



**MODEL:  
SPCIE-C2160**

**Full-Size PICMG 1.3 CPU Card Supports LGA1155 Intel® Xeon® E3/Core™ i3/Pentium®/Celeron® CPU, Intel® C216 Chipset, DDR3, VGA, DVI-D, Dual Intel® PCIe GbE, Two SATA 6Gb/s Ports, PCIe Mini, HD Audio and RoHS**

# User Manual

# Revision

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Date	Version	Changes
24 April, 2014	1.01	Modified LAN pinouts Updated Chapter 2: Packing List
7 May, 2013	1.00	Initial release

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Chapter

1

# Introduction

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## 1.1 Introduction



**Figure 1-1: SPCIE-C2160**

The SPCIE-C2160 is a PICMG 1.3 CPU card. It accepts a Socket LGA1155 Intel® Xeon® E3/Core™ i3/Pentium®/Celeron® processor and supports two 240-pin 1600/1333 MHz dual-channel DDR3 DIMM modules up to 16.0 GB.

The SPCIE-C2160 supports two GbE interfaces through the Intel® 82579 Ethernet PHY (with Intel® AMT 8.0 support) and the Intel® 82574L Ethernet controller.

The integrated Intel® C216 chipset supports two SATA 6Gb/s and four SATA 3Gb/s drives. Two USB 2.0 on the rear panel, six USB 2.0 by pin header and one PCIe Mini interface provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the SPCIE-C2160.

## SPCIE-C2160 PICMG 1.3 CPU Card

### 1.2 Model Variations

The model variations of the SPCIE-C2160 are listed below.

Model No.	CPU Supported	DVI-D by 26-pin header
SPCIE-C2160-DVI-R10	LGA1155 Intel® Xeon® E3/ Core™ i3/Pentium®/Celeron®	Yes
SPCIE-C2160-R10	LGA1155 Intel® Xeon® E3/ Core™ i3/Pentium®/Celeron®	No

**Table 1-1: SPCIE-C2160 Model Variations**

### 1.3 Features

Some of the SPCIE-C2160 motherboard features are listed below:

- PICMG 1.3 full-size graphics grade solution
- LGA1155 CPU socket
- Intel® C216 chipset
- Dual-channel DDR3 DIMMs support up to 16.0 GB
- Dual independent display by VGA and DVI-D (DVI model only)
- One PCIe Mini expansion slot
- Two Intel® PCIe Gigabit Ethernet connectors (LAN2 with Intel® AMT 8.0 support)
- Two SATA 6Gb/s connectors with RAID function
- Four SATA 3Gb/s connectors with RAID function
- TPM V1.2 hardware security function supported by the TPM module
- High Definition Audio
- RoHS compliant

## 1.4 Connectors

The connectors on the SPCIE-C2160 are shown in the figure below.

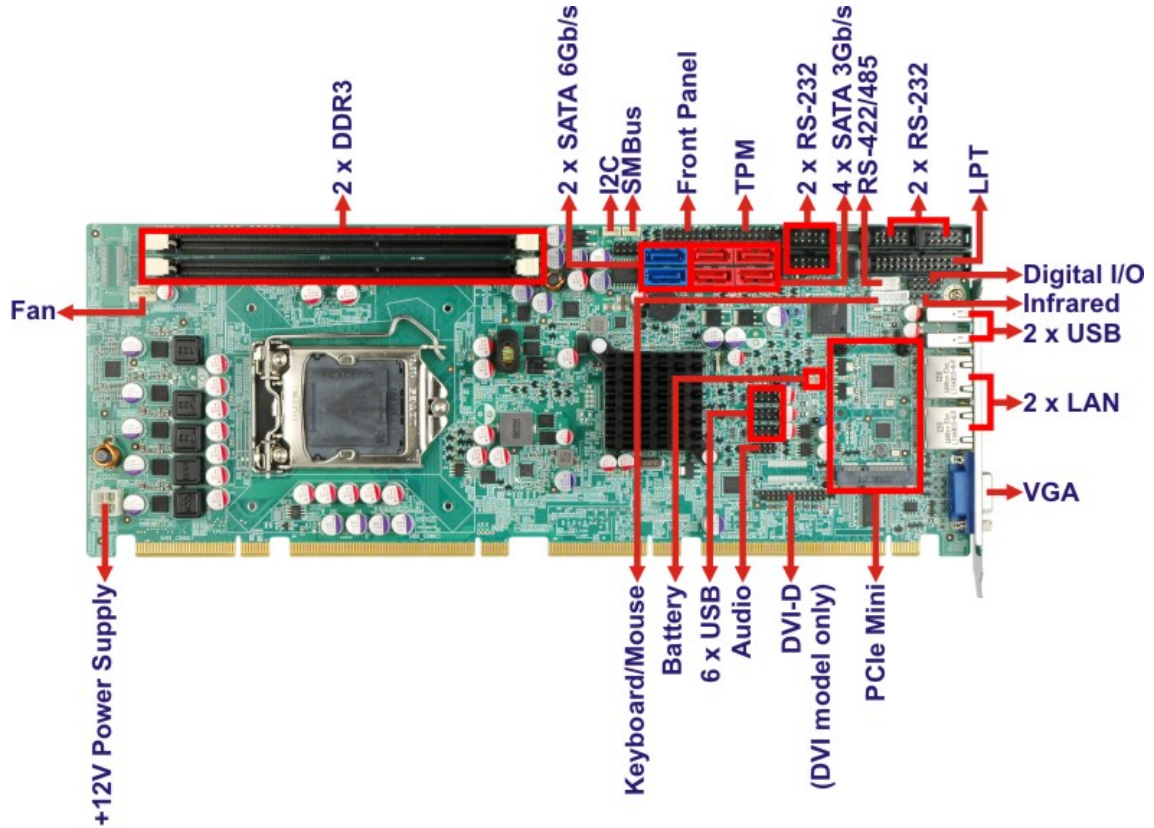


Figure 1-2: Connectors

**SPCIE-C2160 PICMG 1.3 CPU Card**

**1.5 Dimensions**

The main dimensions of the SPCIE-C2160 are shown in the diagram below.

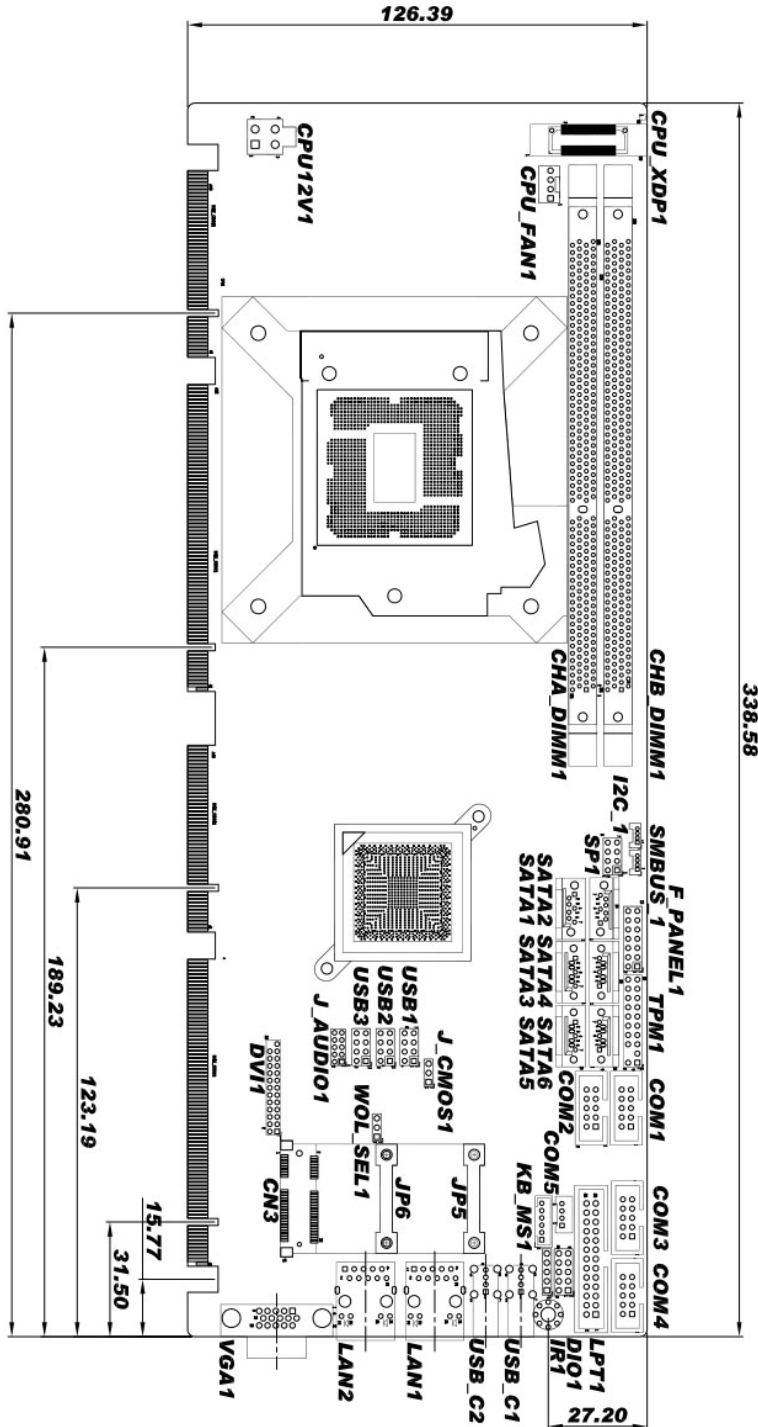


Figure 1-3: SPCIE-C2160 Dimensions (mm)

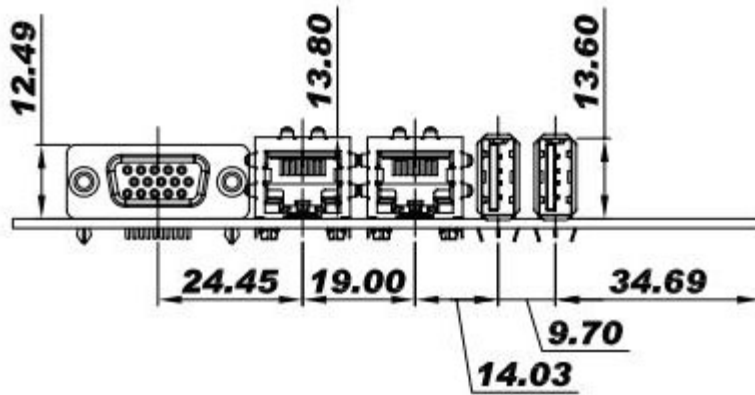


Figure 1-4: External Interface Panel Dimensions (mm)

SPCIE-C2160 PICMG 1.3 CPU Card

1.6 Data Flow

Figure 1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

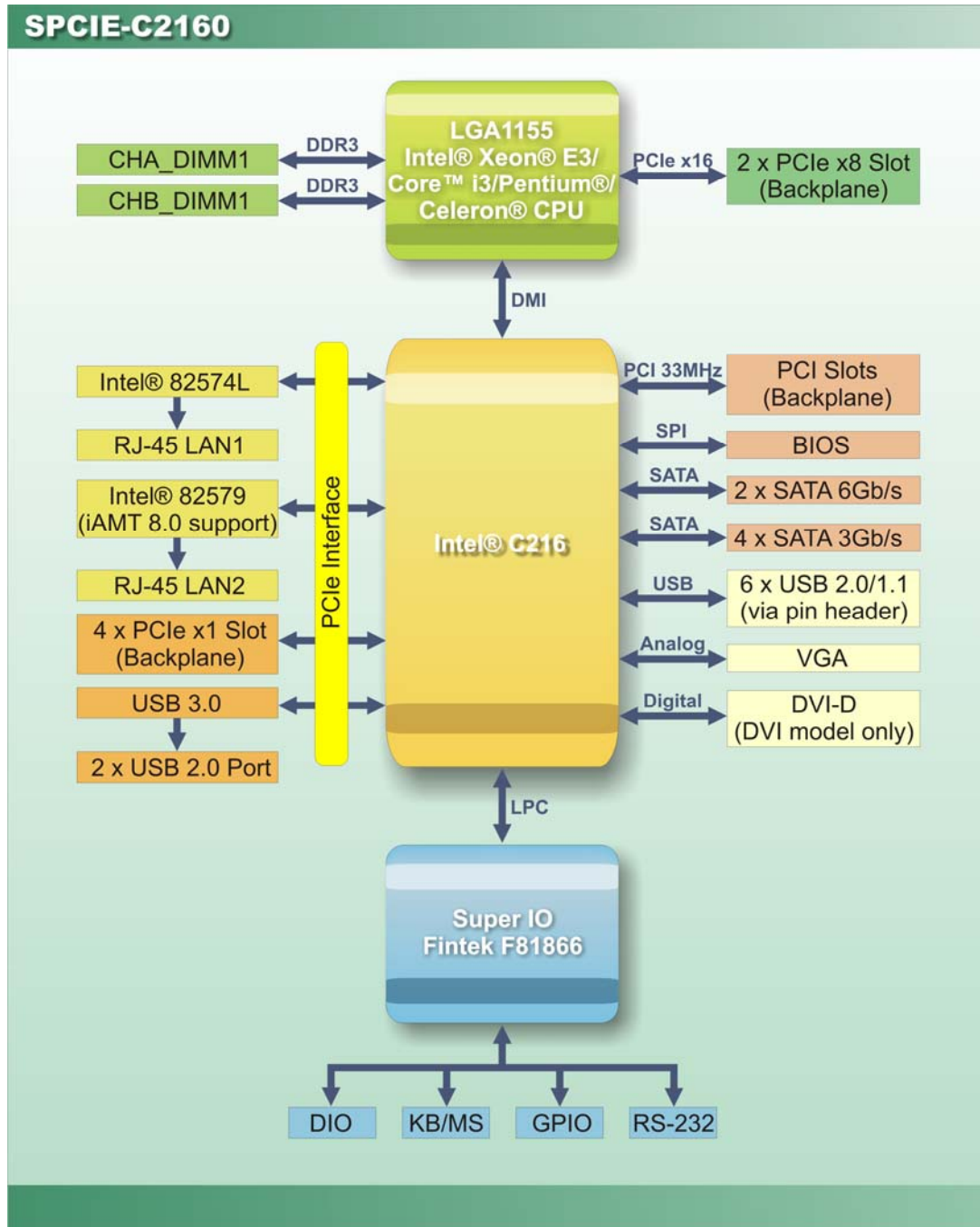


Figure 1-5: Data Flow Diagram

## 1.7 Technical Specifications

The SPCIE-C2160 technical specifications are listed below.

Specification/Model	SPCIE-C2160
<b>Form Factor</b>	PICMG 1.3
<b>CPU Supported</b>	LGA1155 Intel® Xeon® E3/Core™ i3/Pentium®/Celeron® CPU
<b>Chipset</b>	Intel® C216
<b>Memory</b>	Two 240-pin 1600/1333 MHz dual-channel ECC/non-ECC unbuffered DDR3 SDRAM DIMMs support (system max. 16.0 GB)
<b>Graphics Engine</b>	Intel® HD Graphics Gen 7 supports DirectX 11 and OpenCL 1.1 Full MPEG2, VC1, AVC Decode
<b>Audio</b>	Supports IEI AC-KIT-892HD-R10 audio kit
<b>BIOS</b>	UEFI BIOS
<b>Ethernet Controllers</b>	Intel® 82574L PCIe Ethernet controller (LAN1) Intel® 82579 PHY with Intel® AMT 8.0 support (LAN2)
<b>Super I/O Controller</b>	Fintek F81866
<b>Watchdog Timer</b>	Software programmable supports 1~255 sec. system reset
<b>Expansions</b>	One PCIe Mini slot (with USB 2.0/1.1 signal) PCIe signal and PCI signal via golden fingers Supports one PCIe x4 slot or four PCIe x1* slots on backplane * For installing the PCIe x1 devices on the backplane, the users have to update BIOS to the version which supports PCIe x1 specifications.
<b>I/O Interface Connectors</b>	
<b>Audio Connector</b>	One internal audio connector (10-pin header)
<b>Digital I/O</b>	8-bit, 4-bit input/4-bit output
<b>Display Output</b>	One VGA One DVI-D (via 26-pin header to IO-KIT-001-R20 DVI-D/USB module) (DVI model only)
<b>Ethernet</b>	Two RJ-45 GbE ports
<b>Fan</b>	One 4-pin wafer connector



## SPCIE-C2160 PICMG 1.3 CPU Card

<b>Specification/Model</b>	<b>SPCIE-C2160</b>
<b>Front Panel</b>	One 14-pin header (power LED, HDD LED, speaker, power button, reset button)
<b>I2C</b>	One 4-pin wafer connector
<b>Infrared</b>	One via 5-pin header
<b>Keyboard/Mouse</b>	One 6-pin wafer connector
<b>Parallel Port</b>	One parallel port via internal 26-pin box header
<b>Serial ATA</b>	Four SATA 3Gb/s connectors (support RAID 0, 1, 5, 10) Two SATA 6Gb/s connectors (support RAID 0, 1, 5, 10)
<b>Serial Ports</b>	Four RS-232 via internal box headers One RS-422/485 via internal 4-pin wafer connector
<b>SMBus</b>	One 4-pin wafer connector
<b>TPM</b>	One via 20-pin header
<b>USB Ports</b>	Two external USB 2.0 ports on rear IO Six internal USB 2.0 ports by three pin headers
<b>Environmental and Power Specifications</b>	
<b>Power Supply</b>	AT/ATX power supported
<b>Power Consumption</b>	5V@3.98A , 12V@0.38A, Vcore_12V@7.81A, 3.3V@1.61A, 5VSB@0.15A (3.4 GHz Intel® Xeon® E3 CPU with two 2GB 1333 MHz DDR3 memory)
<b>Operating Temperature</b>	-10°C ~ 60°C
<b>Storage Temperature</b>	-20°C ~ 70°C
<b>Humidity</b>	5% ~ 95% (non-condensing)
<b>Physical Specifications</b>	
<b>Dimensions</b>	338 mm x 126 mm
<b>Weight (GW/NW)</b>	1200 g / 420 g

Table 1-2: SPCIE-C2160 Specifications

Chapter

**2**

# Packing List

---

## SPCIE-C2160 PICMG 1.3 CPU Card

### 2.1 Anti-static Precautions

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#### WARNING!

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

---

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 SPCIE-C2160 is unpacked, please do the following:

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






## 2.3 Packing List







**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the SPCIE-C2160 was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

The SPCIE-C2160 is shipped with the following components:

Quantity	Item and Part Number	Image
1	SPCIE-C2160 CPU card	
4	SATA cable (P/N: 32000-062800-RS)	
1	Dual RS-232 cable (P/N: 19800-000051-RS)	
1	Dual-port USB cable with bracket (P/N: 19800-003100-300-RS)	
1	Mini jumper pack	





## SPCIE-C2160 PICMG 1.3 CPU Card

Quantity	Item and Part Number	Image
1	DVI-D/USB kit (DVI model only) (P/N: IO-KIT-001-R20)	
1	One Key Recovery CD	
1	Utility CD	
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
RS-422/485 cable, 200 mm (P/N: 32205-003800-300-RS)	
KB/MS cable with bracket (P/N: 19800-000075-RS)	
SATA to IDE/CF converter board (P/N: SAIDE-KIT01-R10)	
SATA power cable (P/N: 32102-000100-200-RS)	

Item and Part Number	Image
LPT cable (P/N: 19800-000049-RS)	
7.1-channel HD audio kit with Realtek ALC892 audio codec supporting dual audio stream (P/N: AC-KIT-892HD-R10)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 73W) (P/N: CF-1156A-RS-R11)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 45W) (P/N: CF-1156C-RS)	
LGA1155/LGA1156 cooler kit (1U chassis compatible, 65W) (P/N: CF-1156D-RS)	
LGA1155/LGA1156 cooler kit (95W) (P/N: CF-1156E-R11)	

**Table 2-2: Optional Items**

Chapter

**3**

# Connectors

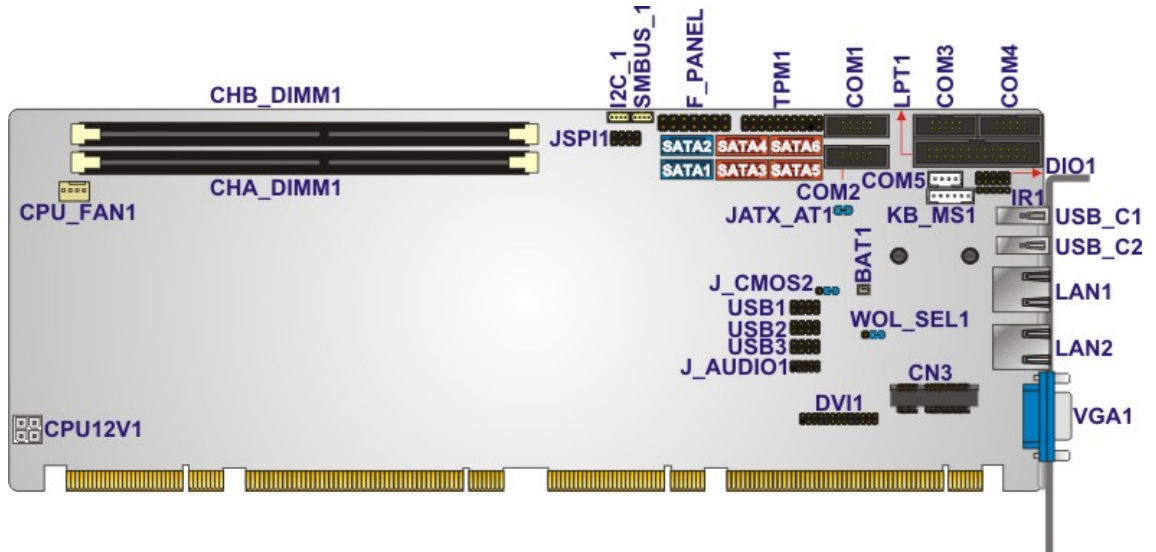
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### 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

#### 3.1.1 SPCIE-C2160 Layout

The figures below show all the connectors and jumpers.



**Figure 3-1: Connectors and Jumpers**

#### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
+12V ATX power supply connector	4-pin Molex power connector	CPU12V1
Audio kit connector	10-pin header	J_AUDIO1
Battery connector	2-pin wafer	BT2
DDR3 DIMM sockets	240-pin socket	CHA_DIMM1 CHB_DIMM1
Digital I/O connector	10-pin header	DIO1
DVI-D connector (DVI model only)	26-pin header	DVI1



## SPCIE-C2160 PICMG 1.3 CPU Card

Connector	Type	Label
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Front panel connector	14-pin header	F_PANEL1
I2C connector	4-pin wafer	I2C_1
Infrared connector	5-pin header	IR1
Keyboard and mouse connector	6-pin wafer	KB_MS1
Parallel port connector	26-pin box header	LPT1
PCIe Mini slot	PCIe Mini	CN3
SATA 3Gb/s drive connector	7-pin SATA connector	SATA3, SATA4, SATA5, SATA6
SATA 6Gb/s drive connector	7-pin SATA connector	SATA1, SATA2
Serial port, RS-422/485	4-pin wafer	COM5
Serial port, RS-232	10-pin box header	COM1, COM2, COM3, COM4
SMBus connector	4-pin wafer	SMBUS_1
SPI ROM connector	8-pin header	JSPI1
TPM connector	20-pin header	TPM1
USB connectors	8-pin header	USB1, USB2, USB3

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

### 3.1.3 External Interface Panel Connectors

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

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port	USB	USB_C1
USB port	USB	USB_C2

Connector	Type	Label
VGA connector	15-pin female	VGA1

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

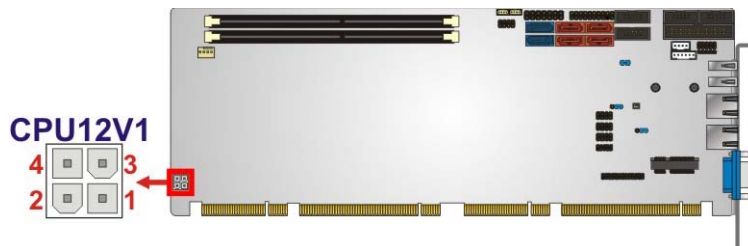
### 3.2 Internal Peripheral Connectors

The section describes all of the connectors on the SPCIE-C2160.

#### 3.2.1 12V Power Connector

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

The connector supports the 12V power supply.



**Figure 3-2: ATX Power Connector Pinout Location**

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

**Table 3-3: ATX Power Connector Pinouts**

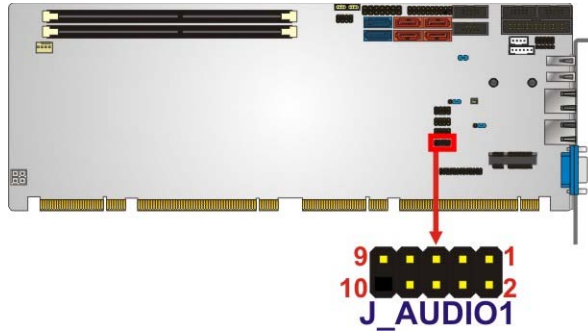
#### 3.2.2 Audio Kit Connector

- CN Label:** J\_AUDIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-3**

**SPCIE-C2160 PICMG 1.3 CPU Card**

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

This connector connects to an external audio kit.



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

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ACZ_SYNC	2	ACZ_BITCLK
3	ACZ_SDOUT	4	ACZ_PCBEEP
5	ACZ_SDIN	6	ACZ_RST#
7	ACZ_VCC	8	ACZ_GND
9	ACZ_12V	10	ACZ_GND

**Table 3-4: Audio Connector Pinouts**

**3.2.3 Battery Connector**



**CAUTION:**

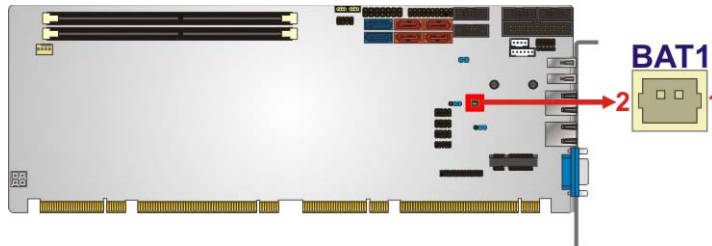
Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

**CN Label:** BAT1  
**CN Type:** 2-pin wafer  
**CN Location:** See **Figure 3-4**

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

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



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

Pin	Description
1	GND
2	Battery+

**Table 3-5: Battery Connector (BT2) Pinouts**

### 3.2.4 DDR3 DIMM Slots

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

**CN Type:** DDR3 DIMM slot

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

The DIMM slots are for DDR3 DIMM memory modules.

SPCIE-C2160 PICMG 1.3 CPU Card

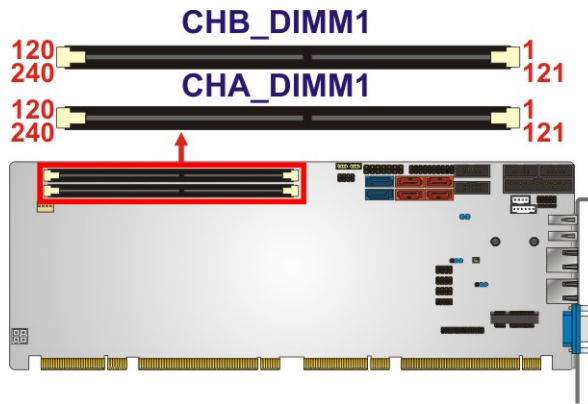


Figure 3-5: DDR3 DIMM Slot Locations

3.2.5 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin header
- CN Location:** See Figure 3-6
- CN Pinouts:** See Table 3-6

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

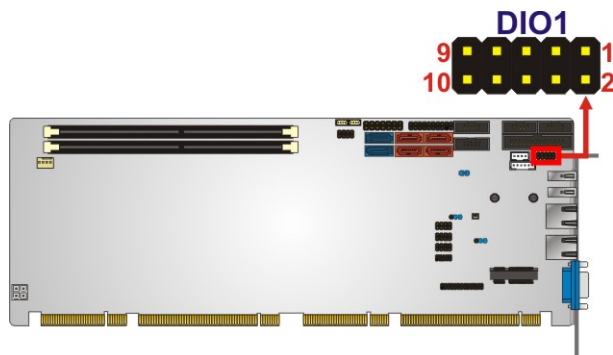


Figure 3-6: Digital I/O Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0

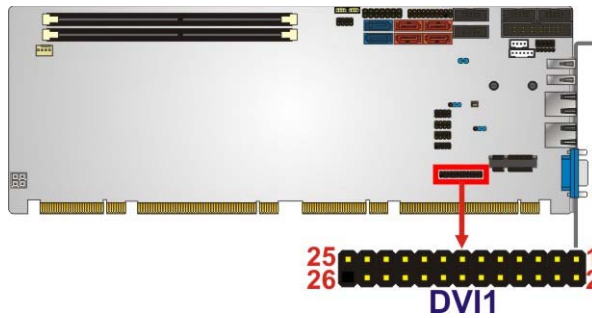
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
7	Input 3	8	Input 2
9	Input 1	10	Input 0

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

### 3.2.6 DVI-D Connector (DVI Model Only)

- CN Label:** DVI1
- CN Type:** 26-pin header
- CN Location:** See **Figure 3-7**
- CN Pinouts:** See **Table 3-7**

The DVI-D connector connects to a monitor that supports DVI video input via the DVI-D/USB kit.



**Figure 3-7: DVI-D Connector Location**

Pin	Description	Pin	Description
1	Data 2-	2	Data 2+
3	GND	4	NC
5	NC	6	DDC Clock
7	DDC Data	8	NC
9	Data 1-	10	Data 1+
11	GND	12	NC
13	NC	14	VCC
15	GND	16	Hot Plug Detect
17	Data 0-	18	Data 0+

**SPCIE-C2160 PICMG 1.3 CPU Card**

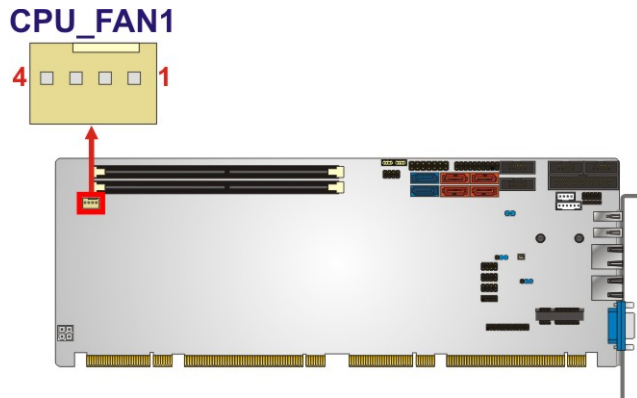
Pin	Description	Pin	Description
19	GND	20	NC
21	NC	22	GND
23	Clock +	24	Clock -
25	GND	26	NC

**Table 3-7: DVI-D Connector Pinouts**

**3.2.7 Fan Connector (CPU)**

- CN Label:** CPU\_FAN1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-8**

The fan connector attaches to a CPU cooling fan.



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

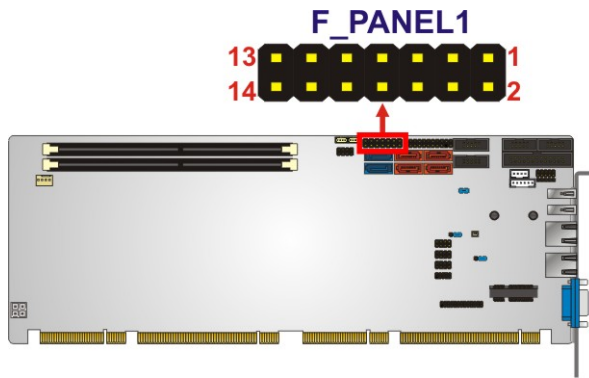
PIN NO.	DESCRIPTION
1	GND
2	+12 V
3	Rotation Signal
4	PWM Control Signal

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

### 3.2.8 Front Panel Connector

- CN Label:** F\_PANEL1
- CN Type:** 14-pin header
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

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



**Figure 3-9: Front Panel Connector Location**

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	GROUND		6	N/C
Power Button	7	PWR_BTN+	Reset	8	Speaker
	9	PWR_BTN-		10	N/C
HDD LED	11	+5V		12	RESET-
	13	HDD_LED-		14	GROUND

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

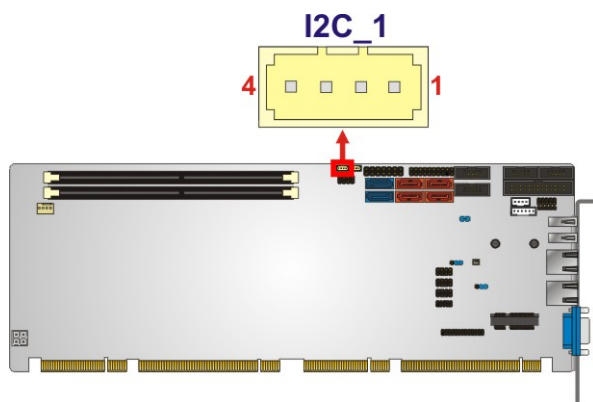


## SPCIE-C2160 PICMG 1.3 CPU Card

### 3.2.9 I2C Connector

- CN Label:** I2C\_1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-10**

The I2C connector is for system debug.



