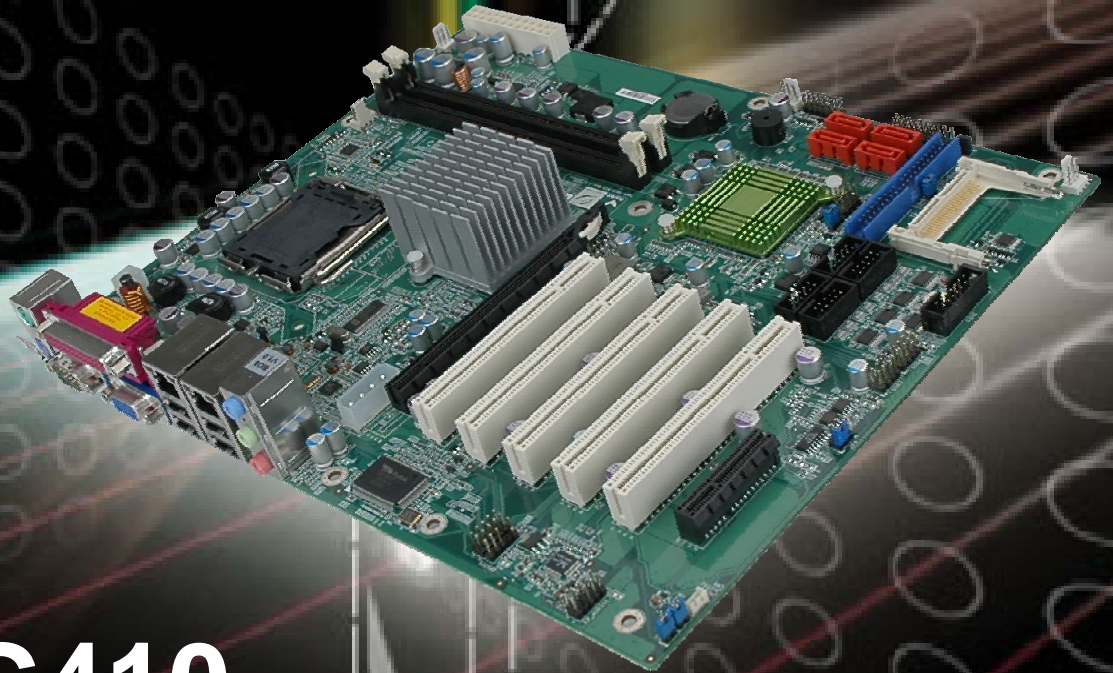




IEI Technology Corp.



**MODEL:  
IMBA-G410**

**ATX Motherboard for Intel® Core™2 Duo/Quad CPU,  
800/1066/1333 MHz FSB, DDR3, VGA, LAN, SATA 3Gb/s,  
PCIe x16, PCIe x4, PCI, USB, HD Audio, RoHS Compliant**

# User Manual

Rev. 1.01 – 17 August, 2011



# Revision

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Date	Version	Changes
17 August, 2011	1.01	Modified Section 4.4.3: COM 2 Function Select Jumper
7 December, 2010	1.00	Initial release

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Chapter

1

# Introduction

---

## 1.1 Introduction



**Figure 1-1: IMBA-G410**

The IMBA-G410 is an ATX motherboard with an 800/1066/1333 MHz front side bus. The LGA775 socket accepts Intel® Core™2 Duo/Quad processors and the motherboard supports two DDR3 DIMMs up to 4.0 GB each (8.0 GB total). The IMBA-G410 includes VGA output with up to QXGA resolution. Multiple expansion cards may be added, including PCIe x16, PCIe x4 and PCI interface. Other features include four SATA 3Gb/s, dual PCIe GbE, digital I/O, five RS-232 serial ports, one RS-232/422/485 serial ports, one parallel port, audio jacks and eight USB ports.

## 1.2 Benefits

Some of the IMBA-G410 motherboard benefits include:

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

## IMBA-G410 ATX Motherboard

### 1.3 Features

Some of the IMBA-G410 motherboard features are listed below:

- ATX form factor
- RoHS compliant
- LGA775 CPU socket
- Supports two DDR3 DIMMs
- Supports dual display by VGA port and an optional PCIe x16 SDVO expansion card
- Two Gigabit Ethernet connectors
- Four SATA connectors
- Eight USB ports
- Six serial ports
- Supports PCI and PCIe x4 (PCIe x1 signal) expansion cards

## 1.4 Connectors

The connectors on the IMBA-G410 are shown in the figure below.

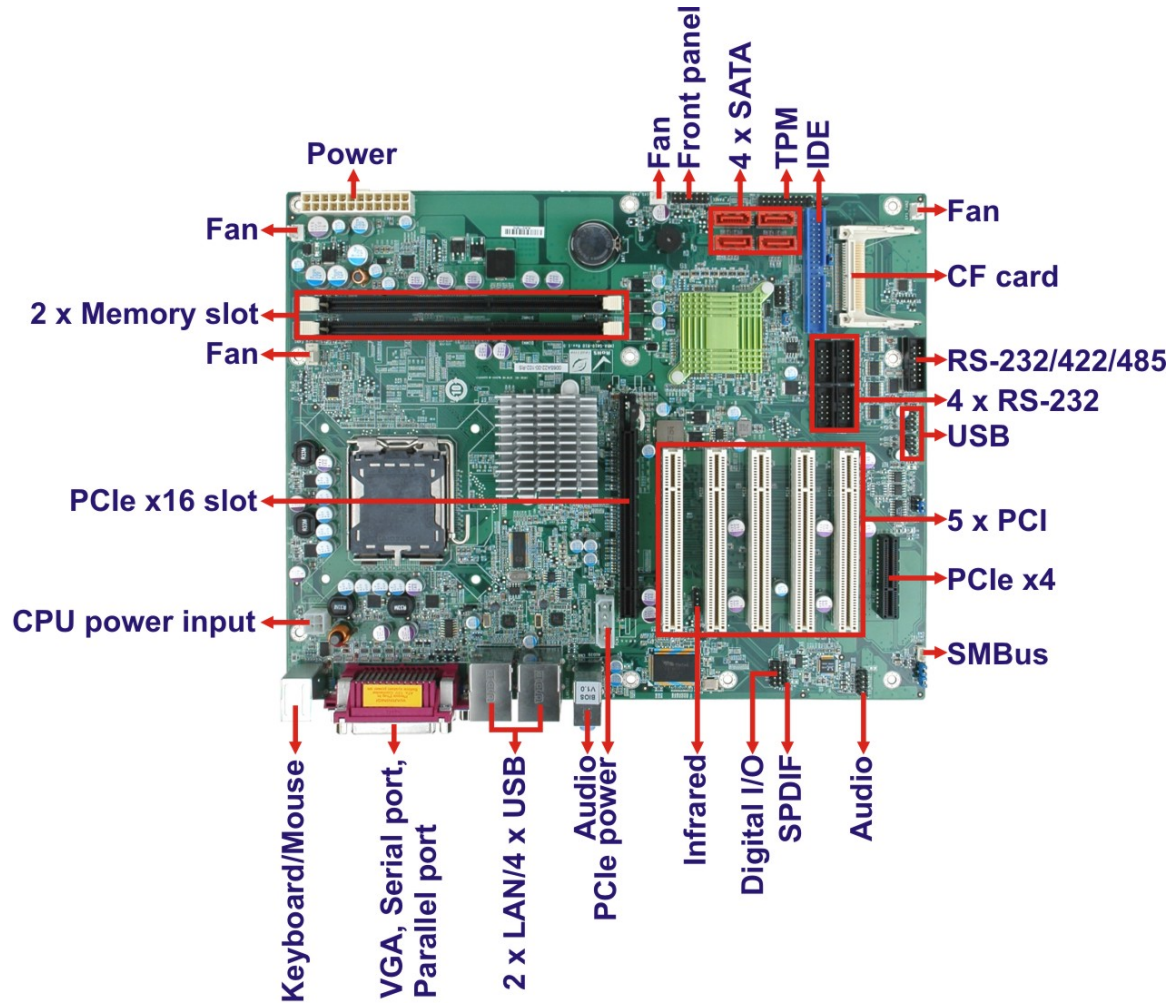


Figure 1-2: Connectors



# IMBA-G410 ATX Motherboard

## 1.5 Dimensions

The main dimensions of the IMBA-G410 are shown in the diagram below.

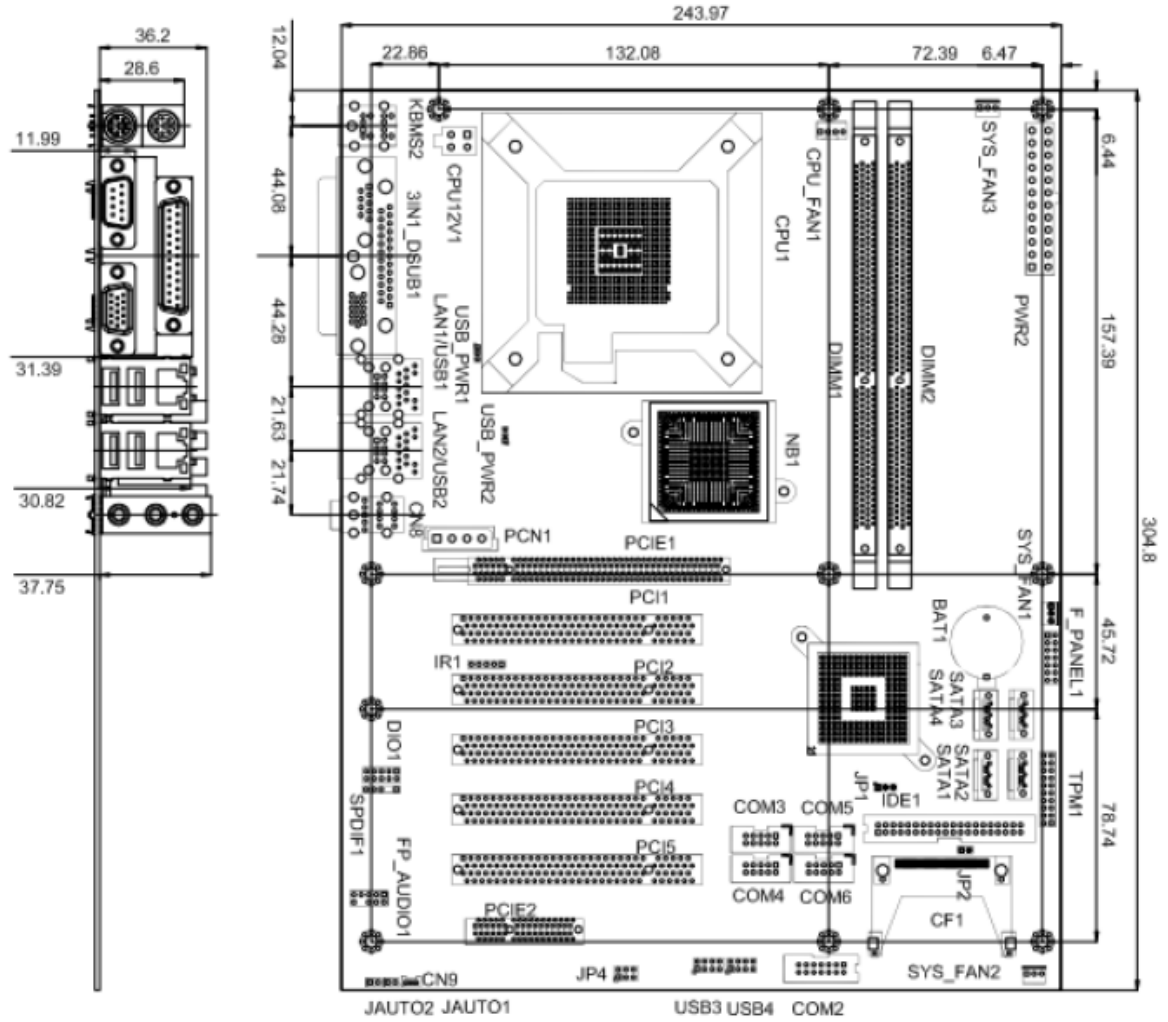


Figure 1-3: Dimensions (mm)

## 1.6 Data Flow

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

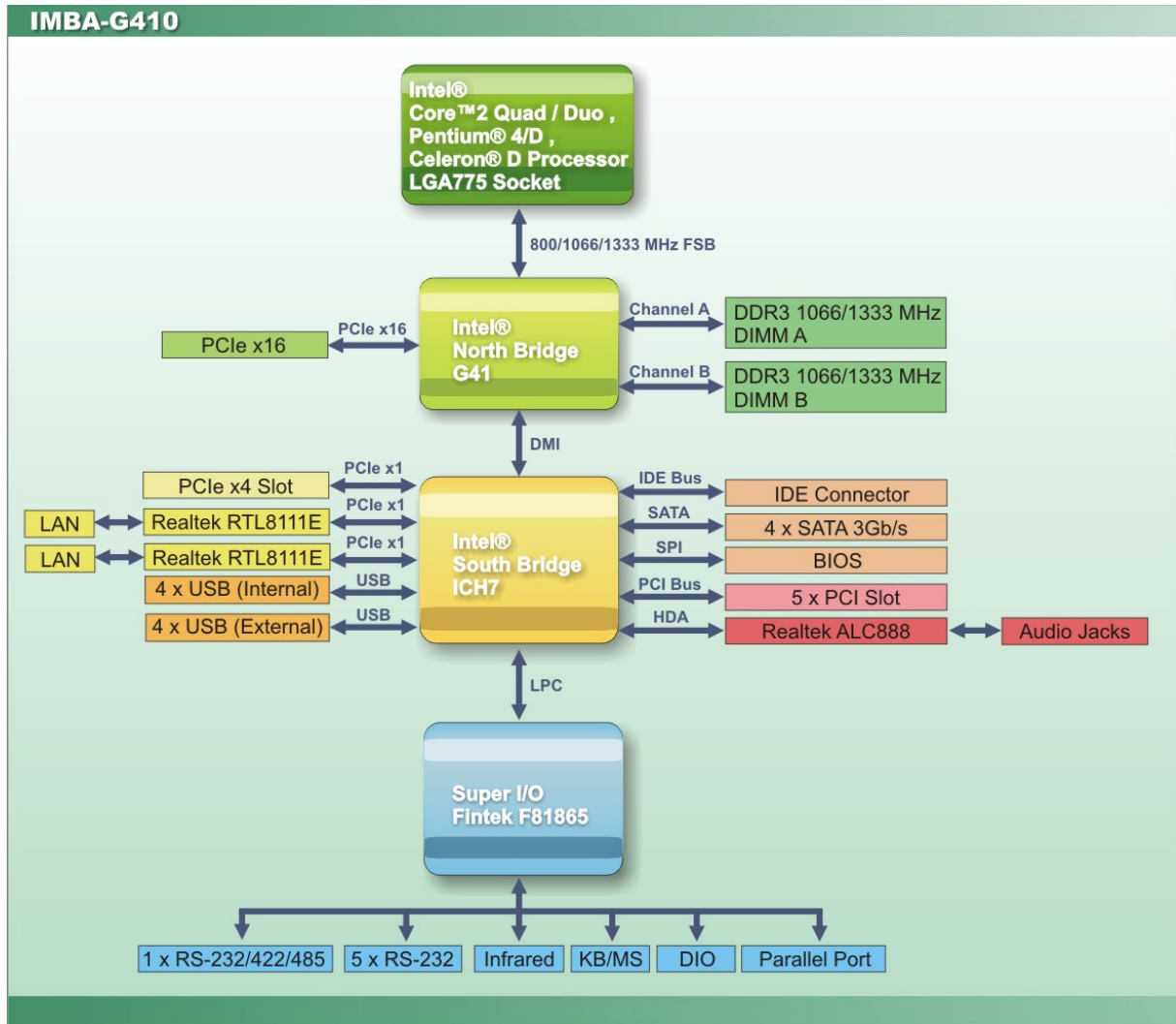


Figure 1-4: Data Flow Diagram

## IMBA-G410 ATX Motherboard

### 1.7 Technical Specifications

IMBA-G410 technical specifications are shown below.

Specifications	IMBA-G410
<b>Form Factor</b>	ATX
<b>CPU Supported</b>	Socket LGA775 Intel® Core™2 Duo/Quad, Pentium® D or Celeron® processor
<b>Front Side Bus (FSB)</b>	800/1066/1333 MHz
<b>Northbridge Chipset</b>	Intel® G41
<b>Memory</b>	Two 240-pin 800/1066 MHz dual-channel DDR3 SDRAM DIMMs (system max. 4 GB)
<b>Graphic Engine</b>	Intel® GMA X4500 supports DirectX 10 / OpenGL 1.5
<b>Integrated Graphics</b>	VGA integrated in Intel® G41 supports up to 2048 x 1536 @ 75 MHz
<b>Southbridge Chipset</b>	Intel® ICH7
<b>BIOS</b>	UEFI BIOS
<b>Digital I/O</b>	8-bit, 4-bit input/4-bit output
<b>Ethernet Controllers</b>	Two Realtek RTL8111E PCIe GbE controllers (LAN1 with ASF2.0 support)
<b>Audio</b>	Realtek ALC888 HD Audio codec
<b>Super I/O Controller</b>	Fintek F81865
<b>Watchdog Timer</b>	Software programmable supports 1~255 sec. system reset
<b>Expansion</b>	One PCIe x16 socket One PCIe x4 socket (with PCIe x1 signal) Five PCI sockets
<b>I/O Interface</b>	
<b>Audio Jack</b>	One line-in One line-out One mic-in

<b>Fan connector</b>	One 4-pin wafer for CPU fan Three 3-pin wafer for system fans
<b>Keyboard/Mouse</b>	Two external PS/2 connectors
<b>Serial Ports</b>	Five RS-232 COM connectors One RS-232/422/485 COM connector with auto flow control
<b>USB 2.0/1.1 ports</b>	Four internal via pin header Four external USB ports
<b>Infrared</b>	One infrared connector via 5-pin header
<b>Parallel Port</b>	One external parallel port
<b>Serial ATA</b>	Four independent SATA channels with 3.0 Gb/s data transfer rates
<b>IDE</b>	One 40-pin IDE connector
<b>CompactFlash®</b>	One CF Type II slot
<b>SMBus</b>	One 4-pin wafer SMBus connector
<b>TPM</b>	One TPM module connector via 20-pin header
<b>Environmental and Power Specifications</b>	
<b>Power Supply</b>	ATX power supported
<b>Power Consumption</b>	5 V @ 5.45 A 12 V @ 4.80 A 3.3 V @ 0.16 A -12 V @ 0.06 A (2.83 GHz Intel® Core™2 Quad Q9550 with 2 GB 1333 MHz DDR3 DIMM)
<b>Operating temperature</b>	-10°C ~ 60°C, requires cooler and silicone heat sink paste
<b>Humidity</b>	5% ~ 95% (non-condensing)
<b>Physical Specifications</b>	
<b>Dimensions</b>	305 mm x 244 mm
<b>Weight (Gross/Net)</b>	1200 g / 750 g

**Table 1-1: Technical Specifications**

Chapter

2

# Packing List

---



## 2.1 Anti-static Precautions

---



### WARNING!

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

---

Make sure to adhere to the following guidelines:

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

## 2.2 Unpacking Precautions

When the IMBA-G410 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.

## IMBA-G410 ATX Motherboard







### 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-G410 was purchased from or contact an IEI sales representative directly by sending an email to [sales@iei.com.tw](mailto:sales@iei.com.tw).

The IMBA-G410 is shipped with the following components:





Quantity	Item and Part Number	Image
1	IMBA-G410 SBC	
2	SATA cable (P/N: 32000-062800-RS)	
2	Dual RS-232 cable (P/N: 19800-000051-RS)	
1	Mini jumper pack (2.54mm) (P/N:33100-000079-RS)	
1	I/O shielding (P/N:45014-0017C0-00-RS)	
1	Utility CD	

Quantity	Item and Part Number	Image
1	Quick Installation Guide	







**Table 2-1: Packing List**

## 2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
CPU cooler kit (P/N: CF-520-RS-R11)	
CPU cooler kit (P/N: CF-775A-RS)	
CPU cooler (P/N: CF-775B-RS)	
ATA 66/100 flat cable (P/N: 32200-000052-RS)	

## IMBA-G410 ATX Motherboard

Item and Part Number	Image
USB cable <b>(P/N: CB-USB02-RS)</b>	
4 USB cable <b>(P/N: 19800-000100-200-RS)</b>	
SATA power cable <b>(P/N: 32102-000100-200-RS)</b>	
DVI output SDVO card <b>(P/N: SDVO-100DVI-R10)</b>	
VGA output SDVO card <b>(P/N: SDVO-100VGA-R10)</b>	
Infineon TPM module <b>(P/N: TPM-IN01-R11)</b>	

**Table 2-2: Optional Items**



Chapter

3

# Connectors

---



# IMBA-G410 ATX Motherboard

## 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

### 3.1.1 Layout

The figure below shows all the connectors and jumpers.

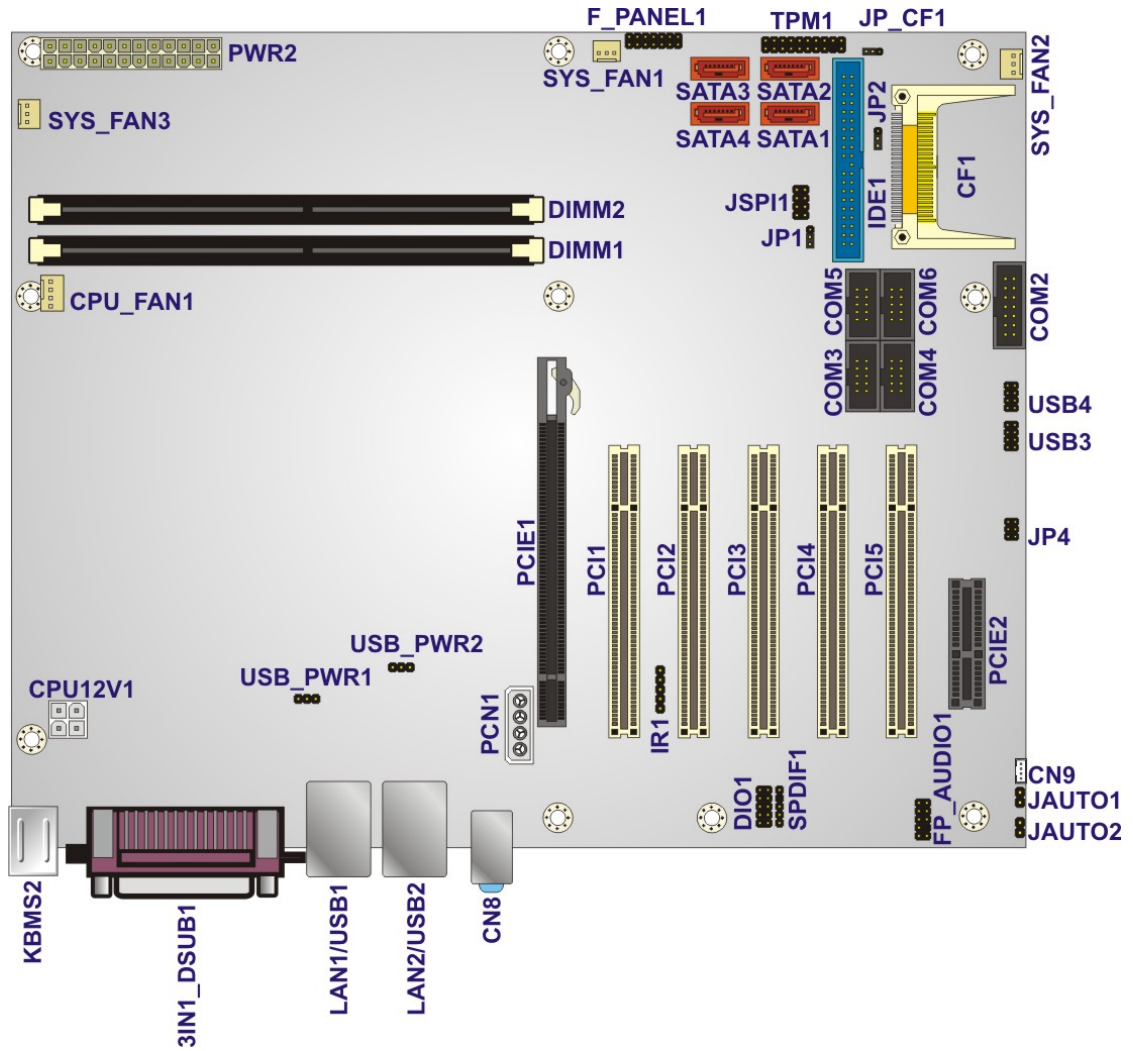


Figure 3-1: Connectors and Jumpers

### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin header	FP_AUDIO1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	SYS_FAN1, SYS_FAN2, SYS_FAN3
CPU power input connector	4-pin connector	CPU12V1
Digital I/O connector	10-pin header	DIO1
Front panel connector	14-pin header	F_PANEL1
IDE connector	40-pin box header	IDE1
Infrared connector	5-pin header	IR1
Memory slot	240-pin DDR3 DIMM slot	DIMM1, DIMM2
PCI slots	PCI slot	PCI1, PCI2, PCI3, PCI4, PCI5
PCIe x4 slot	PCIe x4 slot	PCIE2
PCIe x16 slot	PCIe x16 slot	PCIE1
PCIe power connector	4-pin connector	PCN1
Power connector	24-pin connector	PWR2
RS-232 serial port connector	10-pin box header	COM3, COM4, COM5, COM6
RS-232/422/485 serial port connector	14-pin box header	COM2
SATA drive connectors	7-pin SATA drive connectors	SATA1, SATA2, SATA3, SATA4
SMBus connector	4-pin wafer	CN9
SPDIF connector	5-pin header	SPDIF1

## IMBA-G410 ATX Motherboard

Connector	Type	Label
SPI Flash	8-pin header	JSPI1
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB3, USB4

**Table 3–1: Internal Peripheral 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	CN8
Keyboard/Mouse connector	PS/2	KBMS2
LAN connector	RJ-45	LAN1, LAN2
Parallel port	DB-25 Female	3IN1_DSUB1A
Serial port connector	DB-9 Male	3IN1_DSUB1B
USB connector	USB port	USB1, USB2
VGA connector	15-pin Female	3IN1_DSUB1C

**Table 3–2: External Peripheral Connectors**

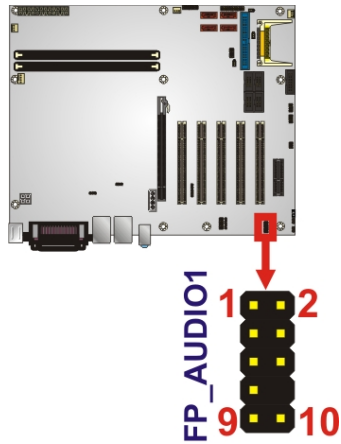
## 3.2 Internal Peripheral Connectors

The section describes all of the connectors on the IMBA-G410.

