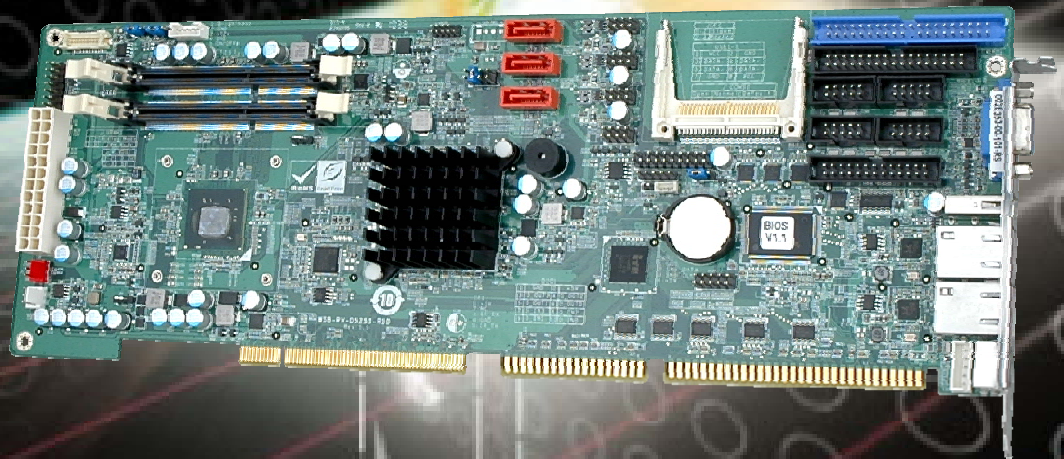




IEI Technology Corp.



MODEL:

WSB-PV-D4251/D5251

**Full-size PICMG 1.0 Intel® Atom™ Processor D525/D425
DDR3 up to 4GB, VGA/LVDS, Dual PCIe GbE
Four RS-232 Ports, Three SATA 3Gb/s Ports
Seven USB 2.0, RoHS, Audio**

User Manual

Rev. 1.02 – 21 June, 2012



Revision

Date	Version	Changes
21 June, 2012	1.02	Correct some information in the manual
24 November, 2011	1.01	Updated Table 3-3: ATX Power Control Pinouts
14 January, 2011	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

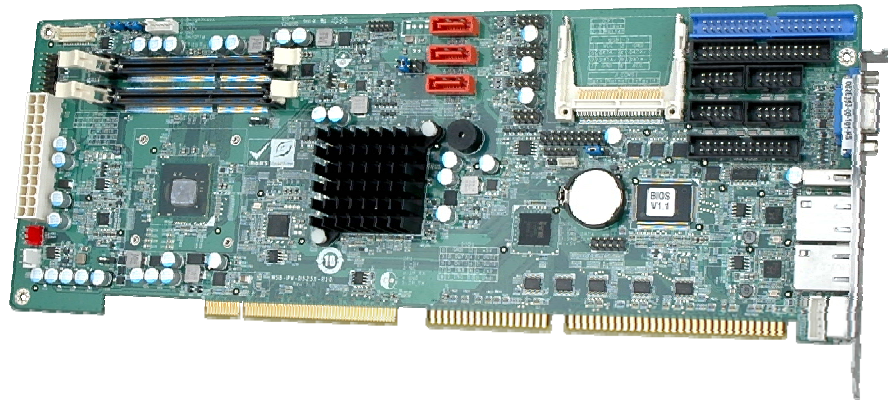


Figure 1-1: WSB-PV-D4251/D5251

The WSB-PV-D4251/D5251 is a full-size PICMG 1.0 SBC featuring Intel® Atom™ D525 dual-core processor or Intel® Atom™ D425 single-core processor.

On board storage is handled by three SATA 3Gb/s ports for connecting hard drives, optical drives or SSD.

The board has two graphics outputs. A VGA output connects to a traditional VGA monitor and one LVDS connector supports 18-bit single-channel display.

Other slots and connectors include four RS-232 serial ports, two Gigabit Ethernet connectors, seven USB ports, and digital I/O.

1.2 Benefits

Some of the WSB-PV-D4251/D5251 motherboard benefits include:

- Low power consumption
- Wide range of I/O interfaces
- Dual display support

1.3 Features

Some of the WSB-PV-D4251/D5251 motherboard features are listed below:

- Full size PICMG 1.0 form factor

WSB-PV-D4251/D5251 SBC

- RoHS compliant
- Seven USB 2.0 ports
- Three SATA 3Gb/s ports
- Four RS-232 serial ports
- Gigabit Ethernet

1.4 Connectors

The connectors on the WSB-PV-D4251/D5251 are shown in the following figure.