**Figure 3-10: I2C Connector Location**

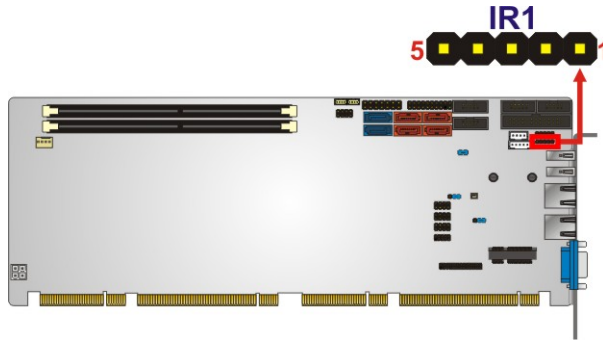
Pin	Description
1	GND
2	PCH_GP38_PU
3	PCH_GP39_PU
4	+5VS

**Table 3-10: I2C Connector Pinouts**

### 3.2.10 Infrared Interface Connector

- CN Label:** IR1
- CN Type:** 5-pin header
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

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



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

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

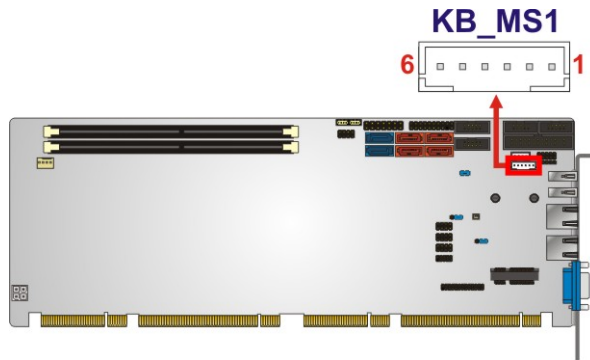
**Table 3-11: Infrared Connector Pinouts**

### 3.2.11 Keyboard/Mouse Connector

- CN Label:** KB\_MS1
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

**SPCIE-C2160 PICMG 1.3 CPU Card**



**Figure 3-12: Keyboard/Mouse Connector Location**

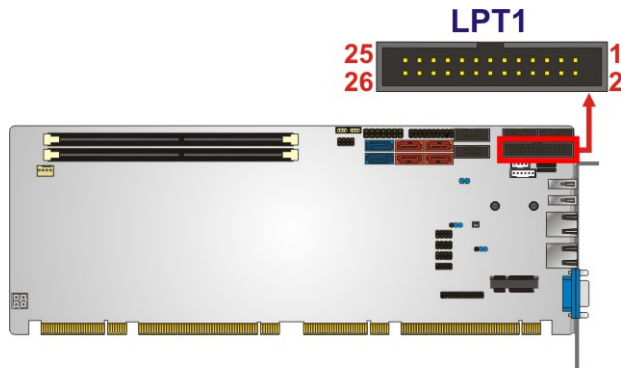
Pin	Description
1	+5 VCC
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GROUND

**Table 3-12: Keyboard/Mouse Connector Pinouts**

**3.2.12 Parallel Port Connector**

- CN Label:** LPT1
- CN Type:** 26-pin box header
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-13**

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



**Figure 3-13: Parallel Port Connector Location**

Pin	Description	Pin	Description
1	STROBE#	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACKNOWLEDGE#
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE#
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

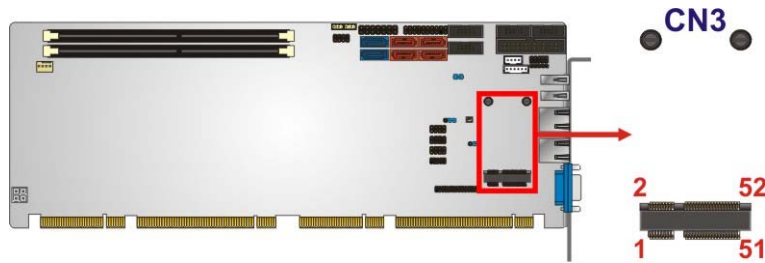
**Table 3-13: Parallel Port Connector Pinouts**

### 3.2.13 PCIe Mini Card Slot

- CN Label:** CN3
- CN Type:** PCIe Mini card slot
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-14**

## SPCIE-C2160 PICMG 1.3 CPU Card

The PCIe Mini card slot is for installing a PCIe Mini expansion card.



**Figure 3-14: PCIe Mini Card Slot Location**

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	NC	4	GND
5	NC	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB-
37	NC	38	USB+
39	NC	40	GND
41	NC	42	NC
43	NC	44	RF_LINK#
45	NC	46	BLUELED#

Pin	Description	Pin	Description
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	VCC3

**Table 3-14: PCIe Mini Card Slot Pinouts**

### 3.2.14 SATA 3Gb/s Drive Connector

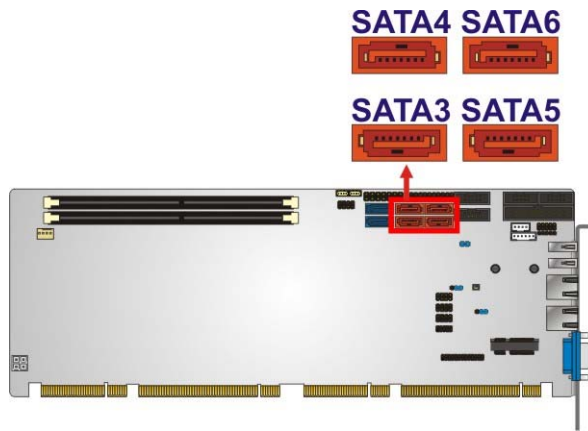
**CN Label:** SATA3, SATA4, SATA5, SATA6

**CN Type:** 7-pin SATA drive connector

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

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

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



**Figure 3-15: SATA 3Gb/s Drive Connector Location**

Pin	Description	Pin	Description
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

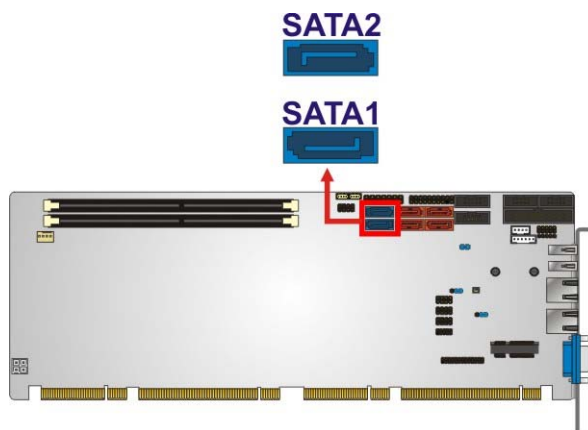
**Table 3-15: SATA 3Gb/s Drive Connector Pinouts**

## SPCIE-C2160 PICMG 1.3 CPU Card

### 3.2.15 SATA 6Gb/s Drive Connector

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connector
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-16**

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



**Figure 3-16: SATA 6Gb/s Drive Connector Location**

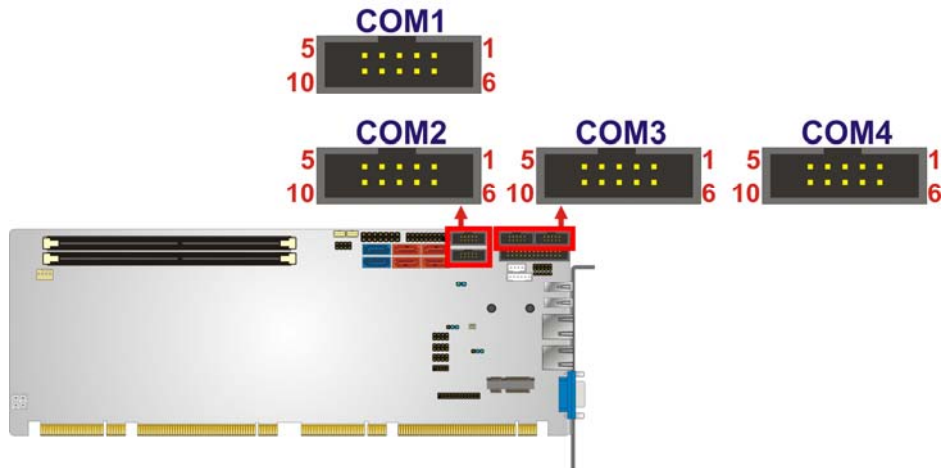
Pin	Description	Pin	Description
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		

**Table 3-16: SATA 6Gb/s Drive Connector Pinouts**

### 3.2.16 Serial Port Connectors, RS-232

- CN Label:** COM1, COM2, COM3, COM4
- CN Type:** 10-pin box header
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-17**

Each of these connectors provides RS-232 connections.



**Figure 3-17: Serial Port Connector Location**

Pin	Description	Pin	Description
1	Data Carrier Direct (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set Ready (DSR)
7	Request To Send (RTS)	8	Clear To Send (CTS)
9	Ring Indicator (RI)	10	N/C

**Table 3-17: Serial Port Connector Pinouts**

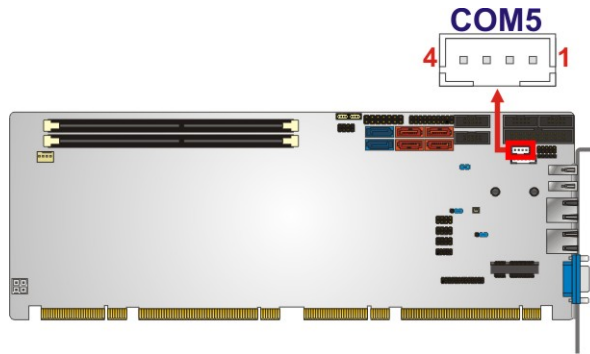
### 3.2.17 Serial Port Connector, RS-422/485

- CN Label:** COM5
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-18**

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



**SPCIE-C2160 PICMG 1.3 CPU Card**



**Figure 3-18: RS-422/485 Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD422-	3	TXD422+/TXD485+
2	RXD422+	4	TXD422-/TXD485-

**Table 3-18: RS-422/485 Connector Pinouts**

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

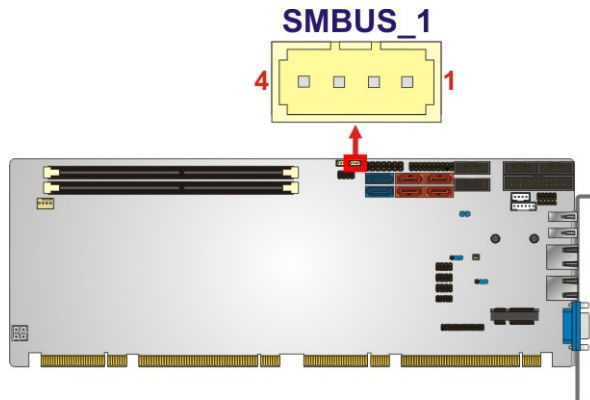
RS-422 Pinouts	RS-485 Pinouts

**Table 3-19: DB-9 RS-422/485 Pinouts**

**3.2.18 SMBus Connector**

- CN Label:** SMBUS\_1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-19**
- CN Pinouts:** See **Table 3-20**

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



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

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

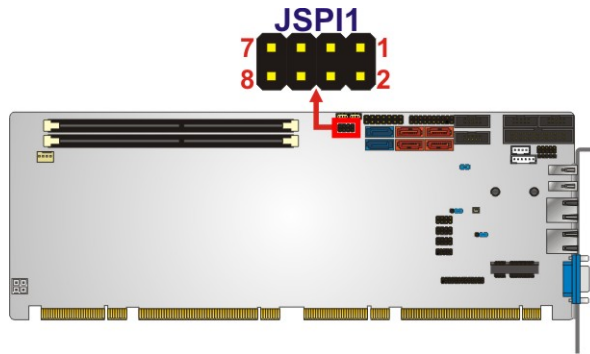
**Table 3-20: SMBus Connector Pinouts**

### 3.2.19 SPI ROM Connector

- CN Label:** JSPI1
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-20**
- CN Pinouts:** See **Table 3-21**

The SPI connector is used to flash the BIOS.

**SPCIE-C2160 PICMG 1.3 CPU Card**



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

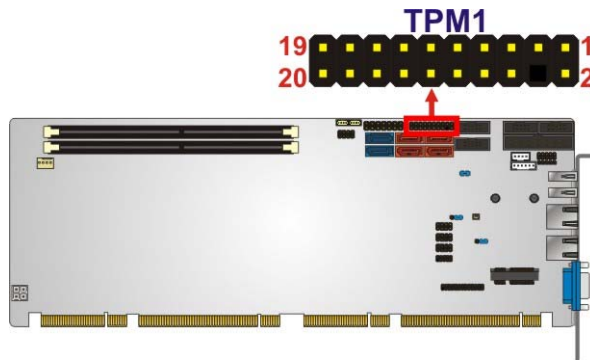
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SPI_CS0	4	SPI_CLK
5	SPI_S00	6	SPI_SI
7	NC	8	NC

**Table 3-21: SPI Connector Pinouts**

**3.2.20 TPM Connector**

- CN Label:** TPM1
- CN Type:** 20-pin header
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-22**

The TPM connector connects to a TPM module.



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

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CLK	2	GND
3	ERAME#	4	NC
5	RESRT#	6	+5V
7	AD3	8	AD2
9	+3V	10	AD1
11	AD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	SB3V	16	SERIRO
17	GND	18	CLKRUN#
19	PM_SUS_STAT#	20	DRQ#

**Table 3-22: TPM Connector Pinouts**

### 3.2.21 USB Connectors

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

**CN Type:** 8-pin header

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

**CN Pinouts:** See **Table 3-23**

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

SPCIE-C2160 PICMG 1.3 CPU Card

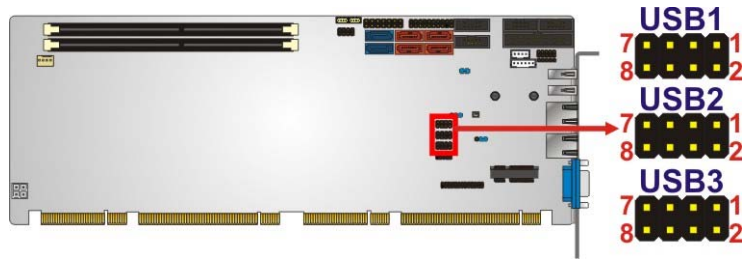


Figure 3-22: USB Connector Pinout Locations

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

Table 3-23: USB Port Connector Pinouts

### 3.3 External Peripheral Interface Connector Panel

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

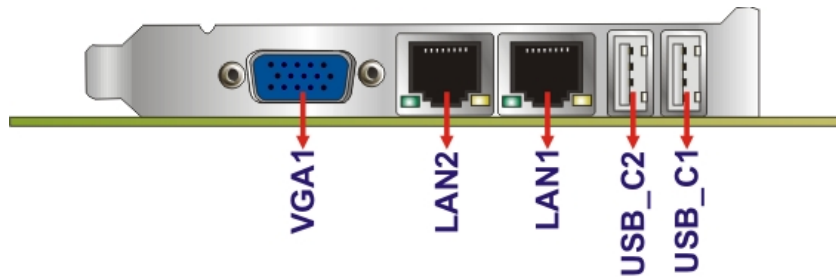


Figure 3-23: External Peripheral Interface Connector

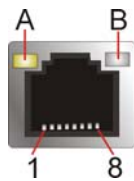
#### 3.3.1 Ethernet Connectors

- CN Label:** LAN1 and LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 3-23
- CN Pinouts:** See Figure 3-24 and Table 3-24

The SPCIE-C2160 is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

Pin	Description	Pin	Description
1	MDIA3-	5	MDIA2+
2	MDIA3+	6	MDIA1+
3	MDIA1-	7	MDIA0-
4	MDIA2-	8	MDIA0+

**Table 3-24: LAN Pinouts**



**Figure 3-24: Ethernet Connector**

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

**Table 3-25: Connector LEDs**

### 3.3.2 USB Connectors

**CN Label:** USB\_C1 and USB\_C2

**CN Type:** USB port

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

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

The SPCIE-C2160 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

Pin	Description
1	VCC
2	DATA-

## SPCIE-C2160 PICMG 1.3 CPU Card

Pin	Description
3	DATA+
4	GROUND

**Table 3-26: USB Port Pinouts**

### 3.3.3 VGA Connector

**CN Label:** VGA1

**CN Type:** 15-pin Female

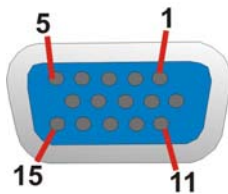
**CN Location:** See **Figure 3-23**

**CN Pinouts:** See **Figure 3-25** and **Table 3-27**

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

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

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



**Figure 3-25: VGA Connector**

Chapter

**4**

# Installation

---



## SPCIE-C2160 PICMG 1.3 CPU Card

### 4.1 Anti-static Precautions

---



#### WARNING:

Failure to take ESD precautions during the installation of the SPCIE-C2160 may result in permanent damage to the SPCIE-C2160 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the SPCIE-C2160. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the SPCIE-C2160 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 SPCIE-C2160, place it on an anti-static pad. This reduces the possibility of ESD damaging the SPCIE-C2160.
- **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 SPCIE-C2160 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 SPCIE-C2160 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 SPCIE-C2160 off:
  - When working with the SPCIE-C2160, 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 SPCIE-C2160 **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.

## SPCIE-C2160 PICMG 1.3 CPU Card

### 4.2.1 Socket LGA1155 CPU Installation



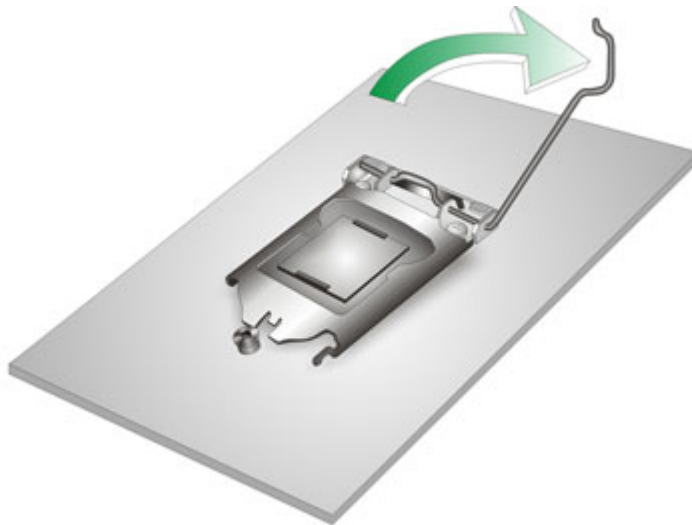
#### **WARNING:**

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

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

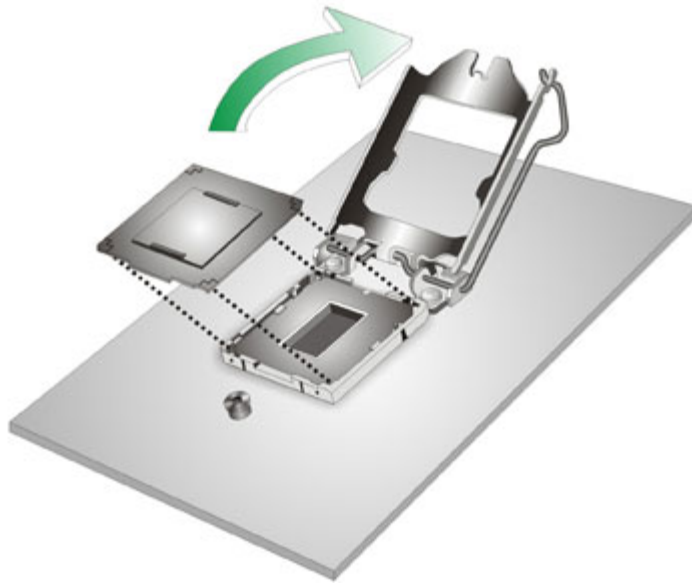
To install the CPU, follow the steps below.

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



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

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



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

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

## SPCIE-C2160 PICMG 1.3 CPU Card

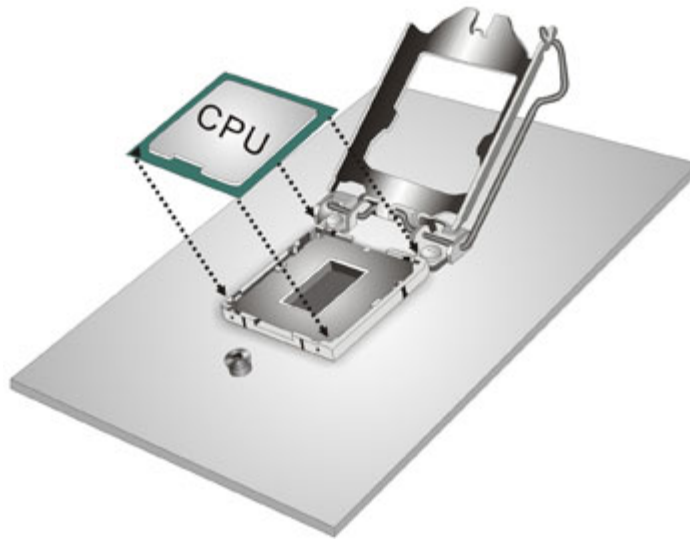


Figure 4-3: Insert the Socket LGA1155 CPU

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

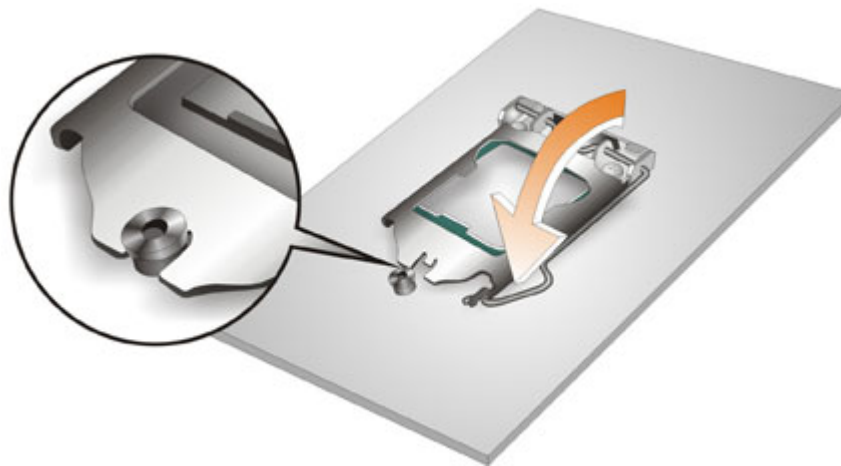


Figure 4-4: Close the Socket LGA1155

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

## 4.2.2 Socket LGA1155 Cooling Kit Installation

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



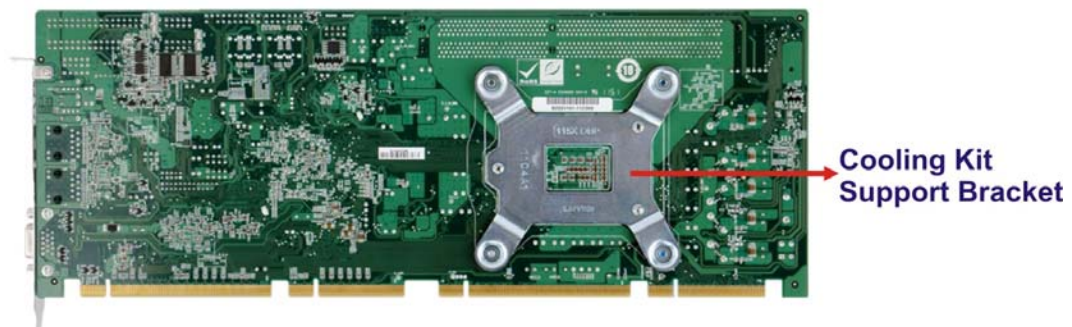
### WARNING:

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

---

To install the cooling kit, follow the instructions below.

**Step 1:** A cooling kit bracket is pre-installed on the rear of the motherboard. See **Figure 4-5**.



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

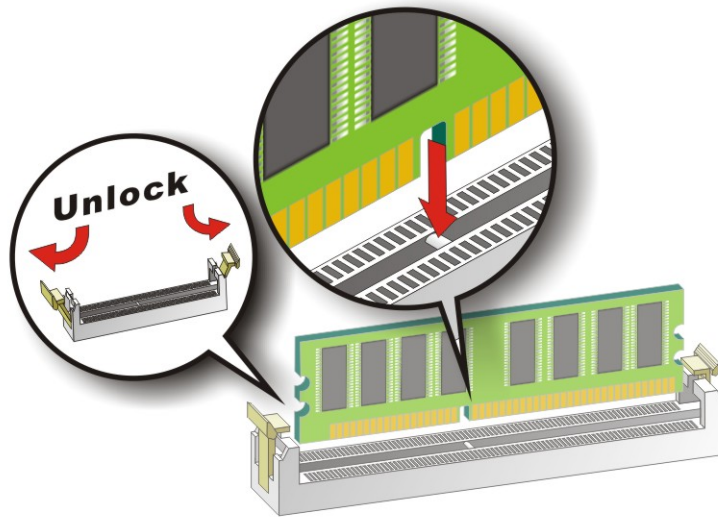
- Step 2:** Place the cooling kit onto the socket LGA1155 CPU. Make sure the CPU cable can be properly routed when the cooling kit is installed.
- Step 3:** Mount the cooling kit. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the holes of the cooling kit bracket.
- Step 4:** Secure the cooling kit by fastening the four retention screws of the cooling kit.

## SPCIE-C2160 PICMG 1.3 CPU Card

**Step 5: Connect the fan cable.** Connect the cooling kit fan cable to the fan connector on the SPCIE-C2160. Carefully route the cable and avoid heat generating chips and fan blades.

### 4.2.3 DIMM Installation

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



**Figure 4-6: DIMM Installation**

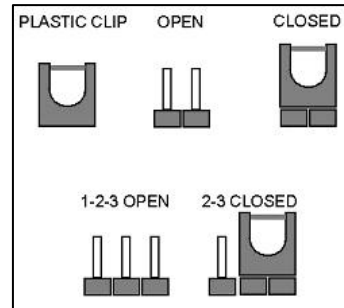
- Step 1: Open the DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-6**.
- Step 2: Align the DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.
- Step 3: Insert the DIMM.** Once aligned,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

### 4.3 Jumper Settings



**NOTE:**

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



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

Description	Label	Type
AT/ATX power select	JATX_AT1	2-pin header
Clear CMOS jumper	J_CMOS1	3-pin header
Wake-on LAN	WOL_SEL1	3-pin header

**Table 4-1: Jumpers**

#### 4.3.1 AT/ATX Power Select Jumper

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

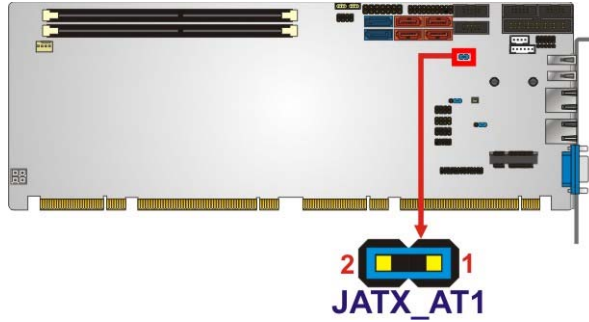
The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX.



**SPCIE-C2160 PICMG 1.3 CPU Card**

Setting	Description
Closed	ATX power (Default)
Open	AT power

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



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

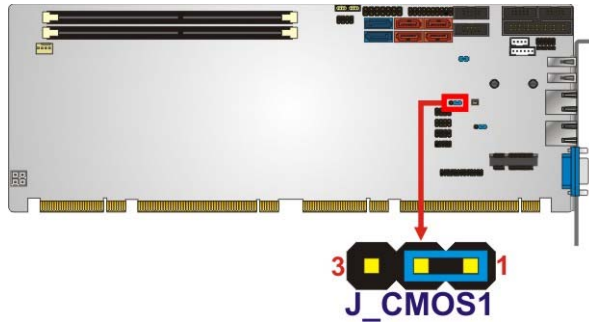
**4.3.2 Clear CMOS Jumper**

- Jumper Label:** J\_CMOS1
- Jumper Type:** 3-pin header
- Jumper Settings:** See Table 4-3
- Jumper Location:** See Figure 4-8

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

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

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



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

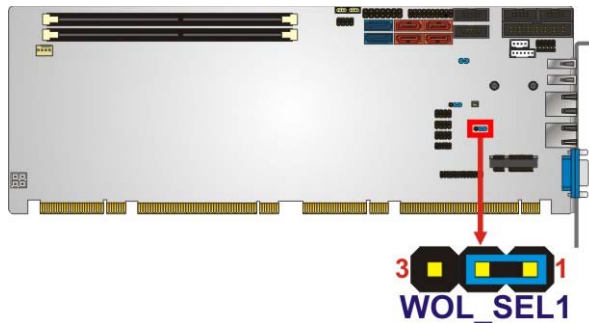
### 4.3.3 Wake-on LAN Jumper

- CN Label:** WOL\_SEL1
- CN Type:** 3-pin header
- CN Location:** See **Figure 4-9**
- CN Pinouts:** See **Table 4-4**

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

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

**Table 4-4: Wake-on LAN Connector Pinouts**



**Figure 4-9: Wake-on LAN Connector Pinout Locations**

## SPCIE-C2160 PICMG 1.3 CPU Card

### 4.4 Chassis Installation

#### 4.4.1 Airflow



#### **WARNING:**

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the SPCIE-C2160 must have air vents to allow cool air to move into the system and hot air to move out.

---

The SPCIE-C2160 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

#### 4.4.2 CPU Card Installation

To install the CPU card onto the backplane, carefully align the CPU card edge connector with the CPU card socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

### 4.5 Internal Peripheral Device Connections

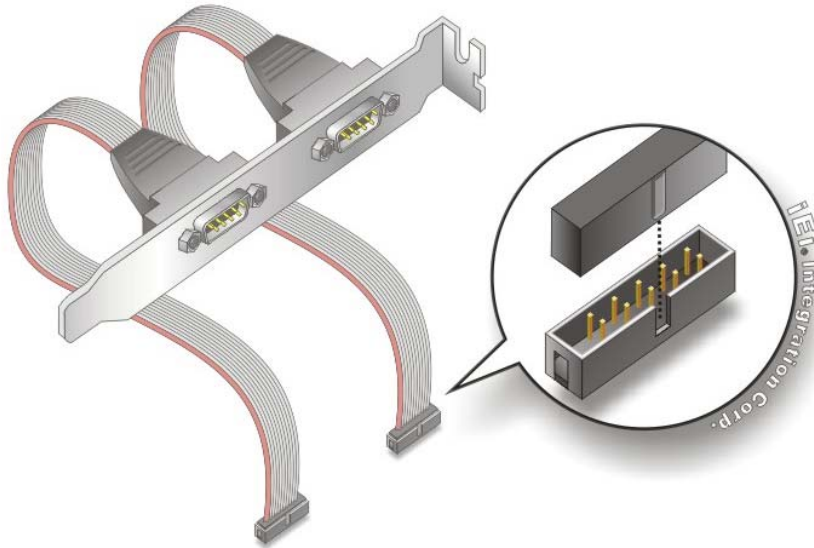
This section outlines the installation of peripheral devices to the onboard connectors.

#### 4.5.1 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 (**Figure 4-10**). A key on the front of the cable connectors ensures the connector can only be installed in one direction.



