

**MODEL:  
IMBA-H610**

**ATX Motherboard for LGA1155 Intel® Core™  
i7/i5/i3/Pentium®/Celeron® CPU, Intel® H61 Chipset, DDR3,  
VGA, DVI-D, Dual Realtek PCIe GbE, USB 2.0, SATA 3Gb/s,  
HD Audio and RoHS**

## **User Manual**

# Revision

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24 April, 2014	1.03	Modified LAN pinouts Updated Chapter 2: Packing List
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21 October, 2011	1.00	Initial release

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Chapter

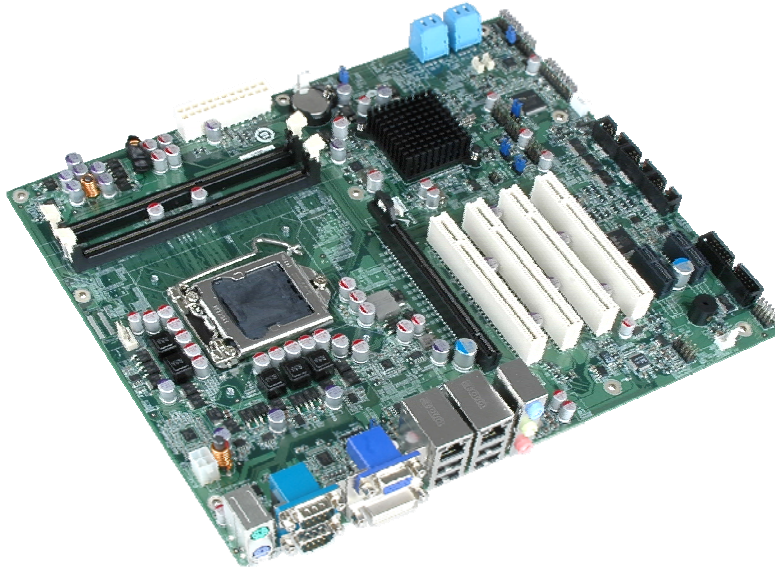
1

# Introduction

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## 1.1 Introduction



**Figure 1-1: IMBA-H610**

The IMBA-H610 is an ATX motherboard. It accepts a Socket LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron® processor and supports two 240-pin 1333/1066 MHz DDR3 DIMM modules up to 16.0 GB. The IMBA-H610 includes a VGA and DVI-D port. Expansion and I/O include four PCI slots, one PCIe x16 slot, two PCIe x1 slots, four USB 2.0 by rear panel, six USB 2.0 by pin header, four SATA 3Gb/s connectors, six COM ports, and two keyboard/mouse connectors.

## 1.2 Features

Some of the IMBA-H610 motherboard features are listed below:

- ATX form factor
- LGA1155 CPU socket
- Intel® H61 chipset
- DDR3 DIMMs support up to 16.0 GB
- Intel® HD graphics technology integrates high-performance graphics and media processing
- TPM V1.2 hardware security function provided by the TPM module
- Four PCI card expansion slots
- Two external RS-232 serial ports

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- Three internal RS-232 serial port connectors
- One internal RS-422/485 serial port connector
- Two Realtek PCIe Gigabit Ethernet connectors (LAN1 with ASF 2.0 support)
- Four SATA 3Gb/s connectors
- High Definition Audio
- RoHS compliant

### 1.3 Connectors

The connectors on the IMBA-H610 are shown in the figure below.

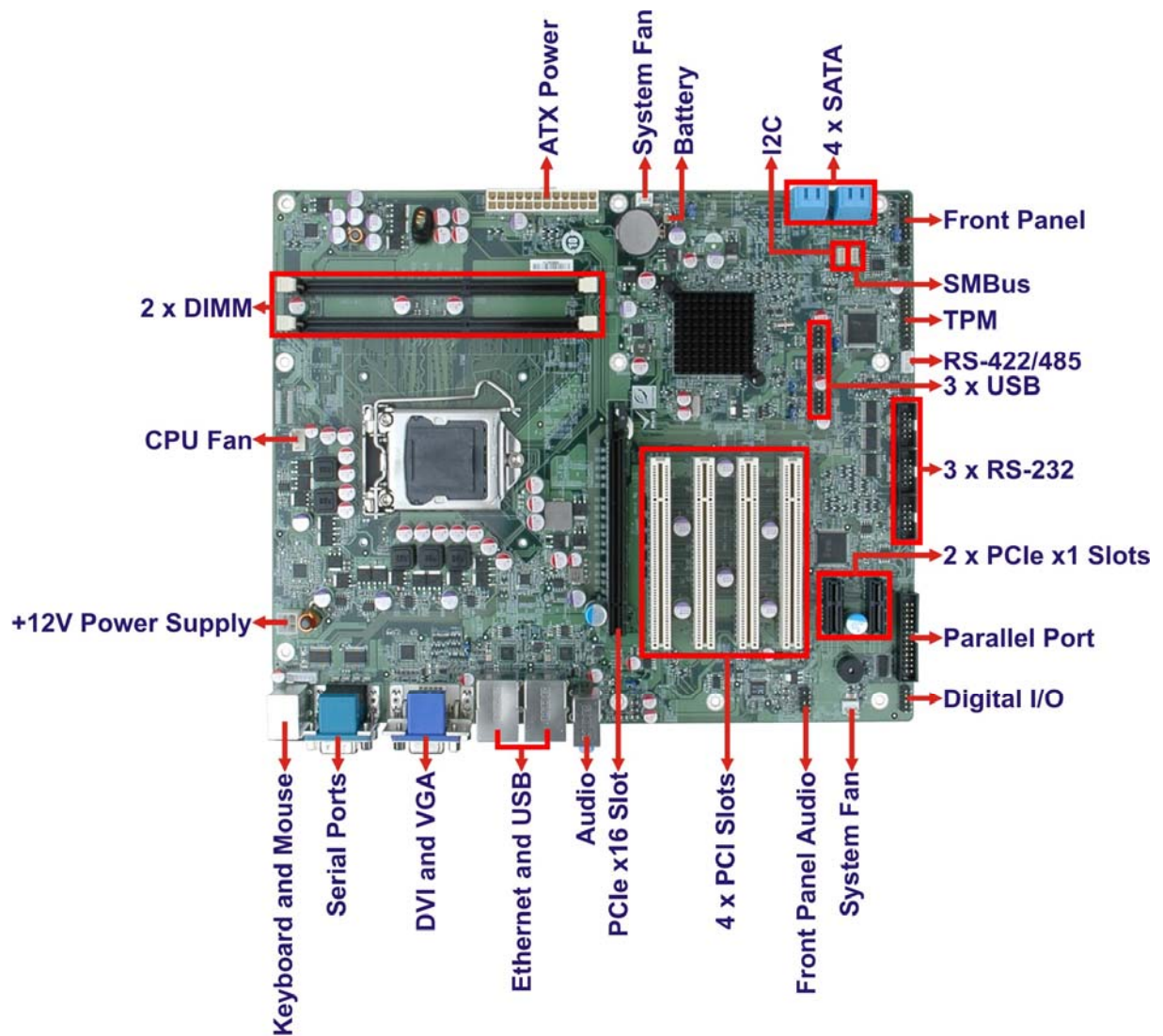


Figure 1-2: Connectors

### 1.4 Dimensions

The main dimensions of the IMBA-H610 are shown in the diagram below.

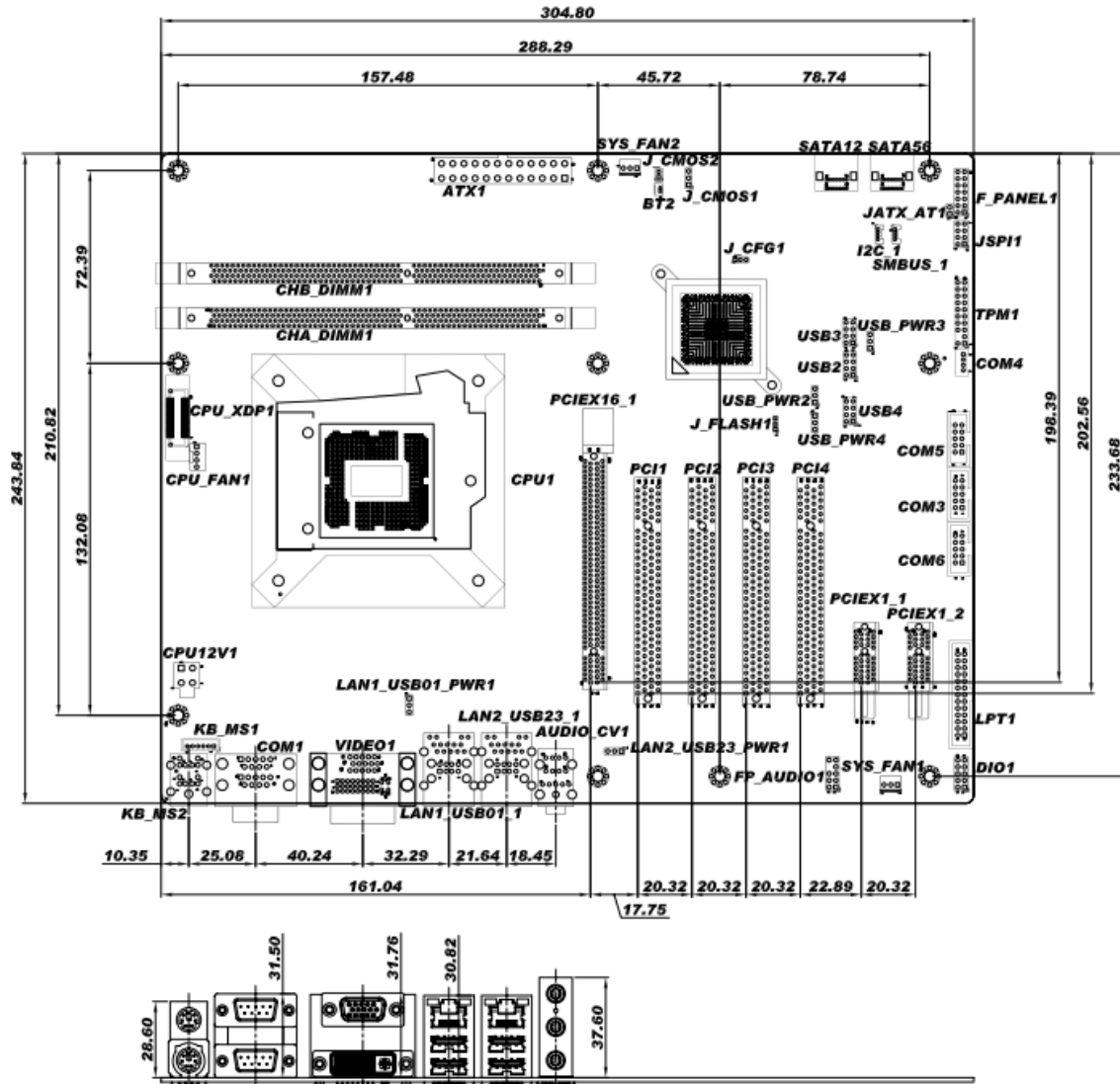


Figure 1-3: IMBA-H610 Dimensions (mm)

IMBA-H610 ATX Motherboard

1.5 Data Flow

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

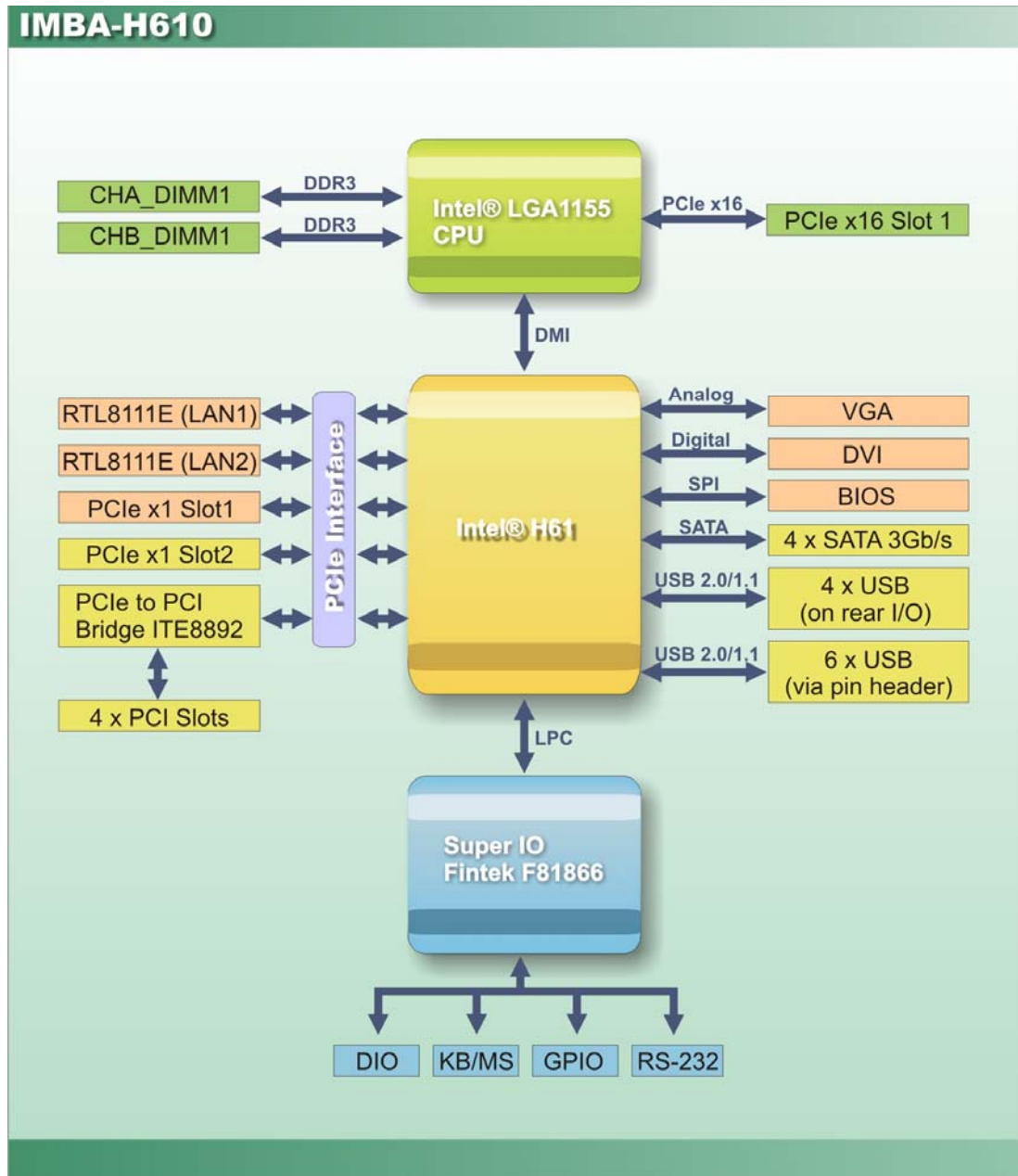


Figure 1-4: Data Flow Diagram

## 1.6 Technical Specifications

IMBA-H610 technical specifications are listed below.

Specification/Model	IMBA-H610
<b>Form Factor</b>	ATX
<b>CPU Supported</b>	LGA1155 Intel® Core™ i7/i5/i3/Pentium®/Celeron® CPU
<b>Chipset</b>	Intel® H61
<b>Memory</b>	Two 240-pin 1333/1066 MHz unbuffered DDR3 SDRAM DIMMs support (system max. 16.0 GB)
<b>Graphics Engine</b>	Intel® HD Graphics 2000/3000 (based on CPU type) Supports DirectX 10.1 and OpenGL 3.0 Full MPEG2, VC1, AVC Decode
<b>Ethernet Controllers</b>	Dual Realtek RTL8111E PCIe GbE controllers (LAN1 with ASF 2.0 support)
<b>Audio</b>	Realtek ALC662 HD Audio codec (Line-in, Line-out, Mic)
<b>BIOS</b>	UEFI BIOS
<b>Super I/O Controller</b>	Fintek F81866
<b>PCIe-PCI Bridge</b>	ITE IT8892E
<b>Watchdog Timer</b>	Software programmable supports 1~255 sec. system reset
<b>Expansion</b>	
<b>PCI</b>	Four PCI slots
<b>PCIe</b>	One PCIe x16 slot Two PCIe x1 slots
<b>I/O Interface Connectors</b>	
<b>Audio Connectors</b>	Three external audio jacks (line-in, line-out, mic-in) One internal front panel audio connector (10-pin header)
<b>Digital I/O</b>	8-bit programmable I/O
<b>Display Ports</b>	One VGA integrated in the Intel® H61 One DVI-D integrated in the Intel® H61

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<b>Specification/Model</b>	<b>IMBA-H610</b>
<b>Ethernet</b>	Two RJ-45 GbE ports
<b>Fan Connectors</b>	One 4-pin CPU fan connector Two 3-pin system fan connector
<b>Front Panel</b>	One 14-pin header (power LED, HDD LED, speaker, power button, reset button)
<b>I2C</b>	One 4-pin wafer connector
<b>Keyboard/Mouse</b>	Dual PS/2 port
<b>Parallel Port</b>	One parallel port via internal 26-pin box header
<b>Serial ATA</b>	Four SATA 3Gb/s connectors
<b>Serial Ports</b>	Two external RS-232 serial ports Three RS-232 via internal box headers One RS-422/485 via internal 4-pin wafer connector
<b>SMBus</b>	One 4-pin wafer connector
<b>TPM</b>	One via 20-pin header
<b>USB Ports</b>	Four external USB 2.0 ports on rear IO Six internal USB 2.0 ports by three pin headers
<b>Environmental and Power Specifications</b>	
<b>Power Supply</b>	AT/ATX power supported
<b>Power Consumption</b>	3.3V@1.65A, 5V@6.31A, 12V@0.18A, Vcore@7.88A, 5VSb@0.15 (3.10 GHz Intel® Core™ i5-2400 CPU with 4 GB 1333 MHz DDR3 memory)
<b>Operating Temperature</b>	-10°C ~ 60°C
<b>Humidity</b>	5% ~ 95% (non-condensing)
<b>Physical Specifications</b>	
<b>Dimensions</b>	244 mm x 305 mm
<b>Weight GW/NW</b>	1200 g / 700 g

**Table 1-1: IMBA-H610 Specifications**

Chapter

**2**

# Packing List

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## IMBA-H610 ATX Motherboard

### 2.1 Anti-static Precautions

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#### 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.

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Make sure to adhere to the following guidelines:

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

### 2.2 Unpacking Precautions

When the IMBA-H610 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 IMBA-H610 was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

The IMBA-H610 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-H610 motherboard	
4	SATA cable (P/N: 32000-062800-RS)	
1	I/O shielding (P/N: 45014-0008C0-00-RS)	
1	Mini jumper pack	
1	One Key Recovery CD	
1	Utility CD	







## IMBA-H610 ATX Motherboard





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: 19800-003100-300-RS)	
SATA power cable (P/N: 32102-000100-200-RS)	
RS-422/485 cable (200 mm) (P/N: 32205-003800-300-RS)	
Parallel port cable (P/N: 19800-000049-RS)	
Dual RS-232 cable (P/N: 19800-000051-RS)	
20-pin Infineon TPM module, S/W management tool, firmware v3.17 (P/N: TPM-IN01-R11)	

Item and Part Number	Image
LGA1155/LGA1156 cooler kit (1U chassis compatible, 73W) (P/N: CF-1156A-RS-R11)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 45W) (P/N: CF-1156C-RS)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 65W) (P/N: CF-1156D-RS)	
High-performance LGA1155/LGA1156 cooler kit (95W) (P/N: CF-1156E-R11)	
Intel® Core™ i5-2500T processor (LGA1155, quad core 2.3 GHz, 6M cache, 45W, compatible with CF-1156C-RS CPU cooler kit) (P/N: CPU-DT-i5-2500T)	
Intel® Core™ i5-2390T processor (LGA1155, dual core 2.7 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (P/N: CPU-DT-i5-2390T)	
Intel® Core™ i3-2120T processor (LGA1155, dual core 2.6 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (P/N: CPU-DT-i3-2120T)	

## IMBA-H610 ATX Motherboard

Item and Part Number	Image
Intel® Pentium® G630T processor (LGA1155, dual core 2.3 GHz, 3M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (P/N: CPU-DT-P-G630T)	
Intel® Celeron® G440 processor (LGA1155, single core 1.6 GHz, 1M cache, 35W, compatible with CF-1156C-RS CPU cooler kit) (P/N: CPU-DT-C-G440)	

**Table 2-2: Optional Items**

Chapter

**3**

# Connectors

---

## IMBA-H610 ATX Motherboard

### 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

#### 3.1.1 IMBA-H610 Layout

The figures below show all the connectors and jumpers.

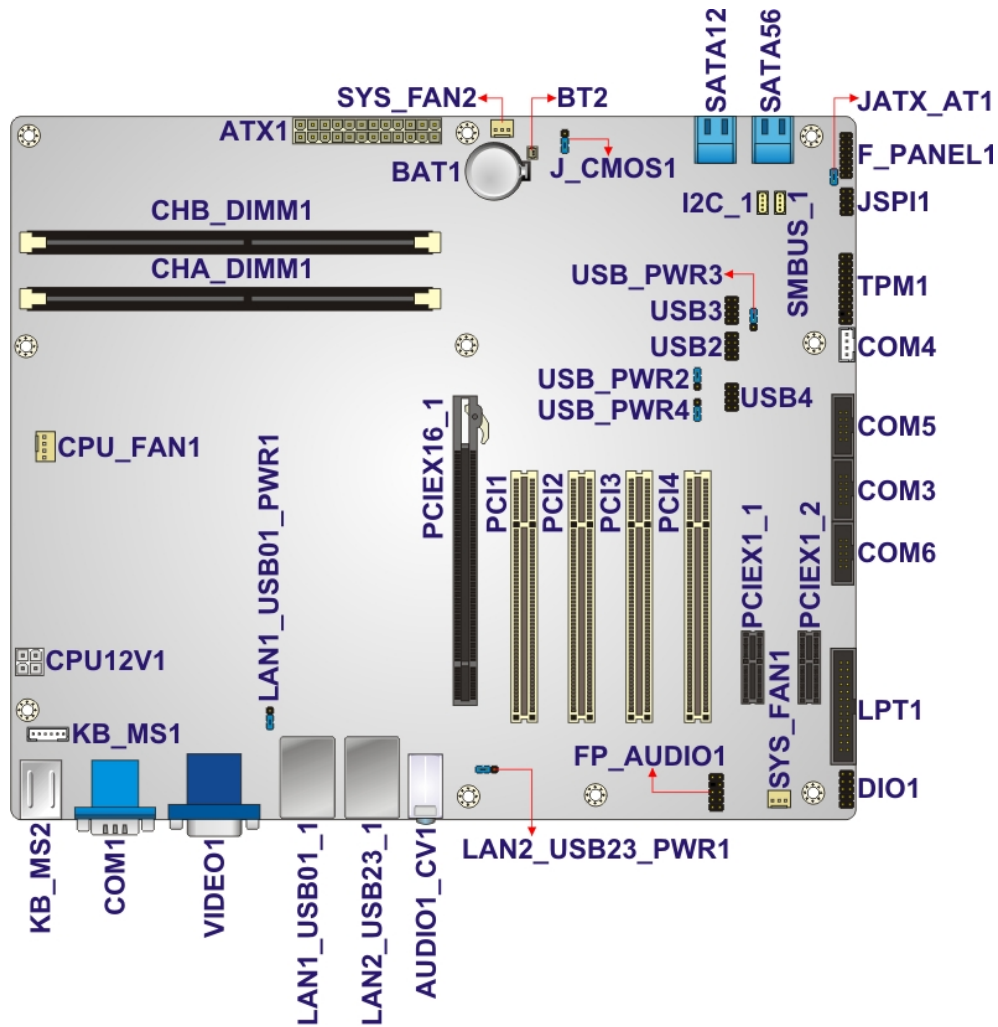


Figure 3-1: Connectors and Jumpers

### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
+12V ATX power supply connector	4-pin Molex	CPU12V1
ATX Power connector	24-pin ATX	ATX1
Battery connector	2-pin wafer	BT2
Battery holder	CR2032 battery holder	BAT1
DDR3 DIMM slots	DDR3 DIMM slot	CHA_DIMM1 CHB_DIMM1
Digital I/O connector	10-pin header	DIO1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system 1)	3-pin wafer	SYS_FAN1
Fan connector (system 2)	3-pin wafer	SYS_FAN2
Front panel audio connector	10-pin header	FP_AUDIO1
Front panel connector	14-pin header	F_PANEL1
I2C connector	4-pin wafer	I2C_1
Parallel port connector	26-pin box header	LPT1
PCI slots	PCI slots	PCI1, PCI2, PCI3, PCI4
PCIe x1 slots	PCIe x1 slot	PCIEX1_1, PCIEX1_2
PCIe x16 slot	PCIe x16 slot	PCIEX16_1
SATA 3Gb/s drive connector	14-pin SATA connector	SATA12, SATA56
Serial port, RS-422/485	4-pin wafer	COM4
Serial ports, RS-232	10-pin box header	COM3, COM5, COM6
SMBus connector	4-pin wafer	SMBUS_1
SPI ROM connector	8-pin header	JSPI1

## IMBA-H610 ATX Motherboard

Connector	Type	Label
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB2, USB3, USB4

**Table 3-1: Peripheral Interface Connectors**

### 3.1.3 External Interface Panel Connectors

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

Connector	Type	Label
Audio connector	Audio jack	AUDIO_CV1
Ethernet and USB 2.0 ports	RJ-45, USB	LAN1_USB01_1, LAN2_USB23_1
Keyboard and mouse connector	Dual PS/2	KB_MS2
Serial port connectors	9-pin male DB-9	COM1
VGA and DVI connector	15-pin female, 24-pin header	VIDEO1

**Table 3-2: Rear Panel Connectors**

## 3.2 Internal Peripheral Connectors

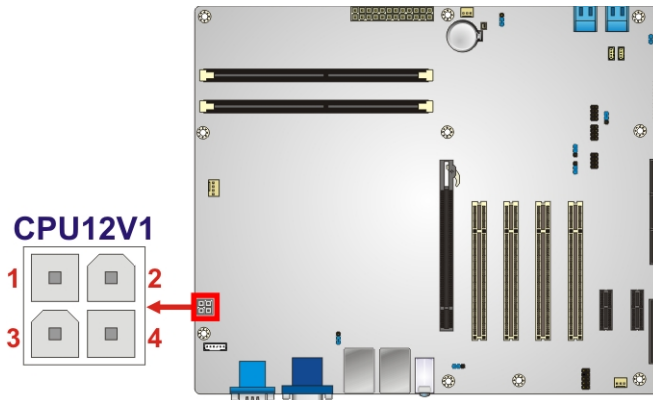
The section describes all of the connectors on the IMBA-H610.