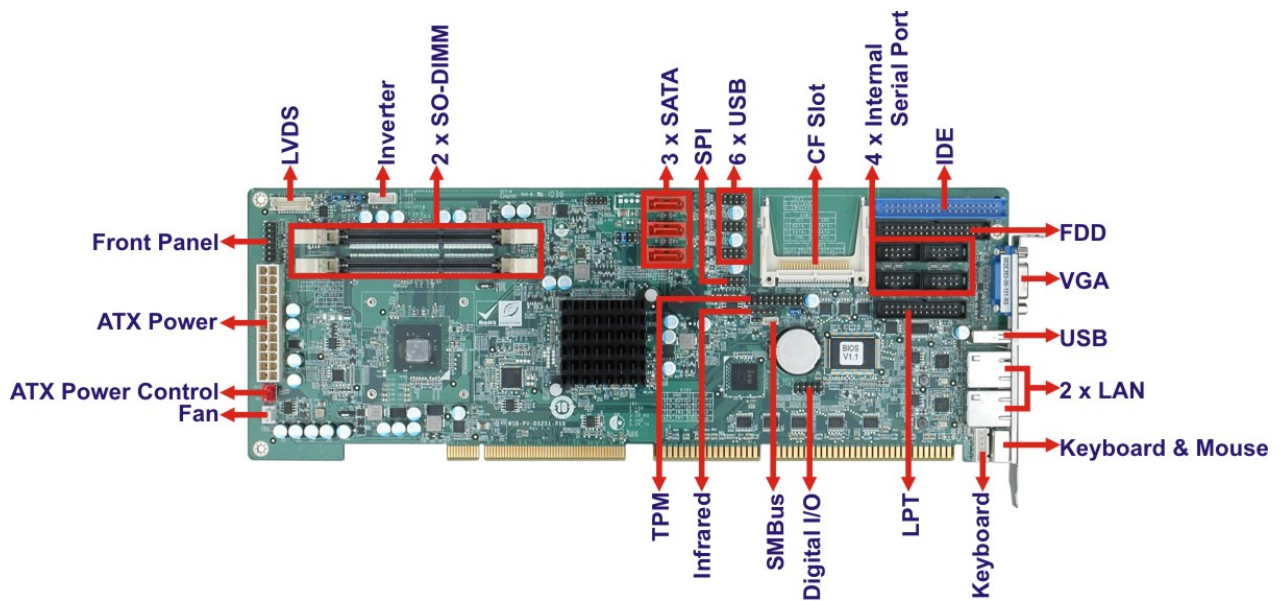


Figure 1-2: Connectors

1.5 Dimensions

The main dimensions of the WSB-PV-D4251/D5251 are shown in the diagram below.