### 3.2.1 Audio Connector

<b>CN Label:</b>	<b>FP_AUDIO1</b>
<b>CN Type:</b>	10-pin header
<b>CN Location:</b>	See <b>Figure 3-2</b>
<b>CN Pinouts:</b>	See <b>Table 3-3</b>

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


**Figure 3-2: Audio Connector Location**

Pin	Description	Pin	Description
1	MIC_L	2	Audio GND
3	MIC_R	4	FP_AUO_DETECT
5	LINE_R	6	PD
7	F_SENSE	8	NC
9	LINE_L	10	PD

**Table 3-3: Audio Connector Pinouts**

### 3.2.2 CPU Fan Connector

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

The fan connector attaches to a CPU cooling fan.

## IMBA-G410 ATX Motherboard

### CPU\_FAN1

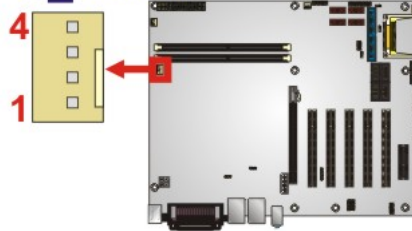


Figure 3-3: CPU Fan Connector Location

Pin	Description
1	GND
2	+12 V
3	FANIN1
4	Fan Control1

Table 3-4: CPU Fan Connector Pinouts

### 3.2.3 System Fan Connectors

**CN Label:** SYS\_FAN1, SYS\_FAN2, SYS\_FAN3

**CN Type:** 3-pin wafer

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

**CN Pinouts:** See Table 3-5 and Table 3-6

The fan connector attaches to a system cooling fan.

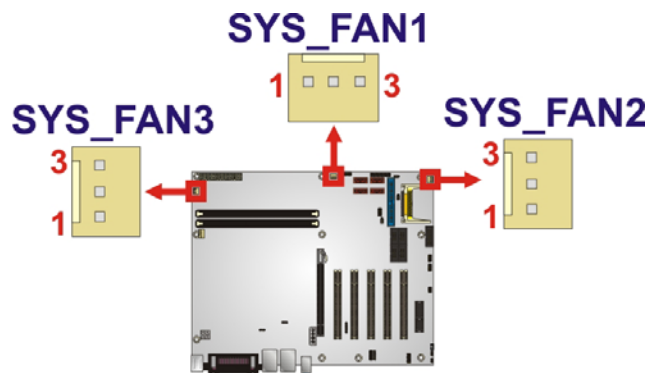


Figure 3-4: System Fan Connector Locations



Pin	Description
1	FANIN2
2	+12 V
3	GND

**Table 3-5: System Fan Connector Pinouts (SYS\_FAN1)**

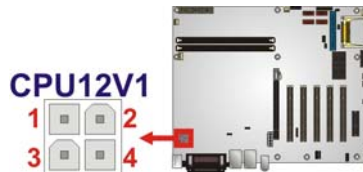
Pin	Description
1	NC
2	+12 V
3	GND

**Table 3-6: System Fan Connector Pinouts (SYS\_FAN2 and SYS\_FAN3)**

### 3.2.4 CPU Power Input Connector

- CN Label:** CPU12V1
- CN Type:** 4-pin connector
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-7**

The CPU power input connector provides power to the CPU.


**Figure 3-5: CPU Power Input Connector Location**

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

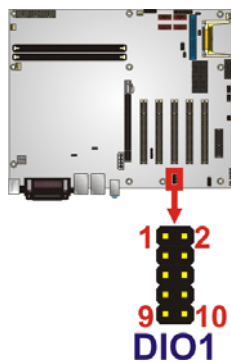
**Table 3-7: CPU Power Input Connector Pinouts**

## IMBA-G410 ATX Motherboard

### 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 3-8**

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	VCC5S
3	Output 0	4	Output 1
5	Output 2	6	Output 3
7	Input 0	8	Input 1
9	Input 2	10	Input 3

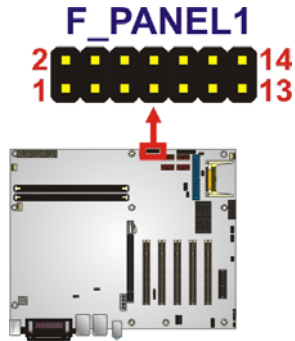
**Table 3-8: Digital I/O Connector Pinouts**

### 3.2.6 Front Panel Connector

- CN Label:** F\_PANEL1
- CN Type:** 14-pin header
- CN Location:** See **Figure 3-7**

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

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



**Figure 3-7: Front Panel Connector Location**

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	Power LED	Buzzer	2	BEEP_PWR
	3	NC		4	NC
	5	GND		6	NC
Power Button	7	PWRBTSW#		8	PC_BEEP
	9	GND	--	10	NC
HDD LED	11	HDD LED+	Reset	12	RESET
	13	HDD LED-		14	GND

**Table 3-9: Front Panel Connector Pinouts**

### 3.2.7 IDE Connector

**CN Label:** IDE1

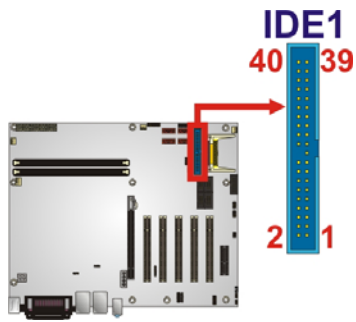
**CN Type:** 40-pin box header (2x20)

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

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

The IDE connector can connect to an IDE hard drive or optical device.

# IMBA-G410 ATX Motherboard



**Figure 3-8: IDE Connector Location**

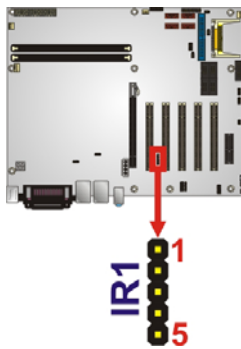
Pin	Description	Pin	Description
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND-DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

**Table 3-10: IDE Connector Pinouts**

### 3.2.8 Infrared Interface Connector

- CN Label:** IR1
- CN Type:** 5-pin header (1x5)
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-11**

The infrared connector attaches to an infrared receiver for use with remote controls.



**Figure 3-9: Infrared Connector Location**

Pin	Description
1	+5V
2	NC
3	IR-RX
4	GND
5	IR-TX

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

### 3.2.9 Memory Slots

- CN Label:** DIMM1, DIMM2
- CN Type:** DIMM slot
- CN Location:** See **Figure 3-10**

The DIMM slots are for DDR3 DIMM memory modules.



## IMBA-G410 ATX Motherboard

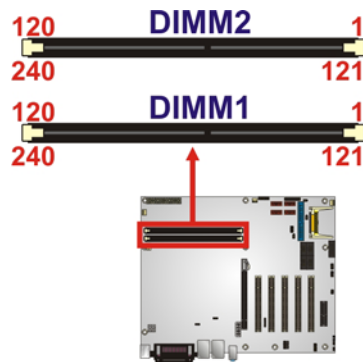


Figure 3-10: Memory Card Slot Locations

### 3.2.10 PCIe Power Input Connector

- CN Label:** PNC1
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-12**

The PCIe power input connector provides extra power to the PCIe card.

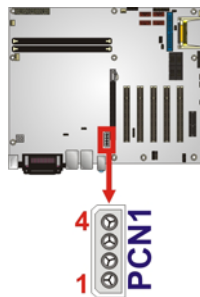


Figure 3-11: PCIe Power Input Connector Location

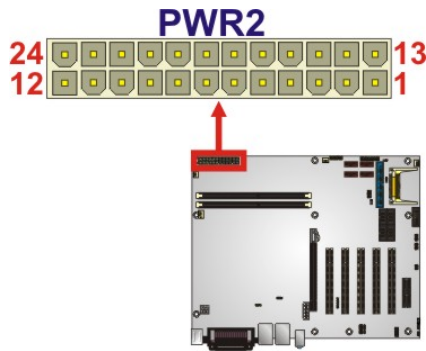
Pin	Description
1	VCC +5 V
2	GND
3	GND
4	VCC +12 V

Table 3-12: PCIe Power Input Connector Pinouts

### 3.2.11 Power Connector

- CN Label:** PWR2
- CN Type:** 24-pin connector
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-13**

The power connector connects to an ATX power supply.



**Figure 3-12: Power Connector 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 3-13: Power Connector Pinouts**

## IMBA-G410 ATX Motherboard

### 3.2.12 RS-232 Serial Port Connectors

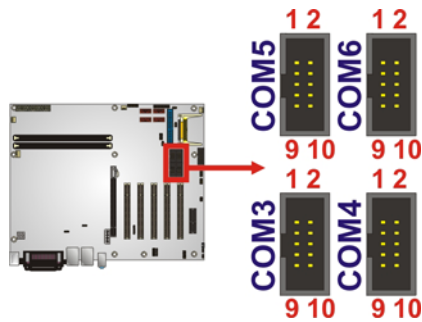
**CN Label:** COM3, COM4, COM5, COM6

**CN Type:** 10-pin box header

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

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

This connector provides RS-232 communications.



**Figure 3-13: Serial Port Connector Locations**

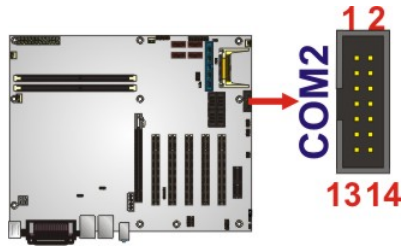
Pin	Description
1	NRLSD
2	NDSR
3	NRX
4	NRTS
5	NTX
6	NCTS
7	NDTR
8	NRI
9	GND
10	NC

**Table 3-14: Serial Port Connector Pinouts**

### 3.2.13 RS-232/422/485 Serial Port Connector

- CN Label:** COM2
- CN Type:** 14-pin box header
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-15**

This connector provides RS-232, RS-422 or RS-485 communications.



**Figure 3-14: RS-232/422/485 Serial Port Connector Location**

Pin	Description	Pin	Description
1	NDCD	2	NDSR
3	NRX	4	NRTS
5	NTX	6	NCTS
7	NDTR	8	NRI
9	GND	10	NC
11	TX+	12	TX-
13	RX+	14	RX-

**Table 3-15: RS-232/422/485 Serial Port Connector Pinouts**

### 3.2.14 SATA Drive Connectors

- CN Label:** SATA1, SATA2, SATA3, SATA4
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See **Figure 3-15**

The SATA drive connectors can be connected to SATA 3Gb/s drives.

## IMBA-G410 ATX Motherboard

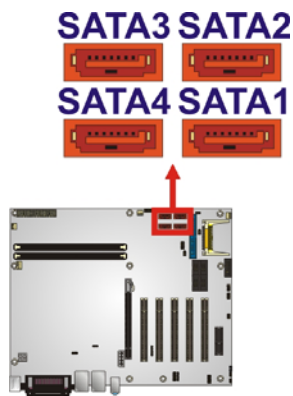


Figure 3-15: SATA Drive Connector Locations

### 3.2.15 SMBus Connector

<b>CN Label:</b>	<b>CN9</b>
<b>CN Type:</b>	4-pin wafer
<b>CN Location:</b>	See <b>Figure 3-16</b>
<b>CN Pinouts:</b>	See <b>Table 3-16</b>

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

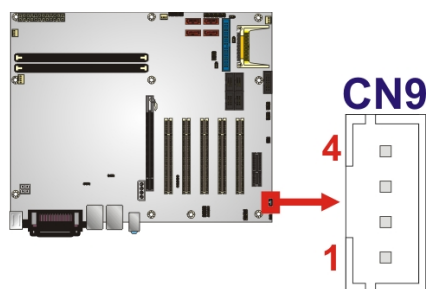


Figure 3-16: SMBus Connector Location

Pin	Description
1	GND
2	SMBDATA



Pin	Description
3	SMBCLK
4	+5V

**Table 3-16: SMBus Connector Pinouts**

### 3.2.16 SPDIF Connector

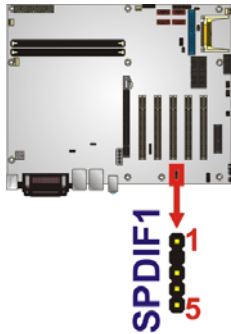
**CN Label:** SPDIF1

**CN Type:** 5-pin header

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

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

Use the SPDIF connector to connect digital audio devices to the system.


**Figure 3-17: SPDIF Connector Location**

Pin	Description
1	+5V
2	NC
3	SPDIF OUT
4	GND AUDIO
5	SPDIF IN

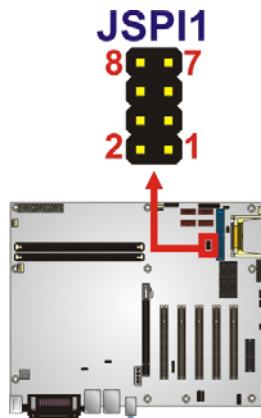
**Table 3-17: SPDIF Connector Pinouts**

## IMBA-G410 ATX Motherboard

### 3.2.17 SPI Flash Connector

<b>CN Label:</b>	<b>JSPI1</b>
<b>CN Type:</b>	8-pin header
<b>CN Location:</b>	See <b>Figure 3-18</b>
<b>CN Pinouts:</b>	See <b>Table 3-18</b>

The 8-pin SPI Flash connector is used to flash the BIOS.



**Figure 3-18: SPI Flash Connector Location**

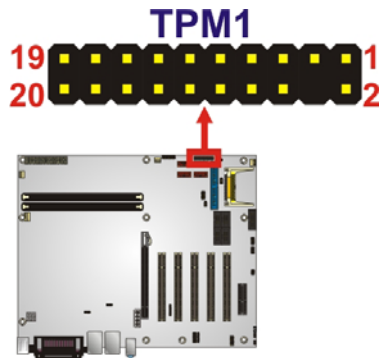
Pin	Description	Pin	Description
1	+3.3V	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	NC	8	NC

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

### 3.2.18 TPM Connector

<b>CN Label:</b>	<b>TPM1</b>
<b>CN Type:</b>	20-pin header (2x10)
<b>CN Location:</b>	See <b>Figure 3-19</b>
<b>CN Pinouts:</b>	See <b>Table 3-19</b>

The Trusted Platform Module (TPM) connector secures the system on bootup.



**Figure 3-19: TPM Connector Pinout Location**

Pin	Description	Pin	Description
1	TPMCLK	2	GND
3	LFRAME-	4	NC
5	PCIRST4-	6	+5 V
7	LAD3	8	LAD2
9	LAD0	10	LAD1
11	GND	12	GND
13	SMBCLK_MAIN	14	SMBDATA_MAIN
15	+3.3 V	16	SERIRQ
17	GND	18	CLKRUN-
19	+3.3 V	20	LDRQ-

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

### 3.2.19 USB Connectors

**CN Label:** USB3, USB4

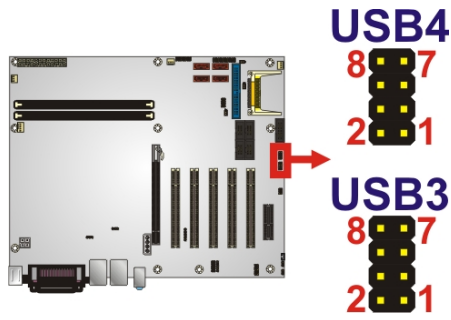
**CN Type:** 8-pin header

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

**CN Pinouts:** See **Table 3-20**

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

**IMBA-G410 ATX Motherboard**



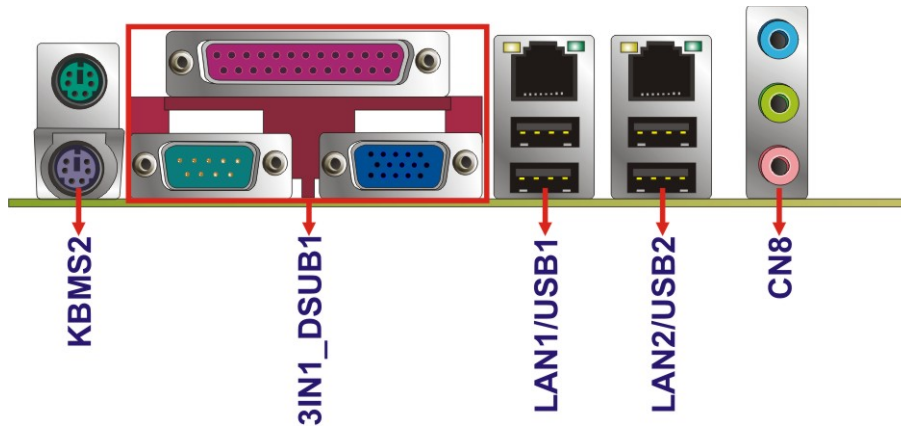
**Figure 3-20: USB Connector Pinout Locations**

Pin	Description	Pin	Description
1	+5V	2	GND
3	USBP4/6#	4	USBP5/7
5	USBP4/6	6	USBP5/7#
7	GND	8	+5V

**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 3-21: External Peripheral Interface Connector**

### 3.3.1 Audio Connectors

<b>CN Label:</b>	<b>CN8</b>
<b>CN Type:</b>	Audio jacks
<b>CN Location:</b>	See <b>Figure 3-21</b>

The audio jacks connect to external audio devices.

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

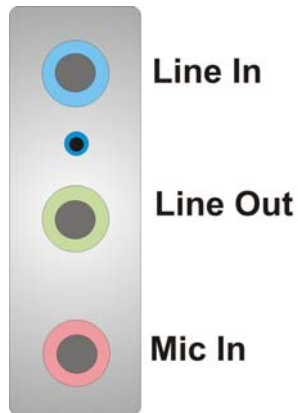


Figure 3-22: Audio Connector

### 3.3.2 Keyboard/Mouse Connector

<b>CN Label:</b>	<b>KBMS2</b>
<b>CN Type:</b>	PS/2
<b>CN Location:</b>	See <b>Figure 3-21</b>
<b>CN Pinouts:</b>	See <b>Table 3-21, Figure 3-23</b>

The keyboard and mouse connector is a standard PS/2 connector.



## IMBA-G410 ATX Motherboard

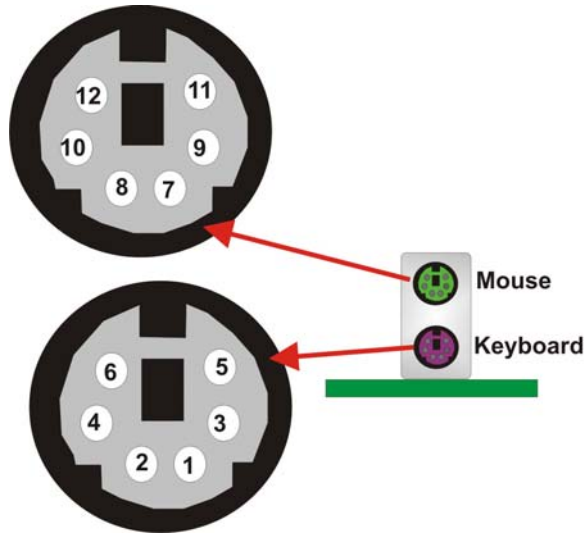


Figure 3-23: PS/2 Pinout and Configuration

Pin	Description	Pin	Description
1	KB_DATA	8	NC
2	NC	9	GND
3	GND	10	5 V
4	5 V	11	MS_CLK
5	KB_CLK	12	NC
6	NC	13	KB_GND
7	MS_DATA	14	KB_GND

Table 3-21: Keyboard Connector Pinouts

### 3.3.3 LAN Connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 3-21
- CN Pinouts:** See Table 3-22

The LAN connector connects to a local network.

Pin	Description	Pin	Description
1	3.3 V	8	LAN1/2_MDI3+
2	LAN1/2_MDI0+	9	LAN1/2_MDI3-
3	LAN1/2_MDI0-	10	GND
4	LAN1/2_MDI1+	11	LAN1/2_LINK100
5	LAN1/2_MDI1-	12	LAN1/2_LINK1000
6	LAN1/2_MDI2+	13	LAN1/2_LED0
7	LAN1/2_MDI2-	14	3.3 V

**Table 3-22: LAN Pinouts**

### 3.3.4 Parallel Port Connector

- CN Label:** 3IN1\_DSUB1A
- CN Type:** DB-25 Female
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-23**

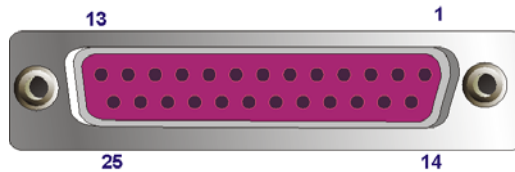
The parallel port connects to parallel port device, typically a printer.

Pin	Description	Pin	Description
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	25	GROUND

## IMBA-G410 ATX Motherboard

Pin	Description	Pin	Description
13	PRINTER SELECT		

**Table 3-23: Parallel Port Connector Pinouts**



**Figure 3-24: Parallel Port Connector Location**

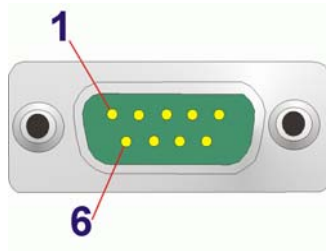
### 3.3.5 Serial Port Connector (COM1)

- CN Label:** 3IN1\_DSUB1B (COM1)
- CN Type:** DB-9 Male
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-24** and **Figure 3-25**

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

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

**Table 3-24: Serial Port Pinouts**


**Figure 3-25: Serial Port Pinouts**

### 3.3.6 USB Connectors

- CN Label:** USB1, USB2
- CN Type:** USB port
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-25**

The USB connector can be connected to a USB device.

Pin	Description	Pin	Description
1	USBPWR1	2	USBP0/2-
3	USBP0/2+	4	GND
5	USBPWR1	6	USBP1/3-
7	USBP1/3+	8	GND

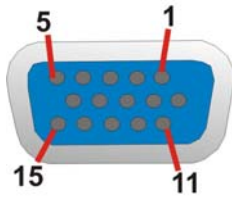
**Table 3-25: USB Port Pinouts**

### 3.3.7 VGA Connector

- CN Label:** 3IN1\_DSUB1C
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Figure 3-26** and **Table 3-26**

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

**IMBA-G410 ATX Motherboard**



**Figure 3-26: VGA Connector**

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	CRT_PLUG#
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

**Table 3-26: VGA Connector Pinouts**





Chapter

4

# Installation

---

## IMBA-G410 ATX Motherboard

### 4.1 Anti-static Precautions

---



#### WARNING:

Failure to take ESD precautions during the installation of the IMBA-G410 may result in permanent damage to the IMBA-G410 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-G410. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-G410 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-G410, place it on an anti-static pad. This reduces the possibility of ESD damaging the IMBA-G410.
- **Only handle the edges of the PCB:** When handling the PCB, hold the PCB by the edges.