### 3.2.1 12V Power Connector

- CN Label:** CPU12V1
- CN Type:** 4-pin Molex
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-3**

The connector supports the 12V power supply.





**Figure 3-2: 12V Power Connector Location**

Pin	Description
1	GND
2	GND
3	+12V
4	+12V

**Table 3-3: 12V Power Connector Pinouts**

### 3.2.2 ATX Power Connector

- CN Label:** ATX1
- CN Type:** 24-pin ATX
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-4**

The ATX power connector connects to an ATX power supply.

IMBA-H610 ATX Motherboard

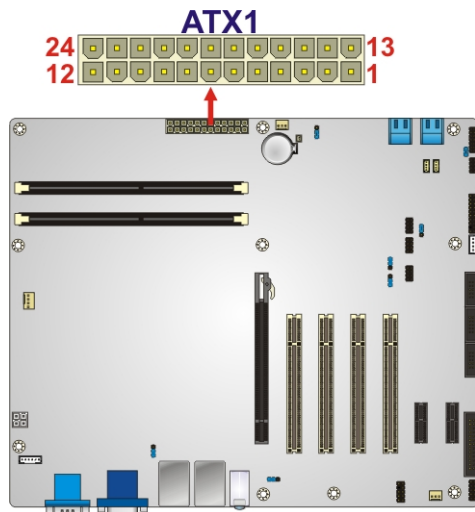


Figure 3-3: ATX Power Connector Pinout Location

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

Table 3-4: ATX Power Connector Pinouts

### 3.2.3 Battery Connectors



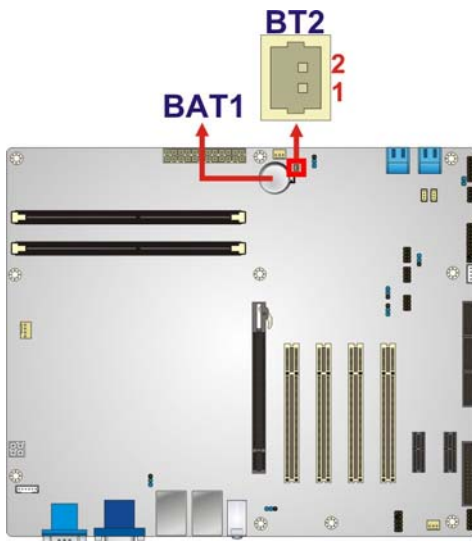
**CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

- CN Label:**        **BAT1, BT2**
- CN Type:**        Battery holder and 2-pin wafer
- CN Location:**    See **Figure 3-4**
- CN Pinouts:**     See **Table 3-5**

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



**Figure 3-4: Battery Connector Locations**

Pin	Description
1	GND

## IMBA-H610 ATX Motherboard

Pin	Description
2	Battery+

Table 3-5: Battery Connector (BT2) Pinouts

### 3.2.4 DDR3 DIMM Slots

**CN Label:** CHA\_DIMM1, CHB\_DIMM1

**CN Type:** DDR3 DIMM slot

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

The DIMM slots are for DDR3 DIMM memory modules.

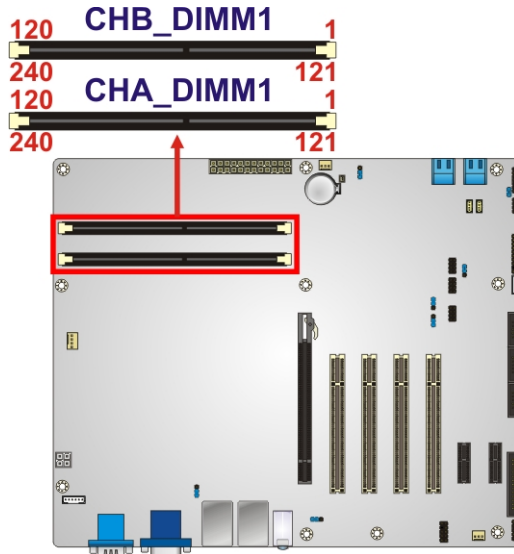


Figure 3-5: DDR3 DIMM Slot Locations

### 3.2.5 Digital I/O Connector

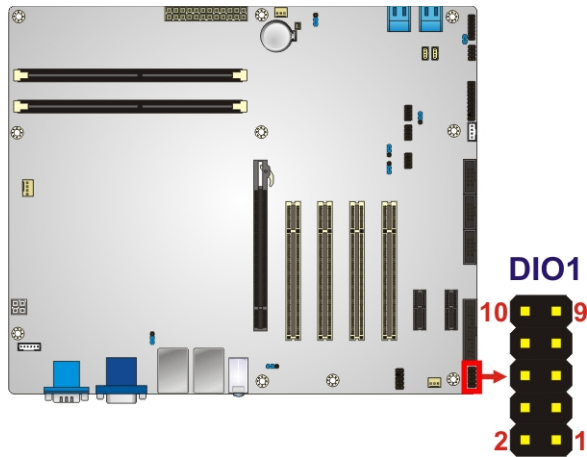
**CN Label:** DIO1

**CN Type:** 10-pin header

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

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

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.



**Figure 3-6: Digital I/O Connector Location**

Pin	Description	Pin	Description
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

**Table 3-6: Digital I/O Connector Pinouts**

### 3.2.6 Fan Connector (CPU)

- CN Label:** CPU\_FAN1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-7**

The fan connector attaches to a CPU cooling fan.

IMBA-H610 ATX Motherboard

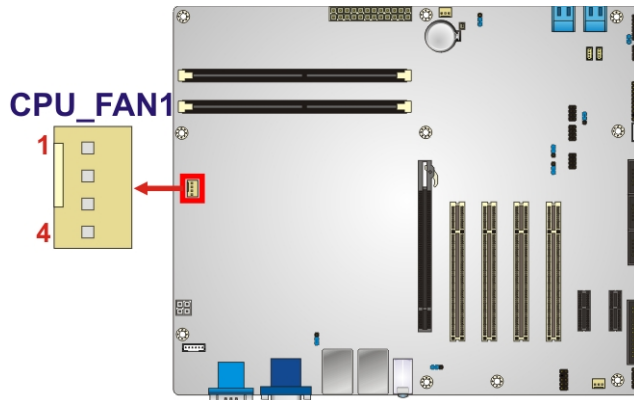


Figure 3-7: CPU Fan Connector Location

Pin	Description
1	GND
2	+12 V
3	FANIO1
4	PWM

Table 3-7: CPU Fan Connector Pinouts

3.2.7 Fan Connectors (System)

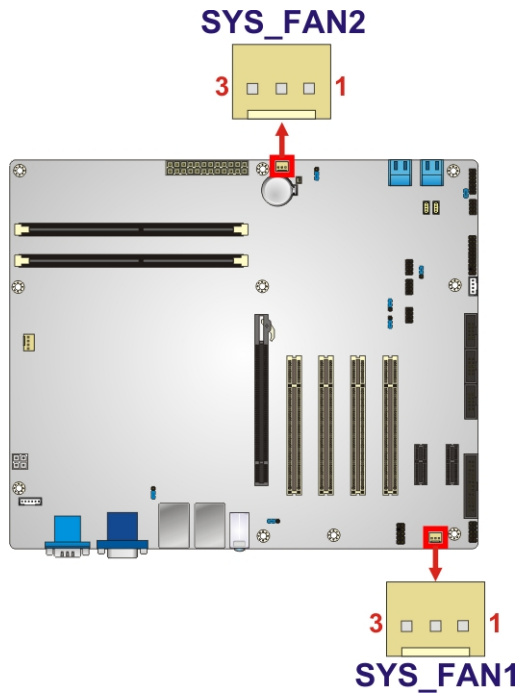
**CN Label:** SYS\_FAN1, SYS\_FAN2

**CN Type:** 3-pin wafer

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

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

The fan connector attaches to a cooling fan.



**Figure 3-8: System Fan Connector Location**

Pin	Description
1	FANIO
2	+12 V (PWM)
3	GND

**Table 3-8: System Fan Connector Pinouts**

### 3.2.8 Front Panel Audio Connector

- CN Label:** FP\_AUDIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

This connector connects to speakers, a microphone and an audio input.

## IMBA-H610 ATX Motherboard

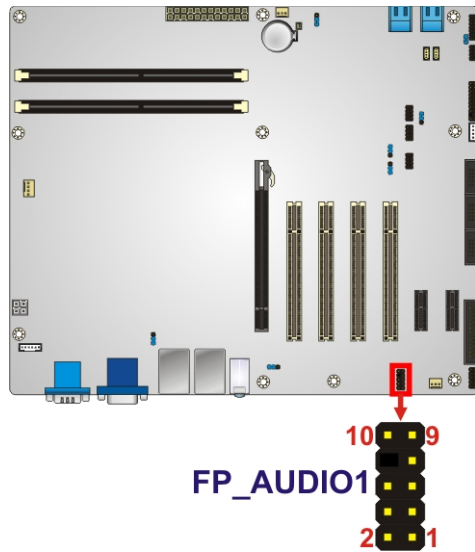


Figure 3-9: Front Panel Audio Connector Location

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

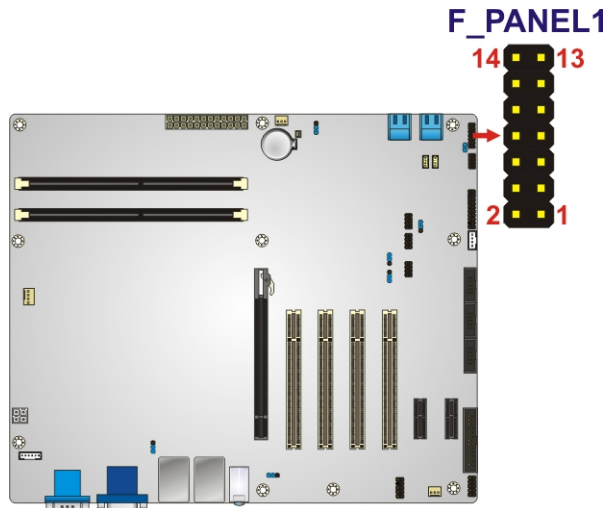
Table 3-9: Front Panel Audio Connector Pinouts

### 3.2.9 Front Panel Connector

- CN Label:** F\_PANEL1
- CN Type:** 14-pin header
- CN Location:** See Figure 3-10
- CN Pinouts:** See Table 3-10

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





**Figure 3-10: Front Panel Connector Location**

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

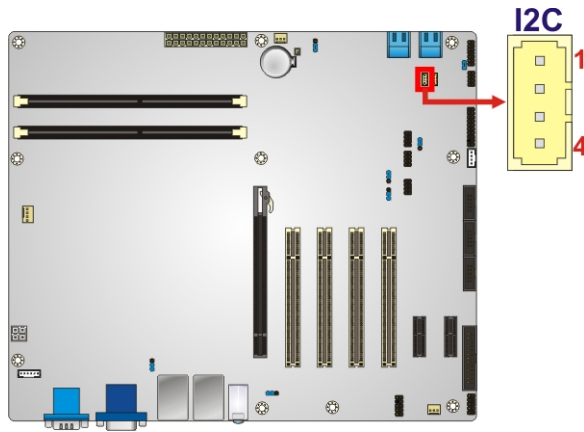
**Table 3-10: Front Panel Connector Pinouts**

### 3.2.10 I2C Connector

- CN Label:** I2C\_1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

The I2C connector is for system debug.

**IMBA-H610 ATX Motherboard**



**Figure 3-11: I2C Connector Location**

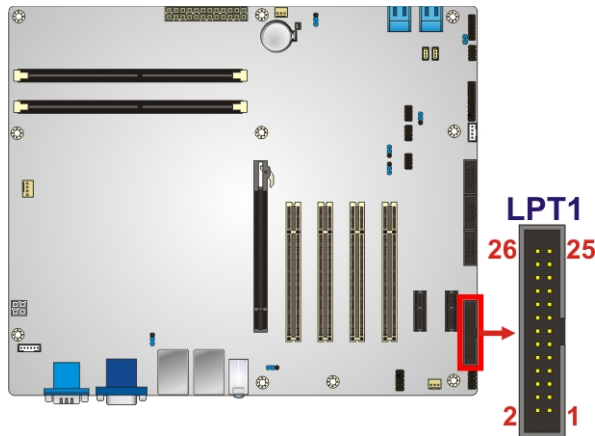
Pin	Description
1	+5V_DUAL
2	PCH_GP38_PU
3	PCH_GP39_PU
4	GND

**Table 3-11: I2C Connector Pinouts**

**3.2.11 Parallel Port Connector**

- CN Label:** LPT1
- CN Type:** 26-pin box header
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.



**Figure 3-12: Parallel Port Connector Location**

Pin	Description	Pin	Description
1	STB	2	AFD
3	PPD0	4	ERROR
5	PPD1	6	INIT
7	PPD2	8	SLIN
9	PPD3	10	GND
11	PPD4	12	GND
13	PPD5	14	GND
15	PPD6	16	GND
17	PPD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT		

**Table 3-12: Parallel Port Connector Pinouts**

### 3.2.12 PCI Slots

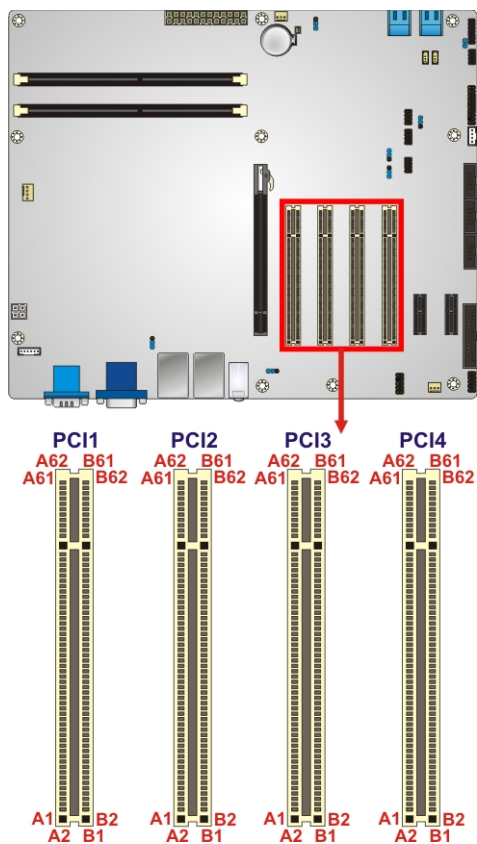
**CN Label:** PCI1, PCI2, PCI3, PCI4

**CN Type:** PCI Slot

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

## IMBA-H610 ATX Motherboard

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



**Figure 3-13: PCI Slot Locations**

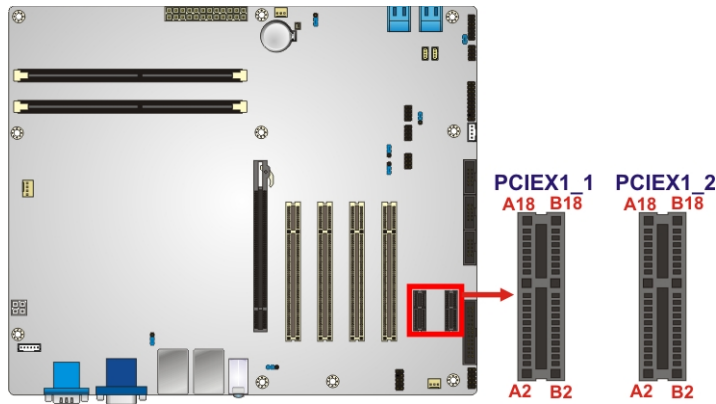
### 3.2.13 PCIe x1 Slots

**CN Label:** PCIEX1\_1, PCIEX1\_2

**CN Type:** PCIe x1 slot

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

The PCIe x1 slot is for PCIe x1 expansion cards.

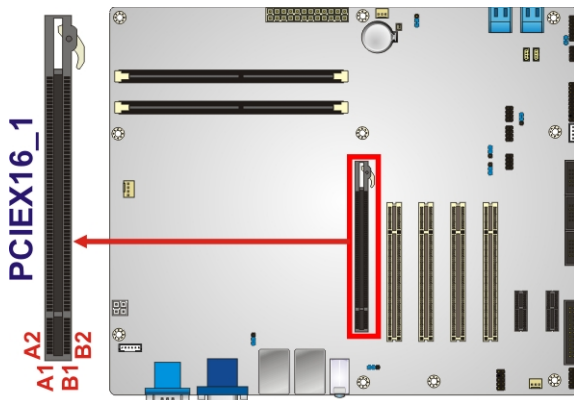


**Figure 3-14: PCIe x1 Slot Locations**

### 3.2.14 PCI Express x16 Slot

- CN Label:** PCIEX16\_1
- CN Type:** PCIe x16 slot
- CN Location:** See **Figure 3-15**

The PCIe x16 expansion card slot is for PCIe x16 expansion cards.



**Figure 3-15: PCIe x16 Slot Location**

### 3.2.15 SATA 3Gb/s Drive Connectors

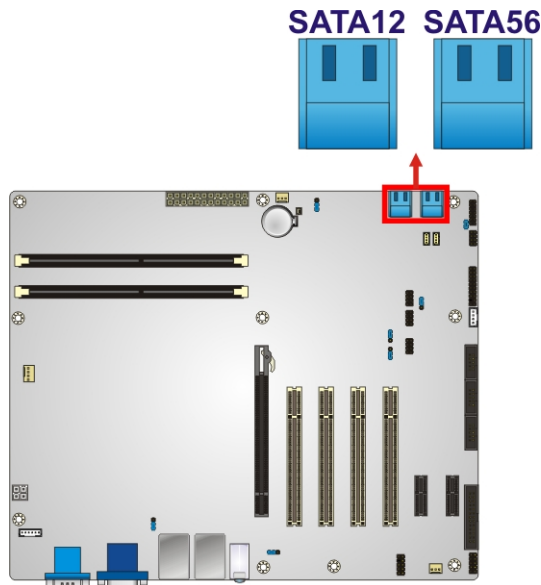
- CN Label:** SATA12, SATA56
- CN Type:** 14-pin SATA connector

## IMBA-H610 ATX Motherboard

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

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

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



**Figure 3-16: SATA 3Gb/s Drive Connector Location**

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

**Table 3-13: SATA 3Gb/s Drive Connector Pinouts**

### 3.2.16 Serial Port Connector, RS-422/485

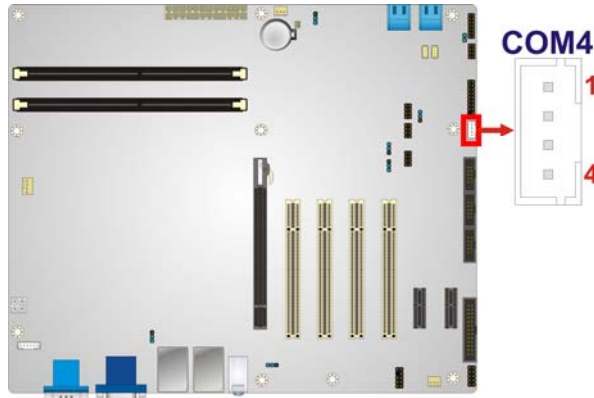
**CN Label:** COM4

**CN Type:** 4-pin wafer

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

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

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



**Figure 3-17: RS-422/485 Connector Location**

Pin	Description
1	RXD422-
2	RXD422+
3	TXD422+/TXD485+
4	TXD422-/TXD485-

**Table 3-14: RS-422/485 Connector Pinouts**

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

RS-422 Pinouts	RS-485 Pinouts

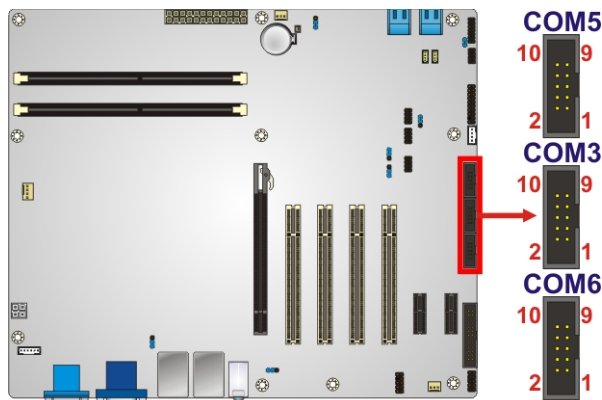
**Table 3-15: DB-9 RS-422/485 Pinouts**

## IMBA-H610 ATX Motherboard

### 3.2.17 Serial Port Connectors, RS-232

- CN Label:** COM3, COM5, COM6
- CN Type:** 10-pin box header
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-16**

Each of these connectors provides RS-232 connections.



**Figure 3-18: Serial Port Connector Location**

Pin	Description	Pin	Description
1	-NDCD1	6	-NCTS1
2	-NDSR1	7	-NDTR1
3	NSIN1	8	-XRI1
4	-NRTS1	9	GND
5	NSOUT1	10	GND

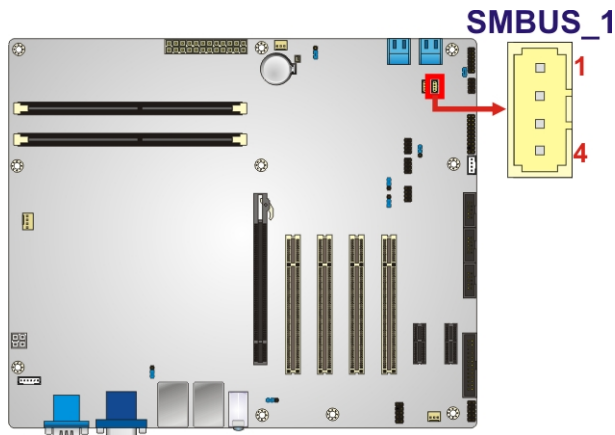
**Table 3-16: Serial Port Connector Pinouts**

### 3.2.18 SMBus Connector

- CN Label:** SMBUS\_1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-19**
- CN Pinouts:** See **Table 3-17**



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



**Figure 3-19: SMBus Connector Location**

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

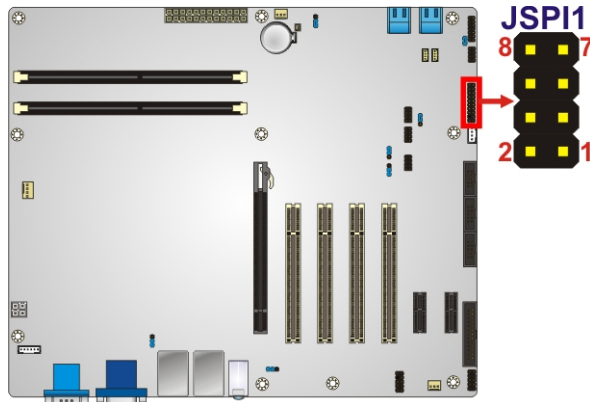
**Table 3-17: SMBus Connector Pinouts**

### 3.2.19 SPI ROM Connector

- CN Label:** JSPI1
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-20**
- CN Pinouts:** See **Table 3-18**

The SPI connector is used to flash the BIOS.

## IMBA-H610 ATX Motherboard



**Figure 3-20: SPI Connector Location**

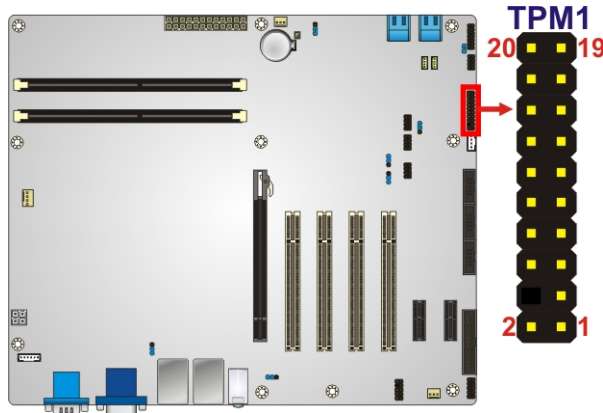
Pin	Description	Pin	Description
1	+3.3V	2	GND
3	SPI_CS0	4	SPI_CLK
5	SPI_S00	6	SPI_SI
7	NC	8	NC

**Table 3-18: SPI Connector Pinouts**

### 3.2.20 TPM Connector

- CN Label:** TPM1
- CN Type:** 20-pin header
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-19**

The TPM connector connects to a TPM module.



