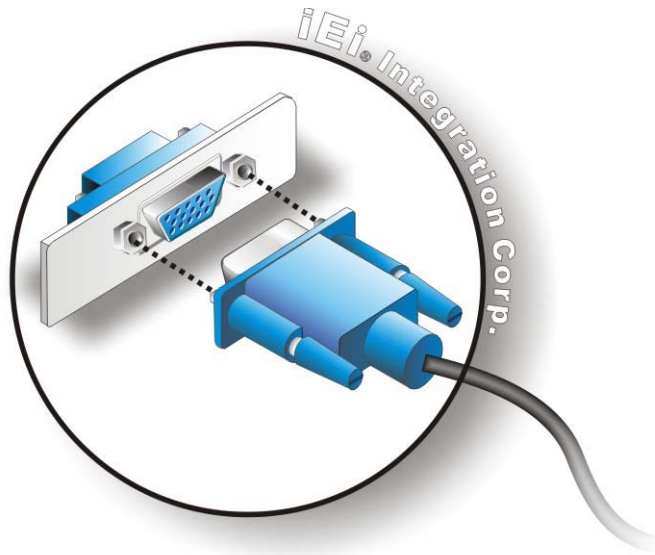
Figure 4-20: VGA Connector

Step 4: **Secure the connector**. Secure the D-sub 15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.6 Intel® AMT Setup Procedure

The IMBA-Q670 is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

Step 1: Make sure the **CHA_DIMM1** socket is installed with one DDR3 DIMM.

Step 2: Connect an Ethernet cable to the RJ-45 connector labeled **LAN2**.

Step 3: The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,

Step 4: Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD. See **Section 6.8**.

Step 5: Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up

process. Enter the Intel® current ME password as it requires (the Intel® default

password is **admin**).

![NOTE icon] **NOTE:**

To change the password, enter a new password following the strong
password rule (containing at least one upper case letter, one lower
case letter, one digit and one special character, and be at least eight
characters).

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press ESC to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side

Key	Function
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **4**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- ▪ Main – Changes the basic system configuration.
- ▪ Advanced – Changes the advanced system settings.
- ▪ Chipset – Changes the chipset settings.
- ▪ Boot – Changes the system boot configuration.

- ▪ Security – Sets User and Supervisor Passwords.
- ▪ Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

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

 BIOS Information                                             Set the Date. Use Tab to
 BIOS Vendor                    American Megatrends           switch between Data
 Core Version                   4.6.5.3                       elements.
 Compliency                     UEFI 2.3; PI 1.2
 Project Version                B216AR20.ROM
 Build Date                     04/10/2012 13:48:33           ----------------------

 Processor Information
 Name                           IvyBridge                     ←→: Select Screen
 Brand String                   Genuine Intel(R) CPU          ↑↓: Select Item
 Frequency                      3400MHz                       Enter Select
 Processor ID                   306a8                         + -   Change Opt.
 Stepping                       E0/L1                         F1   General Help
 Number of Processors           4Core(S)/8Thread(s)           F2   Previous Values
 Microcode Revision             10                            F3   Optimized Defaults
 GT Info                        GT2 (1150MHz)                 F4   Save & Exit
                                                              ESC  Exit
 IGFX VBIOS Version             2132
 Memory RC Version              1.1.0.0
 Total Memory                   2048 MB (DDR3 1333)
 Memory Frequency               1333 MHz

 PCH Information
 Name                           CogarPoint
 Stepping                       05/B3
 TXT Capability of              Supported
 Platform/PCH
 LAN PHY Revision               C0

 ME FW Version                  8.0.4.1441
 ME Firmware SKU                5MB

 System Date                    [Tue 03/04/2011]
 System Time                    [15:10:27]

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

BIOS Menu 1: Main

➔   **System Overview**

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version

- ▪ **Build Date:** Date the current BIOS version was made

➔ **Memory Information**

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- ▪ Total Memory: Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

⚠ **WARNING!**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

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

> ACPI Settings                                        System ACPI Parameters
> RTC Wake Settings
> Trusted Computing
> CPU Configuration
> SATA Configuration                                   ----------------------
> Intel TXT(LT) Configuration
> AMT Configuration                                    ←→: Select Screen
> USB Configuration                                    ↑ ↓: Select Item
> F81866 Super IO Configuration                        Enter Select
> F81866 H/M Monitor                                   + -   Change Opt.
> Serial Port Console Redirection                      F1   General Help
> iEi Feature                                          F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 2: Advanced

5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.

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

ACPI Settings                                          Select the highest ACPI
                                                       sleep state the system
ACPI Sleep State                  [S1 (CPU Stop Clock)] will enter when the
                                                       SUSPEND button is
                                                       pressed.


                                                       ----------------------

                                                       ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       Enter Select
                                                       + -   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 3: ACPI Configuration

➔ **ACPI Sleep State [S1 (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (CPU Stop Clock)** DEFAULT The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.

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

Wake System with Fixed Time      [Disabled]            Enables or Disables
                                                       system wake on alarm
                                                       event. When enabled,
                                                       system will wake on the
                                                       date: hr: min: sec
                                                       specified.


                                                       ----------------------

                                                       ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       Enter Select
                                                       + –   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 4: RTC Wake Settings

➔ **Wake System with Fixed Time [Disabled]**

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** Dᴇꜰᴀᴜʟᴛ The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

*Wake up every day

*Wake up date

*Wake up hour

*Wake up minute

*Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 5**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

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

TPM Configuration                                        Enables or Disables TPM
  TPM SUPPORT                        [Disable]           support. O.S. will not
                                                         show TPM. Reset of
Current TPM Status Information                           platform is required.
  NO TPM Hardware
                                                         ----------------------

                                                         ←→: Select Screen
                                                         ↑ ↓: Select Item
                                                         Enter Select
                                                         + -  Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 5: Trusted Computing

➔ **TPM Support [Disable]**

Use the **TPM Support** option to configure support for the TPM.

➔ **Disable** DEFAULT   TPM support is disabled.

➔ **Enable**   TPM support is enabled.

5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to enter the **CPU Information** submenu or enable Intel Virtualization Technology.
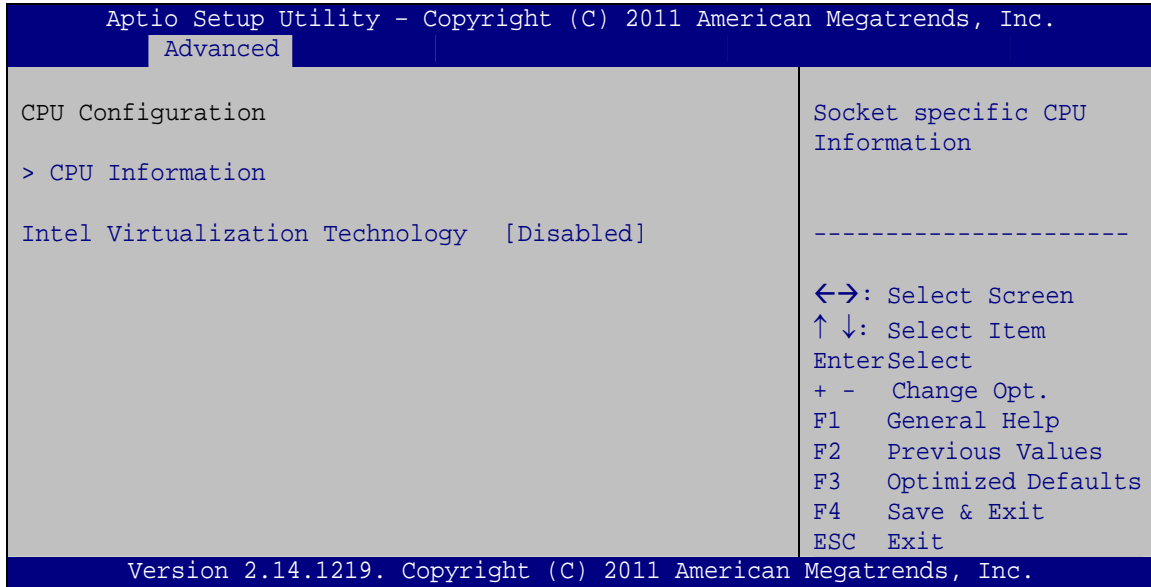
```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
     Advanced

CPU Configuration                              Socket specific CPU
                                               Information
> CPU Information

Intel Virtualization Technology   [Disabled]   --------------------

                                               ←→: Select Screen
                                               ↑↓: Select Item
                                               Enter Select
                                               + -  Change Opt.
                                               F1   General Help
                                               F2   Previous Values
                                               F3   Optimized Defaults
                                               F4   Save & Exit
                                               ESC  Exit
     Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 6: CPU Configuration

➔ **Intel Virtualization Technology [Disabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**   DEFAULT Disables   Intel   Virtualization
                                 Technology.

➔ **Enabled**   Enables Intel Virtualization Technology.

5.3.4.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 7**) to view detailed CPU specifications and configure the CPU.

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

 CPU Configuration

 Intel(R) Core(TM) i5-2400 CPU 0 @ 3.10GHz
 CPU Signature                    206a7                   ---------------------
 Microcode Patch                  14
 Max CPU Speed                    3100 MHz                ←→: Select Screen
 Min CPU Speed                    1600 MHz                ↑ ↓: Select Item
 Processor Cores                  4                       EnterSelect
 Intel HT Technology              Not Supported           + -   Change Opt.
 Intel VT-x Technology            Supported               F1   General Help
 Intel SMX Technology             supported               F2   Previous Values
                                                          F3   Optimized Defaults
 L1 Data Cache                    32 kB x 4               F4   Save & Exit
 L1 Code Cache                    32 kB x 4               ESC  Exit
 L2 Cache                         256 kB x 4
 L3 Cache                         6144 kB
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: CPU Information

The CPU Configuration menu (**BIOS Menu 7**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 8**) to change and/or set the configuration of the SATA devices installed in the system.

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

SATA Controller(s)                    [Enabled]              Enable or disable SATA
SATA Mode                             [AHCI Mode]            device


                                                             --------------------

                                                             ←→: Select Screen
                                                             ↑↓: Select Item
                                                             Enter Select
                                                             + -  Change Opt.
                                                             F1   General Help
                                                             F2   Previous Values
                                                             F3   Optimized Defaults
                                                             F4   Save & Exit
                                                             ESC  Exit
           Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
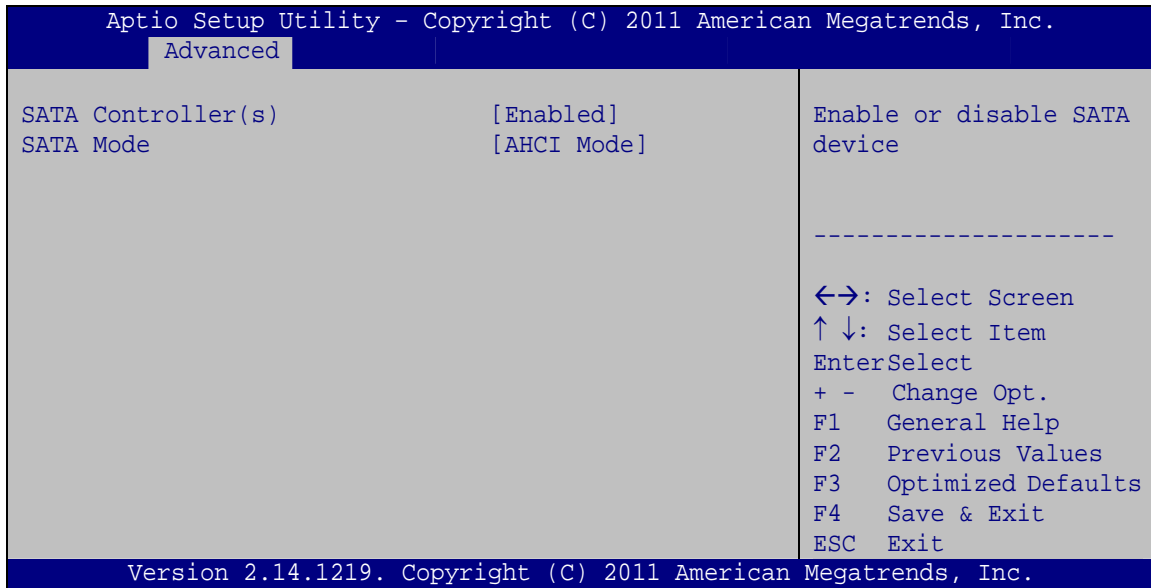
BIOS Menu 8: SATA Configuration

➔ **SATA Controller(s) [Enabled]**

Use the **SATA Controller(s)** option to enable or disable the SATA controller on the system.

➔ **Enabled** **DEFAULT** SATA controller enabled

➔ **Disabled** SATA controller disabled

➔ **SATA Mode [AHCI Mode]**

Use the **SATA Mode** option to configure SATA devices as normal IDE devices.

➔ **IDE Mode** Configures SATA devices as normal IDE device.

➔ **AHCI Mode** **DEFAULT** Configures SATA devices as AHCI device.

➔ **RAID Mode** Configures SATA devices as RAID device.

5.3.6 Intel TXT(LT) Configuration

Use the **Intel TXT(LT) Configuration** menu to configure Intel Trusted Execution Technology support.

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

Intel Trusted Execution Technology Configuration

Intel TXT support only can be enabled/disabled if SMX
is enabled. VT and VT-d support must also be enabled prior    --------------------
to TXT.                                                       ←→: Select Screen
                                                              ↑ ↓: Select Item
Secure Mode Extensons (SMX)       Enabled                     Enter Select
                                                              + -   Change Opt.
Intel TXT(LT) Support            [Disabled]                   F1   General Help
                                                              F2   Previous Values
                                                              F3   Optimized Defaults
                                                              F4   Save & Exit
                                                              ESC  Exit

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 9: Intel TXT(LT) Configuration

5.3.7 AMT Configuration

The **AMT Configuration** submenu (**BIOS Menu 10**) allows advanced power management options to be configured.

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

 Intel AMT                        [Enabled]              Enable/Disable Intel(R)
 Unconfigure ME                   [Disabled]             Active Management
                                                         Technology BIOS
                                                         Extension


                                                         --------------------
                                                         ←→: Select Screen
                                                         ↑ ↓: Select Item
                                                         Enter Select
                                                         + -   Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit
          Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```
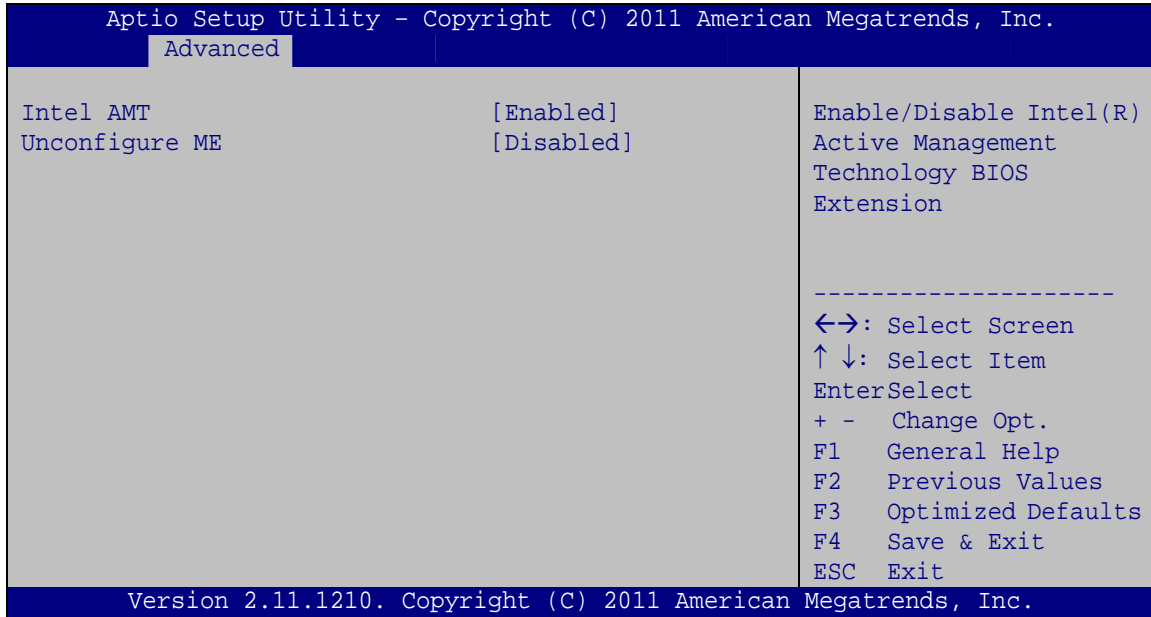
BIOS Menu 10: AMT Configuration

➔ **AMT [Enabled]**

Use **AMT** option to enable or disable the Intel® AMT function.

➔ **Disabled**   Intel® AMT is disabled

➔ **Enabled**   DEFAULT   Intel® AMT is enabled

➔ **Unconfigure ME [Disabled]**

Use the **Unconfigure ME** option to perform ME unconfigure without password operation.

➔ **Disabled**   DEFAULT   Disable ME unconfigure

➔ **Enabled**   Enable ME unconfigure

5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 11**) to read USB configuration information and configure the USB settings.

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

USB Configuration                                      Enables legacy USB
                                                       Support.
USB Devices:                                           AUTO optional disables
     1 Keyboard, 2 Hubs                                legacy support if no USB
                                                       devices are connected.
Legacy USB Support                [Enabled]            DISABLE option will keep
                                                       USB devices available
                                                       only for EFI
                                                       applications.

                                                       --------------------
                                                       ←→: Select Screen
                                                       ↑↓: Select Item
                                                       Enter Select
                                                       + -   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
   BIOS Menu 11: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

   ➔ **Enabled**   **DEFAULT**   Legacy USB support enabled

è	**Disabled**	Legacy USB support disabled
è	**Auto**	Disable legacy support if no USB device connected

5.3.9 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

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

F81866 Super IO Configuration                     Set Parameters of Serial
                                                  Port 1 (COMA)
F81866 Super IO Chip          Fintek F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration                     ---------------------
> Serial Port 4 Configuration                     ←→: Select Screen
> Serial Port 5 Configuration                     ↑ ↓: Select Item
> Serial Port 6 Configuration                     Enter Select
                                                  + -  Change Opt.
                                                  F1   General Help
                                                  F2   Previous Values
                                                  F3   Optimized Defaults
                                                  F4   Save & Exit
                                                  ESC  Exit
    Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 12: F81866 Super IO Configuration

5.3.9.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 13**) to configure the serial port n.

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

Serial Port n Configuration                                Enable or Disable Serial
                                                           Port (COM)
Serial Port                        [Enabled]
Device Settings                    IO=3F8h; IRQ=4
                                                           --------------------
Change Settings                    [Auto]                  ←→: Select Screen
                                                           ↑ ↓: Select Item
                                                           Enter Select
                                                           = -   Change Opt.
                                                           F1   General Help
                                                           F2   Previous Values
                                                           F3   Optimized Defaults
                                                           F4   Save & Exit
                                                           ESC  Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
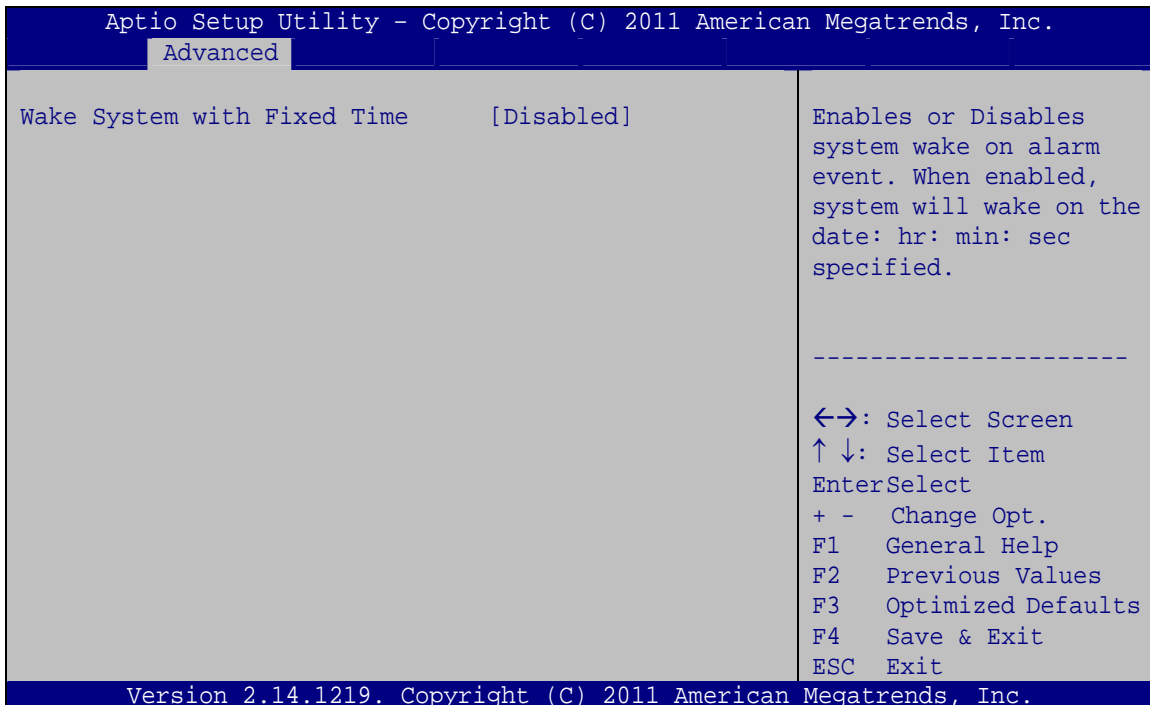
BIOS Menu 13: Serial Port n Configuration Menu

5.3.9.1.1 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address are automatically detected.

➔ **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
  IRQ=4   address is IRQ4

➔ **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2C0h;**   Serial Port I/O port address is 2C0h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2C8h;**   Serial Port I/O port address is 2C8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

5.3.9.1.2 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3   address is IRQ3

➔ **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2C0h;**   Serial Port I/O port address is 2C0h and the interrupt
    IRQ=3, 4   address is IRQ3, 4

➔ **IO=2C8h;**   Serial Port I/O port address is 2C8h and the interrupt

  IRQ=3, 4   address is IRQ3, 4

5.3.9.1.3 Serial Port 3 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address
                                  are automatically detected.

➔ **IO=3E8h;**   Serial Port I/O port address is 3E8h and the interrupt

  IRQ=10   address is IRQ10

➔ **IO=3E8h;**   Serial Port I/O port address is 3E8h and the interrupt

  IRQ=10, 11   address is IRQ10, 11

➔ **IO=2E8h;**   Serial Port I/O port address is 2E8h and the interrupt

  IRQ=10, 11   address is IRQ10, 11

➔ **IO=2D0h;**   Serial Port I/O port address is 2D0h and the interrupt

  IRQ=10, 11   address is IRQ10, 11

➔ **IO=2D8h;**   Serial Port I/O port address is 2D8h and the interrupt

  IRQ=10, 11   address is IRQ10, 11

5.3.9.1.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2E8h;**   Serial Port I/O port address is 2E8h and the interrupt
    IRQ=10   address is IRQ10

➔ **IO=3E8h;**   Serial Port I/O port address is 3E8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **IO=2D0h;**   Serial Port I/O port address is 2D0h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **IO=2D8h;**   Serial Port I/O port address is 2D8h and the interrupt
    IRQ=10, 11   address is IRQ10, 11

➔ **Device Mode [RS485]**

Use the **Device Mode** option to select the serial port mode.

➔ **RS422**   Enables serial port RS22 support.

➔ **RS485**   DEFAULT   Enables serial port RS485 support.

5.3.9.1.5 Serial Port 5 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** — Disable the serial port

➔ **Enabled** DEFAULT — Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** DEFAULT — The serial port IO port address and interrupt address are automatically detected.

➔ **IO=2D0h; IRQ=10** — Serial Port I/O port address is 2D0h and the interrupt address is IRQ10

➔ **IO=3F8h; IRQ=10, 11** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11

➔ **IO=2F8h; IRQ=10, 11** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11

➔ **IO=2D0h; IRQ=10, 11** — Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11

➔ **IO=2D8h; IRQ=10, 11** — Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

5.3.9.1.6 Serial Port 6 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** — Disable the serial port

➔   **Enabled**   D<small>EFAULT</small>   Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔   **Auto**   D<small>EFAULT</small>   The serial port IO port address and interrupt address are automatically detected.

➔   **IO=2D8h;**   Serial Port I/O port address is 2D8h and the interrupt
          IRQ=10   address is IRQ10

➔   **IO=3F8h;**   Serial Port I/O port address is 3F8h and the interrupt
          IRQ=10, 11   address is IRQ10, 11

➔   **IO=2F8h;**   Serial Port I/O port address is 2F8h and the interrupt
          IRQ=10, 11   address is IRQ10, 11

➔   **IO=2D0h;**   Serial Port I/O port address is 2D0h and the interrupt
          IRQ=10, 11   address is IRQ10, 11

➔   **IO=2D8h;**   Serial Port I/O port address is 2D8h and the interrupt
          IRQ=10, 11   address is IRQ10, 11

5.3.9.2 Parallel Port Configuration

Use the **Parallel Port Configuration** menu (**BIOS Menu 14**) to configure the serial port n.

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

Parallel Port Configuration                                    Change the Printer Port
                                                               mode
Parallel Port                     [Enabled]
Device Settings                   IO=378h; IRQ=5
                                                               --------------------
Change Settings                   [Auto]                       ←→: Select Screen
Device Mode                       [STD Printer Mode]           ↑ ↓: Select Item
                                                               Enter Select
                                                               F1   General Help
                                                               F2   Previous Values
                                                               F3    Optimized
                                                               Defaults
                                                               F4    Save
                                                               ESC   Exit
            Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 14: Parallel Port Configuration Menu

➔ **Parallel Port [Enabled]**

Use the **Parallel Port** option to enable or disable the parallel port.

➔ **Disabled**   Disable the parallel port

➔ **Enabled**   DEFAULT   Enable the parallel port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the parallel port IO port address and interrupt address.

➔ **Auto**   DEFAULT   The parallel port IO port address and interrupt address are automatically detected.

➔ **IO=378h; IRQ=5**   Parallel Port I/O port address is 378h and the interrupt address is IRQ5

➔ **IO=378h; IRQ=5, 7**   Parallel Port I/O port address is 378h and the interrupt address is IRQ5, 7

➔　**IO=278h;**　　　　　Parallel Port I/O port address is 278h and the
　　IRQ=5, 7　　　　　interrupt address is IRQ5, 7

➔　**IO=3BCh;**　　　　　Parallel Port I/O port address is 3BCh and the
　　IRQ=5, 7　　　　　interrupt address is IRQ5, 7

➔　**Device Mode [STD Printer Mode]**

Use the **Device Mode** option to select the mode the parallel port operates in. Configuration options are listed below.

- STD Printer Mode　　　　**Default**
- SPP Mode
- EPP-1.9 and SPP Mode
- EPP-1.7 and SPP Mode
- ECP Mode
- ECP and EPP 1.9 Mode
- ECP and EPP 1.7 Mode

5.3.10 F81866 H/W Monitor

The F81866 H/W Monitor menu (**BIOS Menu 15**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

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

PC Health Status                                          Smart FAN Configuration

> Smart Fan Mode Configuration
CPU Temperature                  :+63 C
SYS Temperature                  :+33 C
CPU FAN Speed                    :3006 RPM
SYS FAN Speed                    :N/A
VCC3V                            :+3.360 V         --------------------
V_core                           :+1.032 V         ←→: Select Screen
+1.05V                           :+1.064 V         ↑ ↓: Select Item
VDDR                             :+1.616 V         Enter Select
VSB3V                            :+3.424 V         + -   Change Opt.
VBAT                             :+3.200 V         F1   General Help
5VSB                             :+4.968 V         F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
       Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 15: F81866 H/W Monitor

➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - VCC3V
  - Vcore
  - Vcc
  - +1.05V
  - VDDR
  - VSB3V
  - VBAT
  - 5VSB

5.3.10.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 16**) to configure smart fan temperature and speed settings.

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

Smart Fan Mode Configuration

CPU_FAN1 Smart Fan control      [Auto Duty-Cycle Mode]
CPU Temperature 1               60
CPU Temperature 2               50
CPU Temperature 3               40
CPU Temperature 4               30
SYS_FAN1 Smart Fan control      [Auto Duty-Cycle Mode]   ---------------------
System Temperature 1            60                        ←→: Select Screen
System Temperature 2            50                        ↑ ↓: Select Item
System Temperature 3            40                        Enter Select
System Temperature 4            30                        + -   Change Opt.
                                                          F1   General Help
                                                          F2   Previous Values
                                                          F3   Optimized Defaults
                                                          F4   Save & Exit
                                                          ESC  Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 16: Smart Fan Mode Configuration

➔ **CPU_FAN1 Smart Fan control [Auto by Duty-Cycle Mode]**

Use the **CPU_FAN1 Smart Fan control** option to configure the CPU Smart Fan.

➔	**Manual Duty Mode**	The fan spins at the speed set in Manual by Duty Cycle settings
➔	**Auto Duty-Cycle Mode** DEFAULT	The fan adjusts its speed using Auto by Duty-Cycle settings

➔ **SYS_FAN1 Smart Fan control [Auto by Duty-Cycle Mode]**

Use the **SYS_FAN1 Smart Fan control** option to configure the system Smart Fan.

➔	**Manual Duty Mode**	The fan spins at the speed set in Manual by Duty Cycle settings

 ➔   **Auto Duty-Cycle   DEFAULT   The   fan   adjusts   its   speed   using   Auto   by
       Mode   Duty-Cycle settings

 ➔   **CPU/System Temperature n**

      Use the + or – key to change the fan **CPU Temperature n** value. Enter a decimal number
      between 0 and 127.

5.3.11 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 17**) allows the console
redirection options to be configured. Console redirection allows users to maintain a
system remotely by re-directing keyboard input and text output through the serial port.

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

  COM1                                                   Console Redirection
  Console Redirection            [Disabled]              Enable or Disable
> Console Redirection Settings

  COM2
  Console Redirection            [Disabled]
> Console Redirection Settings

  COM3
  Console Redirection            [Disabled]
> Console Redirection Settings                           --------------------
                                                         ←→: Select Screen
  COM4                                                   ↑ ↓: Select Item
  Console Redirection            [Disabled]              EnterSelect
> Console Redirection Settings                           +/-: Change Opt.
                                                         F1   General Help
  COM5                                                   F2   Previous Values
  Console Redirection            [Disabled]              F3   Optimized Defaults
> Console Redirection Settings                           F4   Save & Exit
                                                         ESC  Exit
  COM6
  Console Redirection            [Disabled]
> Console Redirection Settings

> Console Redirection Settings

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

BIOS Menu 17: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

➔ **Disabled**   DEFAULT   Disabled the console redirection function

➔ **Enabled**   Enabled the console redirection function

➔ **Terminal Type [VT-100+]**

Use the **Terminal Type** option to specify the remote terminal type.

➔ **VT100**   The target terminal type is VT100

➔ **VT100+**   DEFAULT   The target terminal type is VT100+

➔ **VT-UTF8**   The target terminal type is VT-UTF8

➔ **ANSI**   The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

➔ **9600**   Sets the serial port transmission speed at 9600.

➔ **19200**   Sets the serial port transmission speed at 19200.

➔ **38400**   Sets the serial port transmission speed at 38400.

➔ **57600**   Sets the serial port transmission speed at 57600.

➔ **115200**   DEFAULT   Sets the serial port transmission speed at 115200.

5.3.12 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 18**) to configure One Key Recovery function.

