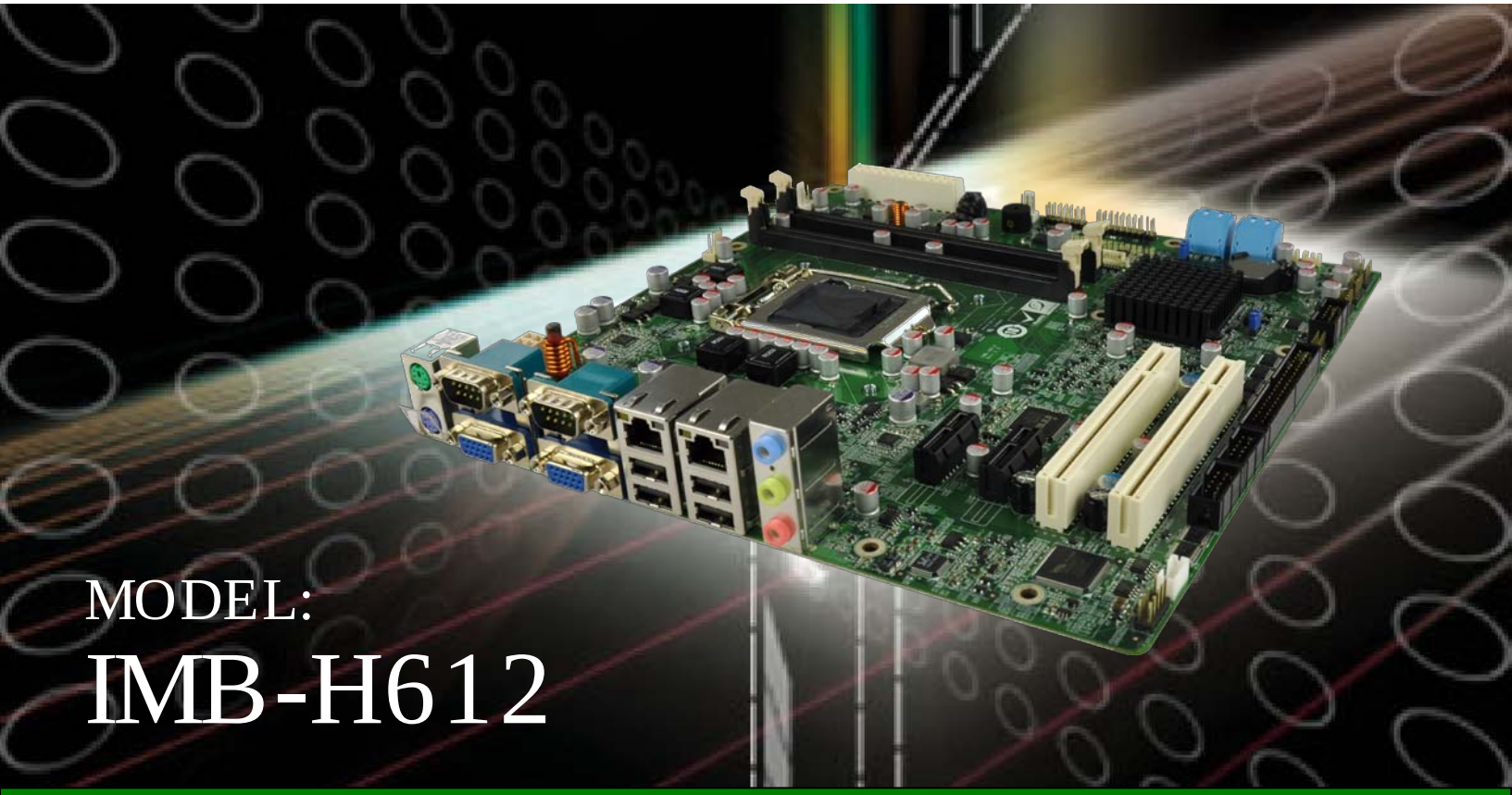
IEI Technology Corp.



MODEL:

IMB-H612

Micro ATX Motherboard supports LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU per Intel® H61, DDR3, Dual VGA, dual Realtek PCIe GbE, USB 2.0, COM, SATA 3Gb/s, HD Audio and RoHS

User Manual

Rev. 1.01 –March 31, 2012

RoHS Lead Free

Revision

Date	Version	Changes
March 31, 2012	1.01	Update Section 2.4: Optional Items
November 30, 2011	1.00	Initial release

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TRADEMARKS

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Chapter

1

Introduction

1.1 Introduction

Figure 1-1: IMB-H612

The IMB-H612 is a Micro-ATX motherboard. It accepts a LGA1155 Intel® Core™ i3/i5/i7 processor and supports two 240-pin 1333/1066 MHz dual-channel DDR3 DIMM modules up to 16 GB.

The integrated Intel® H61 System Chipset supports two GbE LAN ports through dual Realtek RTL8111E PCIe GbE controllers (LAN1 with ASF 2.0 supported). The IMB-H612 includes two VGA ports. Expansion and I/O include two PCI slots, two PCIe x1 slots, four USB 2.0 ports on the rear panel, six USB 2.0 ports by pin header, four SATA 3Gb/s connectors and one external PS/2 keyboard/mouse port. Serial device connectivity is provided by one internal RS-422/485 connector, two external RS-232 and three internal RS-232 connectors for IMB-H612A or seven internal RS-232 connectors for IMB-H612B.

1.2 Model Variations

The model variations of the IMB-H612 series are listed below.

Models	CPU	Serial Ports
IMB-H612A-R10	Intel® Core™ i3/i5/i7, Pentium®, Celeron® processor	Six
IMB-H612B-R10	Intel® Core™ i3/i5/i7, Pentium®, Celeron® processor	Ten

Table 1-1: Model Variations

1.3 Benefits

Some of the IMB-H612 motherboard benefits include:

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

1.4 Features

Some of the IMB-H612 motherboard features are listed below:

- LGA1155 Intel® Core™ i7/i5/i3 processor supported
- Dual-channel 1333MHz DDR3/DDR3L (1.35V) supports up to 16GB
- Intel® HD Graphics technology integrates high-performance graphics and media processing
- Supports independent display output via dual VGA
- Supports legacy PCI 32-bit 33/66MHz
- Supports lower power 1.35V DDR3 memory
- TPM V1.2 hardware security function supported by TPM module
- IEI One Key Recovery solution allows you to create rapid OS backup and recovery

1.5 Connectors

The connectors on the IMB-H612 are shown in the figure below.

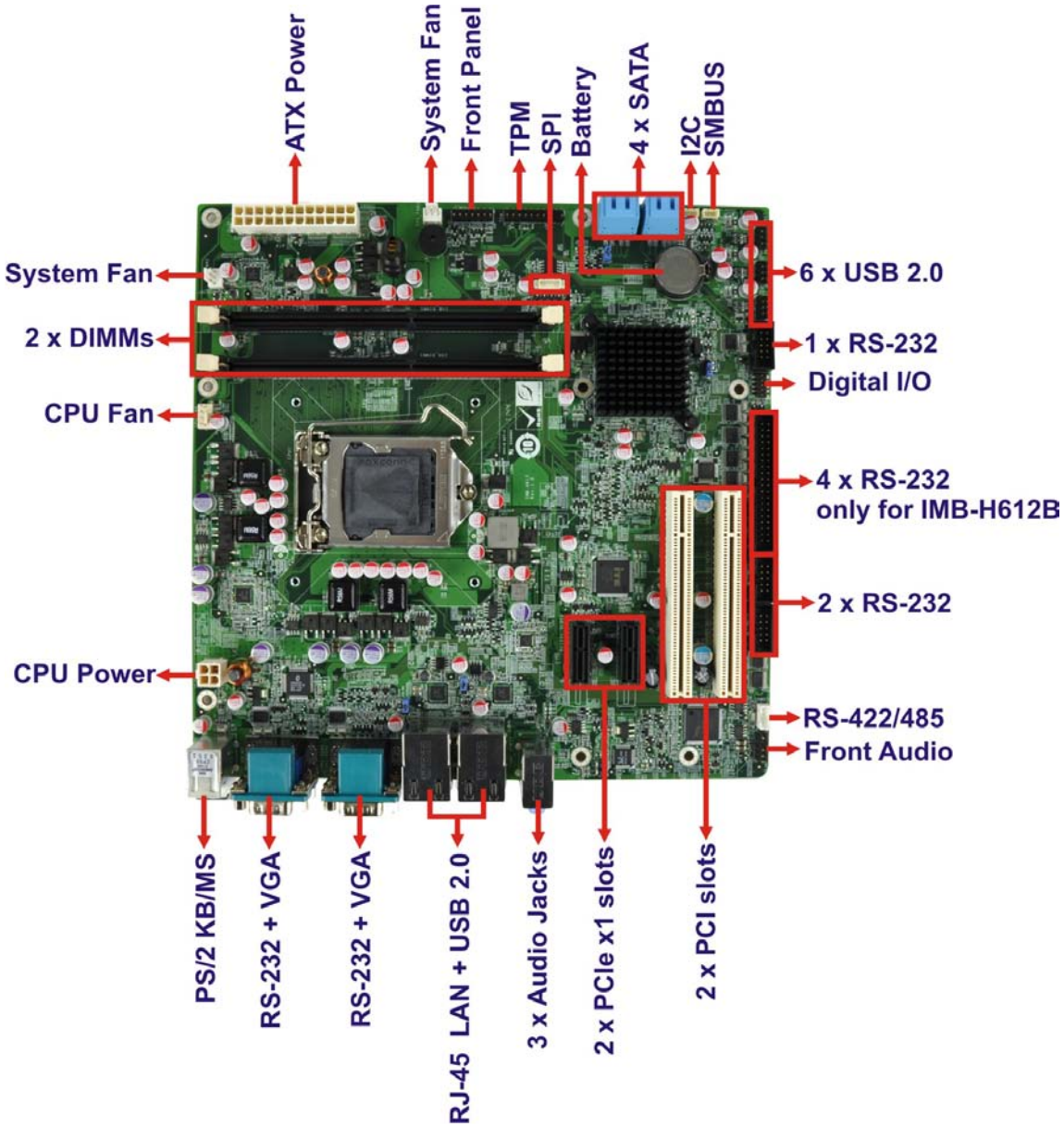


Figure 1-2: Connectors

1.6 Dimensions

The main dimensions of the IMB-H612 are shown in the diagram below.

- **Length**: 244 mm
- **Width**: 244 mm

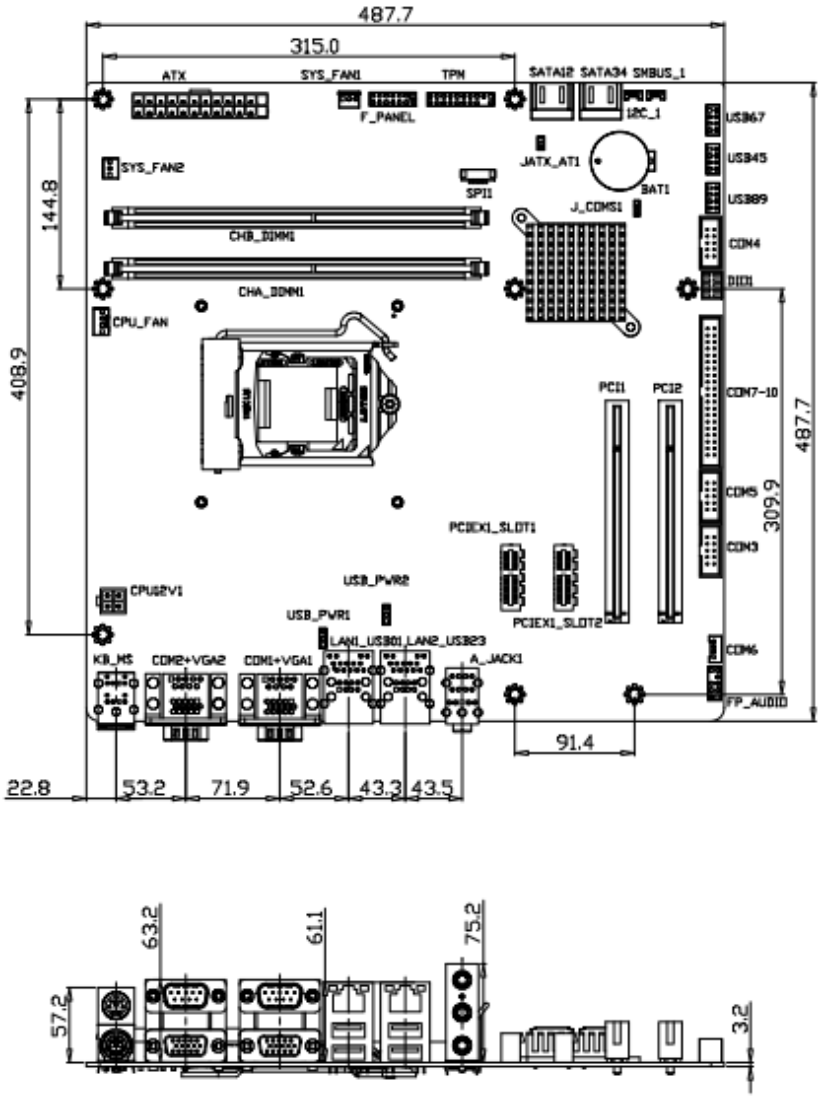


Figure 1-3: IMB-H612 Dimensions (mm)

1.7 Data Flow

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

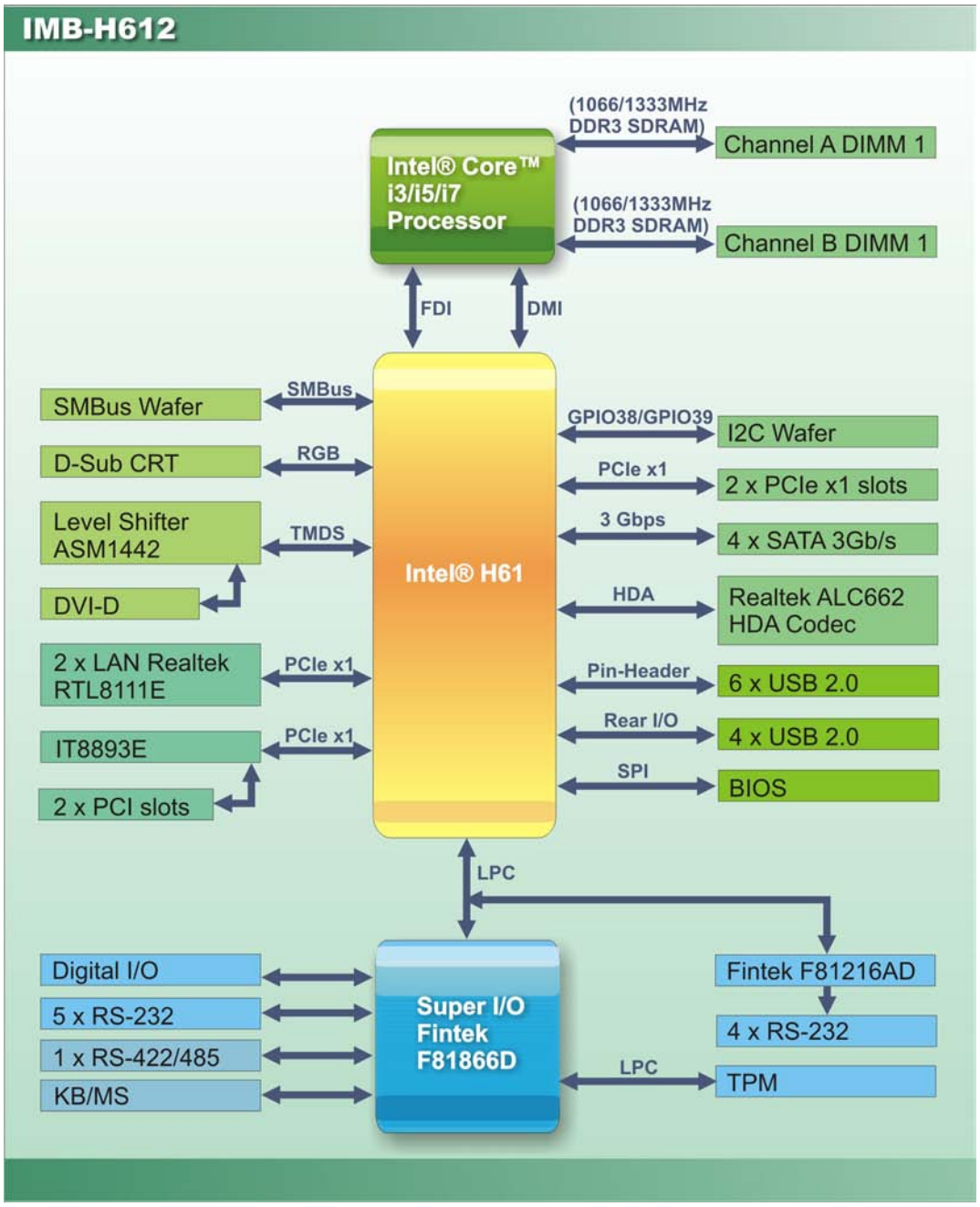


Figure 1-4: Data Flow Diagram

1.8 Technical Specifications

IMB-H612 technical specifications are listed below.

Specification/Model	IMB-H612
Form Factor	Micro-ATX
CPU Supported	LGA1155 socket supports Intel® Core™ i7/i5/i3 quad/dual, Pentium® dual, Celeron® dual/single core processor
System Chipset	Intel® H61
Graphics Engine	VGA1: Intel® HD Graphics 2000 / 3000 (Base on CPU type) Support for DX10.1 and OpenGL 3.0 Full MPEG2, VC1, AVC Decode Resolution supports up to 2048 x 1536 @75Hz VGA2: Chrontel CH7317B Resolution supports up to 1920 x 1200 @60Hz
Memory	Two 240-pin 1333/1066 MHz dual-channel unbuffered DDR3 SDRAM DIMMs supported (system max. 16 GB)
Audio	Realtek ALC662 HD Audio codec (Line-in, Line-out, Mic)
BIOS	UEFI BIOS
Digital I/O	8-bit digital I/O, 4-bit input/4-bit output
Ethernet Controllers	Dual Realtek RTL8111E PCIe GbE controllers (LAN1 with ASF 2.0 support)
Super I/O Controller	Fintek F81866
Watchdog Timer	Software Programmable supports 1~255 sec system reset
Expansions	
PCI	Two PCI slots
PCIe	Two PCIe x1 slots
I/O Interface Connectors	
Audio Connectors	Three external audio jack (Line-in, Line-out, Mic)

Specification/Model	IMB-H612
Display Port	VGA1 integrated in Intel® H61 VGA2 integrated in Chrontel CH7317B
Ethernet	Two RJ-45 ports
Keyboard/Mouse	One external PS/2 keyboard/mouse port
TPM	One 20-pin header
Front Audio	One 10-pin header
SMBus	One 4-pin wafer
I2C	One 4-pin wafer
CPU	One 4-pin CPU fan connector Two 3-pin system fan connectors
Serial Ports	Two external RS-232 via DB-9 male connectors Three RS-232 via internal 10-pin headers Four RS-232 via internal 40-pin box headers for IMB-H612B One RS-422/485 via internal 4-pin header
USB ports	Four external USB 2.0 ports by rear IO Six internal USB 2.0 ports via three 8-pin headers
Serial ATA	Four SATA 3Gb/s connectors
Environmental and Power Specifications	
Power Supply	AT / ATX power supply supported
Power Consumption	12V@0.27A, Vcore@5.3A, 5V@2.0A, 3.3V@1.0 A (Intel® 3.10GHz Core™ I5-2400 with two 1333 MHz 4GB DDR3 DIMMs)
Operating Temperature	-10ºC ~ 60ºC
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	244 mm x 244 mm
Weight GW/NW	1200 g / 680 g

Table 1-2: IMB-H612 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 IMB-H612 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:

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 IMB-H612 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The IMB-H612 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMB-H612	
4	SATA cable (**P/N**: 32801-000703-200-RS)	
1	I/O shielding	
1	Mini jumper pack (2.54mm)	
1	Utility CD	
1	One Key Recovery CD	

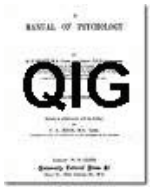
Quantity	Item and Part Number	Image
1	Quick Installation Guide	

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-port USB cable with bracket (**P/N**: 19800-003100-100-RS)	
RS-422/485 cable (**P/N**: 32205-003800-100-RS)	
SATA power cable (**P/N**: 32102-000100-200-RS)	
High-performance LGA1155/LGA1156 cooler kit, 1U Chassis compatible, 73W (**P/N**: CF-1156A-RS)	
High-performance LGA1155/LGA1156 cooler kit, 95W (**P/N**: CF-1156B-RS)	
LGA1155/LGA1156 cooler kit, 1U Chassis compatible, 45W (**P/N**: CF-1156C-RS)	

Item and Part Number	Image
LGA1155/LGA1156 cooler kit, 1U Chassis compatible, 65W (**P/N**: CF-1156D-RS)	
Quad-port RS-232 cable without bracket (400/400/400/400MM) (**P/N**: 32205-001203-100-RS)	
RS232 cable (**P/N**:19800-000114-RS)	
Dual-port RS232 cable (**P/N**: 19800-003600-100-RS)	
20-pin Infineon TPM module, SW management tool, firmware V3.17 (**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 IMB-H612 Layout

The figure below show all the connectors and jumpers.