**Figure 3-21: TPM Connector Location**

Pin	Description	Pin	Description
1	LCLK	2	GND2
3	LERAME#	4	KEY
5	LRESRT#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

**Table 3-19: TPM Connector Pinouts**

### 3.2.21 USB Connectors

- CN Label:** USB2, USB3, USB4
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-22**
- CN Pinouts:** See **Table 3-20**

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

## IMBA-H610 ATX Motherboard

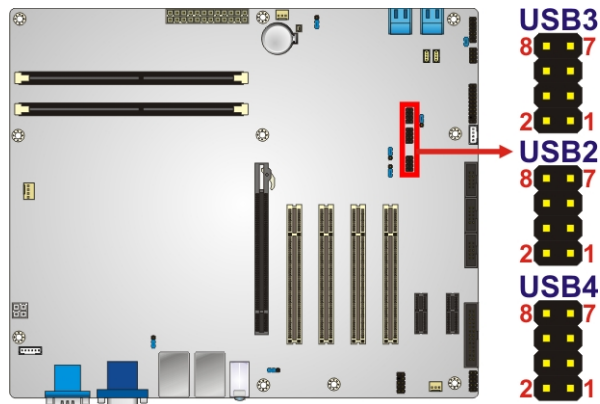


Figure 3-22: USB Connector Pinout Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-20: USB Port Connector Pinouts

### 3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

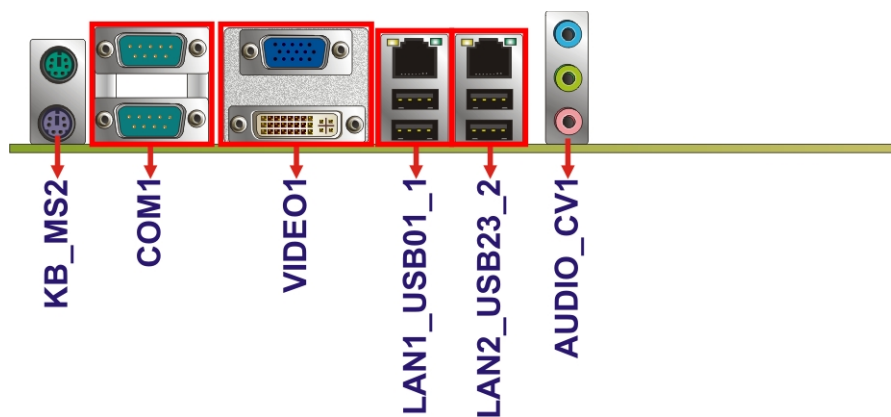


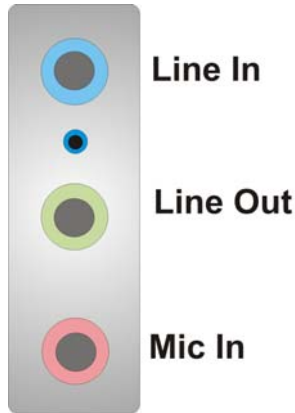
Figure 3-23: External Peripheral Interface Connector

### 3.3.1 Audio Connector

**CN Label:** AUDIO\_CV1  
**CN Type:** Audio jack  
**CN Location:** See **Figure 3-23**

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 3-24: Audio Connector**

### 3.3.2 Ethernet and USB Connector

**CN Label:** LAN1\_USB01\_1, LAN2\_USB23\_1  
**CN Type:** RJ-45 and USB 2.0 connectors  
**CN Location:** See **Figure 3-23**  
**CN Pinouts:** See **Table 3-21**

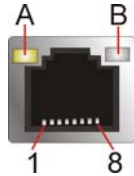
The LAN connector connects to a local network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA2+

## IMBA-H610 ATX Motherboard

PIN	DESCRIPTION	PIN	DESCRIPTION
2	MDIA3+	6	MDIA1+
3	MDIA1-	7	MDIA0-
4	MDIA2-	8	MDIA0+

**Table 3-21: LAN Pinouts**



**Figure 3-25: Ethernet Connector**

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

**Table 3-22: Connector LEDs**

The IMBA-H610 has four external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN	DESCRIPTION
1	VCC
2	DATA -
3	DATA +
4	GND

**Table 3-23: USB Port Pinouts**

### 3.3.3 Keyboard/Mouse Connector

<b>CN Label:</b>	<b>KB_MS2</b>
<b>CN Type:</b>	Dual PS/2
<b>CN Location:</b>	See <b>Figure 3-23</b>
<b>CN Pinouts:</b>	See <b>Table 3-24</b>

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 3-24: PS/2 Connector Pinouts**

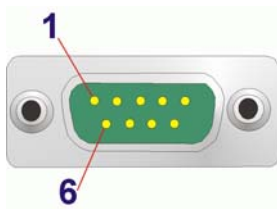
### 3.3.4 Serial Port Connector (COM1)

- CN Label:** COM1 (top)
- CN Type:** DB-9 connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-25** and **Figure 3-26**

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

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

**Table 3-25: Serial Port Connector (COM1) Pinouts**



**Figure 3-26: Serial Port Connector (COM1) Pinouts**

## IMBA-H610 ATX Motherboard

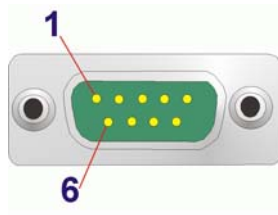
### 3.3.5 Serial Port Connector (COM2)

- CN Label:** COM1 (bottom)
- CN Type:** DB-9 connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-26** and **Figure 3-27**

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

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

**Table 3-26: Serial Port Connector (COM2) Pinouts**



**Figure 3-27: Serial Port Connector (COM2) Pinouts**

### 3.3.6 VGA and DVI Connector

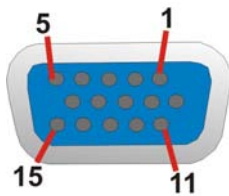
- CN Label:** VIDEO1
- CN Type:** 15-pin Female, 24-pin header
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-27** and **Table 3-28**

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



PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	GND
11	NC	12	DCCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

**Table 3-27: VGA Connector Pinouts**



**Figure 3-28: VGA Connector**

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

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DVI_DATA2#_C	2	DVI_DATA2_C
3	GND	4	NC
5	NC	6	DVI_SCL
7	DVI_SDA	8	NC
9	DVI_DATA1#_C	10	DVI_DATA1_C
11	GND	12	NC
13	NC	14	+5V
15	GND	16	DVI_HPD
17	DVI_DATA0#_C	18	DVI_DATA0_C
19	GND	20	NC
21	NC	22	GND
23	DVI_CLK_C	24	DVI_CLK#_C

**Table 3-28: DVI Connector Pinouts**

Chapter

4

# Installation

---

## 4.1 Anti-static Precautions

---



### WARNING:

Failure to take ESD precautions during the installation of the IMBA-H610 may result in permanent damage to the IMBA-H610 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-H610. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-H610 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the IMBA-H610, place it on an anti-static pad. This reduces the possibility of ESD damaging the IMBA-H610.
- **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.

---

## IMBA-H610 ATX Motherboard



### **WARNING:**

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

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

- Read the user manual:
  - The user manual provides a complete description of the IMBA-H610 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-H610 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-H610 off:
  - When working with the IMBA-H610, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-H610 **DO NOT:**

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

### 4.2.1 Socket LGA1155 CPU Installation

---

**WARNING:**

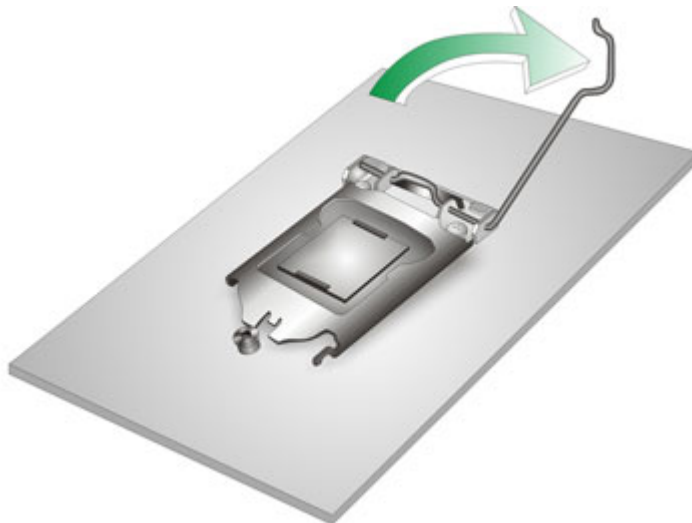
CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

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

---

To install the CPU, follow the steps below.

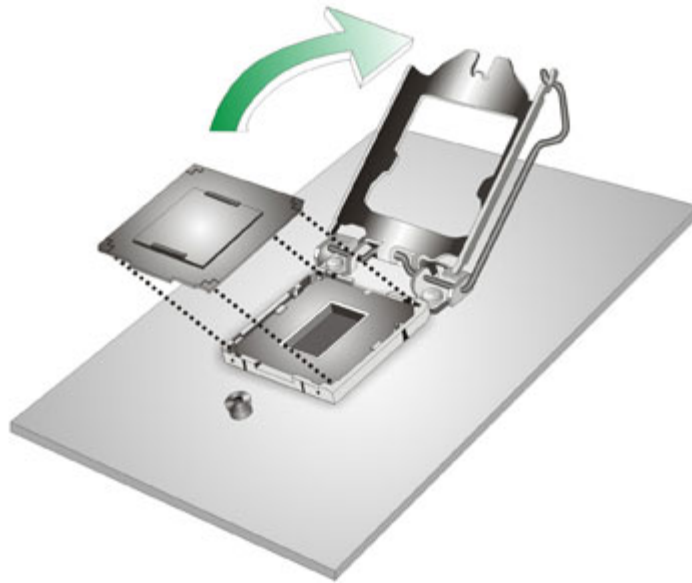
**Step 1:** **Disengage the load lever** by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever. See **Figure 4-1**.



**Figure 4-1: Disengage the CPU Socket Load Lever**

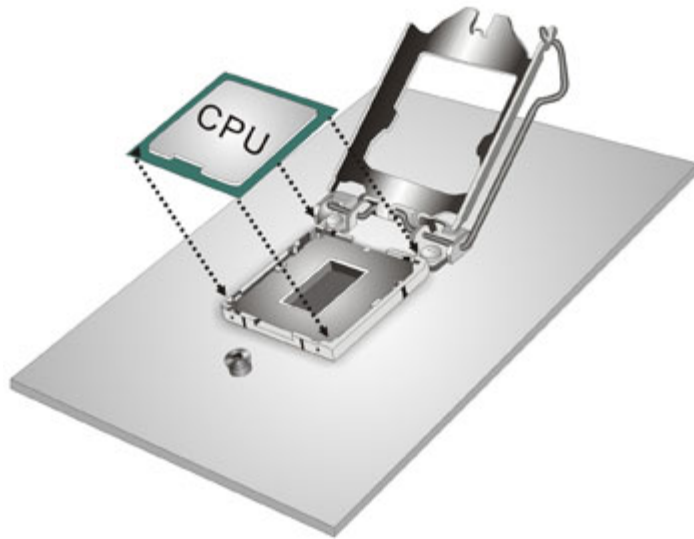
**Step 2:** **Open the socket and remove the protective cover.** The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.

## IMBA-H610 ATX Motherboard



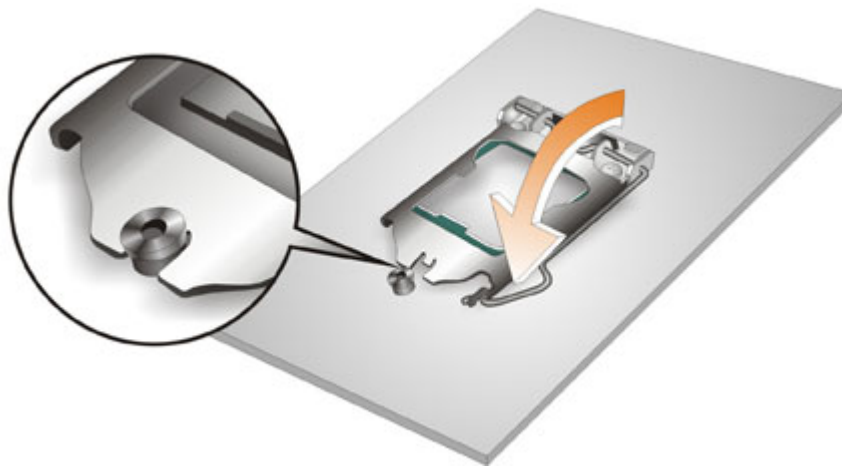
**Figure 4-2: Remove Protective Cover**

- Step 3: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 4: Orientate the CPU properly.** The contact array should be facing the CPU socket.
- Step 5: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.
- Step 6: Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.
- Step 7: Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 4-3.**



**Figure 4-3: Insert the Socket LGA1155 CPU**

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



**Figure 4-4: Close the Socket LGA1155**

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

## IMBA-H610 ATX Motherboard

### 4.2.2 Socket LGA1155 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.

---

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

---

**WARNING:**

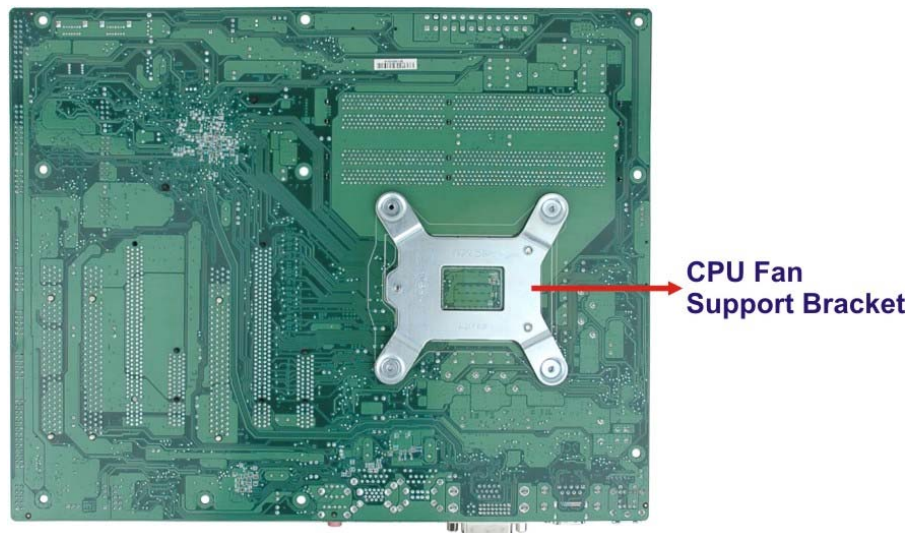
Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

---

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 4-5**.





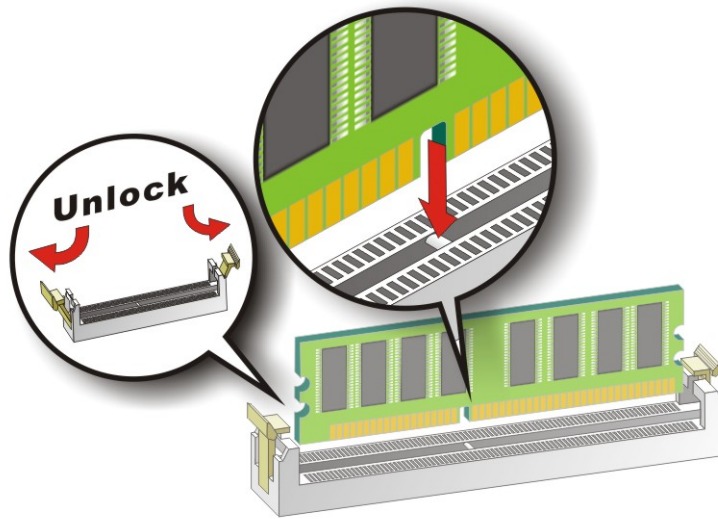
**Figure 4-5: Cooling Kit Support Bracket**

- Step 2:** Place the cooling kit onto the socket LGA1155 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- Step 3:** Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.
- Step 4:** Secure the cooling kit by fastening the four retention screws of the cooling kit.
- Step 5:** Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the IMBA-H610. Carefully route the cable and avoid heat generating chips and fan blades.

## IMBA-H610 ATX Motherboard

### 4.2.3 DIMM Installation

To install a DIMM, please follow the steps below and refer to **Figure 4-6**.



**Figure 4-6: DIMM Installation**

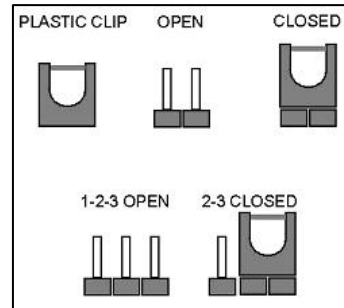
- Step 1: Open the DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-6**.
- Step 2: Align the DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.
- Step 3: Insert the DIMM.** Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-6**.
- Step 4: Removing a DIMM.** To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

### 4.3 Jumper Settings



**NOTE:**

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AT/ATX power select	JATX_AT1	2-pin header
Clear CMOS jumper	J_CMOS1	3-pin header
USB power select jumpers	USB_PWR2, USB_PWR3, USB_PWR4, LAN1_USB01_PWR1, LAN2_USB23_PWR1	3-pin header

**Table 4-1: Jumpers**

#### 4.3.1 AT/ATX Power Select Jumper

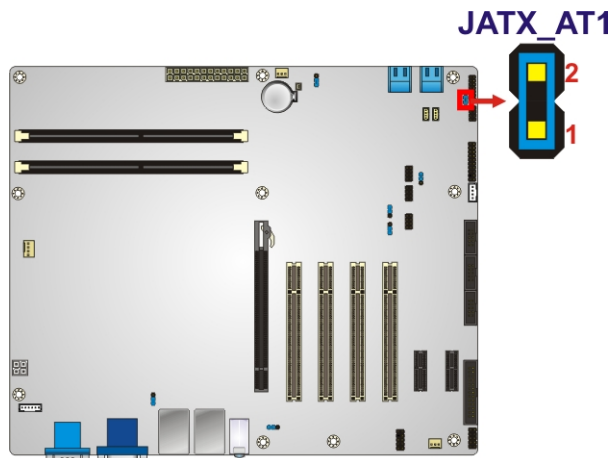
- Jumper Label:** JATX\_AT1
- Jumper Type:** 2-pin header
- Jumper Settings:** See **Table 4-2**
- Jumper Location:** See **Figure 4-7**

## IMBA-H610 ATX Motherboard

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

Setting	Description
Closed	ATX power (Default)
Open	AT power

**Table 4-2: AT/ATX Power Mode Jumper Settings**



**Figure 4-7: AT/ATX Power Mode Jumper Location**

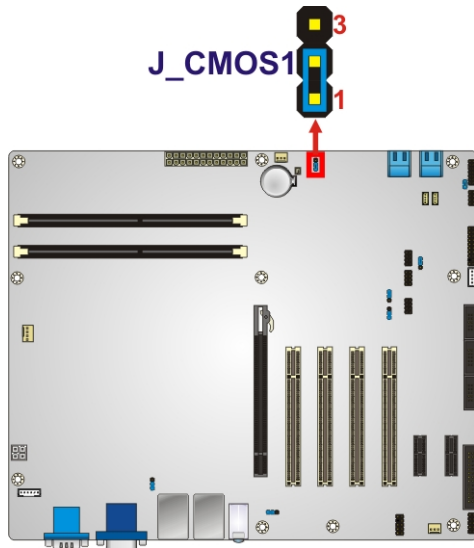
### 4.3.2 Clear CMOS Jumper

<b>Jumper Label:</b>	<b>J_CMOS1</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 4-3</b>
<b>Jumper Location:</b>	See <b>Figure 4-8</b>

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

Setting	Description
Short 1-2	Normal (Default)
Short 2-3	Clear BIOS

**Table 4-3: Clear BIOS Jumper Settings**



**Figure 4-8: Clear BIOS Jumper Location**

### 4.3.3 USB Power Select Jumpers

- Jumper Label:** USB\_PWR2, USB\_PWR3, USB\_PWR4,  
LAN1\_USB01\_PWR1, LAN2\_USB23\_PWR1
- Jumper Type:** 3-pin header
- Jumper Settings:** See Table 4-4
- Jumper Location:** See Figure 4-9

The USB Power Select jumper specifies the USB power.

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

**Table 4-4: USB Power Select Jumper Settings**

## IMBA-H610 ATX Motherboard

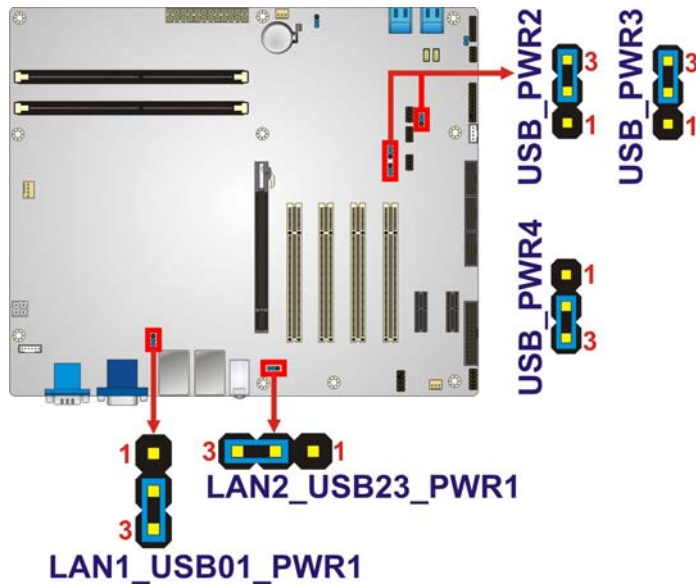


Figure 4-9: USB Power Select Jumper Location

## 4.4 Internal Peripheral Device Connections

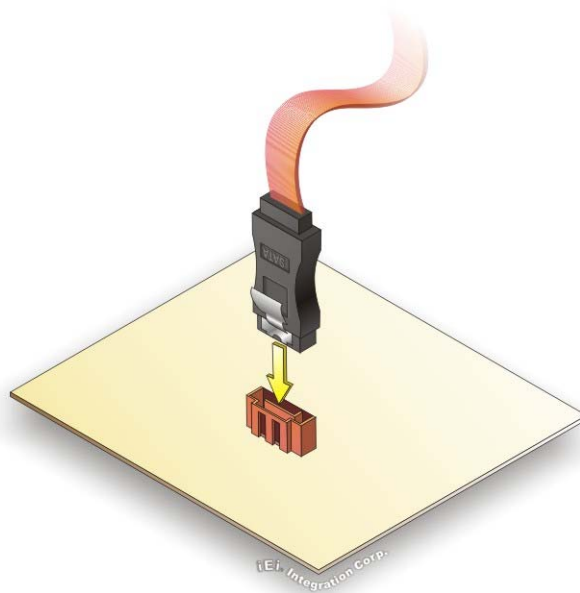
This section outlines the installation of peripheral devices to the onboard connectors.

### 4.4.1 SATA Drive Connection

The IMBA-H610 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**.

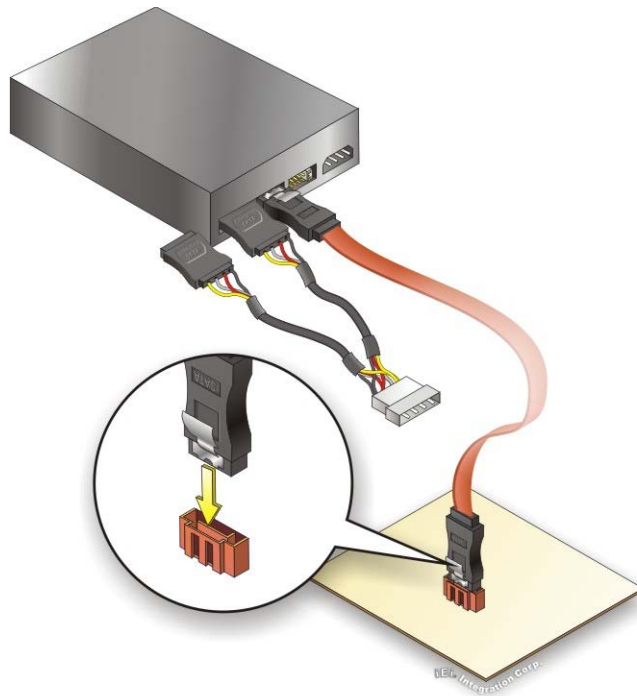
**Step 2: Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-10**.



**Figure 4-10: 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 4-11**.
- Step 4:** **Connect the SATA power cable (optional).** Connect the SATA power connector to the back of the SATA drive. See **Figure 4-11**.

## IMBA-H610 ATX Motherboard



**Figure 4-11: SATA Power Drive Connection**

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

## 4.5 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the IMBA-H610.

### 4.5.1 Audio Connector

The audio jacks on the external audio connector enable the IMBA-H610 to be connected to a stereo sound setup. Each jack supports both input and output. When connecting a device, the High Definition Audio utility will automatically detect input or output. The lime green (top) audio jack does not support input from a microphone. To install the audio devices, follow the steps below.

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



**Step 2:** Plug the audio plugs into the audio jacks. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

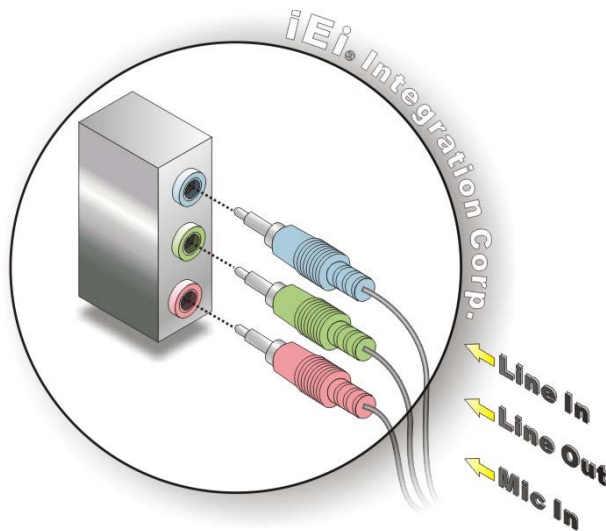


Figure 4-12: Audio Connector

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

#### 4.5.2 DVI Display Device Connection

The IMBA-H610 has a single female DVI-D connector on the external peripheral interface panel. The DVI-D connector is connected to a digital display device. To connect a digital display device to the IMBA-H610, please follow the instructions below.

- Step 1:** Locate the DVI-D connector. The location of the DVI-D connector is shown in another chapter.
- Step 2:** Align the DVI-D connector. Align the male DVI-D connector on the digital display device cable with the female DVI-D connector on the external peripheral interface.
- Step 3:** Insert the DVI-D connector. Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the IMBA-H610. See **Figure 4-13**.