**Figure 4-10: 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.

#### 4.5.2 DVI-D/USB Kit Installation (DVI Model Only)

The DVI-D/USB kit, consisting of one DVI-D and four USB ports, connects to the DVI-D and USB connectors on the SPCIE-C2160. To install the DVI-D/USB kit, please follow the steps below.

**Step 1:** **Connect the cables to the DVI-D/USB kit.** Connect the included cables to the DVI-D/USB kit.

**Step 2:** **Connect the cables to the board.** Connect the other ends of the included cables to the board.

## SPCIE-C2160 PICMG 1.3 CPU Card

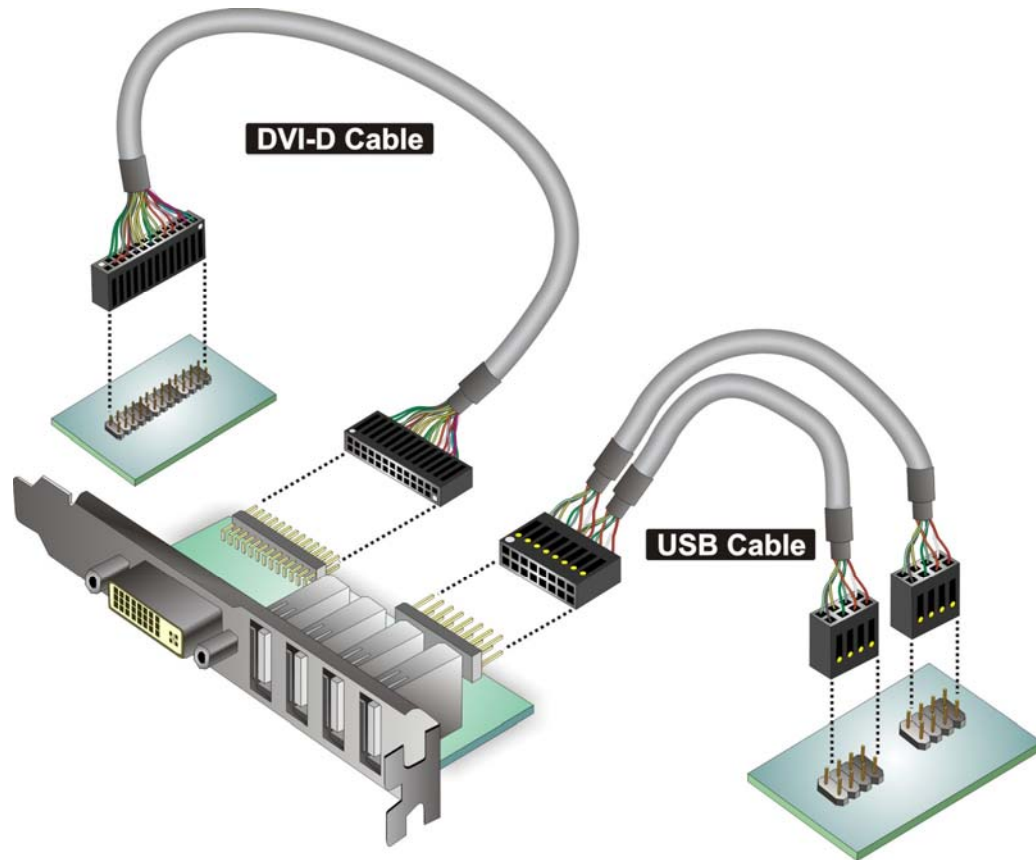


Figure 4-11: DVI-D/USB Kit Installation

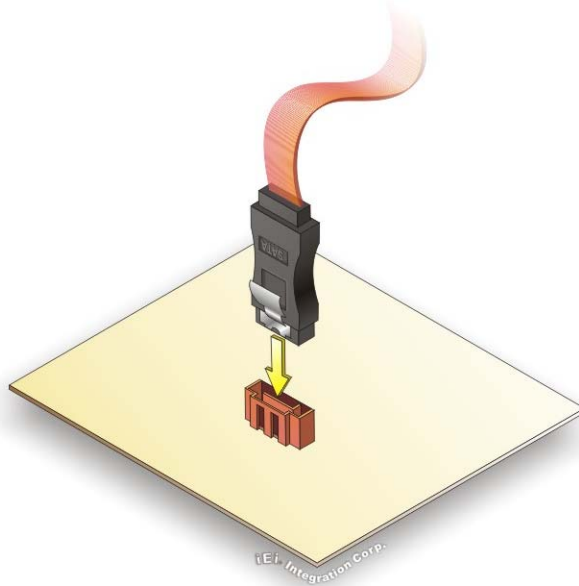
**Step 3:** Mount the DVI-D/USB kit onto the chassis. Once the DVI-D/USB kit is connected to the board, secure the DVI-D/USB kit bracket to the system chassis.

### 4.5.3 SATA Drive Connection

The SPCIE-C2160 is shipped with four SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

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

**Step 2:** Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the on-board SATA drive connector. See **Figure 4-12**.



**Figure 4-12: SATA Drive Cable Connection**

**Step 3:** Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-13**.

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

## SPCIE-C2160 PICMG 1.3 CPU Card

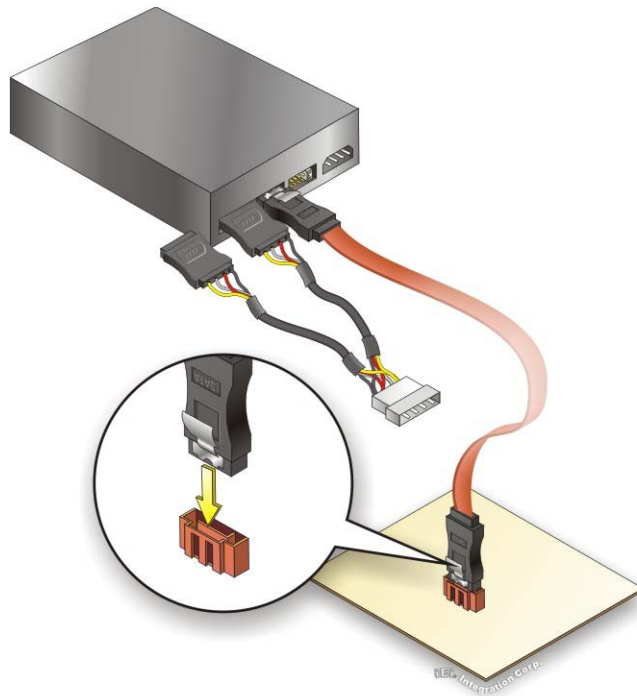


Figure 4-13: SATA Power Drive Connection

### 4.5.4 USB Cable (Dual Port) with Slot Bracket

The SPCIE-C2160 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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



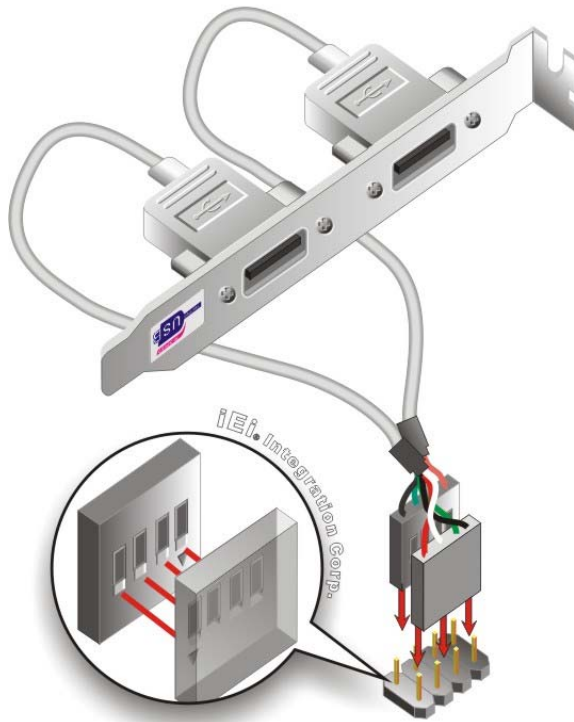
#### **WARNING:**

If the USB pins are not properly aligned, the USB device can burn out.

---

**Step 2:** **Align the connectors.** The cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the SPCIE-C2160 USB connector.

**Step 3:** **Insert the cable connectors.** Once the cable connectors are properly aligned with the USB connectors on the SPCIE-C2160, connect the cable connectors to the on-board connectors. See **Figure 4-14**.



**Figure 4-14: Dual USB Cable Connection**

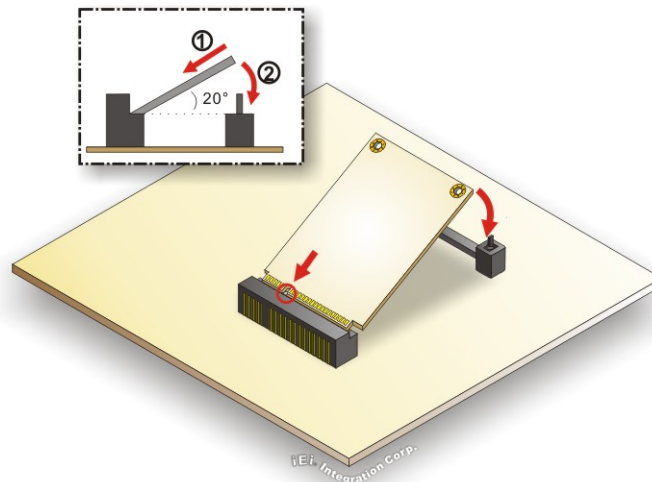
**Step 4:** **Attach the bracket to the chassis.** The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

#### 4.5.5 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.



## SPCIE-C2160 PICMG 1.3 CPU Card



**Figure 4-15: PCIe Mini Card Installation**

- Step 1:** **Insert into the socket at an angle.** Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 2:** **Push down until the card clips into place.** Push the other end of the card down until it clips into place on the plastic connector.

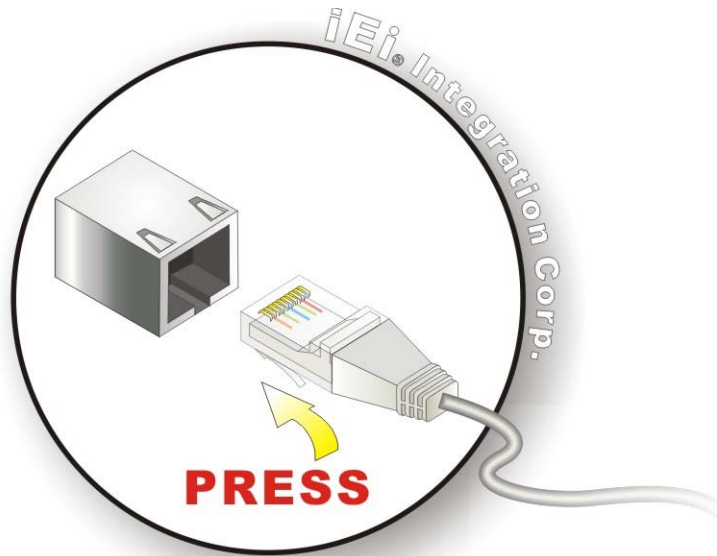
## 4.6 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the SPCIE-C2160.

### 4.6.1 LAN Connection

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

- Step 1:** **Locate the RJ-45 connectors.** The locations of the USB connectors are shown in **Chapter 3**.
- Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the SPCIE-C2160. See **Figure 4-16**.



**Figure 4-16: LAN Connection**

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

#### **4.6.2 USB Device Connection (Single Connector)**

There are two external USB 2.0 connectors. Both connectors are perpendicular to the SPCIE-C2160. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

**Step 1:** Located the USB connectors. The locations of the USB connectors are shown in Chapter 3.

**Step 2:** Align the connectors. Align the USB device connector with one of the connectors on the SPCIE-C2160. See **Figure 4-17**.

## SPCIE-C2160 PICMG 1.3 CPU Card

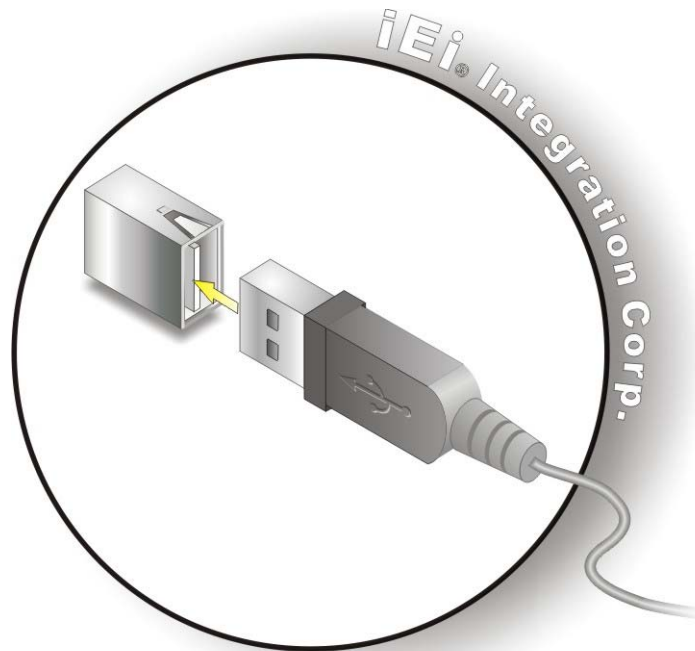


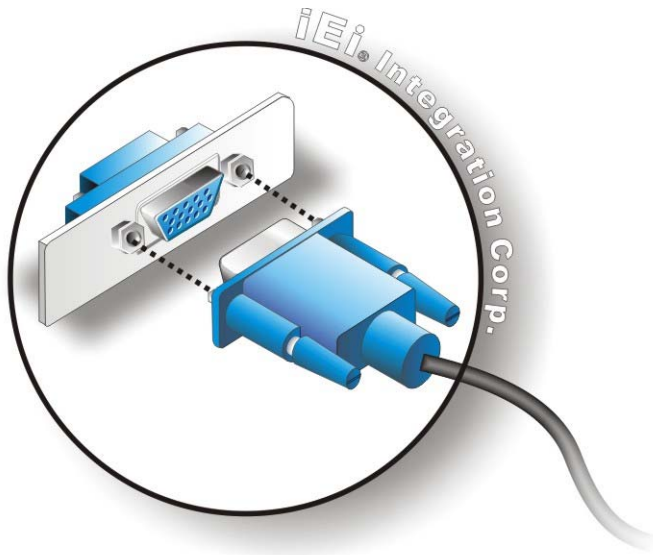
Figure 4-17: USB Device Connection

**Step 3:** **Insert the device connector.** Once aligned, gently insert the USB device connector into the on-board connector.

#### 4.6.3 VGA Monitor Connection

The SPCIE-C2160 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 SPCIE-C2160, 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 SPCIE-C2160. See **Figure 4-18**.



**Figure 4-18: VGA Connector**

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

## 4.7 Intel® AMT Setup Procedure

The SPCIE-C2160 is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

- Step 1:** Make sure the DIMM socket is installed with one DDR3 memory.
- Step 2:** Connect an Ethernet cable to the RJ-45 connector labeled **LAN2**.
- Step 3:** The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,
- Step 4:** Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD. See **Section 6.8**.
- Step 5:** Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up

## SPCIE-C2160 PICMG 1.3 CPU Card

process. Enter the Intel® current ME password as it requires (the Intel® default password is **admin**).



### **NOTE:**

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

---

Chapter

**5**

**BIOS**

---

## 5.1 Introduction

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



### NOTE:

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

---

### 5.1.1 Starting Setup

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

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

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

### 5.1.2 Using Setup

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

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

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

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

### 5.1.3 Getting Help

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

### 5.1.4 Unable to Reboot after Configuration Changes

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

### 5.1.5 BIOS Menu Bar

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

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



## SPCIE-C2160 PICMG 1.3 CPU Card

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

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

## 5.2 Main

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

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information				Set the Date. Use Tab to switch between Data elements.	
BIOS Vendor			American Megatrends		
Core Version			4.6.5.3		
Compliance			UEFI 2.3; PI 1.2		
Project Version			VOWDAR11.ROM		
Build Date and Time			03/27/2013 11:53:40		
Processor Information					
Name			SandyBridge		
Brand String			Intel(R) Xeon(R) CPU		
Frequency			3100 MHz		
Processor ID			206a7		
Stepping			D2		
Number of Processors			4Core(s) / 4Thread(s)		
Microcode Revision			28		
GT Info			GT2 (1350 MHz)		
IGFX VBIOS Version				2137	
Memory RC Version				1.2.2.0	
Total Memory				2048 MB (DDR3)	
Memory Frequency				1333 MHz	
PCH Information					
Name			PantherPoint		
Stepping			04/C1		
TXT Capability of Platform/PCH				Supported	
LAN PHY Revision				C0	
ME FW Version				8.0.0.1351	
ME Firmware SKU				5MB	
SPI Clock Frequency					
DOFR Support				Unsupported	
Read Status Clock Frequency				33 MHz	
Write Status Clock Frequency				33 MHz	
Fast Read Status Clock Frequency				33 MHz	
System Date				[Mon 04/01/2013]	
System Time				[15:10:27]	
Access Level				Administrator	
-----					
→←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit					
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.					

**BIOS Menu 1: Main**

## SPCIE-C2160 PICMG 1.3 CPU Card

### → System Overview

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

- BIOS Information
- Processor Information
- Memory Information
- PCH Information
- SPI Clock Frequency

The **Main** menu has two user configurable fields:

### → System Date [xx/xx/xx]

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

### → System Time [xx:xx:xx]

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

## 5.3 Advanced

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



### **WARNING!**

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

---

```

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

> ACPI Settings
> RTC Wake Settings
> Trusted Computing
> CPU Configuration
> SATA Configuration
> Intel TXT(LT) Configuration
> AMT Configuration
> USB Configuration
> F81866 Super IO Configuration
> F81866 H/M Monitor
> Serial Port Console Redirection
> iEi Feature

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

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

**BIOS Menu 2: Advanced**

**5.3.1 ACPI Settings**

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

```

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Advanced

ACPI Settings
ACPI Sleep State          [S1 only(CPU Stop C...)]

Select ACPI sleep state
the system will enter
when the SUSPEND button
is pressed.
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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

**BIOS Menu 3: ACPI Configuration**

## SPCIE-C2160 PICMG 1.3 CPU Card

### → ACPI Sleep State [S1 only (CPU Stop Clock)]

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

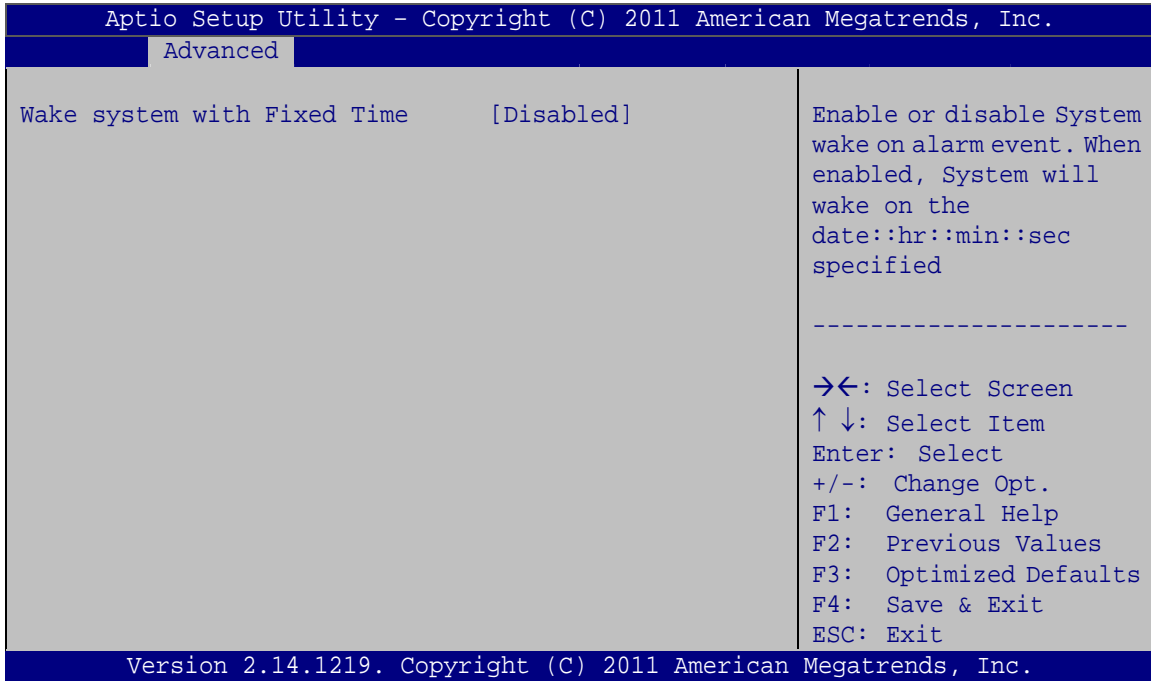
#### → Suspend Disabled

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

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

### 5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.



**BIOS Menu 4: RTC Wake Settings**

→ **Wake system with Fixed Time [Disabled]**

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

→ **Disabled**      **DEFAULT**      The real time clock (RTC) cannot generate a wake event

→ **Enabled**      If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

Wake up minute

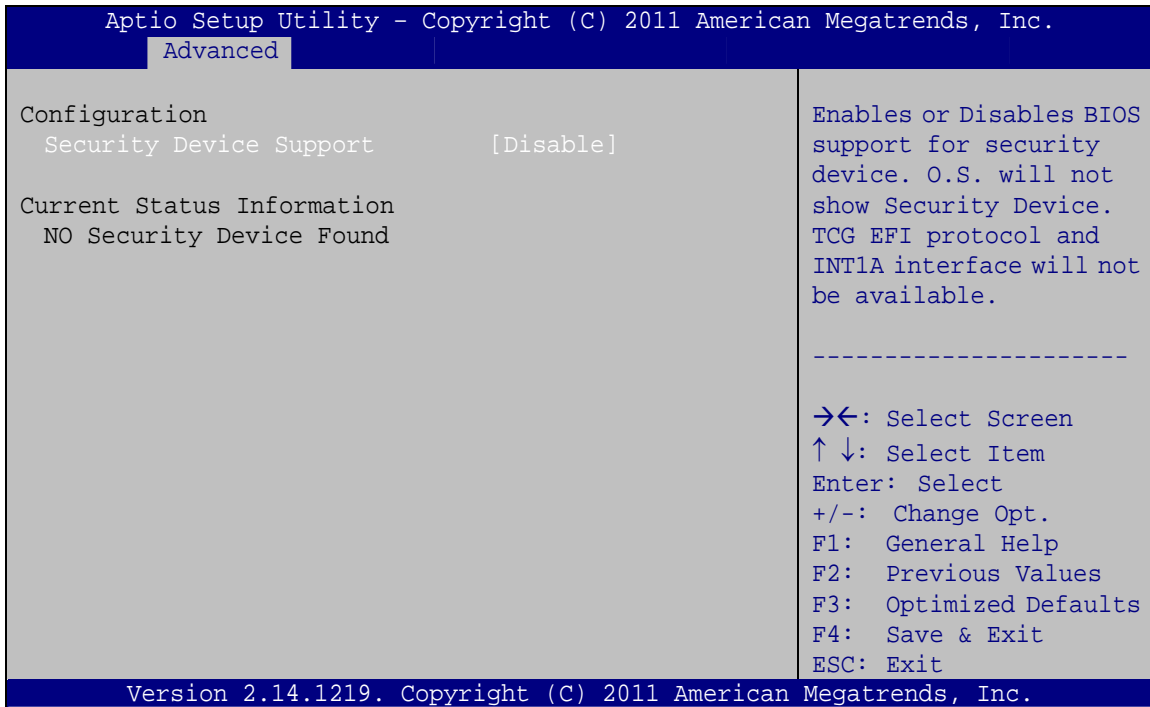
Wake up second

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

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### 5.3.3 Trusted Computing

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



#### BIOS Menu 5: Trusted Computing

##### → Security Device Support [Disable]

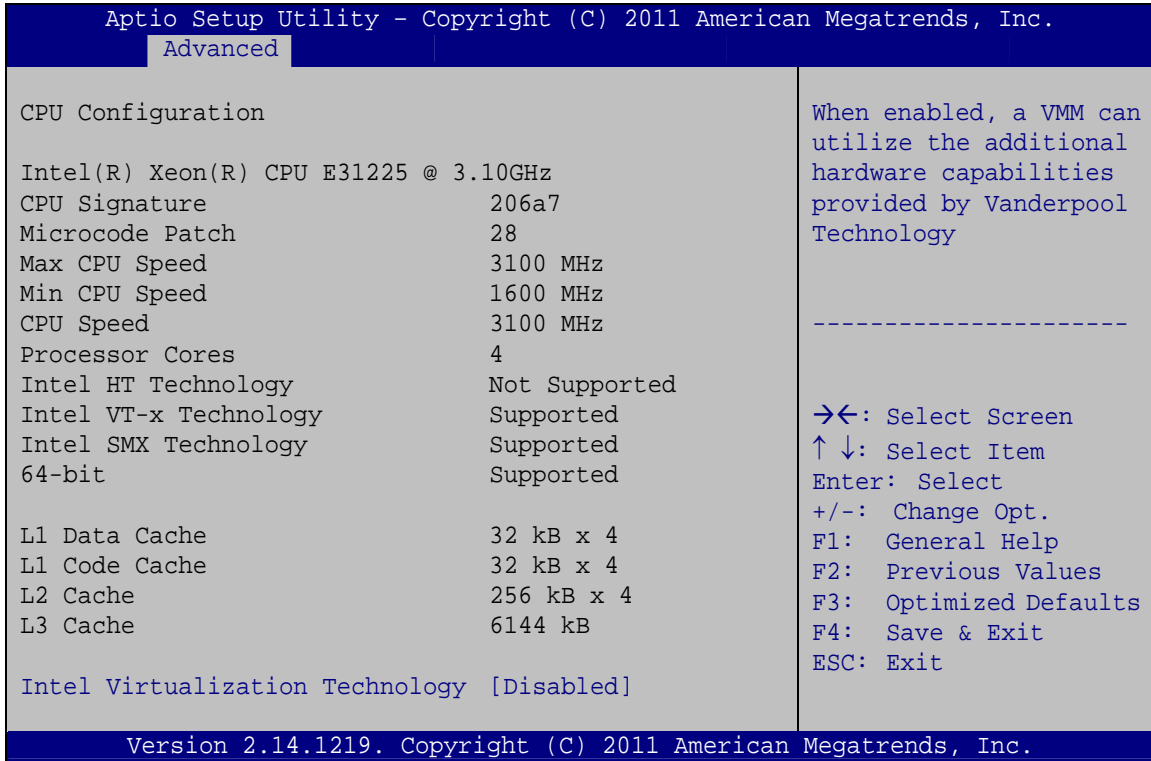
Use the **Security Device Support** option to configure support for the TPM.

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

→ **Enable** TPM support is enabled.

### 5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications or enable the Intel Virtualization Technology.



**BIOS Menu 6: CPU Configuration**

→ **Intel Virtualization Technology [Disabled]**

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

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

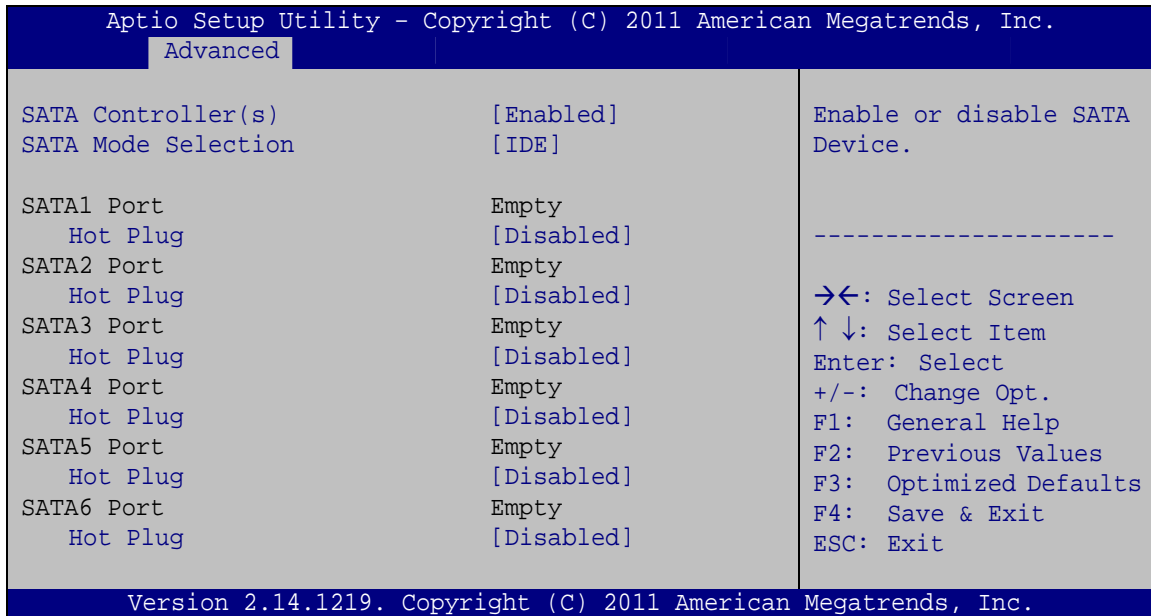
→ **Enabled**                                      Enables Intel Virtualization Technology.



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### 5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.



#### BIOS Menu 7: SATA Configuration

##### → SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to configure the serial ATA controller.

- **Enabled**      **DEFAULT**      Enables the on-board SATA controller.
- **Disabled**                      Disables the on-board SATA controller.

##### → SATA Mode Selection [IDE]

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

- **IDE**              **DEFAULT**      Configures SATA devices as normal IDE device.
- **AHCI**                              Configures SATA devices as AHCI device.
- **RAID**                              Configures SATA devices as RAID device.

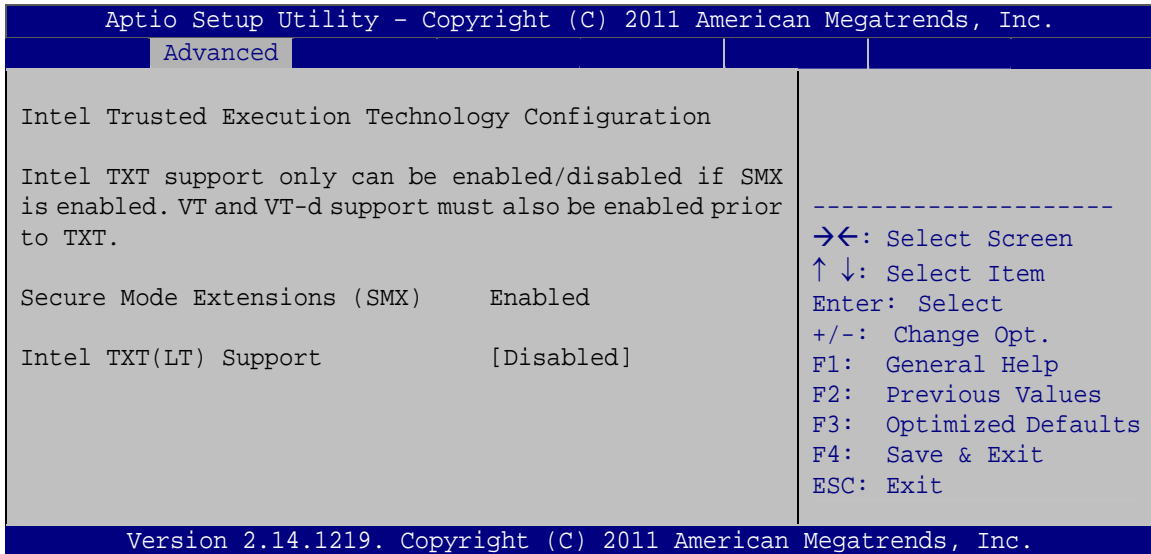
→ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the hot plug function.

- **Disabled**      **DEFAULT**      Disables the hot plug function.
- **Enabled**                      Enables the hot plug function.