### 4.2 Installation Considerations

---



#### NOTE:

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

---

**WARNING:**

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

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

- Read the user manual:
  - The user manual provides a complete description of the IMBA-G410 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-G410 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-G410 off:
  - When working with the IMBA-G410, 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-G410 **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.

## IMBA-G410 ATX Motherboard

### 4.3 Basic Installation

This section outlines the parts that must be installed for the system to function correctly.

#### 4.3.1 CPU Installation



##### NOTE:

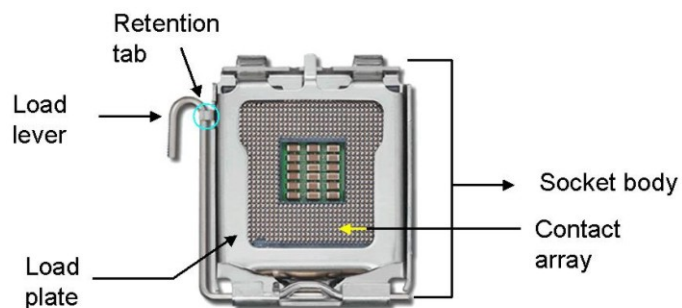
To enable Hyper-Threading, the CPU and chipset must both support it.



##### 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.

The LGA775 socket is shown in **Figure 4-1**.



**Figure 4-1: Intel LGA775 Socket**

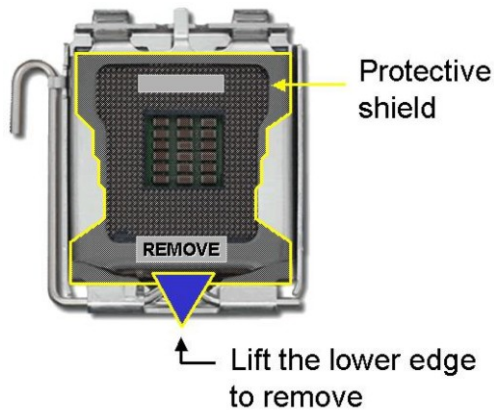
To install the CPU, follow the steps below.



**WARNING:**

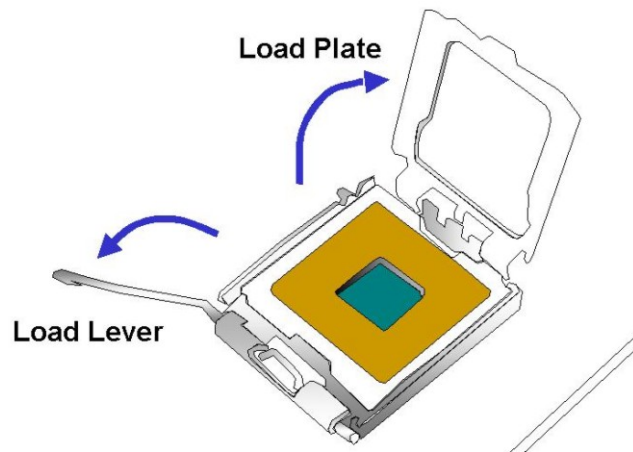
DO NOT touch the pins at the bottom of the CPU. When handling the CPU, only hold it on the sides.

**Step 1:** Remove the protective cover. The black protective cover can be removed by pulling up on the tab labeled "Remove". See **Figure 4-2**.



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

**Step 2:** Open the socket. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Fully open the lever, then open the load plate. See **Figure 4-3**.

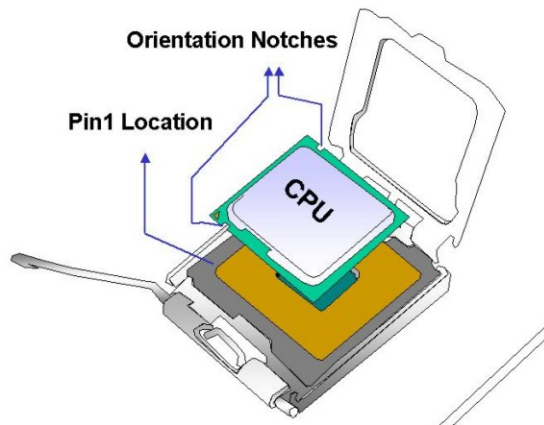


**Figure 4-3: CPU Socket Load Plate**



## IMBA-G410 ATX Motherboard

- 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 4-4.**



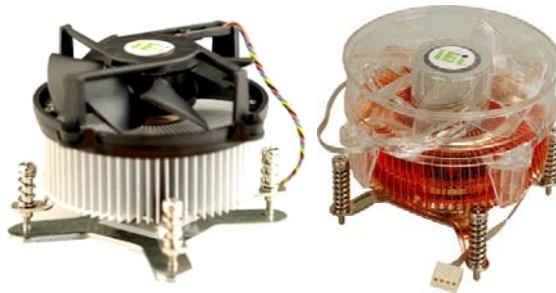
**Figure 4-4: Insert the Socket LGA775 CPU**

- Step 8:** **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. There will be some resistance, but will not require extreme pressure.
- Step 9:** **Connect the 12 V power to the board.** Connect the 12 V power from the power supply to the board.

### 4.3.2 Cooling Kit Installation

**WARNING:**

DO NOT use the original Intel® heat sink and fan. A proprietary one is recommended.



**Figure 4-5: Cooling Kits**

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

**WARNING:**

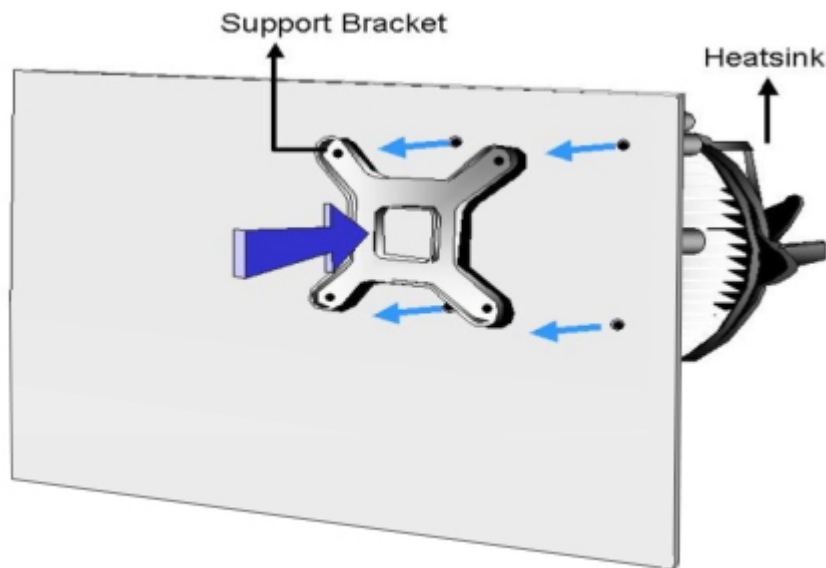
Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

- Step 1:** Place the cooling kit onto the socket LGA775 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- Step 2:** Properly align the cooling kit. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

## IMBA-G410 ATX Motherboard

- 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 predrilled holes on the bottom of the PCB.
- Step 4: Secure the cooling kit.** From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 4-6**)

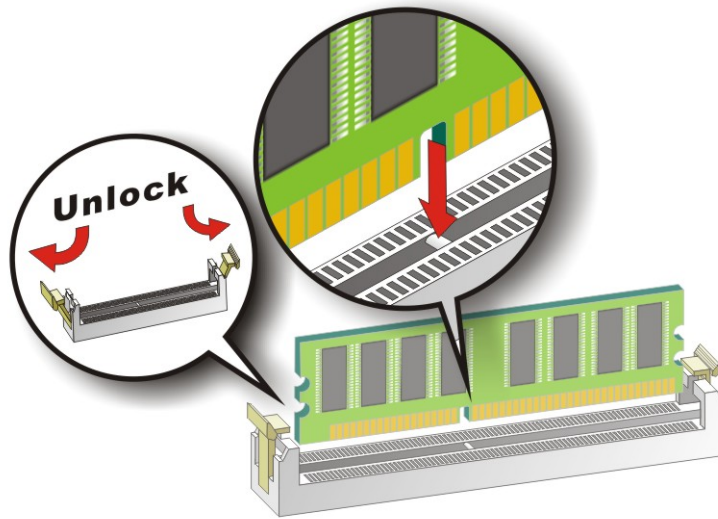


**Figure 4-6: Securing the Heat sink to the IMBA-G410**

- Step 5: Tighten the screws.** Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.
- Step 6: Connect the fan cable.** Connect the cooling kit fan cable to the fan connector on the IMBA-G410. Carefully route the cable and avoid heat generating chips and fan blades.

### 4.3.3 DIMM Installation

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



**Figure 4-7: DIMM Installation**

- Step 1: Open the DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-7**.
- Step 2: Align the DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-7**.
- Step 3: Insert the DIMM.** Once aligned, press down until the DIMM is properly seated. Clip the two handles into place. See **Figure 4-7**.
- Step 4: Removing a DIMM.** To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

### 4.3.4 Motherboard Installation

To install the IMBA-G410 motherboard into the chassis please refer to the reference material that came with the chassis.

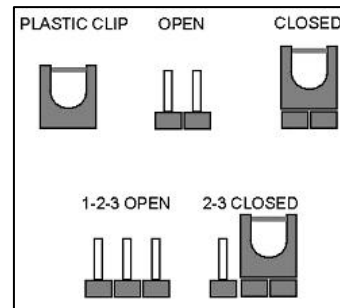


## 4.4 Jumper Settings



### NOTE:

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



The IMBA-G410 includes some jumpers shown in **Table 4-1**.

Description	Label	Type
AT/ATX power select jumpers	JAUTO1, JAUTO2	2-pin header
Clear CMOS jumper	JP1	3-pin header
COM2 function select jumper	JP4	6-pin header
CompactFlash® setup	JP2	2-pin header
CF voltage select jumper	JP_CF1	3-pin header
USB power select jumpers	USBPWR1, USBPWR2	3-pin header

**Table 4-1: Jumpers**

### 4.4.1 AT/ATX Power Select Jumpers

**Jumper Label:** JAUTO1, JAUTO2

**Jumper Type:** 2-pin header

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

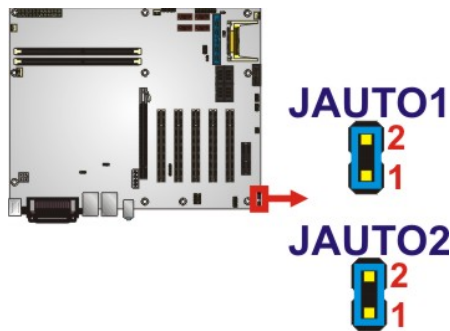


**Jumper Location:** See **Figure 4-8**

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

Setting	Description
Short	Use AT power (Default)
Open	Use ATX power

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



**Figure 4-8: AT/ATX Power Select Jumper Location**

#### 4.4.2 Clear CMOS Jumper

**Jumper Label:** JP1  
**Jumper Type:** 3-pin header  
**Jumper Settings:** See **Table 4-3**  
**Jumper Location:** See **Figure 4-9**

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

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

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

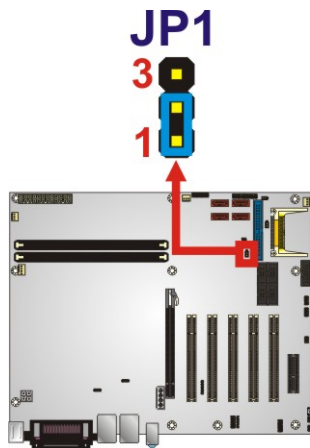


Figure 4-9: Clear BIOS Jumper Location

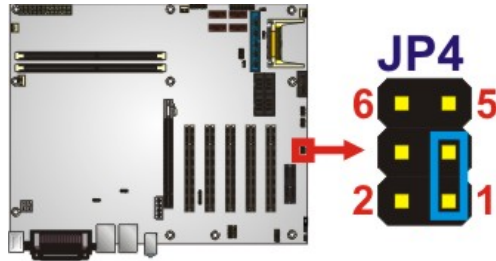
#### 4.4.3 COM 2 Function Select Jumper

- Jumper Label:** JP4
- Jumper Type:** 6-pin header
- Jumper Settings:** See Table 4-4
- Jumper Location:** See Figure 4-10

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 4-4**.

Setting	Description
Short 1-3	RS-232 (Default)
Short 2-4, 3-5	RS-422
Short 3-5, 4-6	RS-485

Table 4-4: COM 2 Function Select Jumper Settings



**Figure 4-10: COM 2 Function Select Jumper Location**

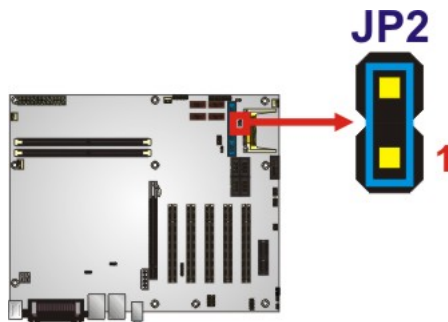
#### 4.4.4 CompactFlash® Setup

- Jumper Label:** JP2
- Jumper Type:** 2-pin header
- Jumper Settings:** See Table 4-5
- Jumper Location:** See Figure 4-11

The CompactFlash® slot is connected through an IDE connection. This jumper sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
Short	Master (Default)
Open	Slave

**Table 4-5: CompactFlash® Setup Jumper Settings**



**Figure 4-11: CompactFlash® Setup Jumper Location**

## IMBA-G410 ATX Motherboard

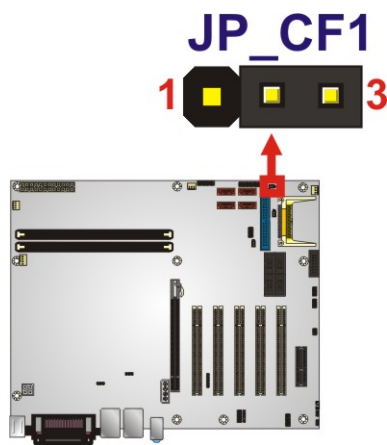
### 4.4.5 CF Voltage Select Jumper

<b>Jumper Label:</b>	<b>JP_CF1</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 4-6</b>
<b>Jumper Location:</b>	See <b>Figure 4-12</b>

The CF voltage select jumper sets the voltage of the CompactFlash® slot.

Setting	Description
Short 1-2	+5.0 V
Short 2-3	+3.3 V

**Table 4-6: LCD Voltage Selection Jumper Settings**



**Figure 4-12: LCD Voltage Selection Jumper Location**

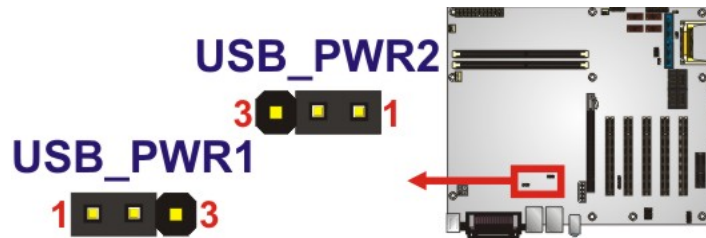
### 4.4.6 USB Power Select Jumpers

<b>Jumper Label:</b>	<b>USBPW12, USBP34</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 4-7</b>
<b>Jumper Location:</b>	See <b>Figure 4-13</b>

The USB Power Select jumper specifies the USB power.

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

**Table 4-7: USB Power Select Jumper Settings**



**Figure 4-13: USB Power Select Jumper Location**

## 4.5 Internal Peripheral Device Connections

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

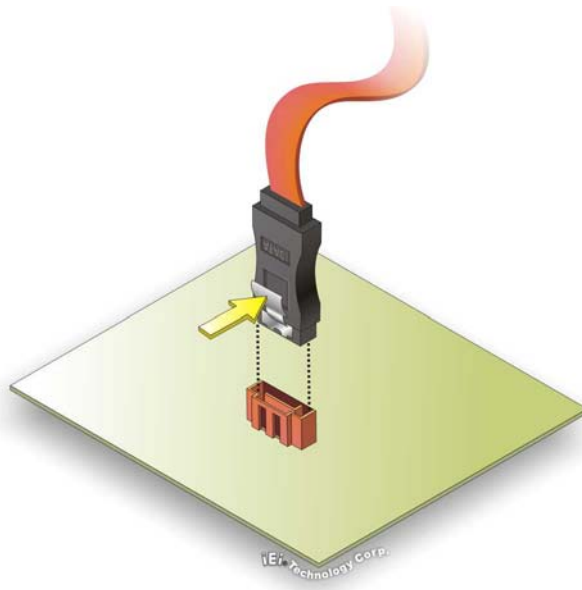
### 4.5.1 SATA Drive Connection

The IMBA-G410 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

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

**Step 2: Insert the cable connector.** Press the clip on the connector at the end of the SATA cable and insert the cable connector into the on-board SATA drive connector. See **Figure 4-14**.





**Figure 4-14: 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 4-15**.
- Step 4:** **Connect the SATA power cable.** Connect the SATA power connector to the back of the SATA drive. See **Figure 4-15**.

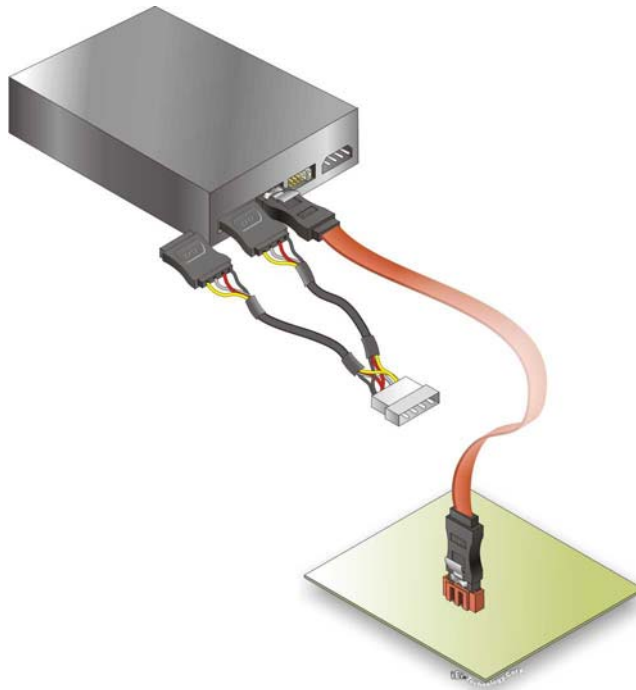


Figure 4-15: SATA Power Drive Connection

#### 4.5.2 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

**Step 1: Locate the connectors.** The locations of the RS-232 connectors are shown in Chapter 3.

**Step 2: Insert the cable connectors.** Insert one connector into each serial port box headers. See Figure 4-16. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

## IMBA-G410 ATX Motherboard

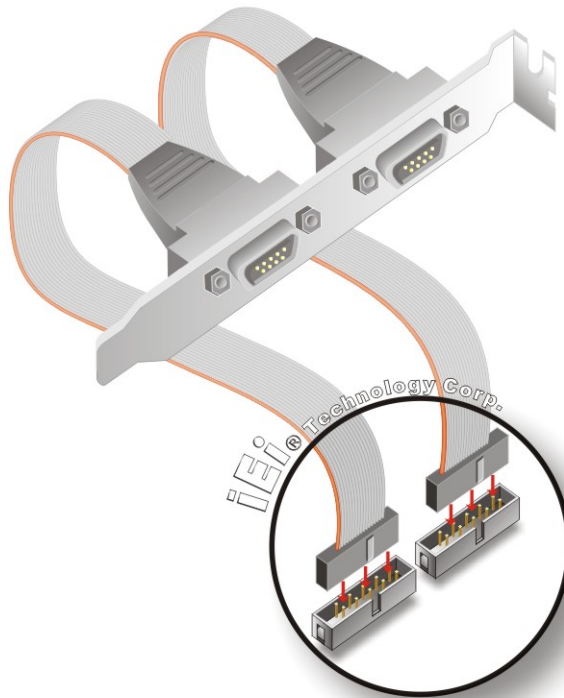


Figure 4-16: Dual RS-232 Cable Installation

**Step 3: Secure the bracket.** The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

## 4.6 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the IMBA-G410.

### 4.6.1 Audio Connector

The audio jacks on the external audio connector enable the IMBA-G410 to be connected to a stereo sound setup. 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. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

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

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

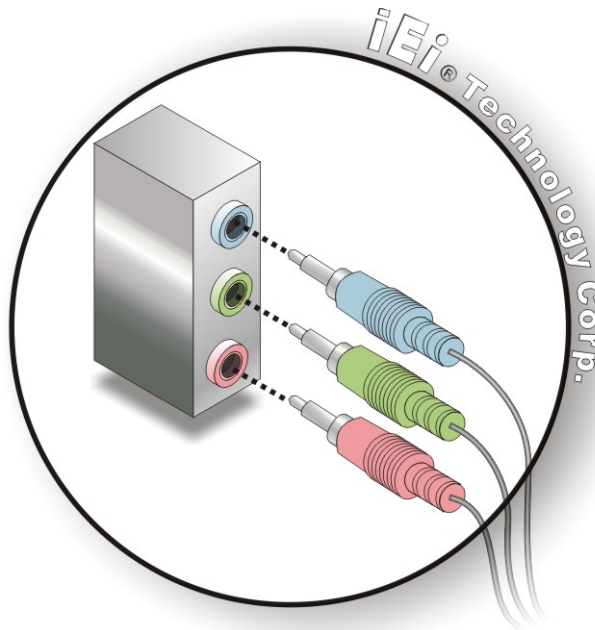


Figure 4-17: Audio Connector

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

#### 4.6.2 PS/2 Keyboard and Mouse Connection

The IMBA-G410 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-G410.

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



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**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 4-18.

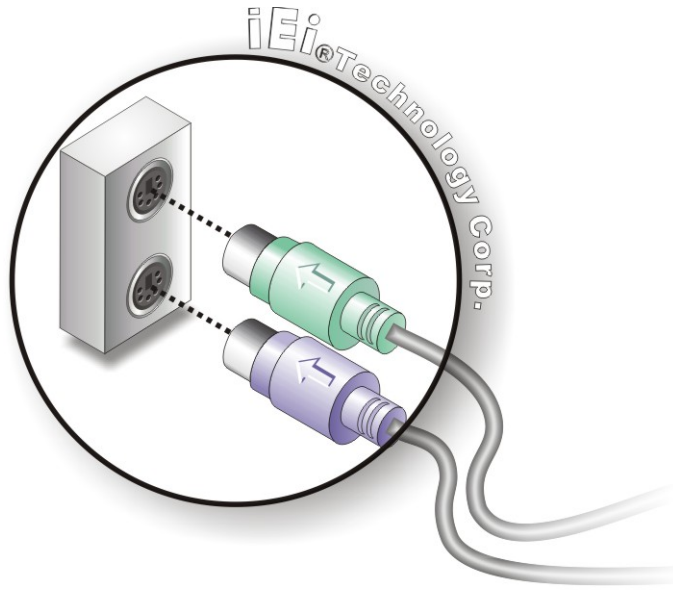


Figure 4-18: PS/2 Keyboard/Mouse Connector

### 4.6.3 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-G410. See **Figure 4-19**.



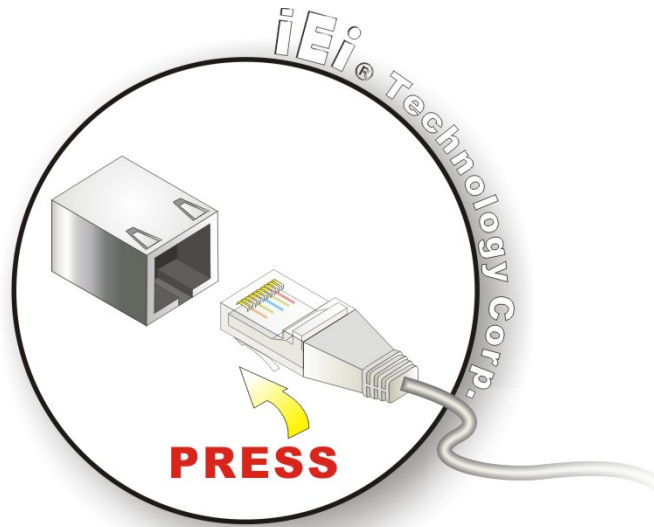


Figure 4-19: LAN Connection

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

#### 4.6.4 Parallel Device Connection

The IMBA-G410 has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the IMBA-G410.