## IMBA-H610 ATX Motherboard

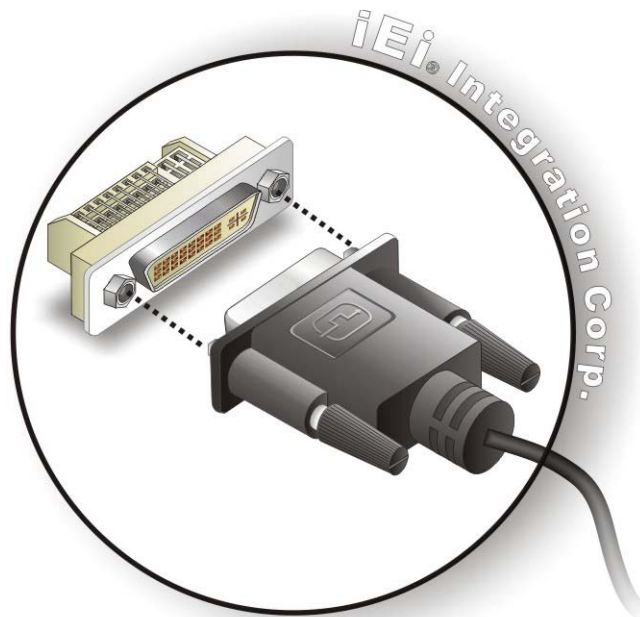


Figure 4-13: DVI Connector

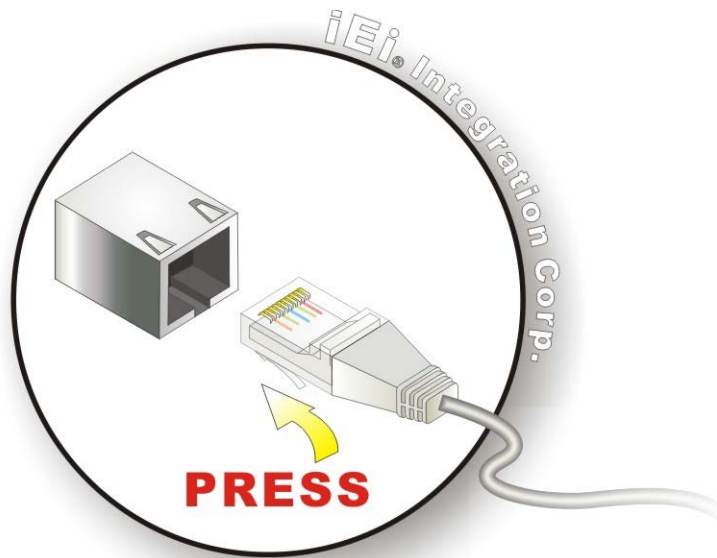
**Step 4: Secure the connector.** Secure the DVI-D connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

### 4.5.3 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 4**.

**Step 2: Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-H610. See **Figure 4-14**.



**Figure 4-14: LAN Connection**

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

#### **4.5.4 PS/2 Keyboard and Mouse Connection**

The IMBA-H610 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-H610.

**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 4-15**.

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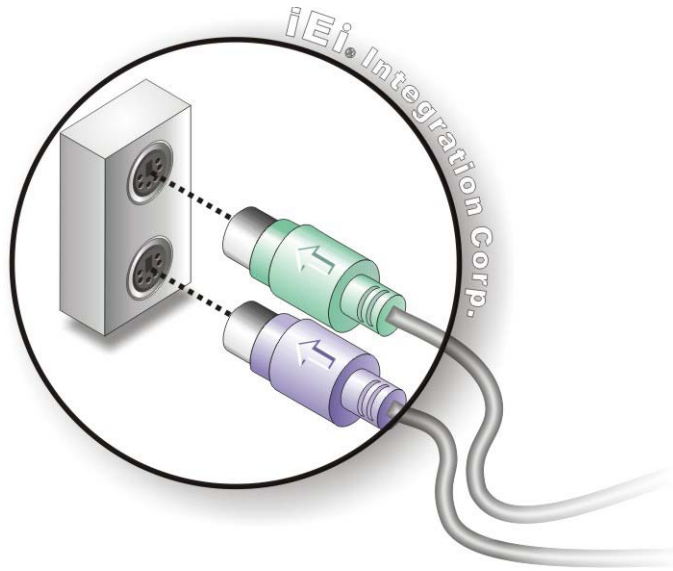
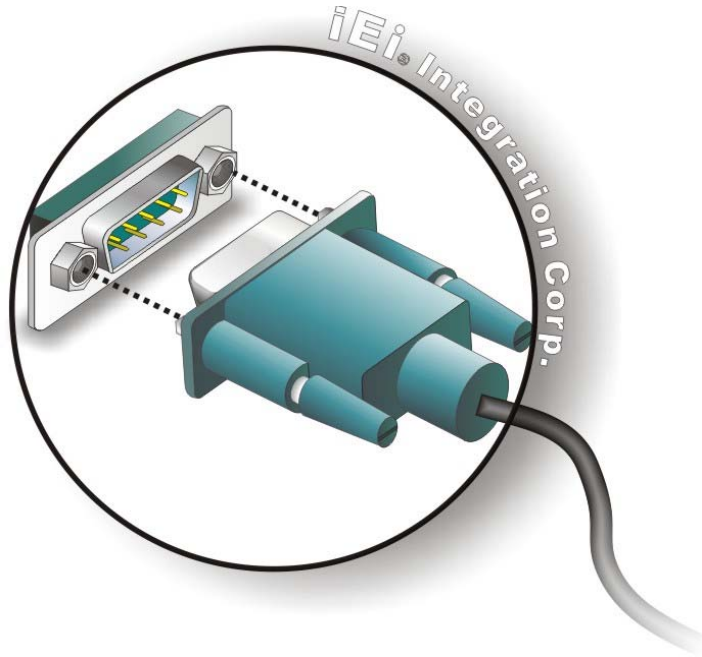


Figure 4-15: PS/2 Keyboard/Mouse Connector

#### 4.5.5 Serial Device Connection

The IMBA-H610 has two female DB-9 connectors on the external peripheral interface panel for two serial devices. Follow the steps below to connect a serial device to the IMBA-H610.

- Step 1:** **Locate the DB-9 connector.** The locations of the DB-9 connectors are 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 4-16**.



**Figure 4-16: Serial Device Connector**

**Step 3: Secure the connector.** Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

#### **4.5.6 USB Connection (Dual Connector)**

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-H610.

**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 4-17**.

## IMBA-H610 ATX Motherboard

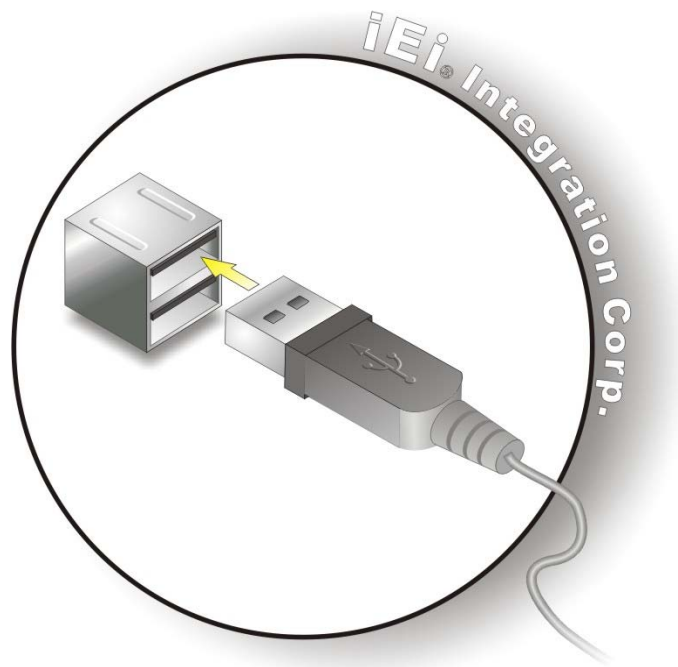
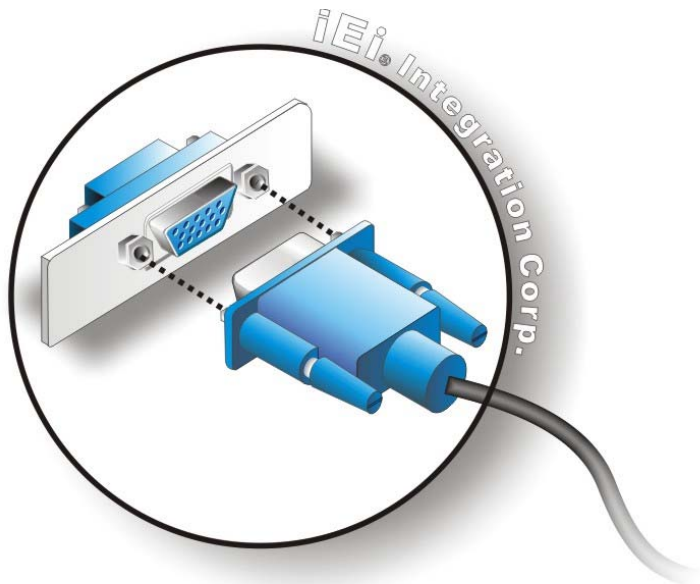


Figure 4-17: USB Connector

#### 4.5.7 VGA Monitor Connection

The IMBA-H610 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-H610, 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 IMBA-H610. See **Figure 4-18**.



**Figure 4-18: 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.



### NOTE:

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

---

### 5.1.1 Starting Setup

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

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

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

### 5.1.2 Using Setup

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

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

## IMBA-H610 ATX Motherboard

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

Table 5-1: BIOS Navigation Keys

### 5.1.3 Getting Help

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

### 5.1.4 Unable to Reboot after Configuration Changes

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

### 5.1.5 BIOS Menu Bar

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

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings

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

### 5.2 Main

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

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information					Set the Date. Use Tab to switch between Date elements.
BIOS Vendor			American Megatrends		
Core Version			4.6.4.0 0.03		
Compliancy			UEFI 2.0		
Project Version			B223AR02.ROM		
Build Date			09/27/2011 11:53:40		-----
Memory Information					←→: Select Screen
Total Memory			1024 MB (DDR3 1333)		↑ ↓: Select Item
System Date			[Tue 10/04/2011]		Enter>Select
System Time			[15:10:27]		+ - Change Opt.
Access Level			Administrator		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 1: Main

##### → System Overview

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

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date:** Date the current BIOS version was made

## IMBA-H610 ATX Motherboard

### → 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

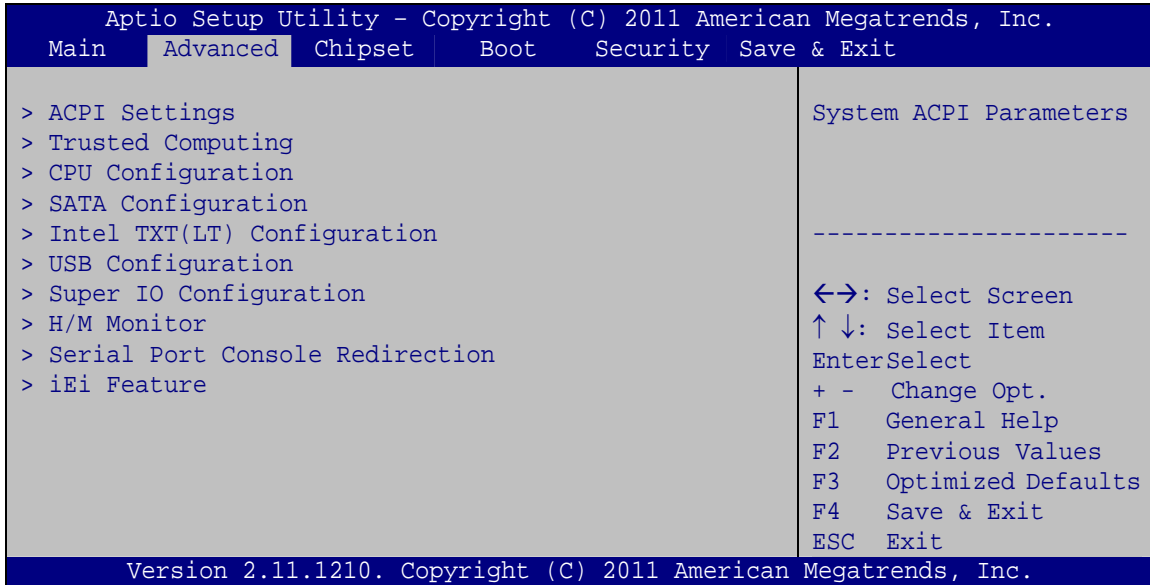
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the sub-menus.



### **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.

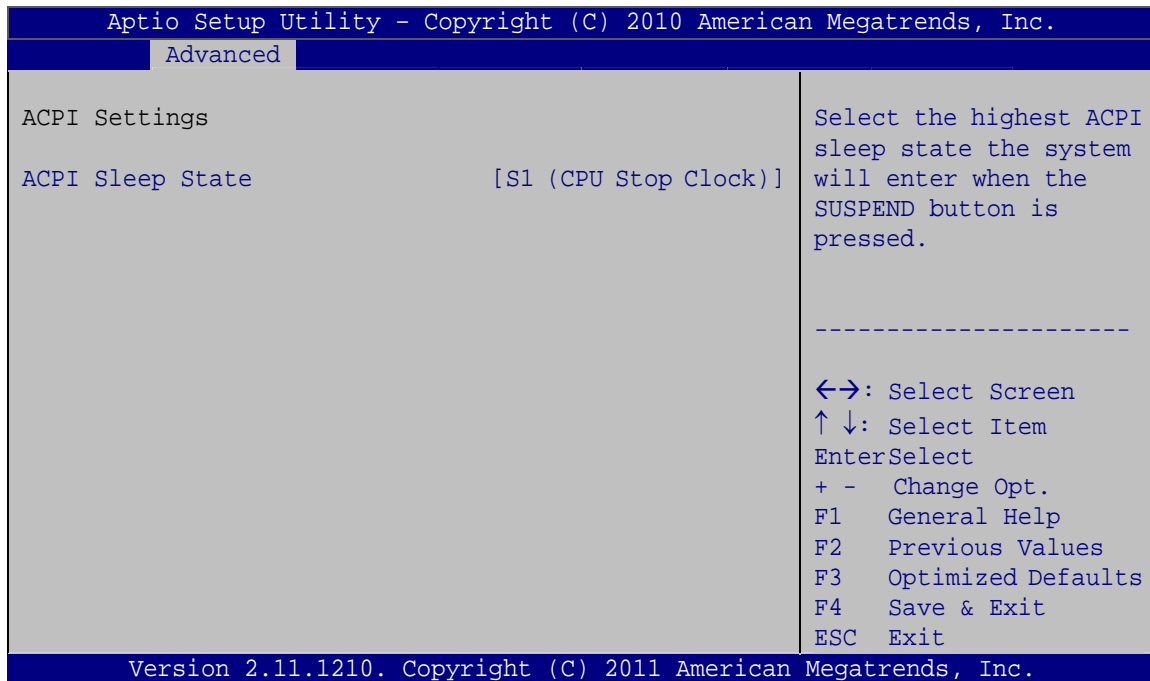
---



### 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.



### BIOS Menu 3: ACPI Configuration

## IMBA-H610 ATX Motherboard

### → 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

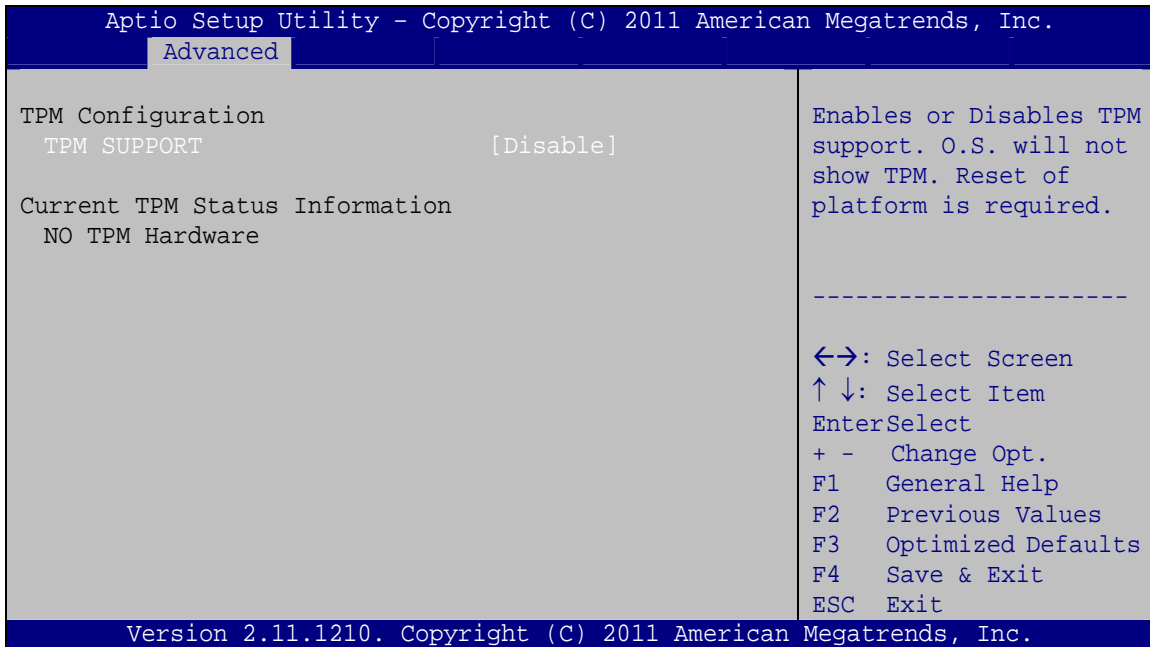
→ **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

#### → 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).



**BIOS Menu 4: TPM Configuration**

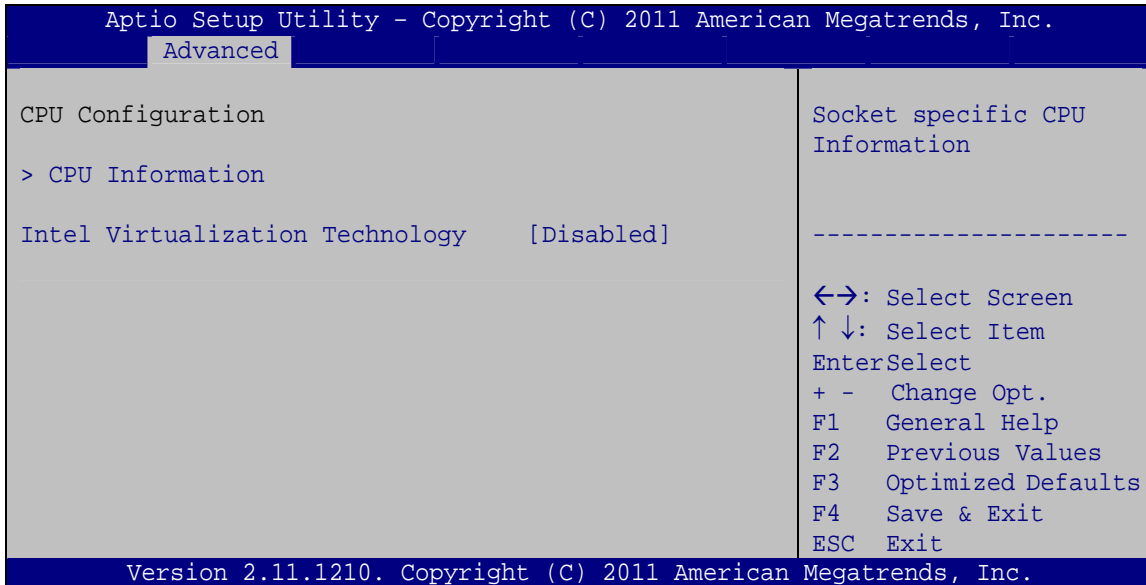
➔ **TPM Support [Disable]**

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.



**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.

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### 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) i5-2400 CPU @ 3.10GHz
CPU Signature                206a7
Microcode Patch              14
Max CPU Speed                 3100 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
Enter>Select
+ - Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit

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

```

#### BIOS Menu 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]
-----
SATA Port0                                           Not Present      ←→: Select Screen
SATA Port1                                           Not Present      ↑ ↓: Select Item
SATA Port4                                           Not Present      EnterSelect
SATA Port5                                           Not Present      + - 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 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.
- **AHCI Mode**                      Configures SATA devices as AHCI device.

##### → Serial-ATA Controller 0 [Compatible]

Use the **Serial-ATA Controller 0** option to configure the serial ATA controller 0.

- **Disabled**                      Disables the on-board ATA controller.

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- **Compatible**    **DEFAULT**    Configures the on-board ATA controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.
  
- **Enhanced**    Configures the on-board ATA controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

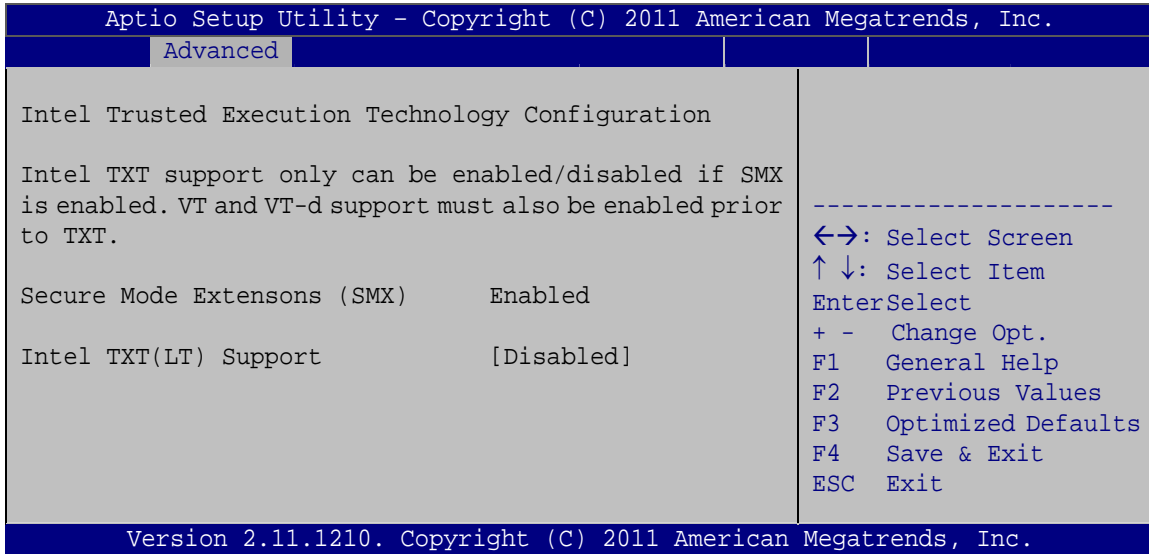
### → **Serial-ATA Controller 1 [Enhanced]**

Use the **Serial-ATA Controller 1** option to configure the serial ATA controller 1.

- **Disabled**    Disables the on-board ATA controller.
  
- **Enhanced**    **DEFAULT**    Configures the on-board ATA controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated.

### 5.3.5 Intel TXT(LT) Configuration

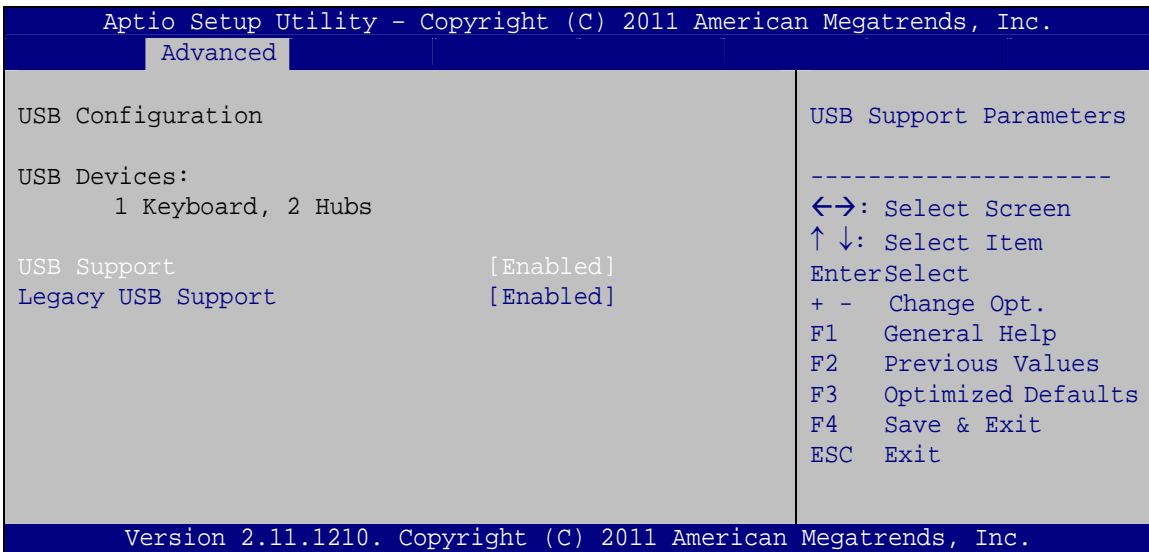
Use the **Intel TXT(LT) Configuration** menu to configure Intel Trusted Execution Technology support.



### 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.



### BIOS Menu 9: USB Configuration

#### → USB Devices

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

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### → 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.

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

### 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
Super IO Chip                Fintek F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration
> Serial Port 5 Configuration
> Serial Port 6 Configuration

Power Saving Function        [Disabled]

Set Parameters of Serial
Port 1 (COMA)
-----
<->: Select Screen
↑ ↓: Select Item
Enter>Select
+ -  Change Opt.
F1   General Help
F2   Previous Values
F3   Optimized Defaults
F4   Save & Exit
ESC  Exit

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

#### BIOS Menu 10: Super IO Configuration

##### → Power Saving Function [Disabled]

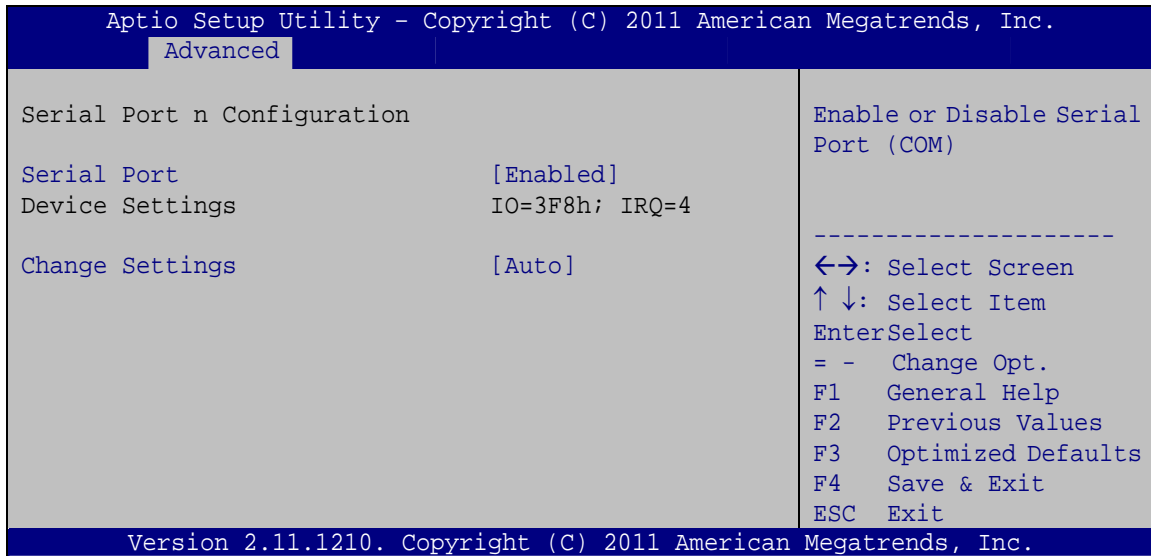
Use the **Power Saving Function** BIOS option to enable or reduce power consumption in the S5 state. When enabled, the system can only be powered-up using the power button.

- **Disabled**     **DEFAULT**     Power saving function support disabled
- **Enabled**                     Power saving function support enabled

## IMBA-H610 ATX Motherboard

### 5.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 11**) to configure the serial port n.



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

### 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=3, 4**                      Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

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

### 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

→ **Device Mode [RS422/485]**

Use the **Device Mode** option to set the serial port signaling mode.

- **Normal**                      Sets the serial port mode to normal.
- **RS422/485      DEFAULT**      Enables serial port RS-422/485 support.

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### 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=2C0h;**  
**IRQ=10**                      Serial Port I/O port address is 2C0h 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=2E0h;**  
**IRQ=10**                      Serial Port I/O port address is 2E0h 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

### 5.3.8 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.

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```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
-----
Advanced
-----
PC Health Status
CPU Temperature           :+50 C
SYS Temperature           :+33 C
CPU FAN Speed             :2209 RPM
SYS FAN Speed             :N/A
VCC3V                     :+3.360 V
V_core                    :+1.224 V
+1.05V                    :+1.072 V
VDDR                      :+1.632 V
VSB3V                     :+3.440 V
VBAT                      :+3.296 V
5VSB                      :+5.040 V

> FAN 1 Configuration
> FAN 2 Configuration

Smart FAN 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 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
Enter>Select
+ - Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit
-----
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
    
```