```
                            BIOS SETUP UTILITY
        Advanced

iEi Feature
_____

Auto Recovery Function          [Disabled]


                                                        ←→   Select Screen
                                                        ↑↓   Select Item
                                                        Enter Go to SubScreen
                                                        F1   General Help
                                                        F10  Save and Exit
                                                        ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
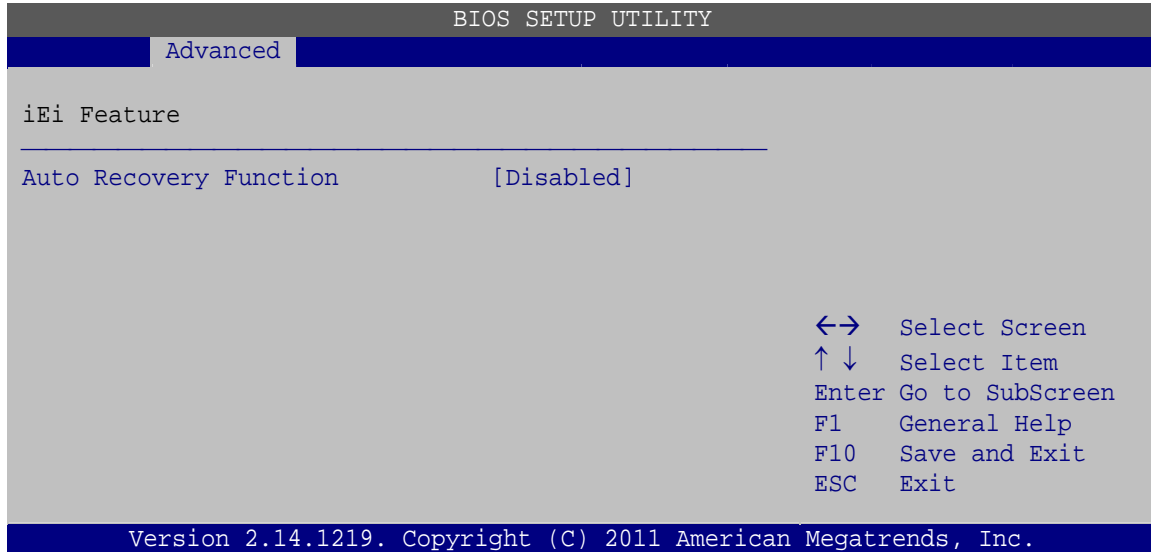
BIOS Menu 18: IEI Feature

➔ **Auto Recovery Function [Disabled]**

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

➔ **Disabled** **DEFAULT** Auto recovery function disabled

➔ **Enabled** Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 19**) to access the Northbridge, Southbridge, Integrated Graphics, and ME Subsystem configuration menus.

⚠ **WARNING!**

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

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

  > PCH-IO Configuration                              PCH Parameters.
  > System Agent (SA) Configuration


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

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

BIOS Menu 19: Chipset

5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 20**) to configure the PCH chipset.

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

  Auto Power Button Status        [Disabled (ATX)]     Enable to reduce power
                                                       consumption in system
  Restore AC Power Loss           [Last State]         off state.

  > PCI Express Configuration
  > PCH Azalia Configuration
                                                       --------------------
  Power Saving Function(ERP)      [Disabled]           ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       Enter Select
                                                       + -   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit

        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: PCH-IO Configuration

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**   The system remains turned off

➔ **Power On**   The system turns on

➔ **Last State**   DEFAULT   The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Saving Function [Disabled]**

Use the **Power Saving Function** BIOS option to enable or reduce power consumption in the S5 state. When enabled, the system can only be powered-up using the power button.

➔ **Disabled**   DEFAULT   Power Saving Function support disabled

➔ **Enabled**   Power Saving Function support enabled

5.4.1.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 21**) to configure the PCI Express slots.

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

PCI Express Configuration


> PCIEx4_2 Slot
> PCIEx4_1 Slot                              --------------------
                                             ←→: Select Screen
                                             ↑↓: Select Item
                                             Enter Select
                                             + -  Change Opt.
                                             F1   General Help
                                             F2   Previous Values
                                             F3   Optimized Defaults
                                             F4   Save & Exit
                                             ESC  Exit

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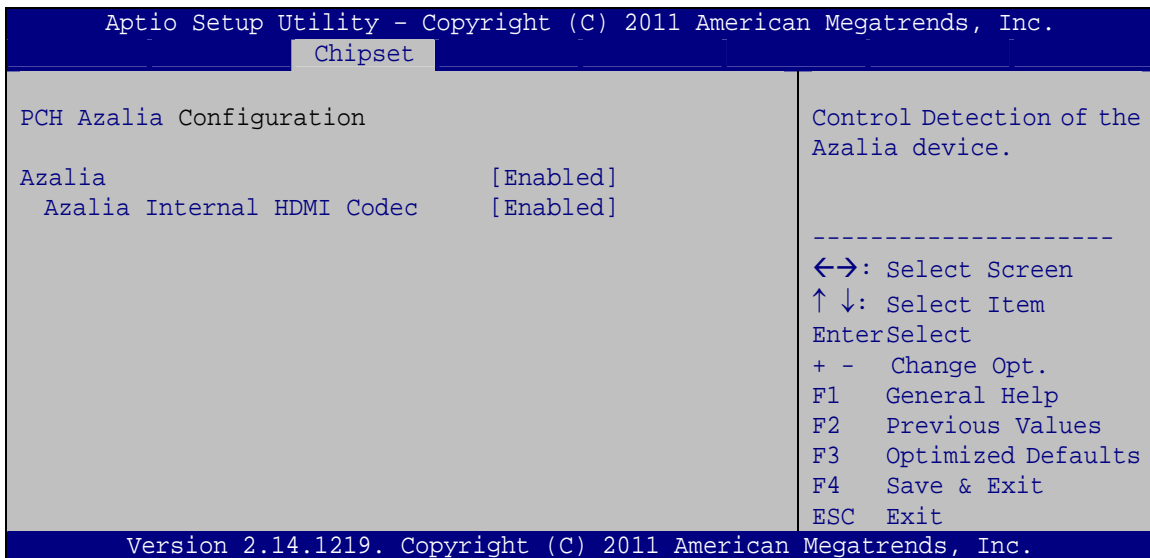```

**BIOS Menu 21: PCI Express Configuration**

➔ **PCIe Speed [Auto]**

Use the **PCIe Speed** option to specify the PCI Express port speed. Configuration options are listed below.