### 5.3.6 Intel TXT(LT) Configuration

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

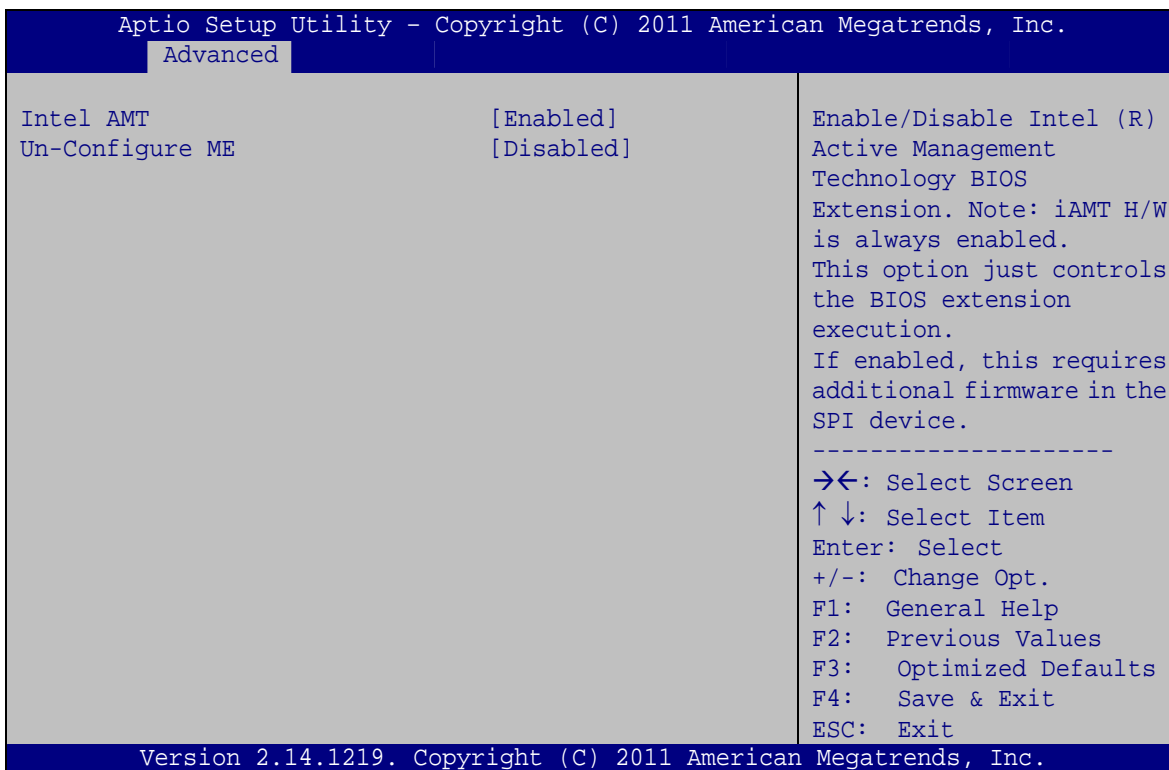


**BIOS Menu 8: Intel TXT(LT) Configuration**

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### 5.3.7 AMT Configuration

The **AMT Configuration** menu (**BIOS Menu 9**) allows the advanced power management options to be configured.



#### BIOS Menu 9: AMT Configuration

##### → Intel AMT [Enabled]

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

→ **Disabled** Intel® AMT is disabled

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

##### → Un-Configure ME [Disabled]

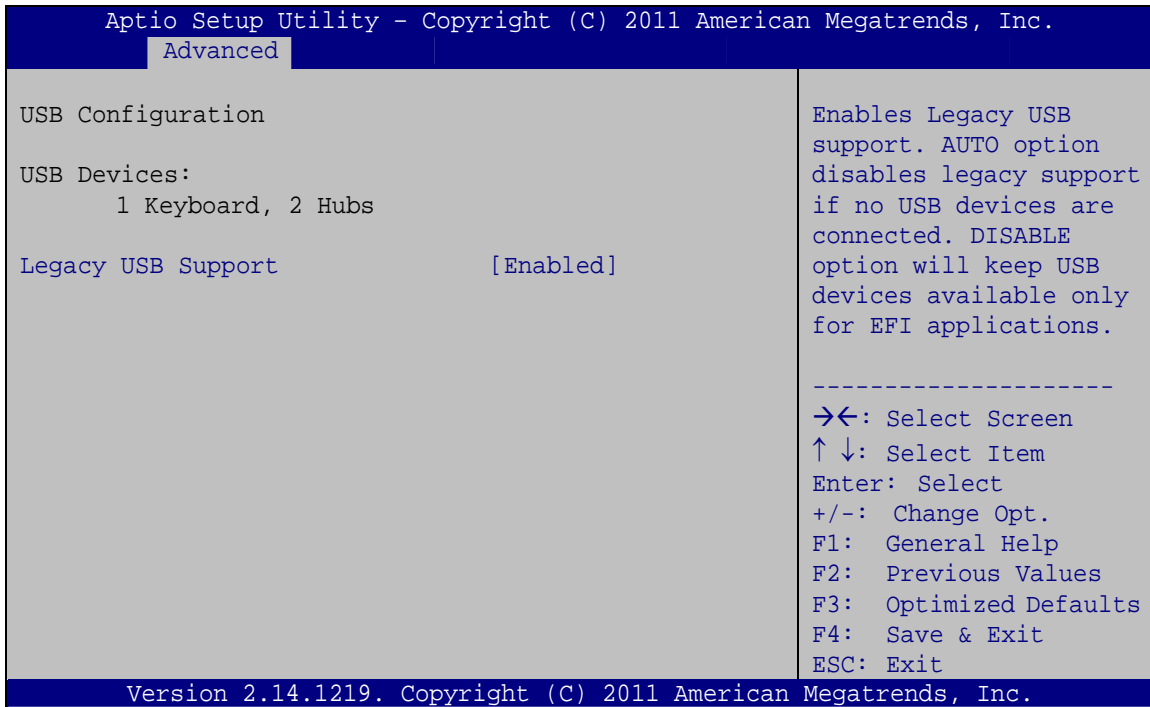
Use the **Un-Configure ME** option to perform ME unconfigure without password operation.

→ **Disabled** **DEFAULT** Not perform ME unconfigure

→ **Enabled** To perform ME unconfigure

### 5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 10**) to read USB configuration information and configure the USB settings.



#### BIOS Menu 10: USB Configuration

##### → USB Devices

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

##### → Legacy USB Support [Enabled]

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

→ **Enabled**      **DEFAULT**      Legacy USB support enabled

## SPCIE-C2160 PICMG 1.3 CPU Card

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

### 5.3.9 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 11**) to set or change the configurations for the parallel ports and serial ports.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
F81866 Super IO Configuration
F81866 Super IO Chip          F81866
> Floppy Disk Controller Configuration
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 4 Configuration
> IrDA Configuration
> Parallel Port Configuration

Set Parameters of Floppy
Disk Controller (FDC)

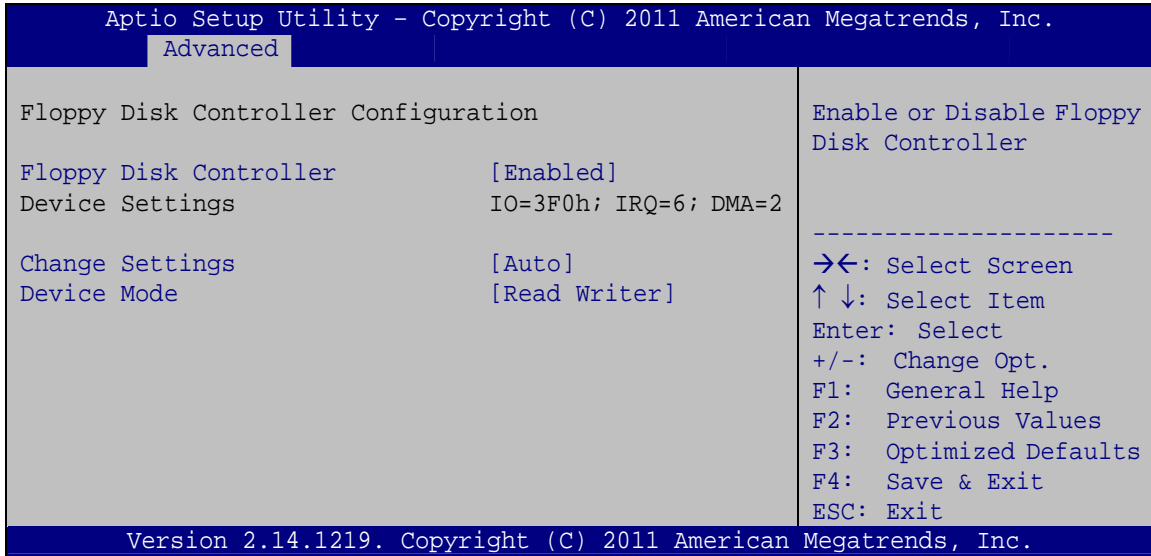
-----
-><: Select Screen
↑ ↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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

#### BIOS Menu 11: F81866 Super IO Configuration

#### 5.3.9.1 Floppy Disk Controller Configuration

Use the **Floppy Disk Controller Configuration** menu (**BIOS Menu 12**) to set the parameters of the floppy disk controller.



**BIOS Menu 12: Floppy Disk Controller Configuration Menu**

→ **Floppy Disk Controller [Enabled]**

Use the **Floppy Disk Controller** option to enable or disable the floppy disk controller.

- **Disabled** Floppy disk controller disabled
- **Enabled** **DEFAULT** Floppy disk controller enabled

→ **Change Settings [Auto]**

Use the **Change Settings** option to select an optimal setting for the super IO device.

- **Auto** **DEFAULT** The super IO device settings are automatically detected.
- **IO=3F0h;**  
**IRQ=6;**  
**DMA=2** The I/O port address is 3F0h, the interrupt address is IRQ6 and the DMA is 2.

→ **Device Mode [Read Write]**

Use the **Device Mode** option to select the floppy disk controller mode.

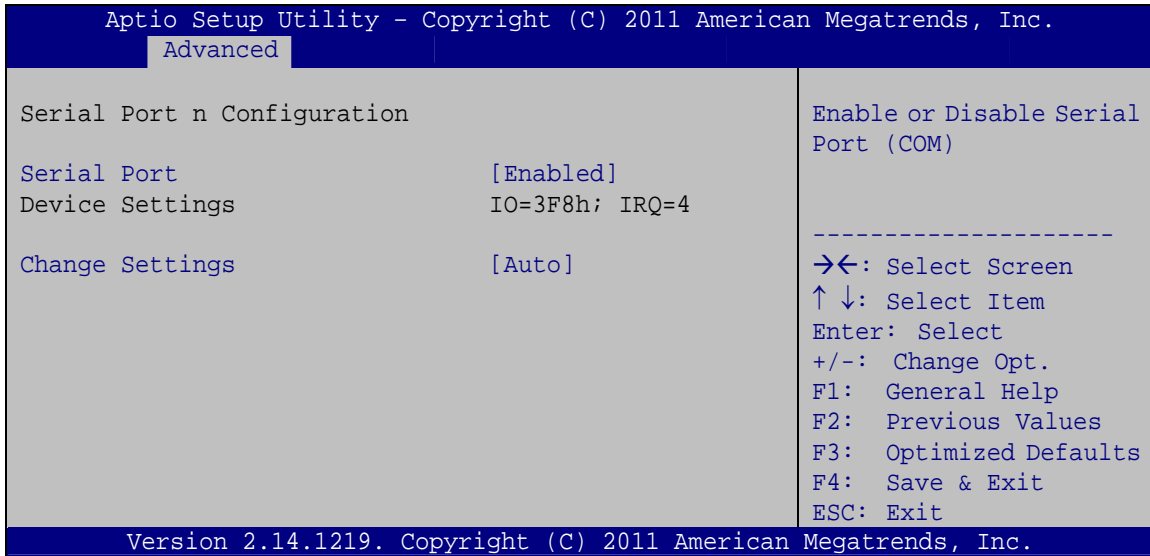
- **Read Write** **DEFAULT** Select this option for normal operation.

## SPCIE-C2160 PICMG 1.3 CPU Card

- ➔ **Write Protect** Select this option for read only operation.

### 5.3.9.2 Serial Port n Configuration

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



#### BIOS Menu 13: Serial Port n Configuration Menu

### 5.3.9.2.1 Serial Port 1 Configuration

#### ➔ Serial Port [Enabled]

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

- ➔ **Disabled** Disable the serial port
- ➔ **Enabled** **DEFAULT** Enable the serial port

#### ➔ Change Settings [Auto]

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

- **Auto**      **DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- **IO=3F8h;**  
**IRQ=4**      Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
- **IO=3F8h;**  
**IRQ=3, 4**      Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=2C0h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
- **IO=2C8h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

### 5.3.9.2.2 Serial Port 2 Configuration

#### → Serial Port [Enabled]

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

- **Disabled**      Disable the serial port
- **Enabled**      **DEFAULT**      Enable the serial port

#### → Change Settings [Auto]

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

- **Auto**      **DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- **IO=2F8h;**  
**IRQ=3**      Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- **IO=3F8h;**  
**IRQ=3, 4**      Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4



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

### 5.3.9.2.3 Serial Port 4 Configuration

#### ➔ Serial Port [Enabled]

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

- ➔ **Disabled**                      Disable the serial port
- ➔ **Enabled      DEFAULT**      Enable the serial port

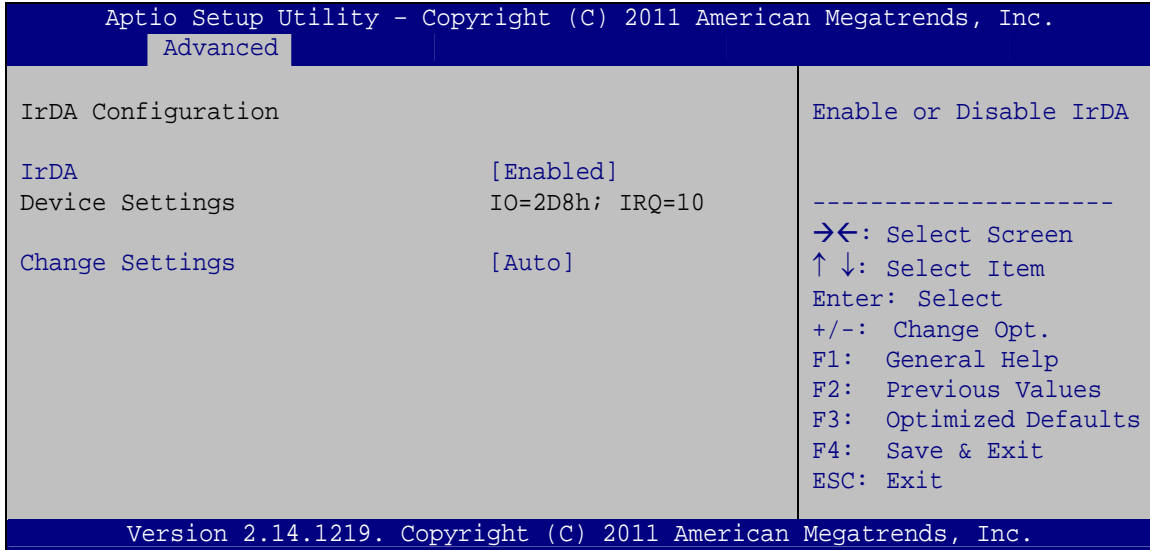
#### ➔ Change Settings [Auto]

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

- ➔ **Auto              DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E8h;**  
**IRQ=10**                      Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
- ➔ **IO=3E8h;**  
**IRQ=10, 11**                      Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E8h;**  
**IRQ=10, 11**                      Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h;**  
**IRQ=10, 11**                      Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2D8h;**  
**IRQ=10, 11**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

### 5.3.9.3 IrDA Configuration

Use the **IrDA Configuration** menu (**BIOS Menu 14**) to set the parameters of the floppy disk controller.



#### BIOS Menu 14: IrDA Configuration Menu

##### → IrDA [Enabled]

Use the **IrDA** option to enable or disable the IrDA function.

- **Disabled**                      Disable the IrDA function
- **Enabled**            **DEFAULT**      Enable the IrDA function

##### → Change Settings [Auto]

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

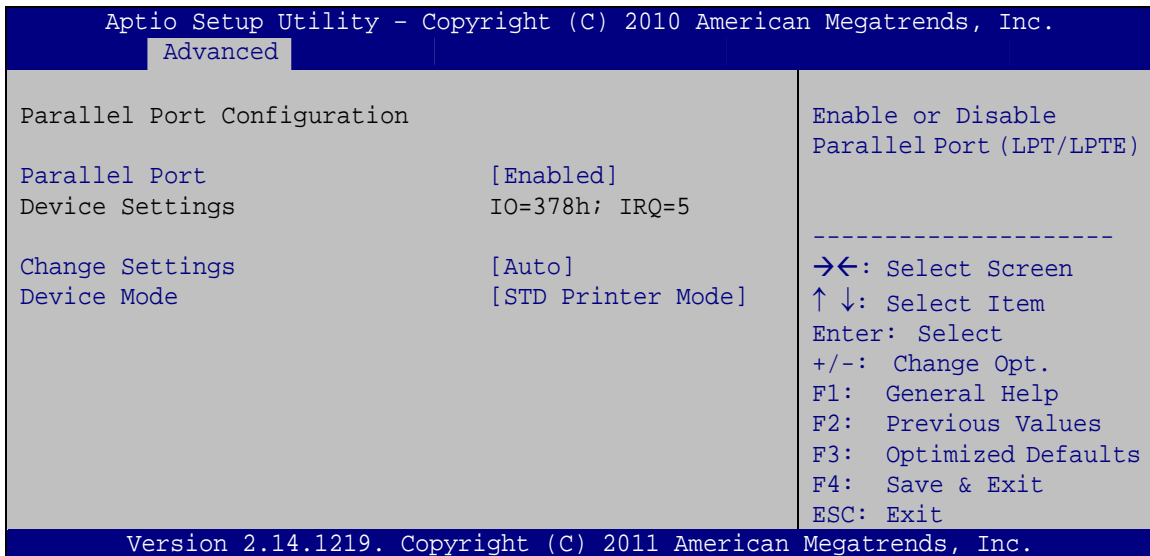
- **Auto**                      **DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- **IO=2D8h;**  
**IRQ=10**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ10

## SPCIE-C2160 PICMG 1.3 CPU Card

- ➔ **IO=2C0h;**                      Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11  
**IRQ=10, 11**
- ➔ **IO=2C8h;**                      Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11  
**IRQ=10, 11**
- ➔ **IO=2D0h;**                      Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11  
**IRQ=10, 11**
- ➔ **IO=2D8h;**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11  
**IRQ=10, 11**
- ➔ **IO=2E0h;**                      Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11  
**IRQ=10, 11**

### 5.3.9.4 Parallel Port Configuration

Use the **Parallel Port Configuration** menu (**BIOS Menu 15**) to configure the serial port n.



#### BIOS Menu 15: Parallel Port Configuration Menu

- ➔ **Parallel Port [Enabled]**

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

- ➔ **Disabled**                      Disable the parallel port
- ➔ **Enabled**                      **DEFAULT**                      Enable the parallel port

### → Change Settings [Auto]

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

- |   |                              |                |   |
|---|------------------------------|----------------|---|
| → | <b>Auto</b>                  | <b>DEFAULT</b> | The parallel port IO port address and interrupt address are automatically detected. |
| → | <b>IO=378h;<br/>IRQ=5</b>    |                | Parallel Port I/O port address is 378h and the interrupt address is IRQ5            |
| → | <b>IO=378h;<br/>IRQ=5, 7</b> |                | Parallel Port I/O port address is 378h and the interrupt address is IRQ5, 7         |
| → | <b>IO=278h;<br/>IRQ=5, 7</b> |                | Parallel Port I/O port address is 278h and the interrupt address is IRQ5, 7         |
| → | <b>IO=3BCh;<br/>IRQ=5, 7</b> |                | Parallel Port I/O port address is 3BCh and the interrupt address is IRQ5, 7         |

### → Device Mode [STD Printer Mode]

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

- |   |                      |                |
|---|----------------------|----------------|
| ▪ | STD Printer Mode     | <b>Default</b> |
| ▪ | SPP Mode             |                |
| ▪ | EPP-1.9 and SPP Mode |                |
| ▪ | EPP-1.7 and SPP Mode |                |
| ▪ | ECP Mode             |                |
| ▪ | ECP and EPP 1.9 Mode |                |
| ▪ | ECP and EPP 1.7 Mode |                |

### 5.3.10 F81866 H/W Monitor

The **F81866 H/W Monitor** menu (**BIOS Menu 16**) contains the fan configuration submenu, and displays the system temperature and CPU fan speed.

## SPCIE-C2160 PICMG 1.3 CPU Card

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
PC Health Status
> Smart Fan Mode Configuration
CPU Temperature      :+27 C
System Temperature  :+36 C
CPU_FAN1 Speed      :2362 RPM

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

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

```

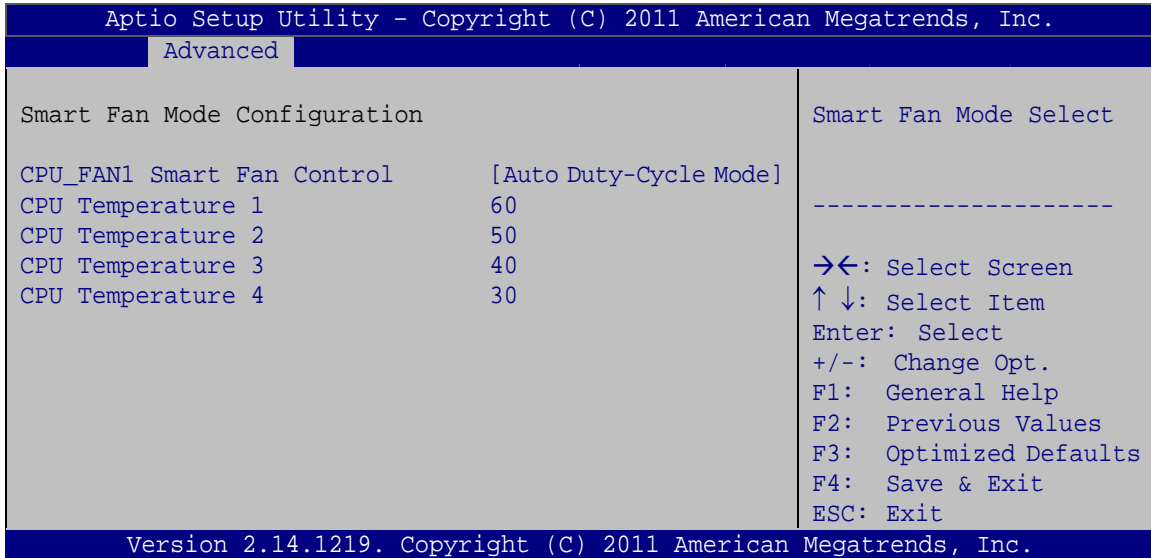
**BIOS Menu 16: F81866 H/W Monitor****→ PC Health Status**

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

- CPU Temperature
- System Temperature
- CPU Fan Speed

**5.3.10.1 Smart Fan Mode Configuration**

Use the **Smart Fan Mode Configuration** submenu (BIOS Menu 17) to configure fan 1 temperature and speed settings.



**BIOS Menu 17: Smart Fan Mode Configuration**

→ **CPU\_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]**

Use the **CPU\_FAN1 Smart Fan Control** option to configure the CPU Smart Fan.

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

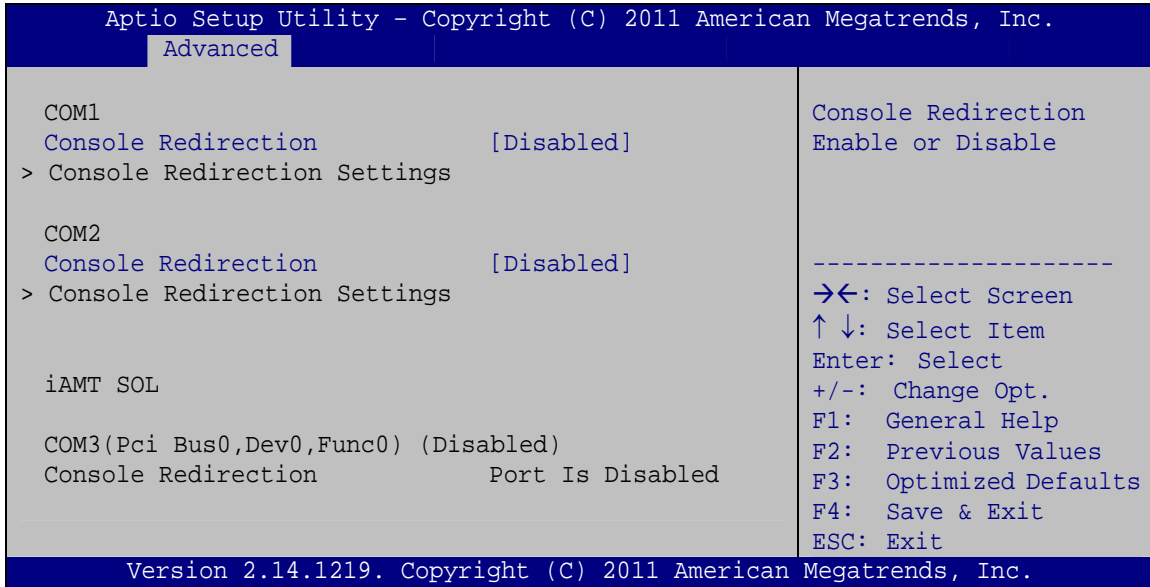
→ **CPU Temperature n**

Use the +/- key or enter a decimal number to change the **CPU Temperature n** value.

**5.3.11 Serial Port Console Redirection**

The **Serial Port Console Redirection** menu (**BIOS Menu 18**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

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### BIOS Menu 18: Serial Port Console Redirection

#### → Console Redirection [Disabled]

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

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

#### → Terminal Type [ANSI]

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

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

#### → Bits per second [115200]

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

- **9600** Sets the serial port transmission speed at 9600.
- **19200** Sets the serial port transmission speed at 19200.
- **38400** Sets the serial port transmission speed at 38400.
- **57600** Sets the serial port transmission speed at 57600.
- **115200**      **DEFAULT** Sets the serial port transmission speed at 115200.

### → Data Bits [8]

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

- **7** Sets the data bits at 7.
- **8**      **DEFAULT** Sets the data bits at 8.

### → Parity [None]

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

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

### → Stop Bits [1]

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

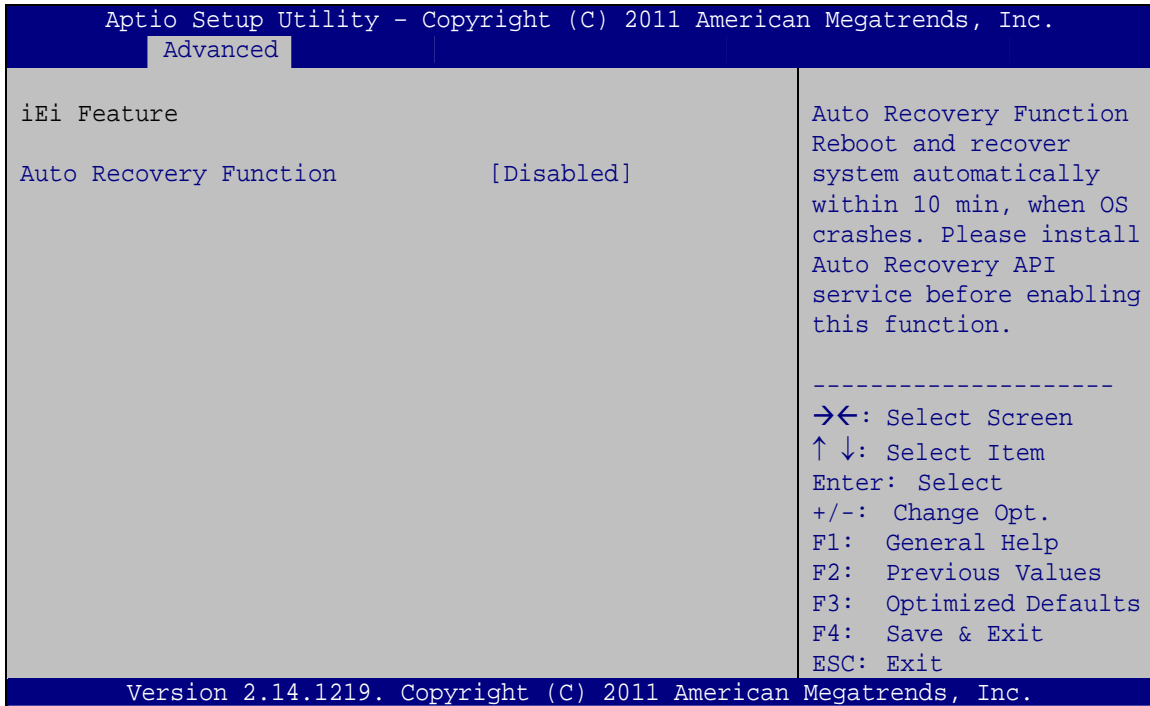


## SPCIE-C2160 PICMG 1.3 CPU Card

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

### 5.3.12 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 19**) to configure One Key Recovery function.



#### BIOS Menu 19: iEi Feature

#### ➔ Auto Recovery Function [Disabled]

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

- ➔ **Disabled**      **DEFAULT**      Auto recovery function disabled
- ➔ **Enabled**                      Auto recovery function enabled

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 20**) to access the PCH IO and System Agent (SA) configuration menus.



### WARNING!

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

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
> System Agent (SA) Configuration      System Agent (SA)
> PCH-IO Configuration                Parameters

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

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

**BIOS Menu 20: Chipset**

## SPCIE-C2160 PICMG 1.3 CPU Card

### 5.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 21**) to configure the System Agent (SA) parameters.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Chipset
VT-d [Disabled] Check to enable VT-d function on MCH.
> Graphics Configuration
> NB PCIe Configuration
> Memory Configuration
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
    
```

#### BIOS Menu 21: System Agent (SA) Configuration

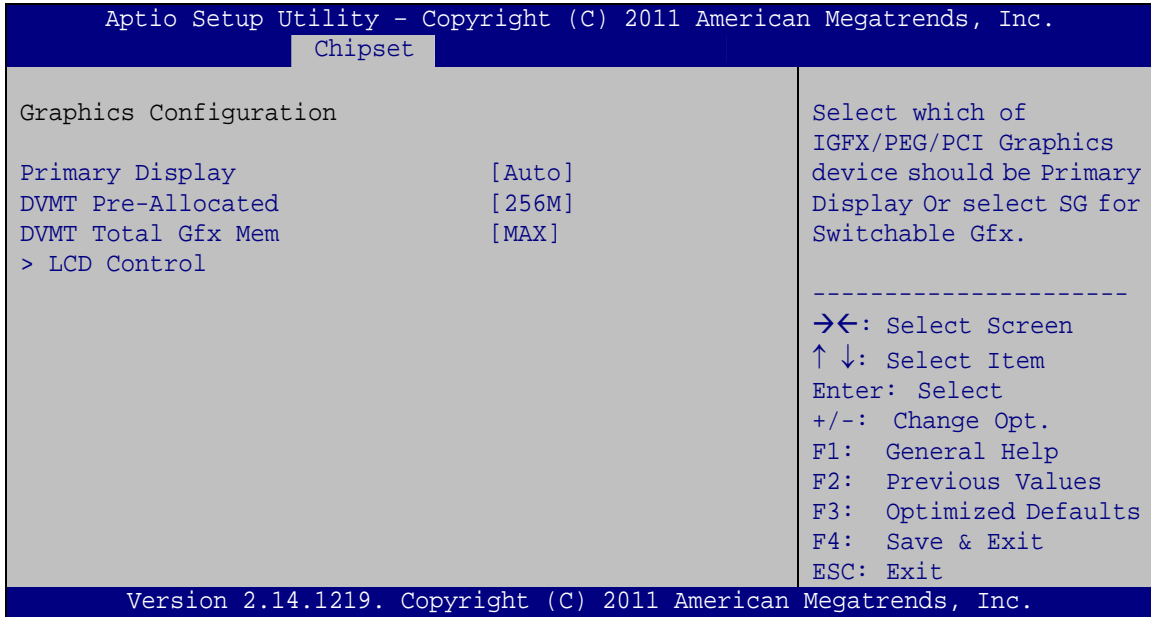
##### → VT-d [Disabled]

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

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

#### 5.4.1.1 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 22**) menu to configure the video device connected to the system.



**BIOS Menu 22: Graphics Configuration**

→ **Primary Display [Auto]**

Use the **Primary Display** option to select the primary graphics controller the system uses.