#### BIOS Menu 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

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### → Target Temp. Sensor [CPU Temperature]

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

- |   |                            |                |  |
|---|----------------------------|----------------|--|
| → | <b>CPU Temperature</b>     | <b>DEFAULT</b> | Sets the target temperature sensor to the CPU temperature.             |
| → | <b>System Temperature1</b> |                | Sets the target temperature sensor to the System Temperature1 setting. |
| → | <b>System Temperature2</b> |                | Sets the target temperature sensor to the System Temperature2 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 (%)

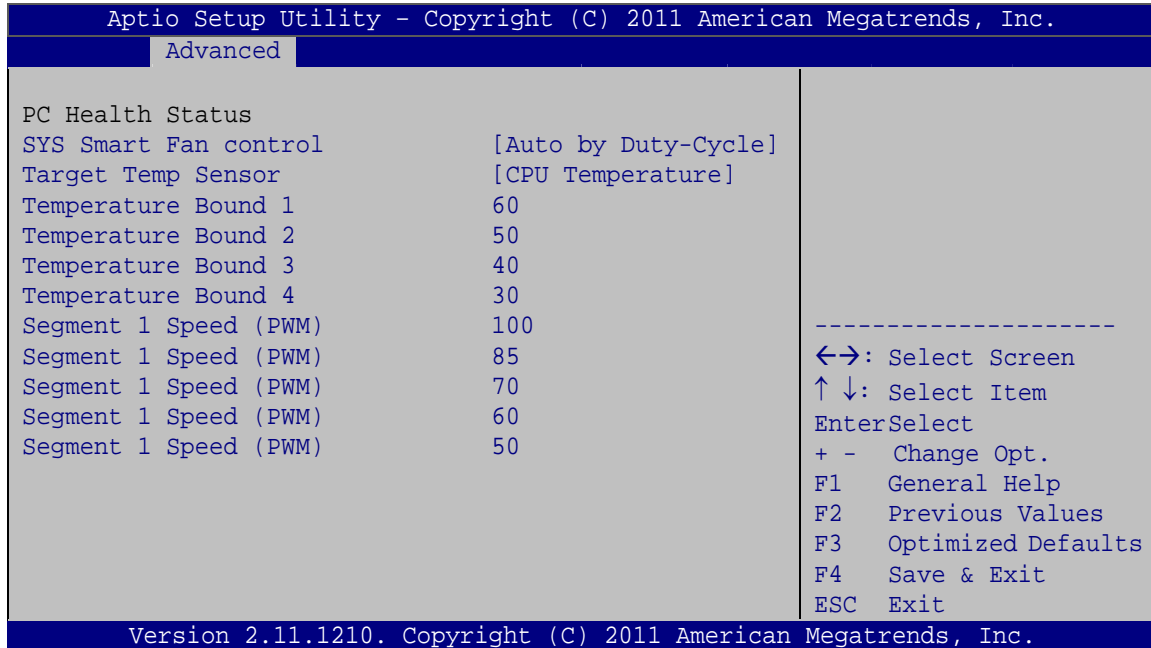
Use the + or – key to change the fan **Segment n Speed** value in percentage. Enter a decimal number between 0 and 100.

### → 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.



### 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 DEFAULT 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.

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- **System Temperature1** Sets the target temperature sensor to the System Temperature1 setting.
- **System Temperature2** Sets the target temperature sensor to the System Temperature2 setting.

### → **Temperature Bound n**

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

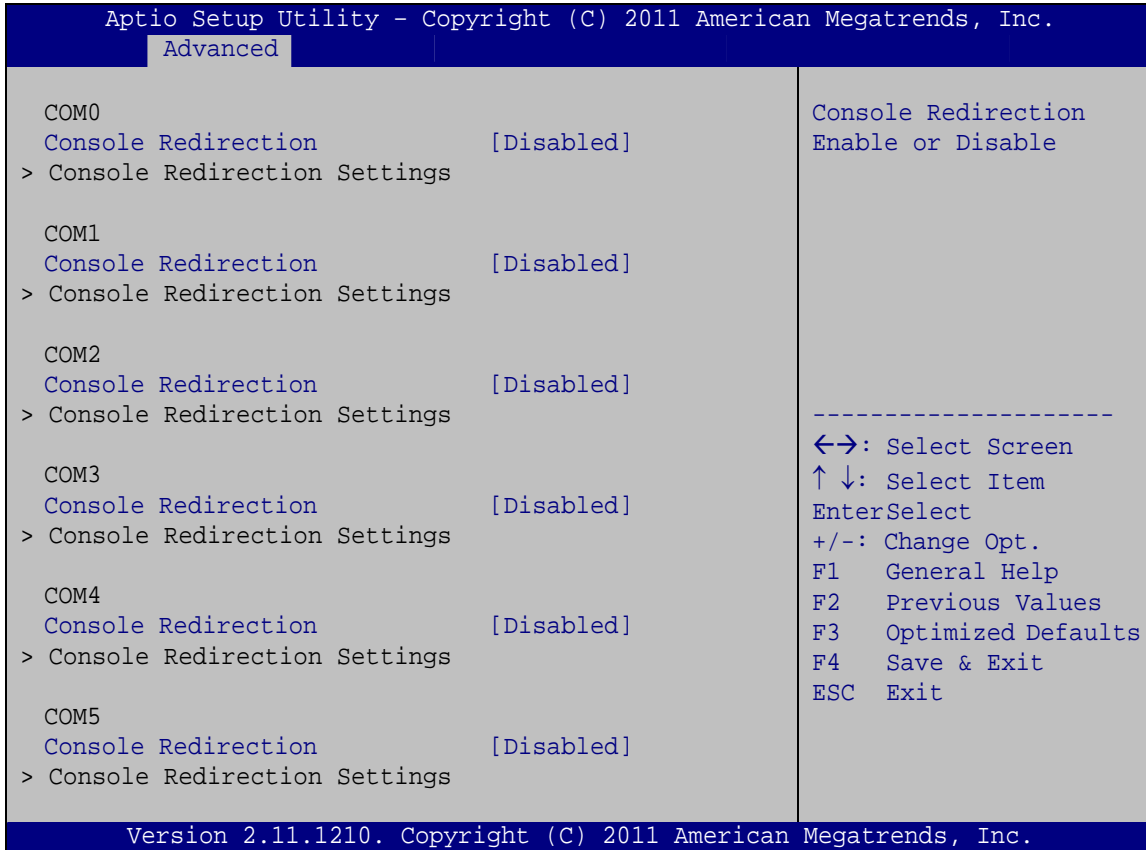
### → **Segment 1 Speed (PWM)**

Use the + or – key to change the fan **Segment 1 Speed** value in Pulse Width Modulation (PWM). Enter a decimal number between 0 and 100.

## 5.3.9 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 15**) 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.





## BIOS Menu 15: Serial Port Console Redirection

### → Console Redirection [Disabled]

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

- **Disabled**      **DEFAULT**      Disabled the console redirection function
- **Enabled**                      Enabled the console redirection function

### → Terminal Type [ANSI]

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

- **VT100**                      The target terminal type is VT100
- **VT100+**                      The target terminal type is VT100+
- **VT-UTF8**                      The target terminal type is VT-UTF8
- **ANSI**                      **DEFAULT**      The target terminal type is ANSI

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### → Bits per second [115200]

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

- |   |               |                |  |
|---|---------------|----------------|--|
| → | <b>9600</b>   |                | Sets the serial port transmission speed at 9600.   |
| → | <b>19200</b>  |                | Sets the serial port transmission speed at 19200.  |
| → | <b>38400</b>  |                | Sets the serial port transmission speed at 38400.  |
| → | <b>57600</b>  |                | Sets the serial port transmission speed at 57600.  |
| → | <b>115200</b> | <b>DEFAULT</b> | Sets the serial port transmission speed at 115200. |

### → Data Bits [8]

Use the **Data Bits** option to specify the number of data bits.

- |   |          |                |                          |
|---|----------|----------------|--------------------------|
| → | <b>7</b> |                | Sets the data bits at 7. |
| → | <b>8</b> | <b>DEFAULT</b> | Sets the data bits at 8. |

### → Parity [None]

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- |   |              |                |   |
|---|--------------|----------------|---|
| → | <b>None</b>  | <b>DEFAULT</b> | No parity bit is sent with the data bits.                                 |
| → | <b>Even</b>  |                | The parity bit is 0 if the number of ones in the data bits is even.       |
| → | <b>Odd</b>   |                | The parity bit is 0 if the number of ones in the data bits is odd.        |
| → | <b>Mark</b>  |                | The parity bit is always 1. This option does not provide error detection. |
| → | <b>Space</b> |                | The parity bit is always 0. This option does not provide error detection. |

**→ Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- 1**                    **DEFAULT**        Sets the number of stop bits at 1.
- 2**                    Sets the number of stop bits at 2.

**→ Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

- None**                **DEFAULT**        No control flow.
- Hardware**                    Hardware is set as the console redirection.  
RTS/CTS

**→ VT-UTF8 Combo Key Support [Enabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

- Disabled**                    Disables the VT-UTF8 terminal keys.
- Enabled**            **DEFAULT**        Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals.

**→ Recorder Mode [Disabled]**

Use the **Recorder Mode** option to enable or disable the recorder mode.

- Disabled**    **DEFAULT**        Disables the recorder mode.

## IMBA-H610 ATX Motherboard

→ **Enabled** Enables the recorder mode.

### → **Resolution 100x31 [Disabled]**

Use the **Resolution 100x31** option to enable or disable 100x31 resolution of the extended terminal.

→ **Disabled** **DEFAULT** Disables 100x31 resolution of the extended terminal.

→ **Enabled** Enables 100x31 resolution of the extended terminal.

### → **Legacy OS Redirection Resolution [80x24]**

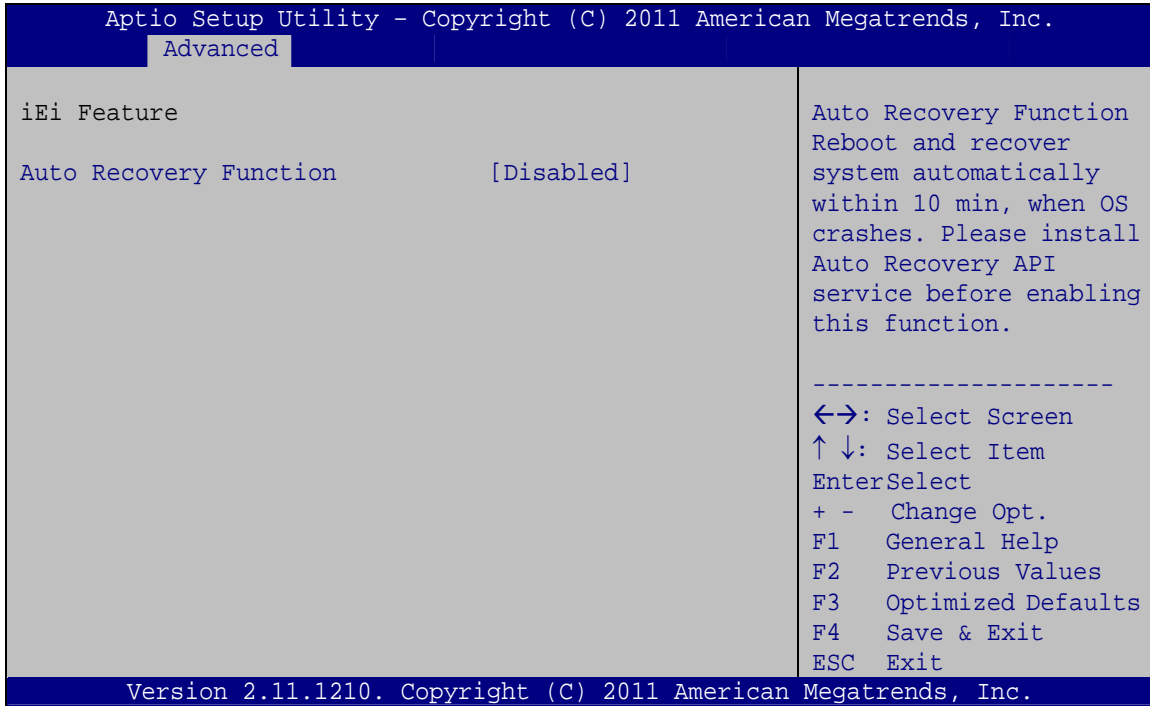
Use the **Legacy OS Redirection Resolution** option to specify the resolution of the remote terminal.

→ **80x24** **DEFAULT** Sets the resolution of the remote terminal at 80x24.

→ **80x25** Sets the resolution of the remote terminal at 80x25.

## 5.3.10 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 16**) to configure One Key Recovery function.



### BIOS Menu 16: 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

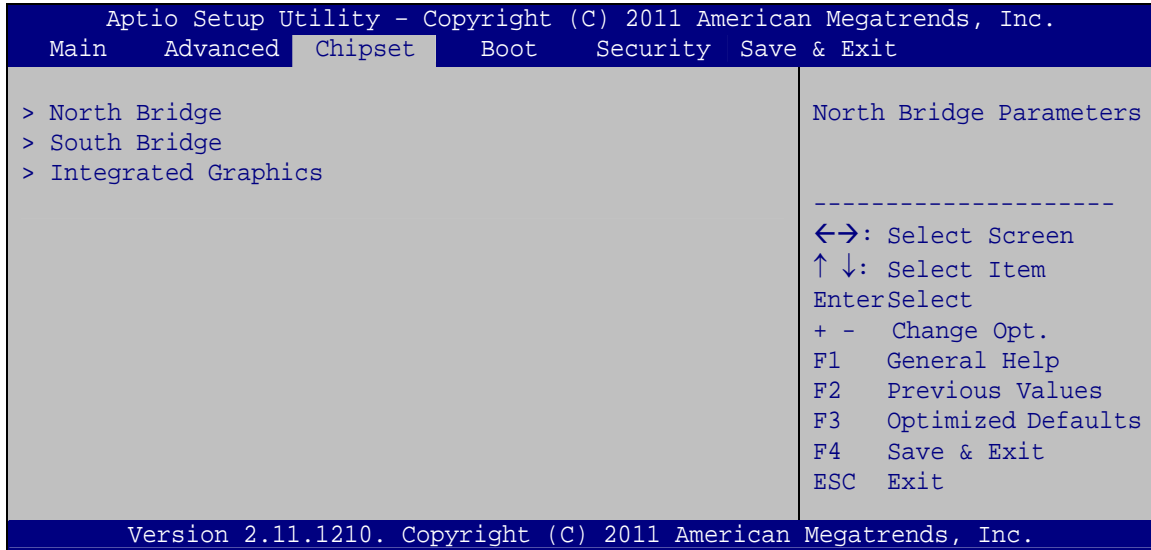
Use the **Chipset** menu (**BIOS Menu 17**) to access the Northbridge, Southbridge and Integrated Graphics configuration menus.



### WARNING!

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

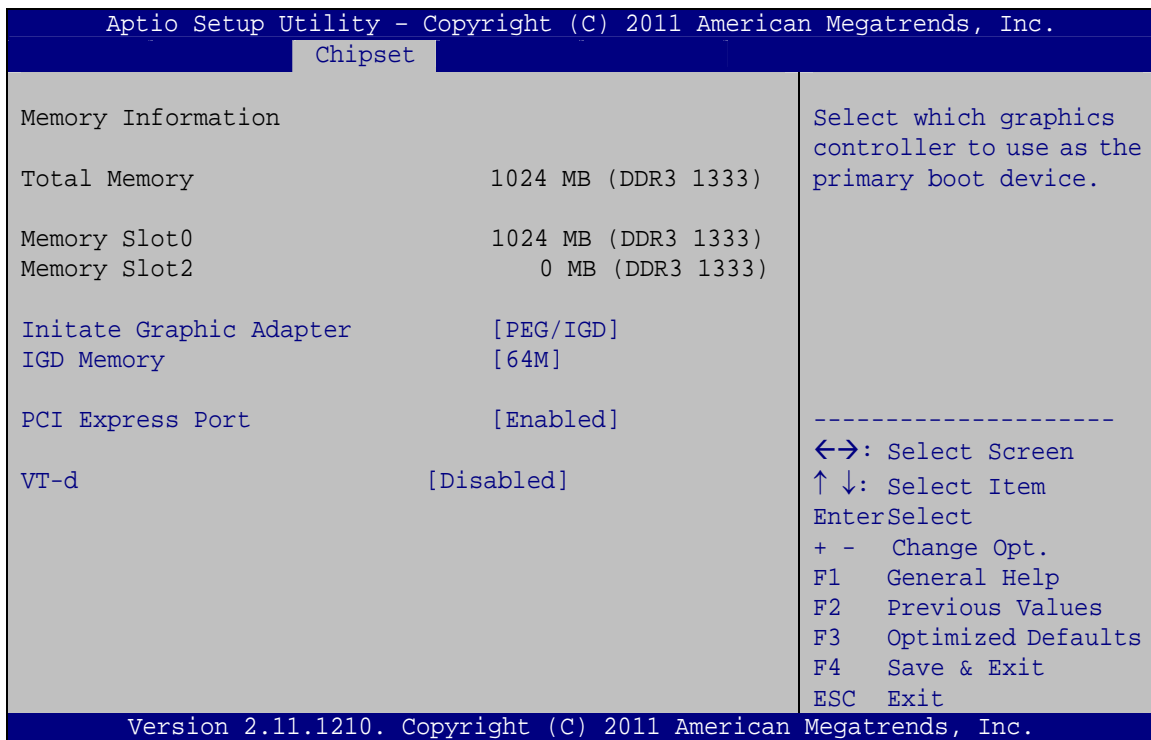
## IMBA-H610 ATX Motherboard



**BIOS Menu 17: Chipset**

### 5.4.1 North Bridge Configuration

Use the **North Bridge Configuration** menu (**BIOS Menu 18**) to configure the Northbridge chipset.



**BIOS Menu 18: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
- PEG/IGD      **DEFAULT**

### → 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.

- |   |                |   |
|---|----------------|---|
| → | <b>Disable</b> |   |
| → | <b>32 M</b>    | 32 MB of memory used by internal graphics device                |
| → | <b>64 M</b>    | <b>DEFAULT</b> 64 MB of memory used by internal graphics device |
| → | <b>96 M</b>    | 96 MB of memory used by internal graphics device                |
| → | <b>128 M</b>   | 128 MB of memory used by internal graphics device               |
| → | <b>160 M</b>   | 160 MB of memory used by internal graphics device               |
| → | <b>192 M</b>   | 192 MB of memory used by internal graphics device               |
| → | <b>224 M</b>   | 224 MB of memory used by internal graphics device               |
| → | <b>256 M</b>   | 256 MB of memory used by internal graphics device               |
| → | <b>288 M</b>   | 288 MB of memory used by internal graphics device               |
| → | <b>320 M</b>   | 320 MB of memory used by internal graphics device               |

## IMBA-H610 ATX Motherboard

- **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]**

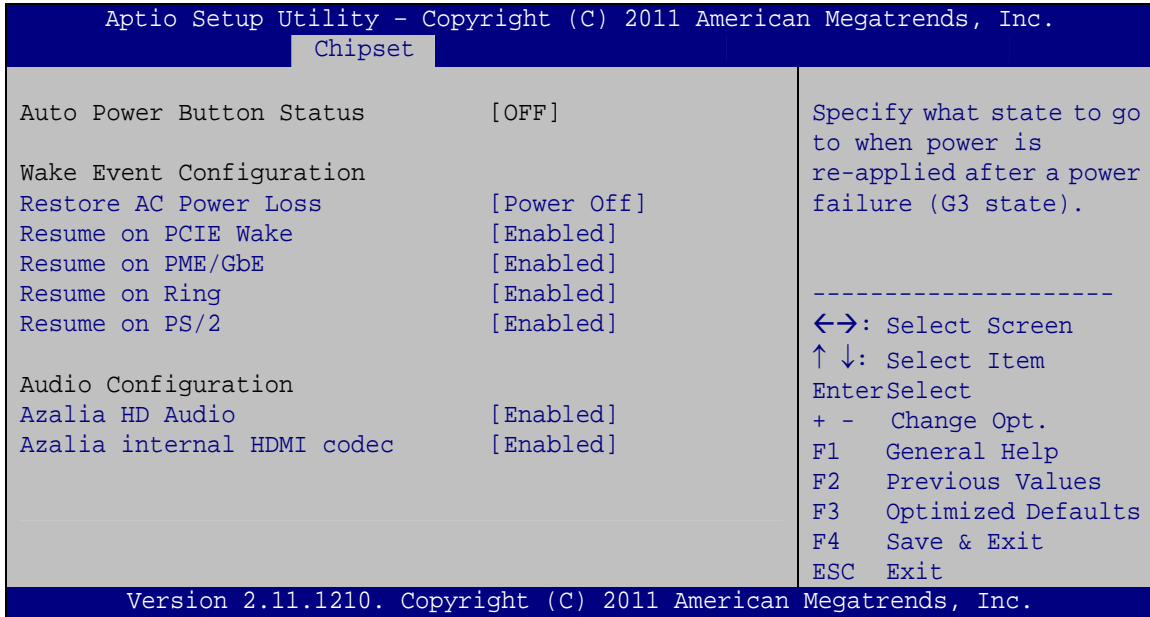
Use the **VT-d** option to enable or disable VT-d support.

- **Disabled** **DEFAULT** Disables VT-d support.
- **Enabled** Enables VT-d support.

## 5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 19**) to configure the Southbridge chipset.





### BIOS Menu 19: Southbridge Chipset Configuration

#### → 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

## IMBA-H610 ATX Motherboard

### → Resume on PME/GbE [Enabled]

Use the **Resume on PME/GbE** option to enable or disable resuming from PCI PME# signal, GbE controller or some 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

### 5.4.3 Integrated Graphics

Use the **Integrated Graphics** menu (**BIOS Menu 20**) to configure the video device connected to the system.



#### BIOS Menu 20: 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.

## IMBA-H610 ATX Motherboard

### → 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

## 5.5 Boot

Use the **Boot** menu (**BIOS Menu 21**) to configure system boot options.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
Boot Configuration
Bootup NumLock State      [On]
Quiet Boot                 [Enabled]
Launch ROM Messages       [Disabled]
Option ROM Messages       [Keep Current]

Boot Option Priorities

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

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

**BIOS Menu 21: 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

**→ Launch PXE OpROM [Disabled]**

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

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

**→ Enabled**    Load PXE Option ROMs.

**→ Option ROM Messages [Keep Current]**

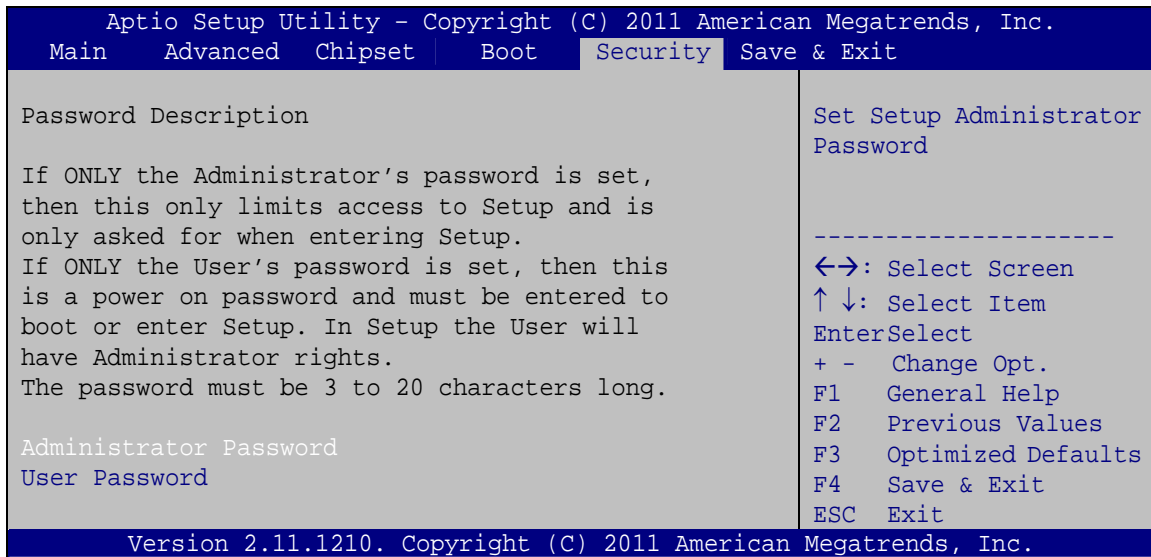
Use the **Option ROM Messages** option to set the Option ROM display mode.