- Auto **DEFAULT**
- Gen 1
- Gen 2

### 5.4.1.2 PCH Azalia Configuration

Use the **PCH Azalia Configuration** submenu (**BIOS Menu 22**) to configure the PCH Azalia codec.

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

PCH Azalia Configuration                                    Control Detection of the
                                                            Azalia device.
Azalia                              [Enabled]
  Azalia Internal HDMI Codec        [Enabled]
                                                            --------------------
                                                            ←→: Select Screen
                                                            ↑ ↓: Select Item
                                                            Enter Select
                                                            + -   Change Opt.
                                                            F1    General Help
                                                            F2    Previous Values
                                                            F3    Optimized Defaults
                                                            F4    Save & Exit
                                                            ESC   Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 22: PCH Azalia Configuration

➔ **Azalia [Enabled]**

Use the **Azalia** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller is detected automatically and enabled
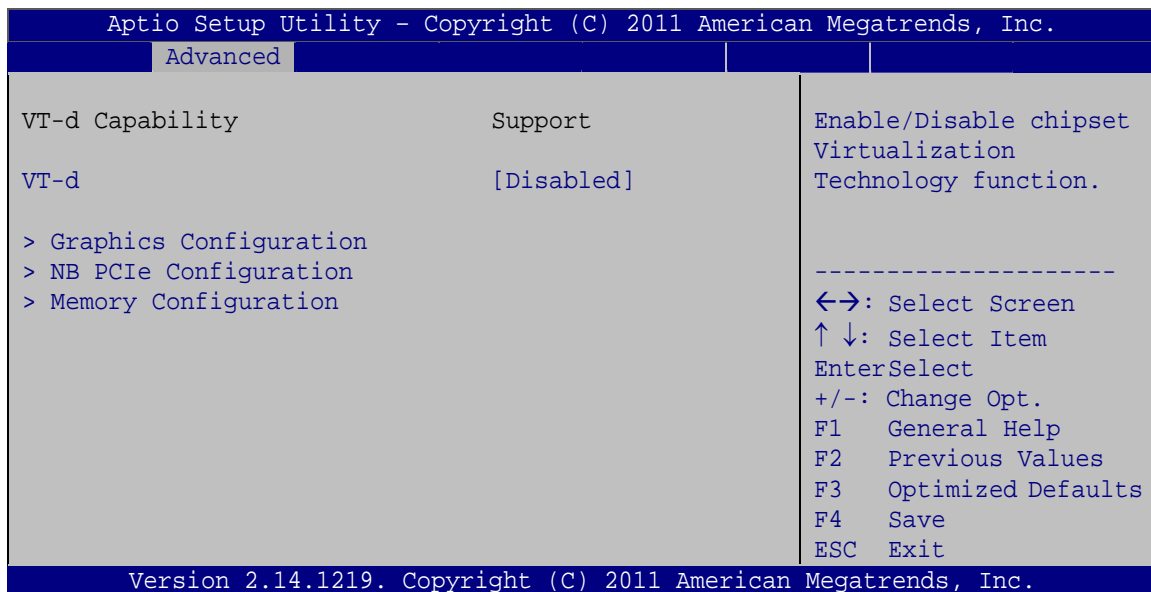
➔ **Azalia internal HDMI codec [Enabled]**

Use the **Azalia internal HDMI codec** option to enable or disable the internal HDMI codec for High Definition Audio.

➔ **Disabled**   Disables the internal HDMI codec for High Definition Audio

➔ **Enabled**   DEFAULT   Enables the internal HDMI codec for High Definition Audio

5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 23**) to configure the video device connected to the system.

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

VT-d Capability                 Support              Enable/Disable chipset
                                                     Virtualization
VT-d                            [Disabled]           Technology function.


> Graphics Configuration
> NB PCIe Configuration                              ---------------------
> Memory Configuration
                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     Enter Select
                                                     +/-: Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save
                                                     ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 23: System Agent (SA) Configuration

➔ **VT-d [Disabled]**

Use the **VT-d** option to enable or disable VT-d support.

➔ **Disabled**   DEFAULT   Disables VT-d support.

➔ **Enabled**   Enables VT-d support.

5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** submenu (**BIOS Menu 24**) to configure the graphics settings.

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

Graphics Configuration

Primary Display                [Auto]
DVMT Pre-Allocated             [256M]                    --------------------
DVMT Total Gfx Mem             [Max]                     ←→: Select Screen
                                                         ↑↓: Select Item
> LCD Control                                            Enter Select
                                                         + -  Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 24: Graphics Configuration

➔ **Primary Display [Auto]**

Use the **Primary Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- Auto   **DEFAULT**
- IGFX
- PEG
- PCI

➔ **DVMT Pre-Allocated [256 MB]**

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

➔ **32 MB**   32 MB of memory used by internal graphics device

➔ **64 MB**   64 MB of memory used by internal graphics device

➔ **128 MB**   128 MB of memory used by internal graphics device

➔ **256 MB**   **DEFAULT**   256 MB of memory used by internal graphics device

➔ **512 MB**   512 MB of memory used by internal graphics device

➔ **DVMT Total Gfx Mem [Max]**

Use the **DVMT Total Gfx Mem** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB
- Maximum   **Default**

➔ **Primary IGFX Boot Display [VBIOS Default]**

Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default   **DEFAULT**
- CRT
- DVI
- HDMI

5.4.2.2 NB PCIe Configuration

Use the **NB PCIe Configuration** submenu (**BIOS Menu 25**) to configure the northbridge
PCIe settings.

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

NB PCIe Configuration

PCIEX16_1                        Not Present
  PCIEX16_1-Gen X                [Auto]                    --------------------
                                                           ←→: Select Screen
Enable PEG                       [Auto]                    ↑ ↓: Select Item
Detect Non-Compliance Device     [Disabled]                Enter Select
                                                           + -   Change Opt.
                                                           F1   General Help
                                                           F2   Previous Values
                                                           F3   Optimized Defaults
                                                           F4   Save & Exit
                                                           ESC  Exit

          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
   BIOS Menu 25: NB PCIe Configuration

➔ **PCIEX16_1-Gen X [Auto]**

Use the **PCIEX16_1-Gen X** option to configure PEG0 B0:D1:F0. Configuration options are
listed below.

- Auto   **Default**
- Gen1
- Gen2
- Gen3

➔ **Enable PEG [Auto]**

Use the **Enable PEG** option to enable or disable PEG.

➔ **Disabled**   Disables PEG.

➔ **Enabled**   Enables PEG.

➔ **Auto**   **DEFAULT**   Automatically detect PEG

➔ **Detect Non-Compliance [Disabled]**

Use the **Detect Non-Compliance** option to detect non-compliance PCIe device in PEG.

➔ **Disabled**   DEFAULT   Do not detect non-compliance PCIe device in PEG

➔ **Enabled**   Detect non-compliance PCIe device in PEG

5.4.2.3 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 26**) to configure the Memory settings.

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

Memory Information

Total Memory                     Not Present
CHA_DIMM1                        Not Present      ---------------------
CHA_DIMM2                        Not Present      ←→: Select Screen
CHB_DIMM1                        Not Present      ↑ ↓: Select Item
CHB_DIMM2                        Not Present      Enter Select
                                                  + –   Change Opt.
                                                  F1   General Help
                                                  F2   Previous Values
                                                  F3   Optimized Defaults
                                                  F4   Save & Exit
                                                  ESC  Exit

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

BIOS Menu 26: Memory Configuration

5.5 Boot

Use the **Boot** menu (**BIOS Menu 27**) to configure system boot options.

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

Boot Configuration                                      Select the keyboard
Bootup NumLock State           [On]                     NumLock state
Quiet Boot                     [Enabled]
Option ROM Messages            [Force BIOS]
Launch PXE OpROM               [Disabled]               --------------------
UEFI Boot                      [Disabled]               ←→: Select Screen
                                                        ↑ ↓: Select Item
Boot Option Priorities                                  Enter Select
                                                        + -   Change Opt.
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 27: Boot

➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On**   DEFAULT   Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off**   Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**   Normal POST messages displayed

➔ **Enabled**   DEFAULT   OEM Logo displayed instead of POST messages

➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**   DEFAULT   Sets display mode to force BIOS.

➔ **Keep Current**   Sets display mode to current.

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**   DEFAULT   Ignore all PXE Option ROMs

➔ **Enabled**   Load PXE Option ROMs

➔ **UEFI Boot [Disabled]**

Use the **UEFI Boot** option to enable or disable to boot from a UEFI device.

➔ **Disabled**   DEFAULT   Disable to boot from a UEFI device.

➔ **Enabled**   Enable to boot from a UEFI device.

5.6 Security

Use the **Security** menu (**BIOS Menu 28**) to set system and user passwords.

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

Password Description                              Set Setup 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    ←→: Select Screen
is a power on password and must be entered to     ↑↓: Select Item
boot or enter Setup. In Setup the User will      EnterSelect
have Administrator rights.                       + -  Change Opt.
The password must be 3 to 20 characters long.    F1   General Help
                                                 F2   Previous Values
                                                 F3   Optimized Defaults
Administrator Password                           F4   Save & Exit
User Password                                    ESC  Exit

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

BIOS Menu 28: Security

➔ **Administrator Password**

Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 29**) to load default BIOS values, optimal failsafe values and to save configuration changes.

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

 Save Changes and Reset                                Exit the system after
 Discard Changes and Reset                             saving the changes.

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

                                                       --------------------
                                                       ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       Enter Select
                                                       + -   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 29: Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

6

Software Drivers

6.1 Available Software Drivers

> **NOTE:**
>
> The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- Graphic
- LAN
- Audio
- USB 3.0
- Intel® AMT
  - o Intel® Management Engine Components driver
  - o Intel® IT Director application

Installation instructions are given below.

6.2 Software Installation

All the drivers for the IMBA-Q670 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

> **NOTE:**
>
> If the installation program doesn't start automatically:
> Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 6-1**).

Figure 6-1: Introduction Screen

Step 3: Click IMBA-Q670.

Step 4: A new screen with a list of available drivers appears (**Figure 6-2**).

Figure 6-2: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1:   Access the driver list. (See **Section 6.2**)

Step 2:   Click "**Chipset**".

Step 3:   Locate the setup file and double click on it.

Step 4:   The setup files are extracted as shown in **Figure 6-3**.

Figure 6-3: Chipset Driver Screen

Step 5:   When the setup files are completely extracted the **Welcome Screen** in **Figure 6-4** appears.
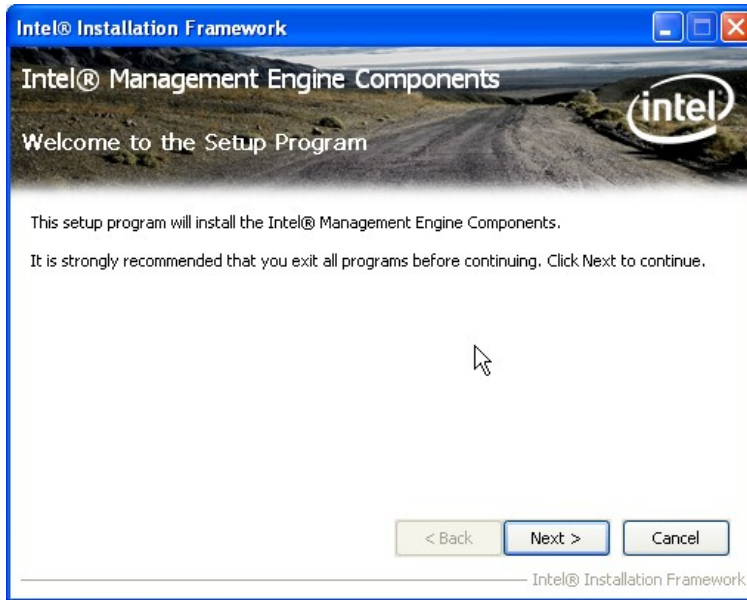
Step 6:   Click **Next** to continue.

Figure 6-4: Chipset Driver Welcome Screen

Step 7: The license agreement in **Figure 6-5** appears.

Step 8: Read the **License Agreement**.

Step 9: Click **Yes** to continue.

Figure 6-5: Chipset Driver License Agreement

Step 10: The **Read Me** file in **Figure 6-6** appears.

Step 11: Click **Next** to continue.
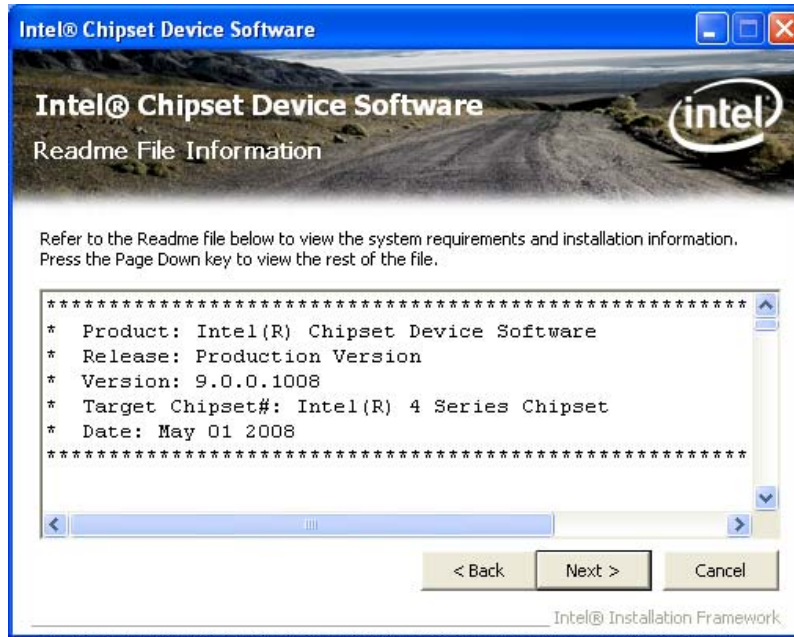
Figure 6-6: Chipset Driver Read Me File

Step 12: **Setup Operations** are performed as shown in **Figure 6-7**.

**Step 13:** Once the **Setup Operations** are complete, click **Next** to continue.

Figure 6-7: Chipset Driver Setup Operations

Step 14: The **Finish** screen in **Figure 6-8** appears.

Step 15: Select "**Yes, I want to restart this computer now**" and click **Finish**.

Figure 6-8: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**VGA**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **Welcome Screen** in **Figure 6-9** appears.

Step 5: Click **Next** to continue.
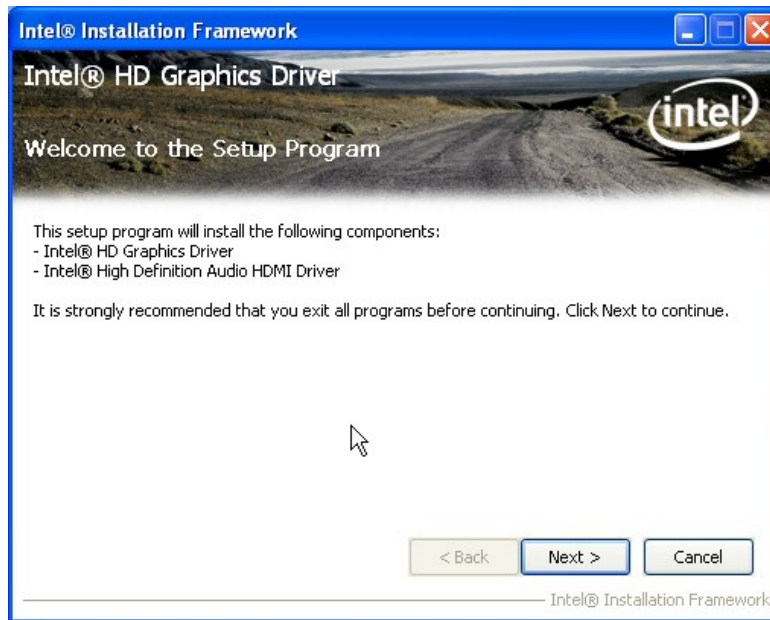
Figure 6-9: Graphics Driver Welcome Screen

Step 6: The **License Agreement** in **Figure 6-10** appears.

Step 7: Click **Yes** to accept the agreement and continue.

Figure 6-10: Graphics Driver License Agreement

Step 8: **Setup Operations** are performed as shown in **Figure 6-11**.

Step 9: Once the **Setup Operations** are complete, click **Next** to continue.
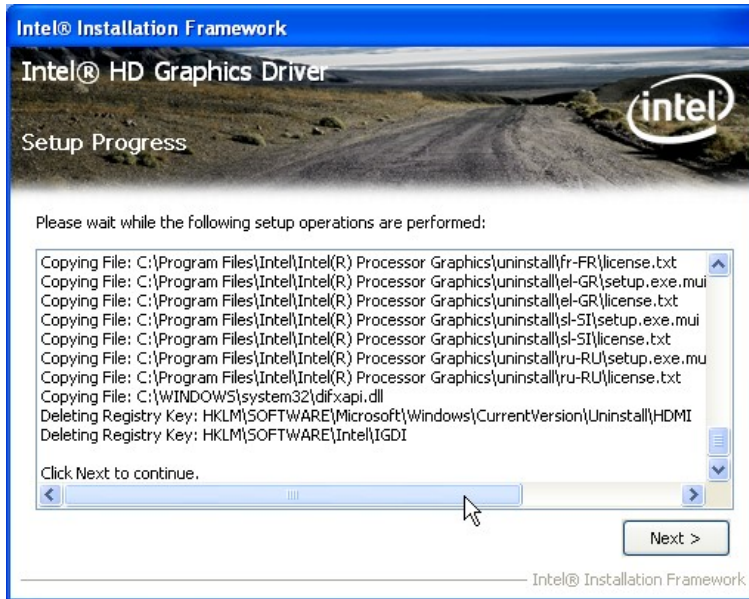
Figure 6-11: Graphics Driver Setup Operations

Step 10: The **Finish** screen in **Figure 6-12** appears.