The following options are available:

- Auto **Default**
- IGFX
- PEG
- PCI

→ **DVMT Pre-Allocated [256M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 128M
- 256M **Default**
- 512M

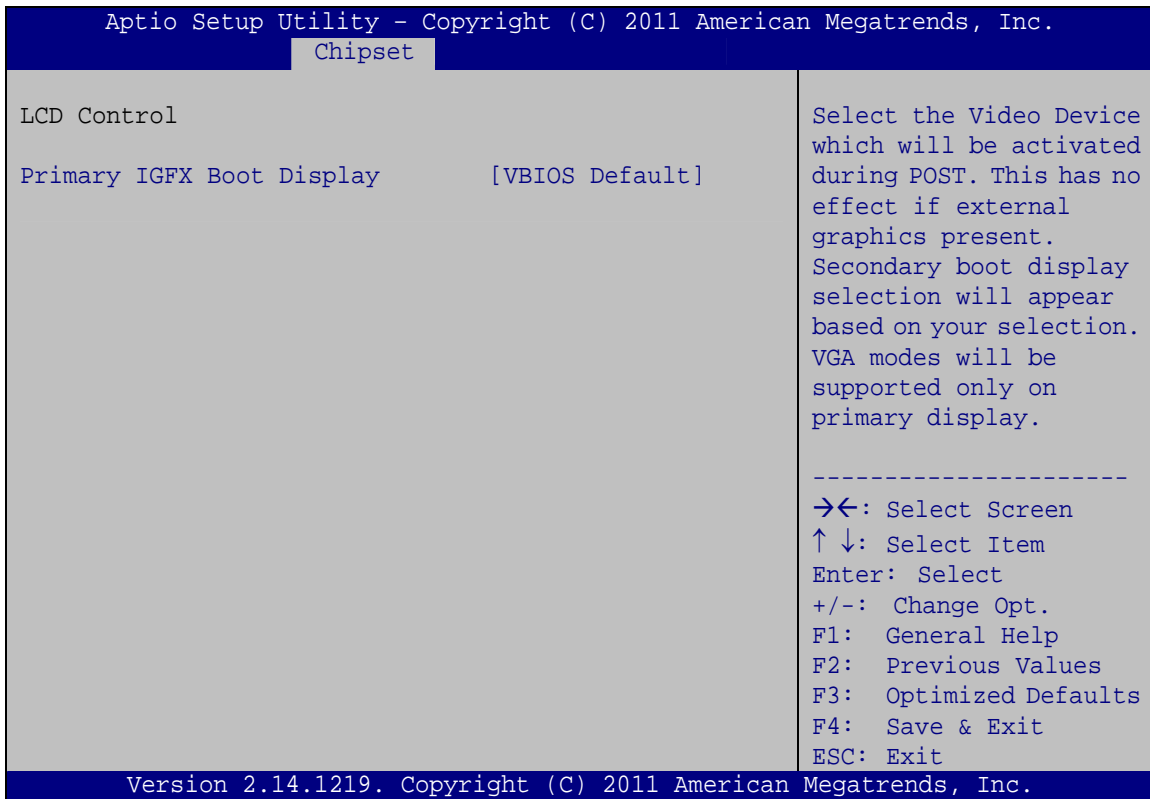
## SPCIE-C2160 PICMG 1.3 CPU Card

### → DVMT Total Gfx Mem [MAX]

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX                      **Default**

### 5.4.1.1.1 LCD Control



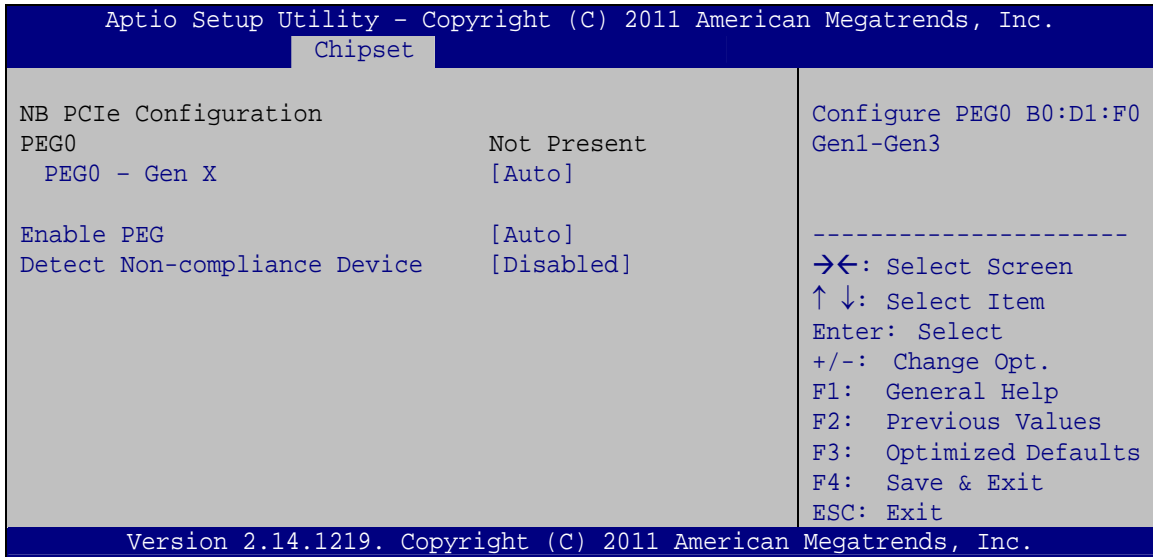
#### BIOS Menu 23: LCD Control

### → Primary IGFX Boot Display [VBIOS Default]

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

- VBIOS                      **DEFAULT**
- CRT
- DVI

### 5.4.1.2 NB PCIe Configuration



#### BIOS Menu 24: NB PCIe Configuration

##### → PEG0 – Gen X [Auto]

Use the **PEG0 – Gen X** option to select the support type of the PCI Express (PEG) controller. The following options are available:

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

##### → Enable PEG [Auto]

Use the **Enable PEG** option to enable or disable the PCI Express (PEG) controller.

- **Disabled**                      Disables the PCI Express (PEG) controller.
- **Enabled**                      Enables the PCI Express (PEG) controller.
- **Auto**                      **DEFAULT**      The PCI Express (PEG) controller is disabled if no PCI Express devices are connected.

## SPCIE-C2160 PICMG 1.3 CPU Card

### → Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to enable or disable detecting if a non-compliance PCI Express device is connected to the PCI Express port.

- **Disabled**                      **DEFAULT**      Disables to detect if a non-compliance PCI Express device is connected to the PCI Express port.
- **Enabled**                                      Enables to detect if a non-compliance PCI Express device is connected to the PCI Express port.

### 5.4.1.3 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 25**) to view memory information.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Chipset
-----
Memory Information
Total Memory           2048 MB (DDR3)
CHA_DIMM1              2048 MB (DDR3)
CHB_DIMM1              Not Present