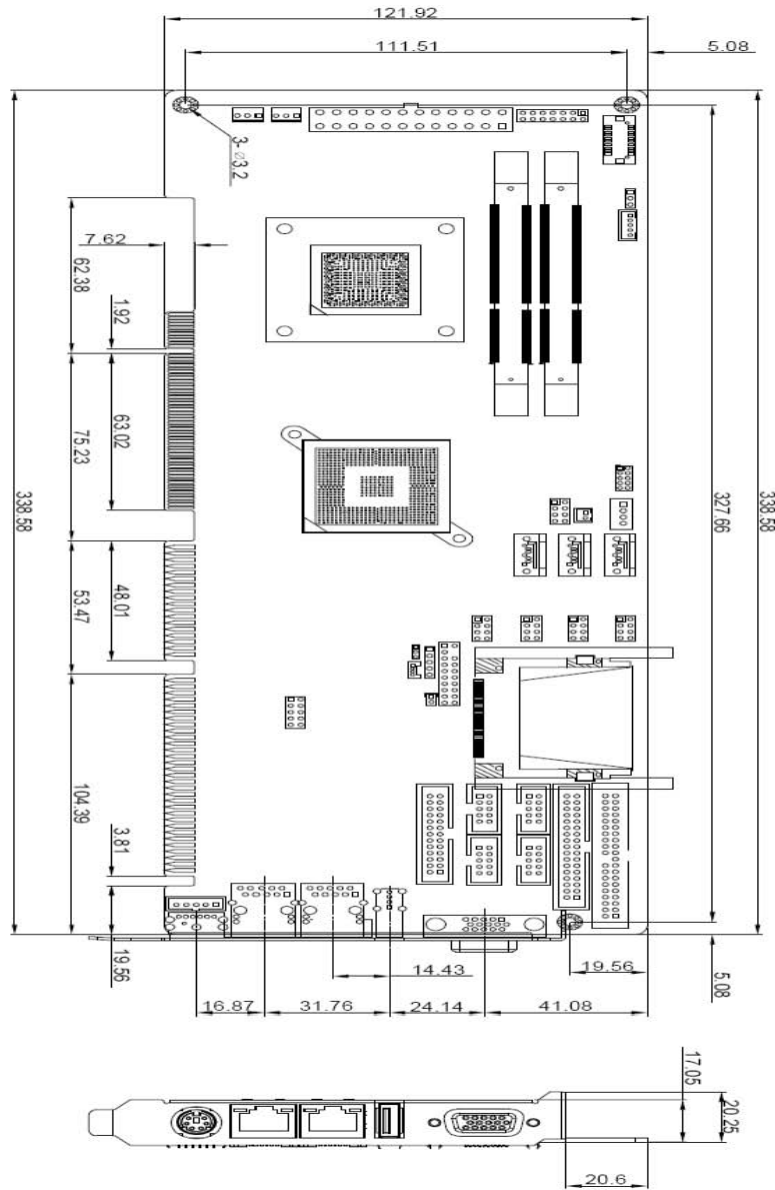


Figure 1-3: Dimensions (mm)

WSB-PV-D4251/D5251 SBC

1.6 Data Flow

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

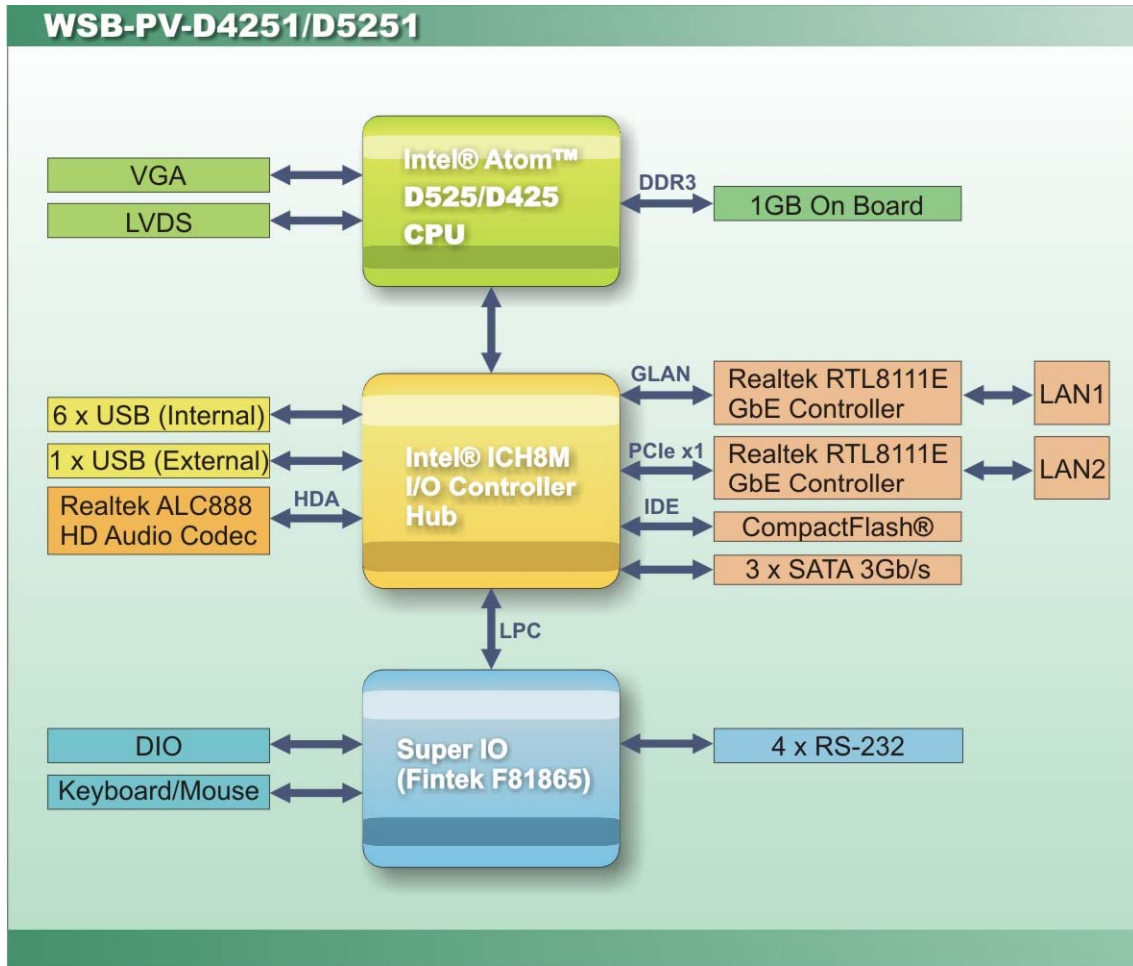


Figure 1-4: Data Flow Diagram

1.7 Technical Specifications

WSB-PV-D4251/D5251 technical specifications are listed in Table 1-1.