Step 11: Select "**Yes, I want to restart this computer now**" and click **Finish**.
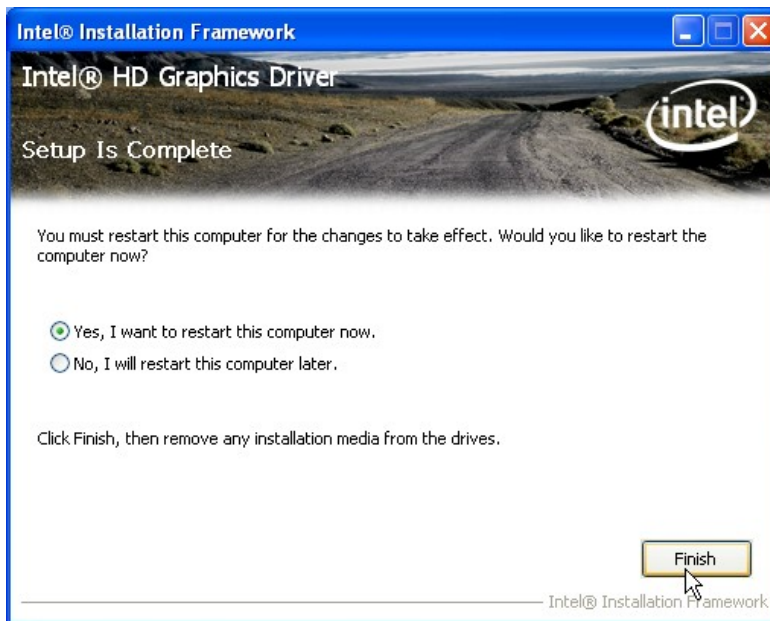
Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**LAN**".

Step 3: Locate the Autorun file and double click it.

Step 4: The Intel® Network Connection menu in **Figure 6-13** appears.

Step 5: Click **Install Drivers and Software**.
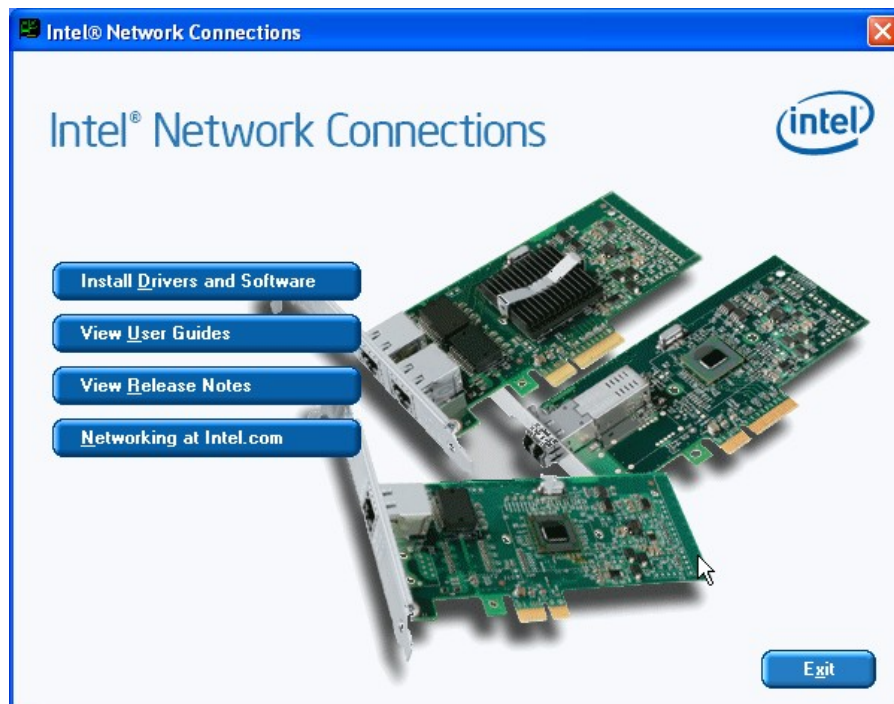
Figure 6-13: Intel® Network Connection Menu

Step 6: The **Welcome** screen in **Figure 6-14** appears.
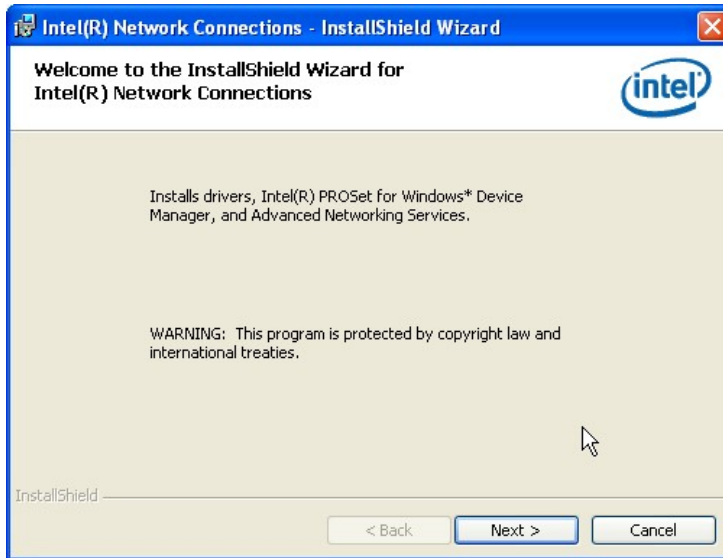
Figure 6-14: LAN Driver Welcome Screen

Step 7: Click **Next** to continue.

Step 8: The **License Agreement** in **Figure 6-15** appears.

Step 9: Accept the agreement by selecting "I accept the terms in the license

agreement".

Step 10: Click **Next** to continue.
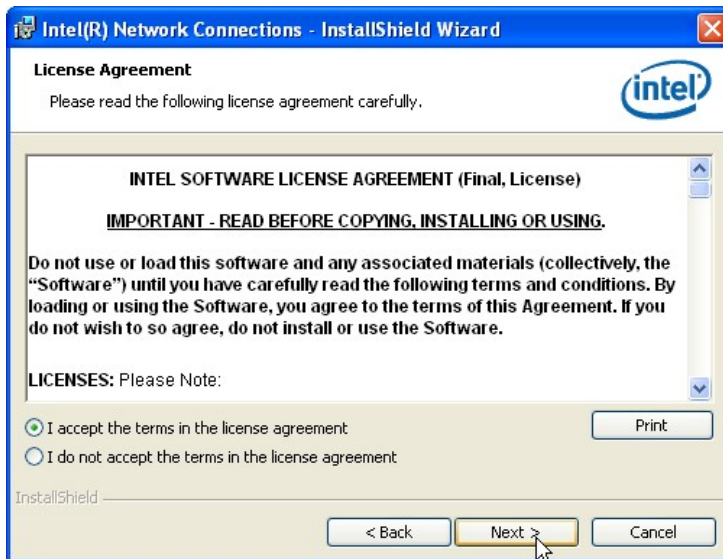
Figure 6-15: LAN Driver License Agreement

Step 11: The **Setup Options** screen in **Figure 6-16** appears.

Step 12: Select program features to install.

Step 13: Click **Next** to continue.
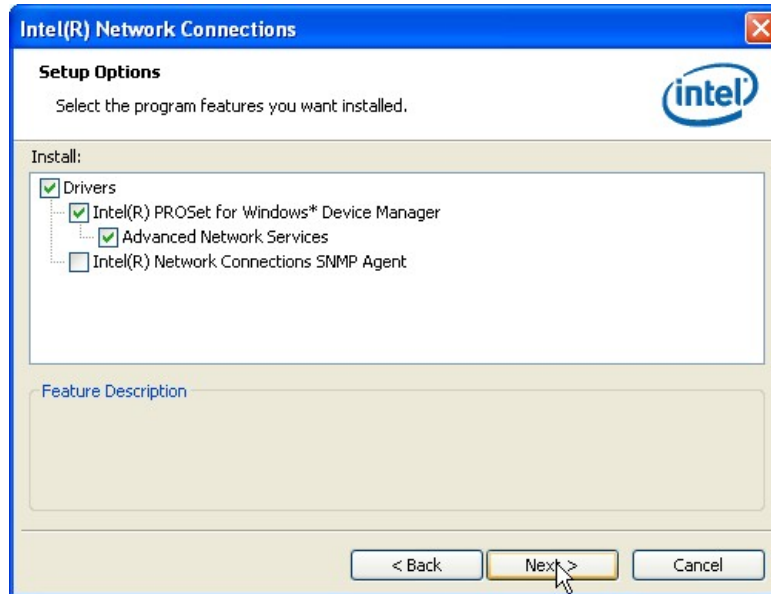
Figure 6-16: LAN Driver Setup Options

Step 14: The **Ready to Install the Program** screen in **Figure 6-17** appears.

Step 15: Click **Install** to proceed with the installation.
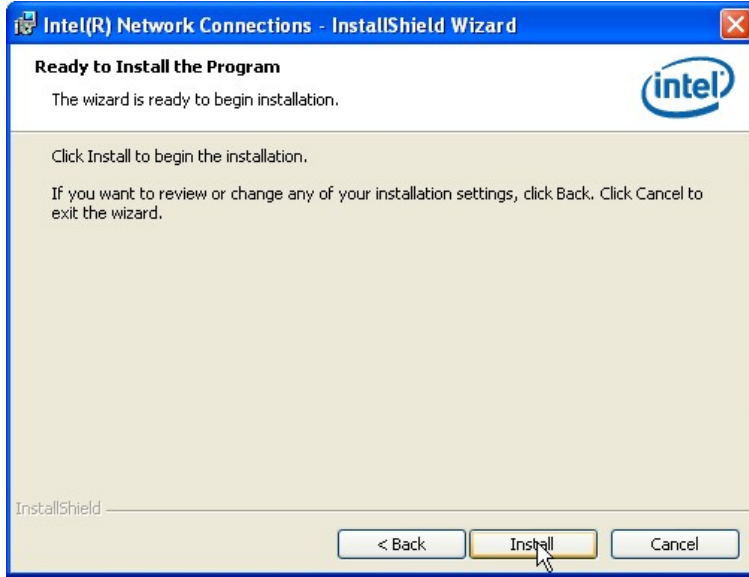
Figure 6-17: LAN Driver Installation

Step 16: The program begins to install.

Step 17: When the driver installation is complete, the screen in **Figure 6-18** appears.

Step 18: Click **Finish** to exit.

Figure 6-18: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the audio driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**Audio**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The InstallShield Wizard starts to extracting files (**Figure 6-19**).

Figure 6-19: Audio Driver – Extracting Files

Step 5: The **Audio Driver Welcome** message in **Figure 6-20** appears.

Step 6: Click **Yes** to install the audio driver.

Figure 6-20: Audio Driver Welcome Screen

Step 7: The audio driver installation begins. See **Figure 6-21**.
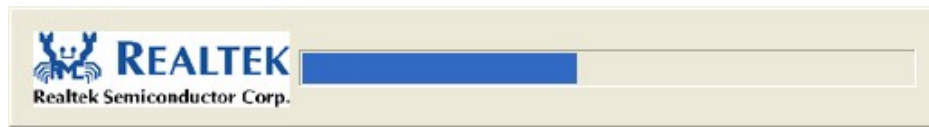
Figure 6-21: Audio Driver Installation

Step 8: When the installation is complete, the screen in **Figure 6-22** appears.

Step 9: Select "**Yes, I want to restart my computer now**" and click **Finish**.

Figure 6-22: Audio Driver Installation Complete

6.7 USB 3.0 Driver Installation

To install the touch panel software driver, please follow the steps below.

Step 1:   Access the driver list. (See **Section 6.2**)

Step 2:   Click "**USB 3.0**".

Step 3:   Locate the setup file and double click on it.

Step 4:   A **Welcome Screen** appears (**Figure 6-23**).

Step 5:   Click **Next** to continue.
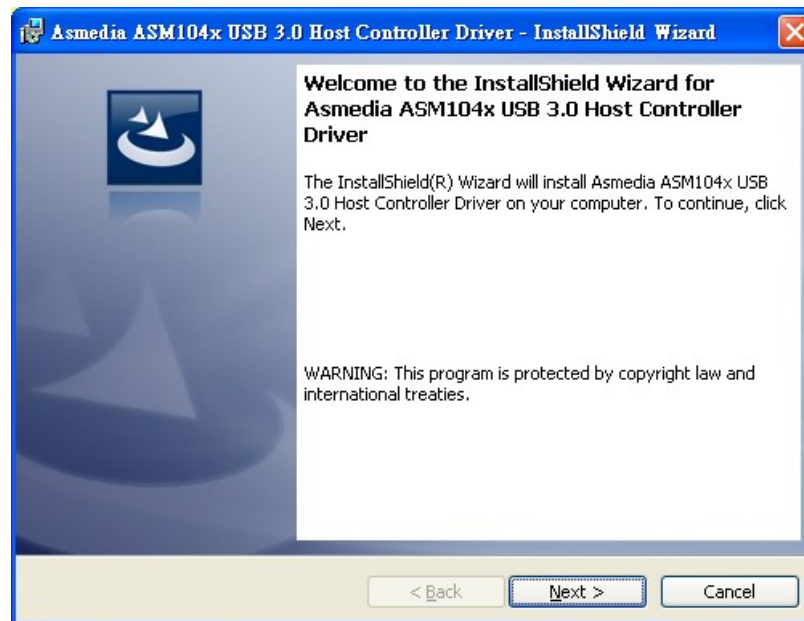
Figure 6-23: USB 3.0 Driver Welcome Screen

Step 6:   The **License Agreement** shown in **Figure 6-24** appears.

Step 7:   Click "**I accept the terms in the license agreement**" to accept and continue.

Figure 6-24: USB 3.0 Driver License Agreement

Step 8: The **Install** screen appears and displays the progress of the installation

(**Figure 6-25**).
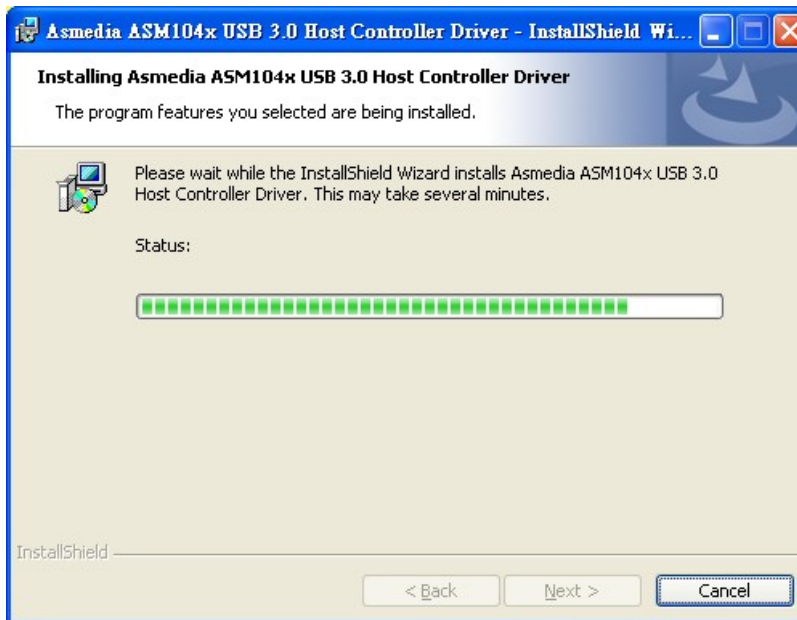
Figure 6-25: USB 3.0 Driver Installation Screen

Step 9: When the installation is complete, click **FINISH** to exit setup. (**Figure 6-26)**.
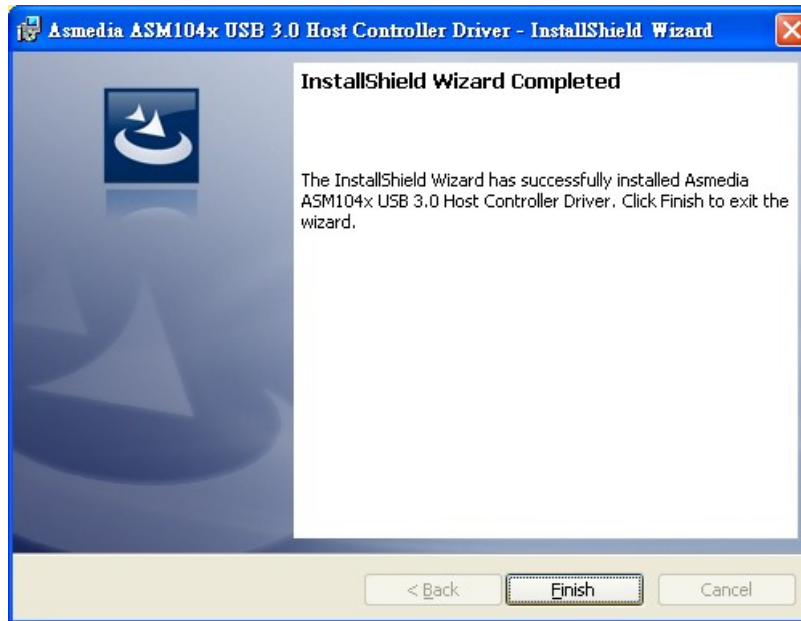
Figure 6-26: USB 3.0 Driver Update Complete

6.8 Intel® AMT Driver and Application

6.8.1 Intel® Management Engine Components Installation

The package of the Intel® ME components includes

- Intel® Management Engine Interface (Intel® ME Interface)
- Serial Over LAN (SOL) driver
- Local Manageability Service (LMS)
- User Notification Service (UNS)
- Intel® ME WMI provider
- Intel® Active Management Technology NAC Posture Plug-in
- Intel Control Center
- Intel® Management and Security Status Application

To install these Intel® ME components, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**iAMT**".

Step 3: Double click the setup file in the **ME_SW_IS** folder.

Step 4: Locate the setup file and double click it.

Step 5: When the setup files are completely extracted the **Welcome Screen** in **Figure 6-27** appears.

Step 6: Click **Next** to continue.

Figure 6-27: Intel® ME Driver Welcome Screen

Step 7: The license agreement in **Figure 6-28** appears.

Step 8: Read the **License Agreement**.

Step 9: Click **Yes** to continue.

Figure 6-28: Intel® ME Driver License Agreement

Step 10: The **Read Me** file in **Figure 6-29** appears.

Step 11: Click **Next** to continue.

Figure 6-29: Intel® ME Driver Read Me File

Step 12: **Setup Operations** are performed as shown in **Figure 6-30**.

Step 13: Once the **Setup Operations** are complete, click **Next** to continue.
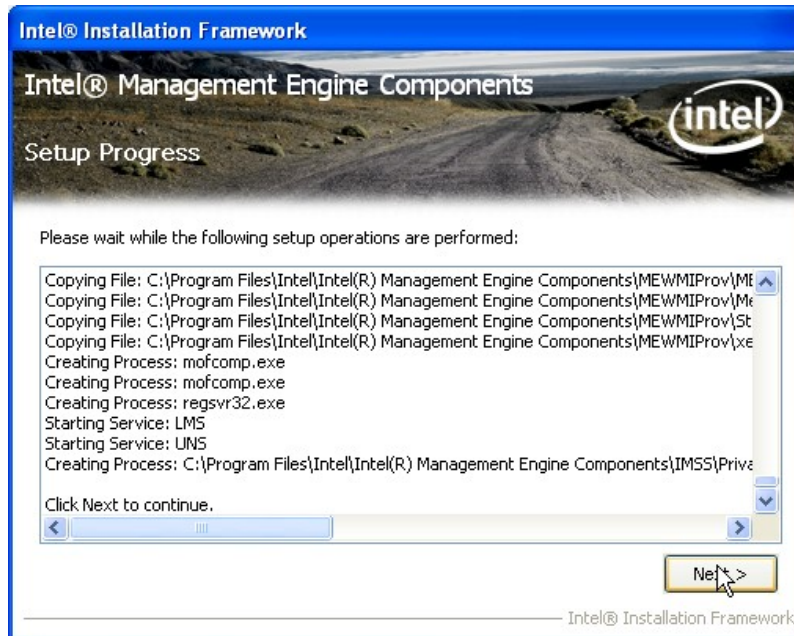
Figure 6-30: Intel® ME Driver Setup Operations

Step 14: The **Finish** screen in **Figure 6-31** appears.