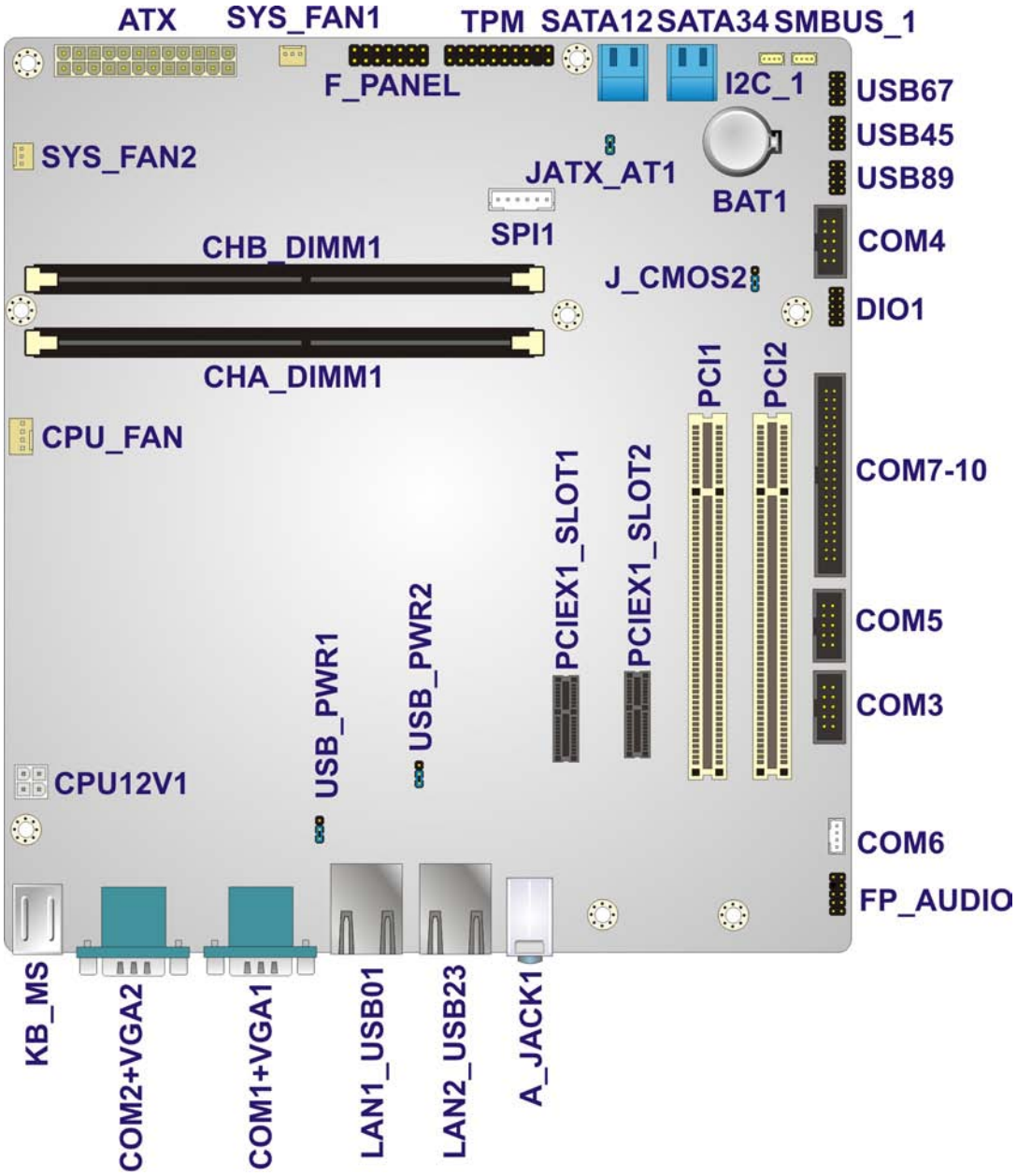


Figure 3-1: Connectors and Jumpers

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	ATX
Battery connector	Battery holder	BAT1
CPU fan connector	4-pin wafer	CPU_FAN
CPU power connector	4-pin Molex	CPU12V1
DDR3 DIMM slots	DDR3 DIMM slot	CHA_DIMM1, CHB_DIMM1
Digital I/O connector	10-pin header	DIO1
Front panel audio connector	10-pin header	FP_AUDIO
Front panel connector	14-pin header	F_PANEL
I2C connector	4-pin wafer	I2C_1
PCI slots	PCI slot	PCI1, PCI2
PCIe x1 slots	PCIe x1 slot	PCIEX1_SLOT1, PCIEX1_SLOT2,
SATA 3Gb/s drive connectors	14-pin SATA connector	SATA12, SATA34
Serial port connector, RS-422/485	4-pin wafer	COM6
Serial port connectors, RS-232	10-pin box header,	COM3, COM4, COM5
Serial port connectors, RS-232	40-pin box header	COM7-10
SMBus connector	4-pin wafer	SMBUS_1
SPI connector	6-pin wafer	SPI1
System fan connectors	3-pin wafer	SYS_FAN1, SYS_FAN2
TPM connector	20-pin header	TPM

Connector	Type	Label
USB connectors	8-pin header	USB45, USB67, USB89

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	A_JACK1
Ethernet and USB connectors	RJ-45, USB	LAN1_USB01, LAN2_USB23
Keyboard/Mouse connector	Dual PS/2	KB_MS
RS-232 serial port connectors	DB-9 male	COM1, COM2
VGA connectors	15-pin female	VGA1, VGA2

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IMB-H612.

3.2.1 ATX Power Connector

CN Label: ATX

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.

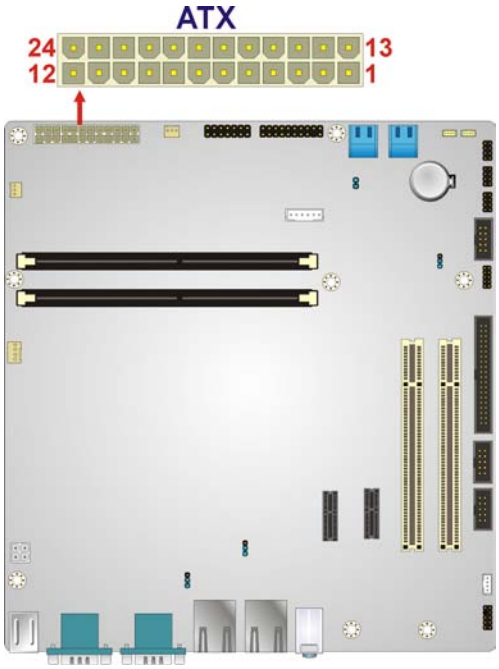


Figure 3-2: ATX Power Connector Location

Pin	Description	Pin	Description
1	+3.3 V	2	+3.3V
3	GND	4	+5 V
5	GND	6	+5 V
7	GND	8	PWROK
9	5VSB	10	+12 V
11	+12 V	12	+3.3V
13	+3.3 V	14	-12V
15	GND	16	PSON
17	GND	18	GND
19	GND	20	NC
21	+5 V	22	+5 V
23	+5 V	24	GND

Table 3-3: ATX Power Connector Pinouts

3.2.2 Battery Connector

CN Label: BAT1

CN Type: Battery holder

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

The battery connector is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

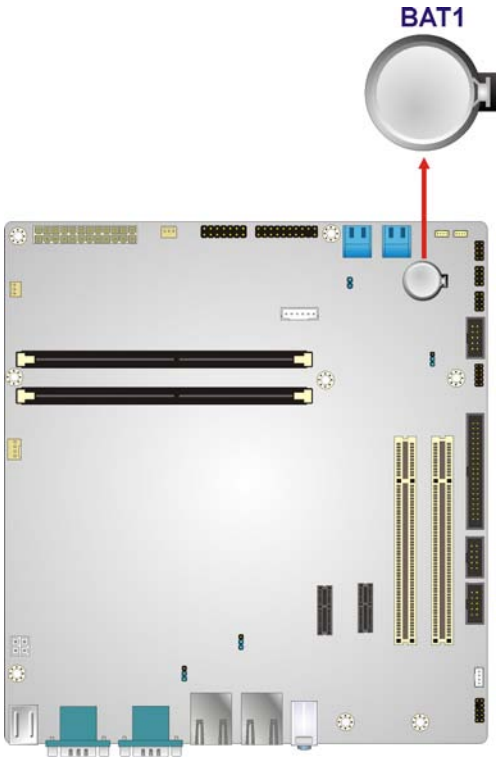


Figure 3-3: Battery Connector Location

3.2.3 CPU Fan Connector

CN Label: CPU_FAN

CN Type: 4-pin wafer

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

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

The CPU fan connector attaches to a CPU cooling fan.

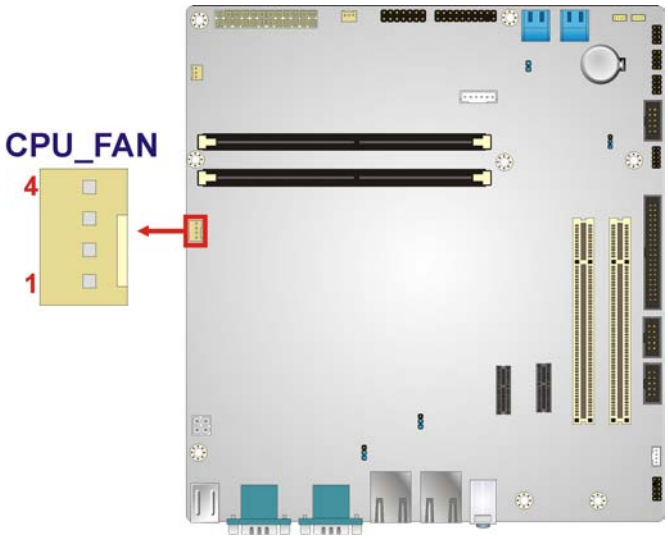


Figure 3-4: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	VCC12
3	FANIO1
4	FANOUT1

Table 3-4: CPU Fan Connector Pinouts

3.2.4 CPU Power Connector

CN Label: CPU12V1

CN Type: 4-pin Molex

CN Location: See **Figure 3-5**

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

The CPU power connector provides power to the CPU.

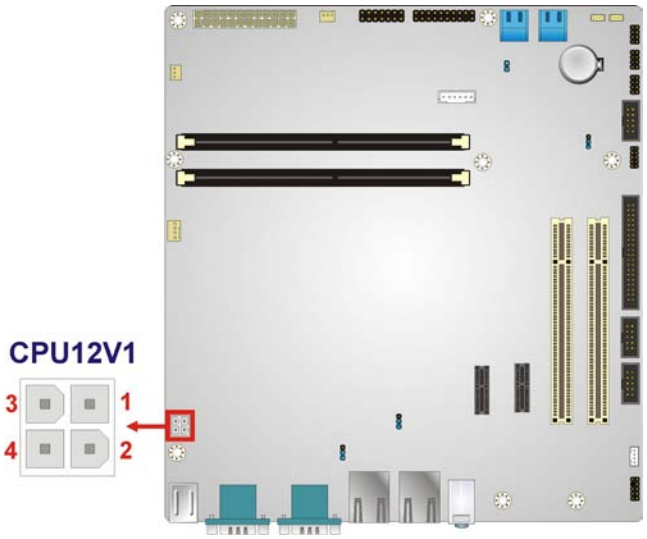


Figure 3-5: CPU Power Connector Location

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

Table 3-5: CPU Power Connector Pinouts

3.2.5 DDR3 DIMM Slots

CN Label: CHA_DIMM1, CHB_DIMM1

CN Type: DDR3 DIMM slot

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

The DDR3 DIMM slots are for DDR3 DIMM memory modules.

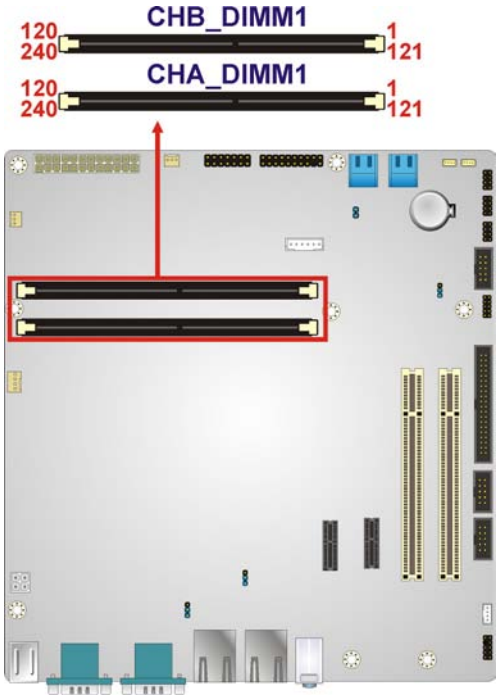


Figure 3-6: DDR3 DIMM Slot Locations

3.2.6 Digital I/O Connector

CN Label:	DIO1
CN Type:	10-pin header
CN Location:	See **Figure 3-7**
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.

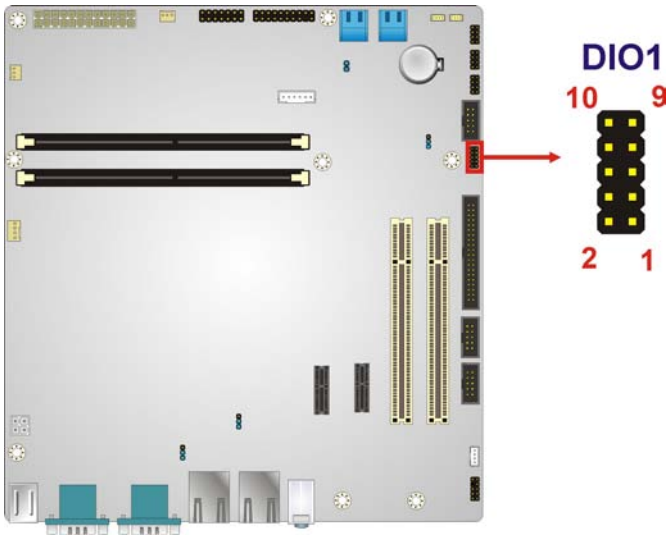


Figure 3-7: Digital I/O Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DGPO3	4	DGPO2
5	DGPO1	6	DGPO0
7	DGPI3	8	DGPI2
9	DGPI1	10	DGPI0

Table 3-6: Digital I/O Connector Pinouts

3.2.7 Front Panel Audio Connector

CN Label: FP_AUDIO

CN Type: 10-pin header

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

CN Pinouts: See **Table 3-7**

The front panel audio connector connects to speakers, a microphone and an audio input.

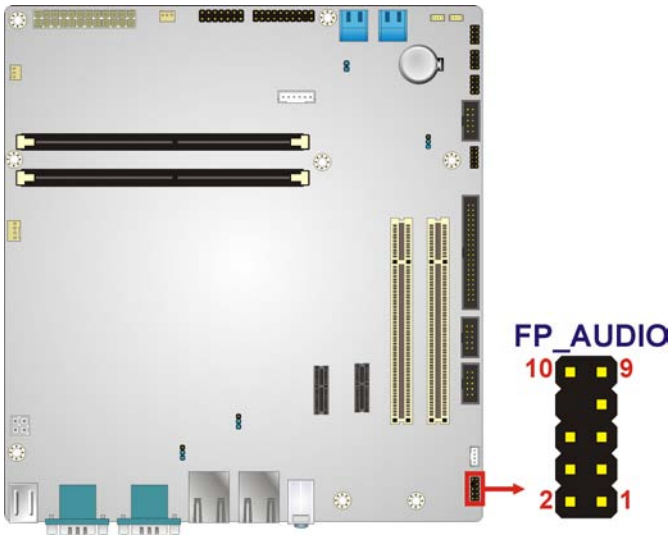


Figure 3-8: Front Panel Audio Connector Location

Pin	Description	Pin	Description
1	MIC_L	2	GND
3	MIC_R	4	FP_AUO_DETECT
5	LINE2_R	6	GND
7	F_SENCE	8	
9	LINE2_L	10	GND

Table 3-7: Front Panel Audio Connector Pinouts

3.2.8 Front Panel Connector

CN Label: F_PANEL

CN Type: 14-pin header

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

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

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

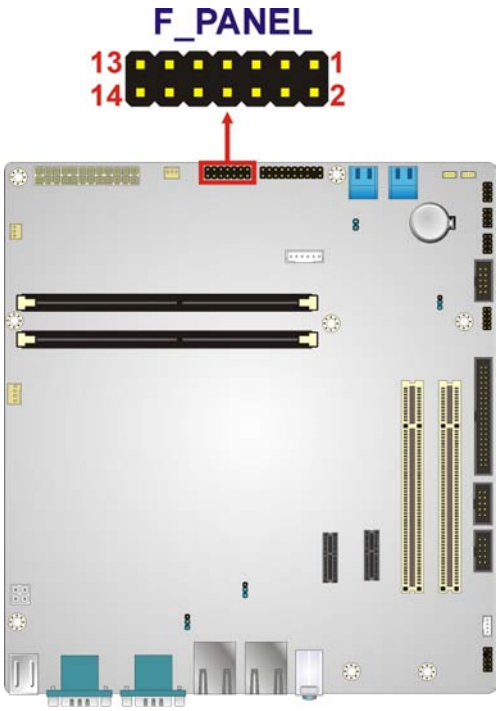


Figure 3-9: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
PWR_LED	1	ACPILED	BUZZER	2	BEEP_PWR
	3	NC		4	NC
	5	GND		6	NC
PWR_BTN	7	Power button		8	PC_BEEP
	9	GND	RESET	10	NC
HDD_LED	11	IDELED		12	External reset
	13	SATALED#-		14	GND

Table 3-8: Front Panel Connector Pinouts

3.2.9 I2C Connector

CN Label: I2C_1

CN Type: 4-pin wafer

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

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

The I2C connector is for system debug.

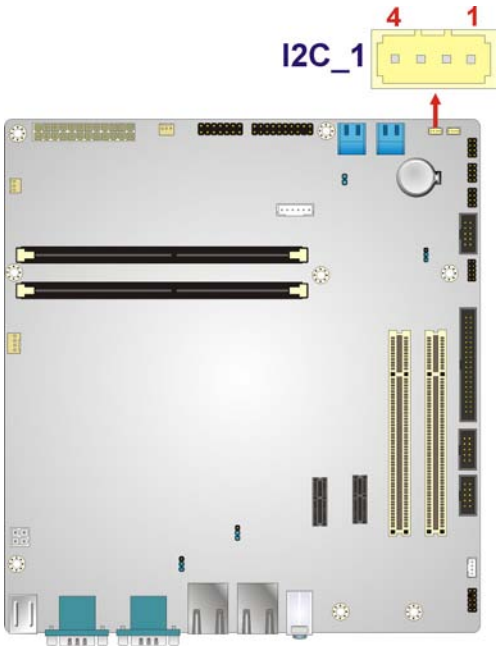


Figure 3-10: I2C Connector Location

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

Table 3-9: I2C Connector Pinouts

3.2.10 PCI Slot

CN Label: PCI1，PCI2

CN Type: PCI slot

CN Location: See **Figure 3-11**

The PCI slot enables a PCI expansion module to be connected to the board.

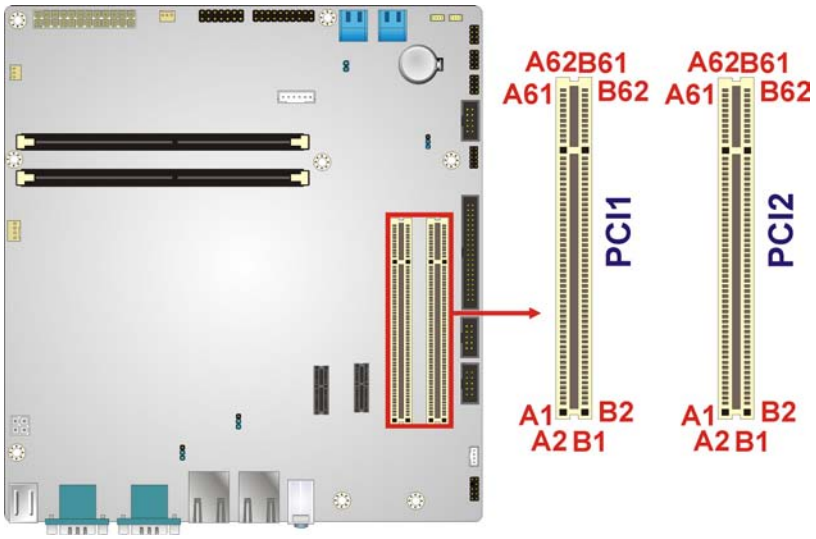


Figure 3-11: PCI Slot Locations

3.2.11 PCIe x1 Slots

CN Label:	PCIEX1_SLOT1, PCIEX1_SLOT2
CN Type:	PCIe x1 slot
CN Location:	See **Figure 3-12**

The PCIe x1 slots are for PCIe x1 expansion cards.

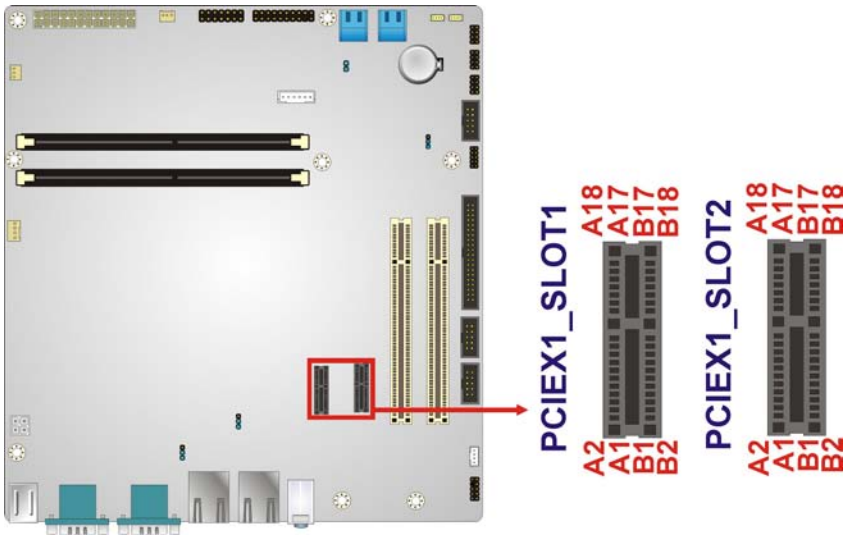


Figure 3-12: PCIe x1 Slot Locations

3.2.12 SATA 3Gb/s Drive Connectors

CN Label:	SATA12, SATA34
CN Type:	14-pin SATA connector
CN Location:	See **Figure 3-13**
CN Pinouts:	See **Table 3-10**

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.

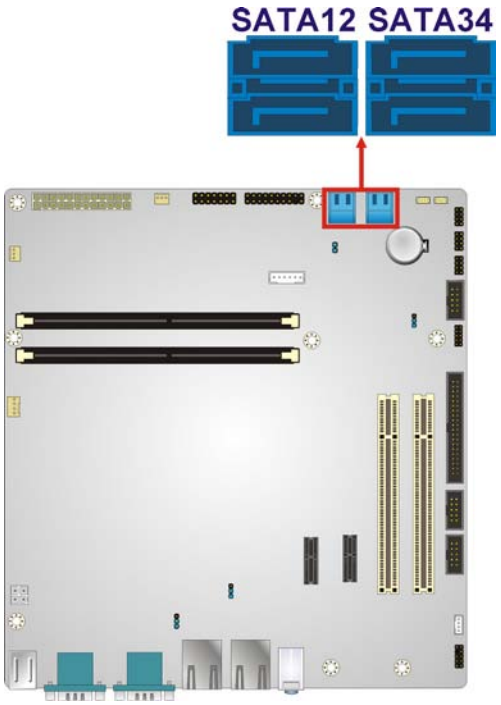


Figure 3-13: SATA 3Gb/s Drive Connector Locations

Pin	Description	Pin	Description
1	GND	2	TXP_A
3	TXN_A	4	GND
5	RXN_A	6	RXP_N
7	GND	8	GND
9	TXP_B	10	TXN_B
11	GND	12	RXN_B
13	RXP_B	14	GND

Table 3-10: SATA 3Gb/s Drive Connector Pinouts

3.2.13 Serial Port Connector, RS-422/485

CN Label: COM6

CN Type: 4-pin wafer

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

CN Pinouts: See **Table 3-11**

This connector provides RS-422 or RS-485 communications.