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- ➔ **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 22**) to set system and user passwords.



### BIOS Menu 22: Security

#### ➔ Administrator Password

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

#### ➔ User Password

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

## 5.7 Exit

Use the **Exit** menu (**BIOS Menu 23**) 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
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Exit the system after
saving the changes.

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

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

### BIOS Menu 23: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.**

## IMBA-H610 ATX Motherboard

### → 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

---

## IMBA-H610 ATX Motherboard

### 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
- VGA
- LAN
- Audio

Installation instructions are given below.

### 6.2 Software Installation

All the drivers for the IMBA-H610 are on the CD that came with the system. To install the drivers, please follow the steps below.

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

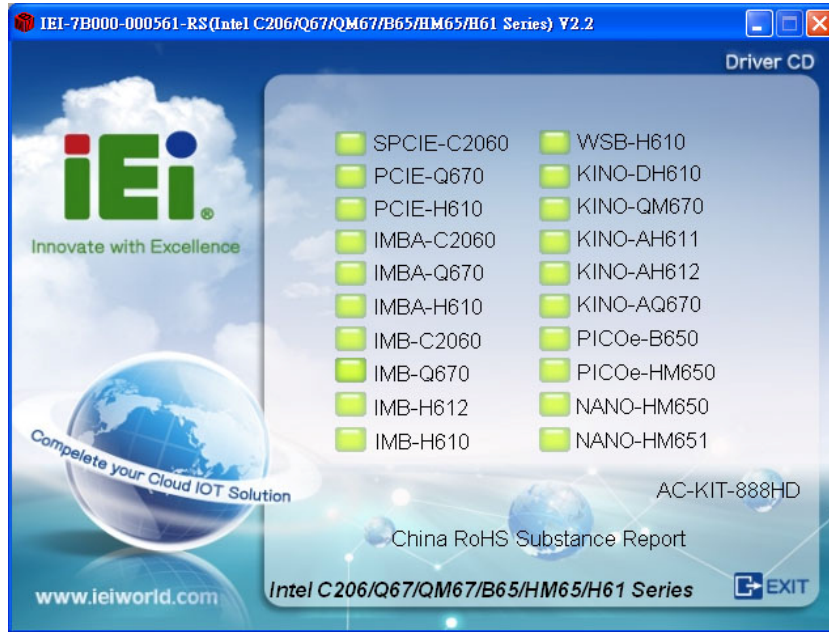
---

**NOTE:**

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

---

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



**Figure 6-1: Introduction Screen**

**Step 3:** Click IMBA-H610.

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



**Figure 6-2: Available Drivers**

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**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.

## IMBA-H610 ATX Motherboard

**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.

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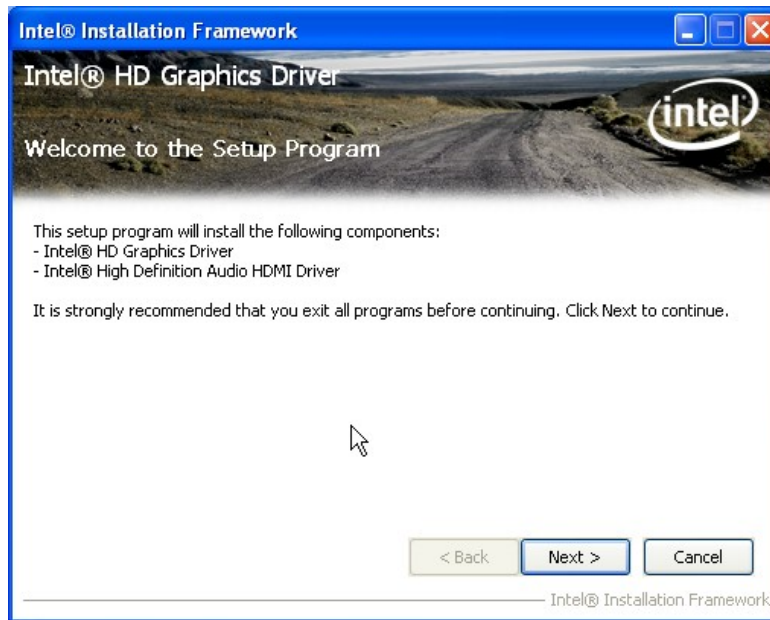


Figure 6-9: Graphics Driver Welcome Screen

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

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

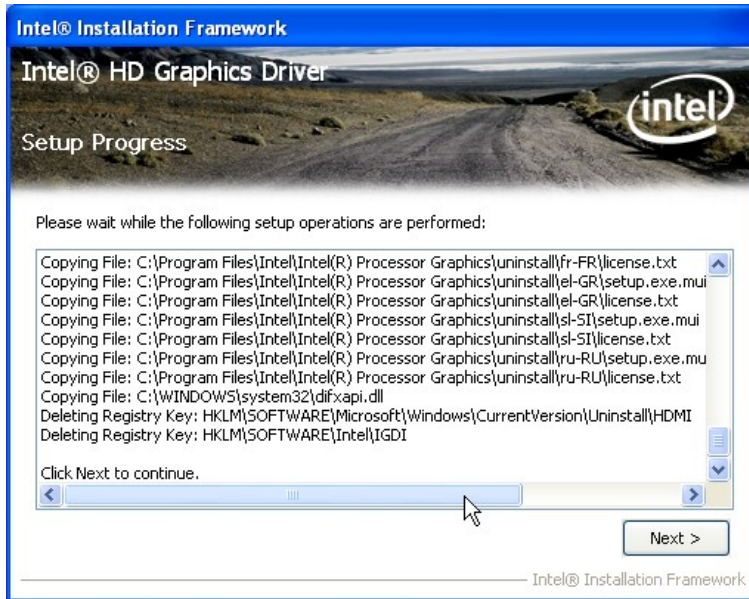


Figure 6-10: Graphics Driver License Agreement

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



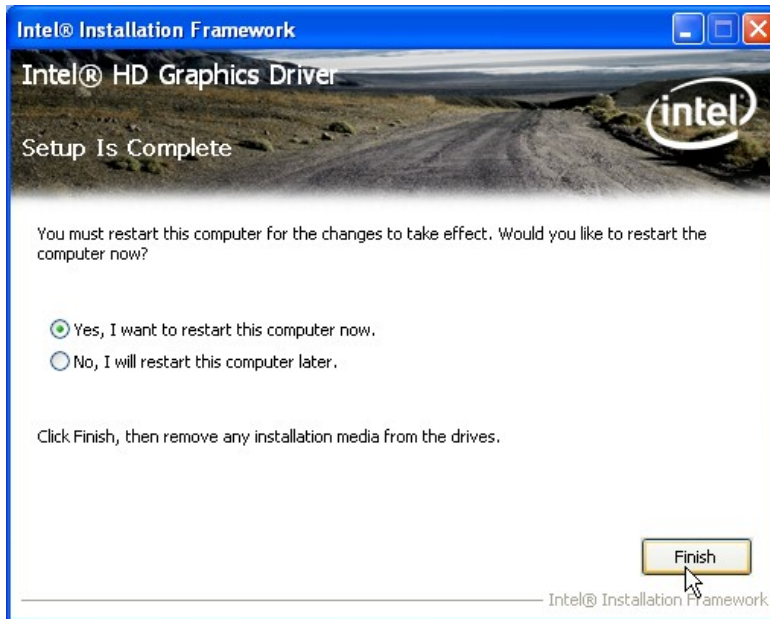
**Step 9:** Once the **Setup Operations** are complete, click **Next** to continue.



**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**

## IMBA-H610 ATX Motherboard

### 6.5 LAN Driver Installation

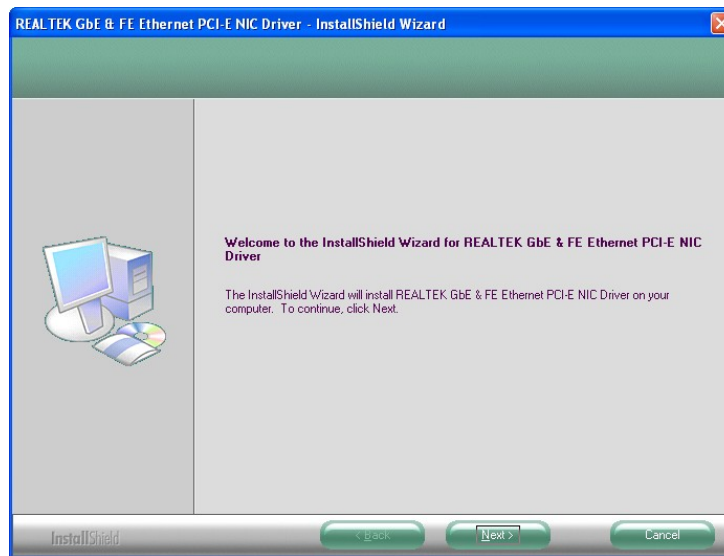
To install the LAN driver, please do the following.

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

**Step 2:** Click “LAN”.

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

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

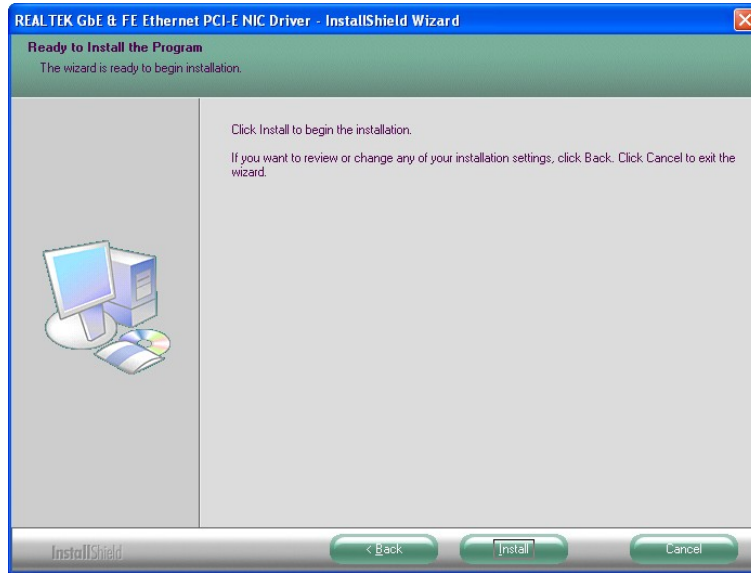


**Figure 6-13: LAN Driver Welcome Screen**

**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.

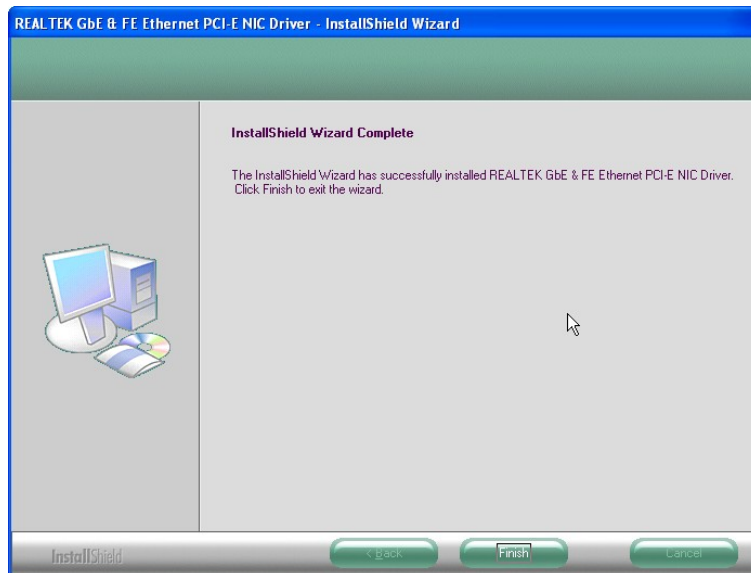


**Figure 6-14: LAN Driver Installation**

**Step 8:** The program begins to install.

**Step 9:** When the driver installation is complete, the screen in **Figure 6-15** appears.

**Step 10:** Click **Finish** to exit.



**Figure 6-15: LAN Driver Installation Complete**

## IMBA-H610 ATX Motherboard

### 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 6-16**).



**Figure 6-16: Audio Driver – Extracting Files**

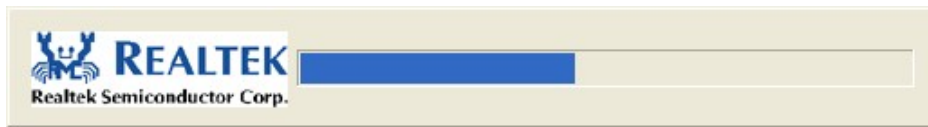
**Step 5:** The **Audio Driver Welcome** message in **Figure 6-17** appears.

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



**Figure 6-17: Audio Driver Welcome Screen**

**Step 7:** The audio driver installation begins. See **Figure 6-18**.



**Figure 6-18: Audio Driver Installation**

**Step 8:** When the installation is complete, the screen in **Figure 6-19** appears.

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



**Figure 6-19: Audio Driver Installation Complete**

Appendix

**A**

# BIOS Options

---

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

<b>System Overview</b> .....	<b>68</b>
<b>Memory Information</b> .....	<b>69</b>
<b>System Date [xx/xx/xx]</b> .....	<b>69</b>
<b>System Time [xx:xx:xx]</b> .....	<b>69</b>
<b>ACPI Sleep State [S1 (CPU Stop Clock)]</b> .....	<b>71</b>
<b>TPM Support [Disable]</b> .....	<b>72</b>
<b>Intel Virtualization Technology [Disabled]</b> .....	<b>72</b>
<b>SATA Mode [IDE Mode]</b> .....	<b>74</b>
<b>Serial-ATA Controller 0 [Compatible]</b> .....	<b>74</b>
<b>Serial-ATA Controller 1 [Enhanced]</b> .....	<b>75</b>
<b>USB Devices</b> .....	<b>76</b>
<b>USB Support [Enabled]</b> .....	<b>77</b>
<b>Legacy USB Support [Enabled]</b> .....	<b>77</b>
<b>Power Saving Function [Disabled]</b> .....	<b>78</b>
<b>Serial Port [Enabled]</b> .....	<b>79</b>
<b>Change Settings [Auto]</b> .....	<b>79</b>
<b>Serial Port [Enabled]</b> .....	<b>80</b>
<b>Change Settings [Auto]</b> .....	<b>80</b>
<b>Serial Port [Enabled]</b> .....	<b>81</b>
<b>Change Settings [Auto]</b> .....	<b>81</b>
<b>Serial Port [Enabled]</b> .....	<b>82</b>
<b>Change Settings [Auto]</b> .....	<b>82</b>
<b>Device Mode [RS422/485]</b> .....	<b>82</b>
<b>Serial Port [Enabled]</b> .....	<b>83</b>
<b>Change Settings [Auto]</b> .....	<b>83</b>
<b>Serial Port [Enabled]</b> .....	<b>83</b>
<b>Change Settings [Auto]</b> .....	<b>84</b>
<b>PC Health Status</b> .....	<b>85</b>
<b>CPU Smart Fan control [Auto by RPM]</b> .....	<b>86</b>
<b>Target Temp. Sensor [CPU Temperature]</b> .....	<b>87</b>
<b>Temperature Bound n</b> .....	<b>87</b>
<b>Segment n Speed (%)</b> .....	<b>87</b>
<b>Full Speed Count</b> .....	<b>87</b>

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CPU Smart Fan control [Auto by Duty-Cycle].....	88
Target Temp. Sensor [CPU Temperature] .....	88
Temperature Bound n.....	89
Segment 1 Speed (PWM).....	89
Console Redirection [Disabled] .....	90
Terminal Type [ANSI].....	90
Bits per second [115200].....	91
Data Bits [8] .....	91
Parity [None].....	91
Stop Bits [1].....	92
Flow Control [None].....	92
VT-UTF8 Combo Key Support [Enabled].....	92
Recorder Mode [Disabled] .....	92
Resolution 100x31 [Disabled].....	93
Legacy OS Redirection Resolution [80x24] .....	93
Auto Recovery Function [Disabled].....	94
Initiate Graphic Adapter [PEG/IGD].....	96
IGD Memory [64 M] .....	96
PCI Express Port [Enabled] .....	97
VT-d [Disabled].....	97
Restore on AC Power Loss [Power Off] .....	98
Resume on PCIE Wake [Enabled] .....	98
Resume on PME/GbE [Enabled].....	99
Resume on Ring [Enabled] .....	99
Resume on PS/2 [Enabled] .....	99
Azalia HD Audio [Enabled].....	99
Azalia internal HDMI codec [Enabled] .....	99
DVMT Mode Select [DVMT Mode].....	100
DVMT Memory [Maximum].....	101
IGD - Boot Type [AUTO] .....	101
Bootup NumLock State [On].....	102
Quiet Boot [Enabled] .....	102
Launch PXE OpROM [Disabled].....	102
Option ROM Messages [Keep Current] .....	102
Administrator Password .....	103



User Password .....	103
Save Changes and Reset .....	104
Discard Changes and Reset .....	104
Restore Defaults .....	104
Save as User Defaults .....	105
Restore User Defaults .....	105

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.

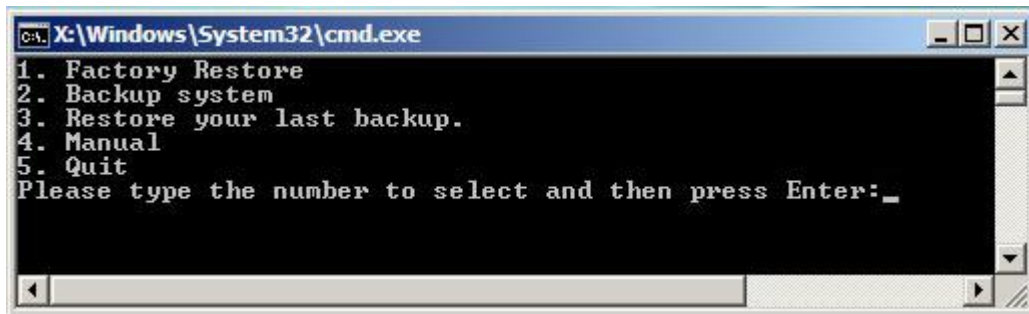


Figure B-1: IEI One Key Recovery Tool Menu

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-up recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

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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
<b>Windows® 7</b>	7 GB	5 GB	70%
<b>Windows® XPE</b>	776 MB	560 MB	70%
<b>Windows® CE 6.0</b>	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 system (OS). The supported OS versions are listed below.

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



### NOTE:

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

---

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- 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 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 1<sup>st</sup> boot device. (**Boot → Boot Device Priority → 1<sup>st</sup> 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.

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**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!

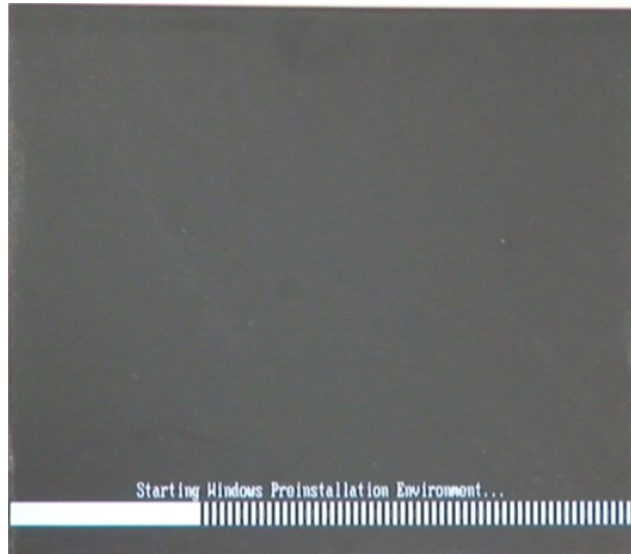


Figure B-2: Launching the Recovery Tool

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

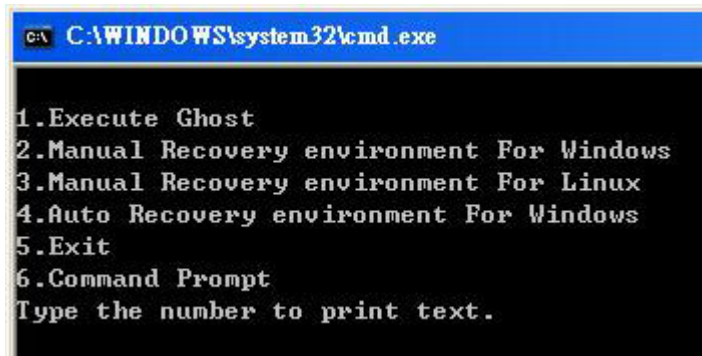
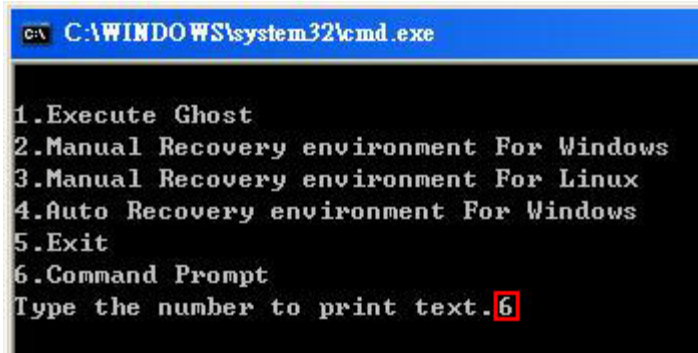


Figure B-3: Recovery Tool Setup Menu

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





```
C:\WINDOWS\system32\cmd.exe

1. Execute Ghost
2. Manual Recovery environment For Windows
3. Manual Recovery environment For Linux
4. Auto Recovery environment For Windows
5. Exit
6. Command Prompt
Type the number to print text. 6
```

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
```

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```

X:\I386\SYSTEM32\CMD.EXE
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-JUC

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 ntfs.
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 → Formate partition 2 (F) as NTFS formate and
                                                         name it as "Recovery".
The type of the file system is ntfs.
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

```

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: MINIMI-JUC

DISKPART> sel disk 0
Disk 0 is now the selected disk.

DISKPART> list part

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

DISKPART> exit
```

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

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

### B.2.3 Install Operating System, Drivers and Applications

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

**NOTE:**

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

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

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### B.2.4 Build-up 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!

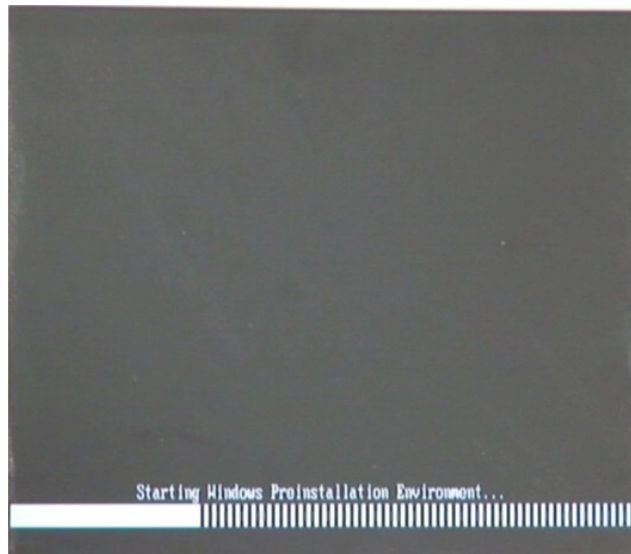


Figure B-6: Launching the Recovery Tool

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

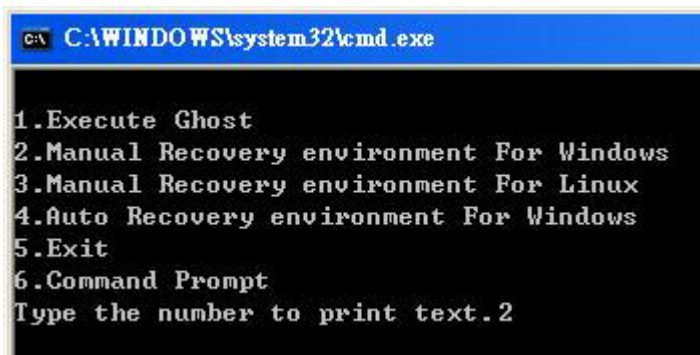
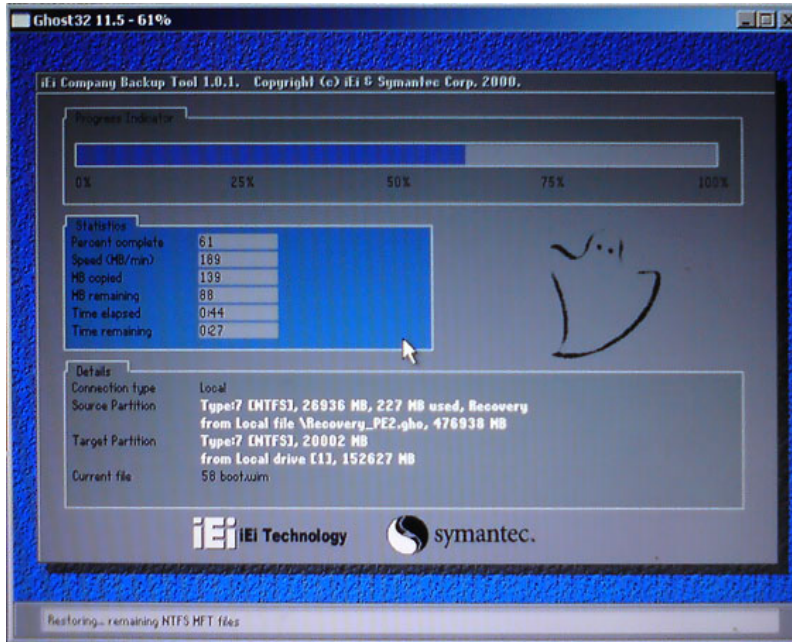


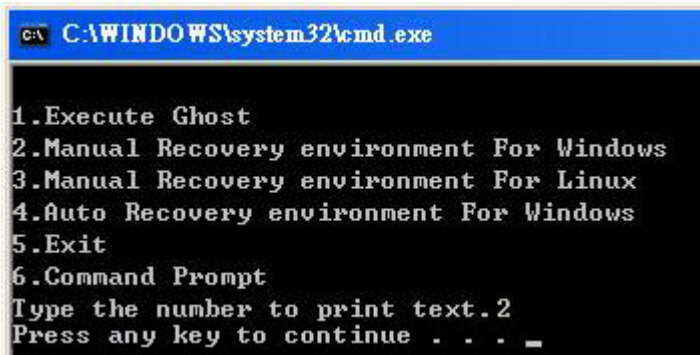
Figure B-7: Manual Recovery Environment for Windows

**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.

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### B.2.5 Create Factory Default Image

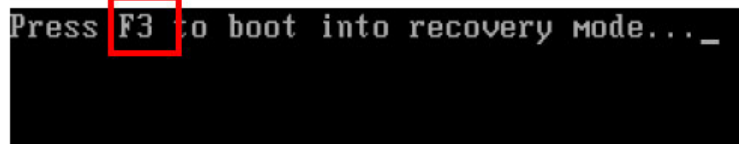


#### NOTE:

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.