Step 15: Select "**Yes, I want to restart this computer now**" and click **Finish**.

Figure 6-31: Intel® ME Driver Installation Finish Screen

6.8.2 Intel® IT Director Application Installation

Intel® IT Director is an application that helps address key IT security, data protection and network health concerns of small businesses. To install the Intel® IT Director application, please do the following.

![NOTE icon] **NOTE:**

> For Windows XP system, please make sure to install the .net Framework 3.5 before installing the Intel® IT Director application. The .net Framework 3.5 setup file is located at **\7-iAMT, iTPM Driver & Utility\Microsoft .NET Framework 3.5** of the driver CD.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**iAMT**".

Step 3: Double click the setup file in the **Intel_ IT Director** folder.

Step 4: Locate the **ITDirector_Setup.exe** setup file and double click it.

Step 5: The **Welcome Screen** in **Figure 6-32** appears.

Step 6: Click **Next** to continue.

Figure 6-32: IT Director Welcome Screen

Step 7: The license agreement in **Figure 6-33** appears.

Step 8: Accept the agreement by selecting "I accept the terms in the license agreement".

Step 9: Click **Next** to continue.

Figure 6-33: IT Director License Agreement

Step 10: Continue to choose the installation type and the destination folder for the IT
Director application.

Step 11: The **Ready to Install the Program** screen in **Figure 6-34** appears.

Step 12: Click **Install** to proceed with the installation.
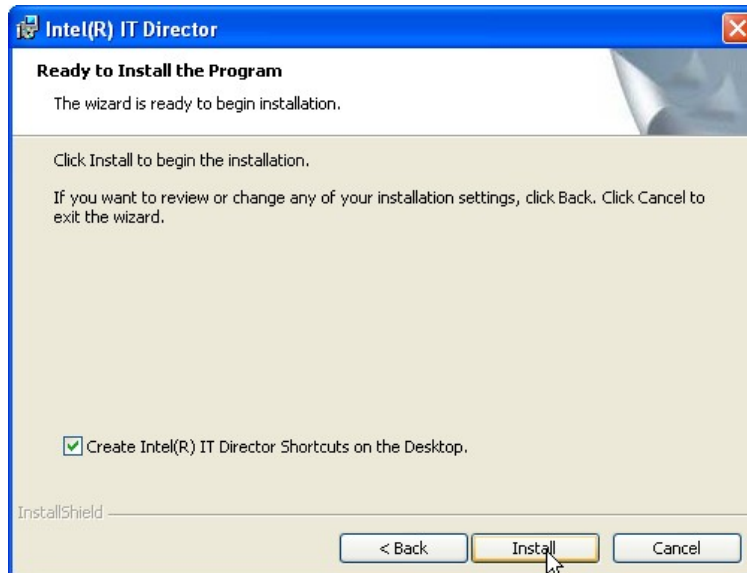
Figure 6-34: IT Director Installation

Step 13: The program begins to install.

Step 14: When the driver installation is complete, the screen in **Figure 6-35** appears.

Step 15: Click **Next** to configure the system for remote monitoring or Cancel to exit the

program and configure the system later.

Figure 6-35: IT Director Installation Complete

Step 16: The Welcome Screen of the IT Director Configuration Tool in **Figure 6-36**

appears.

Figure 6-36: IT Director Configuration Tool Welcome Screen

![NOTE icon] **NOTE:**

It is recommended to open the Intel® IT Director Getting Started Guide shown in **Figure 6-36** to fully understand the configuration process.

Step 17: Select whether this is the first computer you are creating a password for IT Director. (**Figure 6-37**).
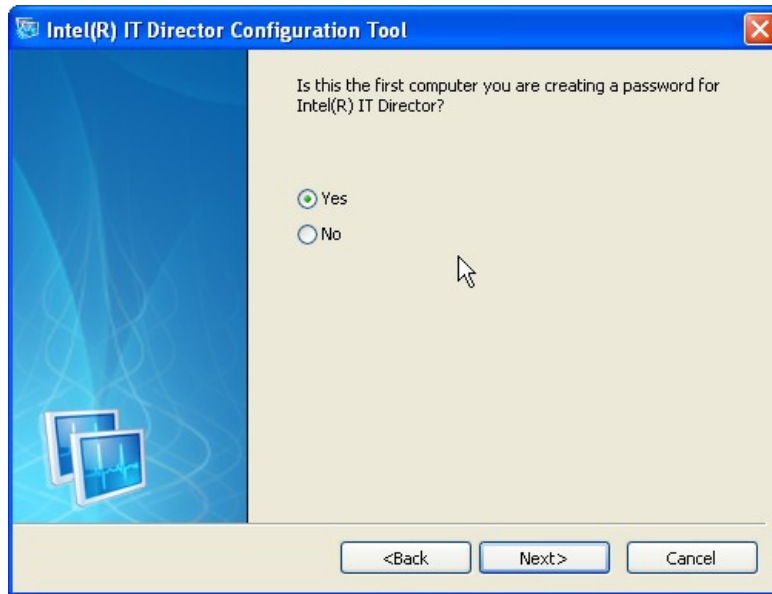
Figure 6-37: IT Director – Creating Password

Step 18: Follow the instructions to create a new password or enter the password created

previously.

Step 19: When the configuration is complete, the screen in **Figure 6-38** appears.

Step 20: Click **Finish** to exit.

Figure 6-38: IT Director Configuration Complete

NOTE:

If the network connection doesn't work after installing the Intel® IT Director in a Windows Vista system, please install the network adapter driver. The driver is located at **\7-iAMT, iTPM Driver & Utility\AMT Hot Fix\V1.0C0206** of the driver CD. Follow the instruction in the Intel Website Message PDF file in the same folder to install the driver.

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

CPU/System Temperature n...98

Console Redirection [Disabled] 99

Terminal Type [VT-100+] 99

Bits per second [115200]...99

Auto Recovery Function [Disabled]... 100

Restore on AC Power Loss [Last State] 102

Power Saving Function [Disabled]... 102

PCIe Speed [Auto].. 103

Azalia [Enabled] 103

Azalia internal HDMI codec [Enabled] 104

VT-d [Disabled]... 104

Primary Display [Auto] 105

DVMT Pre-Allocated [256 MB].. 105

DVMT Total Gfx Mem [Max]... 106

Primary IGFX Boot Display [VBIOS Default] 106

PCIEX16_1-Gen X [Auto] 107

Enable PEG [Auto] 107

Detect Non-Compliance [Disabled]... 108

Bootup NumLock State [On]... 109

Quiet Boot [Enabled] 110

Option ROM Messages [Force BIOS].. 110

Launch PXE OpROM [Disabled] 110

UEFI Boot [Disabled] 110

Administrator Password 111

User Password 111

Save Changes and Reset 112

Discard Changes and Reset 112

Restore Defaults 112

Save as User Defaults 113

Restore User Defaults 113

Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.

 NOTE:

> The latest One Key Recovery software provides an auto recovery function that allows a system running Microsoft Windows OS to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. Please refer to Section B.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.
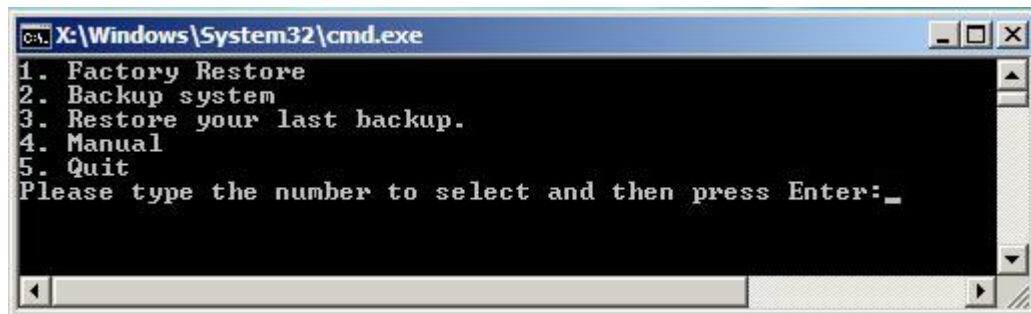
Figure B-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure B-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section B.2.1**)
2. Create partitions (see **Section B.2.2**)
3. Install operating system, drivers and system applications (see **Section B.2.3**)
4. Build the recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section B.5**.

NOTE:

The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.
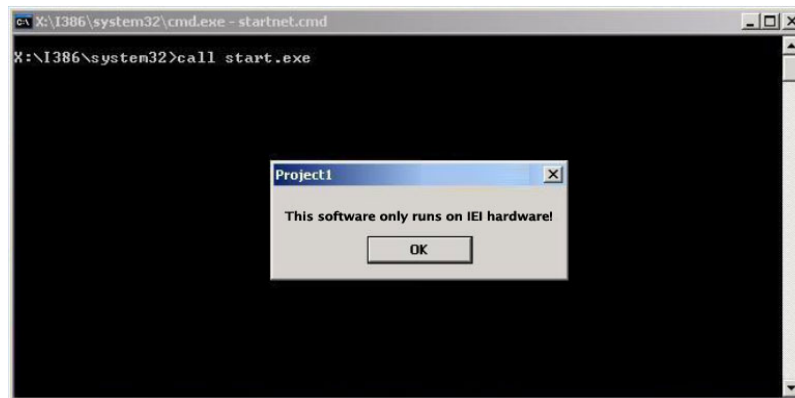
To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the

partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating systems (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows 2000
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
  - Windows Embedded Standard 7

NOTE:

The auto recovery function (described in Section B.3) and the restore through LAN function (described in Section B.6) are not supported in the Windows CE 5.0/6.0 operating system environment.

- Linux
  - o Fedora Core 12 (Constantine)
  - o Fedora Core 11 (Leonidas)
  - o Fedora Core 10 (Cambridge)
  - o Fedora Core 8 (Werewolf)
  - o Fedora Core 7 (Moonshine)
  - o RedHat RHEL-5.4
  - o RedHat 9 (Ghirke)
  - o Ubuntu 8.10 (Intrepid)
  - o Ubuntu 7.10 (Gutsy)
  - o Ubuntu 6.10 (Edgy)
  - o Debian 5.0 (Lenny)
  - o Debian 4.0 (Etch)
  - o SuSe 11.2
  - o SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section B.2.1**)

Step 2: Create partitions (see **Section B.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section B.2.3**)

Step 4: Build the recovery partition (see **Section B.2.4**) or build the auto recovery

partition (see **Section B.3**)

Step 5: Create factory default image (see **Section B.2.5**)

The detailed descriptions are described in the following sections.

> **NOTE:**
>
> The setup procedures described below are for Microsoft Windows operating system users. For Linux, most of the setup procedures are the same except for several steps described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

Step 1:   Make sure the system is powered off and unplugged.

Step 2:   Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3:   Connect an optical disk drive to the system and insert the recovery CD.

Step 4:   Turn on the system.

Step 5:   Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6:   Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7:   Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1:   Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot

from the recovery CD. It will take a while to launch the recovery tool. Please be

patient!
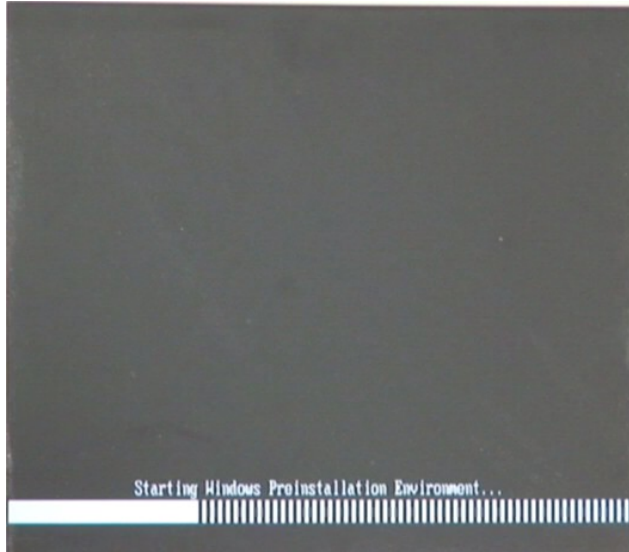
Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.
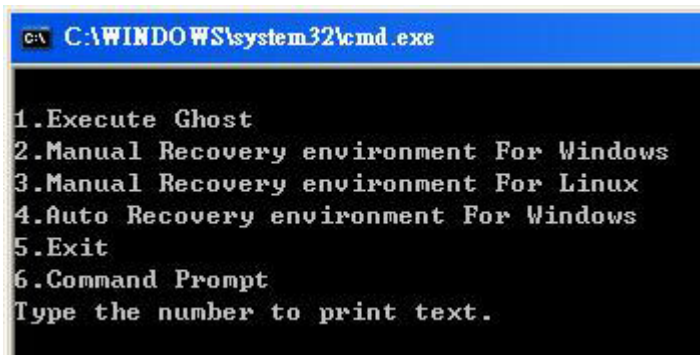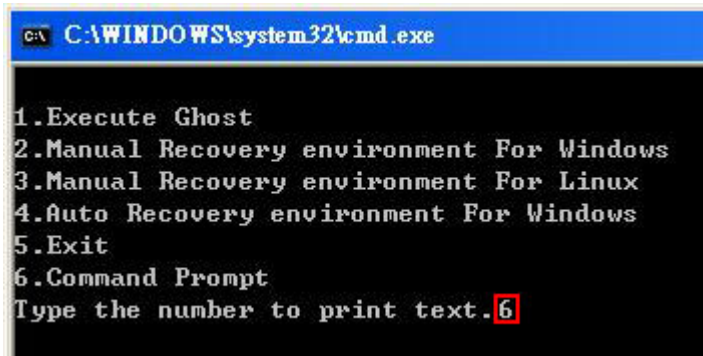
Figure B-3: Recovery Tool Setup Menu

Step 4: Press <**6**> then <Enter>.

Figure B-4: Command Prompt

Step 5:   The command prompt window appears. Type the following commands (marked

in red) to create two partitions. One is for the OS installation; the other is for

saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

Figure B-5: Partition Creation Commands

![IEI Integration Corp. logo]

NOTE:

Use the following commands to check if the partitions were created successfully.

```
X:\I386\SYSTEM32>diskpart

Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC

DISKPART> sel disk 0

Disk 0 is now the selected disk.

DISKPART> list part

  Partition ###  Type              Size     Offset
  -------------  ----------------  -------  -------
  Partition 1    Primary           2000 MB    32 KB
  Partition 2    Primary           1804 MB  2000 MB

DISKPART> exit
```

Step 6:   Press any key to exit the recovery tool and automatically reboot the system.

Please continue to the following procedure: Build the Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Building the Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from the recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!
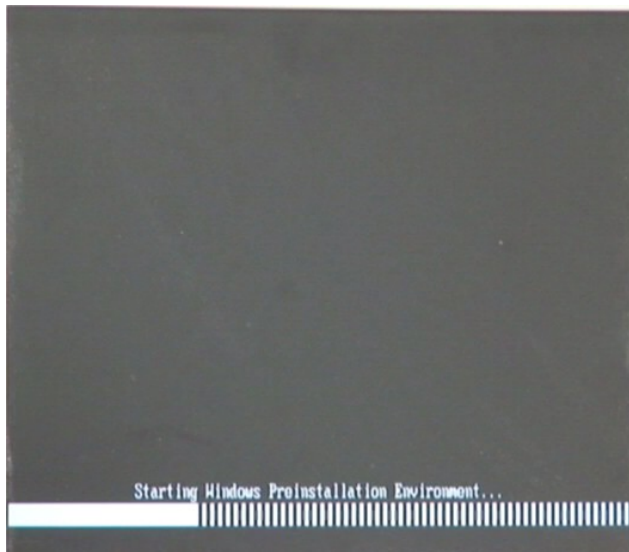
Figure B-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

Figure B-7: Manual Recovery Environment for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.
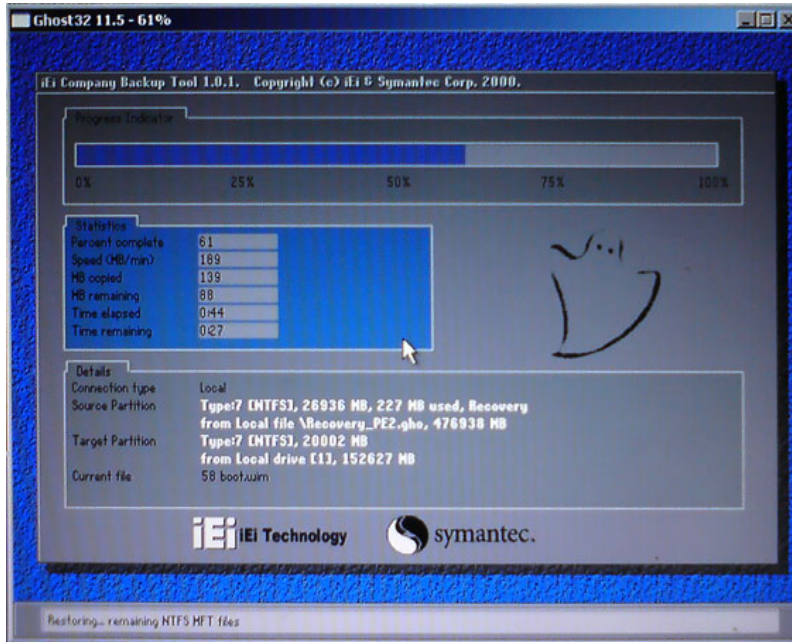
Figure B-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.
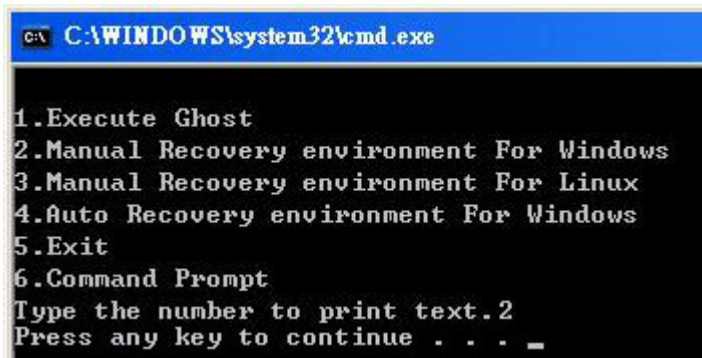
Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image
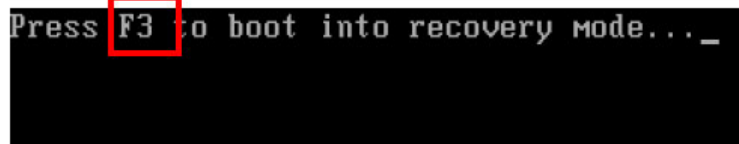
> ![note icon] **NOTE:**
>
> Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

Press F3 to boot into recovery mode...