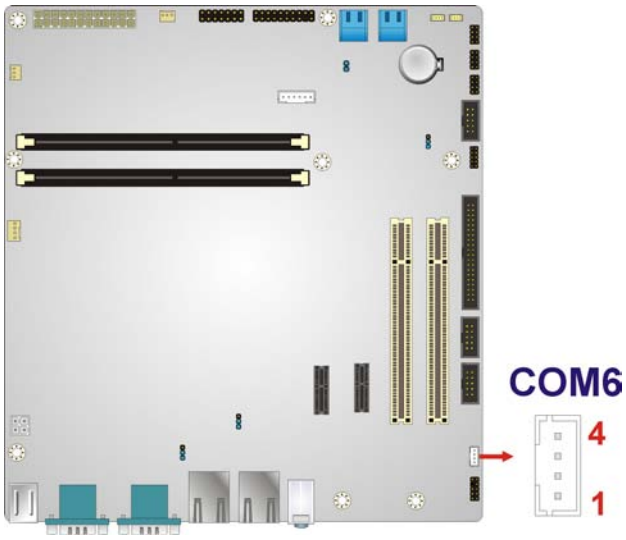


Figure 3-14: Serial Port Connector (RS-422/485) Location

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

Table 3-11: Serial Port Connector (RS-422/485) Pinouts

3.2.14 Serial Port Connectors, RS-232

CN Label: COM3, COM4, COM5, COM7-10

CN Type: 10-pin box header, 40-pin box header

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-12** and **Table 3-13**

Each of these connectors provides RS-232 connections.

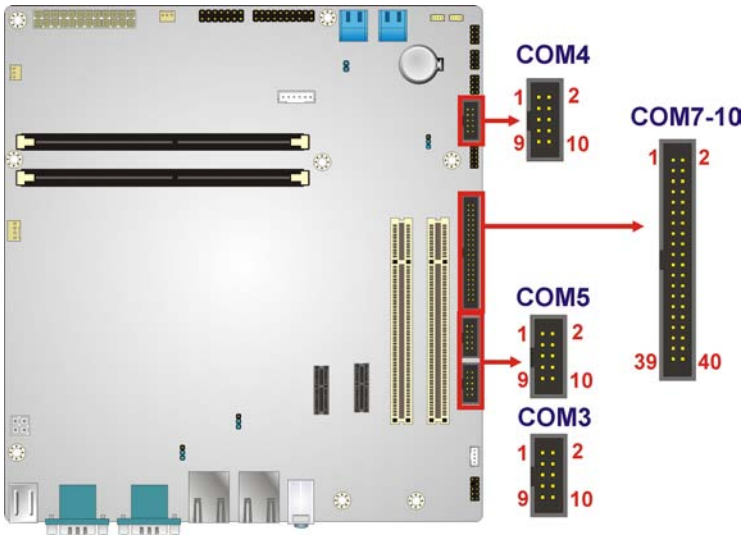


Figure 3-15: Serial Port Connector (RS-232) Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD3/4/5	2	DSR3/4/5
3	RXD3/4/5	4	RTS3/4/5
5	TXD3/4/5	6	CTS3/4/5
7	DTR3/4/5	8	RI3/4/5
9	GND	10	NC

Table 3-12: Serial Port Connector Pinouts (COM3, COM4, COM5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD7	2	DSR7
3	RXD7	4	RTS7
5	TXD7	6	CTS7
7	DTR7	8	RI7
9	GND	10	GND
11	DCD8	12	DSR8
13	RXD8	14	RTS8
15	TXD8	16	CTS8
17	DTR8	18	RI8
19	GND	20	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
21	DCD9	22	DSR9
23	RXD9	24	RTS9
25	TXD9	26	CTS9
27	DTR9	28	RI9
29	GND	30	GND
31	DCD10	32	DSR10
33	RXD10	34	RTS10
35	TXD10	36	CTS10
37	DTR10	38	RI10
39	GND	40	GND

Table 3-13: Serial Port Connector Pinouts (COM7-10)

3.2.15 SMBus Connector

CN Label: SMBUS_1

CN Type: 4-pin wafer

CN Location: See **Figure 3-16**

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

The SMBus (System Management Bus) connector provides low-speed system management communications.

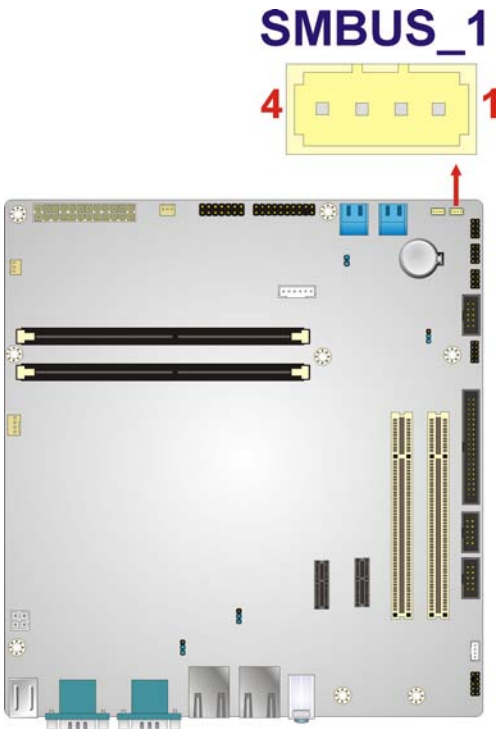


Figure 3-16: SMBus Connector Location

PIN	DESCRIPTION
1	+5V_DUAL
2	SMBCLK_RESUME
3	SMBDATA_RESUME
4	GND

Table 3-14: SMBus Connector Pinouts

3.2.16 SPI Connector

CN Label: SPI1

CN Type: 6-pin header

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

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

The SPI connector is used to flash the BIOS.

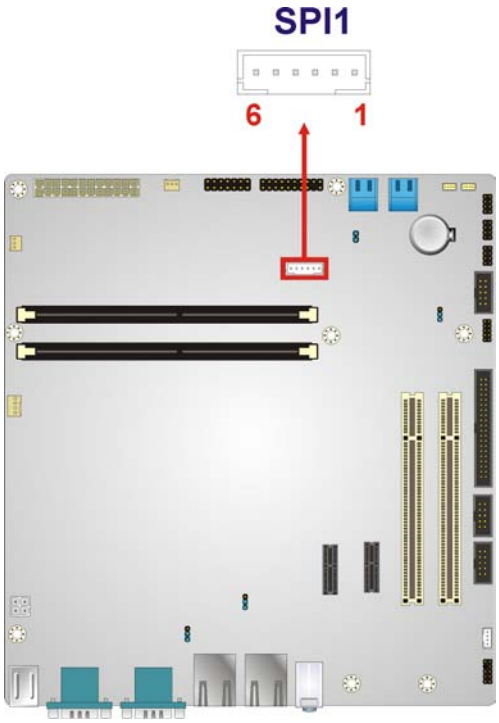


Figure 3-17: SPI Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC	2	GND
3	SPI_CS0#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	NC	8	NC

Table 3-15: SPI Connector Pinouts

3.2.17 System Fan Connector

CN Label: SYS_FAN1, SYS_FAN2

CN Type: 3-pin wafer

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

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

The fan connector attaches to a cooling fan.

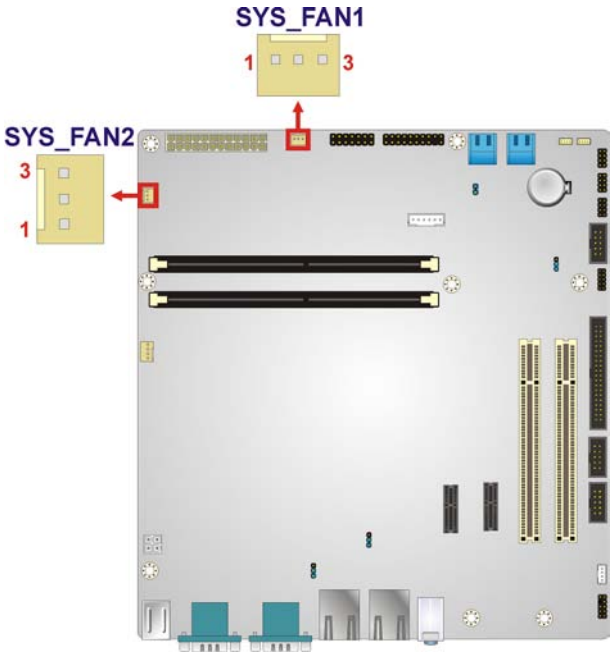


Figure 3-18: System Fan Connector Locations

PIN NO.	DESCRIPTION
1	NC
2	VCC12
3	GND

Table 3-16: System Fan Connector Pinouts

3.2.18 TPM Connector

CN Label: TPM

CN Type: 20-pin header

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

CN Pinouts: See **Table 3-17**

The TPM connector connects to a TPM module.

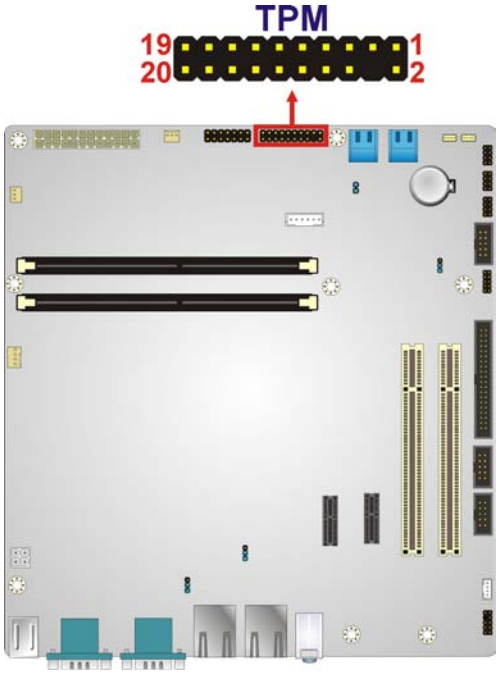


Figure 3-19: TPM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Clock	2	GND
3	Frame#	4	NC(KEY)
5	Reset#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB CLK	14	SMB DATA
15	+3.3V Standby	16	Serial IRQ
17	GND	18	Clock Run#
19	Power Down#	20	DREQ#

Table 3-17: TPM Connector Pinouts

3.2.19 USB Connectors

CN Label: USB45, USB67, USB89

CN Type: 8-pin header

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

CN Pinouts: See **Table 3-18, Table 3-19** and **Table 3-20**

The USB connectors connect to USB devices. Each pin header provides two USB ports.

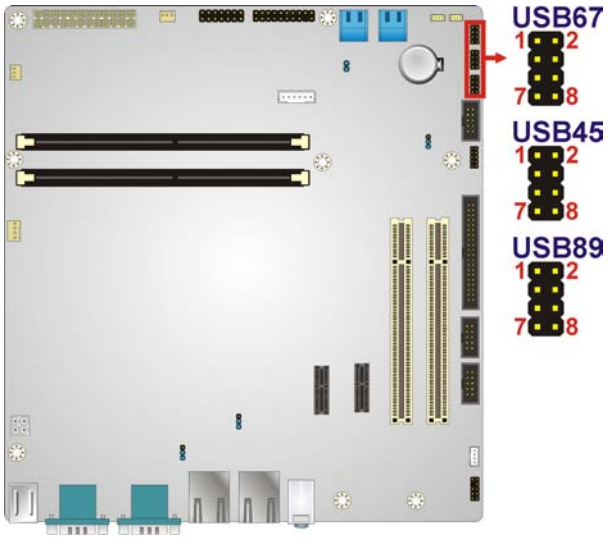


Figure 3-20: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA4_N	4	DATA5_P
5	DATA4_P	6	DATA5_N
7	GND	8	VCC

Table 3-18: USB Port Connector Pinouts (USB45)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA0_N	4	DATA1_P
5	DATA0_P	6	DATA1_N
7	GND	8	VCC

Table 3-19: USB Port Connector Pinouts (USB67)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA10_N	4	DATA11_P
5	DATA10_P	6	DATA11_N
7	GND	8	VCC

Table 3-20: USB Port Connector Pinouts (USB89)

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:

- 3 x Audio jacks
- 2 x Ethernet connectors
- 1 x Keyboard connector
- 1 x Mouse connector
- 2 x RS-232 serial port connectors
- 4 x USB 2.0 connectors
- 2 x VGA connectors

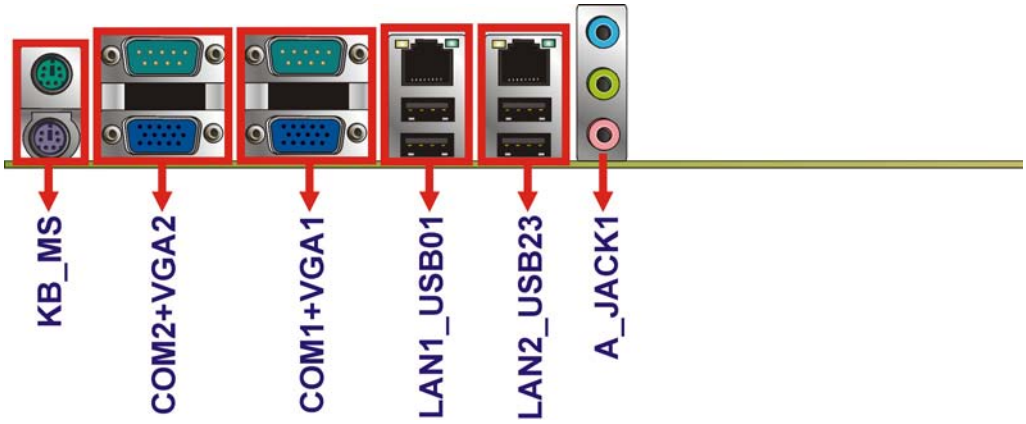


Figure 3-21: External Peripheral Interface Connector

3.3.1 Audio Connector

CN Label: A_JACK1

CN Type: Audio jack

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-21**

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.

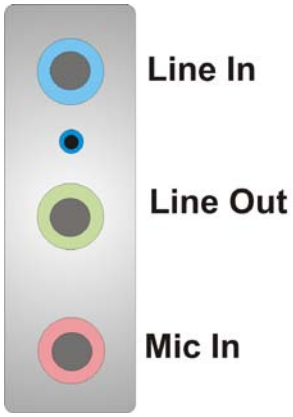


Figure 3-22: Audio Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	MIC1_L
3	GND	4	JD_MIC
5	MIC1_R	22	LOUT
23	GND	24	JD_FRONT
25	ROUT	32	LINL
33	GND	34	JD_LINE
35	LINL		

Table 3-21: Audio Connector Pinouts

3.3.2 Ethernet and USB Connectors

CN Label: LAN1_USB01, LAN2_USB23

CN Type: RJ-45, USB

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-22, Table 3-23 and Table 3-24**

The LAN connector connects to a local network.

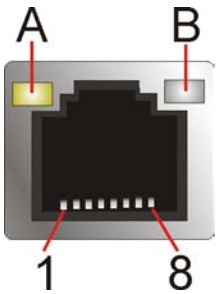


Figure 3-23: LAN Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
P1	TC	P2	LAN1/2_MDI0+
P3	LAN1/2_MDI0-	P4	LAN1/2_MDI1+
P5	LAN1/2_MDI1-	P6	LAN1/2_MDI2+
P7	LAN1/2_MDI2-	P8	LAN1/2_MDI3+
P9	LAN1/2_MDI3-	P10	GND
P11	LAN1/2_LINK1000	P12	LAN1/2_LINK1000
P13	LAN1/2_ACT-1 LED	P14	VCC
P15	GND	P16	GND
9	GND	10	GND
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND

Table 3-22: LAN Connector Pinouts

The USB connector can be connected to a USB device.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	VCC
3	DATA8_N	4	DATA9_N
5	DATA8_P	6	DATA9_P
7	GND	8	GND

Table 3-23: USB Connector Pinouts (USB01)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	VCC
3	DATA2_N	4	DATA3_N
5	DATA2_P	6	DATA3_P
7	GND	8	GND

Table 3-24: USB Connector Pinouts (USB23)

3.3.3 Keyboard/Mouse Connector

CN Label: KB_MS

CN Type: Dual PS/2

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-25**

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 3-25: PS/2 Connector Pinouts

3.3.4 RS-232 Serial Port Connectors

CN Label: COM1, COM2

CN Type: DB-9 Male

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-26**

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

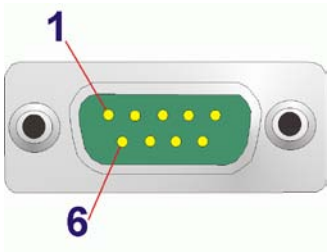


Figure 3-24: RS-232 Serial Port Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1/2	2	RXD1/2
3	TXD1/2	4	DTR1/2
5	GND	6	DSR1/2
7	RTS1/2	8	CTS1/2
9	RI1/2	10	

Table 3-26: RS-232 Serial Port Connector Pinouts (COM1,COM2)

3.3.5 VGA Connectors

CN Label: VGA1, VGA2

CN Type: 15-pin female

CN Location: See **Figure 3-21**

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

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

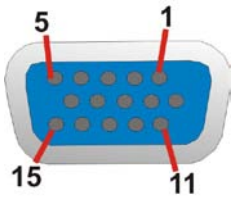


Figure 3-25: VGA Connector

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

Table 3-27: VGA Connector Pinouts (VGA1,VGA2)

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMB-H612 may result in permanent damage to the IMB-H612 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMB-H612. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMB-H612 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 IMB-H612, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMB-H612.
- ***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 IMB-H612, IMB-H612 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 IMB-H612 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 IMB-H612 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 IMB-H612 off:
  - When working with the IMB-H612, 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 IMB-H612 **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.

4.3 Basic Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, IMB-H612 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IMB-H612. If one of these component is not installed the IMB-H612 cannot run.

4.3.1 Socket LGA1155 CPU Installation

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 outwards to clear the retention tab. Fully open the lever. See **Figure 4-1.**

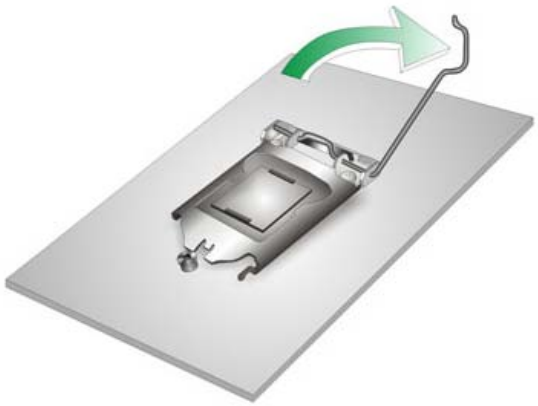


Figure 4-1: Disengage the CPU Socket Load Lever

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.**

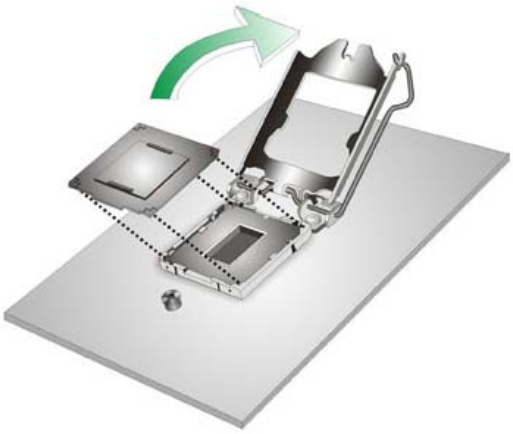


Figure 4-2: Remove Protective Cover

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 CPU 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.**

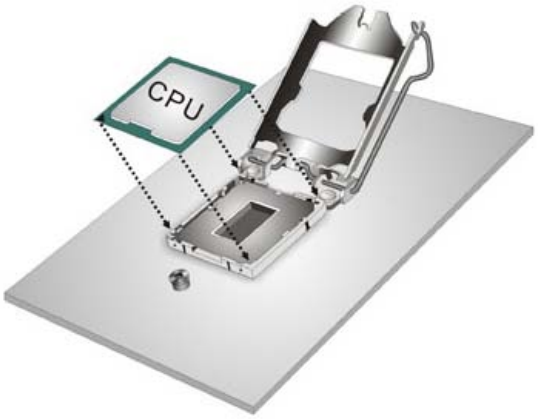


Figure 4-3: Insert the Socket LGA1155 CPU

Step 8: **Close the CPU socket.** Close the load plate and pull the load 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. See **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.

4.3.2 Cooling Kit Installation

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, CF-1156B-RS, CF-1156C-RS, CF-1156D-RS)

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

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.**

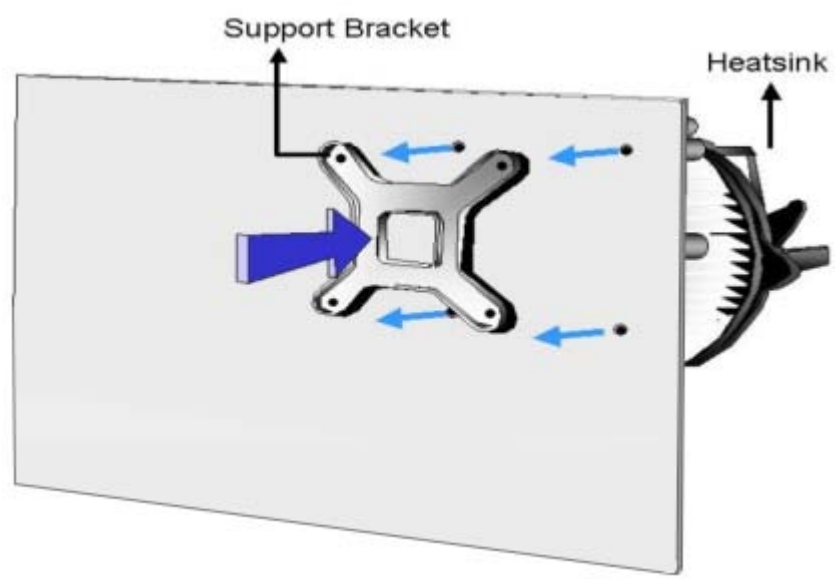


Figure 4-6: Cooling Kit Support Bracket

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 screw of the cooling kit.

Step 5: **Connect the fan cable.** Connect the cooling kit fan cable to the fan connector on the IMB-H612. Carefully route the cable and avoid heat generating chips and fan blades.