```
Press F3 to boot into recovery mode... _
```

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

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

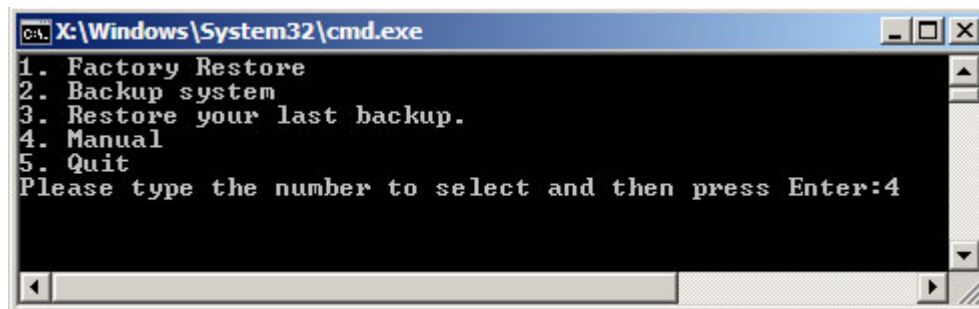


Figure B-11: Recovery Tool Menu

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

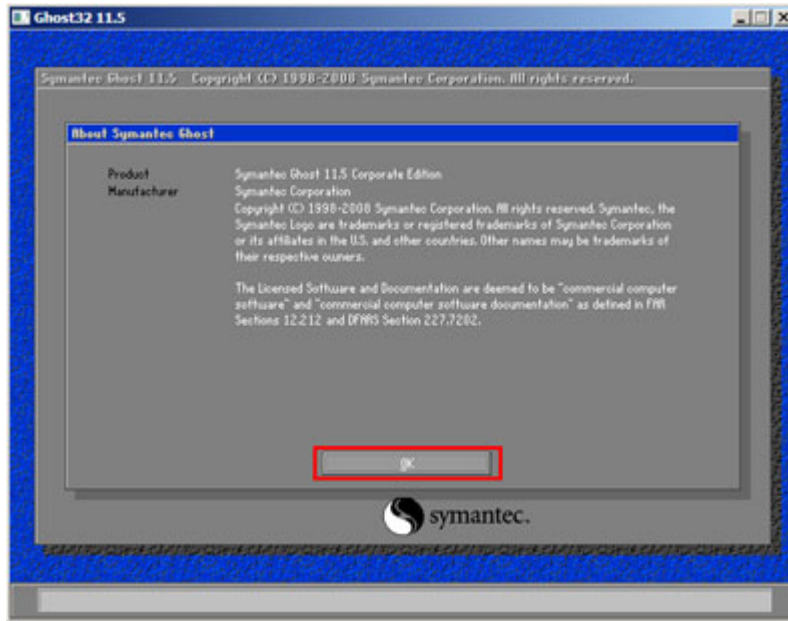


Figure B-12: About Symantec Ghost Window

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

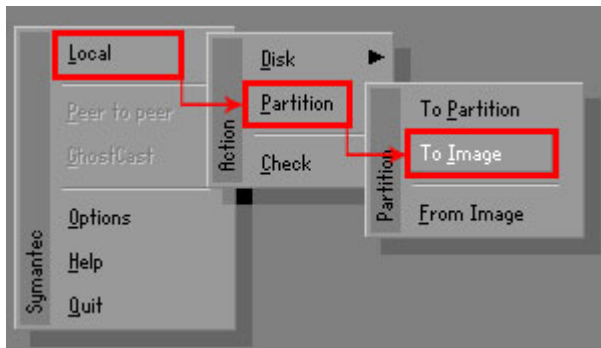
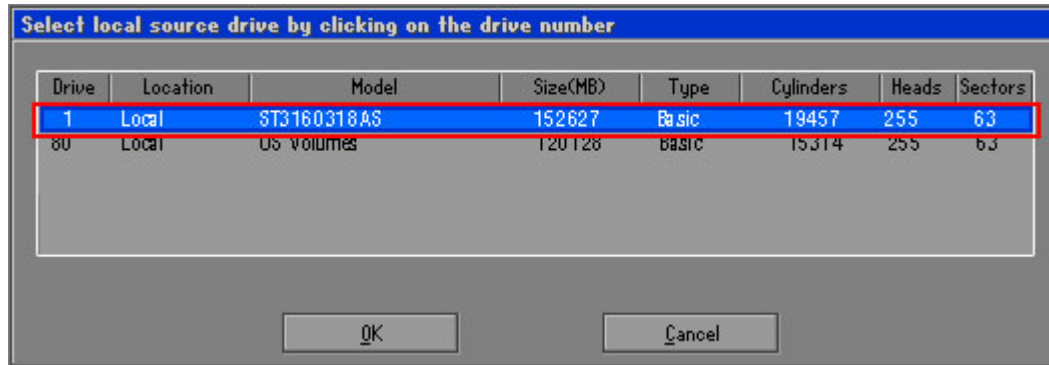


Figure B-13: Symantec Ghost Path

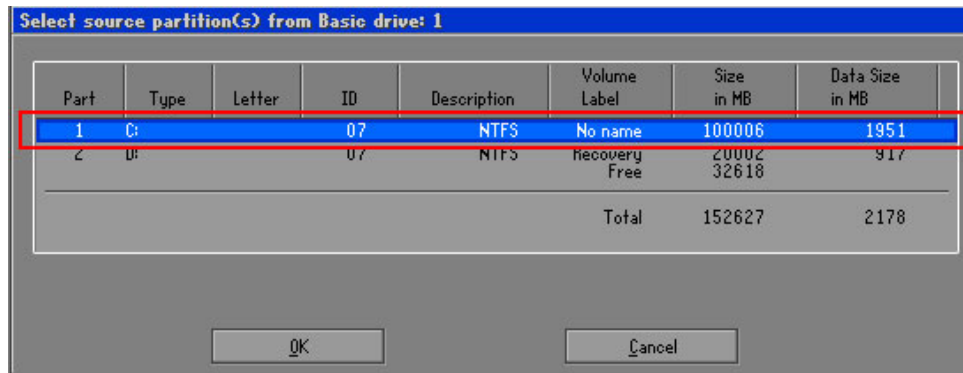
**Step 5:** Select the local source drive (Drive 1) as shown in Figure B-14. Then click OK.

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**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**.



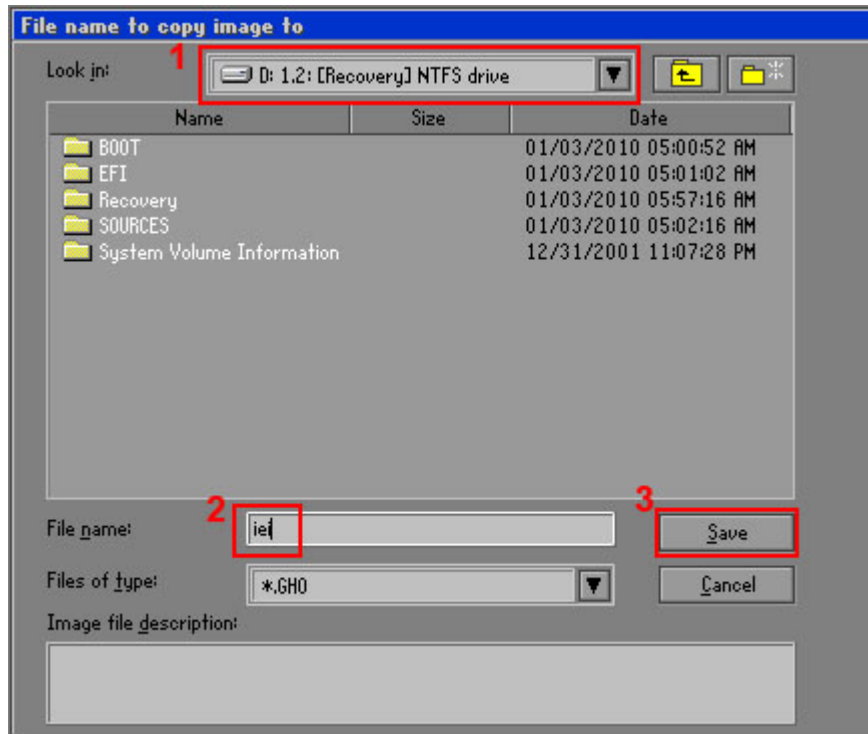


Figure B-16: File Name to Copy Image to

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

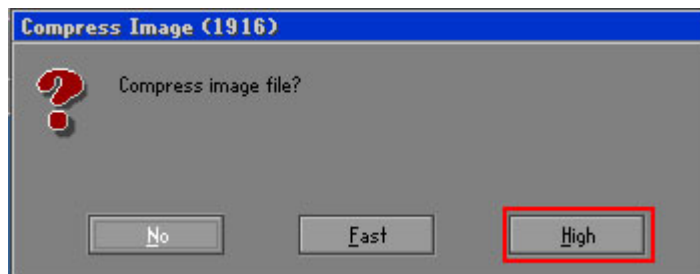
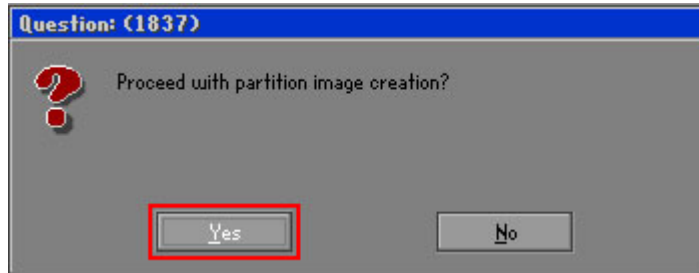


Figure B-17: Compress Image

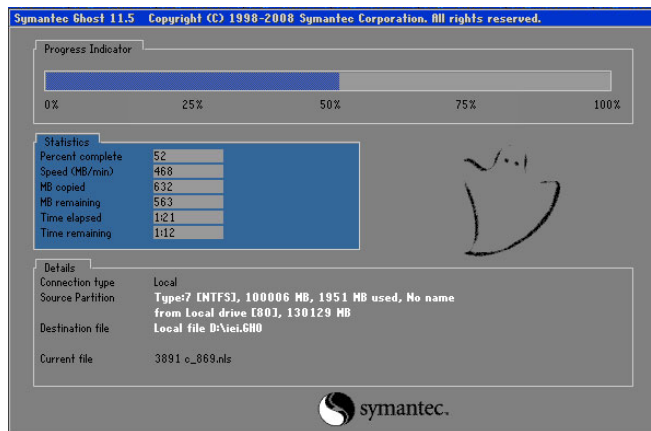
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**Step 9:** The Proceed with partition image creation window appears, click **Yes** to continue.



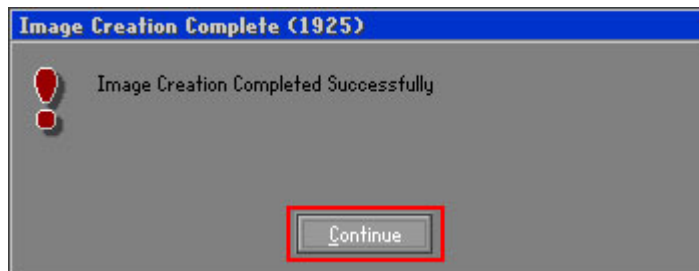
**Figure B-18: Image Creation Confirmation**

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



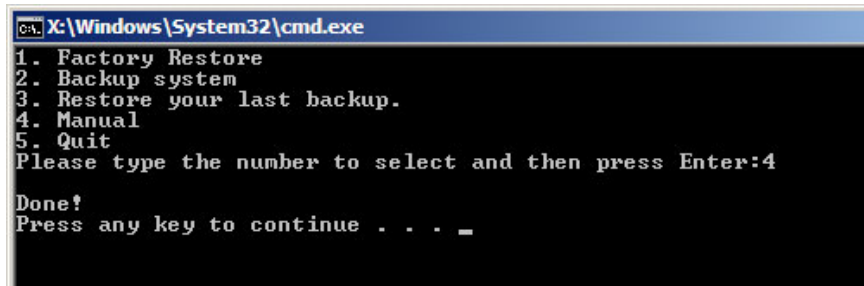
**Figure B-19: Image Creation Complete**

**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.



```
C:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:4
Done!
Press any key to continue . . . _
```

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

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



#### CAUTION:

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.

---

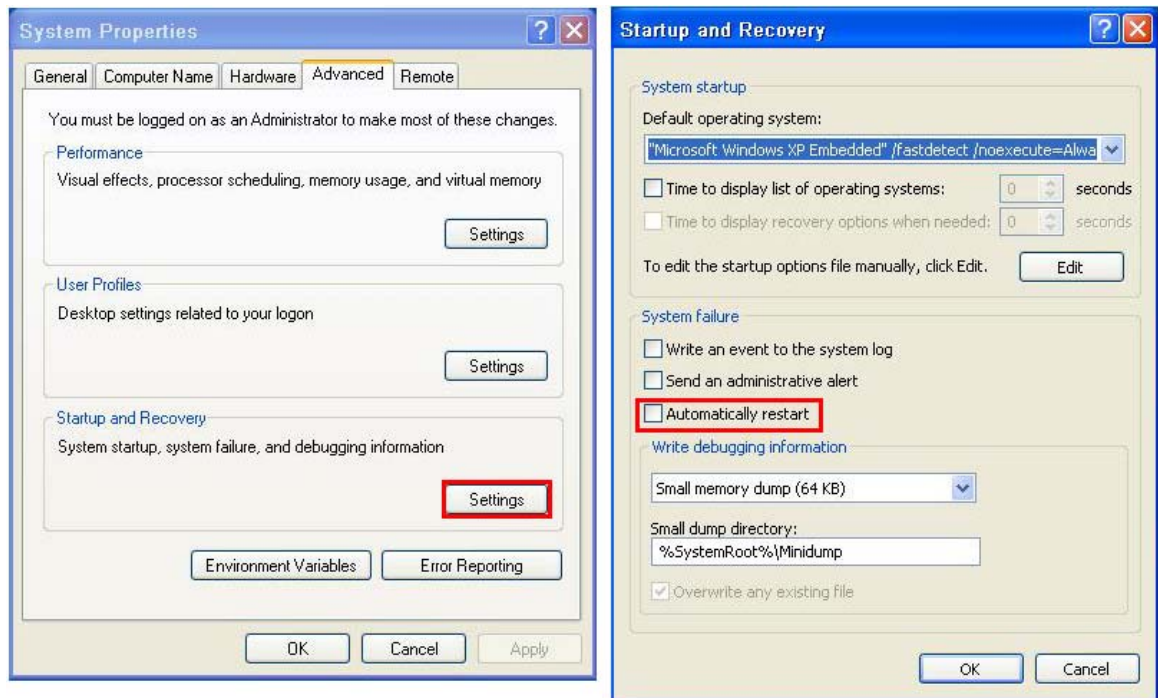
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- Step 1:** Follow the steps described in **Section B.2.1 ~ Section B.2.3** to setup BIOS, create partitions and install operating system.
- Step 2:** Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility **MUST** be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



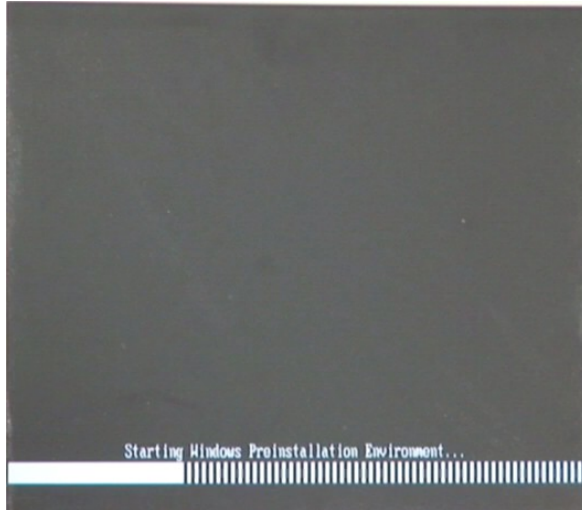
**Figure B-22: Auto Recovery Utility**

- Step 3:** **Disable the automatically restart function before creating the factory default image.** Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure B-23**)



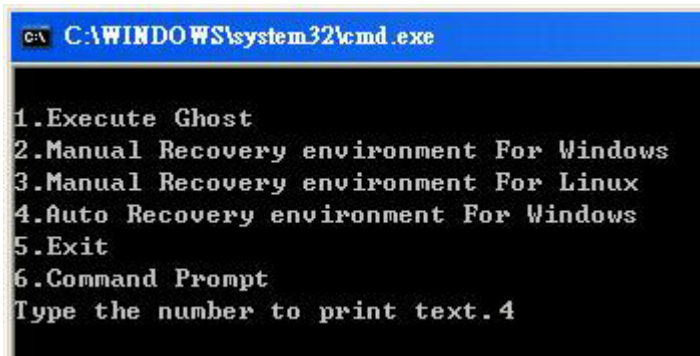
**Figure B-23: Disable Automatically Restart**

**Step 4:** Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!



**Figure B-24: Launching the Recovery Tool**

**Step 5:** When the recovery tool setup menu appears, press <4> then <Enter>.



**Figure B-25: Auto Recovery Environment for Windows**

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

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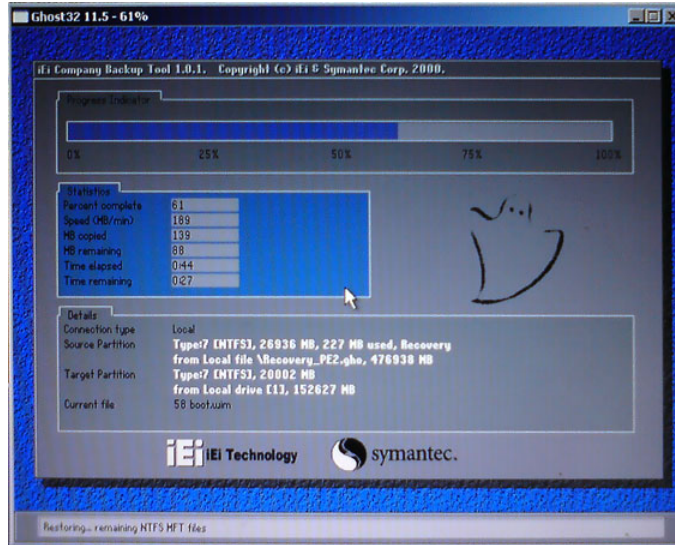


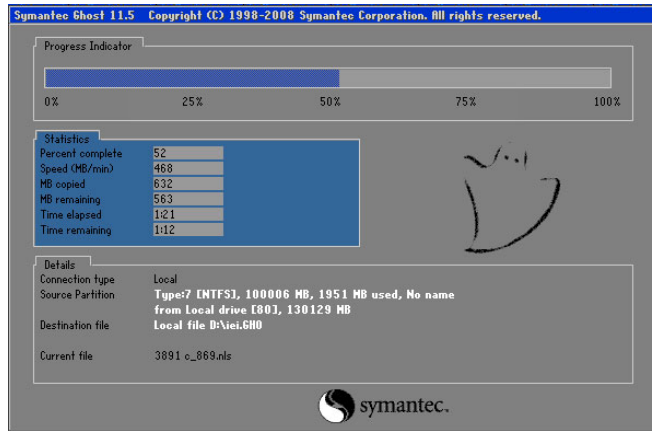
Figure B-26: Building the Auto Recovery Partition

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



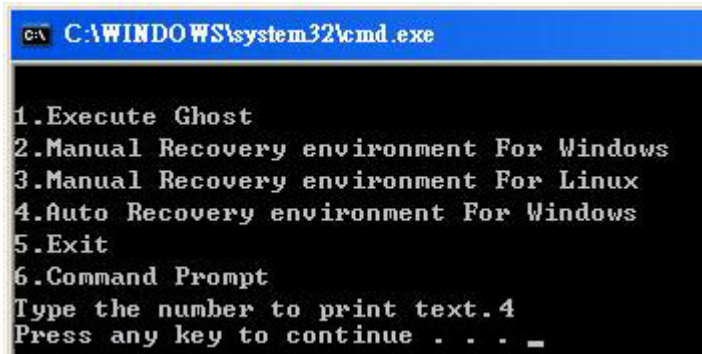
Figure B-27: Factory Default Image Confirmation

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



**Figure B-28: Image Creation Complete**

**Step 9:** After completing the system configuration, press any key in the following window to restart the system.



**Figure B-29: Press any key to continue**

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

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

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

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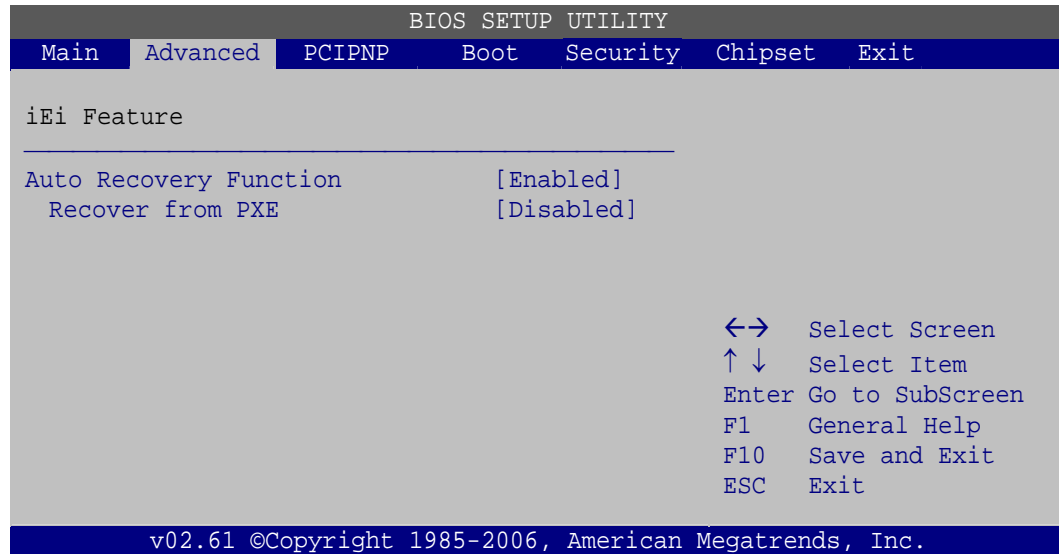


Figure B-30: IEI Feature

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

## B.4 Setup Procedure for Linux

The initial setup procedures for a Linux system are mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup the 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.

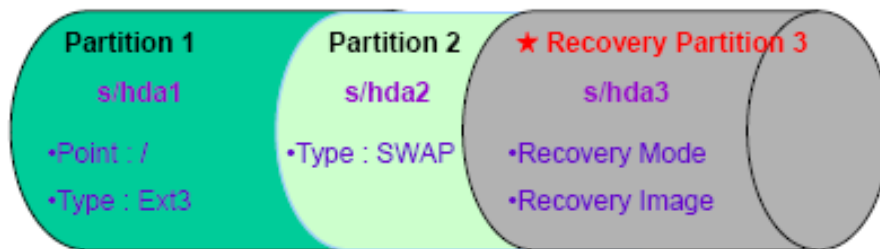


Figure B-31: Partitions for Linux

**Step 3:** Create a recovery partition. Insert the recovery CD into the optical disk drive.

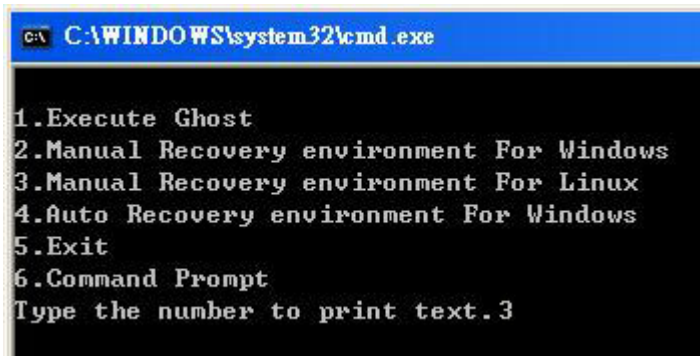
Follow **Step 1 ~ Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>exit
system32>format N: /fs:ntfs /q /v:Recovery /y
system32>exit
```

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

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



```
C:\WINDOWS\system32\cmd.exe

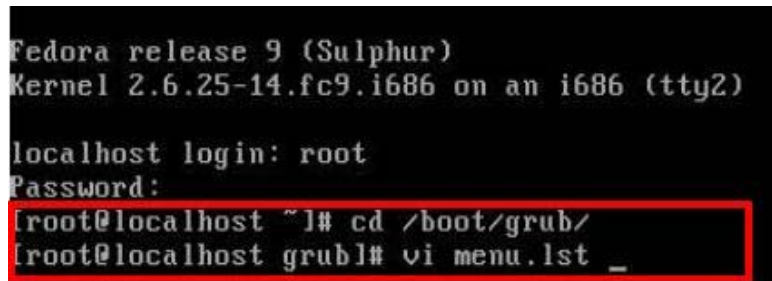
1. Execute Ghost
2. Manual Recovery environment For Windows
3. Manual Recovery environment For Linux
4. Auto Recovery environment For Windows
5. Exit
6. Command Prompt
Type the number to print text.3
```