Figure B-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure B-11**)


```
X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:4
```
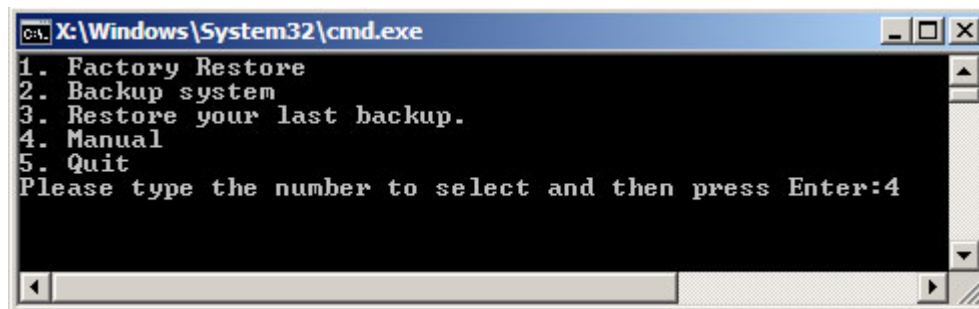
Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.
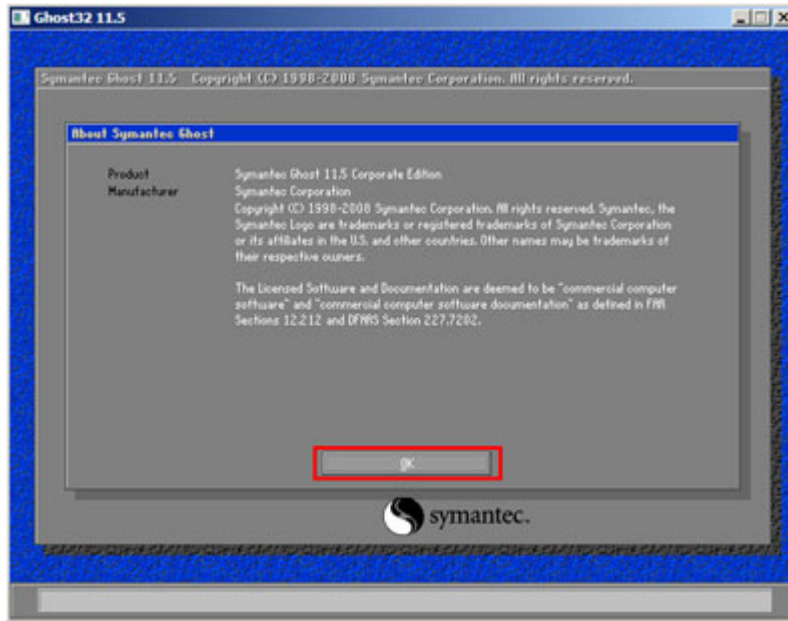
Figure B-12: About Symantec Ghost Window

Step 4:   Use mouse to navigate to the option shown below (**Figure B-13**).
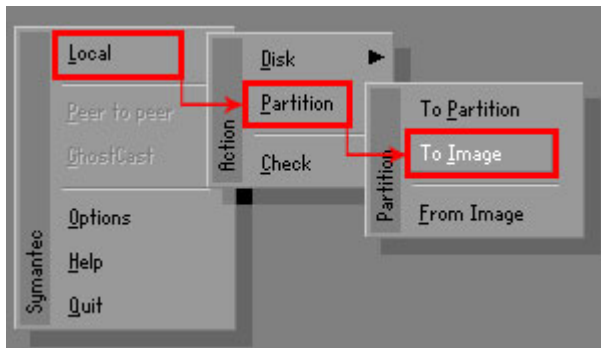
Figure B-13: Symantec Ghost Path

Step 5:   Select the local source drive (Drive 1) as shown in **Figure B-14**. Then click OK.
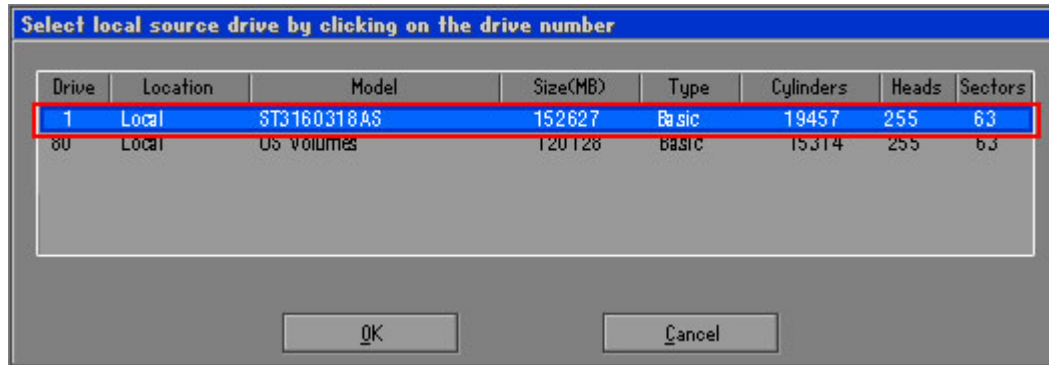
Figure B-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure B-15**.

Then click OK.
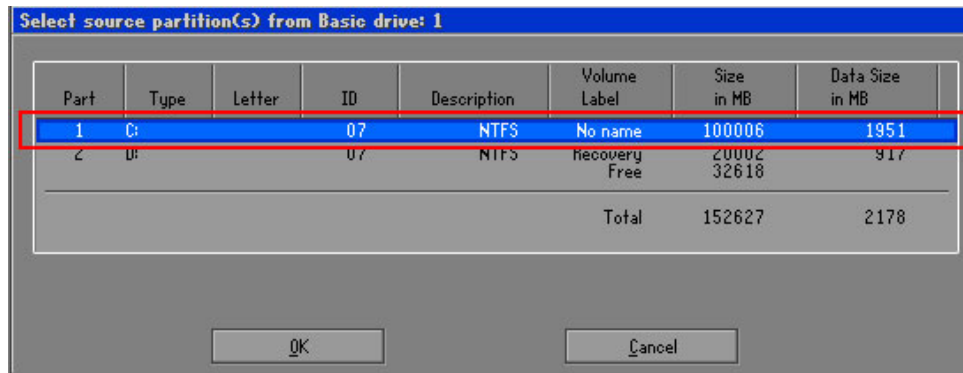
Figure B-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei**

(**Figure B-16**). Click **Save**. The factory default image will then be saved in the

selected recovery drive and named IEI.GHO.

![warning icon] **WARNING:**

The file name of the factory default image must be **iei.GHO**.
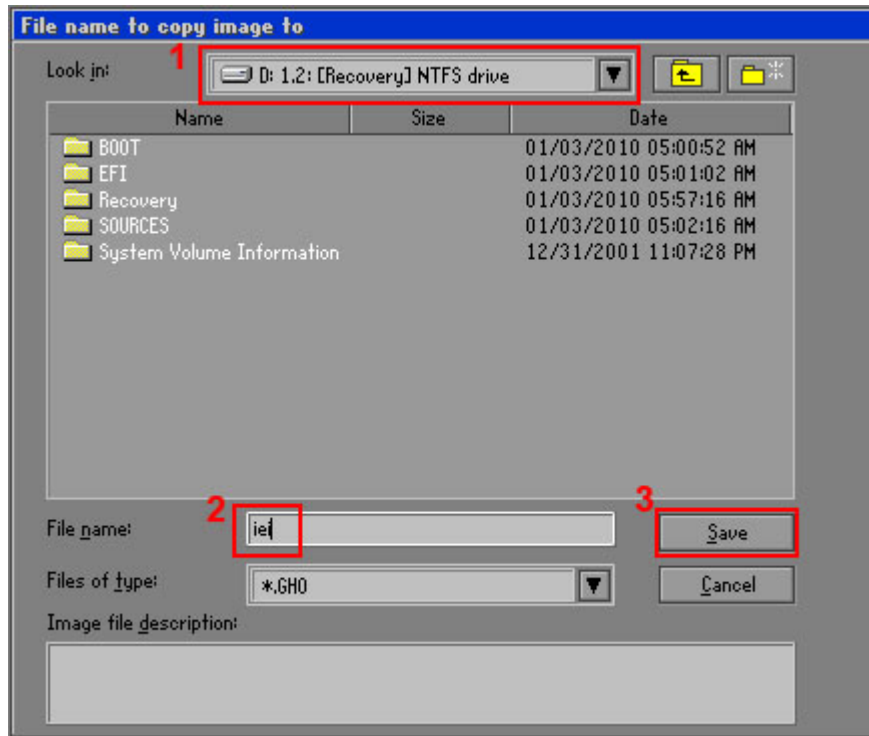
Figure B-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure B-17** prompts, click **High** to make

the image file smaller.
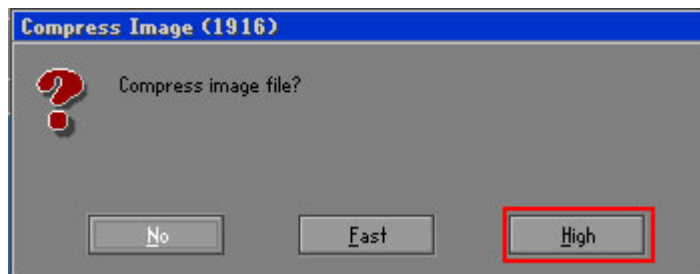
Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to
continue.
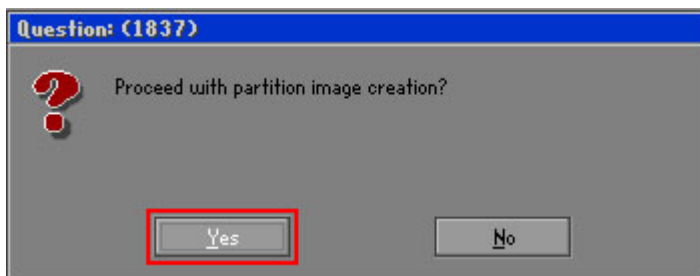
Figure B-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-19**).
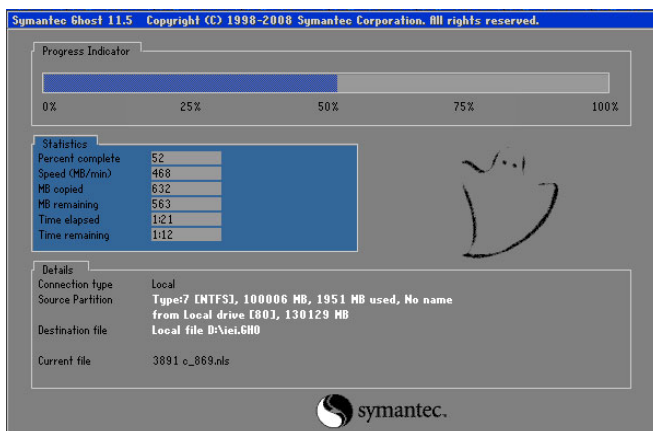
Figure B-19: Creating Image

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**.
Click **Continue** and close the Ghost window to exit the program.
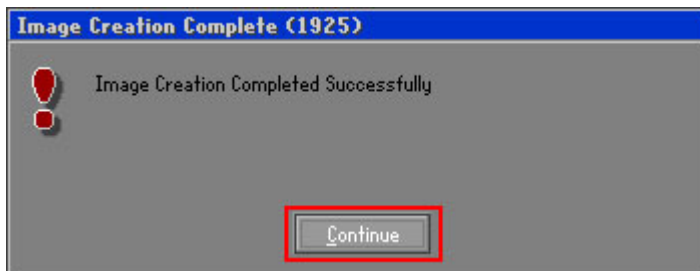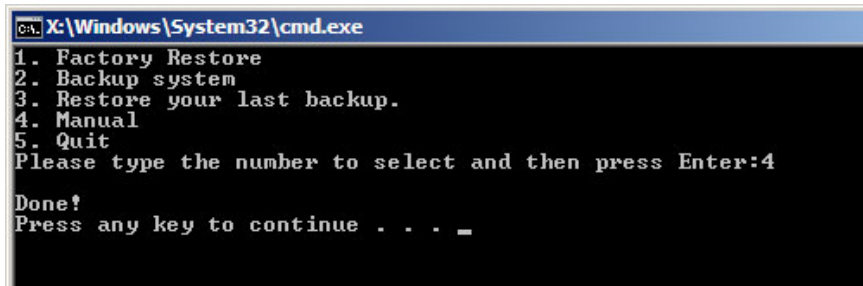
Figure B-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

Figure B-21: Press Any Key to Continue

B.3 Auto Recovery Setup Procedure

The auto recovery function allows a system to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To use the auto recovery function, follow the steps described in the following sections.

![caution] **CAUTION:**

The auto recovery function can only run on a Microsoft Windows system with the following OS versions:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

![caution] **CAUTION:**

The setup procedure may include a step to create a factory default image. It is suggested to configure the system to a factory default environment before the configuration, including driver and application installations.

Step 1: Follow the steps described in **Section B.2.1 ~ Section B.2.3** to setup BIOS,

create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the

Utility/AUTORECOVERY-SETUP.exe in the One Key Recovery CD. This utility

MUST be installed in the system, otherwise, the system will automatically

restore from the factory default image every ten (10) minutes.

Figure B-22: Auto Recovery Utility

Step 3: **Disable the automatically restart function before creating the factory**

default image. Go to: My Computer → Properties → Advanced. Click the

Settings button of Startup and Recovery. Deselect "Automatically restart". Click

OK to save the settings and exit. (See Figure B-23)
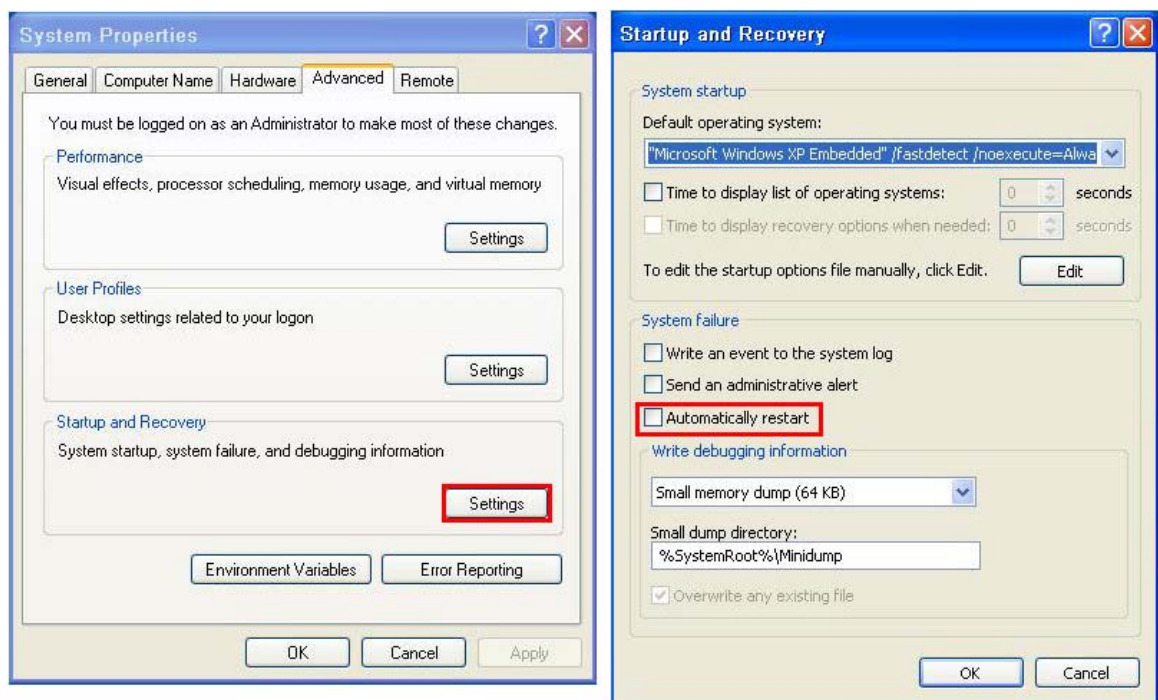
Figure B-23: Disable Automatically Restart

Step 4: Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!
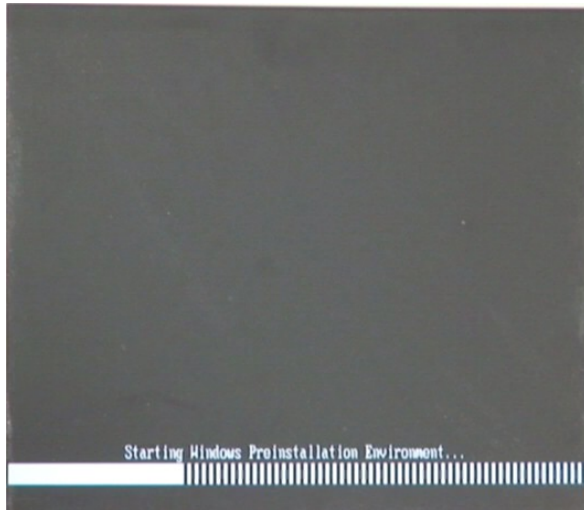
Figure B-24: Launching the Recovery Tool

Step 5: When the recovery tool setup menu appears, press <**4**> then <Enter>.
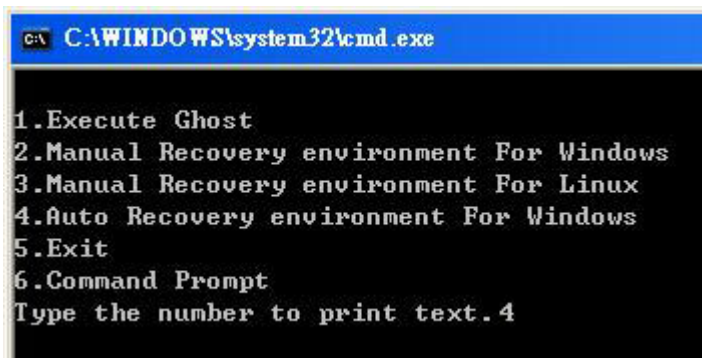
Figure B-25: Auto Recovery Environment for Windows

Step 6: The Symantec Ghost window appears and starts configuring the system to build an auto recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the auto recovery tool is saved in this partition.
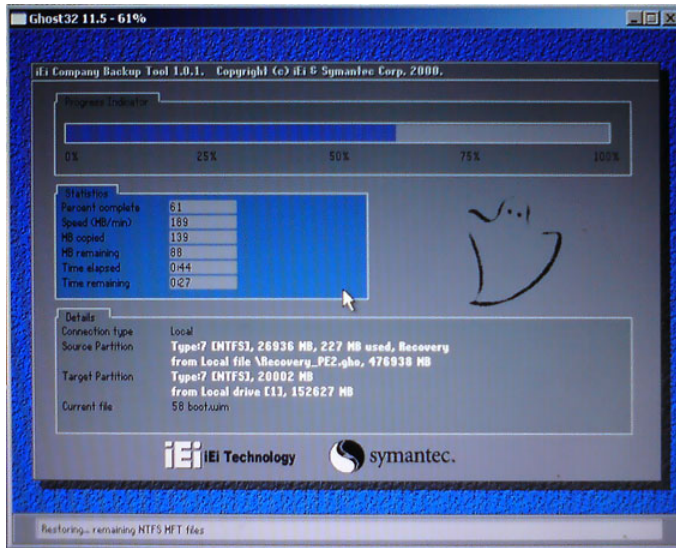
Figure B-26: Building the Auto Recovery Partition

Step 7: After completing the system configuration, the following message prompts to confirm whether to create a factory default image. Type **Y** to have the system create a factory default image automatically. Type **N** within 6 seconds to skip this process (The default option is YES). It is suggested to choose YES for this option.