4.3.3 DIMM Installation

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

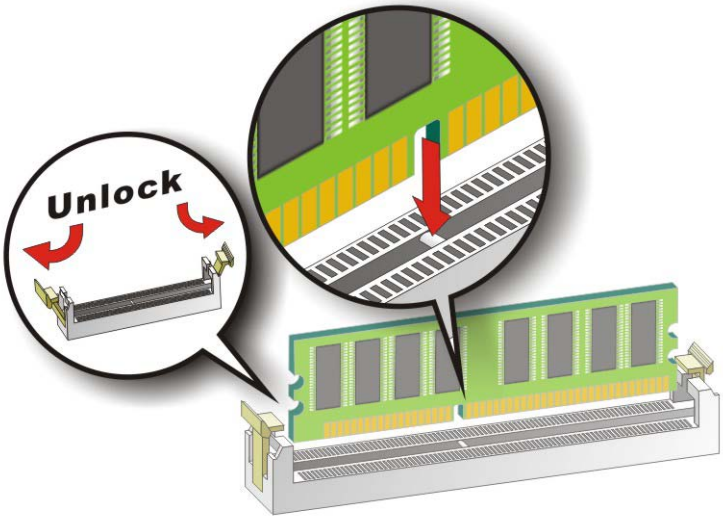


Figure 4-7: DIMM Installation

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.

4.4 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.

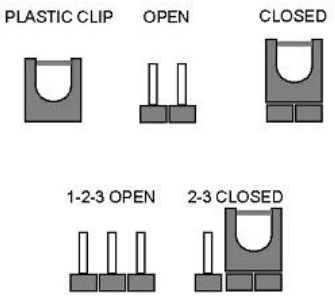


Figure 4-8: Jumper Locations

The jumpers on the IMB-H612 must be set in accordance with the desired configuration before installation. The jumpers on the IMB-H612 are listed in **Table 4-1**.

Description	Label	Type
AT/ATX power select	JATX_AT1	2-pin header
Clear CMOS	J_CMOS2	3-pin header
USB power select	USB_PWR1, USB_PWR2	3-pin header

Table 4-1: Jumpers

4.4.1 AT/ATX Power Select Jumper

Jumper Label: JATX_AT1

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-9**

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

Setting	Description
Closed	ATX Mode (Default)
Open	AT Mode

Table 4-2: AT/ATX Power Select Jumper Settings

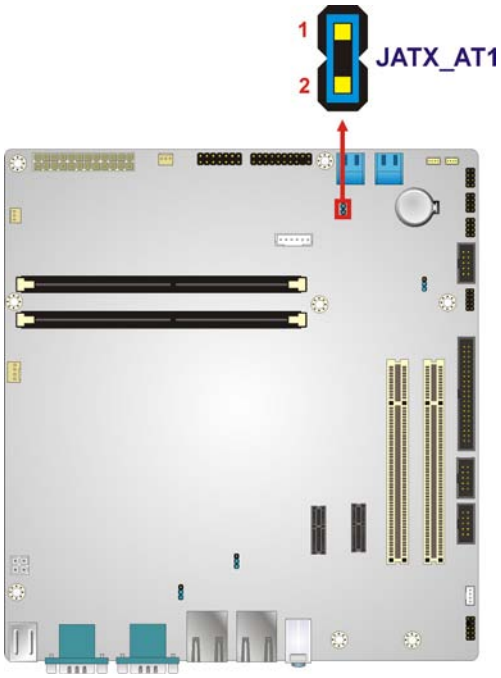


Figure 4-9: AT/ATX Power Select Jumper Location

4.4.2 Clear CMOS Jumper

Jumper Label: J_CMOS2

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-3**

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

If the IMB-H612 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

Setting	Description
1-2	Keep CMOS Setup (Default)
2-3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

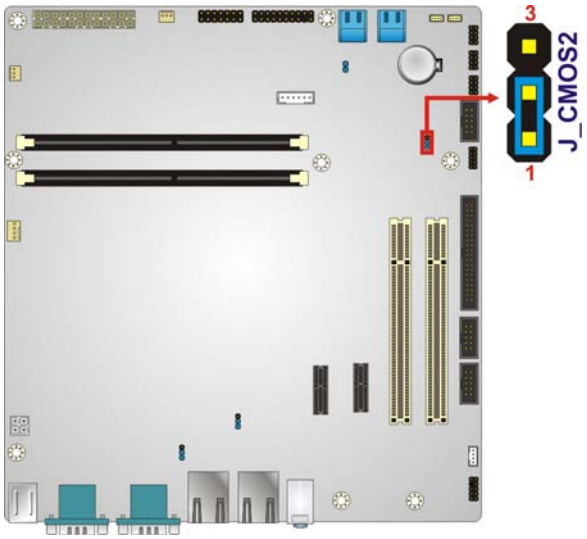


Figure 4-10: Clear CMOS Jumper Location

4.4.3 USB Power Select Jumpers

Jumper Label: **USB_PWR1, USB_PWR2**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-4**

Jumper Location: See **Figure 4-11**

The USB power select jumpers allow the user to select the USB power setting.

Setting	Description
Short 1-2	+5V
Short 2-3	+5V_Dual (Default)

Table 4-4: USB Power Select Jumper Settings

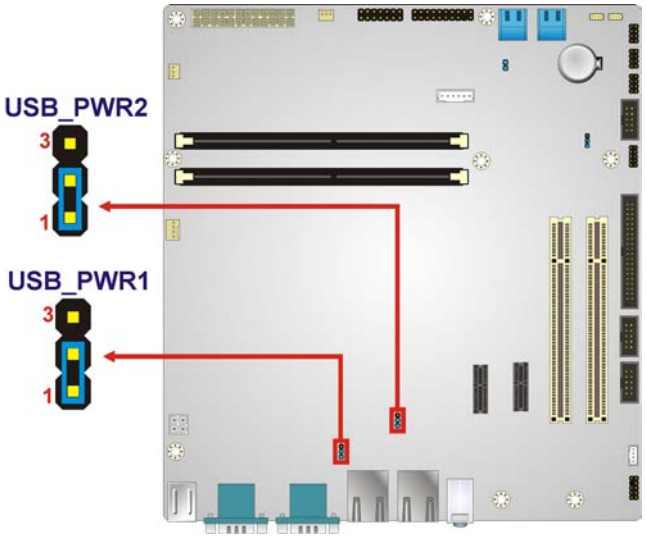


Figure 4-11: USB Power Select Jumpers Location

4.5 Internal Peripheral Device Connections

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

4.5.1 SATA Drive Connection

The IMB-H612 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 4-12**.

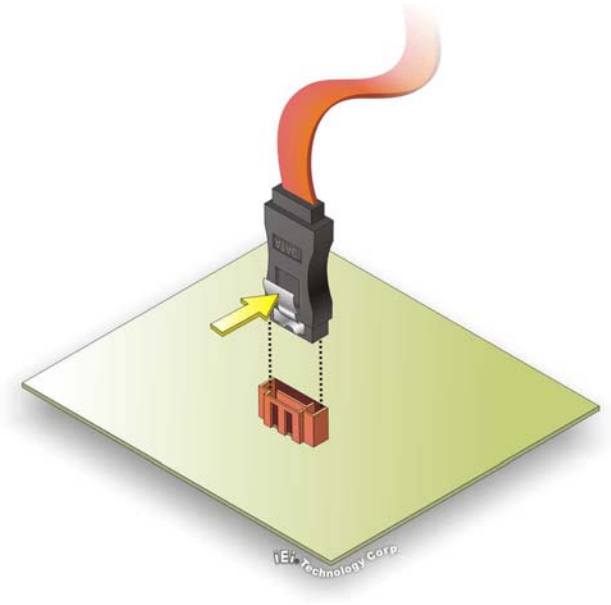


Figure 4-12: SATA Drive Cable Connection

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 4-13**.

Step 4: **Connect the SATA power cable (optional)**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-13**.

Figure 4-13: SATA Power Drive Connection

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

4.6 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the IMB-H612.

4.6.1 Audio Connection

The audio jacks on the external audio connector enable the IMB-H612 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 light blue (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.

- **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.
- **Microphone (Pink):** Connects a microphone.

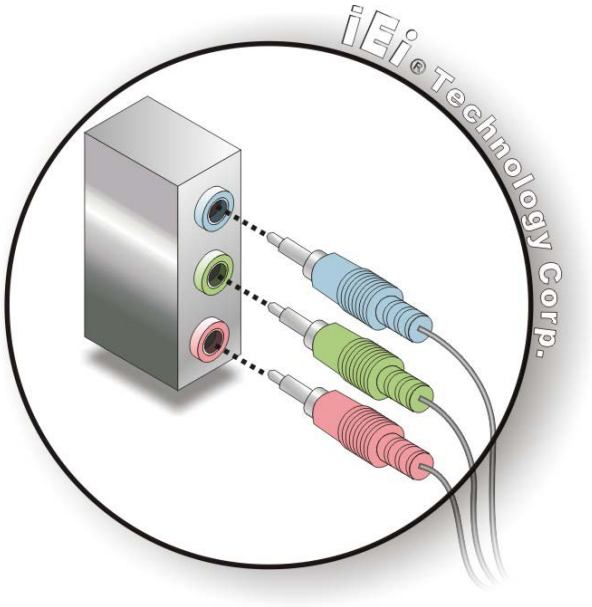


Figure 4-14: Audio Connector

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.

4.6.2 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 USB connectors are shown in **Chapter 3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMB-H612. See **Figure 4-15**.

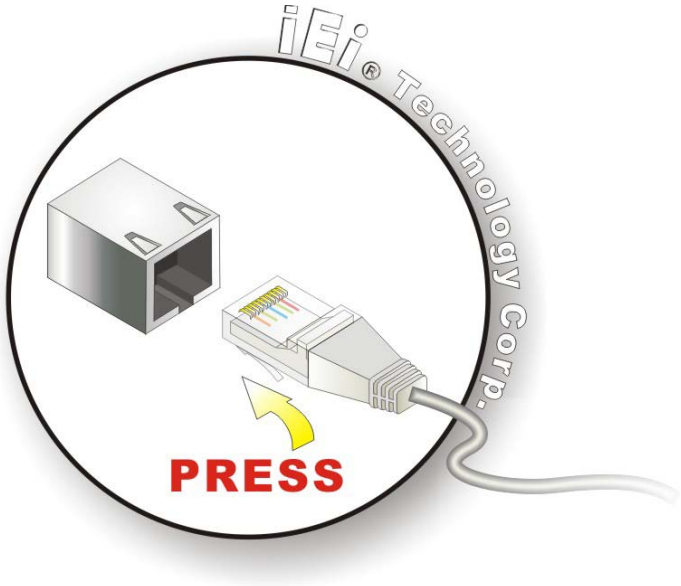


Figure 4-15: LAN Connection

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.

4.6.3 PS/2 Keyboard and Mouse Connection

The IMB-H612 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 IMB-H612.

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 4-16**.

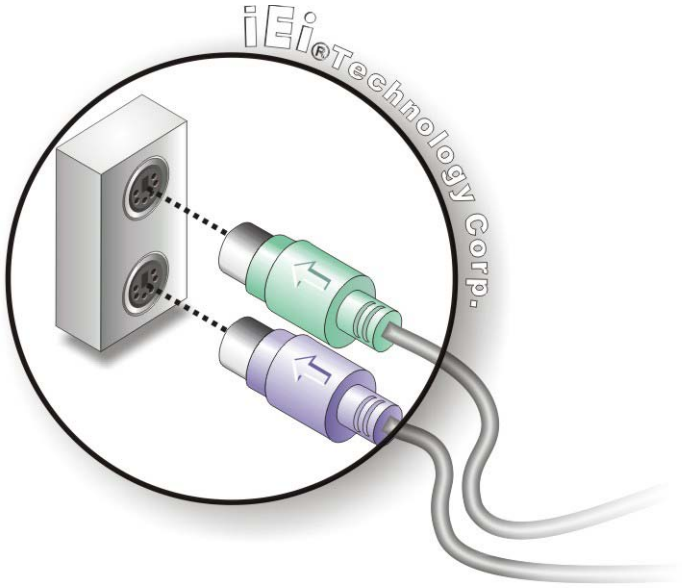


Figure 4-16: PS/2 Keyboard/Mouse Connector

4.6.4 Serial Device Connection

The IMB-H612 has two DB-9 male connectors on the external peripheral interface panel for serial devices. Follow the steps below to connect serial devices to the IMB-H612.

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

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 4-17**.

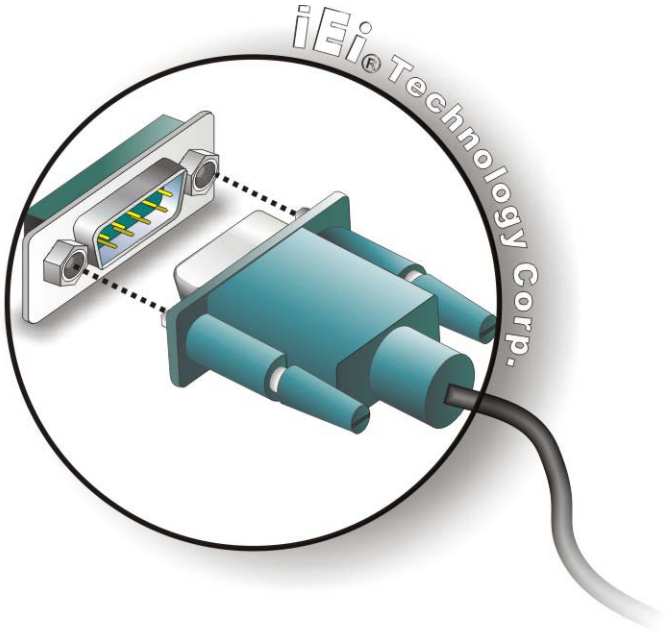


Figure 4-17: Serial Device Connector

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.

4.6.5 USB Connection

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 IMB-H612.

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 4-18**.

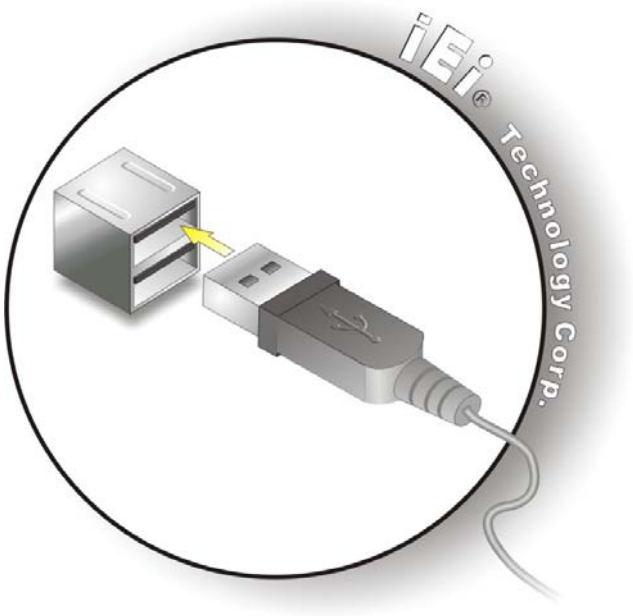


Figure 4-18: USB Connector

4.6.6 VGA Monitor Connection

The IMB-H612 has two female DB-15 connectors on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMB-H612, please follow the instructions below.

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

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-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 IMB-H612. See **Figure 4-19**.

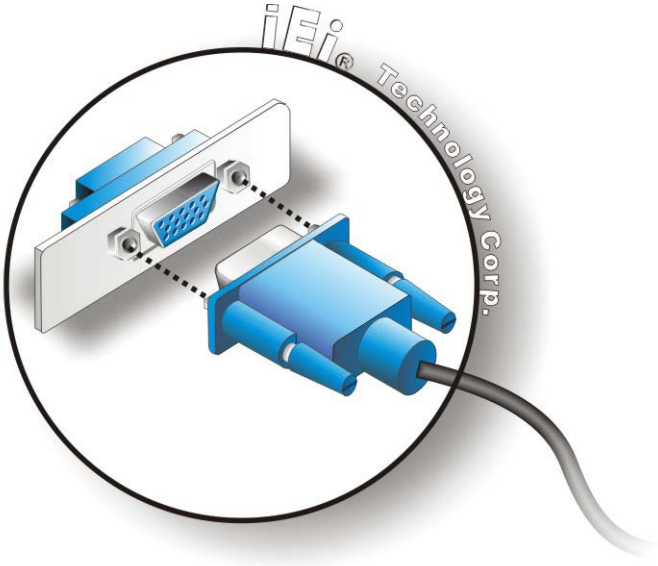


Figure 4-19: VGA Connector

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

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.

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

If the message disappears before the **F2 OR DELETE** 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
+	Increase the numeric value or make changes
-	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 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 key	Load previous values.
F3 key	Load optimized defaults
F4 key	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                   4.6.4.0 0.03        elements.
Compliency                     UEFI 2.0
Project Version                SA60AZ04.ROM
Build Date and Time            11/18/2011 11:53:40 ----------------------

Memory Information                                 ←→: Select Screen
Total Memory                   2048 MB (DDR3 1333) ↑ ↓: Select Item
                                                   EnterSelect
System Date                    [Thu 08/25/2011]    +/-:  Change Opt.
System Time                    [15:10:27]          F1:   General Help
                                                   F2:   Previous Values
Access Level                   Administrator       F3:   Optimized Defaults
                                                   F4:   Save & Exit
                                                   ESC:  Exit
        Version 2.11.1210. 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
- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date and Time:** 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
> Trusted Computing
> CPU Configuration
> SATA Configuration
> Intel TXT(LT) Configuration                    ----------------------
> USB Configuration
> Super IO Configuration                         ←→: Select Screen
> H/M Monitor                                    ↑ ↓: Select Item
> Secondary Super IO Configuration               EnterSelect
> Serial Port Console Redirection                +/-:  Change Opt.
> iEi Feature                                    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 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
                                                 EnterSelect
                                                 +/-:  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 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.

➔ **Suspend Disabled**

➔ **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 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) 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
                                            EnterSelect
                                            +/-:  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 4: 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.

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) 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
                                                   EnterSelect
                                                   +/-:  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 5: 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.

5.3.3.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 6**) 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) i5-2500S CPU @ 2.70GHz
CPU Signature                    206a7
Microcode Patch                  17
Max CPU Speed                    2700 MHz
Min CPU Speed                    1600 MHz
Processor Cores                  4
Intel HT Technology              Not Supported
Intel VT-x Technology            Supported
Intel SMX Technology             Supported

L1 Data Cache                    32 kB x 4
L1 Code Cache                    32 kB x 4
L2 Cache                         256 kB x 4
L3 Cache                         6144 kB

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

←→: Select Screen
↑↓: Select Item
EnterSelect
+/-:  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 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) 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.

5.3.4 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) 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 Configuration                                  (1) IDE Mode. (2) AHCI
                                                    Mode. (3) RAID Mode.
SATA Mode                        [IDE Mode]
Serial-ATA Controller 0          [Compatible]       ---------------------
Serial-ATA Controller 1          [Enhanced]
                                                    ←→: Select Screen
SATA Port0                       Not Present        ↑ ↓: Select Item
                                                    EnterSelect
SATA Port1                       Not Present        +/-:  Change Opt.
                                                    F1:   General Help
SATA Port2                       Not Present        F2:   Previous Values
                                                    F3:   Optimized Defaults
SATA Port3                       Not Present        F4:   Save & Exit
                                                    ESC:  Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 7: SATA Configuration

➔ SATA Mode [IDE Mode]

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

➔ **Disable**		Disables SATA devices.
➔ **IDE Mode**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔ **ACHI Mode**		Configures SATA devices as AHCI device.
➔ **RAID Mode**		Configures SATA devices as RAID device.

➔ Serial-ATA Controller 0 [Compatible]

Use the **Serial-ATA Controller 0** option to configure the Serial-ATA controller mode when the SATA mode is set to IDE Mode.

- **Disable** — Disables Serial-ATA controller.
- **Enhanced** — Configures the Serial-ATA controller to be in enhanced mode. In this mode, IDE channels and SATA channels are separated. Some legacy OS do not support this mode.
- **Compatible** **DEFAULT** — Configures the Serial-ATA controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels.

➔ Serial-ATA Controller 1 [Enhanced]

Use the **Serial-ATA Controller 1** option to configure the Serial-ATA controller mode when the SATA mode is set to IDE Mode.

- **Disable** — Disables Serial-ATA controller.
- **Enhanced** **DEFAULT** — Configures the Serial-ATA controller to be in enhanced mode. In this mode, IDE channels and SATA channels are separated. Some legacy OS do not support this mode.

5.3.5 Intel TXT(LT) Configuration

Use the **Intel TXT(LT) Configuration** menu (**BIOS Menu 8**) 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.

Secure Mode Extensons (SMX)      Enabled

Intel TXT(LT) Support            [Disabled]

---------------------
←→: Select Screen
↑↓: Select Item
EnterSelect
+/-:  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 8: Intel TXT(LT) Configuration

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.

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

USB Configuration

USB Devices:
      1 Keyboard, 2 Hubs

USB Support                      [Enabled]
Legacy USB Support               [Enabled]

Enables BIOS USB
support. This item does
not effect USB
functionality in OS.

---------------------
←→: Select Screen
↑↓: Select Item
EnterSelect
+/-:  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 9: USB Configuration

➔ USB Devices

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

➔ USB Support [Enabled]

Use the **USB Support** option to enable or disable USB support on the system.

➔ **Disabled**		USB support disabled
➔ **Enabled**	**DEFAULT**	USB support enabled

➔ 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.

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

5.3.7 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 10**) 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

Super IO Configuration                          Set Parameters of Serial
                                                Port 1 (COMA)
Super IO Chip                   Fintek F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration                   ---------------------
> Serial Port 3 Configuration                   ←→: Select Screen
> Serial Port 4 Configuration                   ↑ ↓: Select Item
> Serial Port 5 Configuration                   EnterSelect
> Serial Port 6 Configuration                   +/-:  Change Opt.
                                                F1:   General Help
  Power Saving Function         [Disabled]      F2:   Previous Values
                                                F3:   Optimized Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 10: Super IO Configuration

➔ 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

5.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 11**) 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
                                               EnterSelect
                                               +/-:  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 11: Serial Port n Configuration Menu

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

- **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3,4
- **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3,4
- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11

5.3.7.1.2 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; IRQ=3** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11

➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11

5.3.7.1.3 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; IRQ=10**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h 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

5.3.7.1.4 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; IRQ=10**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h 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

5.3.7.1.5 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=2C0h; IRQ=10, 11** Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** Serial Port I/O port address is 2C8h 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
- **IO=2E0h; IRQ=10, 11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.7.1.6 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** 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=2D8h; IRQ=10**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h 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
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

➔ Device Mode [Normal]

Use the **Device Mode** option to enable or disable the serial port.