Figure B-32: System Configuration 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-33: 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-34)

```
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-34: Recovery Tool Menu

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

## B.5 Recovery Tool Functions

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

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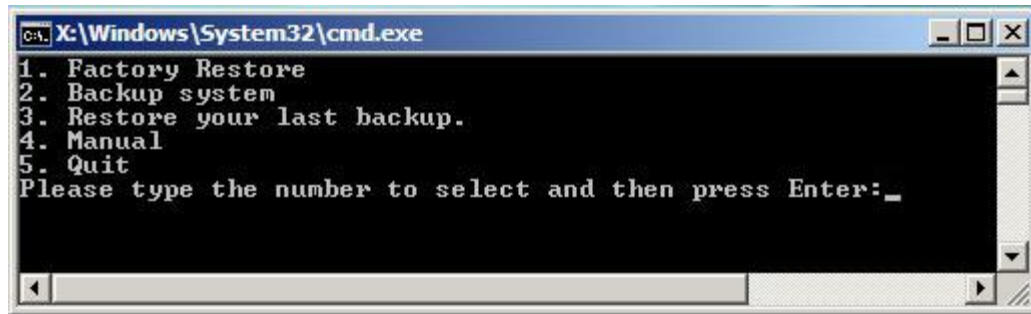


Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

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

**WARNING:**

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).

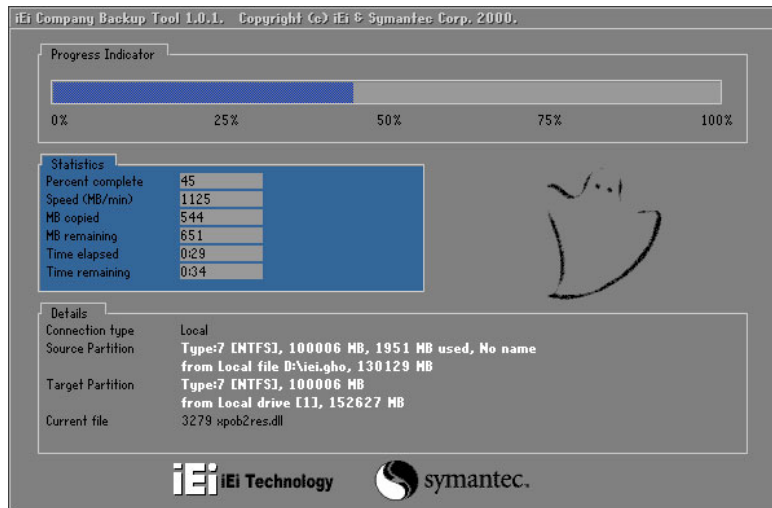
---

### B.5.1 Factory Restore

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

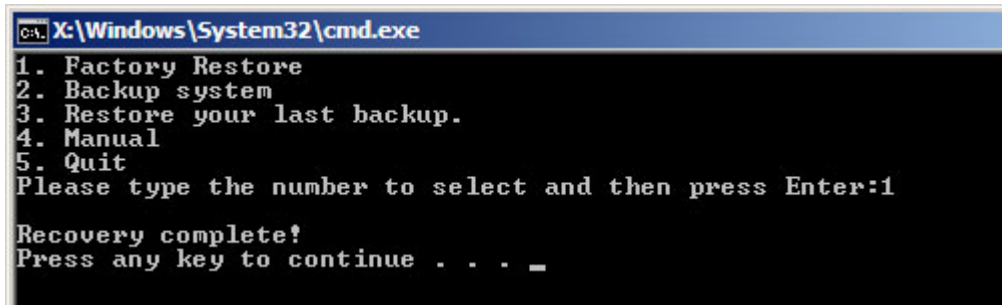
**Step 1:** Type <1> and press <Enter> in the main menu.

**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-36: Restore Factory Default**

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



**Figure B-37: Recovery Complete Window**

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### 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.

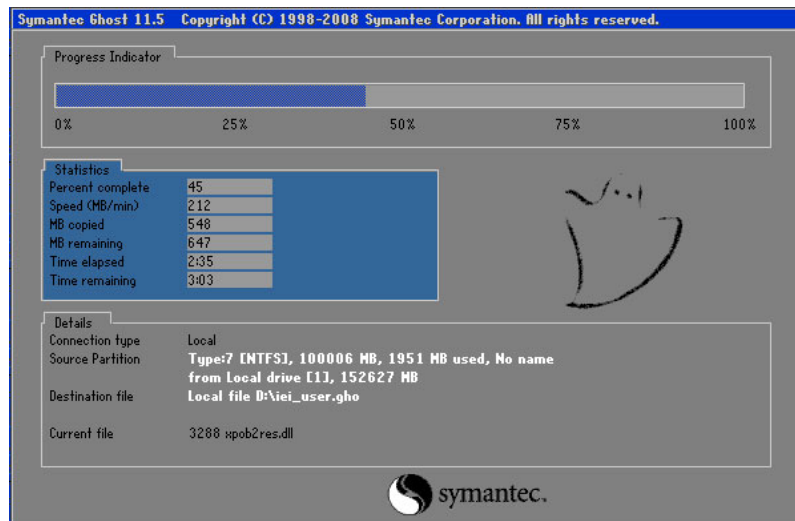


Figure B-38: Backup System

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

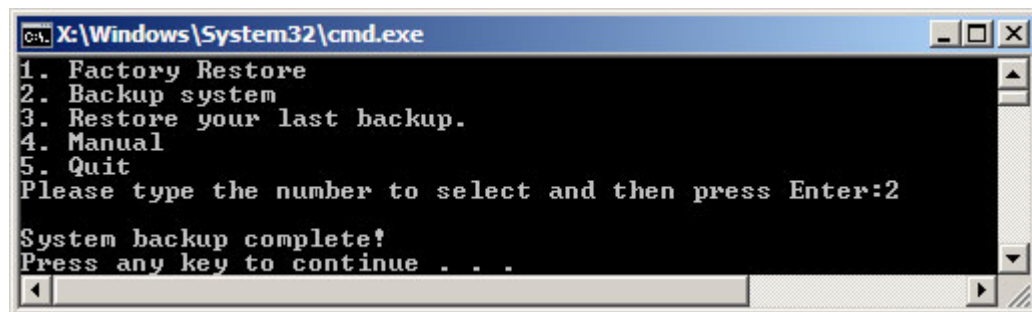


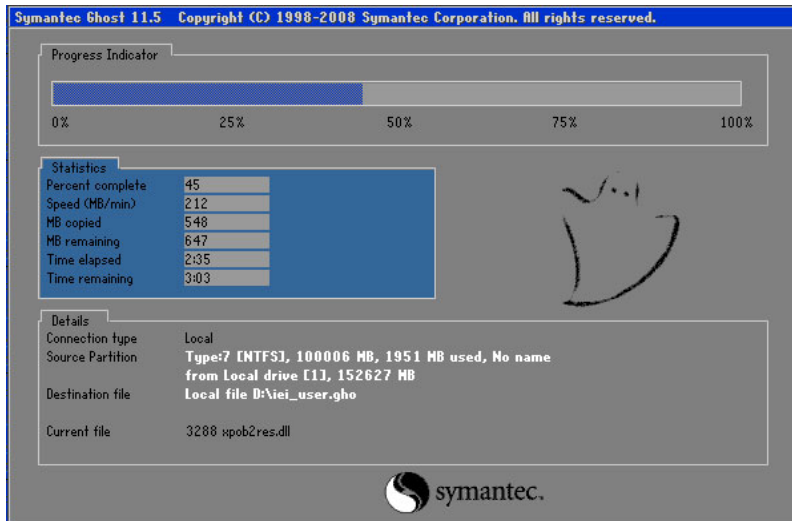
Figure B-39: System Backup Complete Window

**B.5.3 Restore Your Last Backup**

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

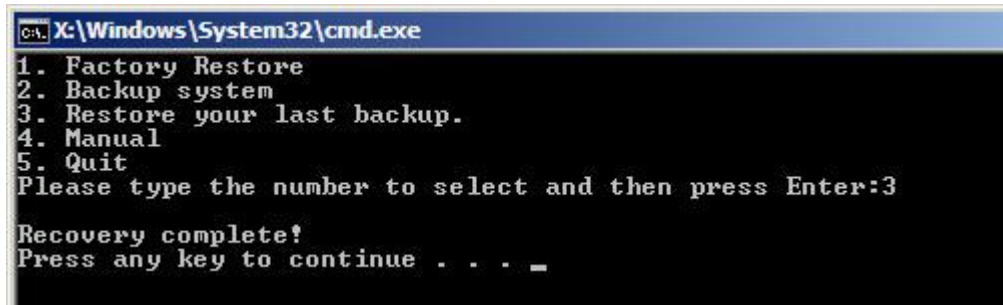
**Step 1:** Type <3> and press <Enter> in the main menu.

**Step 2:** The Symantec Ghost window appears and starts to restore the last backup image (iei\_user.GHO).



**Figure B-40: Restore Backup**

**Step 3:** The screen shown in **Figure B-41** appears when backup recovery is complete. Press any key to reboot the system.



**Figure B-41: Restore System Backup Complete Window**

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### B.5.4 Manual

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

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

**Step 2:** The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

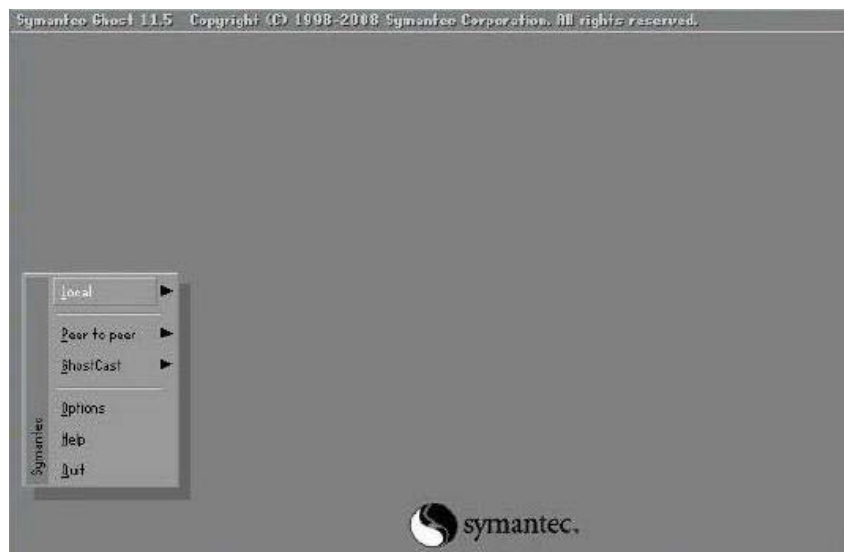


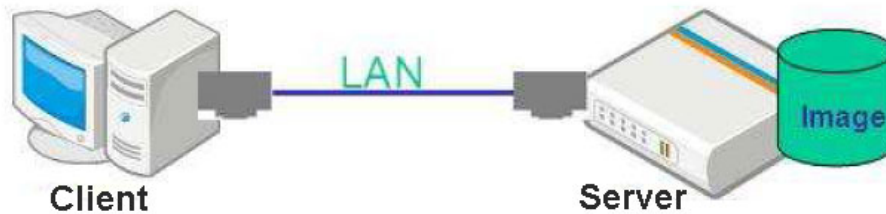
Figure B-42: Symantec Ghost Window

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



## B.6 Restore Systems from a Linux Server through LAN

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



### CAUTION:

The supported client OS includes:

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

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

**Step 1:** Configure DHCP server settings

**Step 2:** Configure TFTP settings

**Step 3:** Configure One Key Recovery server settings

**Step 4:** Start DHCP, TFTP and HTTP

**Step 5:** Create a shared directory

**Step 6:** Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

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### 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;
    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
```

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**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 -n /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 -xvzf RecoveryR10.tar.bz2
```

**Step 3:** Copy “pxelinux.0” from “syslinux” and install to “tftpboot”.

```
#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
```

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Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

**Step 4:** Edit “/etc/samba/smb.conf” for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
security = share
```

```
[image]
comment = One Key Recovery
path = /share/image
browseable = yes
writable = yes
public = yes
create mask = 0644
directory mask = 0755
```

**Step 5:** Modify the hostname

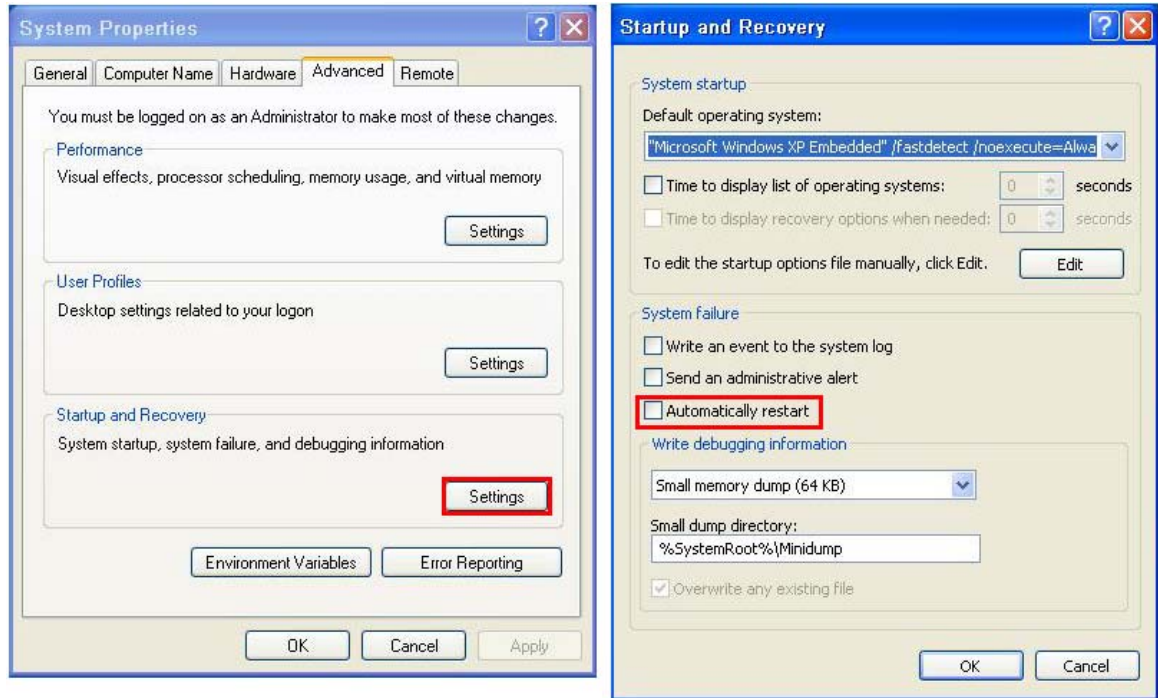
```
#vi /etc/hostname
```

Modify: RecoveryServer

```
RecoveryServer
```

### B.6.6 Setup a Client System for Auto Recovery

**Step 1:** Disable the automatically restart function before creating the factory default image. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure B-43**)



**Figure B-43: Disable Automatically Restart**

**Step 2:** Configure the following BIOS options of the client system.

Advanced → iEi Feature → Auto Recovery Function → **Enabled**

Advanced → iEi Feature → Recover from PXE → **Enabled**

Boot → Launch PXE OpROM → **Enabled**

**Step 3:** Continue to configure the **Boot Option Priorities** BIOS option of the client system:

Boot Option #1 → remain the default setting to boot from the original OS.

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

**Step 4:** Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

**Step 5:** Install the auto recovery utility into the system by double clicking the

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

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MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



**Step 6:** Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

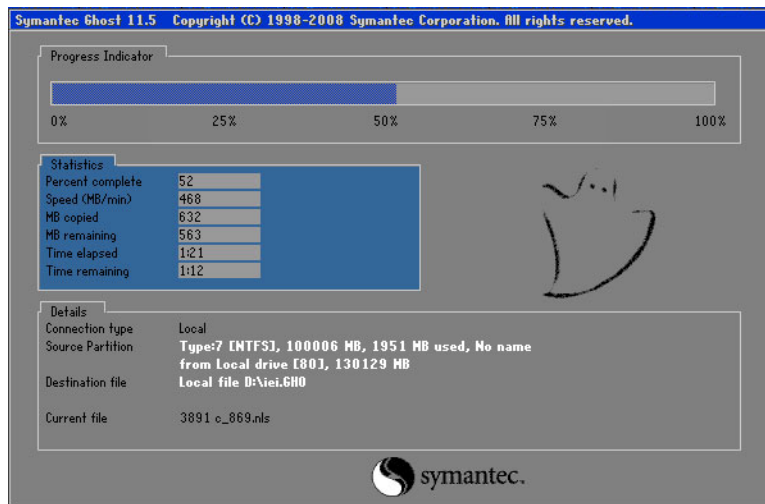
```
Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89  GUID: 00020003-0004-0005-0006-0007000000
DHCP . ./
```

```
My IP address seems to be C0A80009 192.168.0.9
ip=192.168.0.9:192.168.0.8:192.168.0.2:255.255.255.0
TFTP prefix:
Trying to load: pxelinux.cfg/00020003-0004-0005-0006-000700000009
Trying to load: pxelinux.cfg/01-00-18-7d-13-e6-89
Trying to load: pxelinux.cfg/C0A80009
Trying to load: pxelinux.cfg/C0A8000
Trying to load: pxelinux.cfg/C0A800
Trying to load: pxelinux.cfg/C0A80
Trying to load: pxelinux.cfg/C0A8
Trying to load: pxelinux.cfg/C0A
Trying to load: pxelinux.cfg/C0
Trying to load: pxelinux.cfg/C
Trying to load: pxelinux.cfg/default
boot:
```

Windows is loading files...

```
IP: 192.168.0.8, File: \Boot\WinPE.wim
```



**NOTE:**

A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

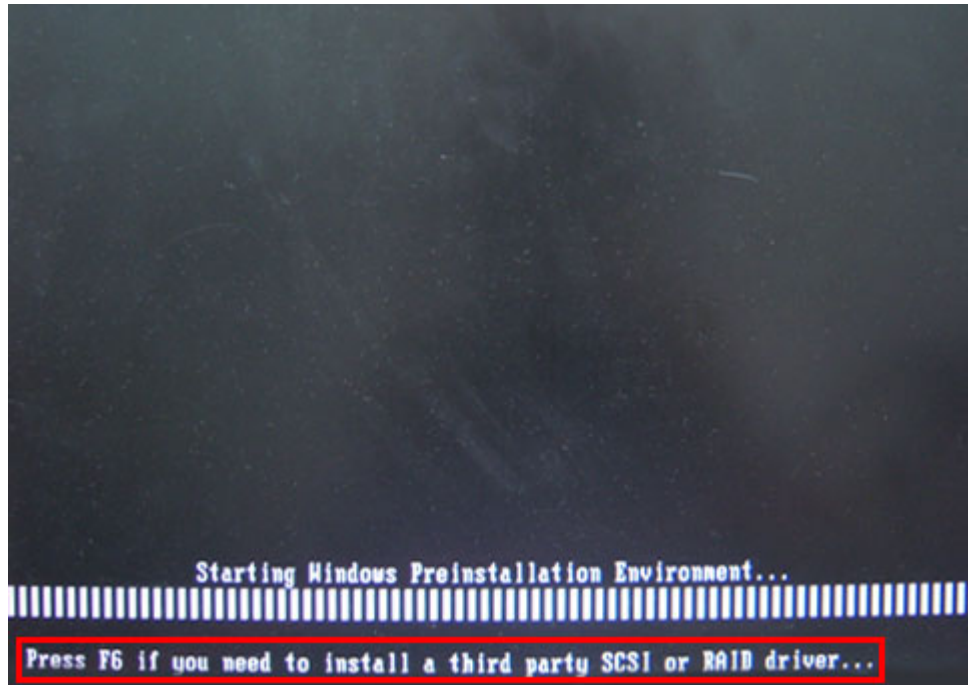
## B.7 Other Information

### B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

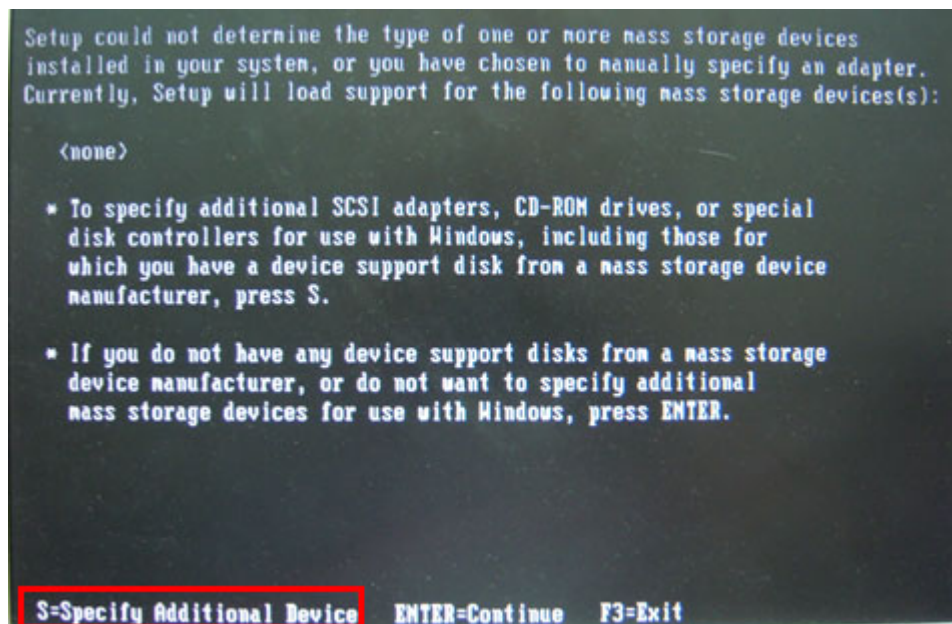
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

- Step 1:** Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.
- Step 2:** Connect the USB floppy disk drive to the system.
- Step 3:** Insert the One Key Recovery CD into the system and boot the system from the CD.
- Step 4:** When launching the recovery tool, press <F6>.

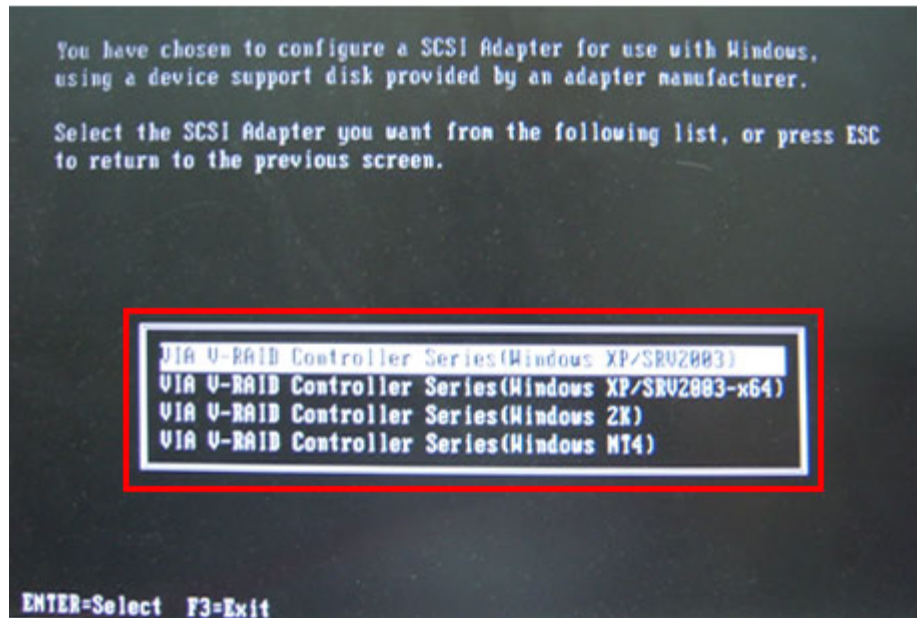
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**Step 5:** When the following window appears, press <S> to select "Specify Additional Device".



**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

---

<b>AC '97</b>	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
<b>ACPI</b>	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
<b>AHCI</b>	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
<b>ATA</b>	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
<b>ARMD</b>	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
<b>ASKIR</b>	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.
<b>BIOS</b>	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
<b>CODEC</b>	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
<b>CMOS</b>	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
<b>COM</b>	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.
<b>DAC</b>	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
<b>DDR</b>	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
<b>DMA</b>	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

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<b>DIMM</b>	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.
<b>DIO</b>	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.
<b>EHCI</b>	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
<b>EIDE</b>	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
<b>EIST</b>	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.
<b>FSB</b>	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
<b>GbE</b>	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
<b>GPIO</b>	General purpose input
<b>HDD</b>	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
<b>ICH</b>	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
<b>IrDA</b>	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
<b>L1 Cache</b>	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
<b>L2 Cache</b>	The Level 2 Cache (L2 Cache) is an external processor memory cache.
<b>LCD</b>	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

<b>LVDS</b>	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
<b>POST</b>	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
<b>RAM</b>	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.
<b>SATA</b>	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.
<b>S.M.A.R.T</b>	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
<b>UART</b>	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
<b>UHCI</b>	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
<b>USB</b>	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.
<b>VGA</b>	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

**D**

# Digital I/O Interface

---



## D.1 Introduction

The DIO connector on the IMBA-H610 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	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

**Table D-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.

## IMBA-H610 ATX Motherboard

<b>MOV</b>	<b>AX, 6F08H</b>	Sets the digital port as input
<b>INT</b>	<b>15H</b>	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.

<b>MOV</b>	<b>AX, 6F09H</b>	Sets the digital port as output
<b>MOV</b>	<b>BL, 09H</b>	
<b>INT</b>	<b>15H</b>	Initiates the INT 15H BIOS call

Appendix

**E**

# Watchdog Timer

---

## IMBA-H610 ATX Motherboard



### 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

# Hazardous Materials Disclosure

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## **F.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.

## IMBA-H610 ATX Motherboard

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printed Circuit Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Metal Fasteners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cable Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fan Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power Supply Assemblies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○

○: 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。