Figure B-27: Factory Default Image Confirmation

Step 8: The Symantec Ghost starts to create the factory default image (**Figure B-28**).
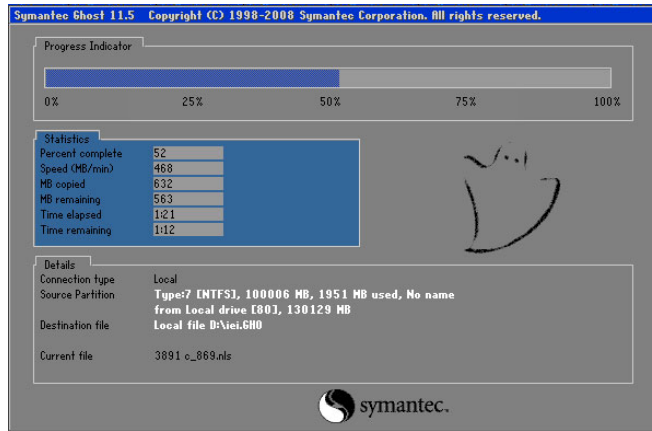
Figure B-28: Creating Image

Step 9: After completing the system configuration, press any key in the following window to restart the system.
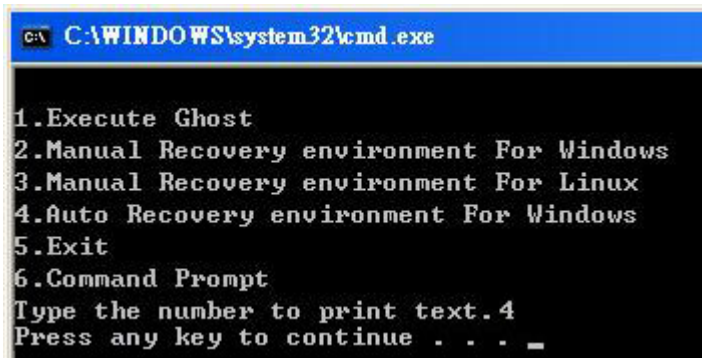
Figure B-29: Press Any Key to Continue

Step 10: Eject the One Key Recovery CD and restart the system.

Step 11: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 12: Enable the Auto Recovery Function option (**Advanced → iEi Feature → Auto Recovery Function**).

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

 iEi Feature
 _____

 Auto Recovery Function         [Enabled]
   Recover from PXE             [Disabled]


                                             ←→    Select Screen
                                             ↑↓    Select Item
                                             Enter Go to SubScreen
                                             F1    General Help
                                             F10   Save and Exit
                                             ESC   Exit
       v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```
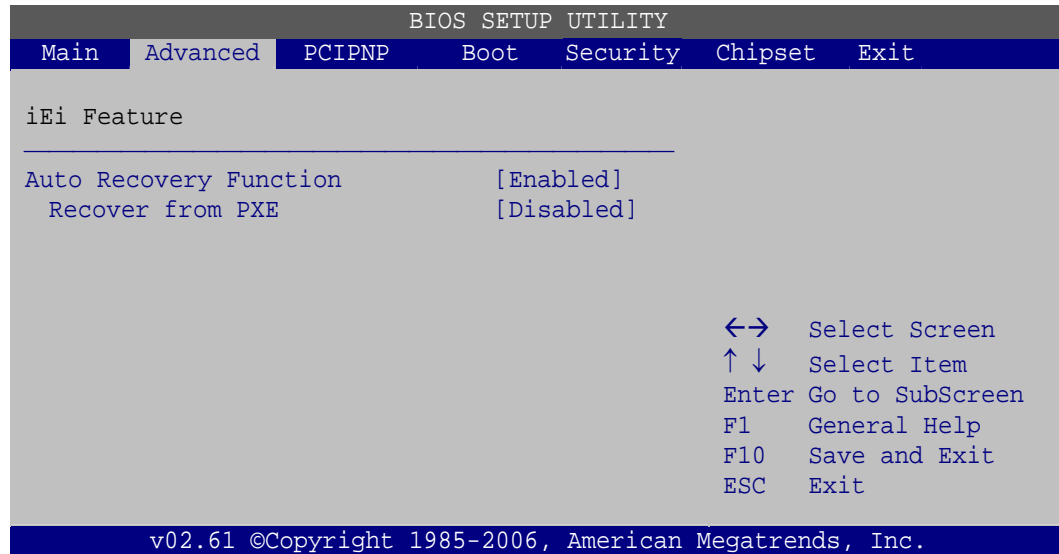
Figure B-30: IEI Feature BIOS Menu

Step 13: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

B.4 Setup Procedure for Linux

The initial setup procedure for Linux system is mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section B.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

![Note icon] **NOTE:**

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- ▪ Partition 1: **/**
- ▪ Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.
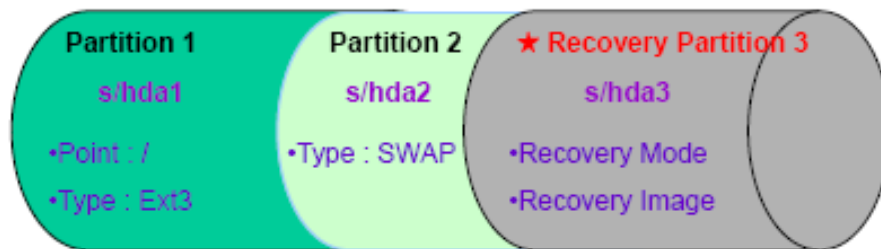
Figure B-31: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.
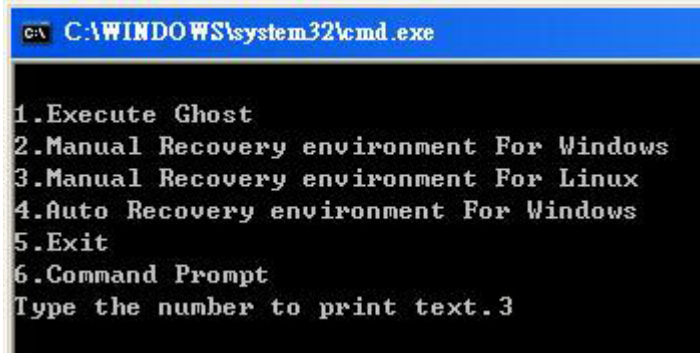
system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build the recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type **<3>** and press <Enter> (**Figure B-32**). The Symantec Ghost window appears and starts configuring the system to build a

recovery partition. After completing the system configuration, press any key to

reboot the system. Eject the recovery CD.
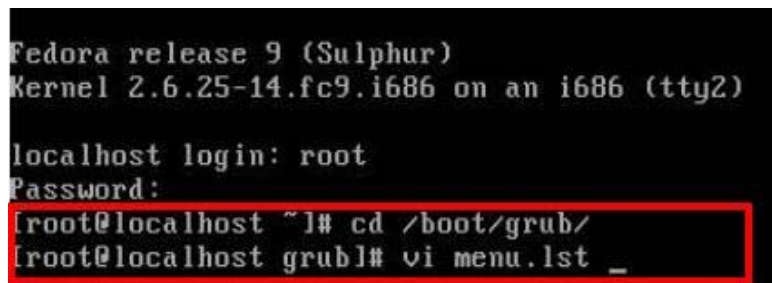
Figure B-32: Manual Recovery Environment for Linux

Step 5:   **Access the recovery tool main menu by modifying the "menu.lst".** To first

access the recovery tool main menu, the menu.lst must be modified. In Linux,

enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

Figure B-33: Access menu.lst in Linux (Text Mode)

Step 6:   Modify the menu.lst as shown below.

- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure B-34**)

Figure B-34: Recovery Tool Menu

Step 8: Create a factory default image. Follow **Step 2** ~ **Step 12** described in **Section B.2.5** to create a factory default image.

B.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. However, if the setup procedure in Section B.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.
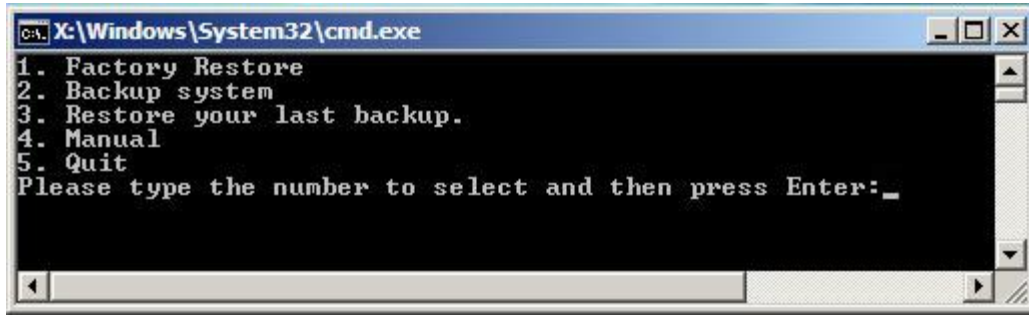
Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section B.2.5.
2. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup**: Restore the last system backup image
4. **Manual**: Enter the Symantec Ghost window to configure manually.
5. **Quit**: Exit the recovery tool and restart the system.

![WARNING icon] **WARNING:**

Please do not turn off the system power during the process of system recovery or backup.

![WARNING icon] **WARNING:**

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

B.5.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

**Step 2:** The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.
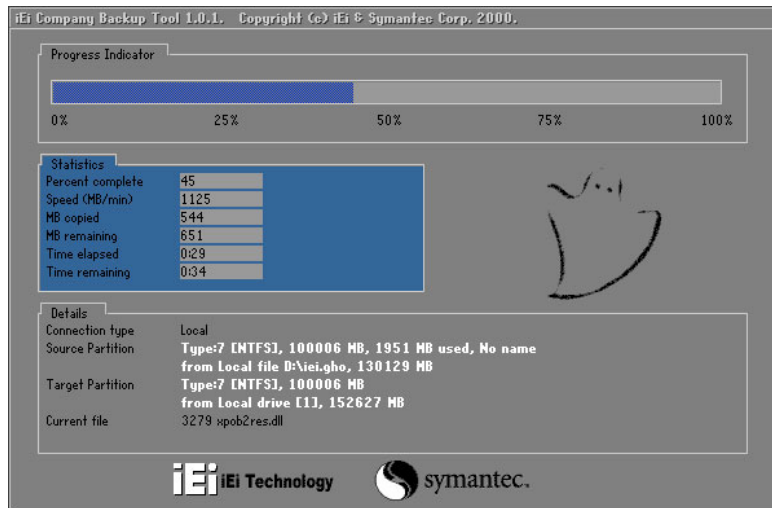
Figure B-36: Restore Factory Default

Step 3: The screen shown in **Figure B-37** appears when completed. Press any key to reboot the system.
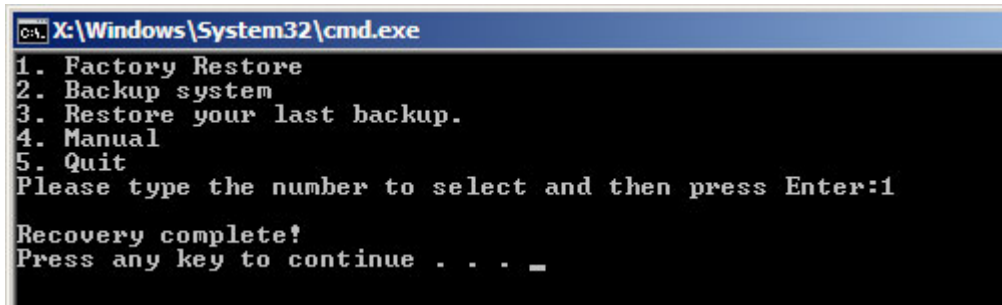
Figure B-37: Recovery Complete Window

B.5.2 Backup System

To backup the system, please follow the steps below.

Step 4: Type <**2**> and press <**Enter**> in the main menu.

Step 5: The Symantec Ghost window appears and starts to backup the system. A

backup image called **iei_user.GHO** is created in the hidden Recovery partition.
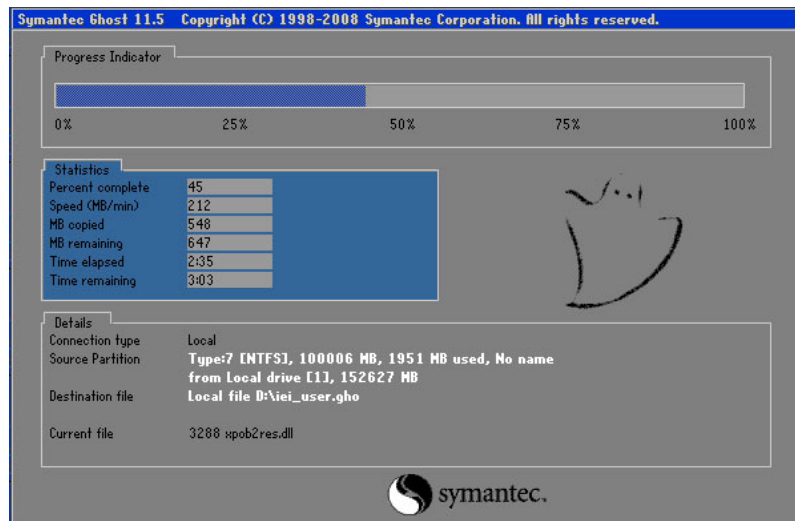
Figure B-38: Backup System

Step 6: The screen shown in **Figure B-39** appears when system backup is complete.

Press any key to reboot the system.
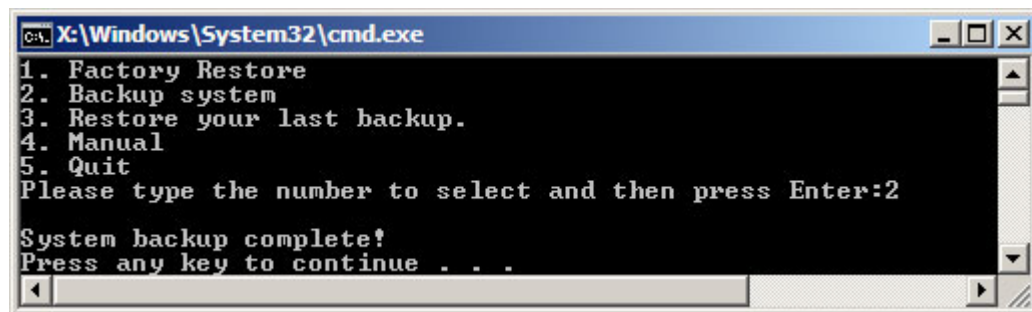
Figure B-39: System Backup Complete Window

B.5.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1:   Type <**3**> and press <**Enter**> in the main menu.

Step 2:   The Symantec Ghost window appears and starts to restore the last backup

image (iei_user.GHO).
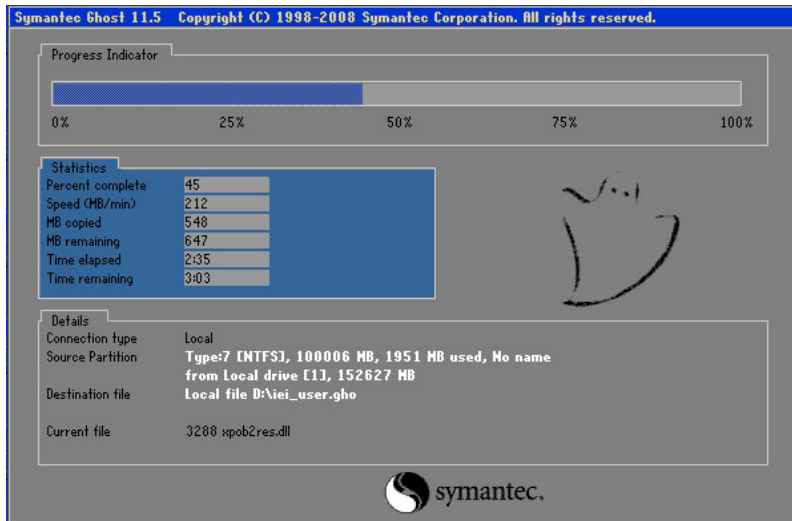
Figure B-40: Restore Backup

Step 3:   The screen shown in **Figure B-41** appears when backup recovery is complete.