➔ **Normal**	**DEFAULT**	Sets the serial port mode to normal.
➔ **RS485**		Enables serial port RS-485 support.

5.3.8 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 12**) 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

CPU Temperature                  :+50 C
SYS Temperature                  :+44 C
CPU FAN Speed                    :2189 RPM
SYS FAN Speed                    :N/A
VCC3V                            :+3.344 V
V_core                           :+1.248 V        ---------------------
+1.05V                           :+1.064 V        ←→: Select Screen
VDDR                             :+1.616 V        ↑ ↓: Select Item
VSB3V                            :+3.424 V        EnterSelect
VBAT                             :+2.816 V        +/-:  Change Opt.
5VSB                             :+4.968 V        F1:   General Help
                                                  F2:   Previous Values
> FAN 1 Configuration                             F3:   Optimized Defaults
> FAN 2 Configuration                             F4:   Save & Exit
                                                  ESC:  Exit
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 12: 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
  - +1.05V
  - VDDR
  - VSB3V
  - VBAT
  - 5VSB

5.3.8.1 FAN 1 Configuration

Use the **FAN 1 Configuration** submenu (**BIOS Menu 13**) to configure fan 1 temperature and speed settings.

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

PC Health Status
CPU Smart Fan control          [Auto by RPM]
Target Temp Sensor             [CPU Temperature]
Temperature Bound 1            60
Temperature Bound 2            50
Temperature Bound 3            40
Temperature Bound 4            30
Segment 1 Speed (%)            100
Segment 2 Speed (%)            85
Segment 3 Speed (%)            70
Segment 4 Speed (%)            60
Segment 5 Speed (%)            50
Full Speed Count               3000

                               ---------------------
                               ←→: Select Screen
                               ↑ ↓: Select Item
                               EnterSelect
                               +/-:  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 13: FAN 1 Configuration

➔ CPU Smart Fan control [Auto by RPM]

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

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

➔ Target Temp. Sensor [CPU Temperature]

Use the **Target Temp. Sensor** option to set the target CPU temperature.

➔ **CPU Temperature**	**DEFAULT**	Sets the target temperature sensor to the CPU temperature.
➔ **SYS Temperature**		Sets the target temperature sensor to the System Temperature setting.

➔ Temperature Bound n

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

➔ Segment n Speed (%)

Use the + or – key to change the fan **Segment n Speed** value in percentage. Enter a decimal number between 0 and 100.

➔ Full Speed Count

Use the + or – key to change the fan **Full Speed Count** value. Enter a decimal number between 500 and 15000.

5.3.8.2 FAN 2 Configuration

Use the **FAN 2 Configuration** submenu (**BIOS Menu 14**) to configure fan 2 temperature and speed settings.

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

PC Health Status
SYS Smart Fan control          [Auto by Duty-Cycle]
Target Temp Sensor             [CPU Temperature]
Temperature Bound 1            60
Temperature Bound 2            50
Temperature Bound 3            40
Temperature Bound 4            30
Segment 1 Speed (PWM)          100
Segment 2 Speed (PWM)          85
Segment 3 Speed (PWM)          70
Segment 4 Speed (PWM)          60
Segment 5 Speed (PWM)          50

                                   ---------------------
                                   ←→: Select Screen
                                   ↑ ↓: Select Item
                                   EnterSelect
                                   +/-:  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 14: FAN 2 Configuration

➔ CPU Smart Fan control [Auto by Duty-Cycle]

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

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

➔ Target Temp. Sensor [CPU Temperature]

Use the **Target Temp. Sensor** option to set the target CPU temperature.

➔	**CPU Temperature** DEFAULT	Sets the target temperature sensor to the CPU temperature.

➔ **SYS Temperature** — Sets the target temperature sensor to the System Temperature setting.

➔ Temperature Bound n

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

➔ Segment n Speed (PWM)

Use the + or – key to change the fan **Segment n Speed** value in Pulse Width Modulation (PWM). Enter a decimal number between 0 and 100.

5.3.9 Secondary Super IO Configuration

The **Secondary Super IO Configuration** (**BIOS Menu 15**) displays IO chip type and the submenus for configuring the external SATA ports 7, 8, 9, and 10.

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

 Secondary Super IO Configuration                  Set Parameters of Serial
                                                   Port 7 (COMG)
 Super IO Chip                  Fintek F81216
> Serial Port 7 Configuration
> Serial Port 8 Configuration
> Serial Port 9 Configuration
> Serial Port 10 Configuration                     ---------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   +/-:  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 15: Secondary Super IO Configuration

5.3.9.1 Serial Port 7 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=2C0h; IRQ=10**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ5
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔ **IO=2B0h; IRQ=10, 11**		Serial Port I/O port address is 2B0h and the interrupt address is IRQ5
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

➔ Device Mode [Normal]

Use the Device Mode option to change the serial port mode.

➔ **Normal**	**DEFAULT**	Enables the serial port to function in normal mode.
➔ **IR Mode, Pusle 1.6us, Full Duplex**		Enables the serial port to function in IR mode, pulse 1.6 us at full duplex.
➔ **IR Mode, Pusle 1.6us, Half Duplex**		Enables the serial port to function in IR mode, pulse 1.6 us at half duplex.
➔ **IR Mode, Pusle 3/16 Bit Time, Full Duplex**		Enables the serial port to function in IR mode, pulse 3/16 bit time at full duplex.
➔ **IR Mode, Pusle 3/16 Bit Time, Half Duplex**		Enables the serial port to function in IR mode, pulse 3/16 bit time at half duplex.

5.3.9.2 Serial Port 8 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=2C8h; IRQ=10**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
- **IO=2B0h; IRQ=10, 11** — Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11
- **IO=2B8h; IRQ=10, 11** — Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.9.3 Serial Port 9 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=2B0h; IRQ=10** — Serial Port I/O port address is 2B0h and the interrupt address is IRQ10
- **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11

- **IO=2B0h; IRQ=10, 11** — Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11
- **IO=2B8h; IRQ=10, 11** — Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.9.4 Serial Port 10 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=2B8h; IRQ=10** — Serial Port I/O port address is 2B8h and the interrupt address is IRQ10
- **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
- **IO=2C0h; IRQ=10, 11** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
- **IO=2C8h; IRQ=10, 11** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
- **IO=2B0h; IRQ=10, 11** — Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11
- **IO=2B8h; IRQ=10, 11** — Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.10 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 16**) 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

  COM7
  Console Redirection            [Disabled]
> Console Redirection Settings

  COM8
  Console Redirection            [Disabled]
> Console Redirection Settings

  COM9
  Console Redirection            [Disabled]
> Console Redirection Settings

  COM10
  Console Redirection            [Disabled]
> Console Redirection Settings

iAMT SOL

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

BIOS Menu 16: Serial Port Console Redirection

➔ Console Redirection [Enabled]

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

➔ **Disabled** Disabled the console redirection function

➔ **Enabled** **DEFAULT** Enabled the console redirection function

5.3.11 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 17**) to configure One Key Recovery function.

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

iEi Feature                                   Auto Recovery Function
                                              Reboot and recover
Auto Recovery Function          [Disabled]    system automatically
                                              within 10 min, when OS
                                              crashes. Please install
                                              Auto Recovery API
                                              service before enabling
                                              this function.

                                              ---------------------
                                              ←→: Select Screen
                                              ↑ ↓: Select Item
                                              EnterSelect
                                              +/-:  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 17: 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 18**) 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

> North Bridge                                    North Bridge Parameters
> South Bridge
> Integrated Graphics
> ME Subsystem                                    ---------------------
                                                  ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  EnterSelect
                                                  +/-:  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 18: Chipset

5.4.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 19**) to configure the Northbridge chipset.

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

Memory Information                                  Select which graphics
                                                    controller to use as the
Total Memory                    2048 MB (DDR3 1333) primary boot device.

Memory Slot0                       0 MB (DDR3 1333)
Memory Slot2                    2048 MB (DDR3 1333)

Initate Graphic Adapter         [PEG/IGD]
IGD Memory                      [64M]

PCI Express Port                [Enabled]           ---------------------
                                                    ←→: Select Screen
VT-d                            [Disabled]          ↑ ↓: Select Item
                                                    EnterSelect
                                                    +/-:  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 19: Northbridge Chipset Configuration

➔ Initiate Graphic Adapter [PEG/IGD]

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD DEFAULT
- PEG/PCI

➔ IGD Memory [64 M]

Use the **IGD Memory** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **32 M**		32 MB of memory used by internal graphics device
➔ **64 M**	**DEFAULT**	64 MB of memory used by internal graphics device
➔ **96 M**		96 MB of memory used by internal graphics device
➔ **128 M**		128 MB of memory used by internal graphics device
➔ **160 M**		160 MB of memory used by internal graphics device
➔ **192 M**		192 MB of memory used by internal graphics device
➔ **224 M**		224 MB of memory used by internal graphics device
➔ **256 M**		256 MB of memory used by internal graphics device
➔ **288 M**		288 MB of memory used by internal graphics device
➔ **320 M**		320 MB of memory used by internal graphics device
➔ **352 M**		352 MB of memory used by internal graphics device
➔ **384 M**		384 MB of memory used by internal graphics device
➔ **416 M**		416 MB of memory used by internal graphics device
➔ **448 M**		448 MB of memory used by internal graphics device

➔ **480 M**		480 MB of memory used by internal graphics device
➔ **512 M**		512 MB of memory used by internal graphics device

➔ PCI Express Port [Enabled]

Use the **PCI Express Port** option to enable or disable the PCI Express port.

➔ **Disabled**		Disables the PCI Express port.
➔ **Enabled**	**DEFAULT**	Enables the PCI Express port.

➔ 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 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 20**) to configure the Southbridge chipset.

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

Auto Power Button Status        [OFF]                 Enabled/Disabled All USB
                                                      controllers
USB Controller                  [Enabled]

Wake Event Configuration
Restore AC Power Loss           [Power Off]
Resume on PCIE Wake             [Enabled]
Resume on PME/GbE               [Enabled]
Resume on Ring                  [Enabled]
Resume on PS/2                  [Enabled]

Audio Configuration
Azalia HD Audio                 [Enabled]
Azalia internal HDMI codec      [Enabled]
                                                      ---------------------
PCI Express Ports Configuration                       ←→: Select Screen
PCIe LAN Controller             [Enabled]             ↑ ↓: Select Item
PCIe LAN PXE Boot               [Disabled]            EnterSelect
                                                      +/-:  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: Southbridge Chipset Configuration

➔ USB Controller [Enabled]

Use the **USB Controller** option to enable or disable USB controller function.

- ➔ **Disabled** All USB controllers disabled
- ➔ **Enabled** **DEFAULT** All USB controllers enabled

➔ Restore on AC Power Loss [Power Off]

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** **DEFAULT** The system remains turned off
- ➔ **Power On** The system turns on

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

Resume on PCIe Wake [Enabled]

Use the **Resume on PCIe Wake** option to enable or disable resuming from the PCIe wake message and WAKE# signal.

- **Disabled** Disables Resume on PCIe Wake option
- **Enabled** **DEFAULT** Enables Resume on PCIe Wake option

Resume on PME/GbE [Enabled]

Use the **Resume on PME/GbE** option to enable or disable resuming from PCI PME#, on-chip GbE controller, or other on-chip devices.

- **Disabled** Disables Resume on PME/GbE option
- **Enabled** **DEFAULT** Enables Resume on PME/GbE option

Resume on Ring [Enabled]

Use the **Resume on Ring** option to enable or disable resuming from RI# signal.

- **Disabled** Disables Resume on Ring option
- **Enabled** **DEFAULT** Enables Resume on Ring option

Resume on PS/2 [Enabled]

Use the **Resume on PS/2** option to enable or disable resuming from PS/2 activation.

- **Disabled** Disables Resume on PS/2 option
- **Enabled** **DEFAULT** Enables Resume on PS/2 option

Azalia HD Audio [Enabled]

Use the **Azalia HD Audio** 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

➔ PCIe LAN Controller [Enabled]

Use the **PCIe LAN Controller** option to enable or disable the PCI Express LAN controller.

- **Disabled** The onboard PCIe LAN controller is disabled
- **Enabled** **DEFAULT** The onboard PCIe LAN controller is ensabled

➔ PCIe LAN PXE Boot [Disabled]

Use the **PCIe LAN PXE Boot** option to enable or disable the boot option for the PCIe LAN PXE.

- **Disabled** **DEFAULT** Disables PCIe LAN PXE Boot option
- **Enabled** Enables PCIe LAN PXE Boot option

5.4.3 Integrated Graphics

Use the **Integrated Graphics** menu (**BIOS Menu 21**) to configure the video device connected to the system.

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

Intel IGD SWSCI OpRegion Configuration

DVMT Mode Select                    [DVMT Mode]
DVMT Memory                         [Maximum]

IGD - Boot Type                     [AUTO]

Select DVMT Mode used by
Internal Graphics
Device. If Fixed Mode
selected, IGD Memory
might need to be changed
to a larger value, for
IGD to have sufficient
memory.

---------------------
←→: Select Screen
↑ ↓: Select Item
EnterSelect
+/-:  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 21: Integrated Graphics

➔ DVMT Mode Select [DVMT Mode]

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.

➔ **DVMT Mode** **DEFAULT** Graphics memory is dynamically allocated according to the system and graphics needs.

➔ DVMT Memory [Maximum]

Use the **DVMT/FIXED Memory** 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**

➔ IGD - Boot Type [AUTO]

Use the **IGD - Boot Type** option to select the display device used by the system when it boots. For dual display support, select "Auto." Configuration options are listed below.

- AUTO **DEFAULT**
- CRT
- DVI
- HDMI

5.4.4 ME Subsystem

Use the **ME Subsystem** menu (**BIOS Menu 22**) to configure the Intel® Management Engine (ME) configuration options.

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

Intel ME Subsystem Configuration                  MEBx Mode Help

ME Version                        7.0.10.1203
                                                  ---------------------
ME Subsystem                      [Disabled]      ←→: Select Screen
                                                  ↑ ↓: Select Item
Unconfigure AMT/ME                [Disabled]      EnterSelect
                                                  +/-:  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 22: ME Subsystem

➔ ME Subsystem [Disabled]

Use the **ME Subsystem** option to enables or disables ME subsystem help.

➔ **Disabled** **DEFAULT** Disables ME Subsystem help

➔ **Enabled** Enables ME Subsystem help

➔ Unconfigure AMT/ME [Disabled]

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

➔ **Disabled**	**DEFAULT**	Not perform AMT/ME unconfigure
➔ **Enabled**		To perform AMT/ME unconfigure

5.5 Boot

Use the **Boot** menu (**BIOS Menu 23**) 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]

                                                    ---------------------
Boot Option Priorities                              ←→: Select Screen
                                                    ↑ ↓: Select Item
                                                    EnterSelect
                                                    +/-:  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 23: 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 [Keep Current]

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

➔ **Force BIOS**		Sets display mode to force BIOS.
➔ **Keep Current**	**DEFAULT**	Sets display mode to current.

5.6 Security

Use the **Security** menu (**BIOS Menu 24**) 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
Administrator Password                        F3:  Optimized Defaults
User Password                                 F4:  Save & Exit
                                              ESC: Exit
        Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 24: 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 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 25**) 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                          Reset the system after
 Discard Changes and Reset                       saving the changes.

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 +/-:  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 25: Save & 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

Installation instructions are given below.

6.2 Software Installation

All the drivers for the IMB-H612 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**).

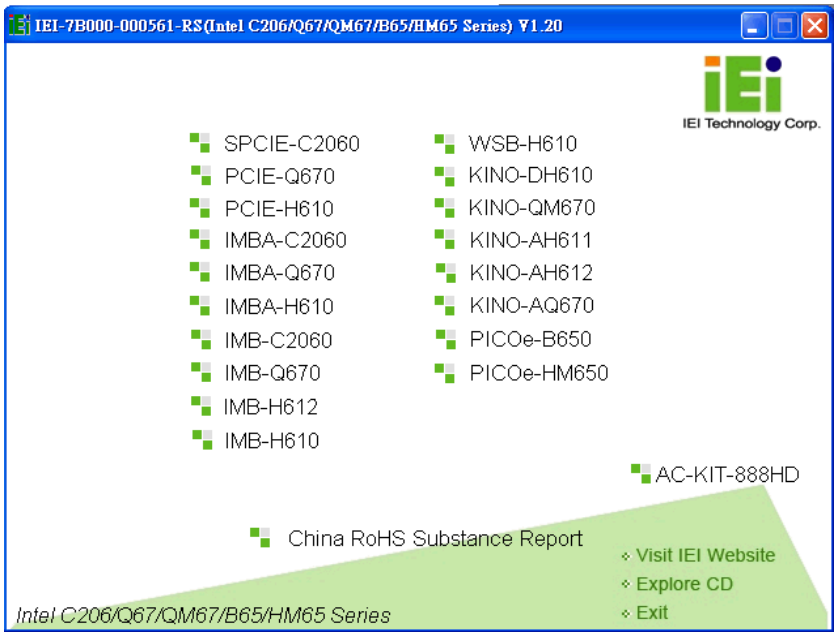


Figure 6-1: Introduction Screen

Step 3: Click IMB-H612.

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

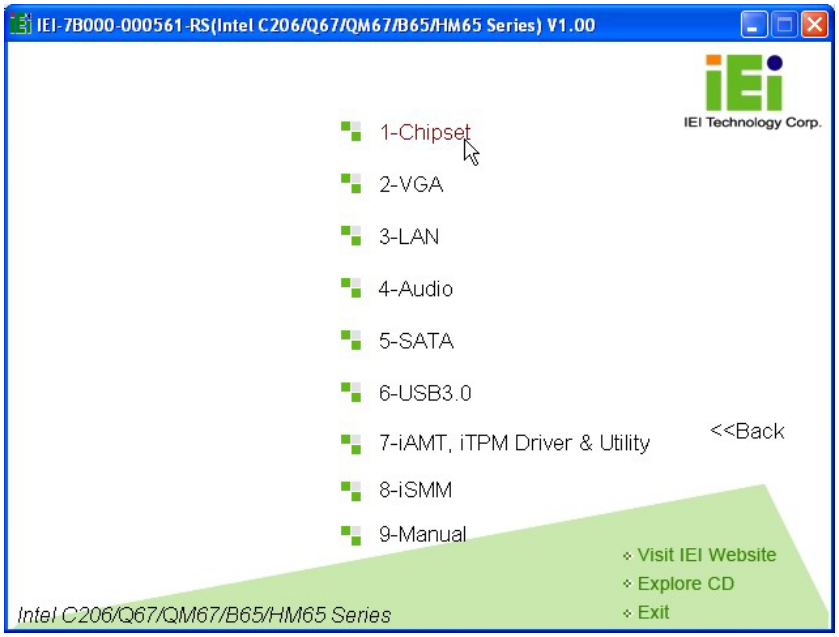


Figure 6-2: Available Drivers

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.

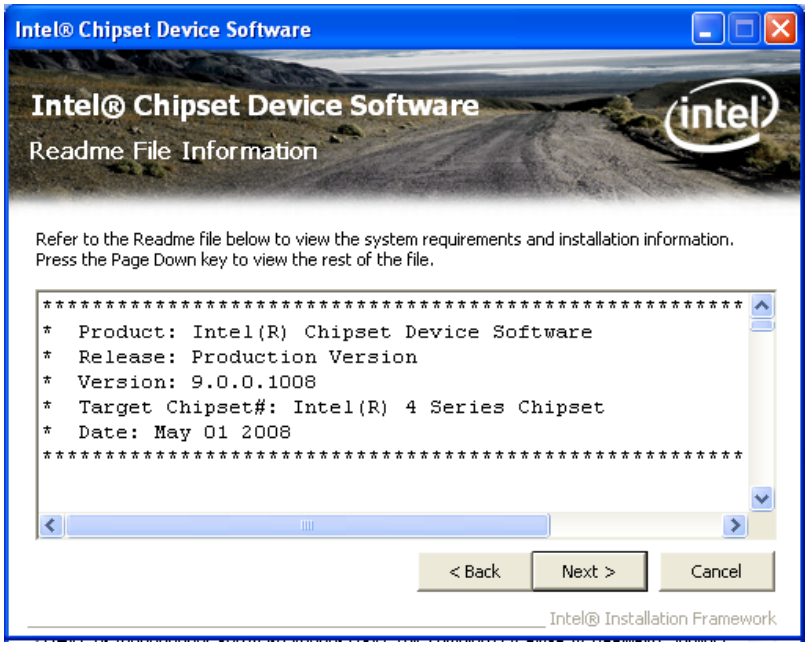


Figure 6-6: Chipset Driver Read Me File

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.

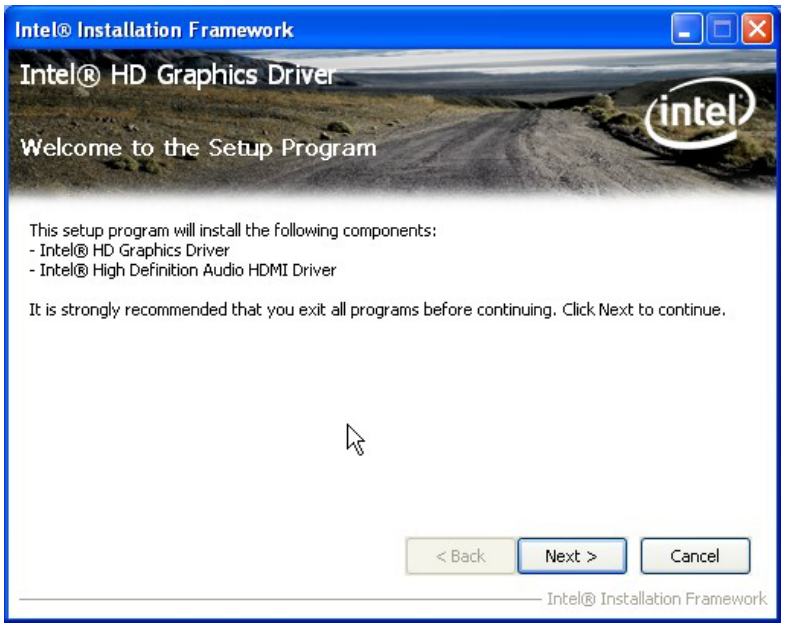


Figure 6-9: Graphics Driver Welcome Screen

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

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

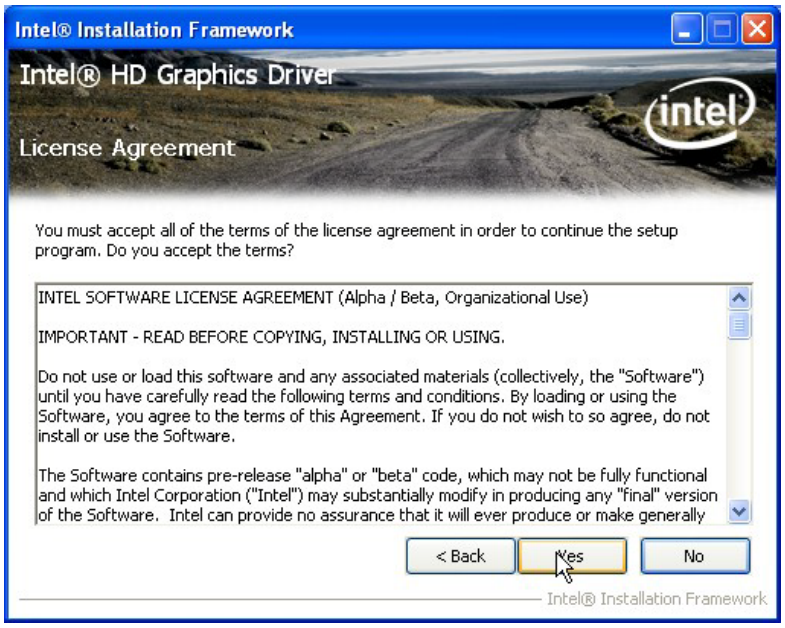


Figure 6-10: Graphics Driver License Agreement

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

Step 9: Once the **Setup Operations** are complete, click **Next** to continue.