**Step 1:** Locate the DB-25 connector. The location of the DB-25 connector is shown in Chapter 3.

**Step 2:** Insert the DB-25 connector. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 4-20.

## IMBA-G410 ATX Motherboard

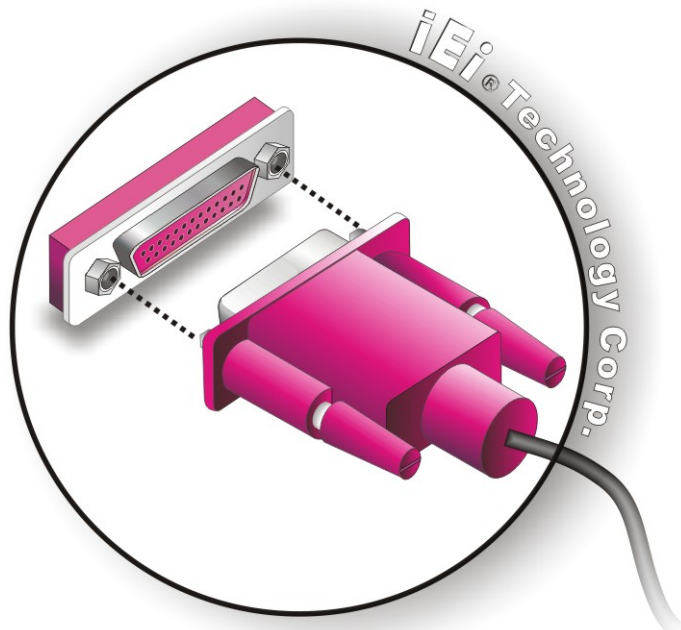


Figure 4-20: Parallel Device Connector

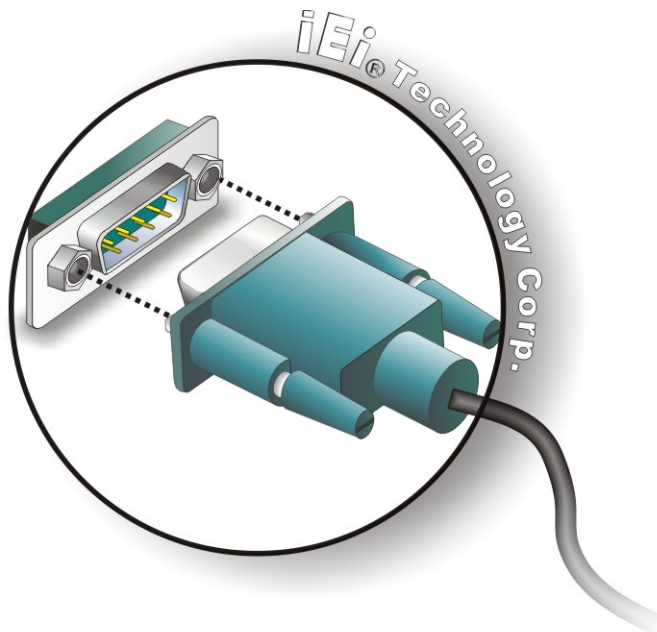
**Step 3:** **Secure the connector.** Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

### 4.6.5 Serial Device Connection

The IMBA-G410 has one male DB-9 connectors on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-G410.

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

**Step 2:** **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-21.



**Figure 4-21: Serial Device Connector**

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

#### 4.6.6 USB Device Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-G410.

**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 4-22**.

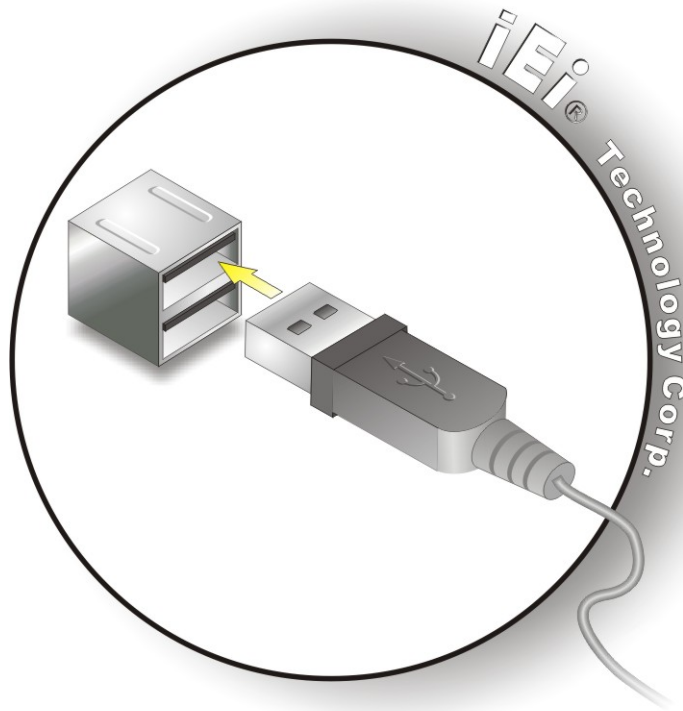


Figure 4-22: USB Connector

#### 4.6.7 VGA Monitor Connection

The IMBA-G410 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-G410, 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-G410. See **Figure 4-23**.



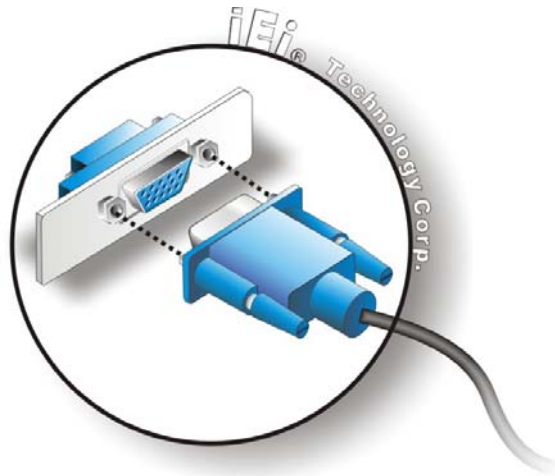


Figure 4-23: VGA Connector

**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.

## 4.7 Software Installation

All the drivers for the IMBA-G410 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.

**Step 3:** Click IMBA-G410.

**Step 4:** A new screen with a list of available drivers appears.

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



Chapter

5

# BIOS

---

## 5.1 Introduction

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

### 5.1.1 Starting Setup

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

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

If the message disappears before the **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, press **F1** for help and press **Esc** to quit. Navigation keys are shown below.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu

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F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F9	Load optimized defaults
F10	Save changes and Exit BIOS

**Table 5-1: BIOS Navigation Keys**

### 5.1.3 Getting Help

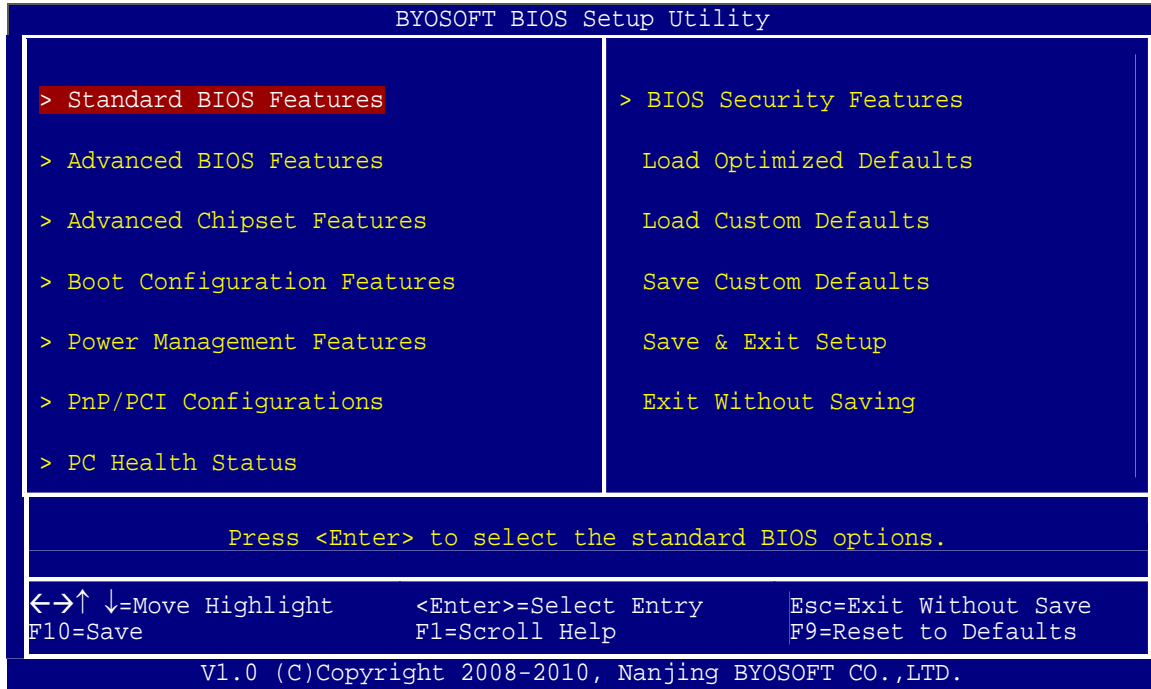
When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

### 5.1.4 Unable to Reboot After Configuration Changes

If the system cannot be booted after changes are made, restore the CMOS defaults. The CPU card should come with a restore CMOS settings jumper. Refer to **Section 4.4.2** for more information.

## 5.2 Main BIOS Menu

Once the BIOS opens, the main menu (**BIOS Menu 1**) appears.


**BIOS Menu 1: BYOSOFT BIOS Setup Utility**

**NOTE:**

The following sections will completely describe the menus listed below and the configuration options available to users.

The following menu options are seen in **BIOS Menu 1**.

- **Standard BIOS Features:** Changes the basic system configuration.
- **Advanced BIOS Features:** Changes the advanced system settings.
- **Advanced Chipset Features:** Changes the chipset configuration features.
- **Boot Configuration Features:** Changes the system boot configurations.
- **Power Management Features:** Configures power saving options.
- **PnP/PCI Configurations:** Changes the advanced PCI/PnP settings.
- **PC Health Status:** Monitors essential system parameters.
- **BIOS Security Features:** Sets passwords and HDD security.

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The following user configurable options are also available in **BIOS Menu 1**:

→ **Load Optimized Defaults**

Use the **Load Optimized Defaults** option to load optimal default values for each BIOS parameter in the setup menus. Press **F9** for this operation on any page.

→ **Load Custom Defaults**

Use the **Load Custom Defaults** option to load custom default values for each BIOS parameter in the setup menus.

→ **Save Custom Defaults**

Use the **Save Custom Defaults** option to save any configuration changes made to custom default.

→ **Save & Exit Setup**

Use the **Save & Exit Setup** option to save any configuration changes made and exit the BIOS menus.

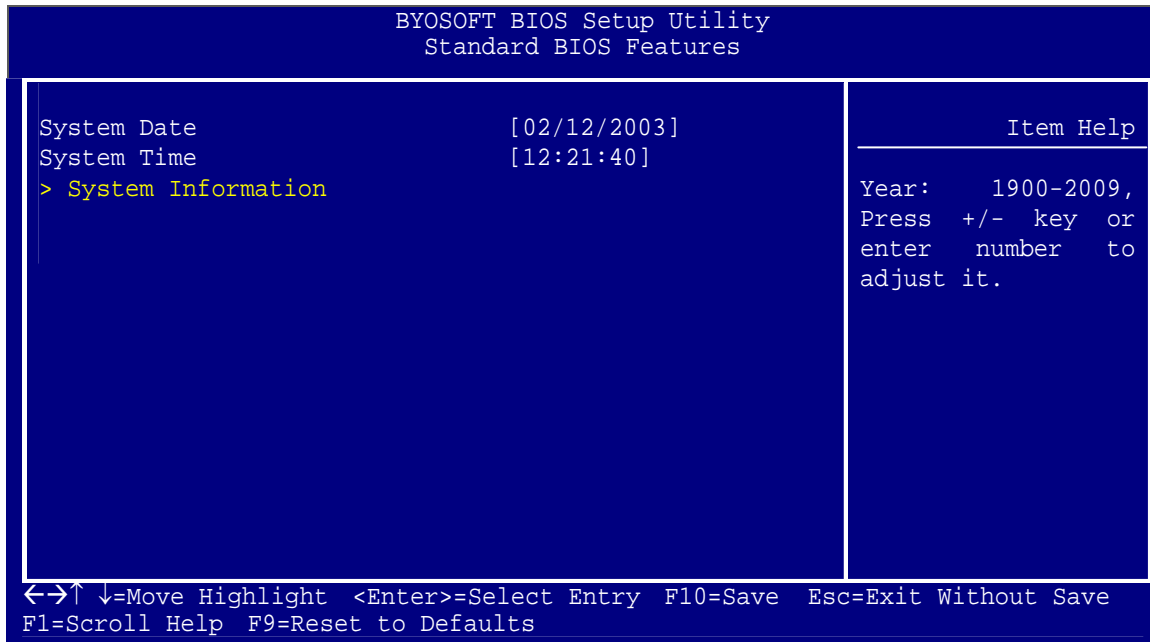
→ **Exit Without Saving**

Use the **Exit Without Saving** option to exit the BIOS menus without saving any configuration changes.



### 5.3 Standard BIOS Features

Use the **Standard BIOS Features** BIOS menu (**BIOS Menu 2**) to set basic BIOS configuration options.



#### BIOS Menu 2: Standard BIOS Features

##### → Date [Day mm:dd:yyyy]

Use the **Date** option to set the system date

##### → Time [hh/mm/ss]

Use the **Time** option to set the system time.

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### 5.3.1 System Information

Use the **System Information** BIOS menu (**BIOS Menu 3**) to view the system information.

```

BYOSOFT BIOS Setup Utility
Standard BIOS Features

BIOS Version          SA22BR11
Build Time            10/21/2010 21:47
Processor Type        Intel(R) Core(TM)2 Duo CPU
                      E7500 @ 2.93GHz
Processor Speed       2.93 GHz
System Bus Speed      1064 MHz
Microcode Revision    00000A07
Processor Stepping    0001067A
L2 Cache RAM
Total Memory          2048 MB
Usable Memory         2015 MB
Memory Mode           Single Channel Mode
Memory Channel A Slot 0 2048 MB (DDRIII1066)
Memory Channel B Slot 0 Not Installed

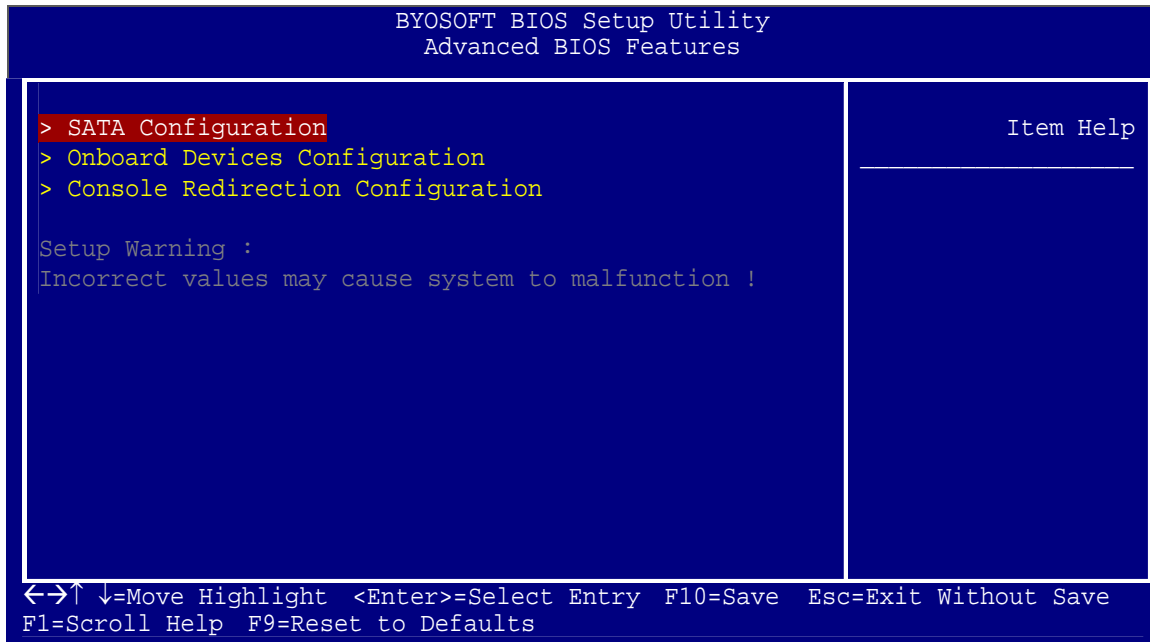
Item Help

←→↑↓=Move Highlight <Enter>=Select Entry F10=Save Esc=Exit Without Save
F1=Scroll Help F9=Reset to Defaults
  
```

**BIOS Menu 3: System Information**

## 5.4 Advanced BIOS Features

Use the **Advanced BIOS Features** menu (**BIOS Menu 4**) to configure the peripheral device configuration options.

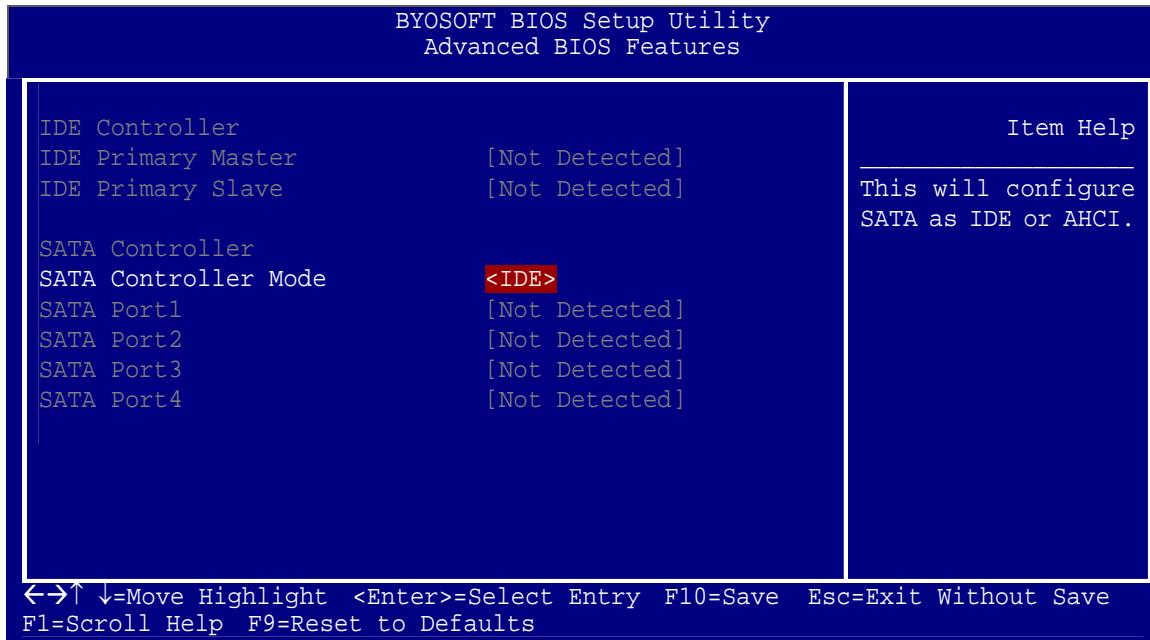


**BIOS Menu 4: Advanced BIOS Features**

### 5.4.1 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 5**) to configure the IDE and SATA device configuration options.

## IMBA-G410 ATX Motherboard



### BIOS Menu 5: SATA Configuration

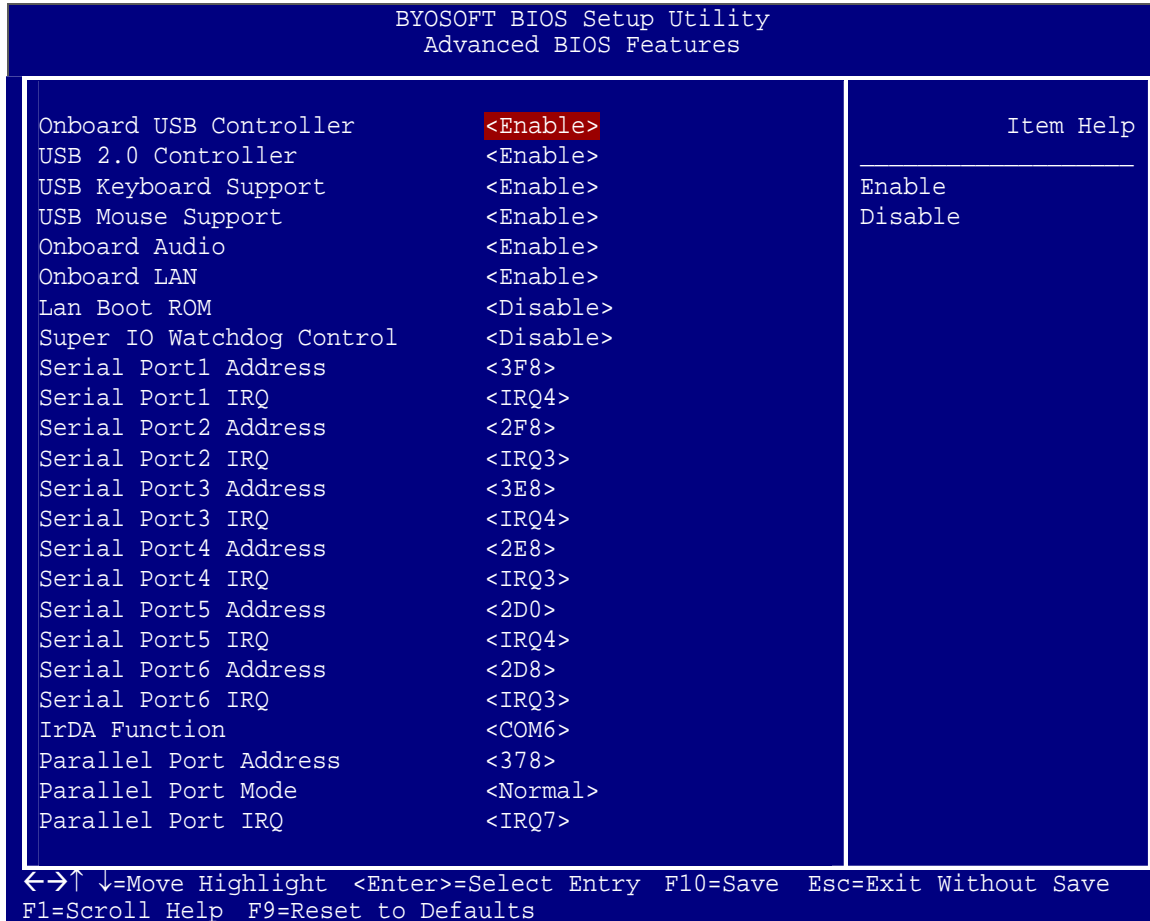
#### → SATA Controller Mode [IDE]

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

→ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

### 5.4.2 Onboard Devices Configuration

Use the **Onboard Devices Configuration** menu (**BIOS Menu 6**) to configure the onboard device configuration options.



### BIOS Menu 6: Onboard Devices Configuration

#### → Onboard USB Controller [Enable]

Use the **Onboard USB Controller** BIOS option to enable or disable the onboard USB controller

- **Enable**      **DEFAULT**      Onboard USB controller enabled
- **Disable**                      Onboard USB controller disabled

#### → USB 2.0 Controller [Enable]

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

- **Enable**      **DEFAULT**      USB 2.0 controller enabled
- **Disable**                      USB 2.0 controller disabled



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### → USB Keyboard Support [Enable]

Use the **USB Keyboard Support** option to enable or disable the use of a USB keyboard.

- **Enable**      **DEFAULT**      USB keyboard can be used
- **Disable**                      USB keyboard cannot be used

### → USB Mouse Support [Enable]

Use the **USB Mouse Support** option to enable or disable the use of a USB keyboard.

- **Enable**      **DEFAULT**      USB mouse can be used
- **Disable**                      USB mouse cannot be used

### → Onboard Audio [Enable]

Use the **Onboard Audio** option to enable or disable the onboard codec.

- **Enable**      **DEFAULT**      The onboard codec is detected and enabled.
- **Disable**                      The onboard codec is disabled.

### → Onboard LAN [Enable]

Use the **Onboard LAN** option to enable or disable the onboard LAN device.

- **Enable**      **DEFAULT**      The onboard LAN device is detected and enabled.
- **Disable**                      The onboard LAN device is disabled.

### → Lan Boot ROM [Disable]

Use the **Lan Boot ROM** option to enable the system to be booted from a remote system. The boot ROM needs to support RPL and PXE protocol. The default setting is for PXE protocol.

- **Enable**                      Can be booted from a remote system through the LAN
- **Disable**      **DEFAULT**      Cannot be booted from a remote system through the

## LAN

→ **Super IO Watchdog Control [Disable]**

Use the **Super IO Watchdog Control** option to enable or disable the watchdog function. If the watchdog is enabled, the default setting is 50 seconds. The minimum value is 50 seconds, while the maximum value is 255 seconds.