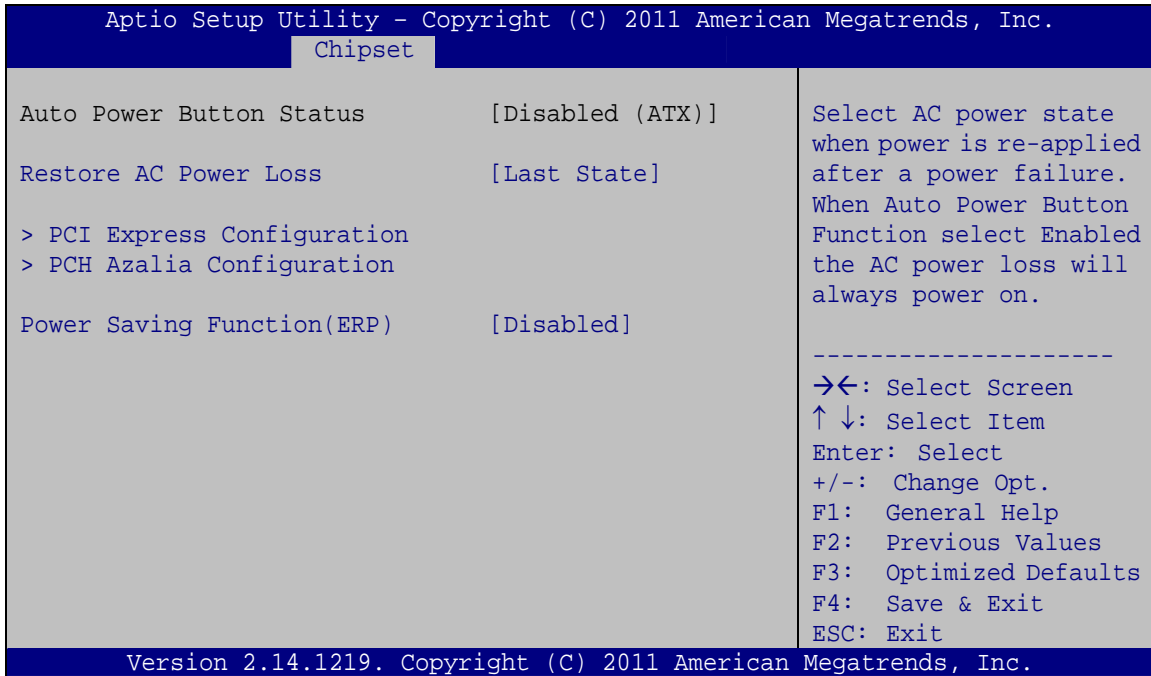
-----
→←: Select Screen
↑ ↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
-----
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

```

**BIOS Menu 25: Memory Configuration**

### 5.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 26**) to configure the PCH parameters.



#### BIOS Menu 26: PCH-IO Configuration

##### → Restore AC Power Loss [Last State]

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

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

##### → Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function(ERP)** BIOS option to enable or disable the power saving function.

- **Disabled**            **DEFAULT**    Power saving function is disabled.
- **Enabled**             Power saving function is enabled. It will reduce power consumption when the system is off.



## SPCIE-C2160 PICMG 1.3 CPU Card

### 5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 24**) to select the support type of the PCI Express or PCIe Mini slots.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Chipset
-----
PCI Express Configuration
> PCIEX1_1
> PCIEX1_2
> PCIEX1_3
> PCIEX1_4
> Mini PCIE

PCI Express Root Port 1
<PCIEX1_1> Settings.
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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

#### BIOS Menu 27: PCI Express Configuration

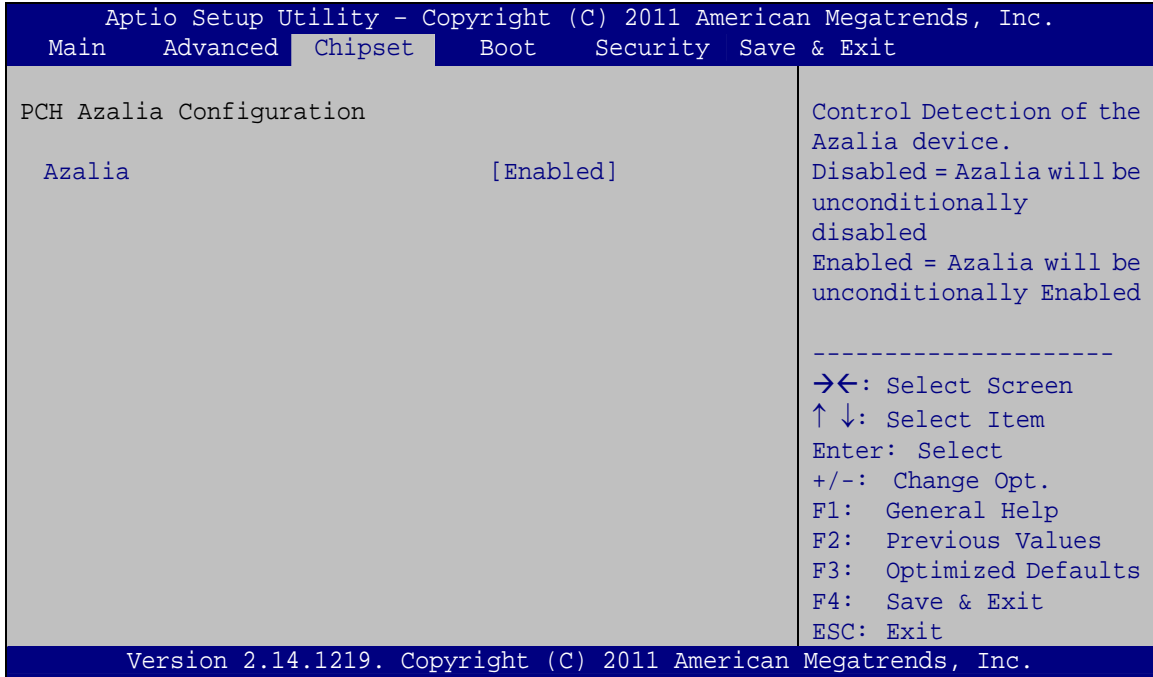
#### → PCIEX1\_1/ PCIEX1\_2/ PCIEX1\_3/ PCIEX1\_4/Mini PCIE

Use this option to select the support type of the PCI Express or PCIe Mini slots. The following options are available:

- Auto                   **Default**
- Gen1
- Gen2

### 5.4.2.2 PCH Azalia Configuration

Use the **PCH Azalia Configuration** menu (**BIOS Menu 28**) to configure the PCH Azalia settings.



#### BIOS Menu 28: PCH Azalia Configuration Menu

##### ➔ Azalia [Enabled]

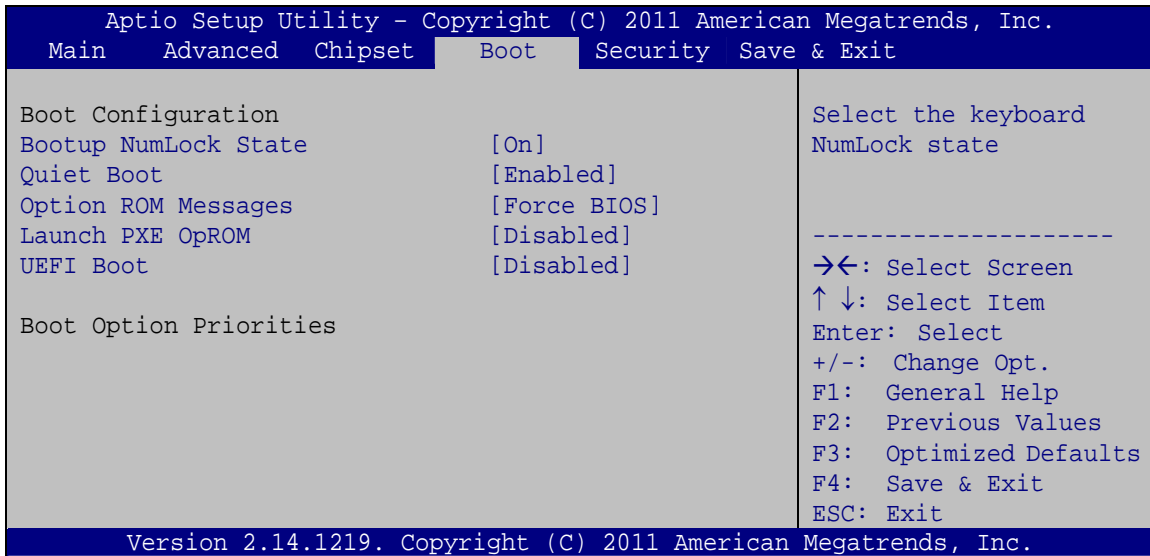
Use the **Azalia** option to enable or disable the High Definition Audio controller.

- ➔ **Disabled**                      The onboard High Definition Audio controller is disabled
- ➔ **Enabled    DEFAULT**            The onboard High Definition Audio controller automatically detected and enabled

## SPCIE-C2160 PICMG 1.3 CPU Card

### 5.5 Boot

Use the **Boot** menu (**BIOS Menu 29**) to configure system boot options.



#### BIOS Menu 29: Boot

##### → Bootup NumLock State [On]

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

- **On**                      **DEFAULT**                      Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.
- **Off**    Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

→ **Quiet Boot [Enabled]**

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

- **Disabled** Normal POST messages displayed
- **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

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

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

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

→ **Launch PXE OpROM [Disabled]**

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

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

→ **UEFI Boot [Disabled]**

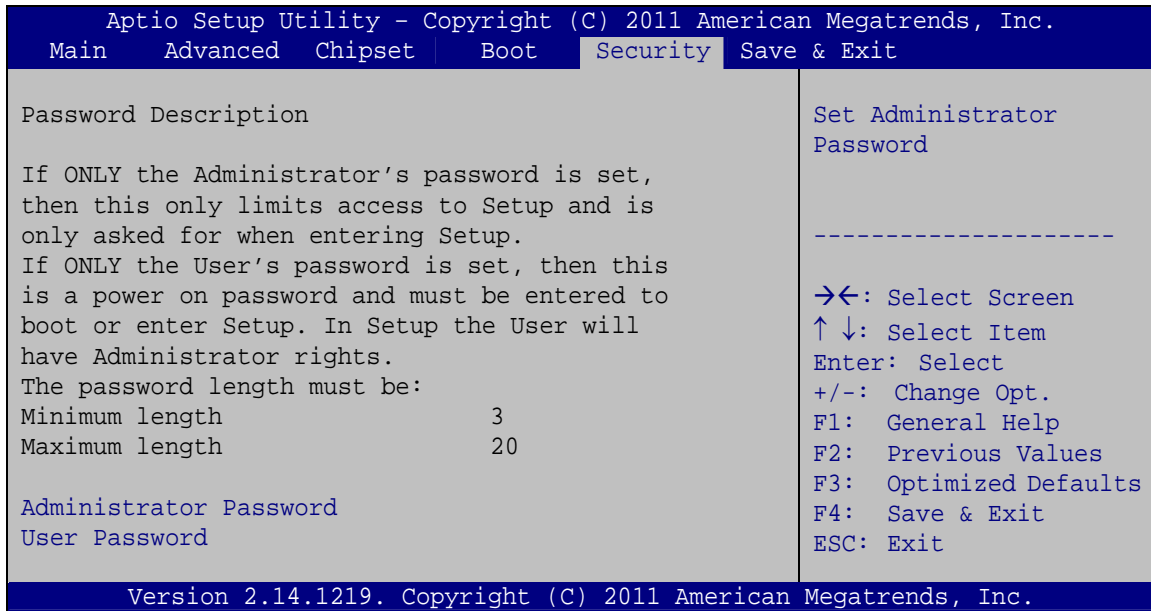
Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

- **Enabled** Boot from UEFI devices is enabled.
- **Disabled** **DEFAULT** Boot from UEFI devices is disabled.

## SPCIE-C2160 PICMG 1.3 CPU Card

## 5.6 Security

Use the **Security** menu (**BIOS Menu 30**) to set system and user passwords.

**BIOS Menu 30: Security****→ Administrator Password**

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

**→ User Password**

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

## 5.7 Save & Exit

Use the **Safe & Exit** menu (**BIOS Menu 31**) to load default BIOS values, optimal failsafe values and to save configuration changes.

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

Save Changes and Reset
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Exit the system after
saving the changes.

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

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

### BIOS Menu 31: Save & Exit

#### → Save Changes and Reset

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

#### → Discard Changes and Reset

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

#### → Restore Defaults

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

## SPCIE-C2160 PICMG 1.3 CPU Card

→ **Save as User Defaults**

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

→ **Restore User Defaults**

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

Chapter

**6**

# Software Drivers

---



## SPCIE-C2160 PICMG 1.3 CPU Card

### 6.1 Available Software Drivers

---

**NOTE:**

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

---

The following drivers can be installed on the system:

- Chipset
- VGA
- LAN
- Audio
- SATA (Intel® Rapid Storage Technology)
- Intel® AMT

Installation instructions are given below.

### 6.2 Software Installation

All the drivers for the SPCIE-C2160 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.

---

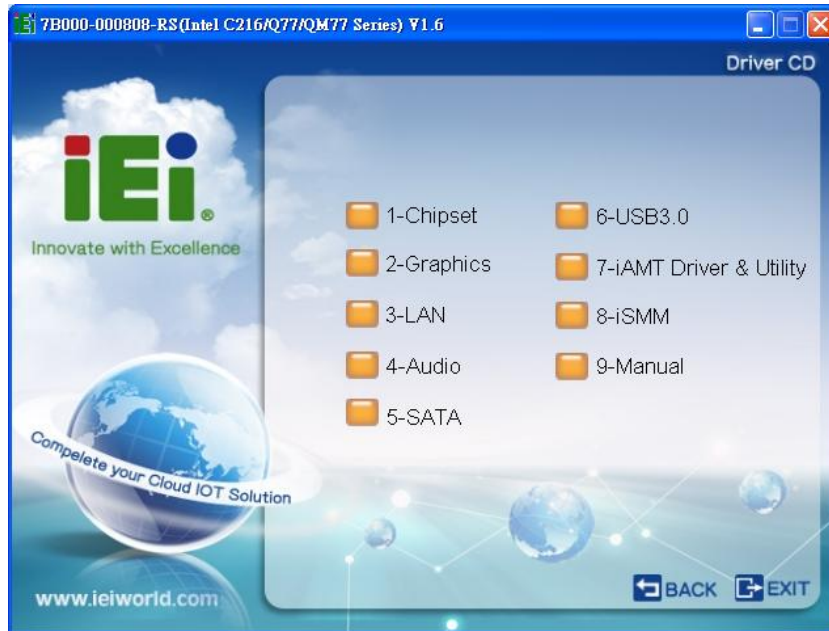
**NOTE:**

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

---

**Step 2:** The driver main menu appears. Click SPCIE-C2160.

**Step 3:** A new screen with a list of available drivers appears (**Figure 6-1**).



**Figure 6-1: Available Drivers**

**Step 4:** Install all of the necessary drivers in this menu.

### 6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

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

**Step 2:** Click “1-Chipset”.

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

**Step 4:** When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-2** appears.

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

SPCIE-C2160 PICMG 1.3 CPU Card



Figure 6-2: Chipset Driver Welcome Screen

**Step 6:** The license agreement in **Figure 6-3** appears.

**Step 7:** Read the **License Agreement**.

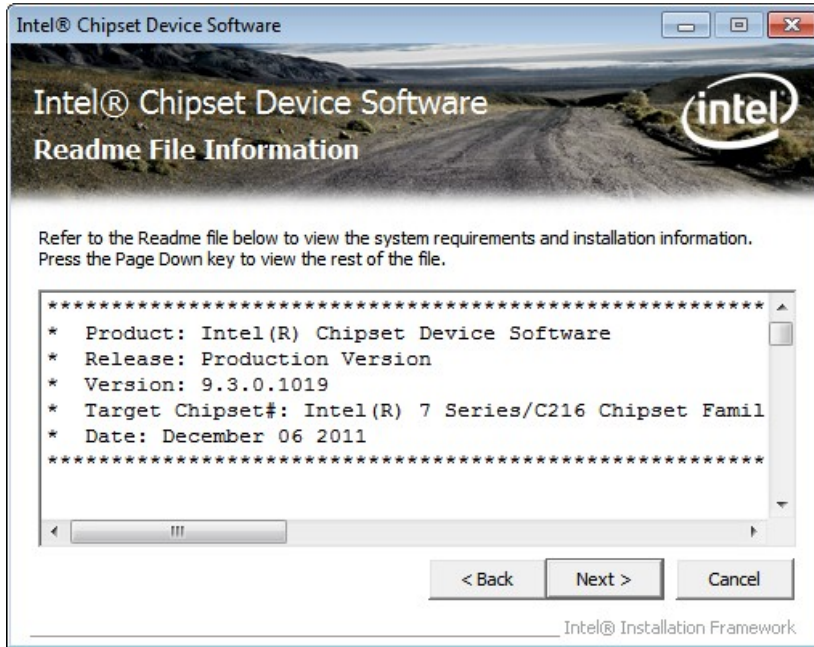
**Step 8:** Click **Yes** to continue.



Figure 6-3: Chipset Driver License Agreement

**Step 9:** The **Read Me** file in **Figure 6-4** appears.

**Step 10:** Click **Next** to continue.

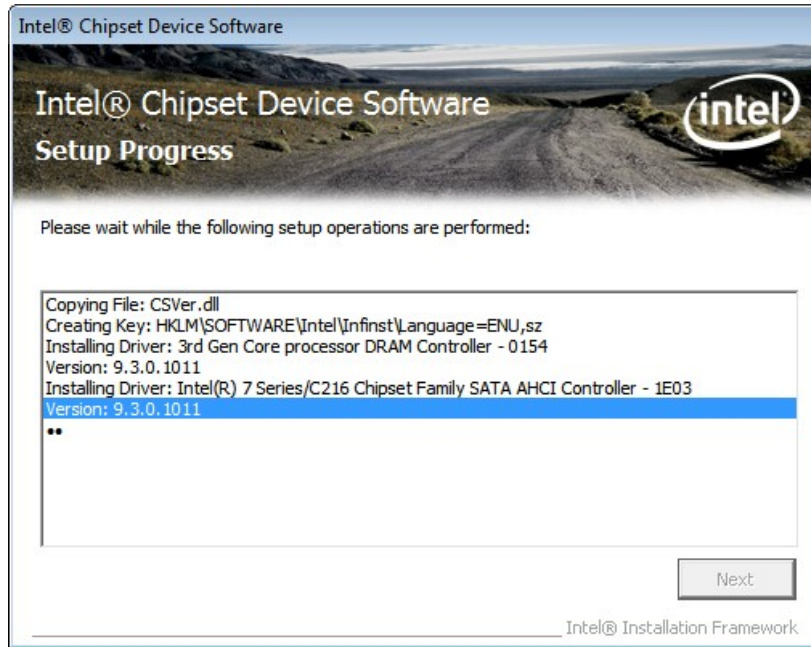


**Figure 6-4: Chipset Driver Read Me File**

**Step 11:** **Setup Operations** are performed as shown in **Figure 6-5**.

**Step 12:** Once the **Setup Operations** are complete, click **Next** to continue.

**SPCIE-C2160 PICMG 1.3 CPU Card**



**Figure 6-5: Chipset Driver Setup Operations**

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

**Step 14:** Select **“Yes, I want to restart this computer now”** and click **Finish**.



**Figure 6-6: Chipset Driver Installation Finish Screen**

## 6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

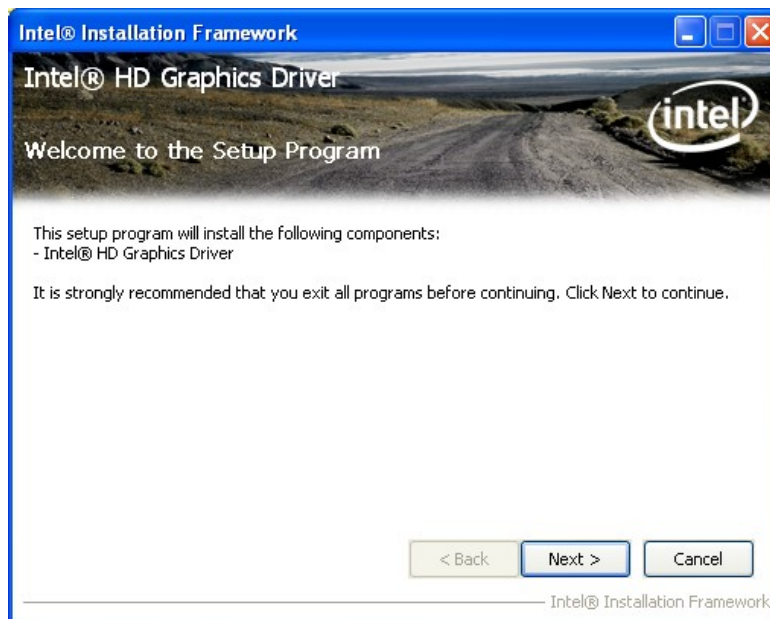
**Step 1:** Access the driver list. (See **Section 6.2**)

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

**Step 3:** Double click the setup file.

**Step 4:** The **Welcome Screen** in **Figure 6-7** appears.

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



**Figure 6-7: Graphics Driver Welcome Screen**

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

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

SPCIE-C2160 PICMG 1.3 CPU Card



Figure 6-8: Graphics Driver License Agreement

**Step 8:** The Read Me file in Figure 6-9 appears. Click **Next** to continue.

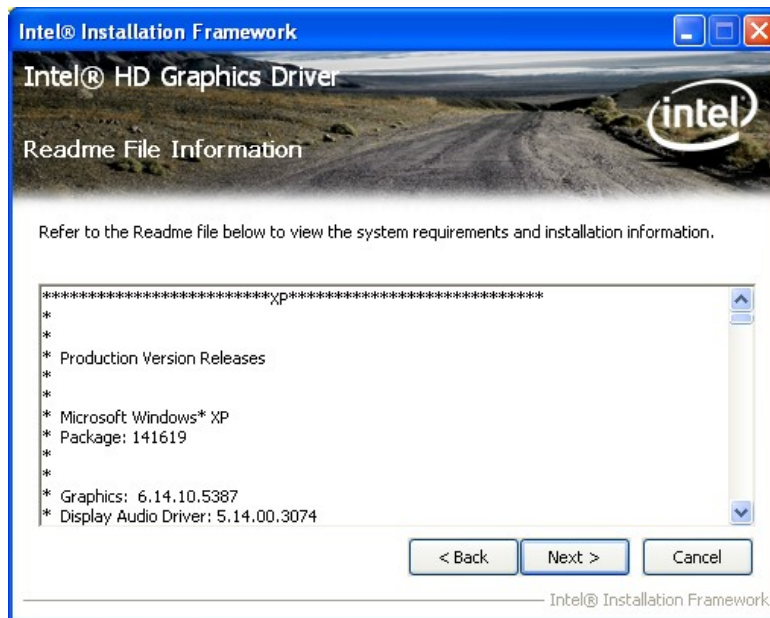
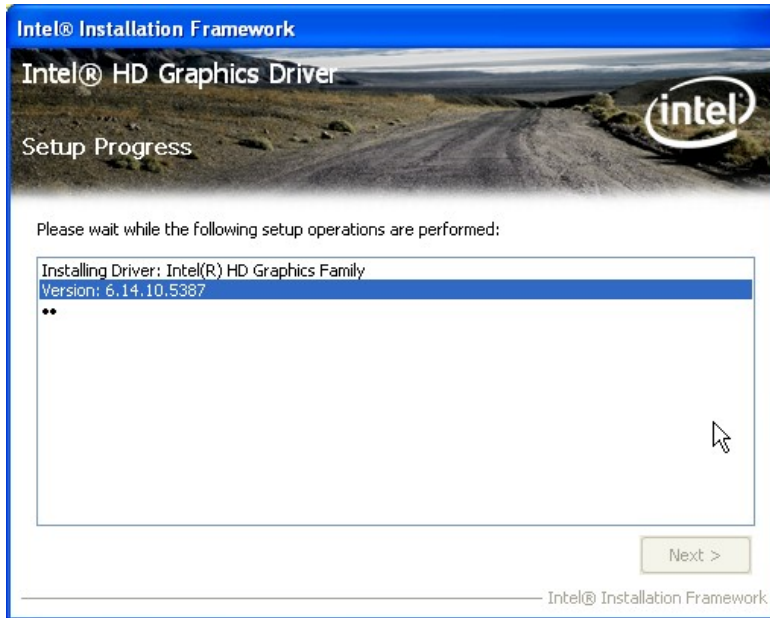


Figure 6-9: Graphics Driver Read Me File

**Step 9:** **Setup Operations** are performed as shown in Figure 6-10.

**Step 10:** Once the **Setup Operations** are complete, click **Next** to continue.



**Figure 6-10: Graphics Driver Setup Operations**

**Step 11:** The **Finish** screen in **Figure 6-11** appears.

**Step 12:** Select **“Yes, I want to restart this computer now”** and click **Finish**.



**Figure 6-11: Graphics Driver Installation Finish Screen**



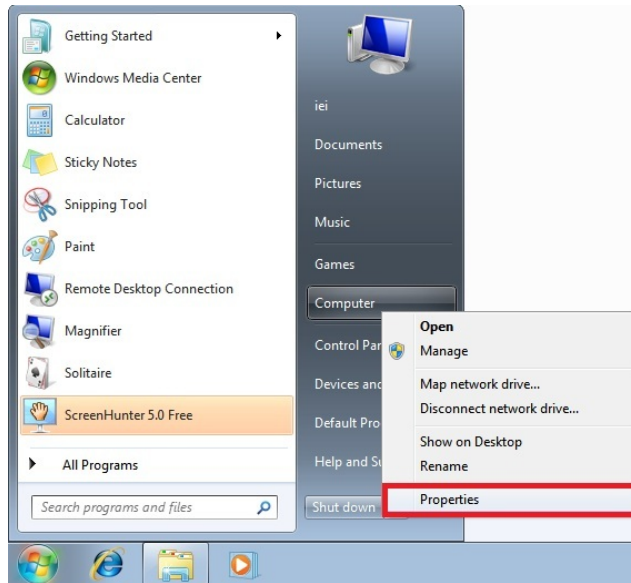
## SPCIE-C2160 PICMG 1.3 CPU Card

### 6.5 LAN Driver Installation

To install the LAN driver, please do the following.

**Step 1:** Right-click the Computer button from the start menu and select **Properties**.

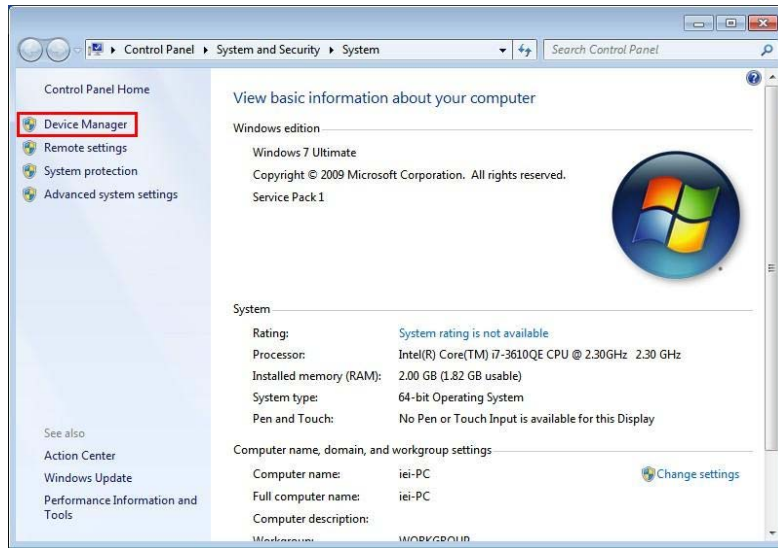
(Figure 6-12).



**Figure 6-12: Windows Control Panel**

**Step 2:** The system control panel window in **Figure 6-13** appears.

**Step 3:** Click the Device Manager link (**Figure 6-13**).



**Figure 6-13: System Control Panel**

- Step 4:** A list of system hardware devices appears (**Figure 6-14**).
- Step 5:** Right-click the Ethernet Controller that has question marks next to it (this means Windows does not recognize the device).
- Step 6:** Select **Update Driver Software**.

## SPCIE-C2160 PICMG 1.3 CPU Card

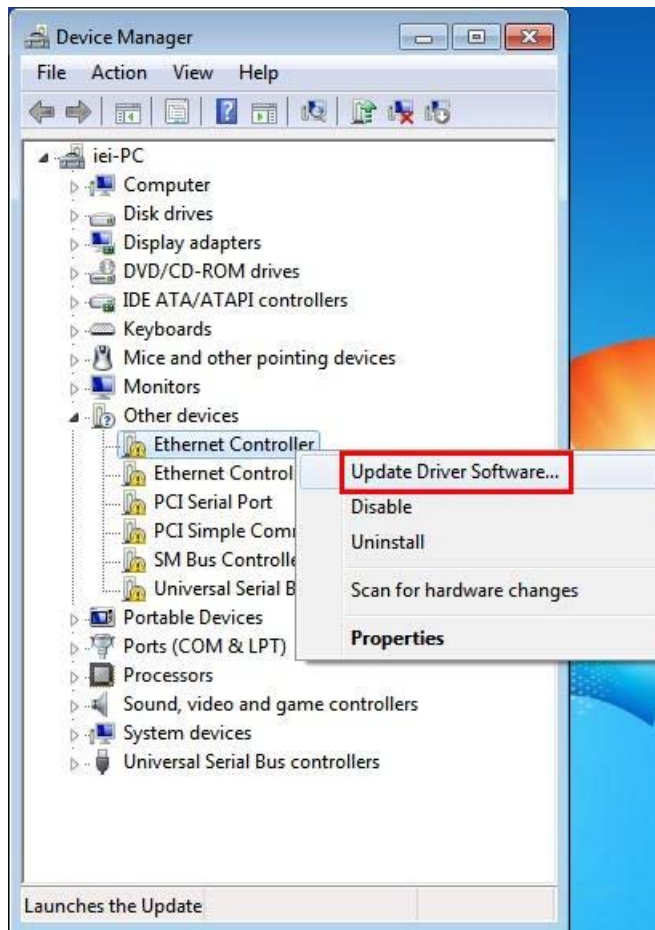
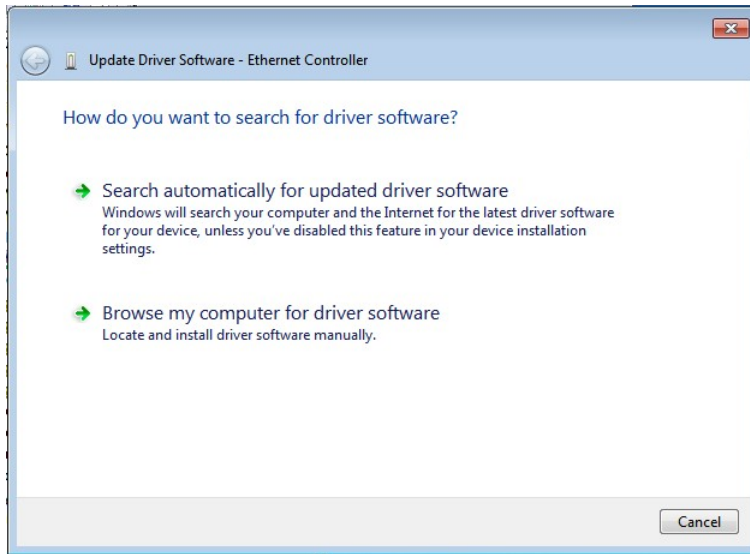


Figure 6-14: Device Manager List

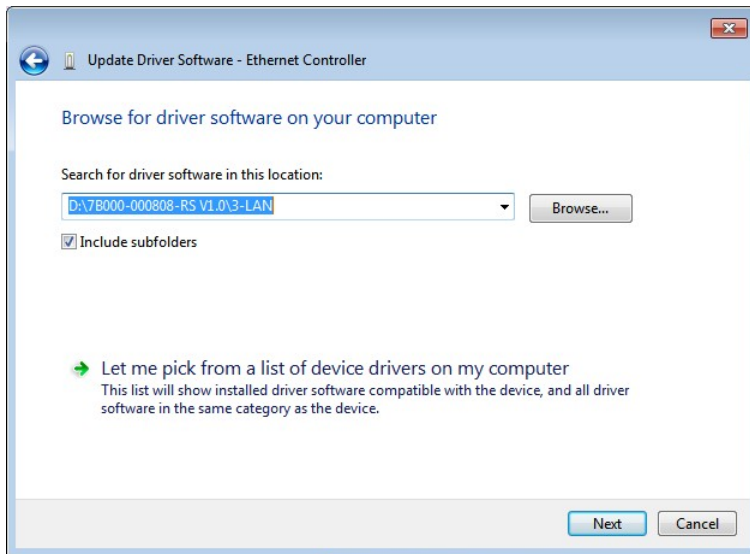
**Step 7:** The Update Driver Software Window appears (Figure 6-15).



**Figure 6-15: Update Driver Software Window**

**Step 8:** Click “Browse my computer for driver software” to continue.

**Step 9:** Click Browse to select “X:\3-LAN” directory in the **Locate File** window, where “X:\” is the system CD drive. (Figure 6-16).



**Figure 6-16: Locate Driver Files**

**Step 10:** Click **NEXT** to continue.

**Step 11:** Driver Installation is performed as shown in **Figure 6-17**.

## SPCIE-C2160 PICMG 1.3 CPU Card

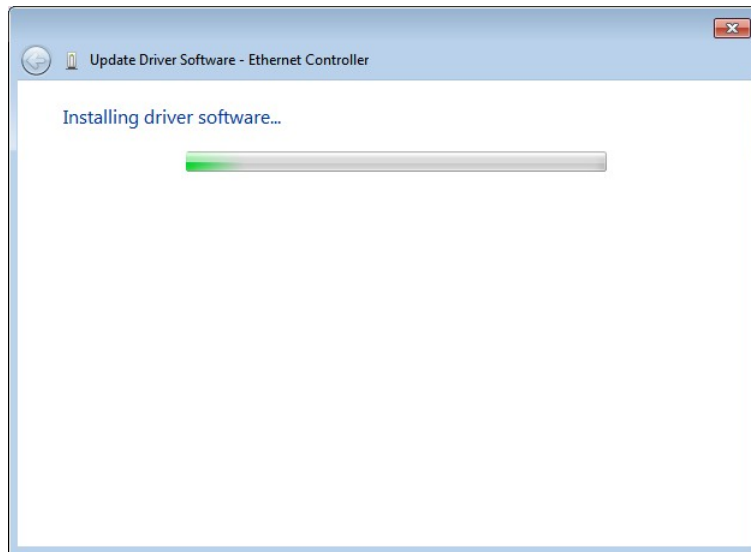


Figure 6-17: LAN Driver Installation

**Step 12:** The **Finish** screen in **Figure 6-18** appears. Click **Close** to exit.

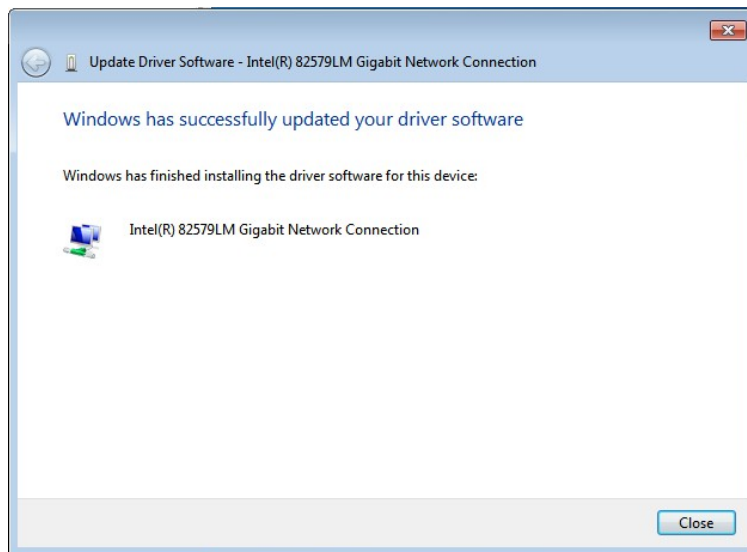
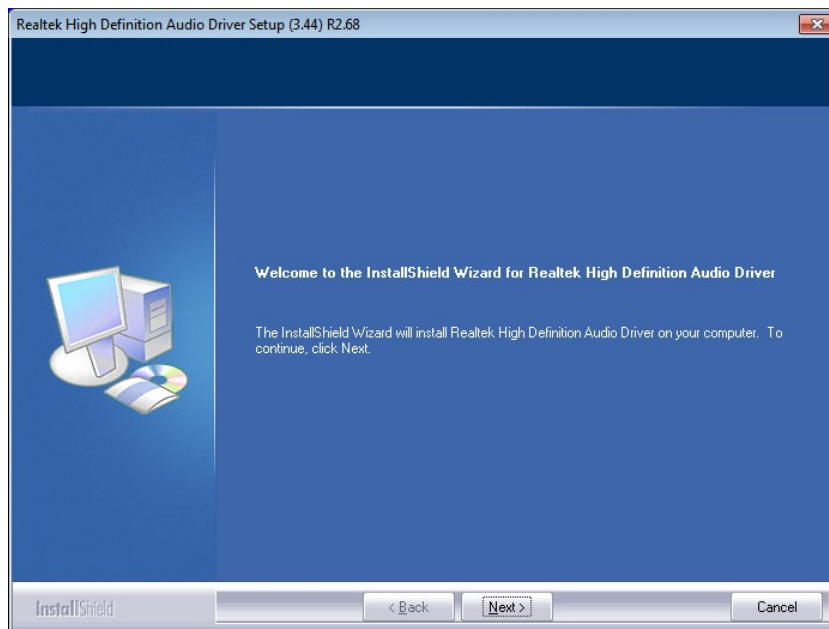


Figure 6-18: LAN Driver Installation Complete

## 6.6 Audio Driver Installation

To install the audio driver, please do the following.

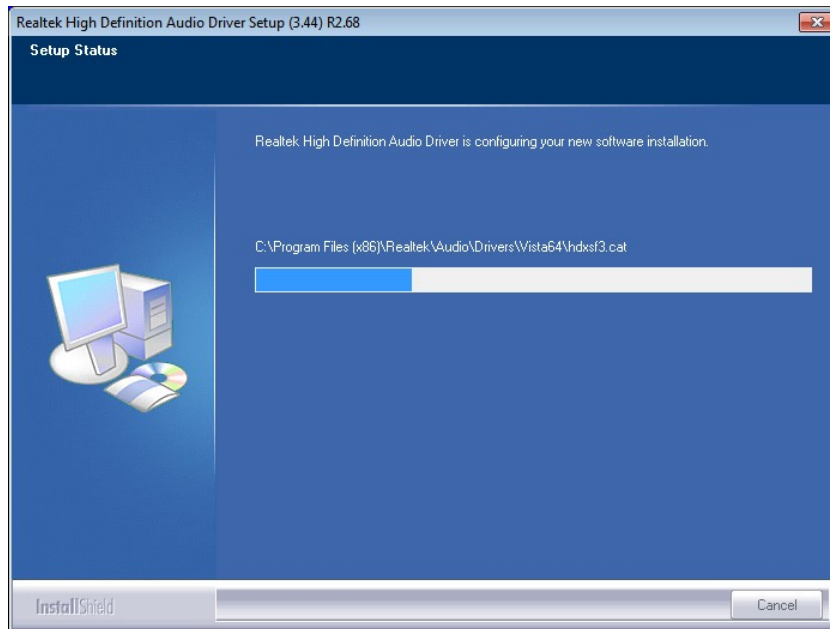
- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click **“4-Audio”** and select the folder which corresponds to the operating system.
- Step 3:** Double click the setup file.
- Step 4:** The **InstallShield Wizard** is prepared to guide the user through the rest of the process.
- Step 5:** Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 6-19**).



**Figure 6-19: InstallShield Wizard Welcome Screen**

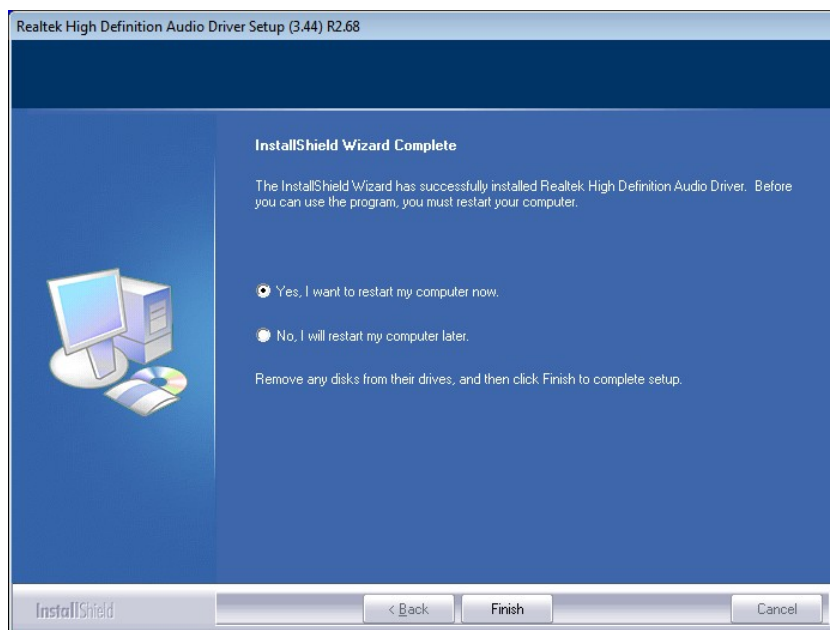
- Step 6:** Click **Next** to continue the installation.
- Step 7:** InstallShield starts to install the new software as shown in **Figure 6-20**.

## SPCIE-C2160 PICMG 1.3 CPU Card



**Figure 6-20: Audio Driver Software Configuration**

**Step 8:** After the driver installation process is complete, a confirmation screen appears (Figure 6-21).



**Figure 6-21: Restart the Computer**

**Step 9:** The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **Finish** to restart the computer.

## 6.7 Intel® Rapid Storage Technology Driver Installation

To install the Intel® Rapid Storage Technology driver, please do the following.

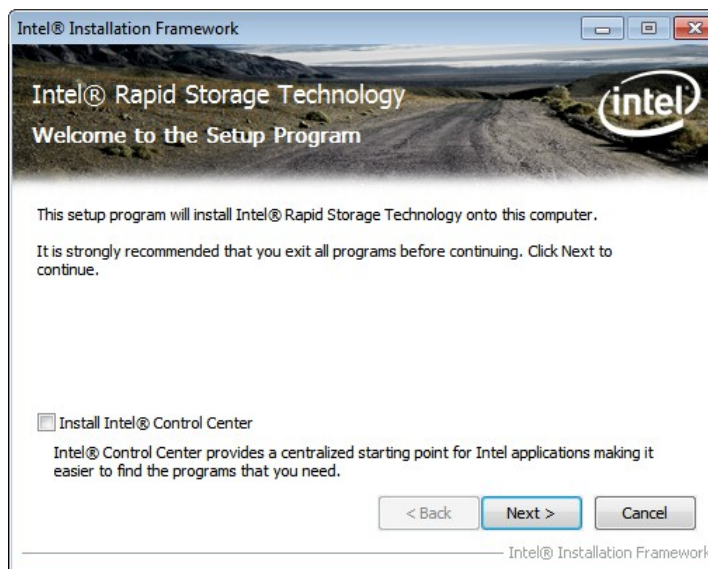
**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click “**5-SATA**”.

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

**Step 4:** The **Welcome Screen** in **Figure 6-22** appears.

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



**Figure 6-22: SATA RAID Driver Welcome Screen**

**Step 6:** The license agreement in **Figure 6-23** appears.

**Step 7:** Read the **License Agreement**.

**Step 8:** Click **Yes** to continue.



SPCIE-C2160 PICMG 1.3 CPU Card

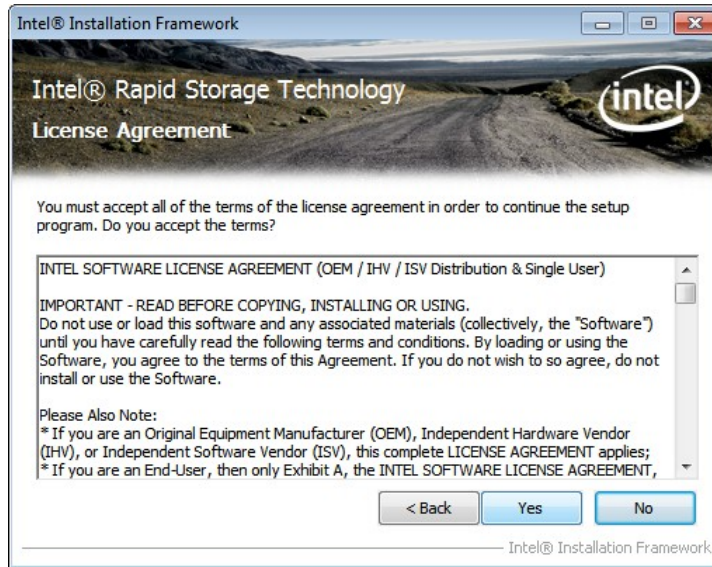


Figure 6-23: SATA RAID Driver License Agreement

**Step 9:** The Read Me file in Figure 6-24 appears.

**Step 10:** Click Next to continue.

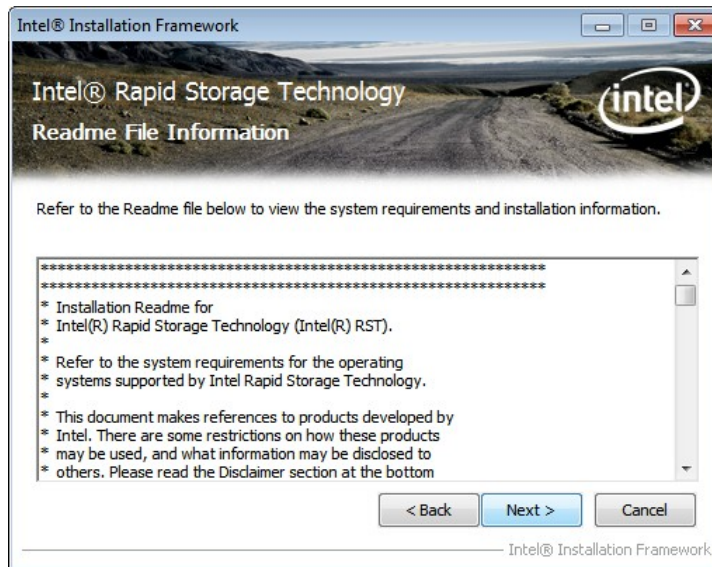
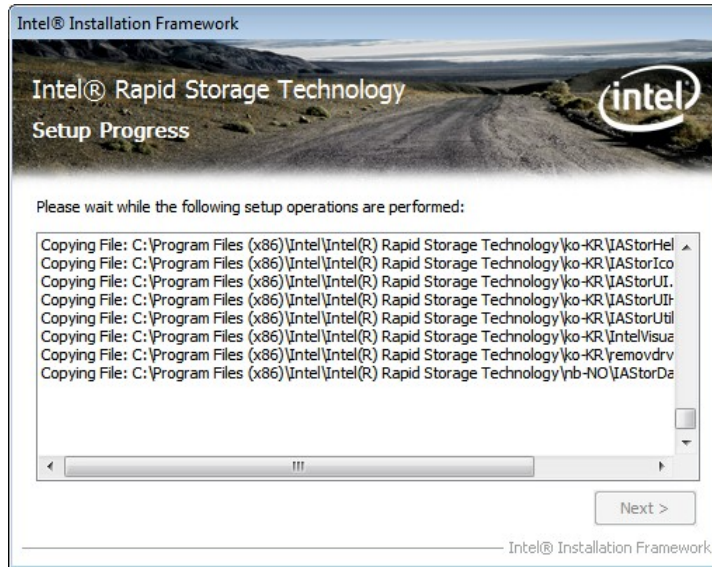


Figure 6-24: SATA RAID Driver Read Me File

**Step 11:** Setup Operations are performed as shown in Figure 6-25.

**Step 12:** Once the Setup Operations are complete, click Next to continue.



**Figure 6-25: SATA RAID Driver Setup Operations**

**Step 13:** The **Finish** screen in **Figure 6-26** appears.

**Step 14:** Select “**Yes, I want to restart this computer now**” and click **Finish**.



**Figure 6-26: SATA RAID Driver Installation Finish Screen**

## 6.8 Intel® AMT Driver Installation

The package of the Intel® ME components includes

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

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

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

**Step 2:** Click “7-iAMT”.

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

**Step 4:** When the setup files are completely extracted the **Welcome Screen** in **Figure 6-27** appears.

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



Figure 6-27: Intel® ME Driver Welcome Screen

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

**Step 7:** Read the **License Agreement**.

**Step 8:** Click **Yes** to continue.

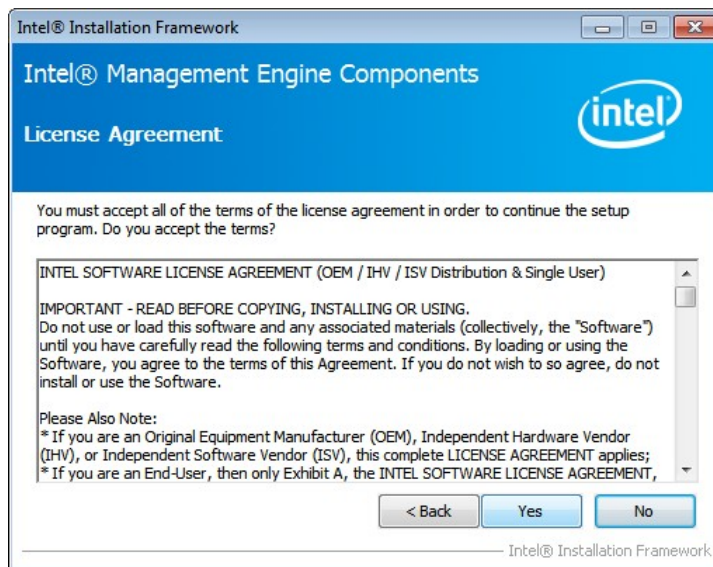


Figure 6-28: Intel® ME Driver License Agreement

**Step 9:** **Setup Operations** are performed as shown in **Figure 6-29**.

**Step 10:** Once the **Setup Operations** are complete, click **Next** to continue.

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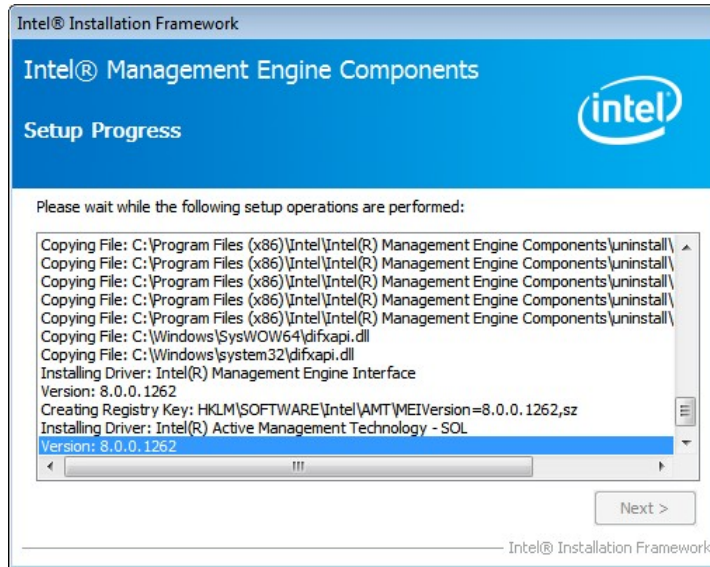


Figure 6-29: Intel® ME Driver Setup Operations

**Step 11:** The **Finish** screen in Figure 6-30 appears.

**Step 12:** Select “**Yes, I want to restart this computer now**” and click **Finish**.

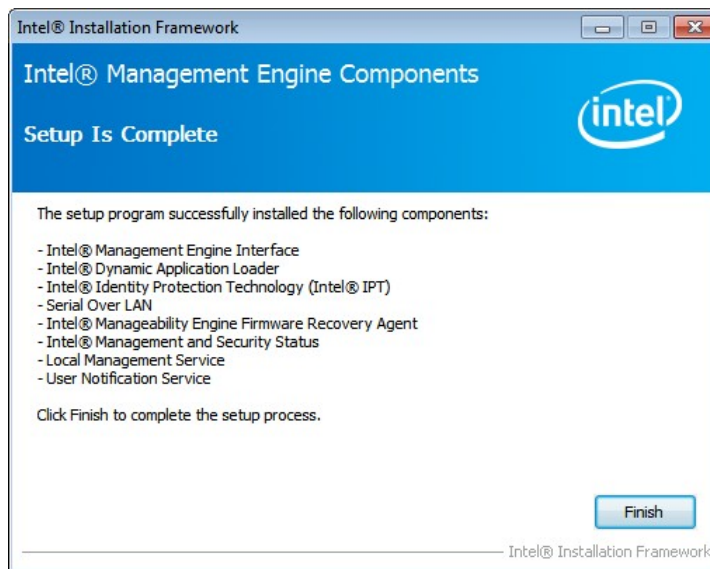


Figure 6-30: Intel® ME Driver Installation Finish Screen

Appendix

**A**

# BIOS Options

---

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

<b>System Overview</b> .....	<b>67</b>
<b>System Date [xx/xx/xx]</b> .....	<b>67</b>
<b>System Time [xx:xx:xx]</b> .....	<b>67</b>
<b>ACPI Sleep State [S1 only (CPU Stop Clock)]</b> .....	<b>69</b>
<b>Wake system with Fixed Time [Disabled]</b> .....	<b>70</b>
<b>Security Device Support [Disable]</b> .....	<b>71</b>
<b>Intel Virtualization Technology [Disabled]</b> .....	<b>72</b>
<b>SATA Controller(s) [Enabled]</b> .....	<b>73</b>
<b>SATA Mode Selection [IDE]</b> .....	<b>73</b>
<b>Hot Plug [Disabled]</b> .....	<b>74</b>
<b>Intel AMT [Enabled]</b> .....	<b>75</b>
<b>Un-Configure ME [Disabled]</b> .....	<b>75</b>
<b>USB Devices</b> .....	<b>76</b>
<b>Legacy USB Support [Enabled]</b> .....	<b>76</b>
<b>Floppy Disk Controller [Enabled]</b> .....	<b>78</b>
<b>Change Settings [Auto]</b> .....	<b>78</b>
<b>Device Mode [Read Write]</b> .....	<b>78</b>
<b>Serial Port [Enabled]</b> .....	<b>79</b>
<b>Change Settings [Auto]</b> .....	<b>79</b>
<b>Serial Port [Enabled]</b> .....	<b>80</b>
<b>Change Settings [Auto]</b> .....	<b>80</b>
<b>Serial Port [Enabled]</b> .....	<b>81</b>
<b>Change Settings [Auto]</b> .....	<b>81</b>
<b>IrDA [Enabled]</b> .....	<b>82</b>
<b>Change Settings [Auto]</b> .....	<b>82</b>
<b>Parallel Port [Enabled]</b> .....	<b>83</b>
<b>Change Settings [Auto]</b> .....	<b>84</b>
<b>Device Mode [STD Printer Mode]</b> .....	<b>84</b>
<b>PC Health Status</b> .....	<b>85</b>
<b>CPU_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]</b> .....	<b>86</b>
<b>CPU Temperature n</b> .....	<b>86</b>
<b>Console Redirection [Disabled]</b> .....	<b>87</b>
<b>Terminal Type [ANSI]</b> .....	<b>87</b>

Bits per second [115200].....	87
Data Bits [8] .....	88
Parity [None].....	88
Stop Bits [1].....	88
Auto Recovery Function [Disabled].....	89
VT-d [Disabled].....	91
Primary Display [Auto] .....	92
DVMT Pre-Allocated [256M] .....	92
DVMT Total Gfx Mem [MAX].....	93
Primary IGFX Boot Display [VBIOS Default] .....	93
PEG0 – Gen X [Auto] .....	94
Enable PEG [Auto].....	94
Detect Non-Compliance Device [Disabled] .....	95
Restore AC Power Loss [Last State] .....	96
Power Saving Function(ERP) [Disabled].....	96
PCIEX1_1/ PCIEX1_2/ PCIEX1_3/ PCIEX1_4/Mini PCIE.....	97
Azalia [Enabled] .....	98
Bootup NumLock State [On].....	99
Quiet Boot [Enabled] .....	100
Option ROM Messages [Force BIOS].....	100
Launch PXE OpROM [Disabled] .....	100
UEFI Boot [Disabled] .....	100
Administrator Password .....	101
User Password .....	101
Save Changes and Reset .....	102
Discard Changes and Reset .....	102
Restore Defaults .....	102
Save as User Defaults .....	103
Restore User Defaults .....	103



Appendix

**B**

# One Key Recovery

---

## B.1 One Key Recovery Introduction

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



### NOTE:

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

---

The IEI One Key Recovery tool menu is shown below.

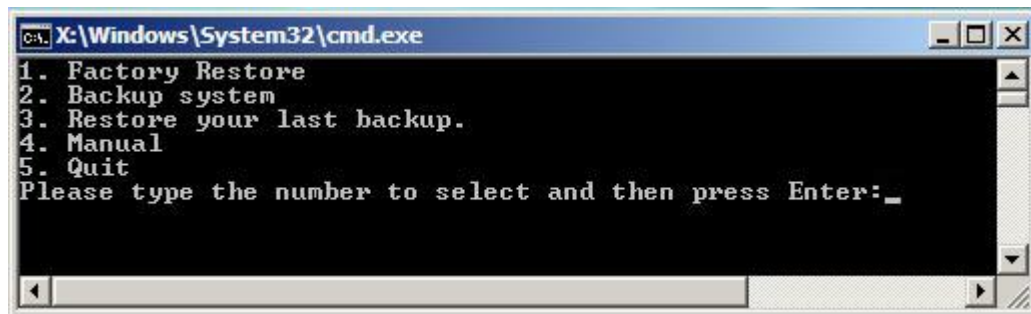


Figure B-1: IEI One Key Recovery Tool Menu

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

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

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



### NOTE:

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

---

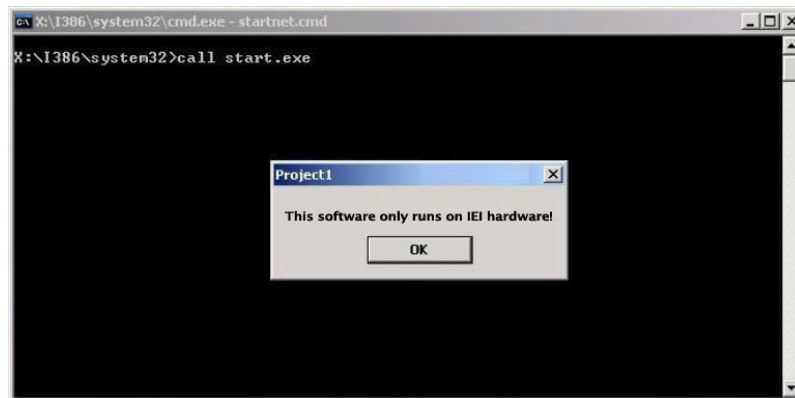
### B.1.1 System Requirement

---



### NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.



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

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

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

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



**NOTE:**

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

**B.1.2 Supported Operating System**

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

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



**NOTE:**

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

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



### NOTE:

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

---

## B.2 Setup Procedure for Windows

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

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

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

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

**Step 4:** Build the recovery partition (see **Section B.2.4**) or build the auto recovery partition (see **Section B.3**)

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

The detailed descriptions are described in the following sections.

**NOTE:**

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

---

### B.2.1 Hardware and BIOS Setup

- Step 1:** Make sure the system is powered off and unplugged.
- Step 2:** Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.
- Step 3:** Connect an optical disk drive to the system and insert the recovery CD.
- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1<sup>st</sup> boot device. (**Boot → Boot Device Priority → 1<sup>st</sup> Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

### B.2.2 Create Partitions

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

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

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

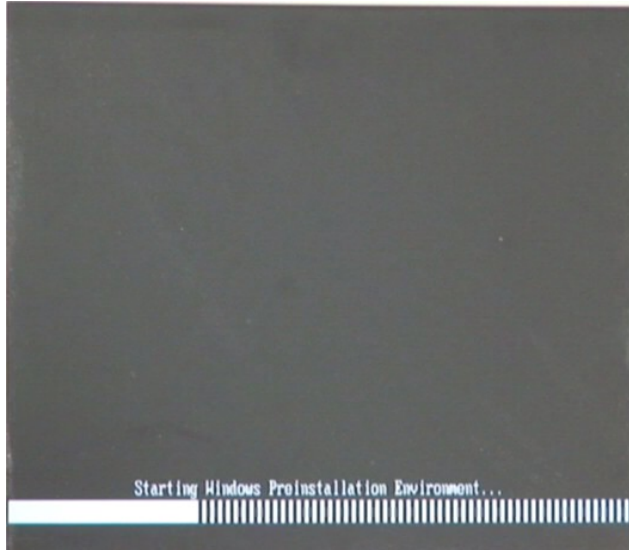


Figure B-2: Launching the Recovery Tool

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

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

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

Figure B-3: Recovery Tool Setup Menu

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

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

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

Figure B-4: Command 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
system32>format F: /fs:ntfs /q /v:Recovery /y
system32>exit
```