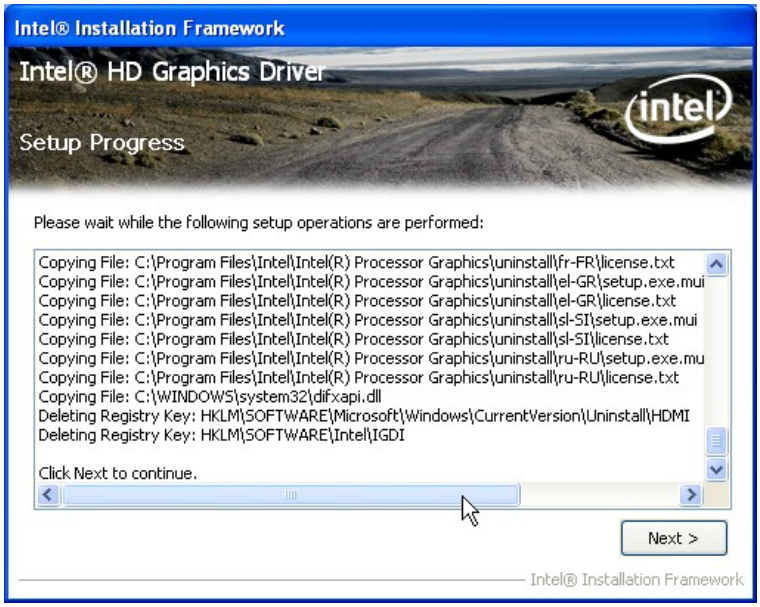


Figure 6-11: Graphics Driver Setup Operations

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

Step 11: Select "**Yes, I want to restart this computer now**" and click **Finish**.

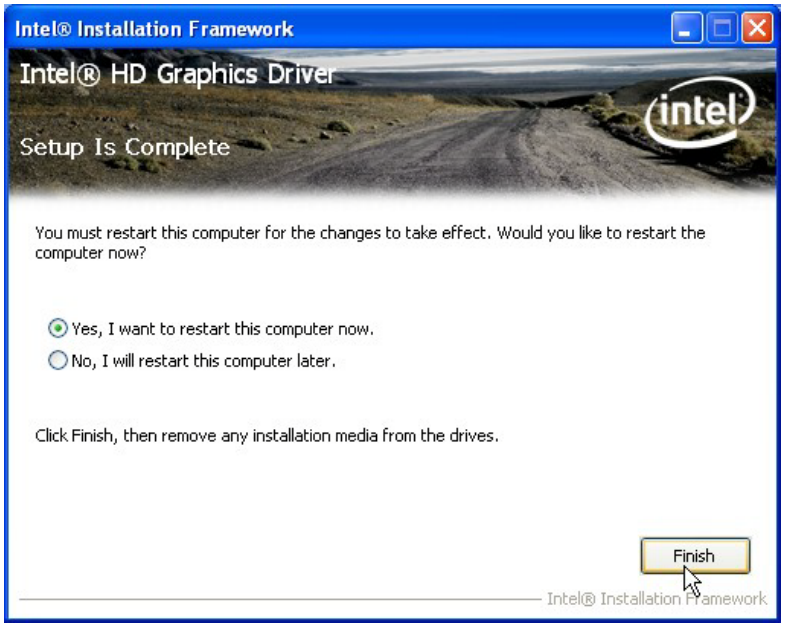


Figure 6-12: Graphics Driver Installation Finish Screen

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**" and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **Welcome** screen in **Figure 6-13** appears.

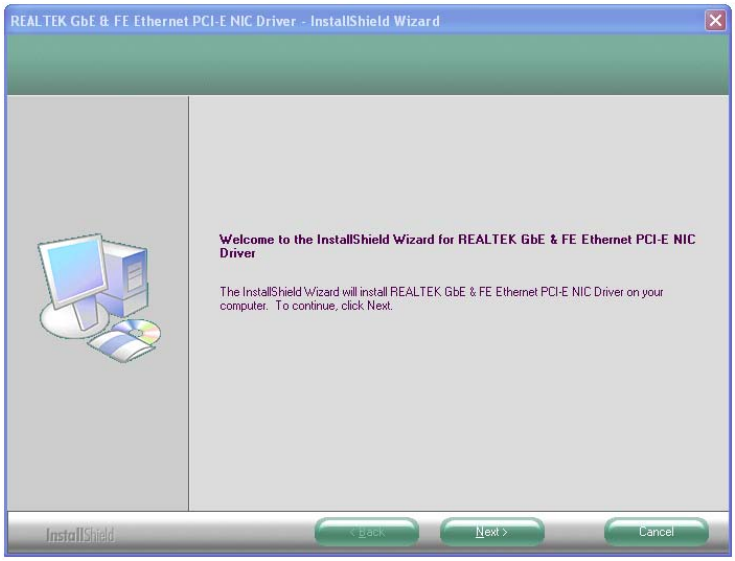


Figure 6-13: LAN Driver Welcome Screen

Step 5: Click **Next** to continue.

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

Step 7: Click **Install** to proceed with the installation.

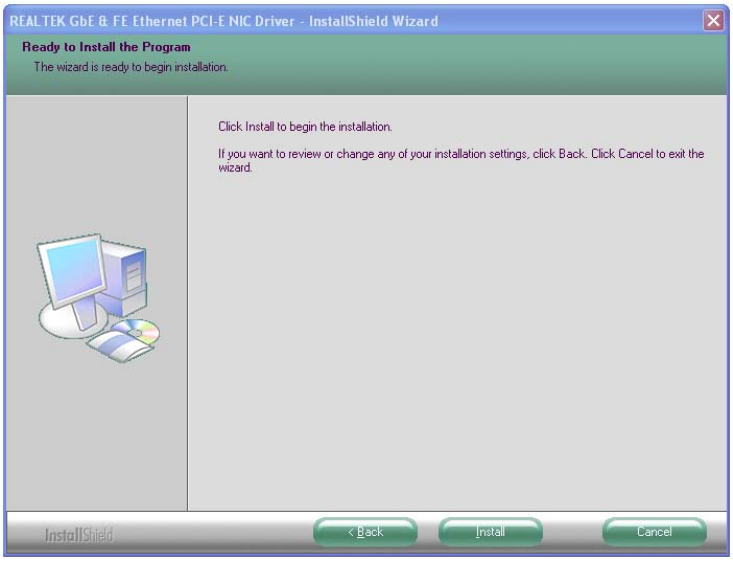


Figure 6-14: LAN Driver Ready to Install Screen

Step 8: The program begins to install.

Step 9: The **Setup Status** screen in **Figure 6-15** appears.

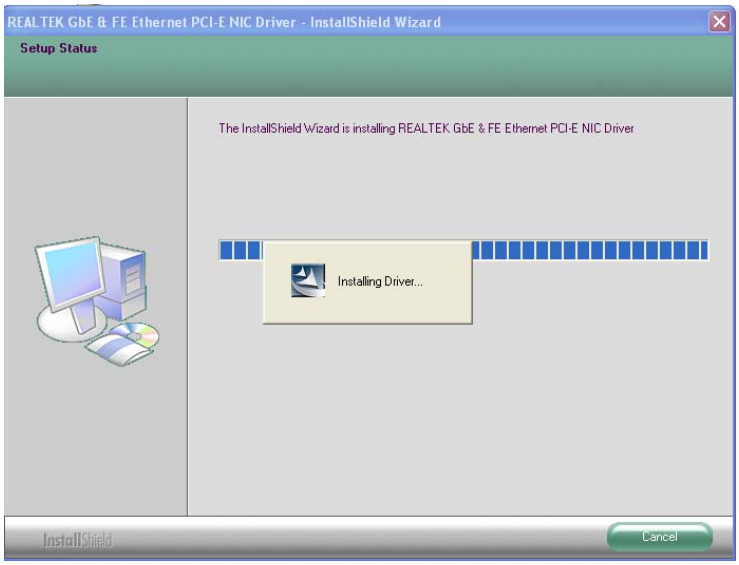


Figure 6-15: LAN Driver Setup Status Screen

Step 10: When the driver installation is complete, the screen in **Figure 6-16** appears.

Step 11: Click **Finish** to exit.

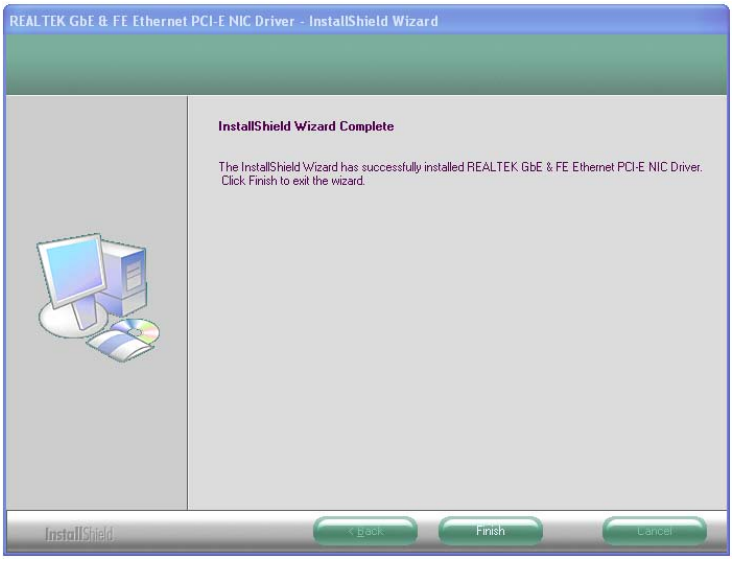


Figure 6-16: LAN Driver Installation Complete

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 6-17**).

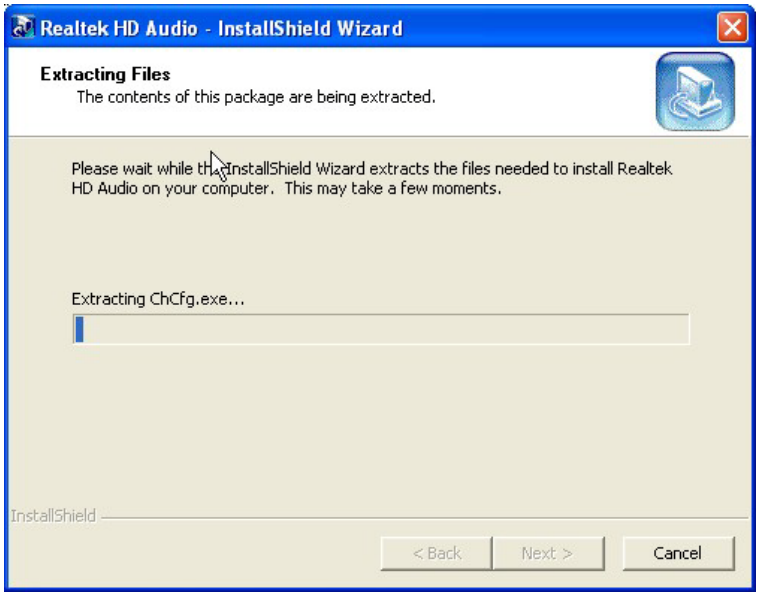


Figure 6-17: Audio Driver – Extracting Files

Step 5: The **Audio Driver Welcome** message in **Figure 6-18** appears.

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

Figure 6-18: Audio Driver Welcome Screen

Step 7: The audio driver installation begins. See **Figure 6-19**.

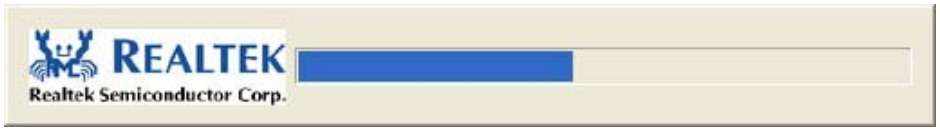


Figure 6-19: Audio Driver Installation

Step 8: When the installation is complete, the screen in **Figure 6-20** appears.

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

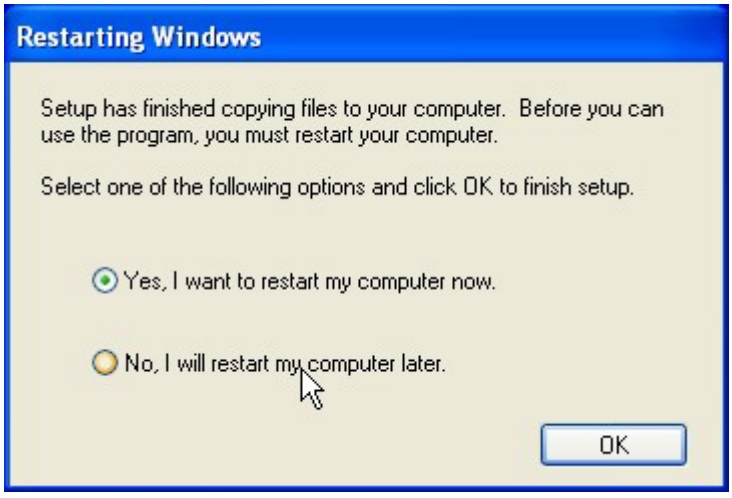


Figure 6-20: Audio Driver Installation Complete

Appendix

A

BIOS Options

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

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.

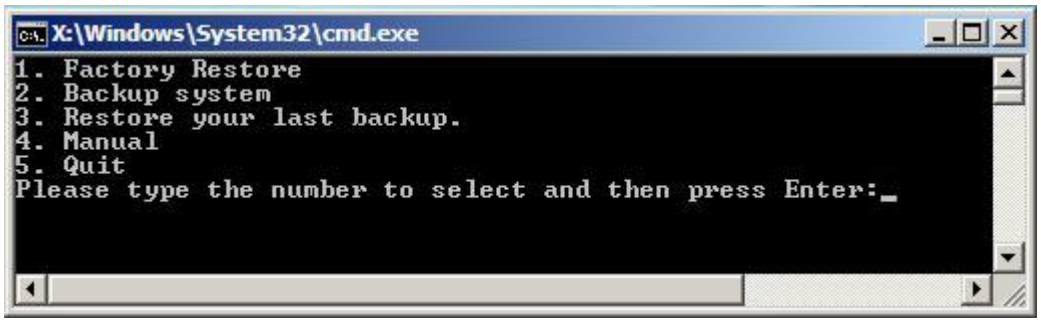


Figure B-1: IEI One Key Recovery Tool Menu

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 XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)

- Ubuntu 8.10 (Intrepid)
- Ubuntu 7.10 (Gutsy)
- Ubuntu 6.10 (Edgy)
- Debian 5.0 (Lenny)
- Debian 4.0 (Etch)
- SuSe 11.2
- 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!

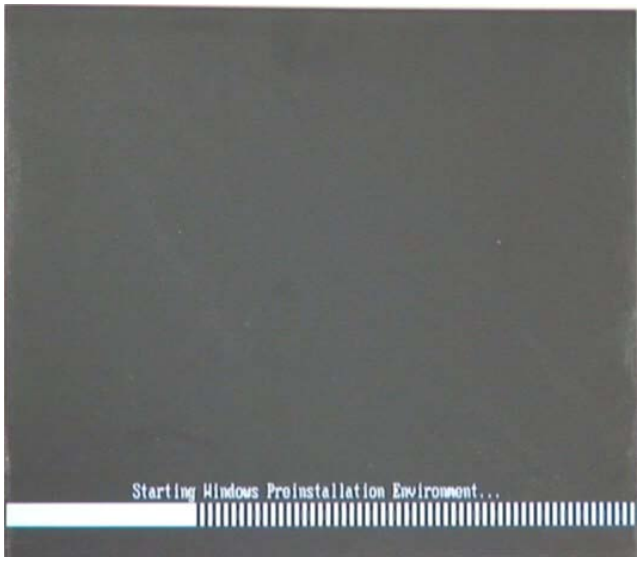


Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

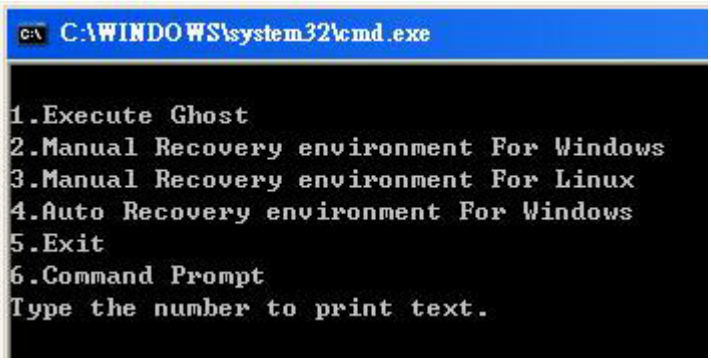


Figure B-3: Recovery Tool Setup Menu

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

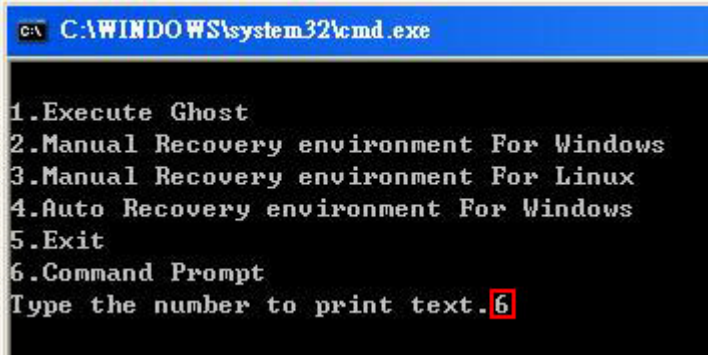


Figure B-4: Command Prompt

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

```
X:\I386\SYSTEM32>diskpart          → Starts the Microsoft disk partitioning tool.

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

DISKPART> list vol                 → Show partition information

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     X   CD_ROM       CDFS   DVD-ROM      405 MB  Healthy    Boot
  Volume 1     D                FAT32  Removeable  3854 MB  Healthy

DISKPART> sel disk 0               → Select a disk

Disk 0 is now the selected disk.

DISKPART> create part pri size=2000   → Create partition 1 and assign a size.
                                        This partition is for OS installation.
DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=N          → Assign partition 1 a code name (N).

DiskPart successfully assigned the drive letter or mount point.

DISKPART> create part pri size=1800   → Create partition 2 and assign a size.
                                        This partition is for recovery images.
DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=F          → Assign partition 2 a code name (F).

DiskPart successfully assigned the drive letter or mount point.

DISKPART> exit                     → Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y   → Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
   2048254 KB total disk space.
   2035620 KB are available.

X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
   1847474 KB total disk space.
   1835860 KB are available.

X:\I386\SYSTEM32>exit              → Exit Windows PE
```

Formate partition 2 (F) as NTFS formate and name it as "Recovery".

Figure B-5: Partition Creation Commands

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-JVC

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!

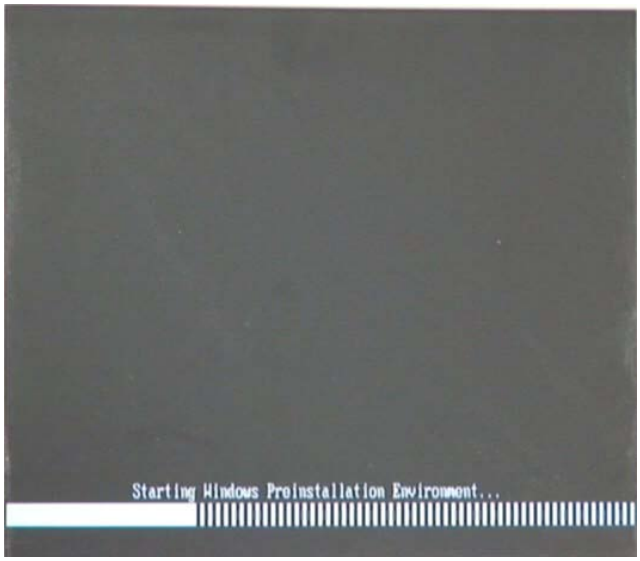


Figure B-6: Launching the Recovery Tool

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

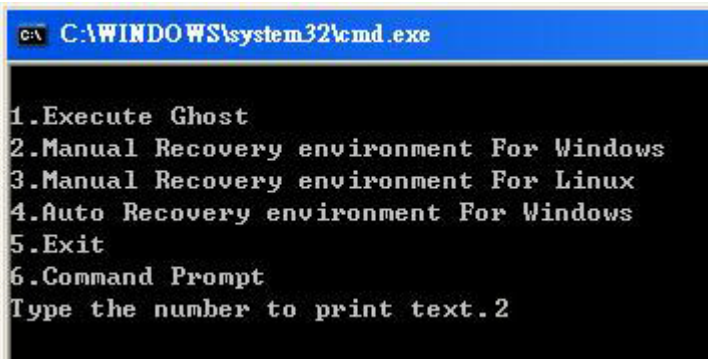


Figure B-7: Manual Recovery Environment for Windows

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.