→ **Enable**                      The watchdog function is enabled. **Watchdog Timer Duration** option appears with the following option to select:

- 50 seconds
- 100 seconds
- 150 seconds
- 200 seconds
- 255 seconds

→ **Disable**      **DEFAULT**      The watchdog function is disabled.

→ **Serial Port1 Address [3F8]**

Use the **Serial Port1 Address** option to select the base addresses for serial port 1

→ **Disabled**                      No base address is assigned to serial port 1

→ **3F8**                      **DEFAULT**      Serial port 1 I/O port address is 3F8

→ **2F8**                      Serial port 1 I/O port address is 2F8

→ **3E8**                      Serial port 1 I/O port address is 3E8

→ **2E8**                      Serial port 1 I/O port address is 2E8

→ **2D0**                      Serial port 1 I/O port address is 2D0

→ **2D8**                      Serial port 1 I/O port address is 2D8

→ **Serial Port1 IRQ [IRQ4]**

Use the **Serial Port1 IRQ** option to select the interrupt address for serial port 1.

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- **IRQ3**                      Serial port 1 IRQ address is 3
- **IRQ4**    **DEFAULT**      Serial port 1 IRQ address is 4
- **IRQ10**                     Serial port 1 IRQ address is 10
- **IRQ11**                    Serial port 1 IRQ address is 11

### → **Serial Port2 Address [2F8]**

Use the **Serial Port2 Address** option to select the base addresses for serial port 2

- **Disabled**                      No base address is assigned to serial port 2
- **3F8**                              Serial port 2 I/O port address is 3F8
- **2F8**                    **DEFAULT**      Serial port 2 I/O port address is 2F8
- **3E8**                              Serial port 2 I/O port address is 3E8
- **2E8**                              Serial port 2 I/O port address is 2E8
- **2D0**                              Serial port 2 I/O port address is 2D0
- **2D8**                              Serial port 2 I/O port address is 2D8

### → **Serial Port2 IRQ [IRQ3]**

Use the **Serial Port2 IRQ** option to select the interrupt address for serial port 2.

- **IRQ3**    **DEFAULT**      Serial port 2 IRQ address is 3
- **IRQ4**                              Serial port 2 IRQ address is 4
- **IRQ10**                     Serial port 2 IRQ address is 10
- **IRQ11**                    Serial port 2 IRQ address is 11

### → **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- **Disabled**                      No base address is assigned to serial port 3
- **3F8**                              Serial port 3 I/O port address is 3F8

- 2F8                      Serial port 3 I/O port address is 2F8
- 3E8            **DEFAULT**      Serial port 3 I/O port address is 3E8
- 2E8                      Serial port 3 I/O port address is 2E8
- 2D0                      Serial port 3 I/O port address is 2D0
- 2D8                      Serial port 3 I/O port address is 2D8

→ **Serial Port3 IRQ [IRQ4]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- IRQ3                      Serial port 3 IRQ address is 3
- IRQ4            **DEFAULT**      Serial port 3 IRQ address is 4
- IRQ10                      Serial port 3 IRQ address is 10
- IRQ11                      Serial port 3 IRQ address is 11

→ **Serial Port4 Address [2E8]**

Use the **Serial Port4 Address** option to select the base addresses for serial port 4

- **Disabled**                      No base address is assigned to serial port 4
- 3F8                      Serial port 4 I/O port address is 3F8
- 2F8                      Serial port 4 I/O port address is 2F8
- 3E8                      Serial port 4 I/O port address is 3E8
- 2E8                      **DEFAULT**      Serial port 4 I/O port address is 2E8
- 2D0                      Serial port 4 I/O port address is 2D0
- 2D8                      Serial port 4 I/O port address is 2D8

→ **Serial Port4 IRQ [IRQ3]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- **IRQ3**            **DEFAULT**      Serial port 4 IRQ address is 3

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- **IRQ4**                      Serial port 4 IRQ address is 4
- **IRQ10**                   Serial port 4 IRQ address is 10
- **IRQ11**                   Serial port 4 IRQ address is 11

### → **Serial Port5 Address [2D0]**

Use the **Serial Port5 Address** option to select the base addresses for serial port 5

- **Disabled**                      No base address is assigned to serial port 5
- **3F8**                              Serial port 5 I/O port address is 3F8
- **2F8**                              Serial port 5 I/O port address is 2F8
- **3E8**                              Serial port 5 I/O port address is 3E8
- **2E8**                              Serial port 5 I/O port address is 2E8
- **2D0**                      **DEFAULT**      Serial port 5 I/O port address is 2D0
- **2D8**                              Serial port 5 I/O port address is 2D8

### → **Serial Port5 IRQ [IRQ4]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- **IRQ3**                              Serial port 5 IRQ address is 3
- **IRQ4**                      **DEFAULT**      Serial port 5 IRQ address is 4
- **IRQ10**                          Serial port 5 IRQ address is 10
- **IRQ11**                          Serial port 5 IRQ address is 11

### → **Serial Port6 Address [2D8]**

Use the **Serial Port6 Address** option to select the base addresses for serial port 6

- **Disabled**                      No base address is assigned to serial port 6
- **3F8**                              Serial port 6 I/O port address is 3F8
- **2F8**                              Serial port 6 I/O port address is 2F8



- 3E8                      Serial port 6 I/O port address is 3E8
- 2E8                      Serial port 6 I/O port address is 2E8
- 2D0                      Serial port 6 I/O port address is 2D0
- 2D8                      **DEFAULT**    Serial port 6 I/O port address is 2D8

→ **Serial Port6 IRQ [IRQ3]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- **IRQ3**    **DEFAULT**    Serial port 6 IRQ address is 3
- **IRQ4**                      Serial port 6 IRQ address is 4
- **IRQ10**                      Serial port 6 IRQ address is 10
- **IRQ11**                      Serial port 6 IRQ address is 11

→ **IrDA Function [COM6]**

Use the **IrDA Function** option to select the transmitting and receiving mode for the sixth serial port.

- **COM6**                      **DEFAULT**    Serial Port 6 mode is normal
- **IrDA**                              Serial Port 6 mode is IrDA

→ **Parallel Port Address [378]**

Use the **Parallel Port Address** option to select the parallel port base address.

- **Disabled**                      No base address is assigned to the Parallel Port
- **378**                      **DEFAULT**    Parallel Port I/O port address is 378
- **278**                              Parallel Port I/O port address is 278
- **3BC**                              Parallel Port I/O port address is 3BC

→ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

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- **Normal**      **DEFAULT**      The normal parallel port mode is the standard mode for parallel port operation.
- **Bi-directional**      Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
- **EPP**      The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- **ECP+EPP**      The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode  
  
The parallel port is also be compatible with EPP devices described above

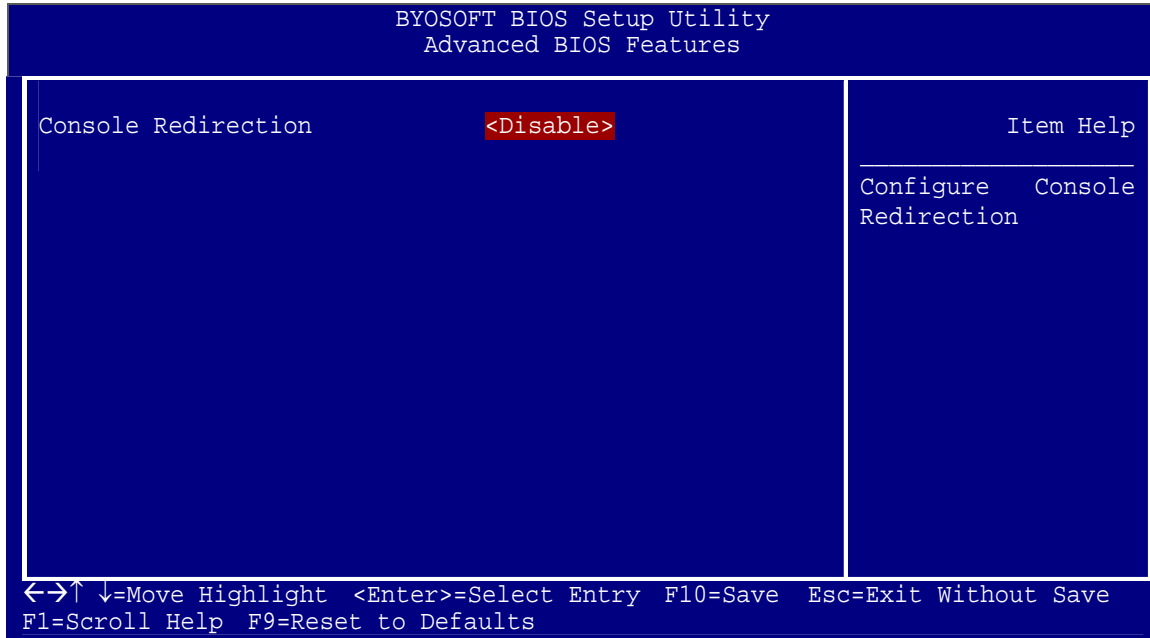
### → Parallel Port IRQ [IRQ7]

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

- **IRQ5**      IRQ5 is assigned as the parallel port interrupt address
- **IRQ7**      **DEFAULT**      IRQ7 is assigned as the parallel port interrupt address

### 5.4.3 Console Redirection Configuration

Use the **Console Redirection Configuration** menu (**BIOS Menu 7**) to configure the console redirection configuration options for remote access.



### BIOS Menu 7: Console Redirection Configuration

#### ➔ Console Redirection [Disable]

Use the **Console Redirection** option to enable or disable access to the remote functionalities of the system.

- ➔ **Disabled**      **DEFAULT**      Console redirection is disabled.
- ➔ **Enabled**      Console redirection configuration options shown below appear:

Serial Port Select

Serial Port Baudrate

These configuration options are discussed below.

#### ➔ Serial Port Select [COM1]

Use the **Serial Port Select** option allows to select the serial port used for console redirection.

- ➔ **COM1**      **DEFAULT**      System is remotely accessed through COM1
- ➔ **COM2**      System is remotely accessed through COM2

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- **COM3**                      System is remotely accessed through COM3
- **COM4**                      System is remotely accessed through COM4
- **COM5**                      System is remotely accessed through COM5
- **COM6**                      System is remotely accessed through COM6

### → **Serial Port Baudrate [115200]**

Use the **Serial Port Baudrate** option to select baud rate through which the console redirection is made. The following configuration options are available

- 9600
- 19200
- 38400
- 57600
- 115200                      **DEFAULT**

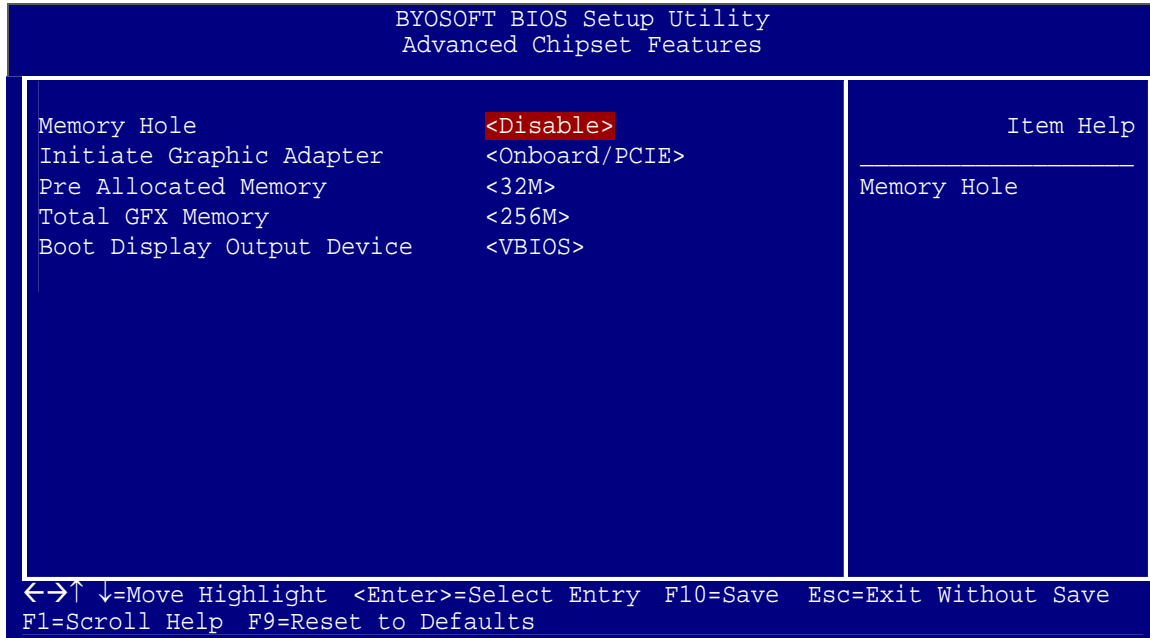


#### **NOTE:**

Identical baud rate setting must be set on the host (a management computer running a terminal software) and the slave

## 5.5 Advanced Chipset Features

Use the **Advanced Chipset Features** menu (**BIOS Menu 8**) to change chipset configuration options.



**BIOS Menu 8: Advanced Chipset Features**

➔ **Memory Hole [Disable]**

Use the **Memory Hole** option to reserve memory space for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- ➔ **Enable** Memory is reserved for ISA expansion cards
- ➔ **Disable** **DEFAULT** Memory is not reserved for ISA expansion cards

➔ **Initiate Graphic Adapter [Onboard/PCIE]**

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Configuration options are listed below:

- PCI/PCIE
- PCIE/Onboard
- Onboard/PCIE **DEFAULT**
- PCI/Onboard



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### → Pre Allocated Memory [32M]

Use the **Pre Allocated Memory** option to determine how much memory is allocated to the graphics device. The **Pre Allocated Memory** options are:

- 32M                    **DEFAULT**
- 64M
- 128M

### → Total GFX Memory [256M]

Use the **Total GFX Memory** option to specify the maximum amount of memory that can be allocated as DVMT 5.0 graphics memory. Configuration options are listed below.

- 128M
- 256M                    **DEFAULT**
- DVMT\_MAX

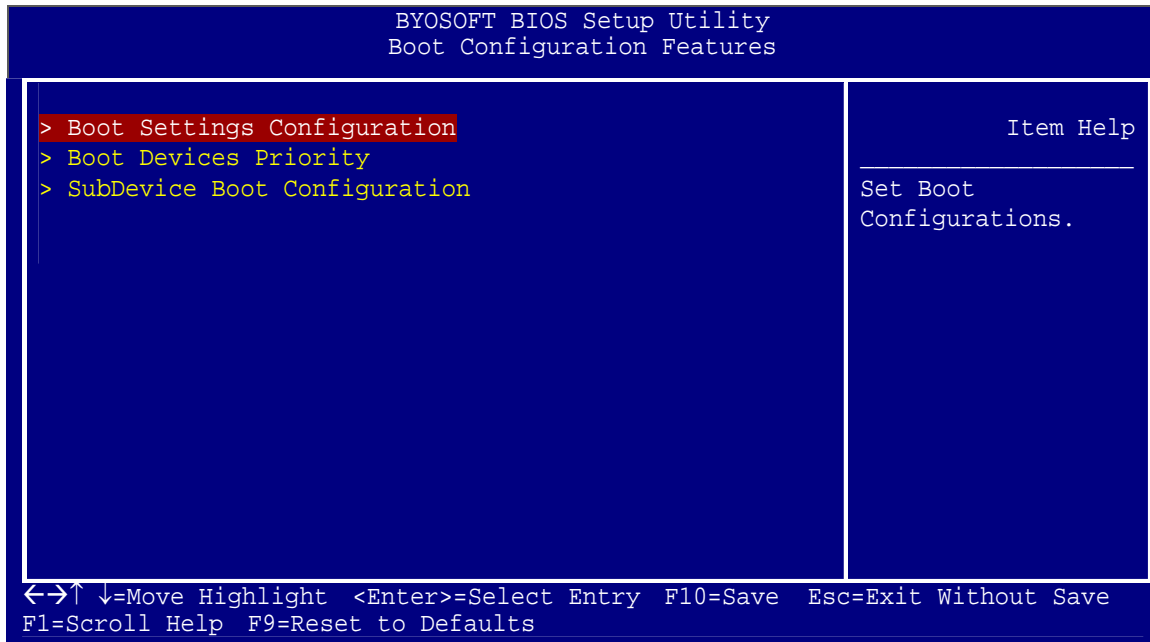
### → Boot Display Output Device [CRT]

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

- VBIOS
- CRT                    **DEFAULT**

## 5.6 Boot Configuration Features

Use the **Boot Configuration Features** menu (**BIOS Menu 9**) to configure system boot options.

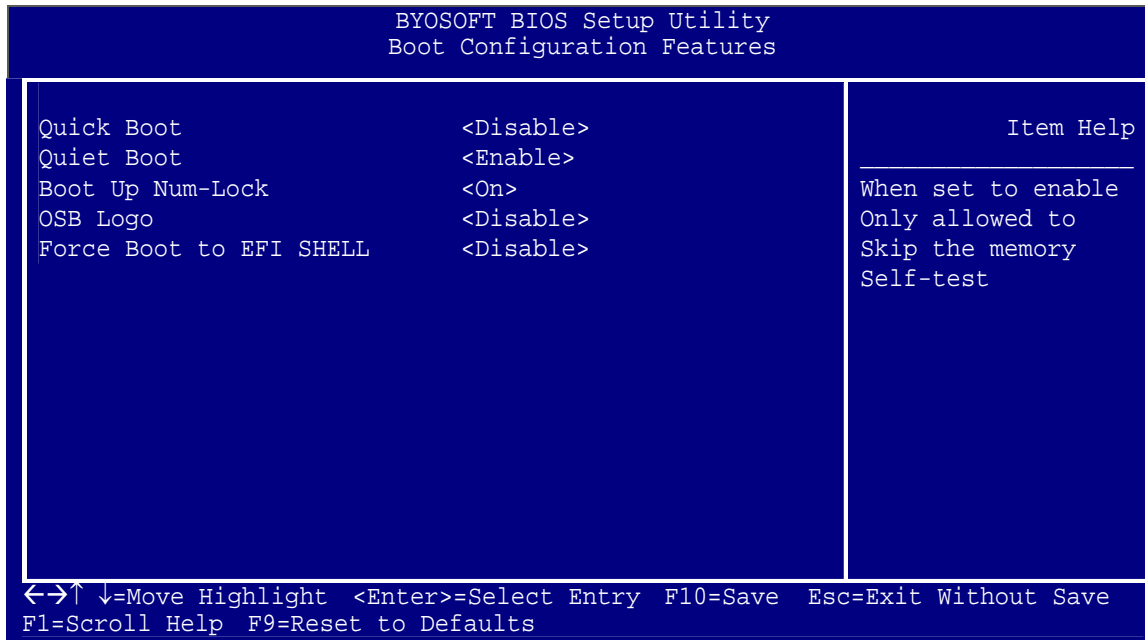


**BIOS Menu 9: Boot Configuration Features**

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### 5.6.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 10**) to configure advanced system boot options.



#### BIOS Menu 10: Boot Settings Configuration

##### → Quick Boot [Disable]

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

→ **Enable** Some POST procedures are skipped to decrease the system boot time

→ **Disable** **DEFAULT** No POST procedures are skipped

##### → Quiet Boot [Enable]

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

→ **Enable** **DEFAULT** OEM Logo displayed instead of POST messages

→ **Disable** Normal POST messages displayed

→ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** 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.

→ **OSB Logo [Disable]**

Use the **OSB Logo** option to specify if the OSB logo appears during the system boot-up process. If enabled, the boot up process may be delayed.

- **Enabled**                    OSB logo appears during boot up.
- **Disabled**    **DEFAULT**    OSB logo does not appear during boot up.

→ **Force Boot to EFI SHELL [Disable]**

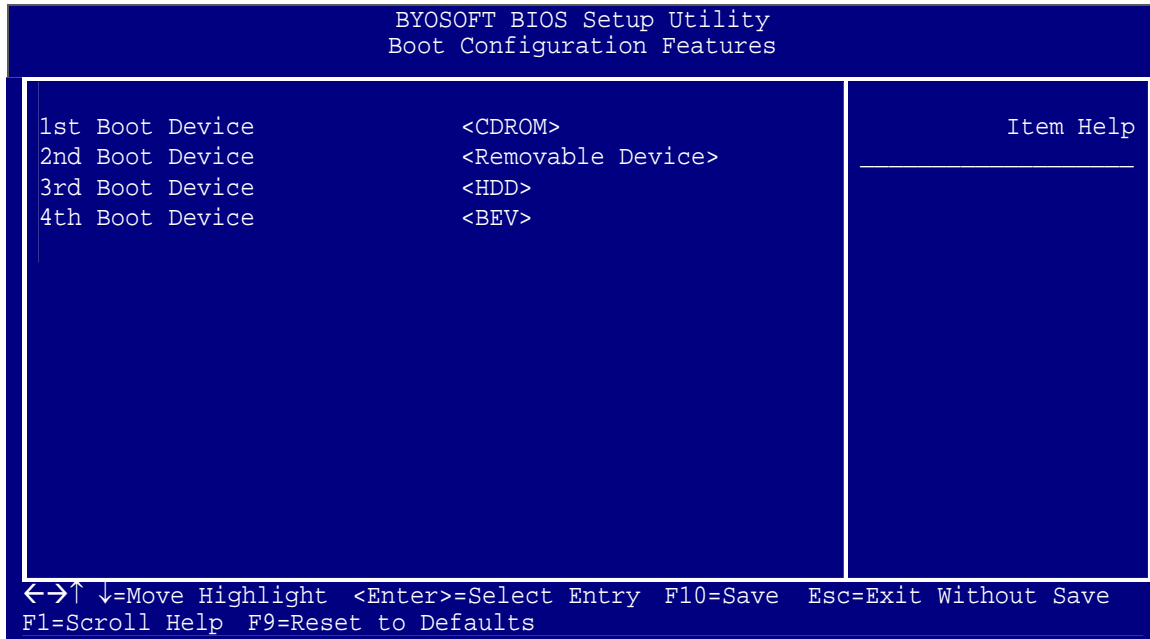
The **Force Boot to EFI SHELL** BIOS option is for UEFI sector test.

- **Enable**                    Force the system to boot to EFI SHELL.
- **Disable**            **DEFAULT**    Do not boot to EFI SHELL.

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### 5.6.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 11**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

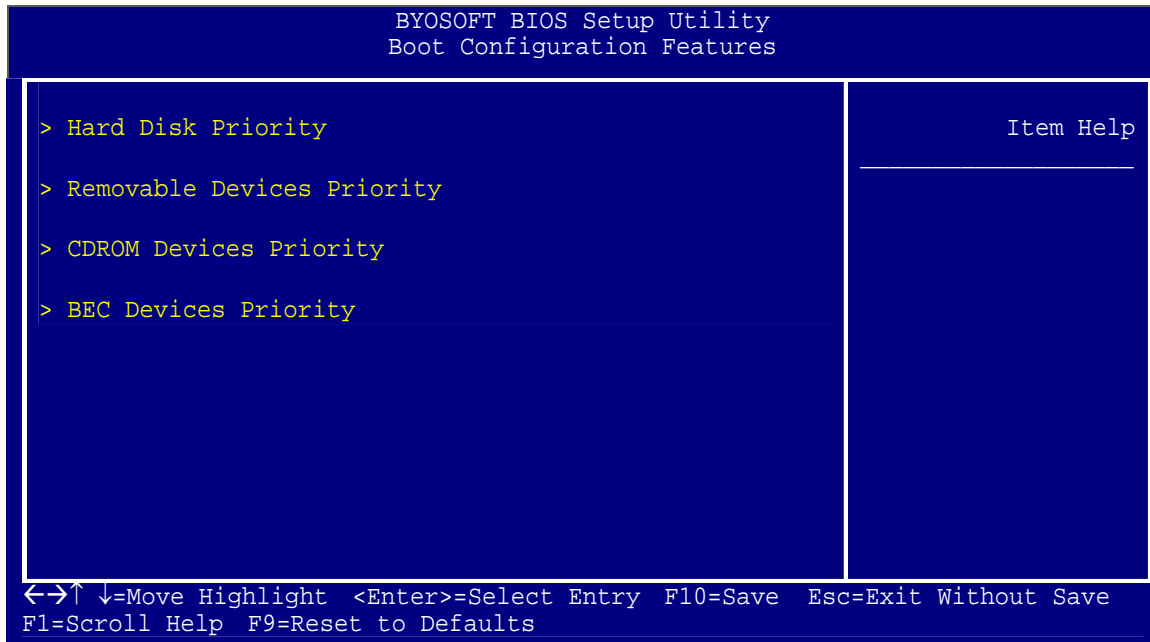


**BIOS Menu 11: Boot Device Priority Settings**



### 5.6.3 SubDevice Boot Configuration

Use the **SubDevice Boot Configuration** menu to specify the boot sequence of the available HDDs, removable devices, CD-ROM and BEC devices.