Press any key to reboot the system.
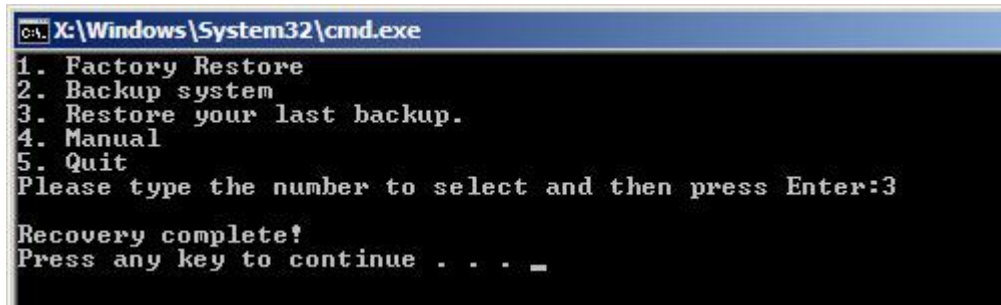
Figure B-41: Restore System Backup Complete Window

B.5.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.
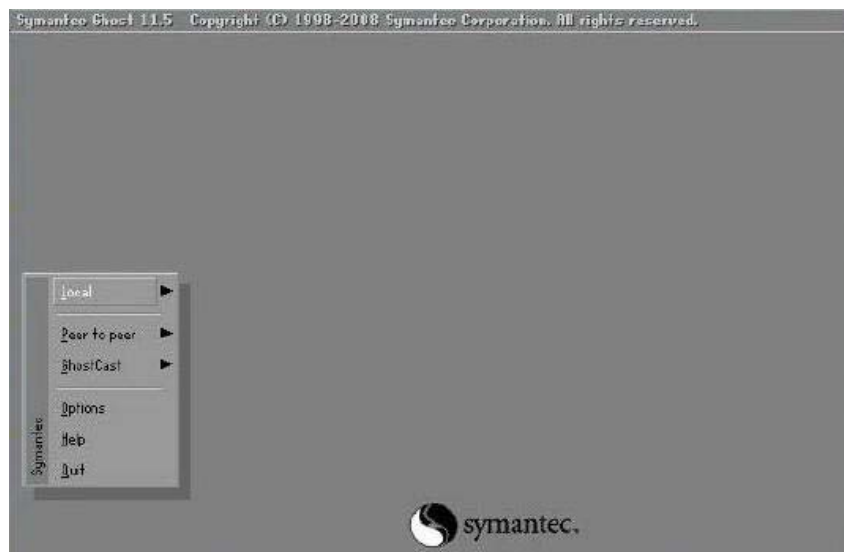
Figure B-42: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

B.6 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.
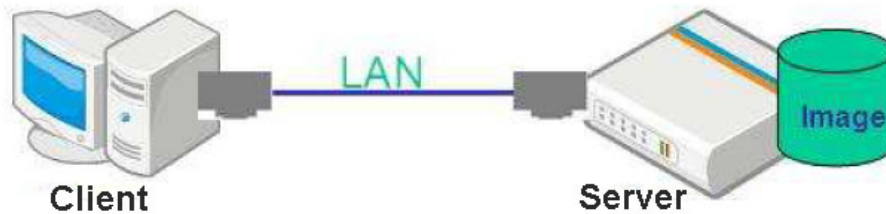
⚠️ **CAUTION:**

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

Prior to restoring client systems from a Linux server, a few setup procedures are required.

Step 1: Configure DHCP server settings

Step 2: Configure TFTP settings

Step 3: Configure One Key Recovery server settings

Step 4: Start DHCP, TFTP and HTTP

Step 5: Create a shared directory

Step 6: Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

B.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

#yum install dhcp (CentOS, commands marked in red)

#apt-get install dhcp3-server (Debian, commands marked in blue)

Step 2: Confirm the operating system default settings: dhcpd.conf.

<u>CentOS</u>

Use the following command to show the DHCP server sample location:

#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf

#vi /etc/dhcpd.conf

<u>Debian</u>

#vi /etc/dhcpd.conf

Edit "/etc/dhcpd.conf" for your environment. For example, add

next-server PXE server IP address;

filename "pxelinux.0";

B.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

#apt-get install tftpd-hpa xinetd syslinux (Debian)

Step 2: Enable the TFTP server by editing the "/etc/xinetd.d/tftp" file and make it use the remap file. The "-vvv" is optional but it could definitely help on getting more information while running the remap file. For example:

CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

server_args = -s /tftpboot –m /tftpboot/tftpd.remap -vvv

<u>**Debian**</u>

Replace the TFTP settings from "inetd" to "xinetd" and annotate the "inetd" by

adding "#".

#vi /etc/inetd.conf

Modify: #tftp dgram udp wait root /usr/sbin....... (as shown below)

#vi /etc/xinetd.d/tftp

B.6.3 Configure One Key Recovery Server Settings

Step 1:   Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key

Recovery CD to the system (server side).

Step 2:   Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

Step 3:   Copy "pxelinux.0" from "syslinux" and install to "/tftboot".

#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/

B.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

#service xinetd restart

#service httpd restart

#service dhcpd restart

Debian

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

#/etc/init.d/dhcp3-server restart

B.6.5 Create Shared Directory

Step 1: Install the samba.

#yum install samba

Step 2: Create a shared directory for the factory default image.

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

⚠ **WARNING:**

The file name of the factory default image must be **iei.gho**.

Step 3: Confirm the operating system default settings: smb.conf.

#vi /etc/samba/smb.conf

Modify:

[image]

    comment = One Key Recovery

    path = /share/image

    browseable = yes

    writable = yes

    public = yes

    create mask = 0644

    directory mask = 0755

Step 4: Edit "/etc/samba/smb.conf" for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
  security = share
```
```
[image]
   comment = One Key Recovery
   path = /share/image
   browseable = yes
   writable = yes
   public = yes
   create mask = 0644
   directory mask = 0755
```

Step 5: Modify the hostname

    #vi /etc/hostname

    Modify: RecoveryServer

```
RecoveryServer
~
```

B.6.6 Setup a Client System for Auto Recovery

Step 1: **Disable the automatically restart function before creating the factory**

    default image. Go to: My Computer → Properties → Advanced. Click the

    Settings button of Startup and Recovery. Deselect "Automatically restart". Click

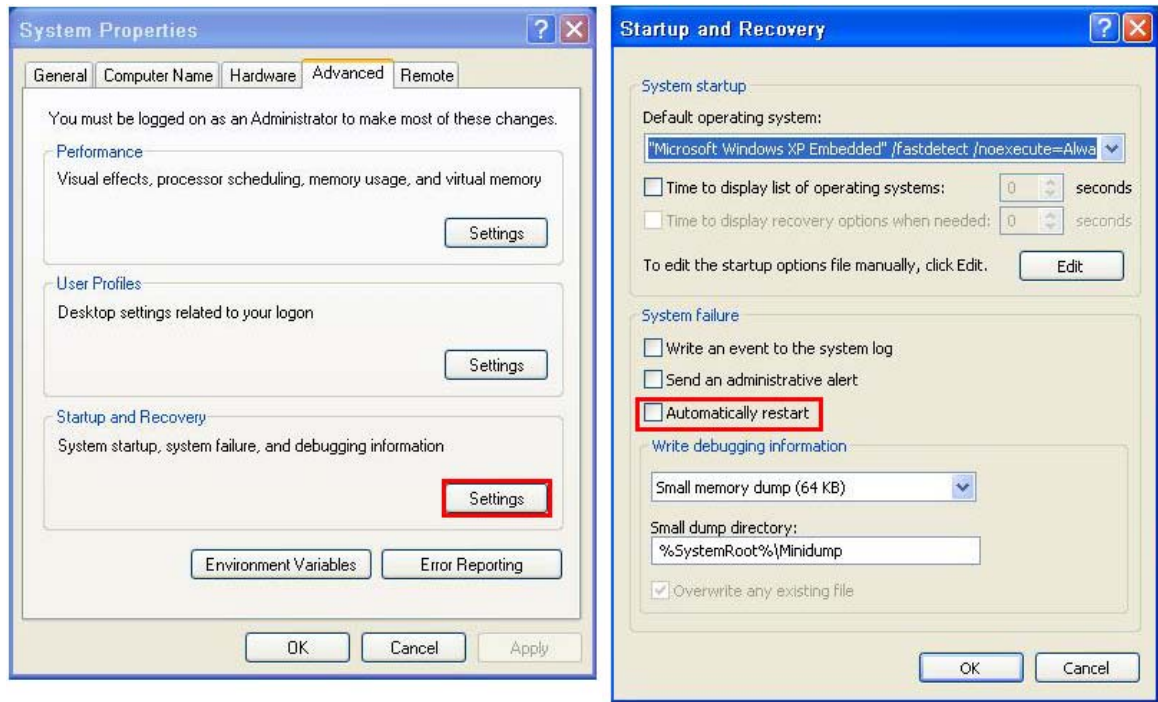   OK to save the settings and exit. (See Figure B-23)

Figure B-43: Disable Automatically Restart

Step 2: Configure the following BIOS options of the client system.

Advanced → iEi Feature → Auto Recovery Function → **Enabled**

Advanced → iEi Feature → Recover from PXE → **Enabled**

Boot → Launch PXE OpROM → **Enabled**

Step 3: Continue to configure the **Boot Option Priorities** BIOS option of the client

system:

Boot Option #1 → remain the default setting to boot from the original OS.

Boot Option #2 → select the boot from LAN option.

Step 4: Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

Step 5: Install the auto recovery utility into the system by double clicking the

Utility/AUTORECOVERY-SETUP.exe in the One Key Recovery CD. This utility

MUST be installed in the system, otherwise, the system will automatically

restore from the factory default image every ten (10) minutes.
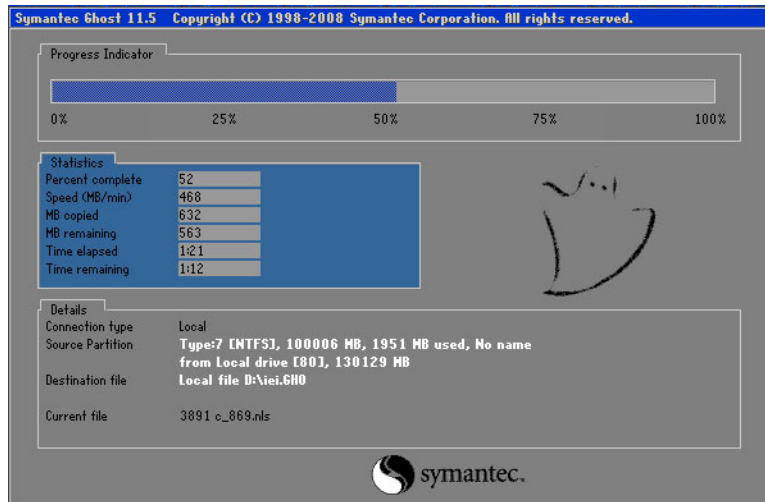

Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of

Death (BSoD) or a hang for around 10 minutes, it will automatically restore from

the factory default image. The following screens will show when the system

starts auto recovering.

![NOTE icon] **NOTE:**

A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1:   Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

Step 2:   Connect the USB floppy disk drive to the system.

Step 3:   Insert the One Key Recovery CD into the system and boot the system from the CD.

Step 4:   When launching the recovery tool, press <**F6**>.
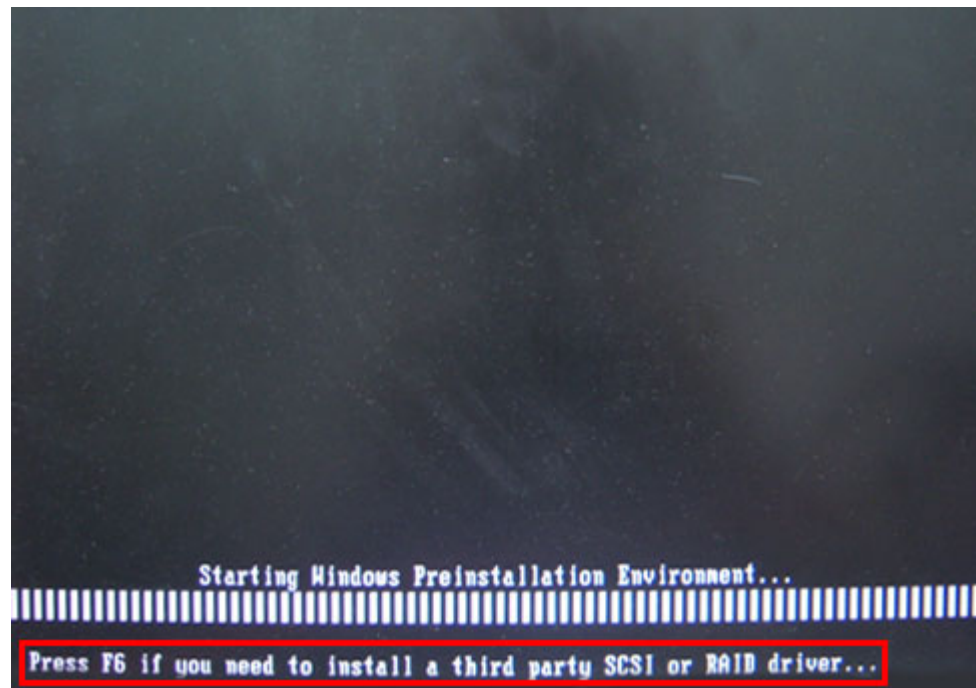
Step 5:   When the following window appears, press **<S>** to select "Specify Additional

Device".
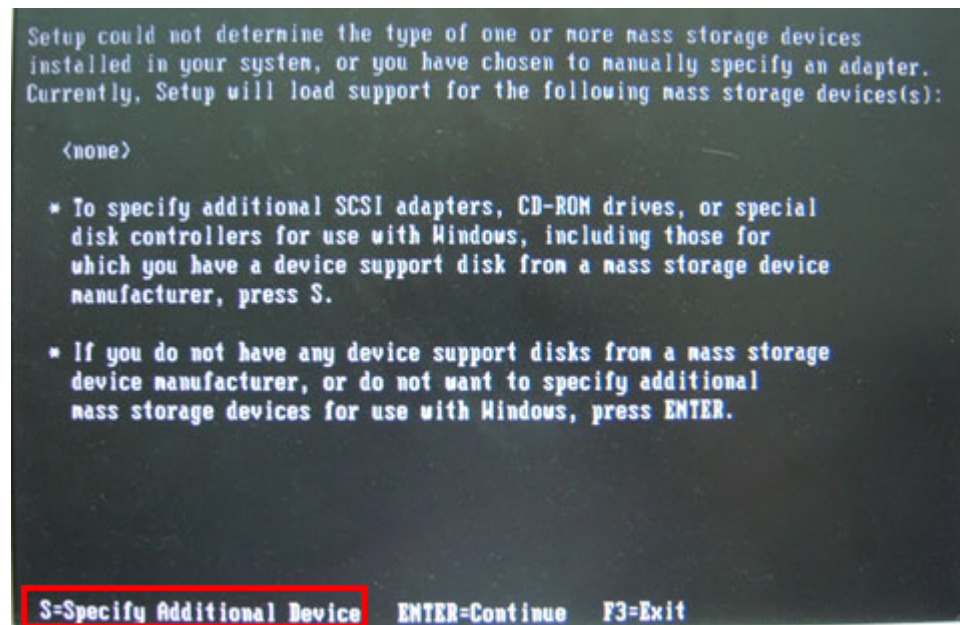
Step 6: In the following window, select a SATA controller mode used in the system. Then

press <**Enter**>. The user can now start using the SATA HDD.
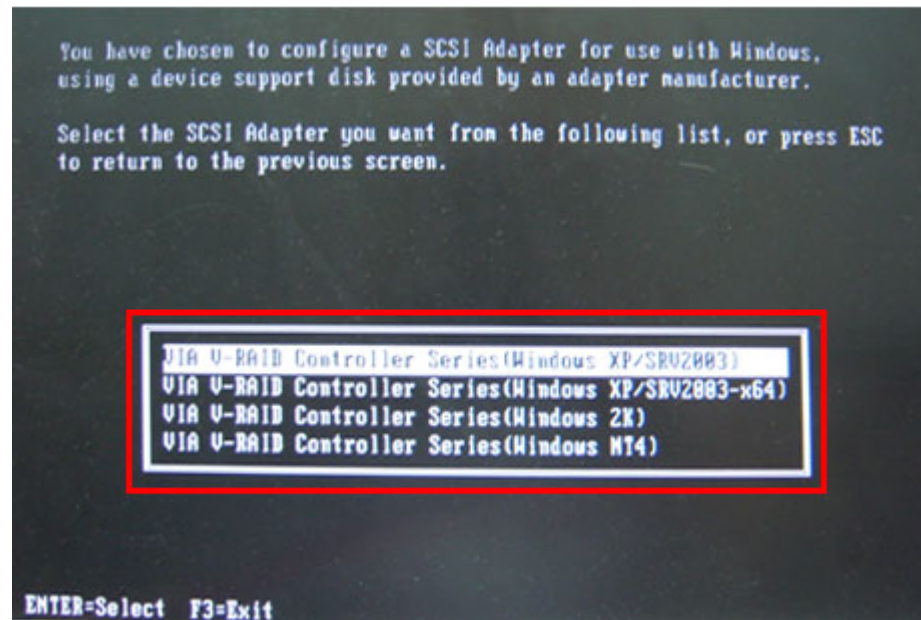
Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu.

Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create**

Partitions to finish the whole setup process.

B.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Appendix

C

Terminology

AC '97
Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.

ACPI
Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.

AHCI
Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.

ATA
The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.

ARMD
An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.

ASKIR
Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.

BIOS
The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user

CODEC
The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.

CMOS
Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.

COM
COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male D-sub 9 connector.

DAC
The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.

DDR
Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA
Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

LVDS   Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.

POST   The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.

RAM   Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.

SATA   Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.

S.M.A.R.T   Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.

UART   Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.

UHCI   The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.

USB   The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.

VGA   The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the IMBA-Q670 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

  NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

D.2 DIO Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 6-1: Digital I/O Connector Pinouts

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV   AX, 6F08H   Sets the digital port as input

INT   15H   Initiates the INT 15H BIOS call

D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

<table>
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Appendix

E

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</table>

Watchdog Timer

  NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table E-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

 NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

```
        MOV        AX, 6F02H         ;setting the time-out value
        MOV        BL, 30            ;time-out value is 48 seconds
        INT    15H
```

;
; ADD THE APPLICATION PROGRAM HERE
;

```
        CMP        EXIT_AP, 1        ;is the application over?
        JNE    W_LOOP               ;No, restart the application

        MOV        AX, 6F02H         ;disable Watchdog Timer
        MOV        BL, 0         ;
        INT    15H
```

;
; EXIT ;

Intel® Matrix Storage Manager

F.1 Introduction

The IMBA-Q670 can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

![caution icon] **CAUTION!**

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

F.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

![warning icon] **WARNING!**

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

⚠ CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

F.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

F.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 8: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

✓ NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 9: **Enable SATA drives in BIOS**. Start the computer and access the BIOS setup program. Enable RAID support for all SATA devices. Refer to the applicable BIOS configuration section in this user manual.

Step 10: **Configure "Option ROM Messages"** BIOS option to **Force BIOS**. This is to allow the "Press <CTRL+I> to enter Configuration Utility……" message to

appear during the POST. Refer to the applicable BIOS configuration section in this user manual.

Step 11: Save and Exit BIOS. After the SATA support option is enabled, save and exit the BIOS.

Step 12: Reboot the system. Reboot the system after saving and exiting the BIOS.

Step 13: Press Ctrl+I. during the system boot process, press Ctrl+I when prompted to enter the RAID configuration software.

Step 14: Configure the RAID settings. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

F.4 Installing the Operating System to the RAID Array

To install the operating system to the RAID array some extra steps are necessary during the installation process.

Step 1: Prepare a RAID driver floppy disk on another computer. If installing on the RAID array a RAID driver floppy disk must be made. The RAID driver floppy disk utility is on the CD in the "5-SATA/Floppy Configuration Utility" folder. The floppy disk will be formatted and the drivers installed.

Step 2: Restart the system with a floppy drive attached. Attach a normal floppy drive or USB floppy drive to the system.

Step 3: Press F6 when prompted. During the installation process, Windows OS prompts the user to press F6 to install the RAID drivers. Press F6 and choose from the drivers on the floppy disk.

Step 4: Install the OS. Continue with OS installation as usual.

Appendix

G

Hazardous Materials Disclosure

G.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						