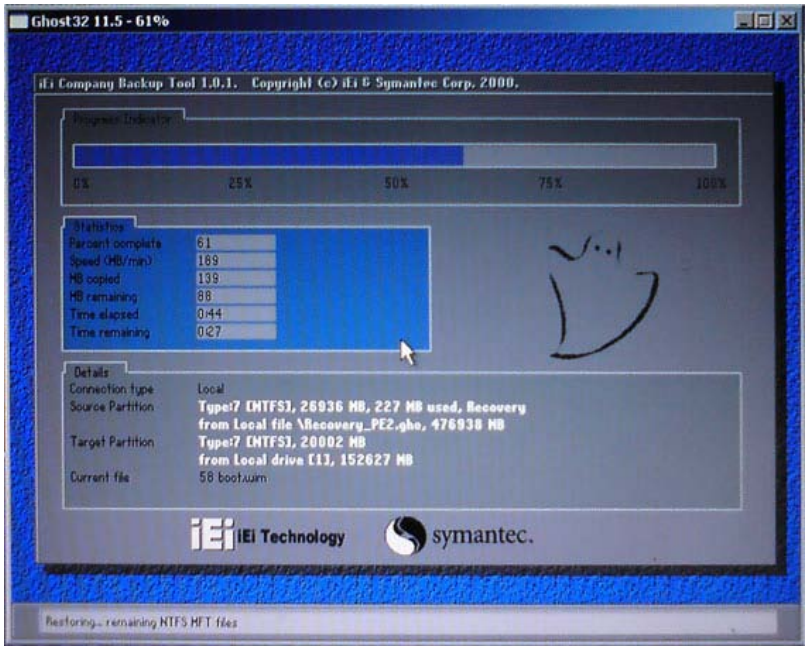


Figure B-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

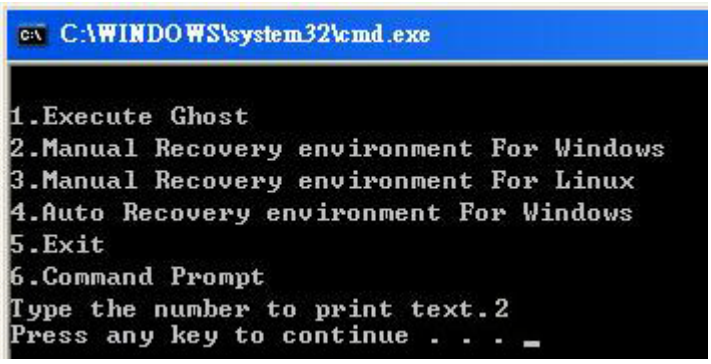


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

NOTE:

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.

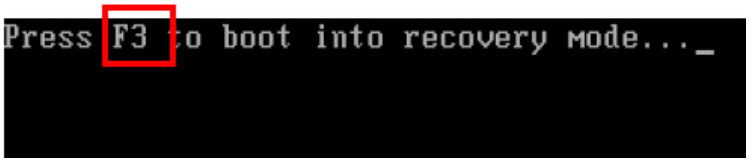


Figure B-10: Press F3 to Boot into Recovery Mode

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

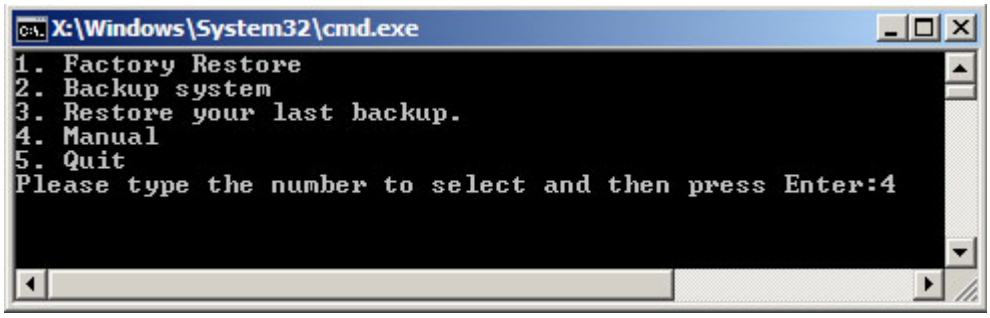


Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

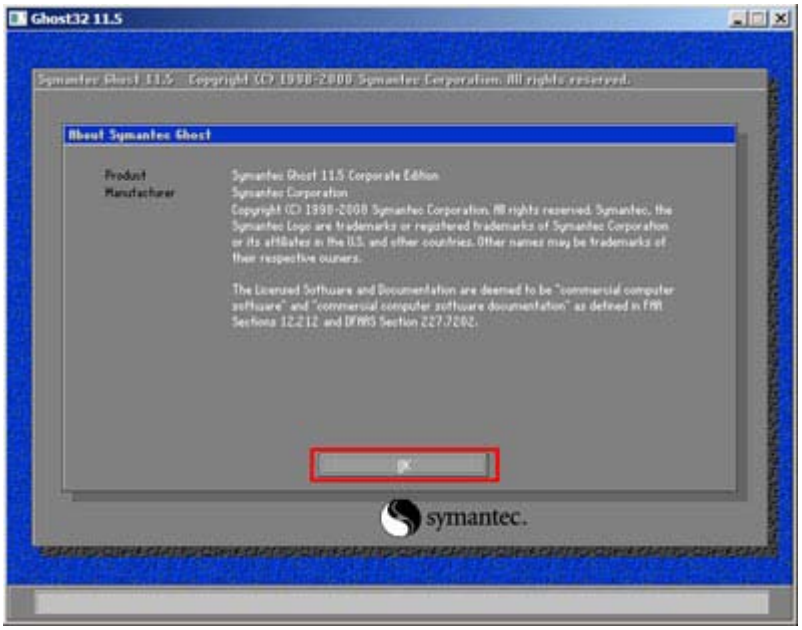


Figure B-12: About Symantec Ghost Window

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

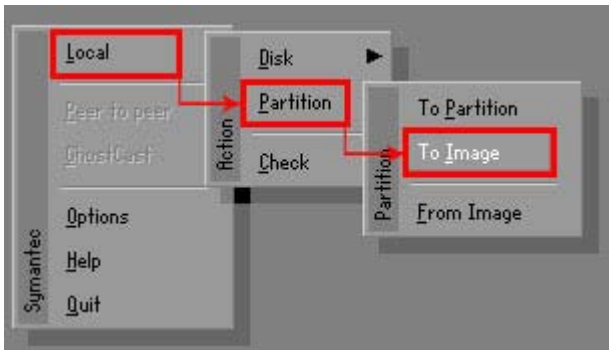


Figure B-13: Symantec Ghost Path

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

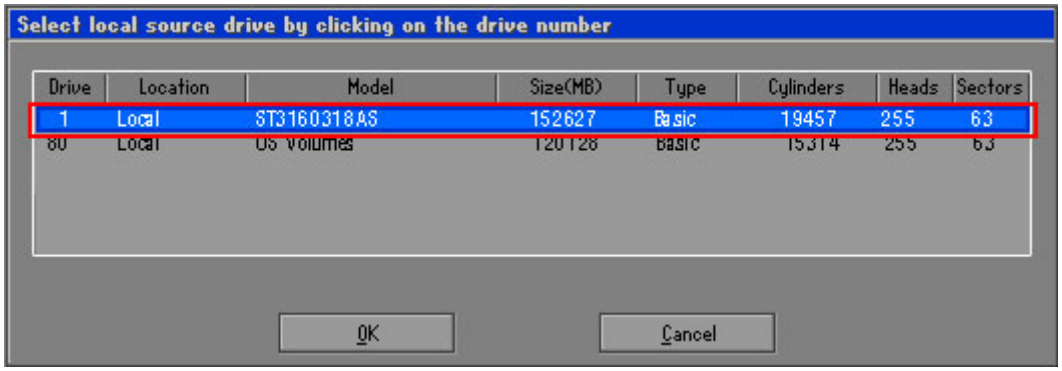


Figure B-14: Select a Local Source Drive

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

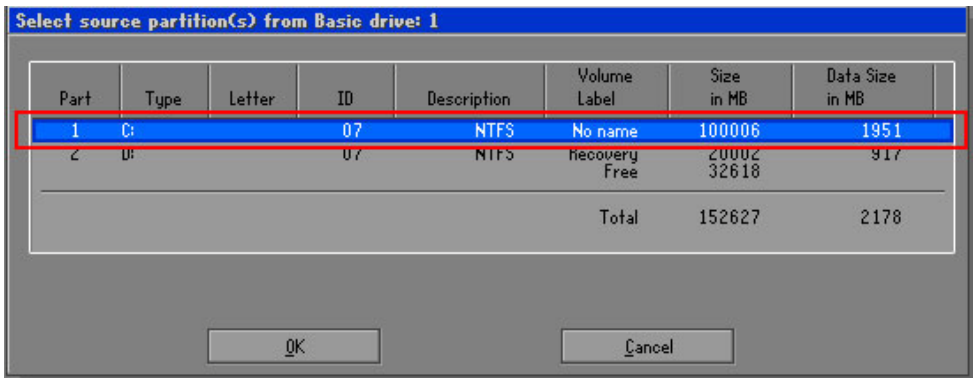


Figure B-15: Select a Source Partition from Basic Drive

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:

The file name of the factory default image must be **iei.GHO**.

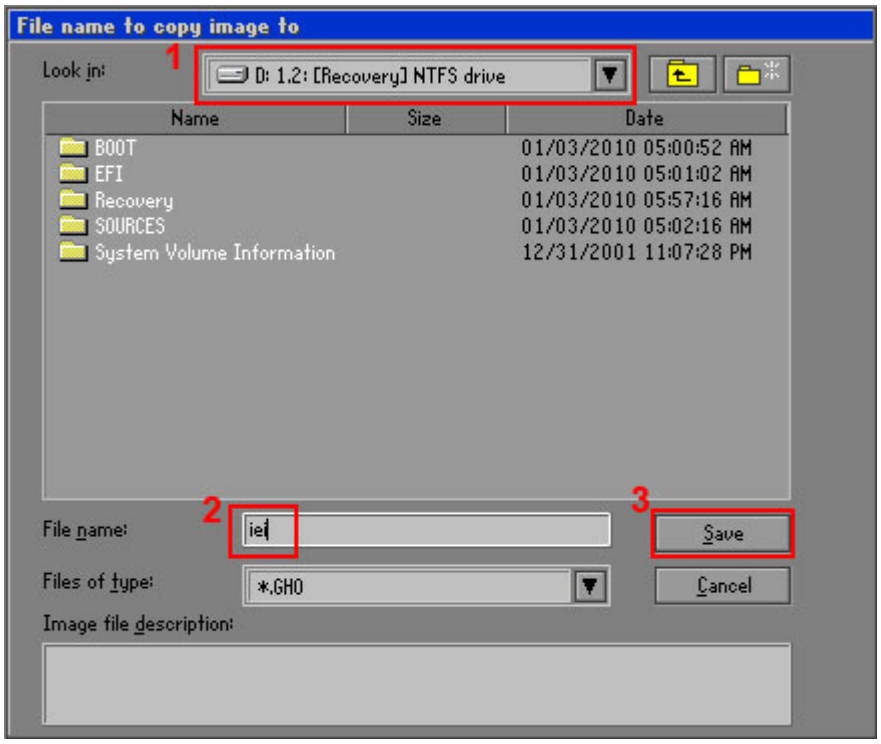


Figure B-16: File Name to Copy Image to

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

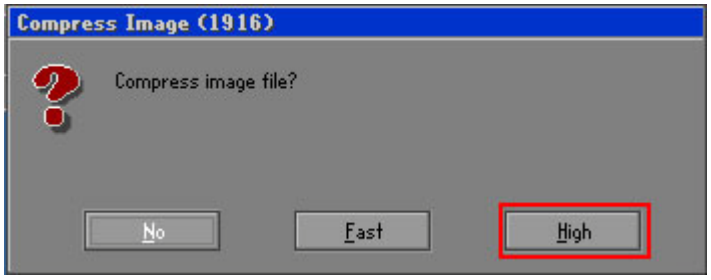


Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

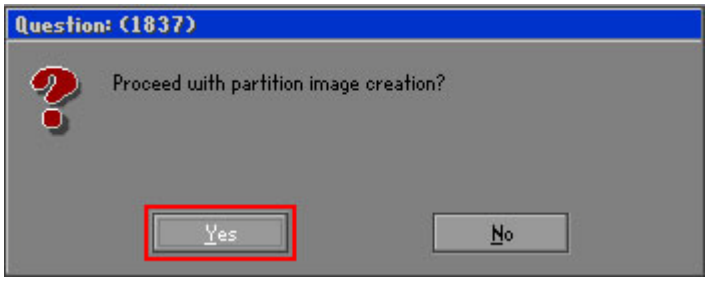


Figure B-18: Image Creation Confirmation

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

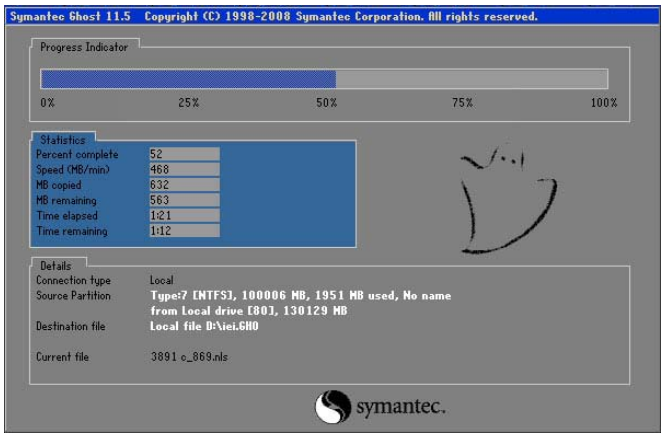


Figure B-19: Image Creation Complete

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.

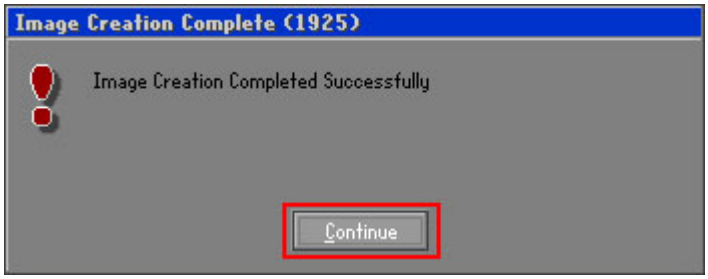


Figure B-20: Image Creation Complete

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

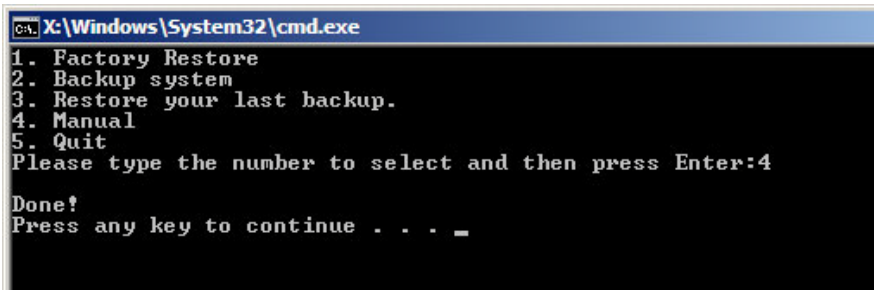


Figure B-21: Press Any Key to Continue

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:

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: 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!

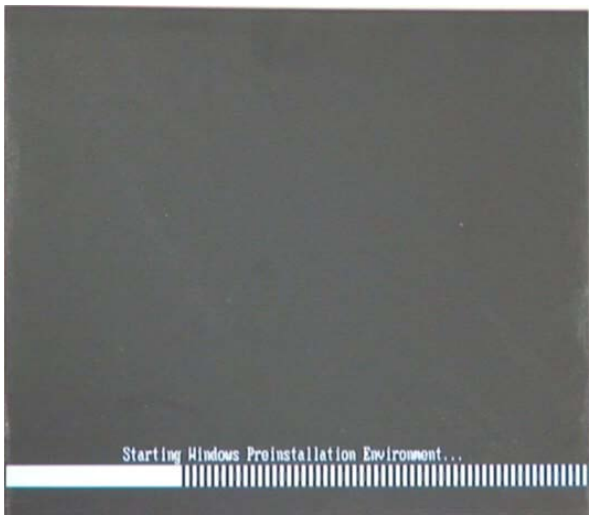


Figure B-23: Launching the Recovery Tool

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

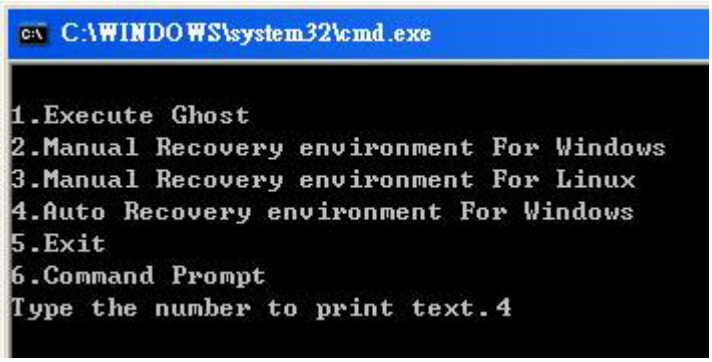


Figure B-24: Auto Recovery Environment for Windows

Step 5: 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.

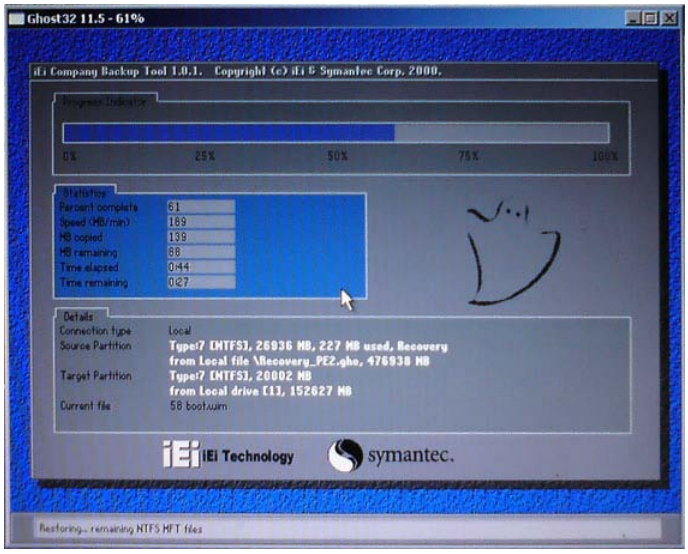


Figure B-25: Building the Auto Recovery Partition

Step 6: 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-26: Factory Default Image Confirmation

Step 7: The Symantec Ghost starts to create the factory default image (**Figure B-27**).

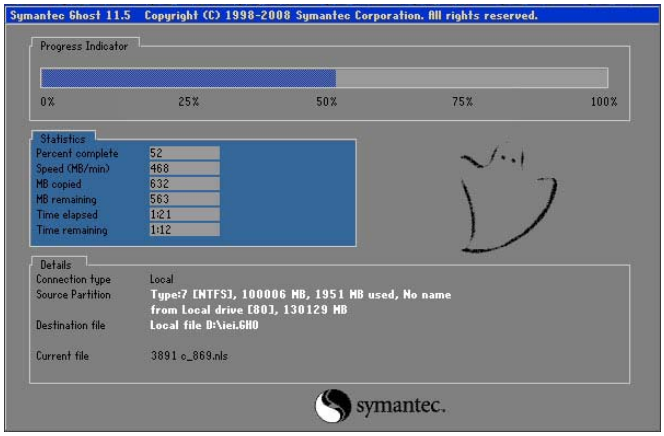


Figure B-27: Image Creation Complete

Step 8: After completing the system configuration, press any key in the following window to restart the system.

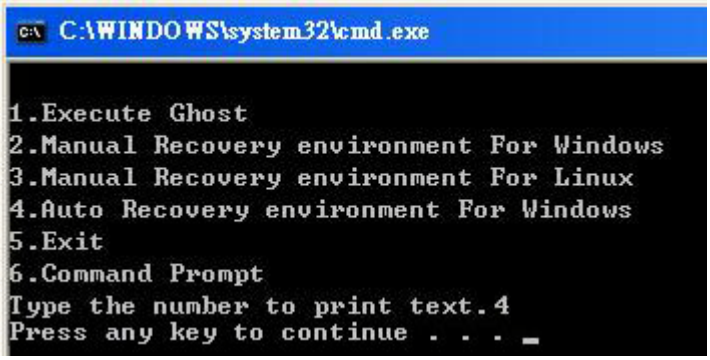


Figure B-28: Press any key to continue

Step 9: Eject the One Key Recovery CD and restart the system.