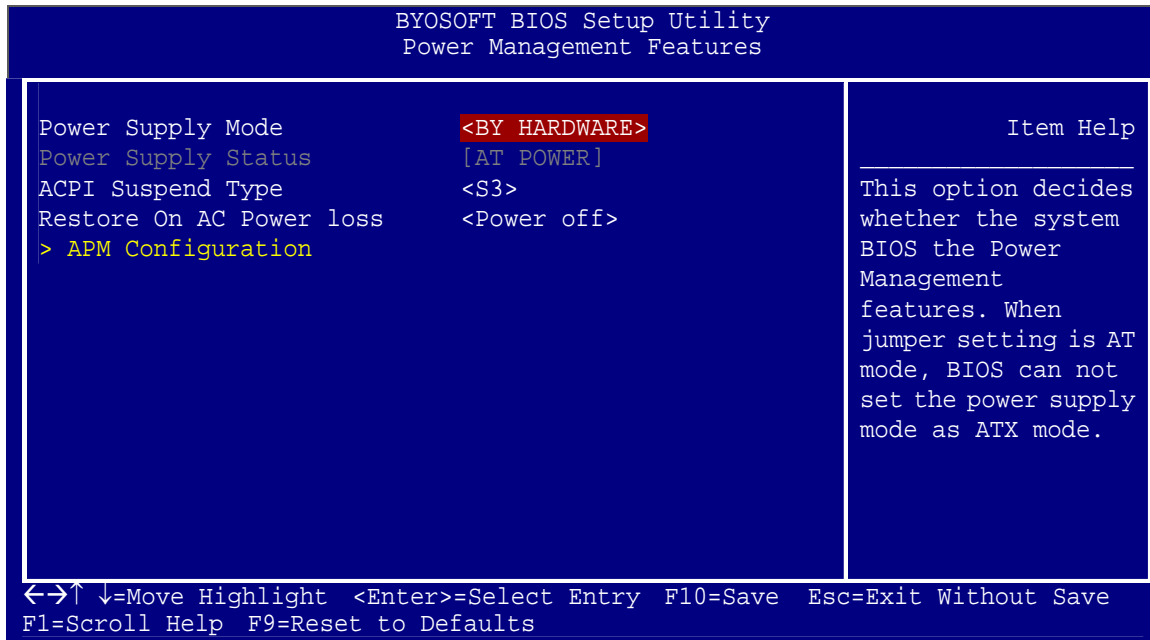


**BIOS Menu 12: SubDevice Boot Configuration**

## 5.7 Power Management Features

Use the **Power Management Features** menu (**BIOS Menu 13**) to set the BIOS power management and saving features.

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### BIOS Menu 13: Power Management Features

#### ➔ Power Supply Mode [BY HARDWARE]

Use the **Power Supply Mode** BIOS option to select the power mode for the system.

- ➔ **AT Power**                      Use AT power mode
- ➔ **ATX Power**                    Use ATX power mode
- ➔ **BY**                      **DEFAULT**      The power mode is selected by the on-board jumper.  
**HARDWARE**

#### ➔ ACPI Suspend Type [S3]

Use the **ACPI Suspend Type** BIOS option to specify the sleep state the system enters when not being used.

- ➔ **S1**                      System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3**                      **DEFAULT**      System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

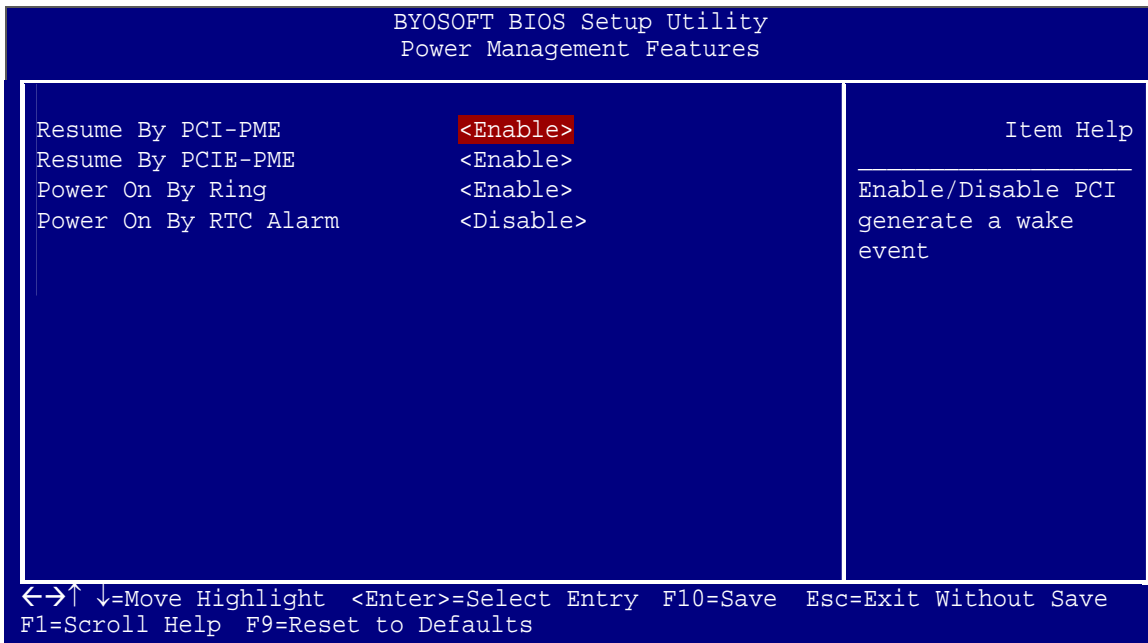
➔ **Restore on AC Power Loss [Power Off]**

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

### 5.7.1 APM Configuration

The **APM Configuration** menu (**BIOS Menu 14**) allows the advanced power management options to be configured..



**BIOS Menu 14: APM Configuration**

➔ **Resume By PCI-PME [Enable]**

Use the **Resume By PCI-PME** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

- ➔ **Enable**                      **DEFAULT**    Wake event generated by PCI PME controller activity

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→ **Disable** Wake event not generated by PCI PME controller activity

### → **Resume By PCIE-PME [Enable]**

Use the **Resume By PCI-PME** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

→ **Enable**      **DEFAULT**      Wake event generated by PCIe PME controller activity

→ **Disable**      Wake event not generated by PCIe PME controller activity

### → **Power On By Ring [Enable]**

Use the **Power On By Ring** option to enable the system to be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system is roused by an incoming call on a modem.

→ **Enable**      **DEFAULT**      Wake event generated by an incoming call

→ **Disable**      Wake event not generated by an incoming call

### → **Power On By RTC Alarm [Disable]**

Use the **Power On By RTC Alarm** option to specify the time the system should be roused from a suspended state.

→ **Enable**      If selected, the following appears with values that can be selected:

RTC Day

RTC Hour

RTC Minute

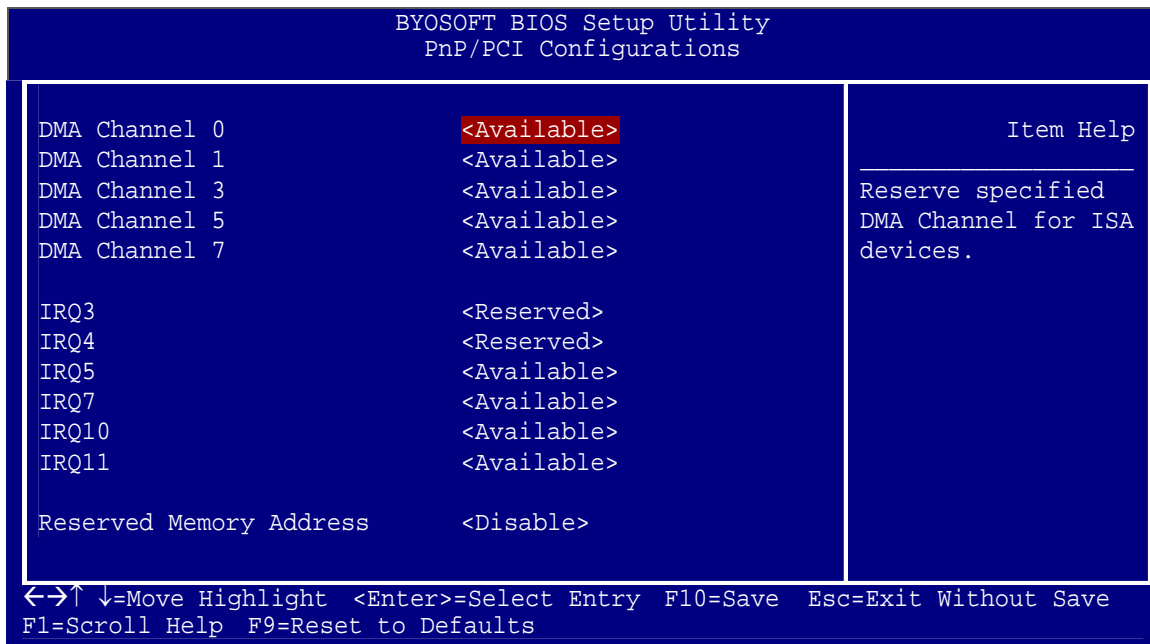
RTC Second

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

- ➔ **Disable**      **DEFAULT**      The real time clock (RTC) cannot generate a wake event

## 5.8 PnP/PCI Configurations

Use the **PnP/PCI Configurations** menu (**BIOS Menu 15**) to set the plug and play, and PCI options.



### BIOS Menu 15: PnP/PCI Configurations

#### ➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

- ➔ **Available**      **DEFAULT**      The specified DMA is available to be used by PCI/PnP devices
- ➔ **Reserved**      The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:



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- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

### → IRQ#

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

- |                    |                                                              |
|--------------------|--------------------------------------------------------------|
| → <b>Available</b> | The specified IRQ is available to be used by PCI/PnP devices |
| → <b>Reserved</b>  | The specified IRQ is reserved for use by Legacy ISA devices  |

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ10
- IRQ 11

### → Reserved Memory Address [Disable]

The **Reserved Memory Base** option specifies the base address for the peripheral device.

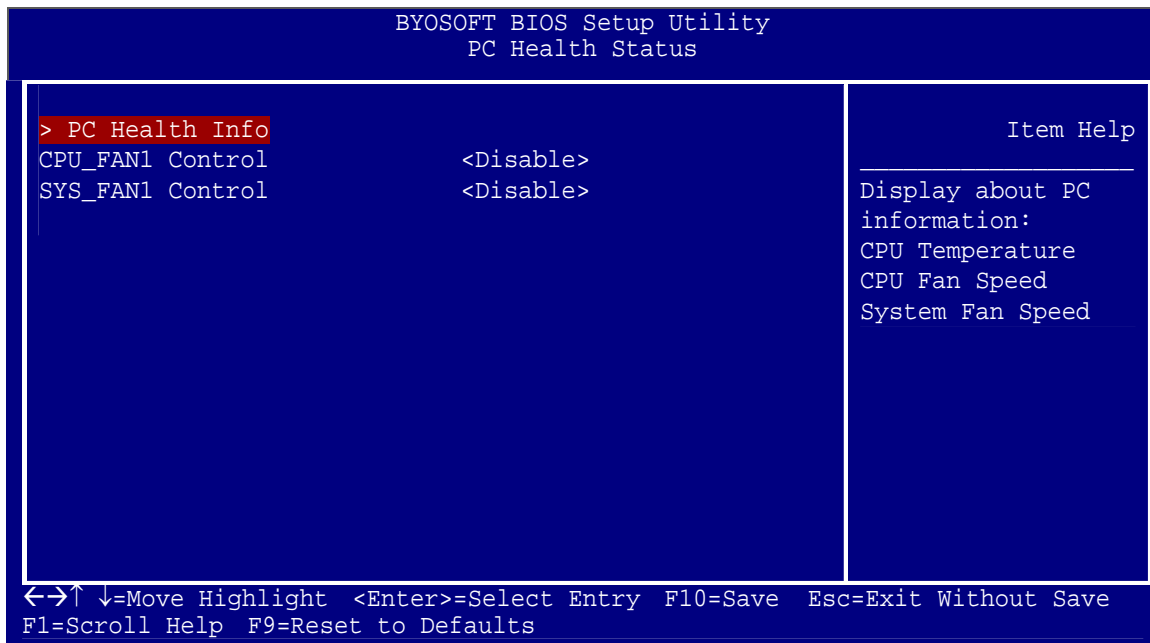
The **Reserved Memory Base** options are:

- Disable **DEFAULT**
- D0000: 16K
- D0000: 32K
- D0000: 64K
- D4000: 16K
- D4000: 32K

- D4000: 64K
- D8000: 16K
- D8000: 32K
- DC000: 16K

## 5.9 PC Health Status

Use the **PC Health Status** menu (**BIOS Menu 16**) to enable or disable the smart fan.



**BIOS Menu 16: PC Health Status**

### → Fan# Control [Disable]

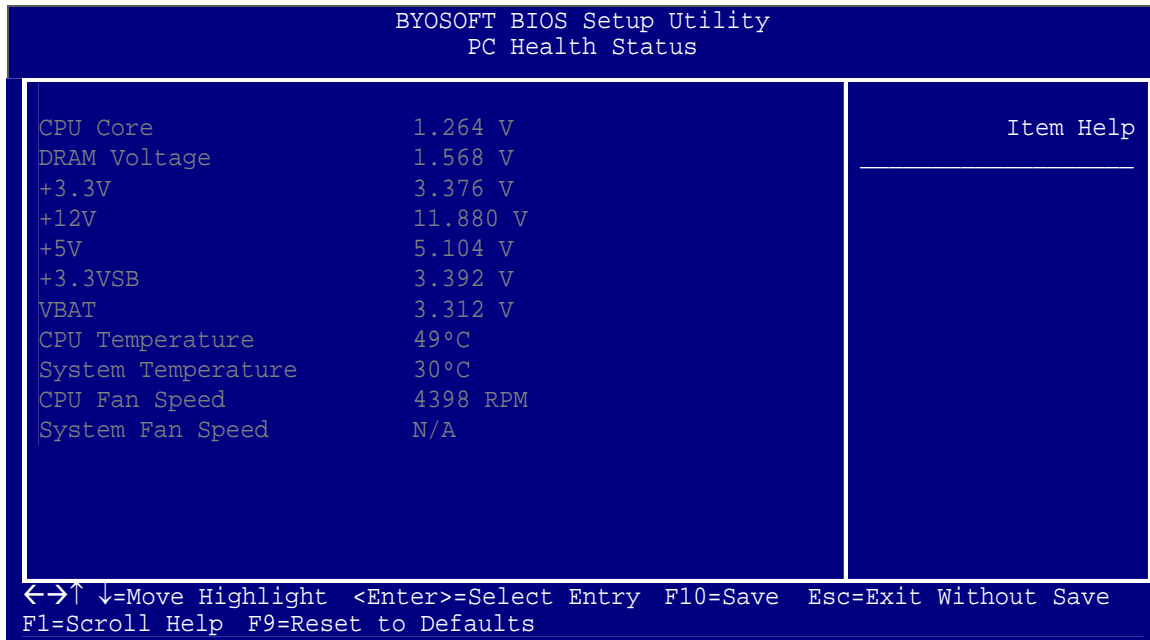
Use the **Smart Fan# Control** to enable or disable the smart fan.

- **Enable**                      Enables the smart fan#
- **Disable**      **DEFAULT**      Disables the smart fan#

### 5.9.1 PC Health Info

The **PC Health Info** menu (**BIOS Menu 17**) has no user configurable options, but shows system operating parameters that are essential to the stable operation of the system.

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### BIOS Menu 17: PC Health Status

The following system parameters are monitored by the **PC Health Status** menu.

#### → Voltages

The following voltages are monitored:

- CPU Core
- DRAM Voltage
- +3.3V
- +12V
- +5V
- +3.3VSB
- VBAT

#### → System Temperature

The following temperatures are monitored:

- CPU Temperature
- System Temperature

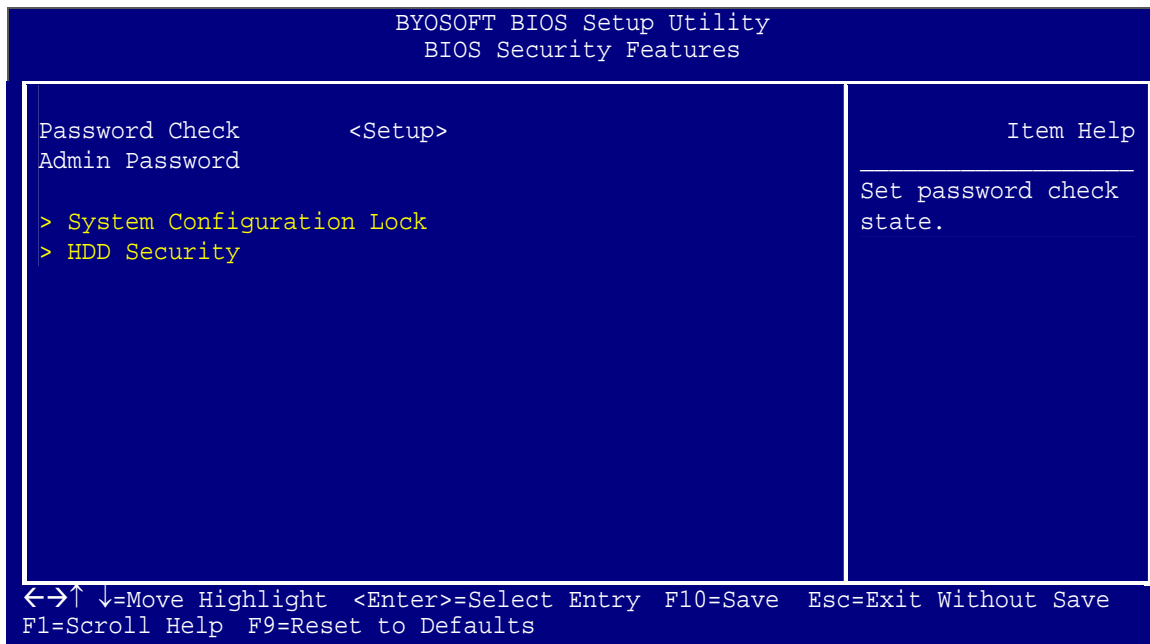
**→ Fan Speeds**

The following fan speeds are monitored:

- CPU Fan Speed
- System Fan Speed

## 5.10 BIOS Security Features

Use the **BIOS Security Features** menu (**BIOS Menu 18**) to set system and user passwords.



**BIOS Menu 18: BIOS Security Features**

**→ Password Check [Setup]**

Use the **Password Check** to limit access to both the system and Setup, or just Setup.

- Setup**      **DEFAULT**      The system does not boot and access to Setup is denied if the correct password is not entered at the prompt.
- System**                      The system boots, but access to Setup is denied if the correct password is not entered at the prompt.

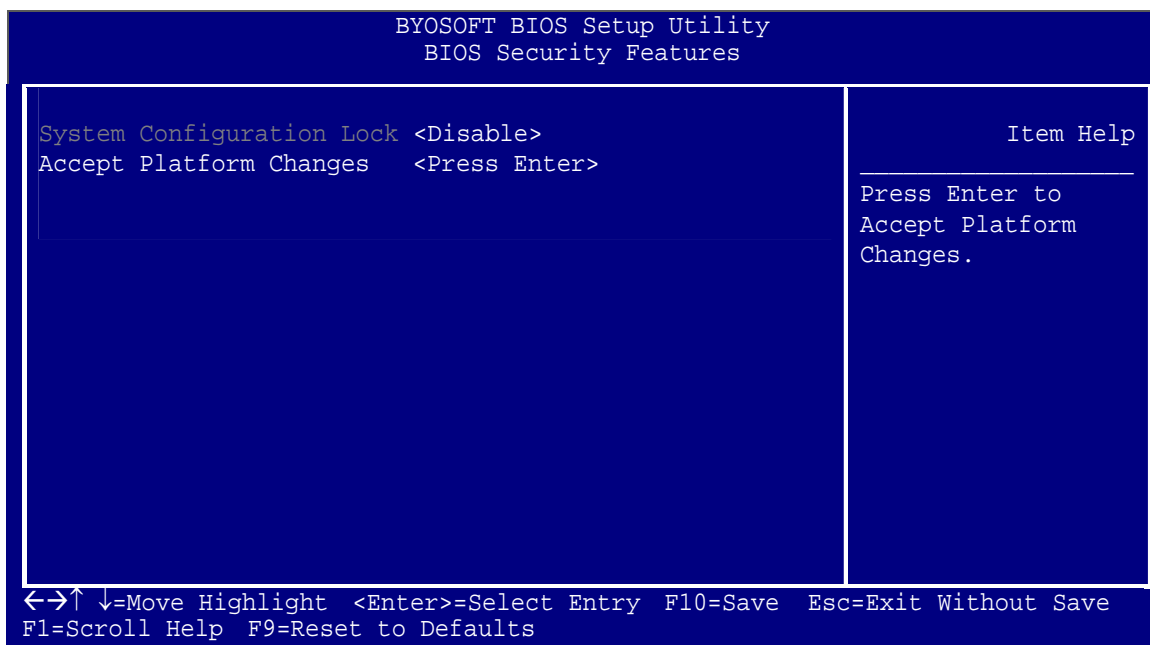
## IMBA-G410 ATX Motherboard

### → Admin Password

Use the **Admin Password** to set or change a administrator password. There is no password by default. If a administrator password must be installed, select this field and enter the password. After the password has been added, the option is changed to **Unlock Password**.

### 5.10.1 System Configuration Lock

Use the **System Configuration Lock** menu (**BIOS Menu 19**) to set system configuration lock.

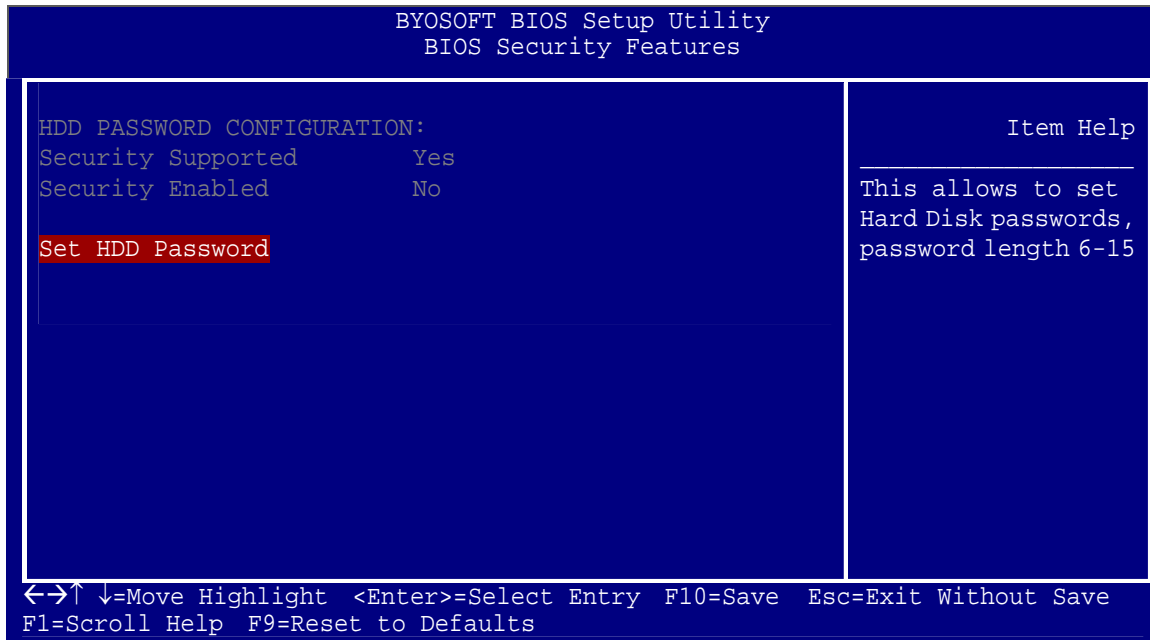


**BIOS Menu 19: System Configuration Lock**



### 5.10.2 HDD Security

Use the **HDD Security** menu (**BIOS Menu 20**) to set HDD password.