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```

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

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

DISKPART> list vol → Show partition information

   Volume ###  Ltr  Label          Fs          Type          Size         Status       Info
   -----  -  -  -  -  -  -  -  -  -
   Volume 0             X   CD_ROM        CDFS        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
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 B-5: Partition Creation Commands

**NOTE:**

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

```
X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
  Partition ###  Type              Size      Offset
-----
  Partition 1    Primary           2000 MB   32 KB
  Partition 2    Primary           1804 MB  2000 MB
DISKPART> exit
```

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

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

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

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

**NOTE:**

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

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

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### B.2.4 Build-up Recovery Partition

- Step 1:** Put the recover CD in the optical drive.
- Step 2:** Start the system.
- Step 3:** **Boot the system from the recovery CD.** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

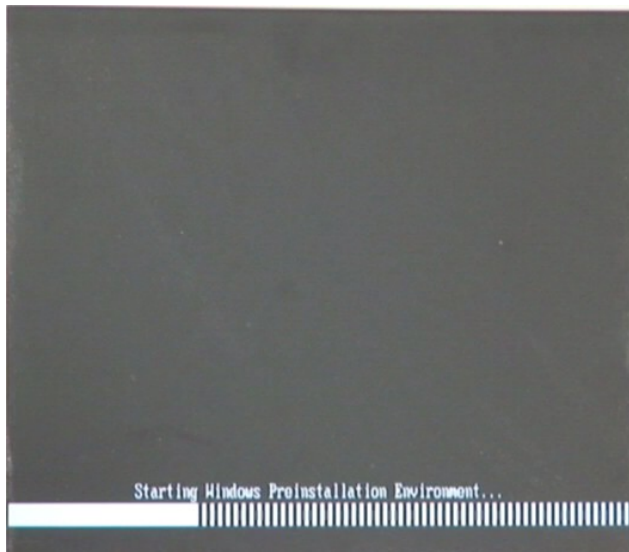


Figure B-6: Launching the Recovery Tool

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

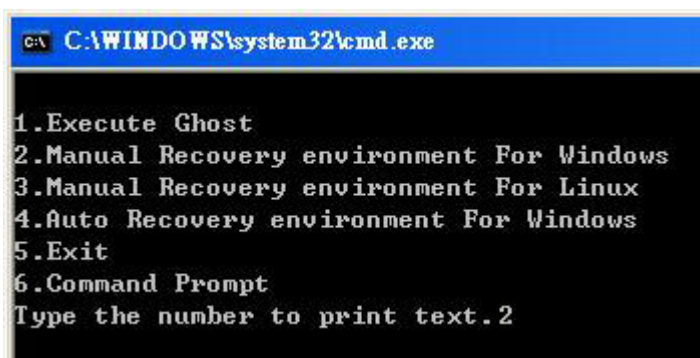
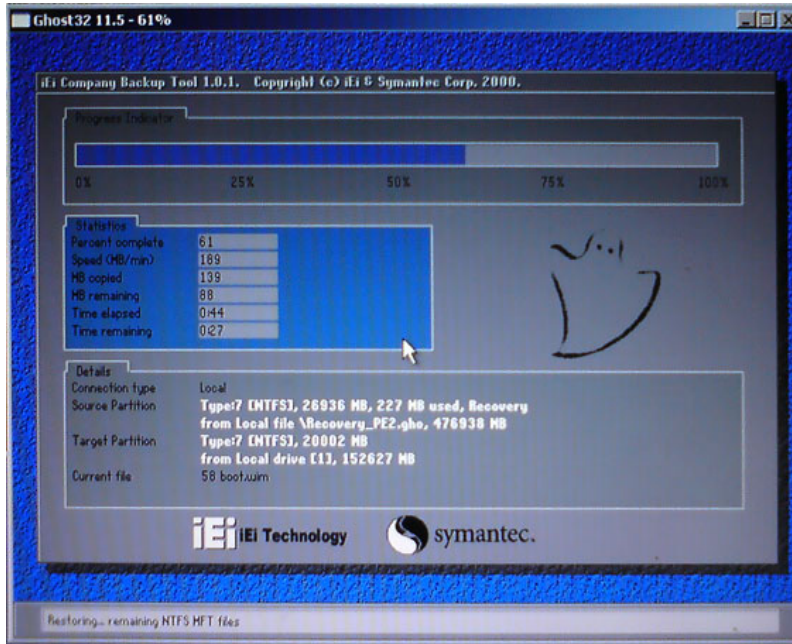


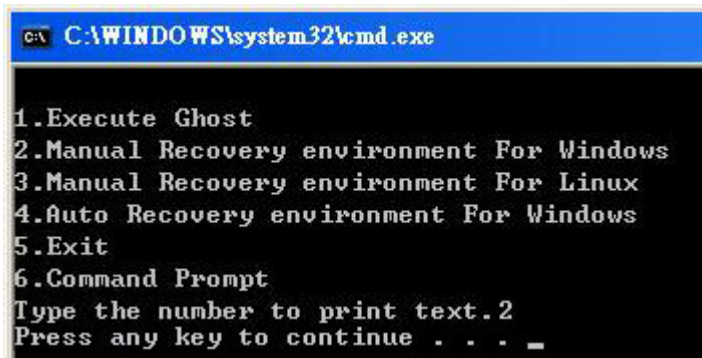
Figure B-7: Manual Recovery Environment for Windows

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



**Figure B-8: Building the Recovery Partition**

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



**Figure B-9: Press Any Key to Continue**

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

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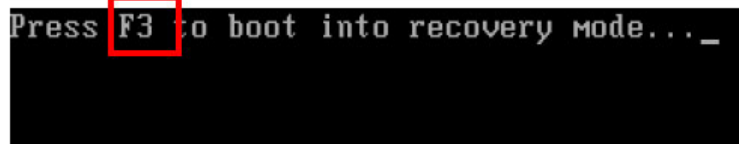
## B.2.5 Create Factory Default Image

**NOTE:**

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

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

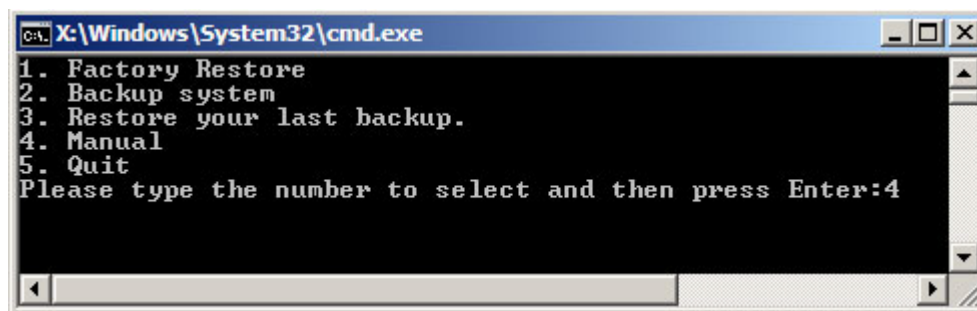
**Step 1:** Turn on the system. When the following screen displays (**Figure B-10**), press the <F3> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.



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

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

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



**Figure B-11: Recovery Tool Menu**

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

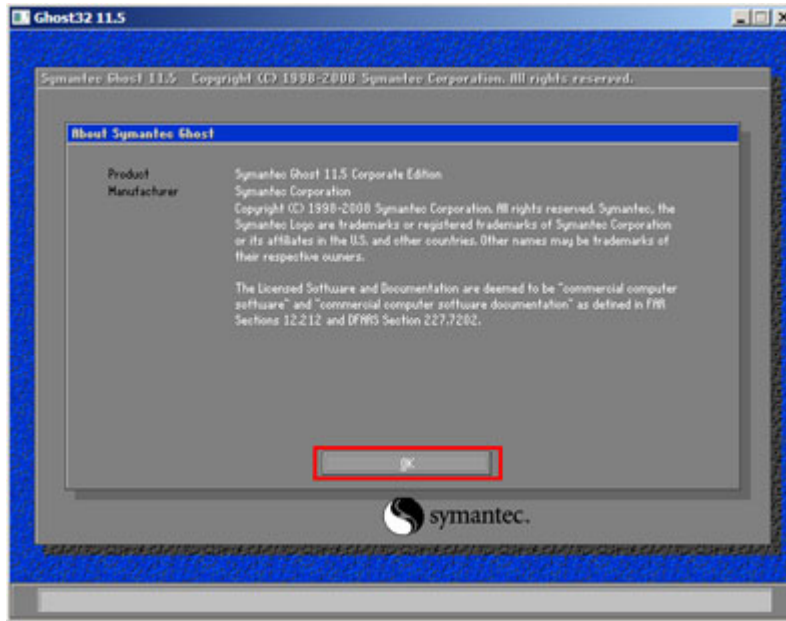


Figure B-12: About Symantec Ghost Window

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

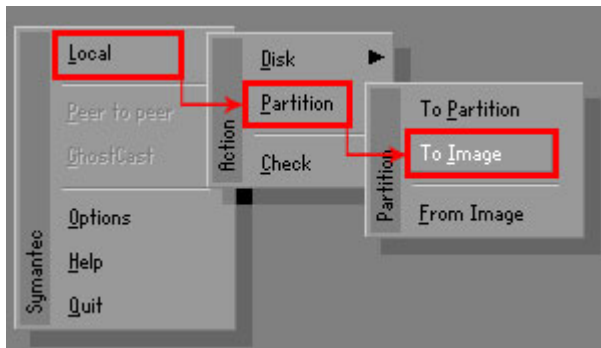
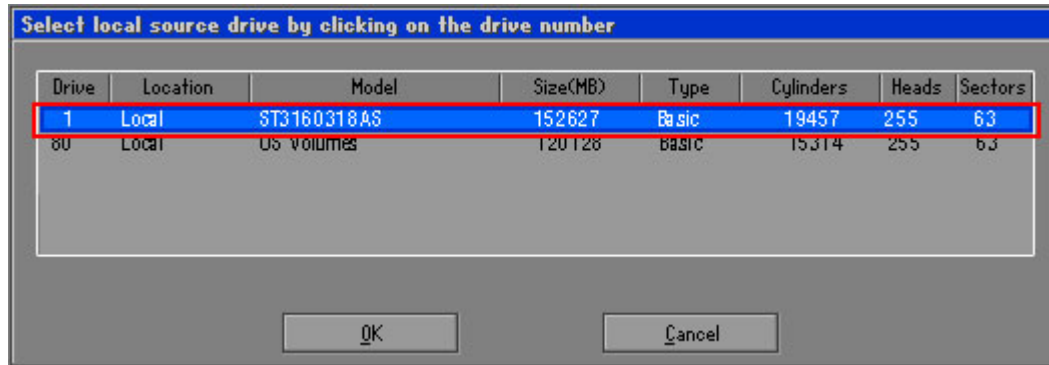


Figure B-13: Symantec Ghost Path

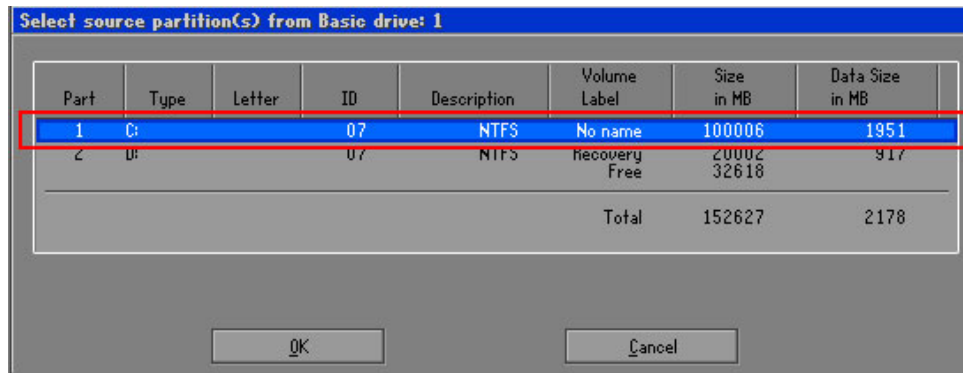
**Step 5:** Select the local source drive (Drive 1) as shown in Figure B-14. Then click OK.

## SPCIE-C2160 PICMG 1.3 CPU Card



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

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



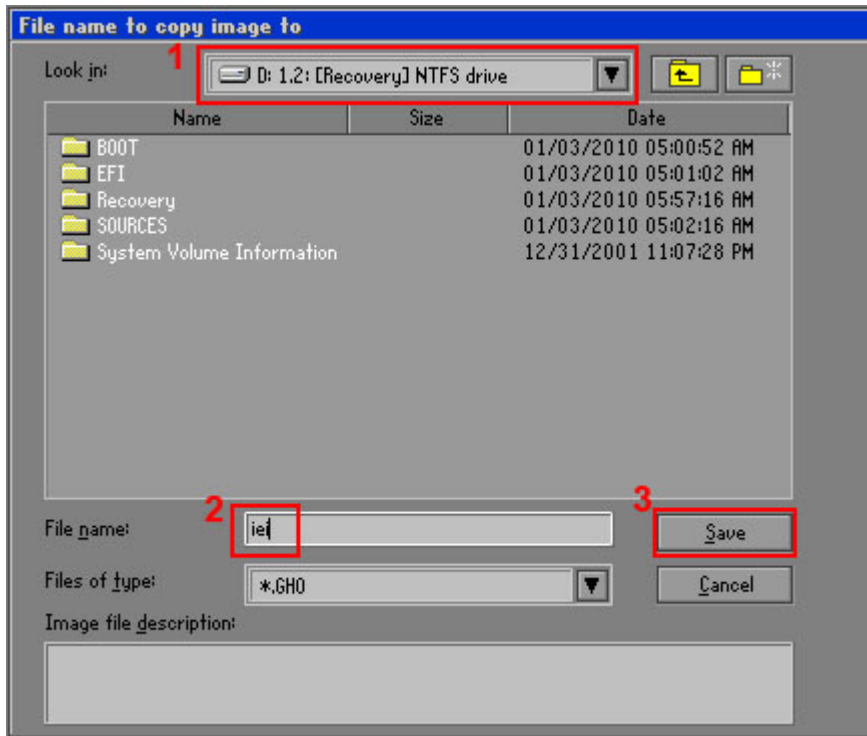
**Figure B-15: Select a Source Partition from Basic Drive**

**Step 7:** Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure B-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named **IEI.GHO**.



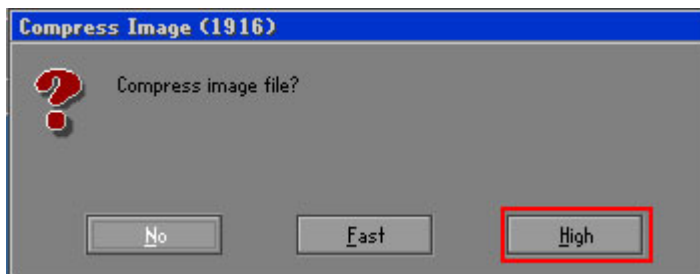
### **WARNING:**

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



**Figure B-16: File Name to Copy Image to**

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

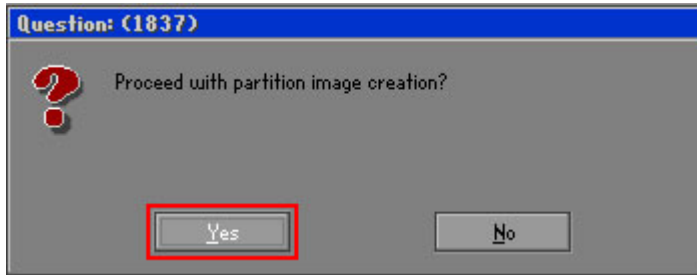


**Figure B-17: Compress Image**



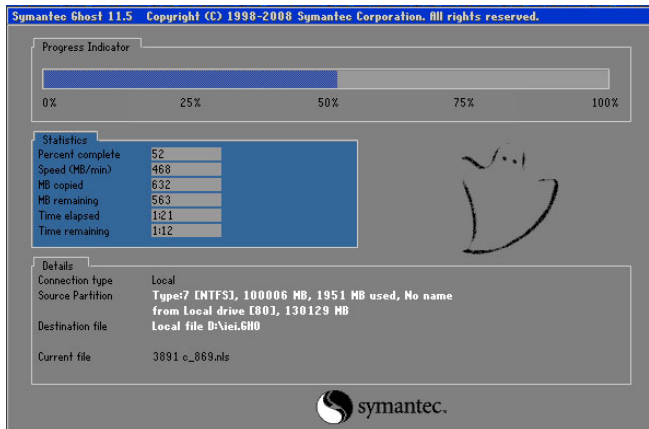
## SPCIE-C2160 PICMG 1.3 CPU Card

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



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

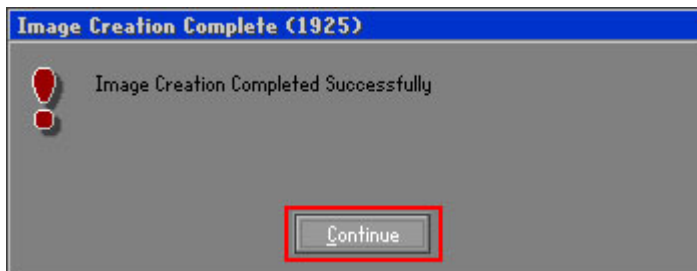
**Step 10:** The Symantec Ghost starts to create the factory default image (**Figure B-19**).



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

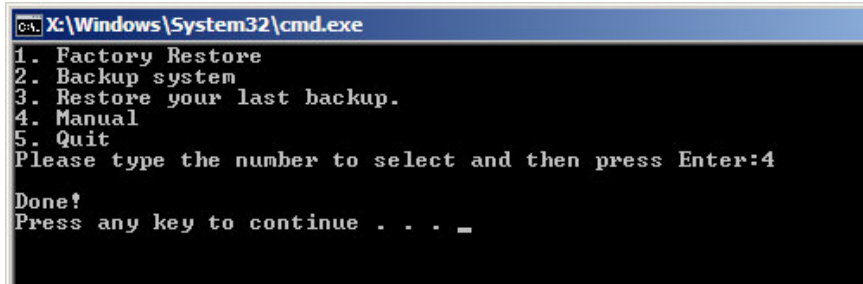
**Step 11:** When the image creation completes, a screen prompts as shown in **Figure B-20**.

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



**Figure B-20: Image Creation Complete**

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



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

Figure B-21: Press Any Key to Continue

### B.3 Auto Recovery Setup Procedure

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



#### CAUTION:

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

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



#### CAUTION:

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

---

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



Figure B-22: Auto Recovery Utility

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

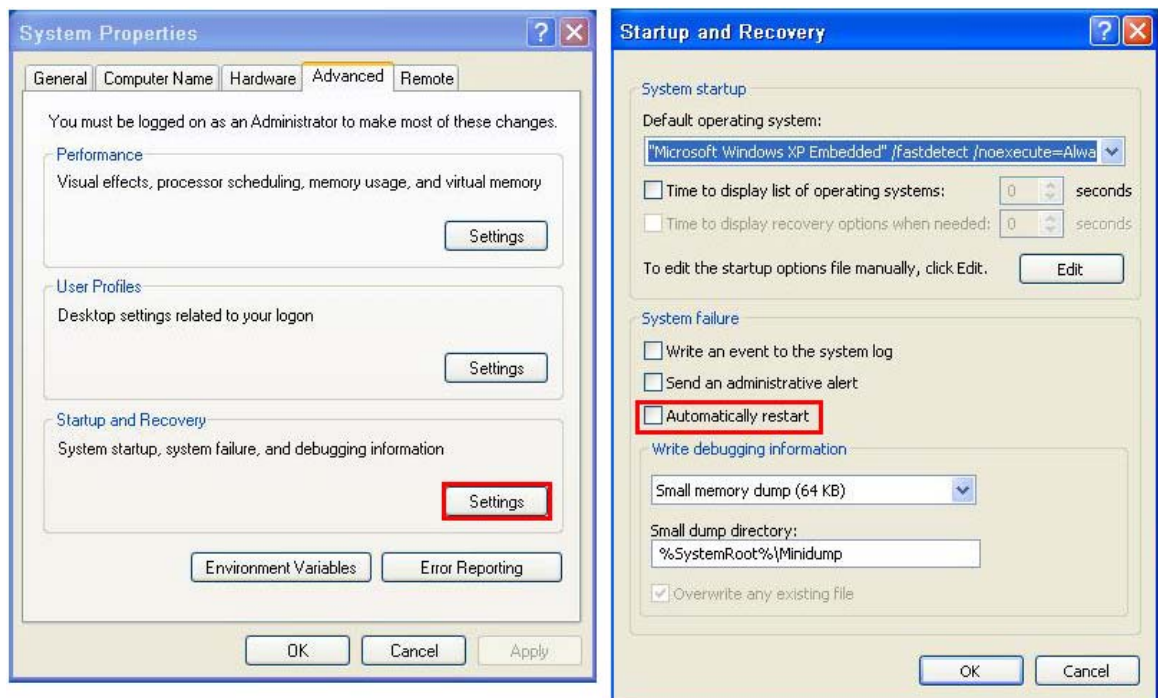


Figure B-23: Disable Automatically Restart

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

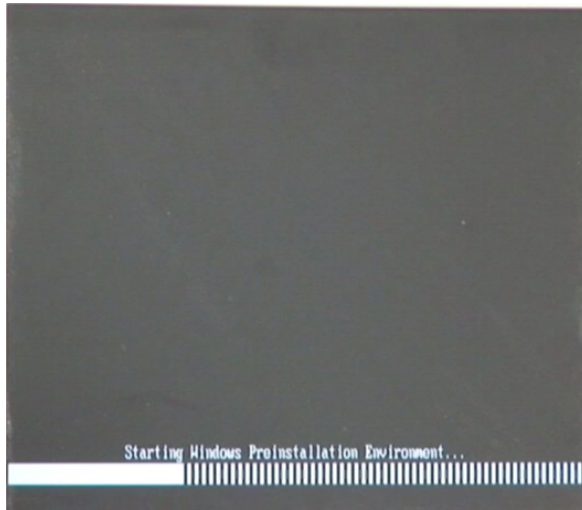


Figure B-24: Launching the Recovery Tool

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

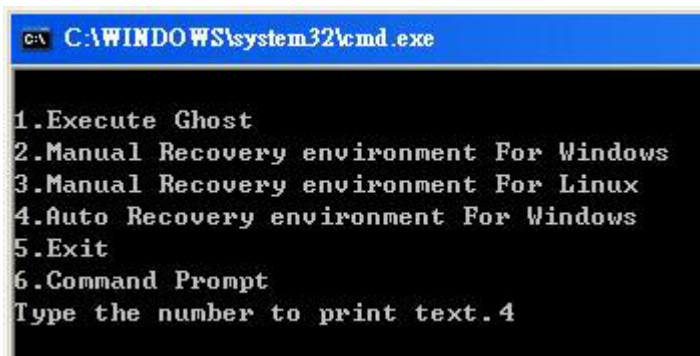


Figure B-25: Auto Recovery Environment for Windows

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

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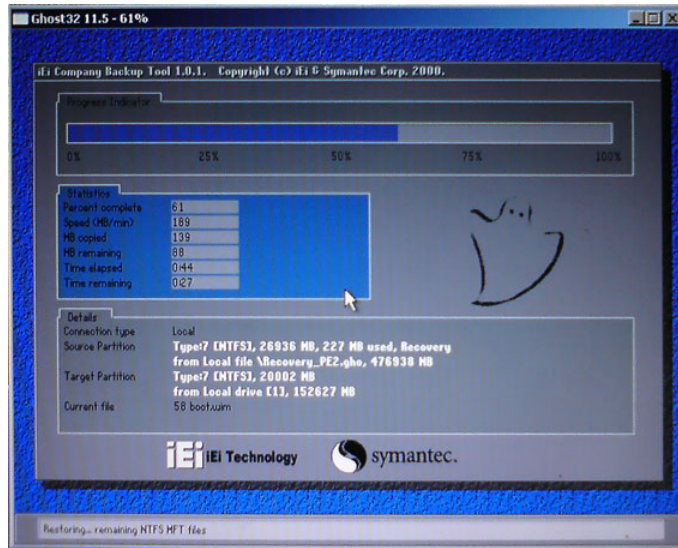


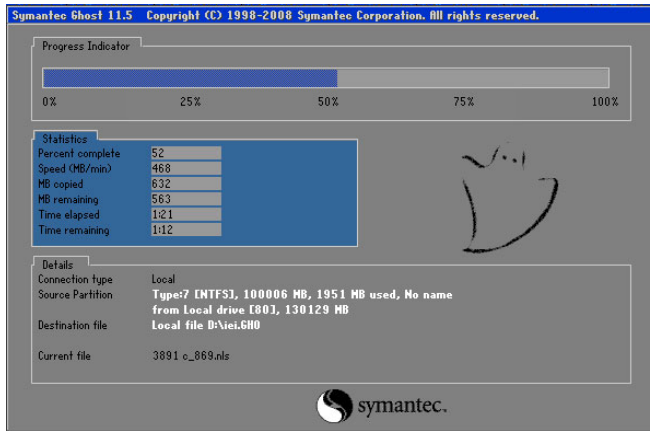
Figure B-26: Building the Auto Recovery Partition

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



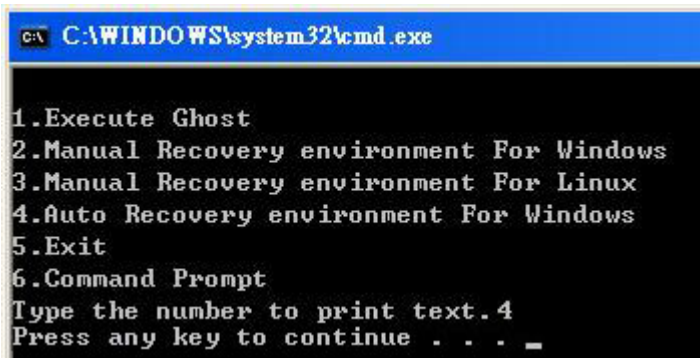
Figure B-27: Factory Default Image Confirmation

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



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

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



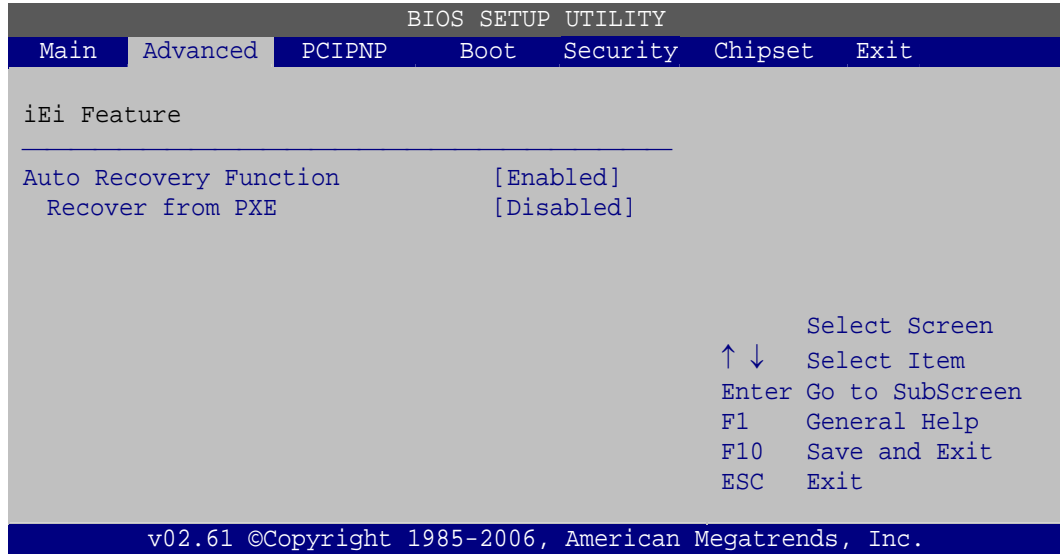
**Figure B-29: Press any key to continue**

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

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

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

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**BIOS Menu 32: IEI Feature**

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

## B.4 Setup Procedure for Linux

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

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

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

**NOTE:**

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

While installing Linux OS, please create two partitions:

- Partition 1: /
- Partition 2: SWAP

**NOTE:**

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

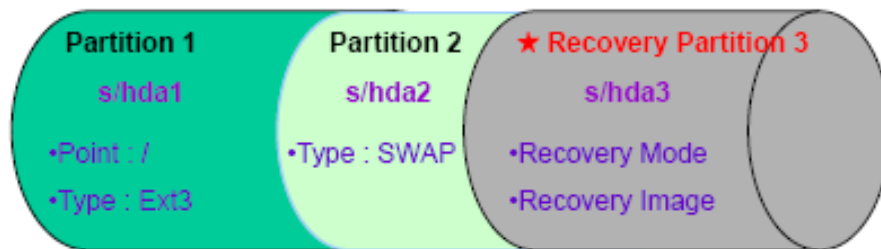


Figure B-30: Partitions for Linux

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

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

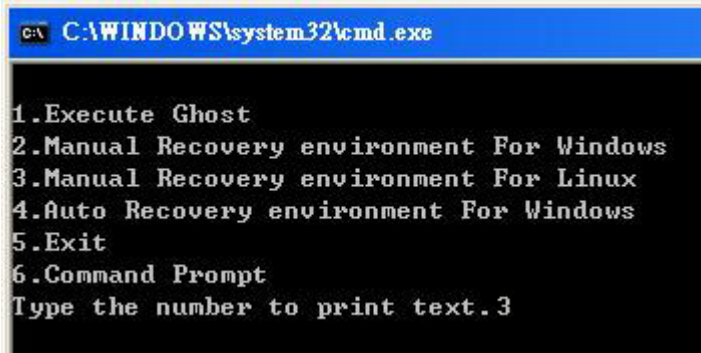
```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>exit
system32>format N: /fs:ntfs /q /v:Recovery /y
system32>exit
```

**Step 4:** Build-up recovery partition. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <3> and press <Enter> (**Figure B-31**). The Symantec Ghost window appears and starts configuring the system to build-up a



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



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

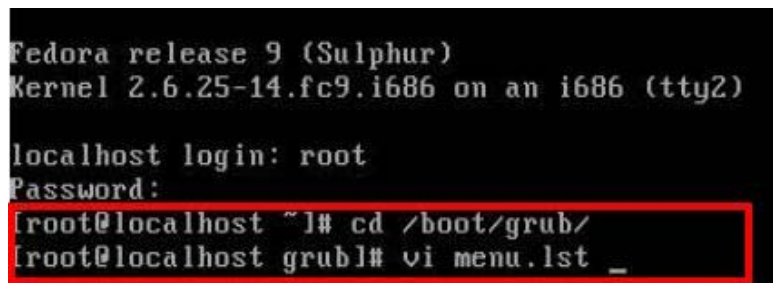
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
```

Figure B-31: System Configuration for Linux

**Step 5:** Access the recovery tool main menu by modifying the “menu.lst”. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, enter Administrator (root). When prompt appears, type:

```
cd /boot/grub
```

```
vi menu.lst
```



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

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

Figure B-32: Access menu.lst in Linux (Text Mode)

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

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

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

- Type command:  
**title Recovery Partition**  
**root (hd0,2)**  
**makeactive**  
**chainloader +1**

**Step 7:** The recovery tool menu appears. (Figure B-33)

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

Figure B-33: Recovery Tool Menu

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

## B.5 Recovery Tool Functions

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

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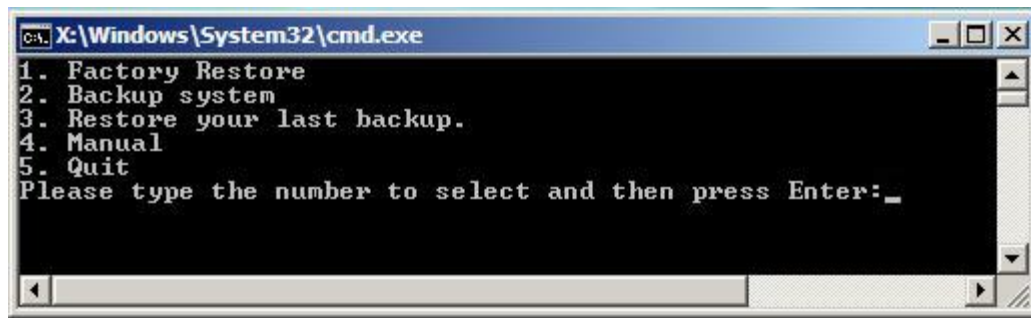


Figure B-34: Recovery Tool Main Menu

The recovery tool has several functions including:

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

**WARNING:**

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

**WARNING:**

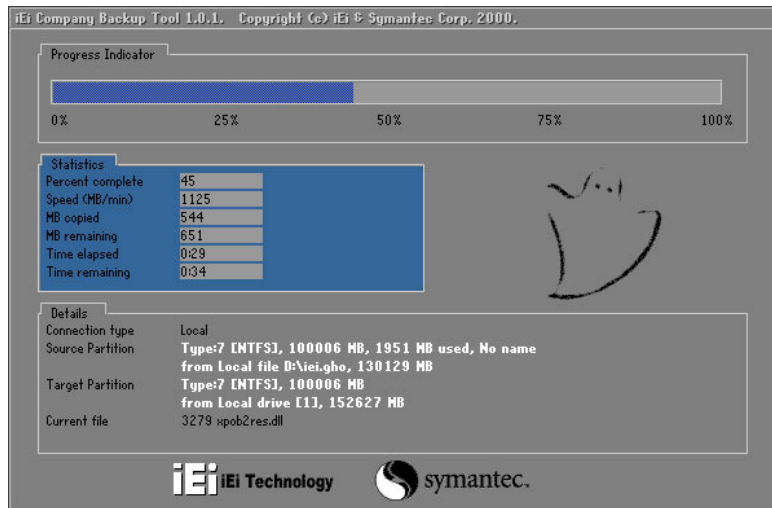
All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

### B.5.1 Factory Restore

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

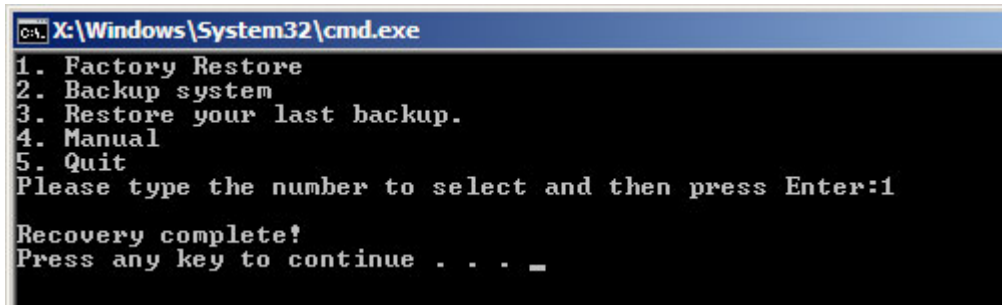
**Step 1:** Type <1> and press <Enter> in the main menu.

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



**Figure B-35: Restore Factory Default**

**Step 3:** The screen is shown in **Figure B-36** appears when completed. Press any key to reboot the system.



**Figure B-36: Recovery Complete Window**

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### B.5.2 Backup System

To backup the system, please follow the steps below.

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

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

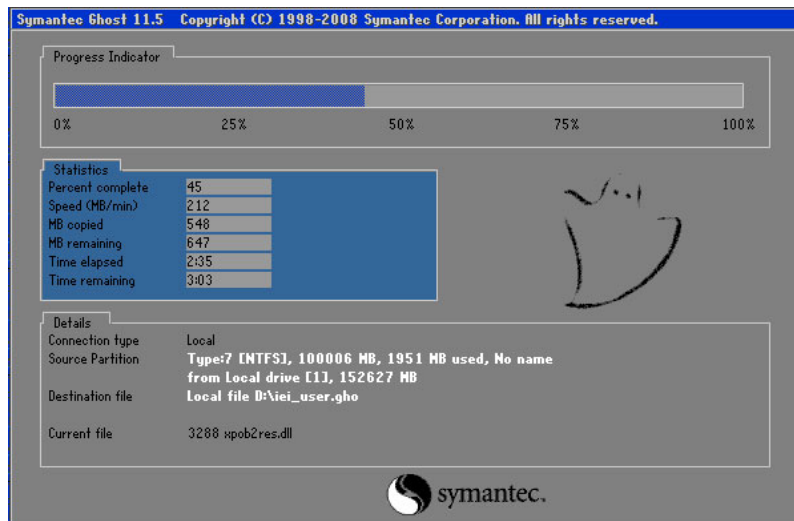


Figure B-37: Backup System

**Step 3:** The screen is shown in **Figure B-38** appears when system backup is complete. Press any key to reboot the system.

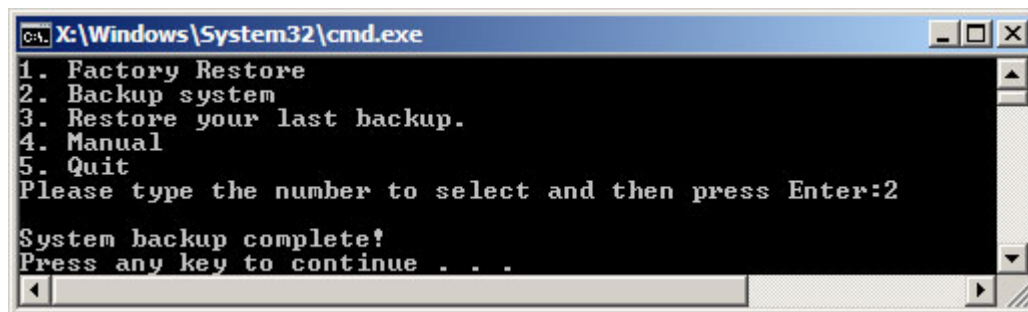


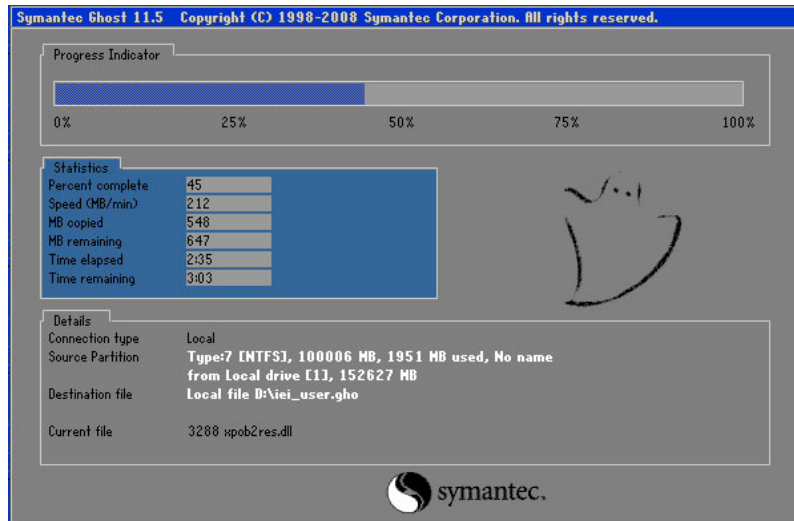
Figure B-38: System Backup Complete Window

### B.5.3 Restore Your Last Backup

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

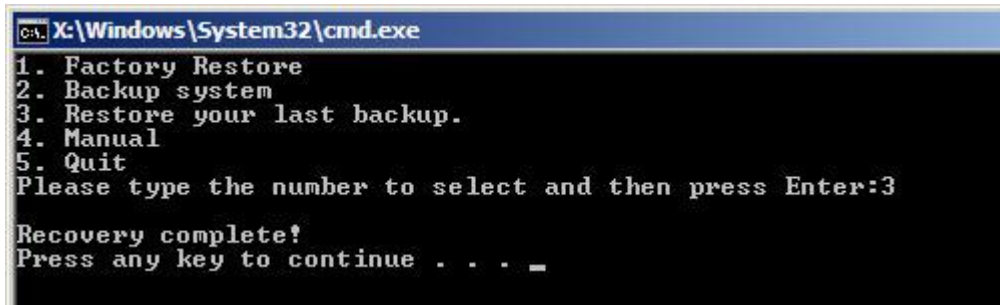
**Step 1:** Type <3> and press <Enter> in the main menu.

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



**Figure B-39: Restore Backup**

**Step 3:** The screen shown in **Figure B-40** appears when backup recovery is complete. Press any key to reboot the system.



**Figure B-40: Restore System Backup Complete Window**

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### B.5.4 Manual

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

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

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

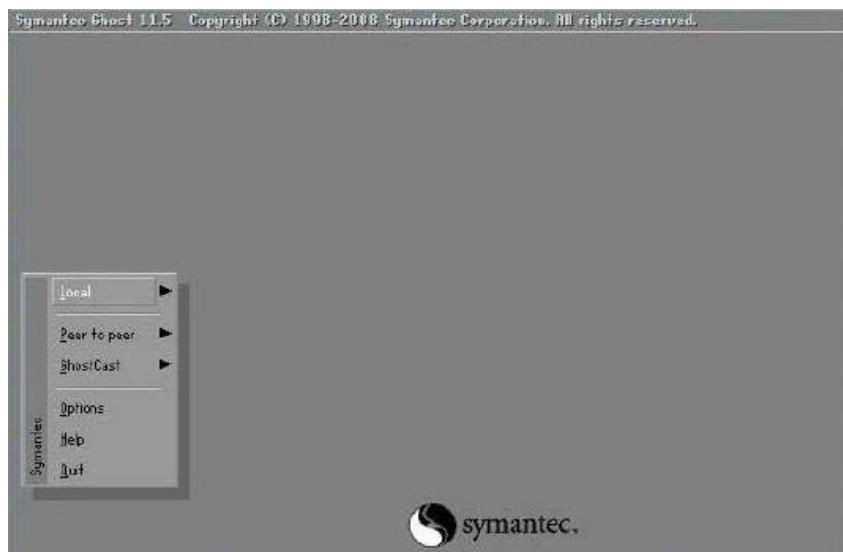
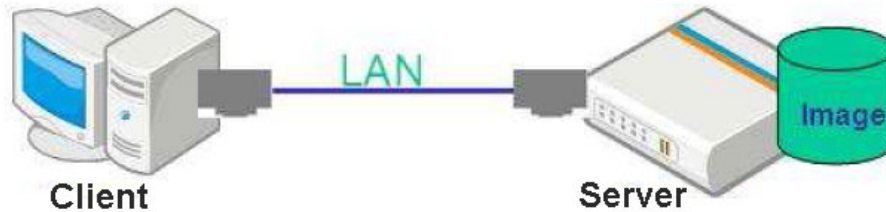


Figure B-41: Symantec Ghost Window

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

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

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



### CAUTION:

The supported client OS includes:

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

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

**Step 1:** Configure DHCP server settings

**Step 2:** Configure TFTP settings

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

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

**Step 5:** Create a shared directory

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

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



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### B.6.1 Configure DHCP Server Settings

**Step 1:** Install the DHCP

`#yum install dhcp` (CentOS, commands marked in red)

`#apt-get install dhcp3-server` (Debian, commands marked in blue)

**Step 2:** Confirm the operating system default settings: dhcpd.conf.

#### CentOS

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

`#vi /etc/dhcpd.conf`

The DHCP server sample location is shown as below:

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

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

`#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf`

`#vi /etc/dhcpd.conf`

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

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask            255.255.255.0;

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

#### Debian

`#vi /etc/dhcpd.conf`

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

`next-server PXE server IP address;`

```
filename "pxelinux.0";
```

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

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask            255.255.255.0;

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

## B.6.2 Configure TFTP Settings

**Step 1:** Install the tftp, httpd and syslinux.

```
#yum install tftp-server httpd syslinux (CentOS)
```

```
#apt-get install tftpd-hpa xinetd syslinux (Debian)
```

**Step 2:** Enable the TFTP server by editing the "/etc/xinetd.d/tftp" file and make it use the remap file. The "-vvv" is optional but it could definitely help on getting more information while running the remap file. For example:

### CentOS

```
#vi /etc/xinetd.d/tftp
```

Modify:

```
disable = no
```

```
server_args = -s /tftpboot -m /tftpboot/tftpd.remap -vvv_
```

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

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**Debian**

Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

`#vi /etc/inetd.conf`

Modify: `#tftp dgram udp wait root /usr/sbin.....` (as shown below)

```
#:BOOT: TFTP service is provided primarily for booting. Most sites
#      run this only on machines acting as "boot servers."
#tftp  dgram  udp   wait  root  /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
#      /var/lib/tftpboot
```

`#vi /etc/xinetd.d/tftp`

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

**B.6.3 Configure One Key Recovery Server Settings**

**Step 1:** Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).



**Step 2:** Extract the recovery package to /.

```
#cp RecoveryR10.tar.bz2 /
#cd /
#tar -xvjf RecoveryR10.tar.bz2
```

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

```
#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/
```

### B.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

#### CentOS

```
#service xinetd restart
```

```
#service httpd restart
```

```
#service dhcpd restart
```

#### Debian

```
#/etc/init.d/xinetd reload
```

```
#/etc/init.d/xinetd restart
```

```
#/etc/init.d/dhcp3-server restart
```

### B.6.5 Create Shared Directory

**Step 1:** Install the samba.

```
#yum install samba
```

**Step 2:** Create a shared directory for the factory default image.

```
#mkdir /share
```

```
#cd /share
```

```
#mkdir /image
```

```
#cp iei.gho /image
```



#### **WARNING:**

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

---

**Step 3:** Confirm the operating system default settings: smb.conf.

```
#vi /etc/samba/smb.conf
```

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Modify:

[image]

```
comment = One Key Recovery
```

```
path = /share/image
```

```
browseable = yes
```

```
writable = yes
```

```
public = yes
```

```
create mask = 0644
```

```
directory mask = 0755
```

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

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

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

**Step 5:** Modify the hostname

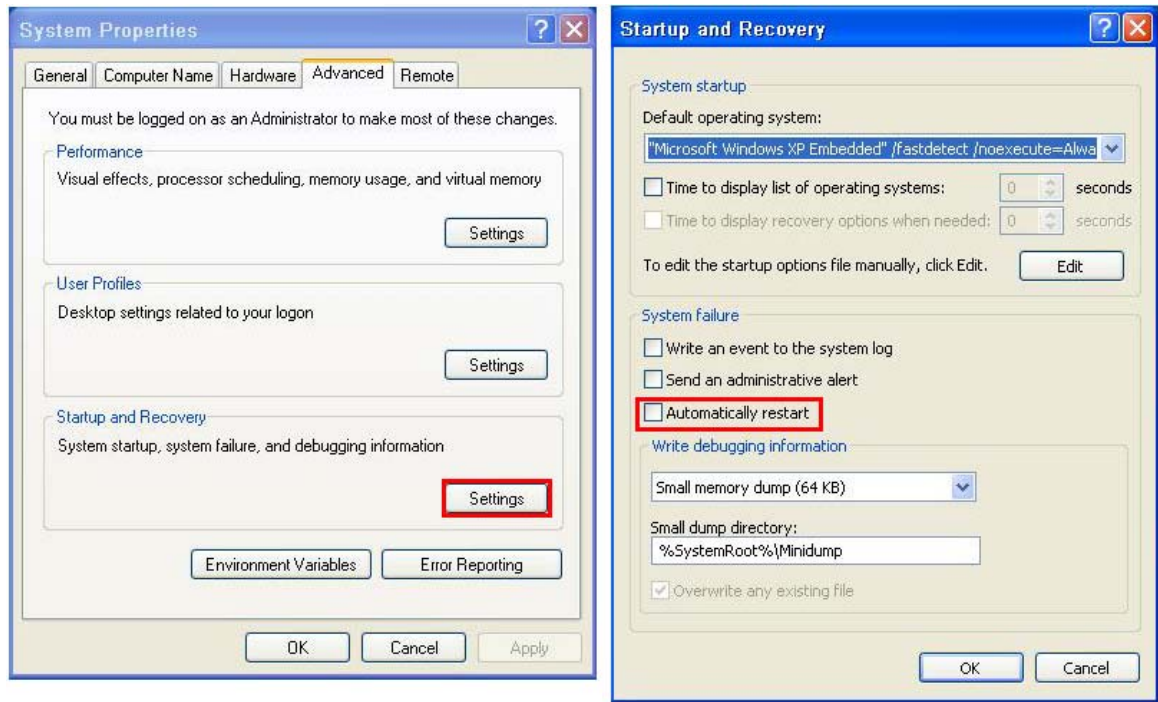
```
#vi /etc/hostname
```

Modify: RecoveryServer

```
RecoveryServer
```

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

**Step 1:** Disable the automatically restart function before creating the factory default image. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See Figure B-23)



**Figure B-42: Disable Automatically Restart**

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

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

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

Boot → Launch PXE OpROM → **Enabled**

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

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

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

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

Exit → **Save Changes and Exit**

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

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

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



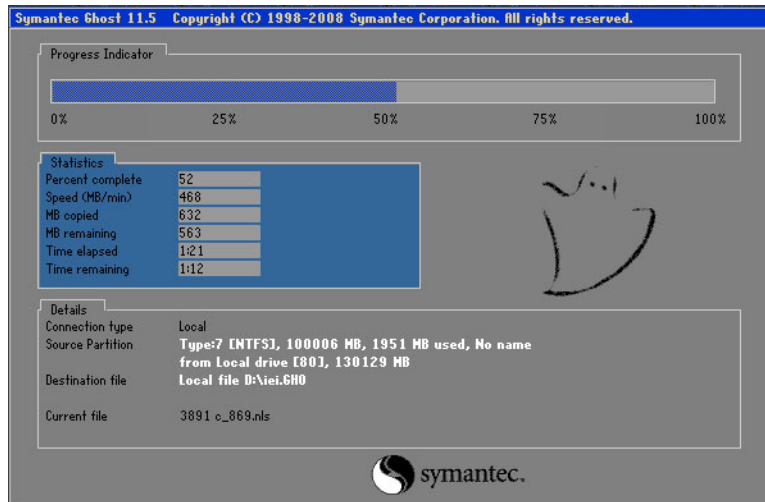
**Step 6:** Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

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

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

Windows is loading files...

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

**NOTE:**

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

## B.7 Other Information

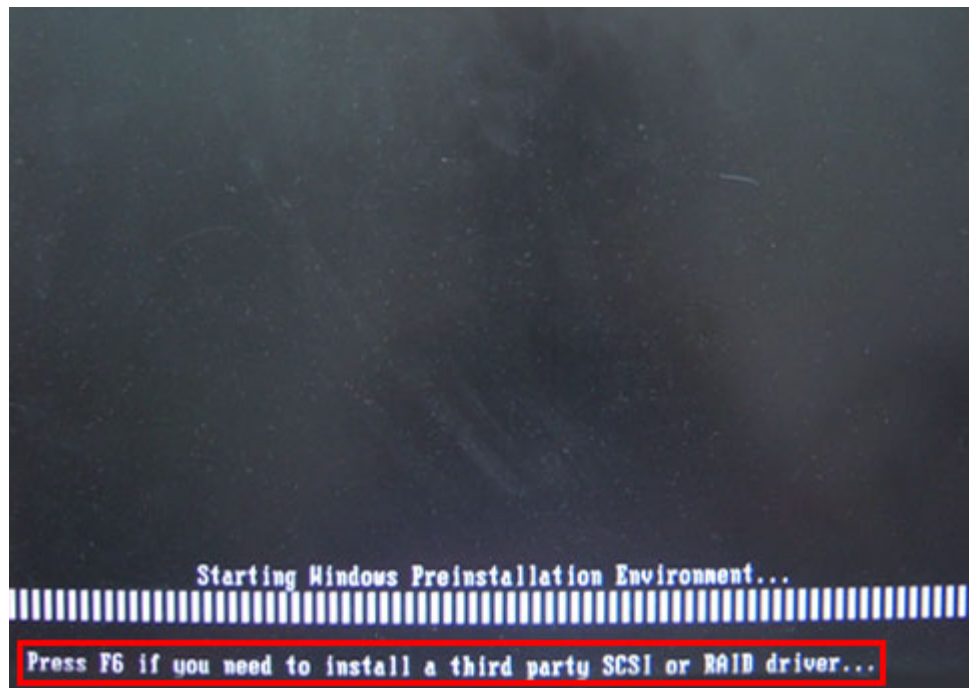
### B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

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

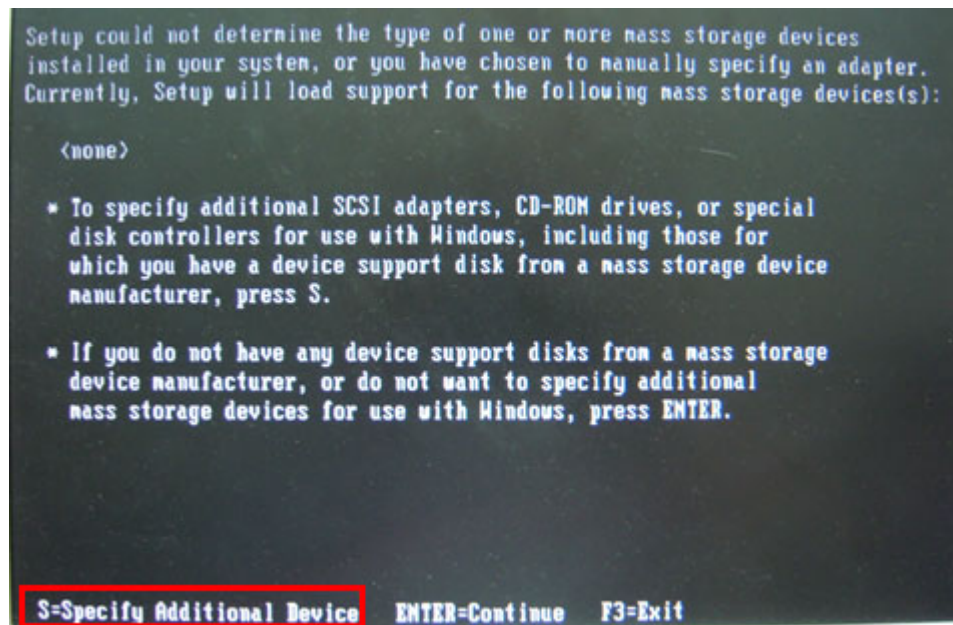
- Step 1:** Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.
- Step 2:** Connect the USB floppy disk drive to the system.
- Step 3:** Insert the One Key Recovery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



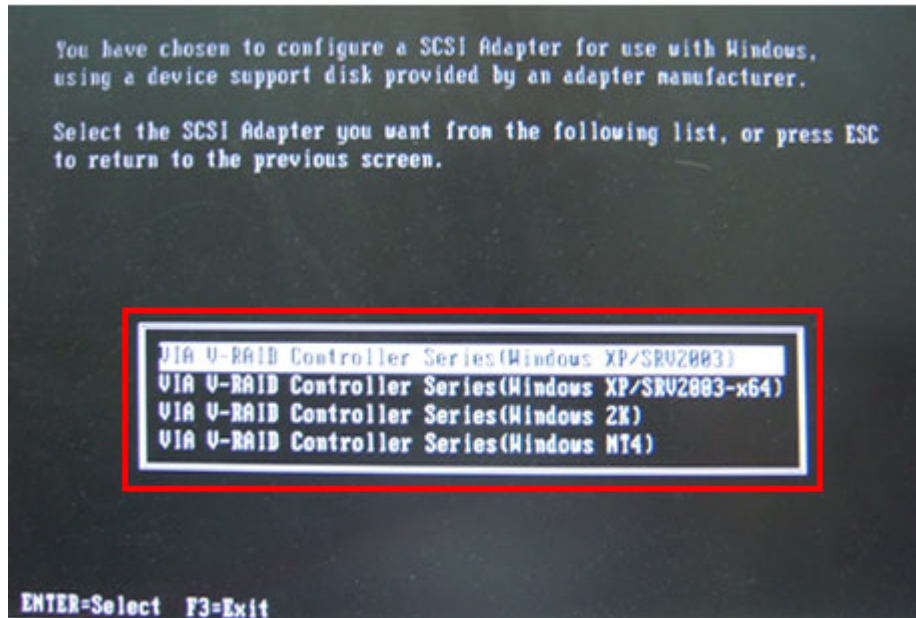
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**Step 5:** When the following window appears, press <S> to select "Specify Additional Device".



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



**Step 7:** After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

### B.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <F3> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS:** 128 MB system memory
- **Using AMI BIOS:** 512 MB system memory.

Appendix

C

# Terminology

---

<b>AC '97</b>	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
<b>ACPI</b>	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
<b>AHCI</b>	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
<b>ATA</b>	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
<b>ARMD</b>	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
<b>ASKIR</b>	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
<b>BIOS</b>	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
<b>CODEC</b>	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
<b>CMOS</b>	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
<b>COM</b>	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
<b>DAC</b>	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
<b>DDR</b>	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
<b>DMA</b>	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

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<b>DIMM</b>	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
<b>DIO</b>	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
<b>EHCI</b>	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
<b>EIDE</b>	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
<b>EIST</b>	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
<b>FSB</b>	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
<b>GbE</b>	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
<b>GPIO</b>	General purpose input
<b>HDD</b>	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
<b>ICH</b>	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
<b>IrDA</b>	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
<b>L1 Cache</b>	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
<b>L2 Cache</b>	The Level 2 Cache (L2 Cache) is an external processor memory cache.
<b>LCD</b>	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

<b>LVDS</b>	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
<b>POST</b>	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
<b>RAM</b>	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
<b>SATA</b>	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
<b>S.M.A.R.T</b>	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
<b>UART</b>	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
<b>UHCI</b>	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
<b>USB</b>	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
<b>VGA</b>	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

**D**

# Digital I/O Interface

---

## D.1 Introduction

The DIO connector on the SPCIE-C2160 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



### NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

## D.2 DIO Connector Pinouts

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

Table 6-1: Digital I/O Connector Pinouts

## D.3 Assembly Language Samples

### D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.



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

### D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

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

Appendix

**E**

# Watchdog Timer

---

## SPCIE-C2160 PICMG 1.3 CPU Card

**NOTE:**

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

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

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

INT 15H:

<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 E-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

**EXAMPLE PROGRAM:**

```
; INITIAL TIMER PERIOD COUNTER
```

```
;
```

```
W_LOOP:
```

```
;
```

```
    MOV     AX, 6F02H      ;setting the time-out value  
    MOV     BL, 30         ;time-out value is 48 seconds  
    INT     15H
```

```
;
```

```
; ADD THE APPLICATION PROGRAM HERE
```

```
;
```

```
    CMP     EXIT_AP, 1     ;is the application over?  
    JNE     W_LOOP        ;No, restart the application
```

```
    MOV     AX, 6F02H      ;disable Watchdog Timer  
    MOV     BL, 0         ;  
    INT     15H
```

```
;
```

```
; EXIT ;
```

Appendix

**F**

# Intel® Matrix Storage Manager

---

## F.1 Introduction

The SPCIE-C2160 can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.



### **CAUTION!**

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

---

### F.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.



### **WARNING!**

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

---

## SPCIE-C2160 PICMG 1.3 CPU Card

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### CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

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## F.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003, Windows Server 2008, Windows Vista and Windows 7

## F.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

**Step 1: Connect SATA drives to the system.** Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

---



### NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

---

**Step 2: Enable SATA drives in BIOS.** Start the computer and access the BIOS setup program. Enable RAID support for all SATA devices. Refer to the applicable BIOS configuration section in this user manual.

**Step 3: Configure “Option ROM Messages” BIOS option to Force BIOS.** This is to allow the “Press <CTRL+I> to enter Configuration Utility.....” message to

appear during the POST. Refer to the applicable BIOS configuration section in this user manual.

- Step 4: Save and Exit BIOS.** After the SATA support option is enabled, save and exit the BIOS.
- Step 5: Reboot the system.** Reboot the system after saving and exiting the BIOS.
- Step 6: Press Ctrl+I. during the system boot process.** Press Ctrl+I when prompted to enter the RAID configuration software.
- Step 7: Configure the RAID settings.** Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

## F.4 Installing the Operating System to the RAID Array

To install the operating system to the RAID array some extra steps are necessary during the installation process.

- Step 1: Prepare a RAID driver floppy disk on another computer.** If installing on the RAID array a RAID driver floppy disk must be made. The RAID driver floppy disk utility is on the CD in the “5-SATA/Floppy Configuration Utility” folder. The floppy disk will be formatted and the drivers installed.
- Step 2: Restart the system with a floppy drive attached.** Attach a normal floppy drive or USB floppy drive to the system.
- Step 3: Press F6 when prompted.** During the installation process, Windows OS prompts the user to press F6 to install the RAID drivers. Press F6 and choose from the drivers on the floppy disk.
- Step 4: Install the OS.** Continue with OS installation as usual.



Appendix

**G**

# **Hazardous Materials Disclosure**

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## **G.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury**

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

### SPCIE-C2160 PICMG 1.3 CPU Card

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printed Circuit Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Metal Fasteners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cable Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fan Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power Supply Assemblies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

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

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

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

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

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