Step 10: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 11: 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.
```

BIOS Menu 26: IEI Feature

Step 12: 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.

CAUTION:

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

- Windows XP
- Windows Vista
- Windows 7

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:

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.

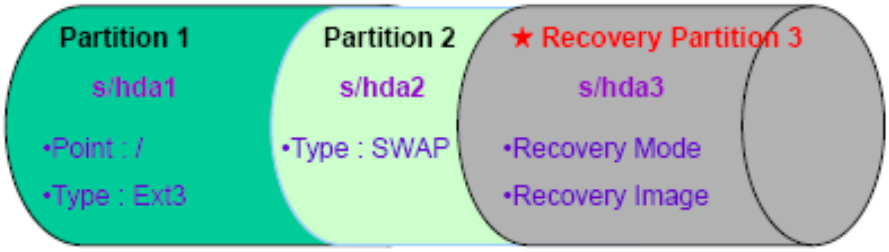


Figure B-29: Partitions for Linux

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-30**). 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.

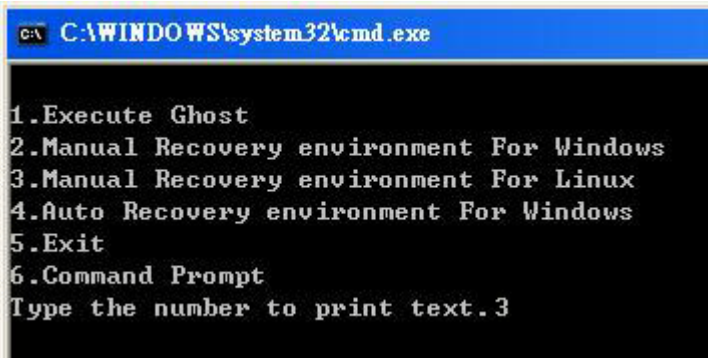


Figure B-30: Manual Recovery Environment for Linux

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

```
Fedora release 9 (Sulphur)
Kernel 2.6.25-14.fc9.i686 on an i686 (tty2)

localhost login: root
Password:
[root@localhost ~]# cd /boot/grub/
[root@localhost grub]# vi menu.lst _
```

Figure B-31: Access menu.lst in Linux (Text Mode)

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

```
#boot=/dev/sda
default=0
timeout=10                    Modify timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.25-14.fc9.i686)
        root (hd0,0)
        kernel /vmlinuz-2.6.25-14.fc9.i686 ro root=UUID=10f1acd
ac38b5c78910 rhgb quiet
        initrd /initrd-2.6.25-14.fc9.i686.img

title   Recovery Partition
root    (hd0,2)
makeactive                    Type command
chainloader +1
```

- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

Step 7: The recovery tool menu appears. (**Figure B-32**)

```
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:
```

Figure B-32: 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.

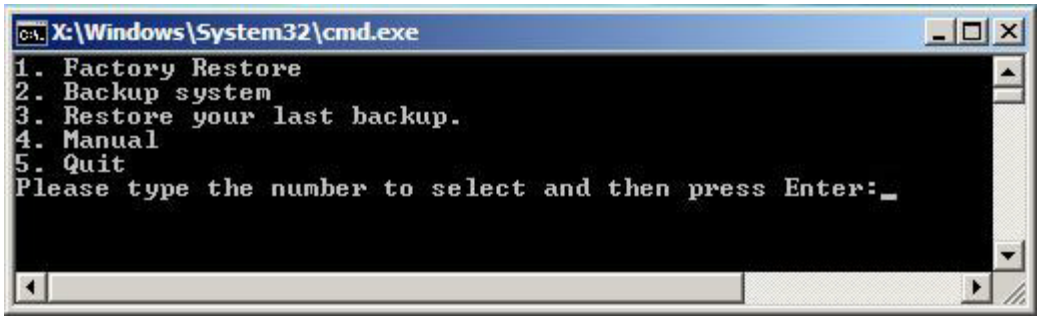


Figure B-33: Recovery Tool Main Menu

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:

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

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.

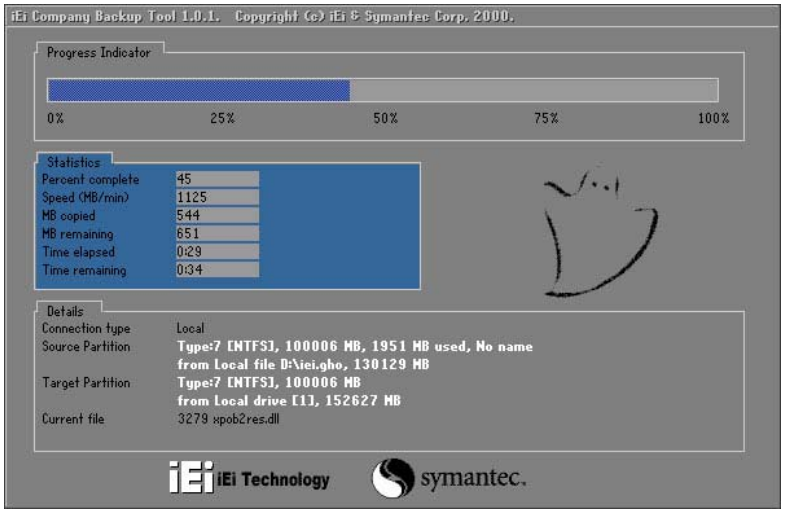


Figure B-34: Restore Factory Default

Step 3: The screen shown in **Figure B-35** appears when completed. Press any key to reboot the system.

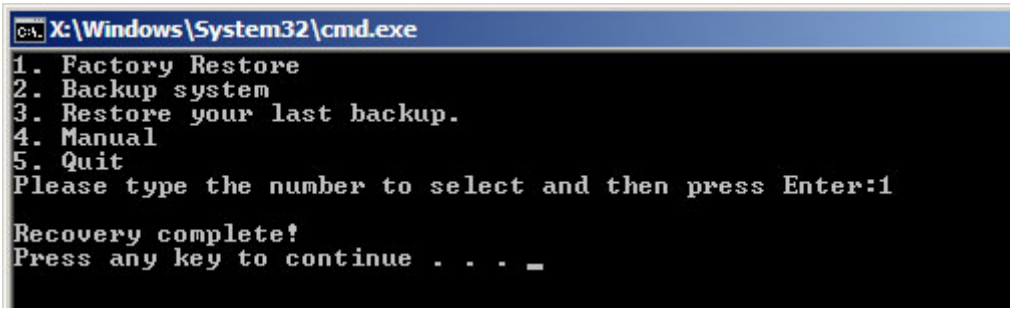


Figure B-35: Recovery Complete Window

B.5.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: 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.

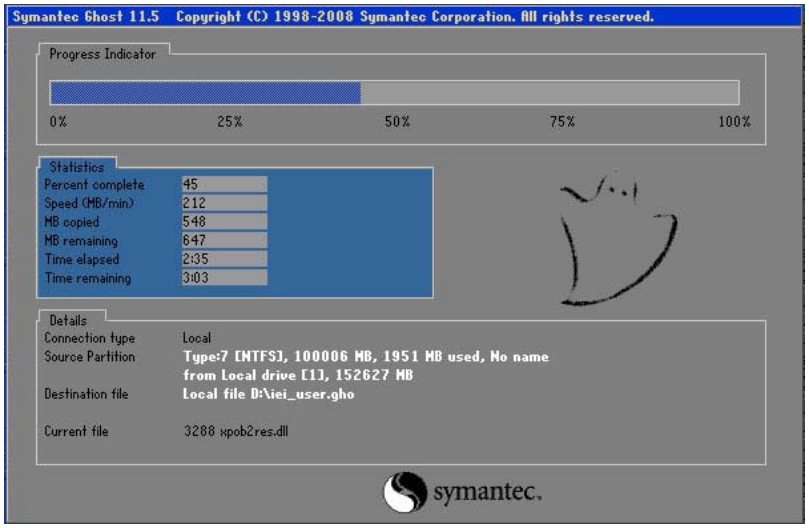


Figure B-36: Backup System

Step 3: The screen shown in **Figure B-37** appears when system backup is complete. Press any key to reboot the system.

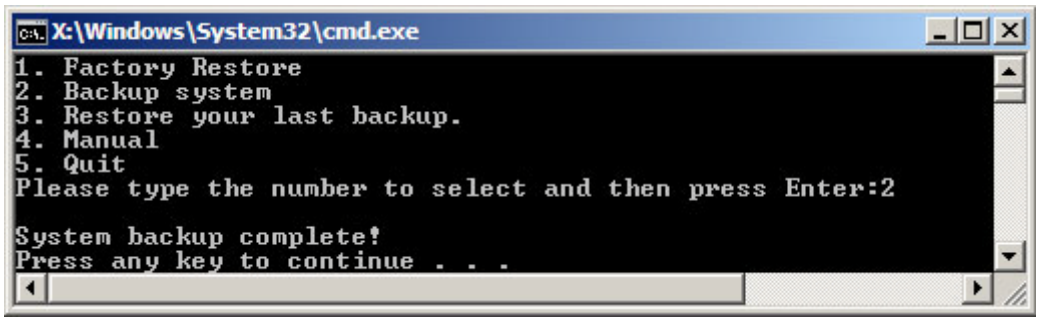


Figure B-37: System Backup Complete Window

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).

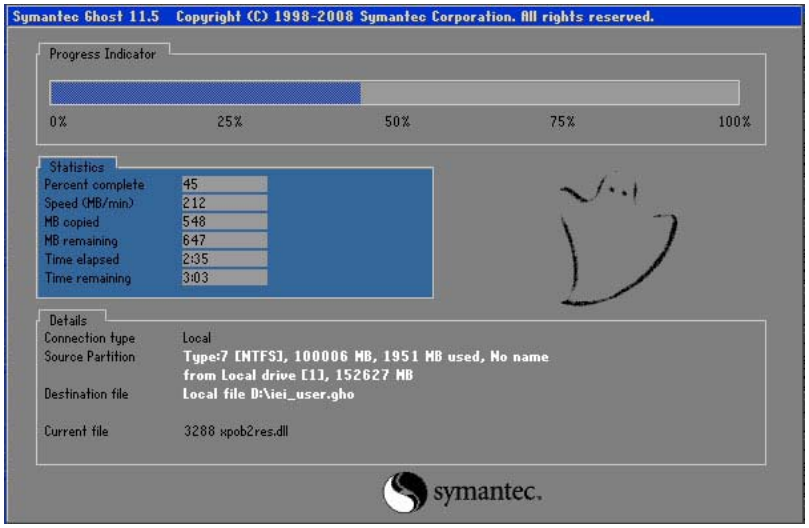


Figure B-38: Restore Backup

Step 3: The screen shown in **Figure B-39** appears when backup recovery is complete. Press any key to reboot the system.

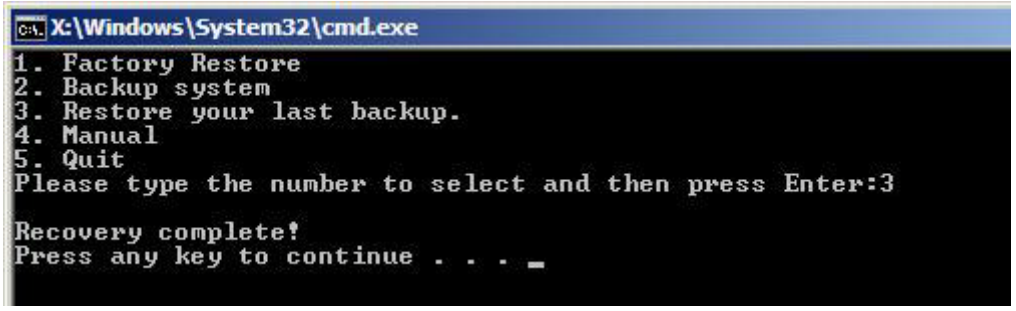


Figure B-39: Restore System Backup Complete Window

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.

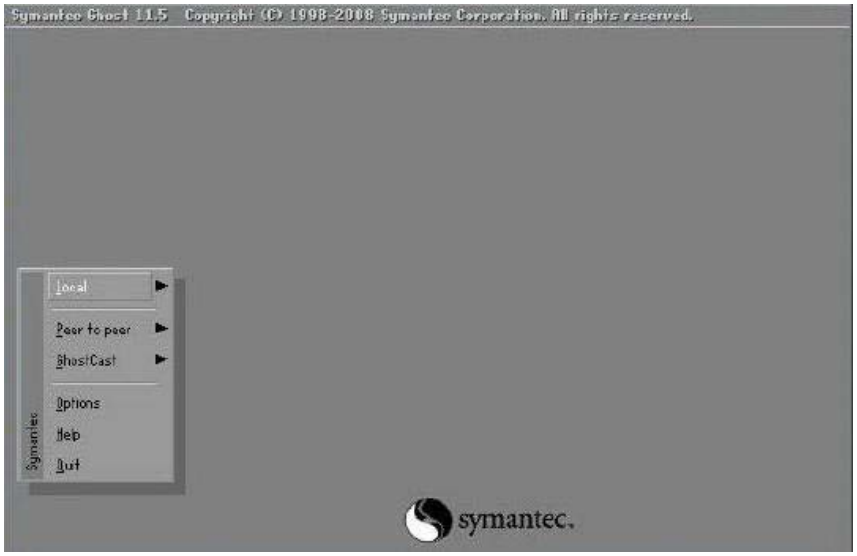
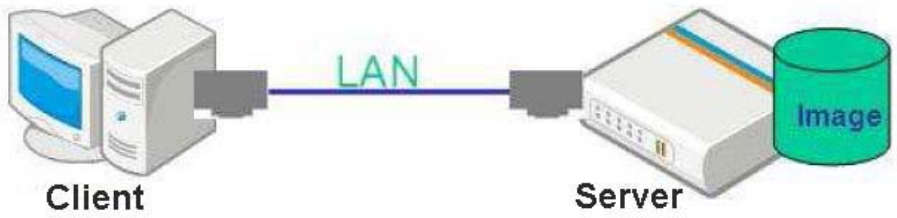


Figure B-40: Symantec Ghost Window

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.



NOTE:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows CE
- Windows XP Embedded

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.

CentOS

Use the following command to show the DHCP server sample location:

#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

```
#
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.sample
#
```

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

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {

# --- default gateway
        option routers                  192.168.0.2;
        option subnet-mask              255.255.255.0;

        option nis-domain               "domain.org";
        option domain-name              "domain.org";
        option domain-name-servers      192.168.0.1;
        next-server 192.168.0.6;
        filename "pxelinux.0";
        option time-offset              -18000; # Eastern Standard Time
#       option ntp-servers              192.168.1.1;
```

Debian

#vi /etc/dhcpd.conf

Edit “/etc/dhcpd.conf” for your environment. For example, add

next-server PXE server IP address;

filename “pxelinux.0”;

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {

# --- default gateway
        option routers                  192.168.0.2;
        option subnet-mask              255.255.255.0;

        option nis-domain               "domain.org";
        option domain-name              "domain.org";
        option domain-name-servers      192.168.0.1;
        next-server 192.168.0.6;
        filename "pxelinux.0";
        option time-offset              -18000; # Eastern Standard Time
#       option ntp-servers              192.168.1.1;
```

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_

```
        socket_type             = dgram
        protocol                = udp
        wait                    = yes
        user                    = root
        server                  = /usr/sbin/in.tftpd
        server_args             = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
        disable                 = no
        per_source              = 11
        cps                     = 100 2
        flags                   = IPv4
```

Debian

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)

```
#:BOOT: TFTP service is provided primarily for booting.  Most sites
#       run this only on machines acting as "boot servers."

#tftp           dgram   udp     wait    root  /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
 /var/lib/tftpboot
```

#vi /etc/xinetd.d/tftp

```
        socket_type             = dgram
        protocol                = udp
        wait                    = yes
        user                    = root
        server                  = /usr/sbin/in.tftpd
        server_args             = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
        disable                 = no
        per_source              = 11
        cps                     = 100 2
        flags                   = IPv4
```

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: 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 2: 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.

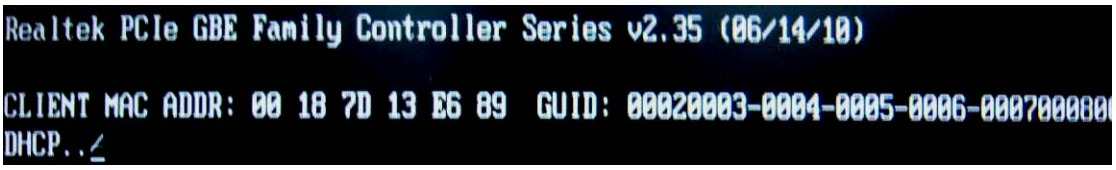
Boot Option #2 → select the boot from LAN option.

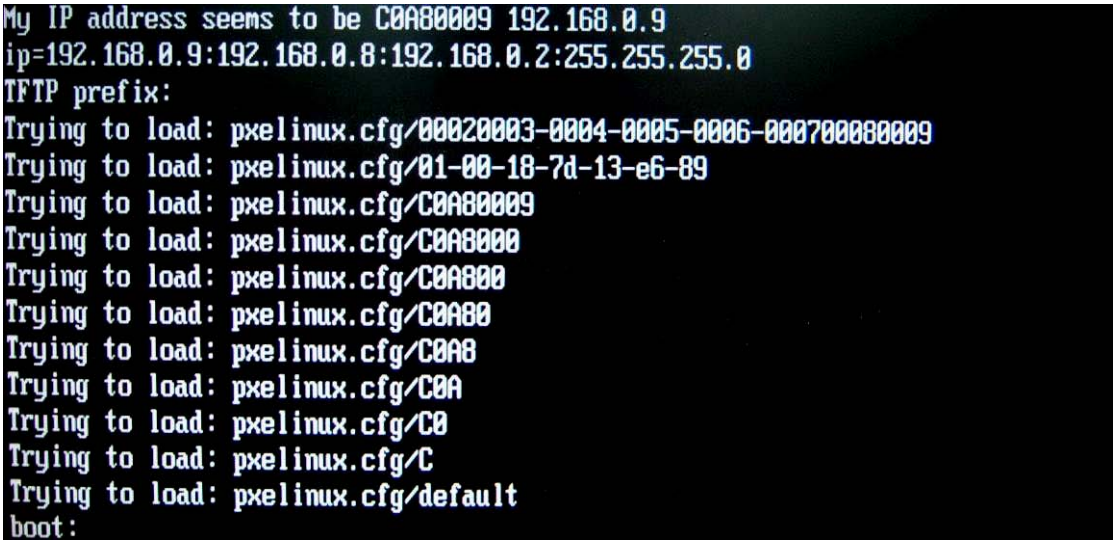
Step 3: Save changes and exit BIOS menu.

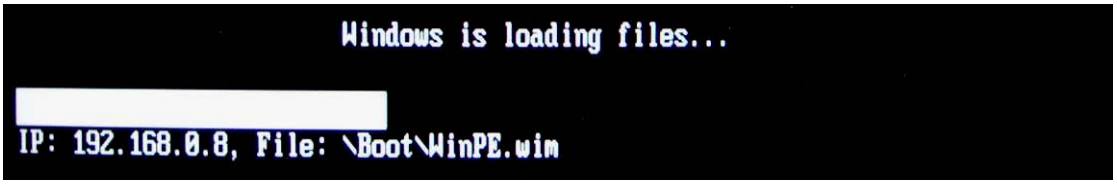
Exit → **Save Changes and Exit**

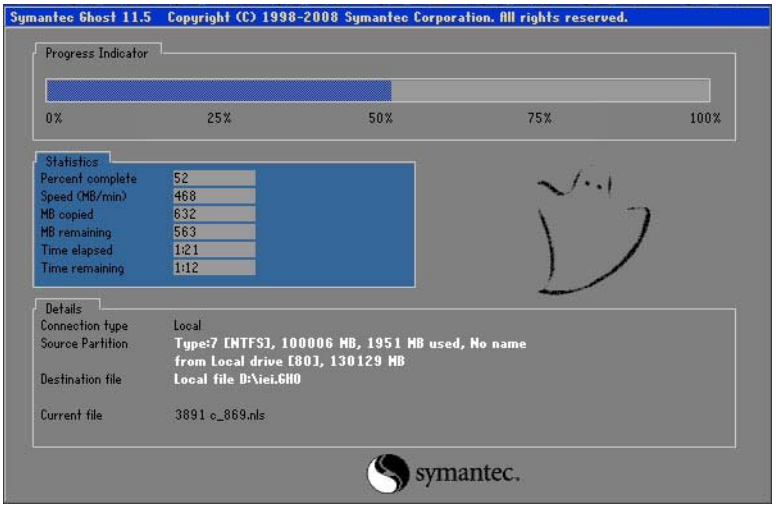
Step 4: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

Step 5: 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:

A firewall or a SELinux is not in use in the whole setup process. 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.

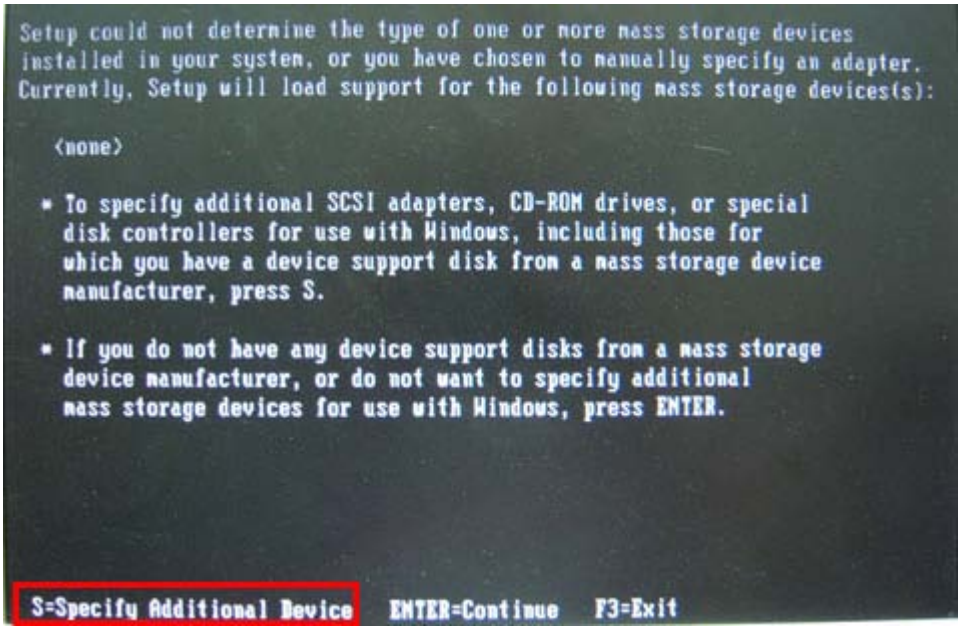
Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

Step 2: Connect the USB floppy disk drive to the system.

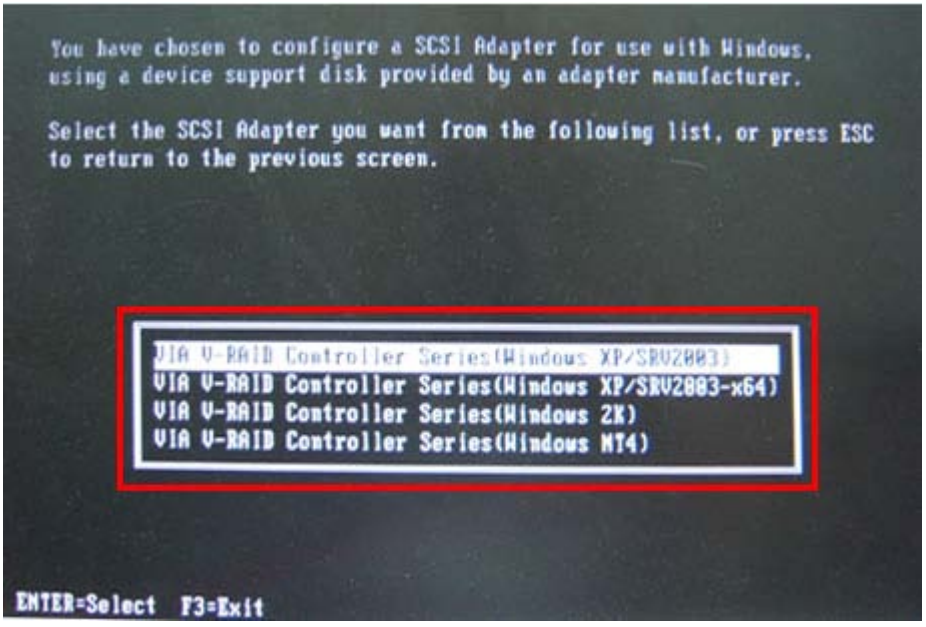
Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

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 DB-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 IMB-H612 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	+5V
3	DGPO3	4	DGPO2
5	DGPO1	6	DGPO0
7	DGPI3	8	DGPI2
9	DGPI1	10	DGPI0

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
```

Appendix

E

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 ;
```

Appendix

F

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the IMB-H612

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the IMB-H612.

- Microsoft Windows XP
- Microsoft Windows 7 Ultimate
- Microsoft Windows Vista Ultimate
- Linux Fedora 14

F.2 Compatible Processors

The following Intel® Socket 1155 processors have been successfully tested on the IMB-H612

CPU	Model
Intel® Core™ Quad/Dual core processor series	i7/i5/i3

Table F-1: Compatible Processors

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	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
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	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
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。						