**BIOS Menu 20: HDD Security**

Appendix

A

# BIOS Options

---

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

<b>Load Optimized Defaults</b> .....	<b>69</b>
<b>Load Custom Defaults</b> .....	<b>69</b>
<b>Save Custom Defaults</b> .....	<b>69</b>
<b>Save &amp; Exit Setup</b> .....	<b>69</b>
<b>Exit Without Saving</b> .....	<b>69</b>
<b>Date [Day mm:dd:yyyy]</b> .....	<b>70</b>
<b>Time [hh/mm/ss]</b> .....	<b>70</b>
<b>SATA Controller Mode [IDE]</b> .....	<b>73</b>
<b>Onboard USB Controller [Enable]</b> .....	<b>74</b>
<b>USB 2.0 Controller [Enable]</b> .....	<b>74</b>
<b>USB Keyboard Support [Enable]</b> .....	<b>75</b>
<b>USB Mouse Support [Enable]</b> .....	<b>75</b>
<b>Onboard Audio [Enable]</b> .....	<b>75</b>
<b>Onboard LAN [Enable]</b> .....	<b>75</b>
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<b>Super IO Watchdog Control [Disable]</b> .....	<b>76</b>
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<b>Serial Port2 Address [2F8]</b> .....	<b>77</b>
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<b>Serial Port3 Address [3E8]</b> .....	<b>77</b>
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Appendix

**B**

# Terminology

---



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<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.

<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.

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<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

C

# One Key Recovery

---

## C.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. The one key recovery provides quick and easy shortcuts for creating a backup and reverting to that backup or for reverting to the factory default settings.

The IEI One Key Recovery tool menu is shown below.

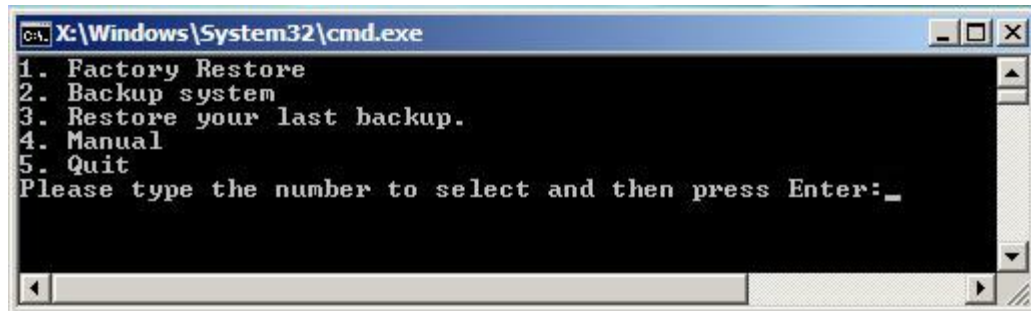


Figure C-1: IEI One Key Recovery Tool Menu

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

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

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <F3> while booting up the system. The detailed information of each function is described in **Section C.4**.



### NOTE:

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

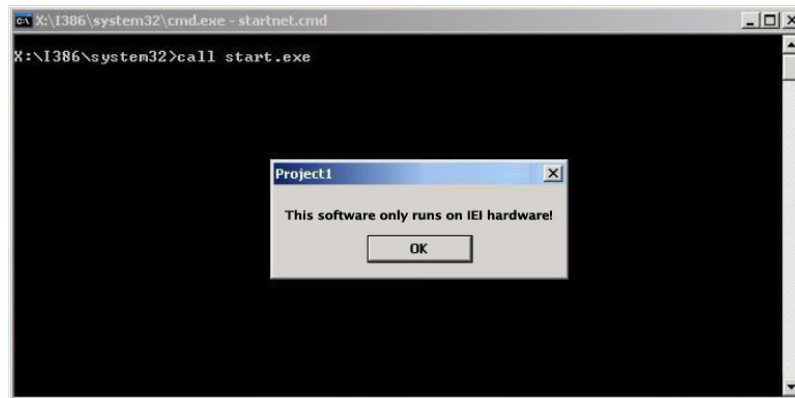
---



### C.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%

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### NOTE:

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

### C.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 XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)
  - Ubuntu 8.10 (Intrepid)
  - Ubuntu 7.10 (Gutsy)
  - Ubuntu 6.10 (Edgy)
  - Debian 5.0 (Lenny)
  - Debian 4.0 (Etch)
  - SuSe 11.2
  - SuSe 10.3

**NOTE:**

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

## C.2 Setup Procedure for Windows

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

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

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

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

**Step 4:** Build-up recovery partition (see **Section C.2.4**)

**Step 5:** Create factory default image (see **Section C.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 system, most setup procedures are the same with Microsoft Windows except for several steps which is described in **Section C.3**.

### C.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.

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- 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.

### C.2.2 Create Partitions

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

- Step 1:** Put the recovery CD in the optical drive of the system.
- Step 2:** **Boot the system from recovery CD.** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

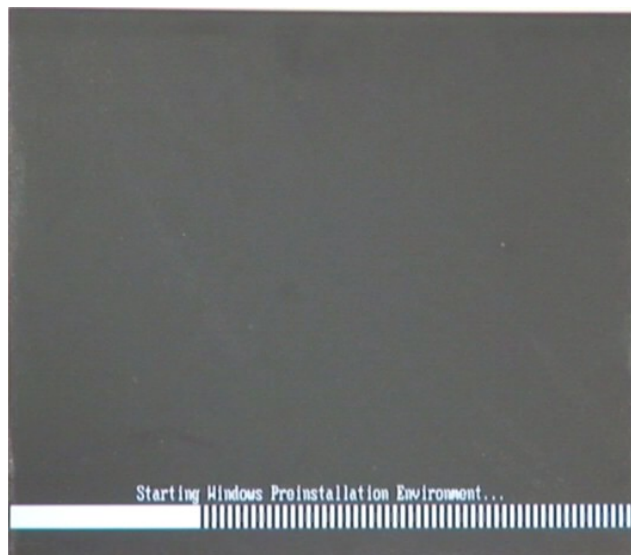


Figure C-2: Launching the Recovery Tool

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

```
C:\ X:\I386\system32\cmd.exe
1.Ghost Execution
2.System Configuration For Windows
3.System Configuration For Linux
4.Exit
5.CMD
Type the number to print text._
```

**Figure C-3: Recovery Tool Setup Menu**

**Step 4:** Press <5> then <Enter>.

```
C:\ X:\I386\system32\cmd.exe
1.Ghost Execution
2.System Configuration For Windows
3.System Configuration For Linux
4.Exit
5.CMD
Type the number to print text. 5
```

**Figure C-4: Command Mode**

**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)

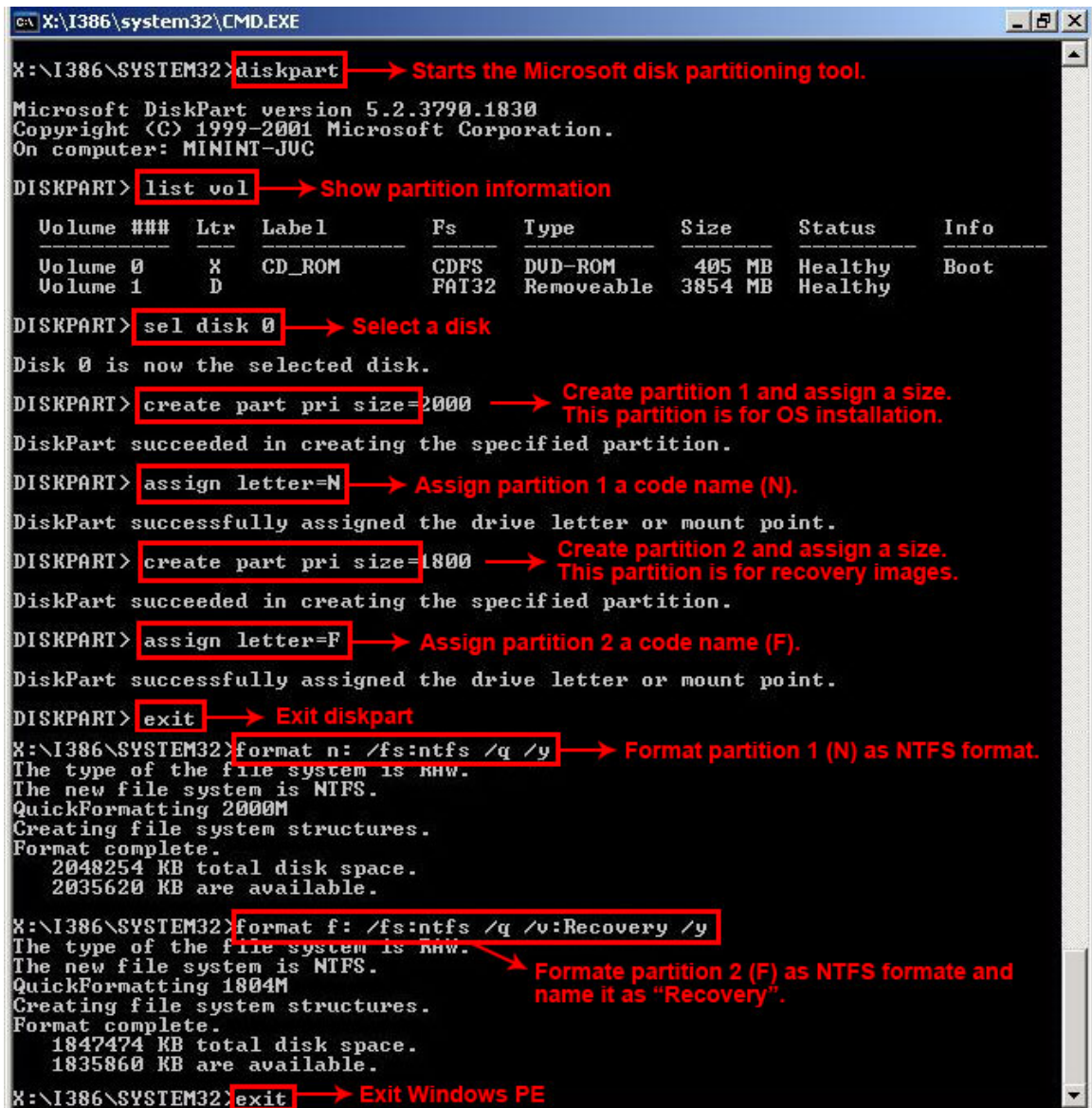
```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>create part pri size= ____
DISKPART>assign letter=F
DISKPART>exit
system32>format N: /fs:ntfs /q /y
```



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

system32>exit



```
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 GDFS DUD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0 → Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000 → Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N → Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800 → Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F → Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit → Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y → Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y → Formate partition 2 (F) as NTFS formate and
name it as "Recovery".
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
1847474 KB total disk space.
1835860 KB are available.
X:\I386\SYSTEM32>exit → Exit Windows PE
```

Figure C-5: Partition Creation Commands

**NOTE:**

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

```
X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-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-up Recovery Partition.

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

Install the operating system onto the unlabelled partition. The partition labeled as "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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### C.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 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!

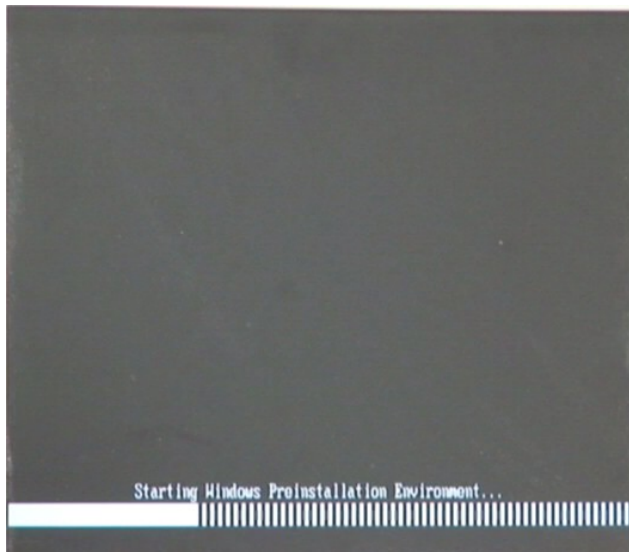


Figure C-6: Launching the Recovery Tool

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

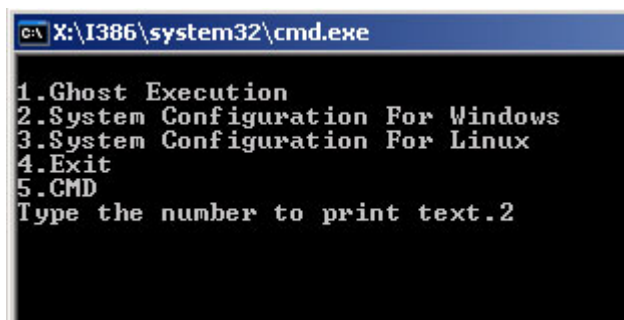
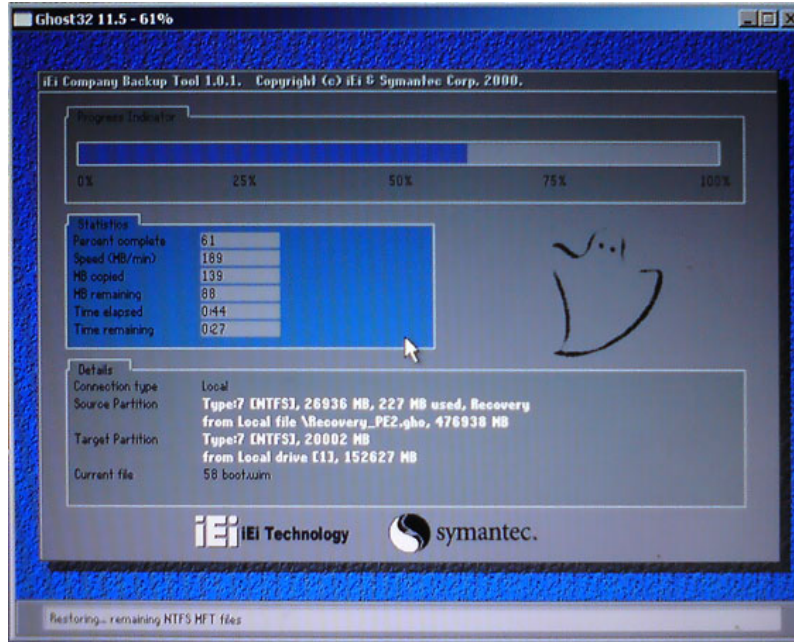


Figure C-7: System Configuration for Windows

- Step 5:** The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. In this process, the partition which is created for

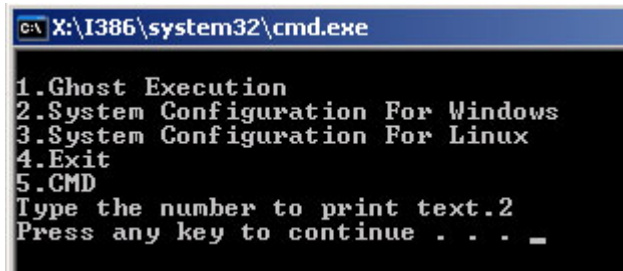


recovery files in **Section C.2.2** is hidden and the recovery tool is saved in this partition.



**Figure C-8: Build-up Recovery Partition**

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



**Figure C-9: Press any key to continue**

**Step 7:** Eject the recovery CD.

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### C.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 C-10**), press the <F3> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.

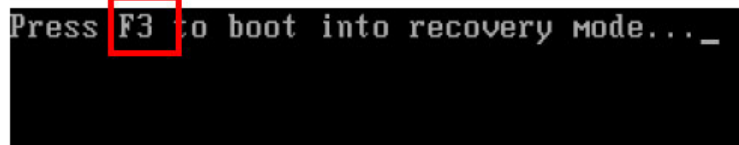


Figure C-10: Press F3 to Boot into Recovery Mode

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

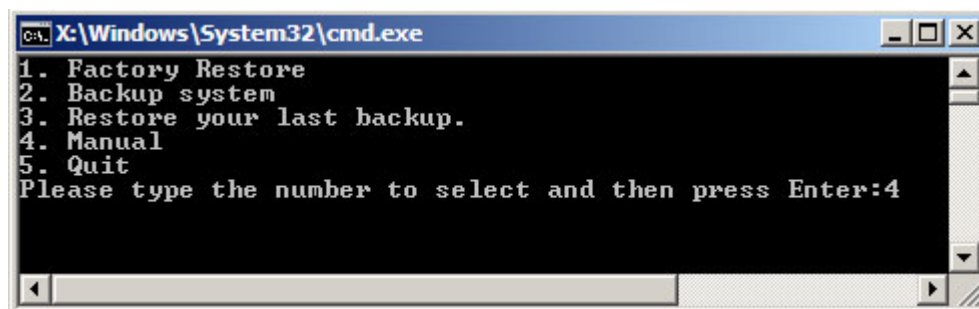


Figure C-11: Recovery Tool Menu

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



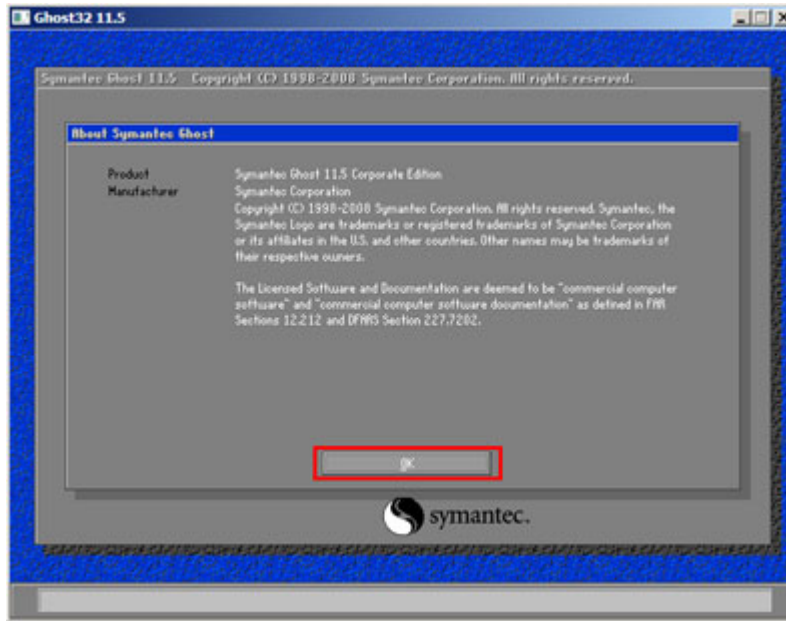


Figure C-12: About Symantec Ghost Window

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

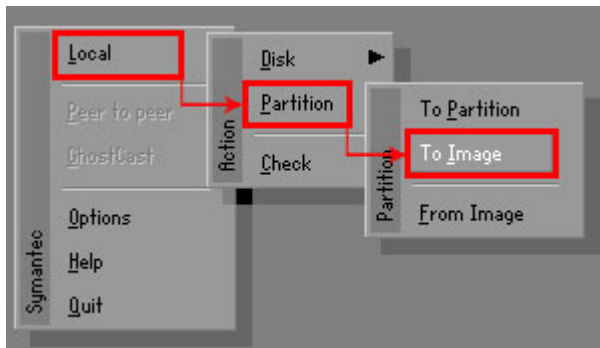
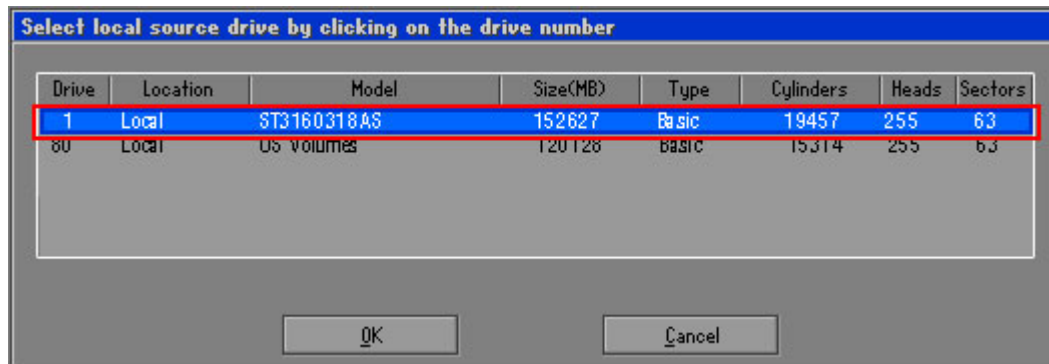


Figure C-13: Symantec Ghost Path

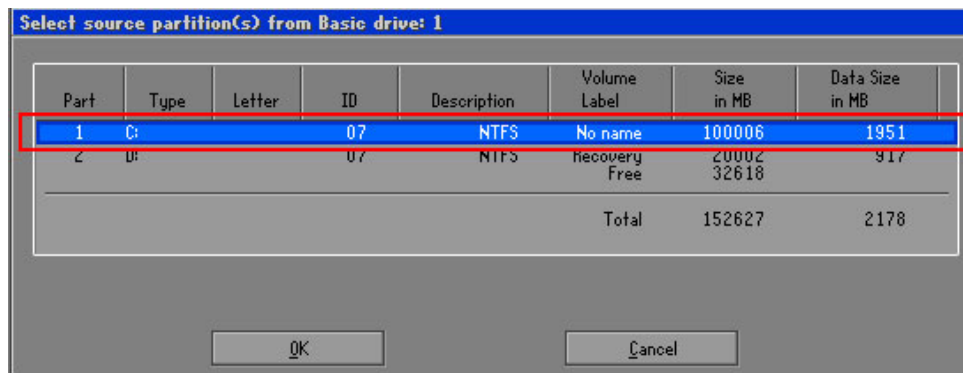
**Step 5:** Select the local source drive (Drive 1) as shown in Figure C-14. Then click OK.

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**Figure C-14: Select a Local Source Drive**

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



**Figure C-15: Select a Source Partition from Basic Drive**

**Step 7:** Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure C-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**.

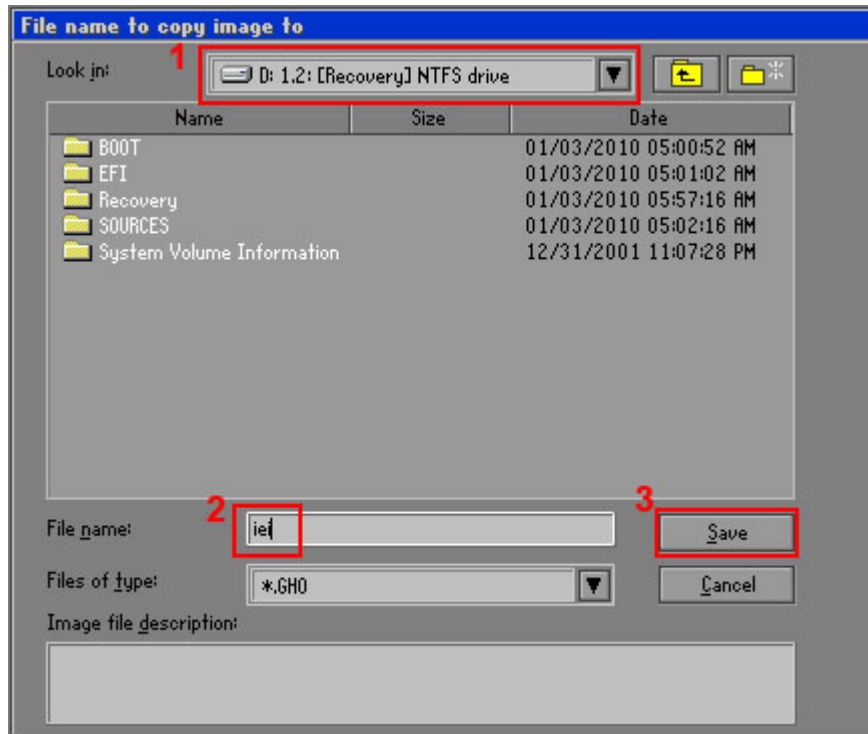


Figure C-16: File Name to Copy Image to

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

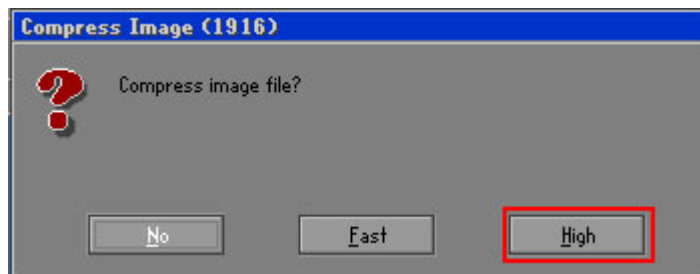
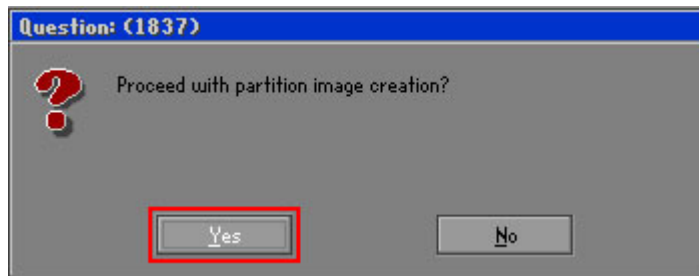


Figure C-17: Compress Image

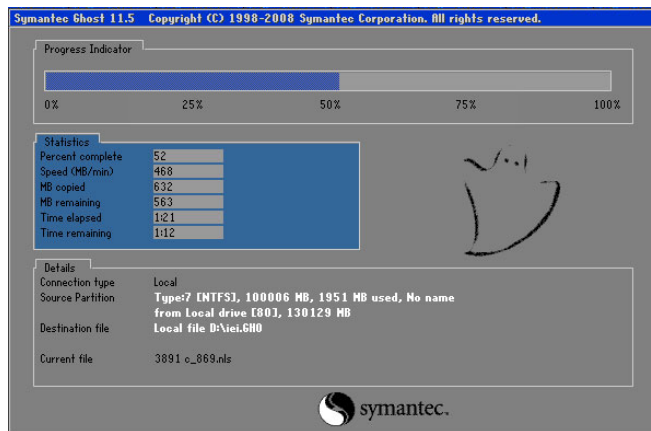
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**Step 9:** The Proceed with partition image creation window appears, click **Yes** to continue.



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

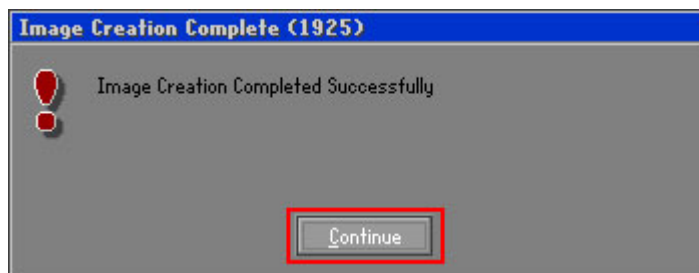
**Step 10:** The Symantec Ghost starts to create the factory default image (**Figure C-19**).



**Figure C-19: Image Creation Process**

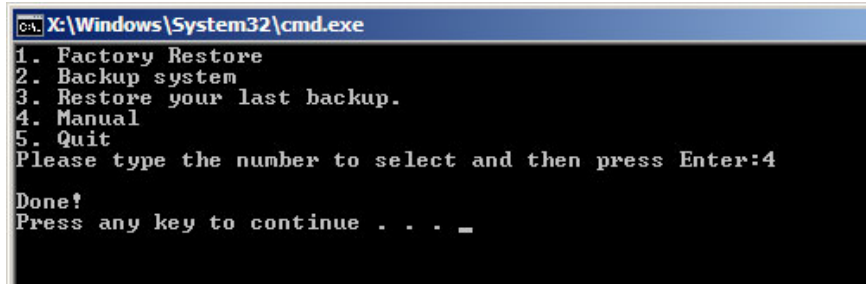
**Step 11:** When the image creation completes, a screen prompts as shown in **Figure C-20**.

Click **Continue** and close the Ghost window to exit the program.



**Figure C-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 C-21: Press Any Key to Continue

### C.3 Setup Procedure for Linux

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

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



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**NOTE:**

Please reserve enough space for partition 3 for saving recovery images.

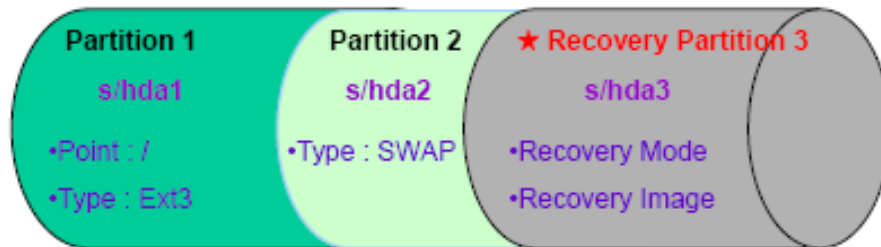


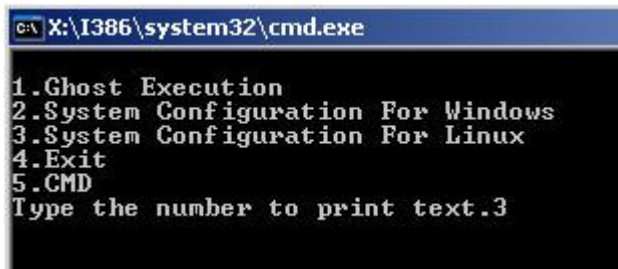
Figure C-22: Partitions for Linux

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

Follow **Step 1 ~ Step 3** described in **Section C.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 C-23**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.



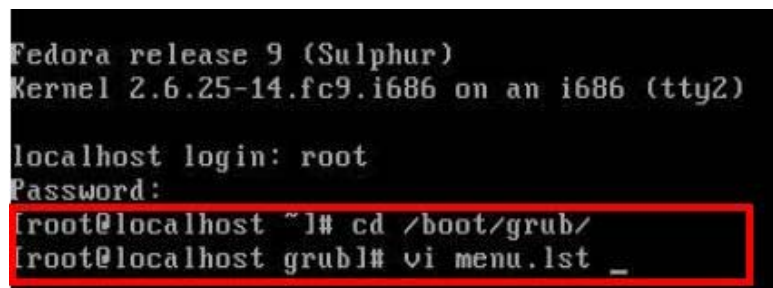
```
C:\X:\I386\system32\cmd.exe
1.Ghost Execution
2.System Configuration For Windows
3.System Configuration For Linux
4.Exit
5.CMD
Type the number to print text.3
```

Figure C-23: 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 system, 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 C-24: Access menu.lst in Linux (Text Mode)

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

## IMBA-G410 ATX Motherboard

```
#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 C-25)

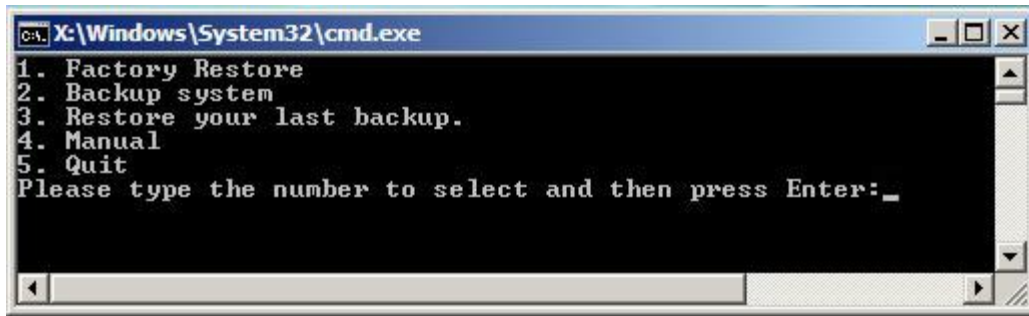
```
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:
```

Figure C-25: Recovery Tool Menu

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

## C.4 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. The main menu of the recovery tool is shown below.



**Figure C-26: Recovery Tool Main Menu**

The recovery tool has several functions including:

6. **Factory Restore:** Restore the factory default image (iei.GHO) created in **Section C.2.5**.
7. **Backup system:** Create a system backup image (iei\_user.GHO) which will be saved in the hidden partition.
8. **Restore your last backup:** Restore the last system backup image
9. **Manual:** Enter the Symantec Ghost window to configure manually.
10. **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).



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### C.4.1 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.

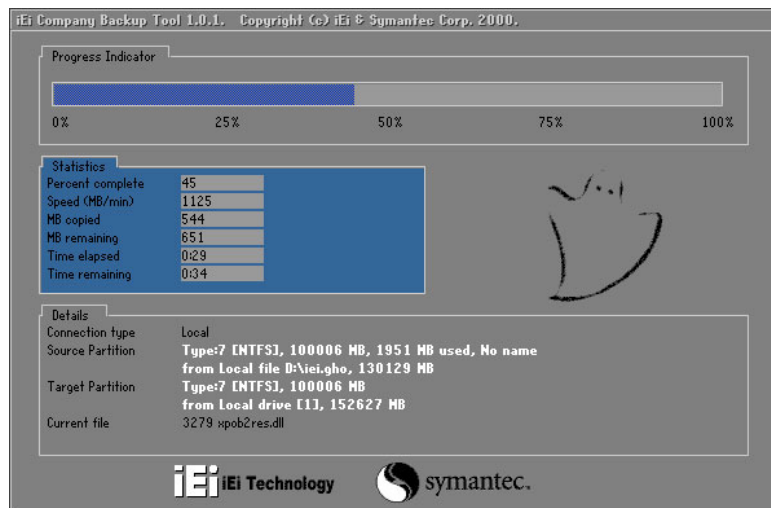


Figure C-27: Restore Factory Default

**Step 3:** The screen is shown as in **Figure C-28** when completed. Press any key to reboot the system.

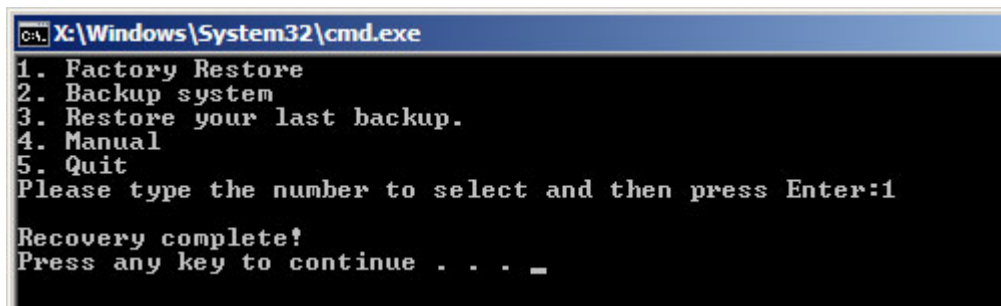


Figure C-28: Recovery Complete Window

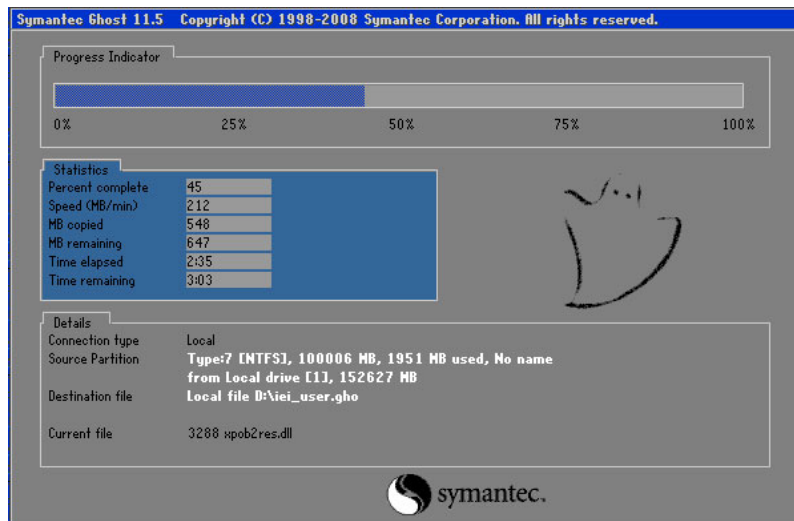


### C.4.2 Backup System

To backup the system, please follow the steps below.

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

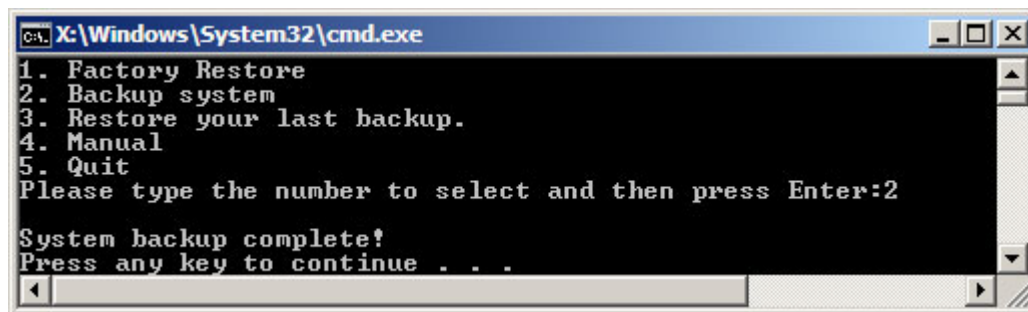
**Step 2:** The Symantec Ghost window appears and starts to backup the system. A backup image called **iei\_user.GHO** is created in the hidden Recovery partition.



**Figure C-29: Backup System**

**Step 3:** The screen is shown as in **Figure C-30** when system backup is completed.

Press any key to reboot the system.



**Figure C-30: System Backup Complete Window**

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### C.4.3 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).

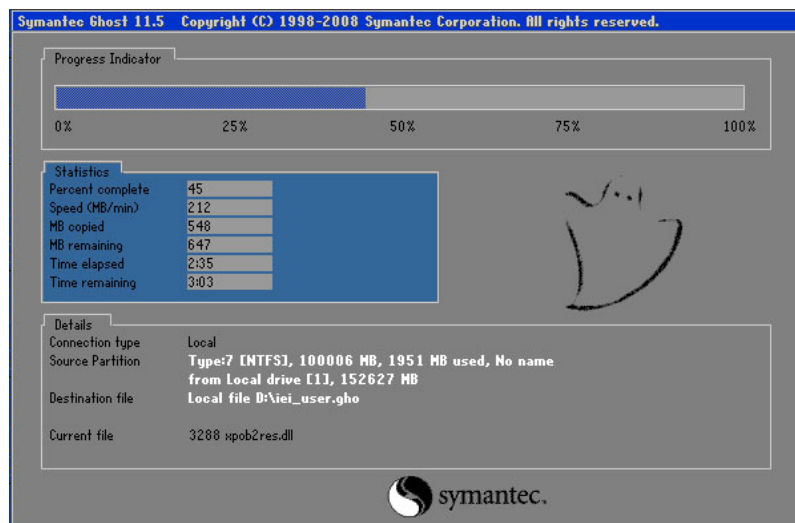


Figure C-31: Restore Backup

**Step 3:** The screen is shown as in **Figure C-32** when backup recovery is completed. Press any key to reboot the system.

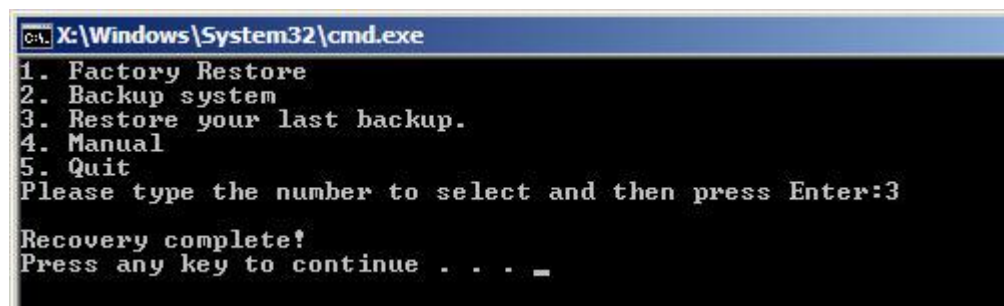


Figure C-32: Restore System Backup Complete Window

### C.4.4 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.

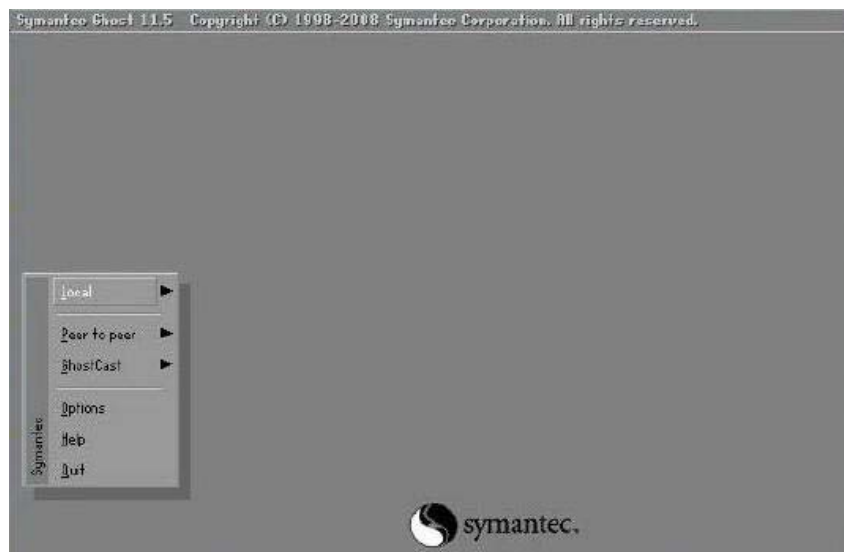


Figure C-33: Symantec Ghost Window

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

## C.5 Other Information

### C.5.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

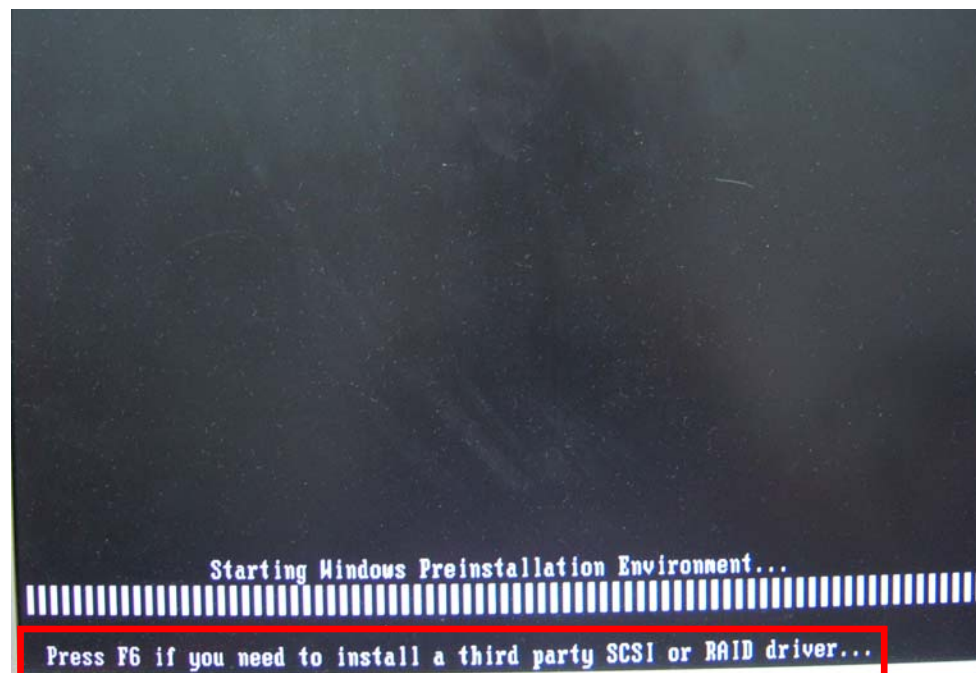
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

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

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

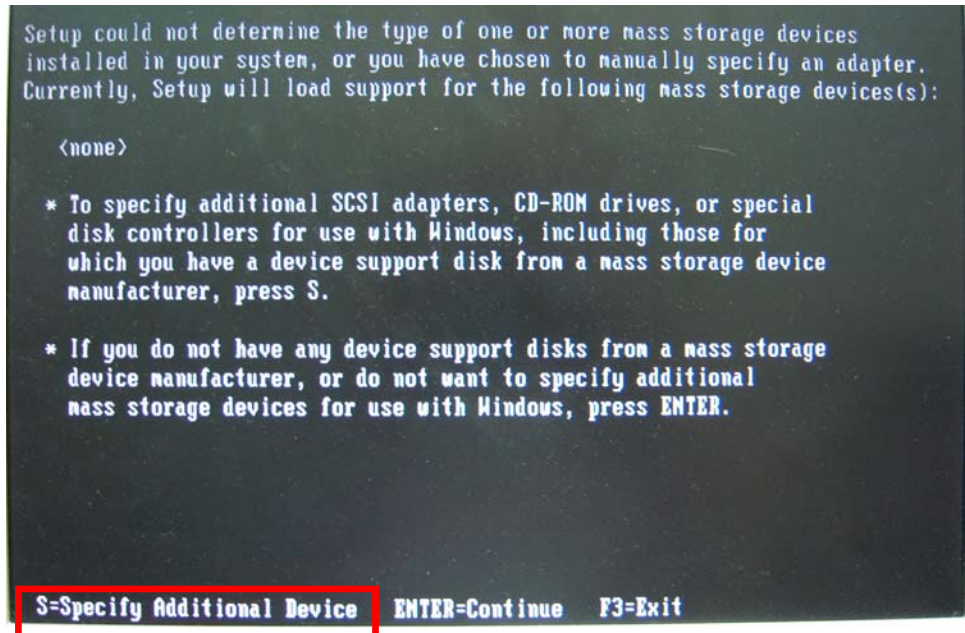
**Step 3:** Insert the One Key Recovery CD into the system and boot the system from the CD.

**Step 4:** When launching the recovery tool, press <F6>.

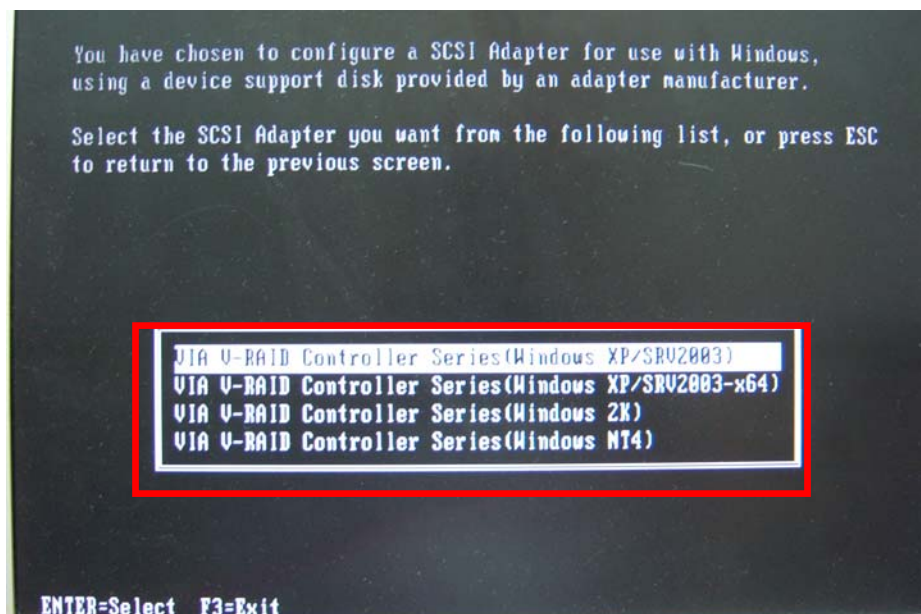




**Step 5:** When the following window appears, press <S> to select “Specify Additional Device”.



**Step 6:** In the following window, select a SATA controller mode used in the system. Then press <Enter>. The user can now start using the SATA HDD.





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**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 C.2.2 Create Partitions** to finish the whole setup process.

### C.5.2 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

D

# Watchdog Timer

---

## IMBA-G410 ATX Motherboard



### NOTE:

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

<b>AH – 6FH Sub-function:</b>	
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 D-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:**

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

**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

E

# Digital I/O Interface

---



## E.1 Introduction

The digital I/O is used for machine control and automation.

## E.2 DIO Connector Pinouts

Located in the Connectors section of this document.

## E.3 Assembly Language Example

```

;*****
; DIO Port:  0A21h[3:0] (4 Out)
;            0A22h[3:0] (4 In)
;*****

;=====
; Get current input and output values into AL register
; AL: bit0~bit3 as output value
;     bit4~bit7 as Input value
;=====

        mov     dx, 0A21h      ; GPIO output I/O base address
        in      al, dx         ; Get output status
        jmp     $+2           ; Wait
        jmp     $+2           ; Wait
        and     al, 0Fh
        mov     bl, al        ; Move al to bl temporarily

        inc     dx            ; sets dx to 0A22h
        in      al, dx         ; Get input status
        jmp     $+2           ; Wait
        jmp     $+2           ; Wait
        and     al, 0Fh
        rol     al, 4         ; Shift input values over
        or      al, bl        ; Merge all results into AL
                                ; AL: bit0~bit3 as output value
                                ;     bit4~bit7 as input value

;=====
; Output value (x) to GPIO
; AL: bit0~bit3 as output value
;=====

        mov     al, 0xh       ; x is the output value (0 ~ Fh)
        mov     dx, 0A21h     ; GPIO output I/O base address
        out     dx, al        ; bit0 ~ bit3 as Output value
                                ; bit4 ~ bit7 are Reserved

```

Appendix

F

# Hazardous Materials Disclosure

---

## **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-G410 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)
<b>Housing</b>	X	O	O	O	O	X
<b>Display</b>	X	O	O	O	O	X
<b>Printed Circuit Board</b>	X	O	O	O	O	X
<b>Metal Fasteners</b>	X	O	O	O	O	O
<b>Cable Assembly</b>	X	O	O	O	O	X
<b>Fan Assembly</b>	X	O	O	O	O	X
<b>Power Supply Assemblies</b>	X	O	O	O	O	X
<b>Battery</b>	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。  
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。