Specification	WSB-PV-D4251/D5251
Form Factor	PICMG 1.0
CPU Supported	1.8 GHz Intel® Atom™ D525 dual-core CPU with 1 MB L2 cache 1.8 GHz Intel® Atom™ D425 single-core CPU with 512 KB L2 cache
System Chipset	Intel® ICH8M
Memory	Two 204-pin 800 MHz DDR3 SDRAM SO-DIMM (system max. 4.0 GB)
Graphic Engine	Intel® GMA3150 <ul style="list-style-type: none"> ▪ Gen 3.5 DX9, 400 MHz
Integrated Graphics	Analog CRT (CRT hot plug supported) <ul style="list-style-type: none"> ▪ Up to 2048 x 1536 18-bit single-channel LVDS
BIOS	AMI BIOS
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	Two Realtek RTL8111E PCIe GbE controllers (LAN1 supports ASF2.0)
Audio	Realtek ALC888 HD Audio codec
Super I/O Controller	Fintek F81865
Watchdog Timer	Software programmable supports 1~255 sec. system reset
I/O Interface Connectors	
Fan connector	One 3-pin wafer CPU fan
Keyboard/Mouse	One internal 6-pin wafer keyboard connector One external PS/2 keyboard/mouse connector
Serial Ports	Four RS-232 COM connectors
USB 2.0/1.1 ports	Six internal via pin header One external USB port

WSB-PV-D4251/D5251 SBC

SMBus	One 4-pin wafer connector
Storage	
SATA	Three SATA 3Gb/s connectors
Environmental and Power Specifications	
Power Supply	AT or ATX
Power Consumption	5V @4.95 ^a (1.8 GHz Intel® Atom™ D525 dual-core CPU with 1066MHz DDR3 2GBx2 memory) 5V@4.05A (1.8 GHz Intel® Atom™ D425 dual-core CPU with 1066MHz DDR3 2GBx2 memory)
Operating temperature	D525 CPU: -20°C ~ 60°C with free air, -20°C ~ 70°C with force air D425 CPU: -20°C ~ 65°C with free air, -20°C ~ 70°C with force air
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	338 mm x 122 mm
Weight GW/NW	1.1 Kg

Table 1-1: Technical Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions



WARNING!

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

Make sure to adhere to the following guidelines:

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

2.2 Unpacking Precautions

When the WSB-PV-D4251/D5251 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 WSB-PV-D4251/D5251 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The WSB-PV-D4251/D5251 is shipped with the following components:

Quantity	Item and Part Number	Image
1	WSB-PV-4251 or WSB-PV-5251 single board computer	
2	SATA cable (P/N: 32801-000703-200-RS)	
1	Dual RS-232 cable with bracket (P/N: 19800-000051-RS)	
1	USB cable (P/N: 19800-003100-200-RS)	
1	Mini jumper pack (2.0mm)	
1	Utility CD	

WSB-PV-D4251/D5251 SBC








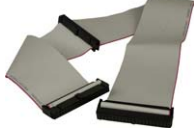
Quantity	Item and Part Number	Image
1	Quick installation guide	

Table 2-1: Packing List

2.4 Optional Items

These optional items are available.

Item and Part Number	Image
Audio kit_ 7.1 Channel (P/N: AC-KIT-888HD-R10)	
4 ports USB cable (P/N: CB-USB14-RS)	
KB/MS Y cable (P/N: 32006-000300-100-RS)	
ATA 66 Flat Cable (P/N: 32200-000052-RS)	
SATA power cable (P/N: 32102-000100-200-RS)	
Parallel port cable (P/N: 19800-000400-100-RS)	
FDD cable (P/N: 2200-000017-RS)	



Item and Part Number	Image
CPU Fan (P/N: 19FTS00032100-000001-RS)	
TPM Module (P/N: TPM-IN01-R11)	

Table 2-2: Optional Items

Chapter

3

Connector Pinouts

3.1 Peripheral Interface Connectors

Section 3.1.2 shows peripheral interface connector locations. Section 3.1.2 lists all the peripheral interface connectors seen in Section 3.1.2.

3.1.1 Layout

The figure below shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

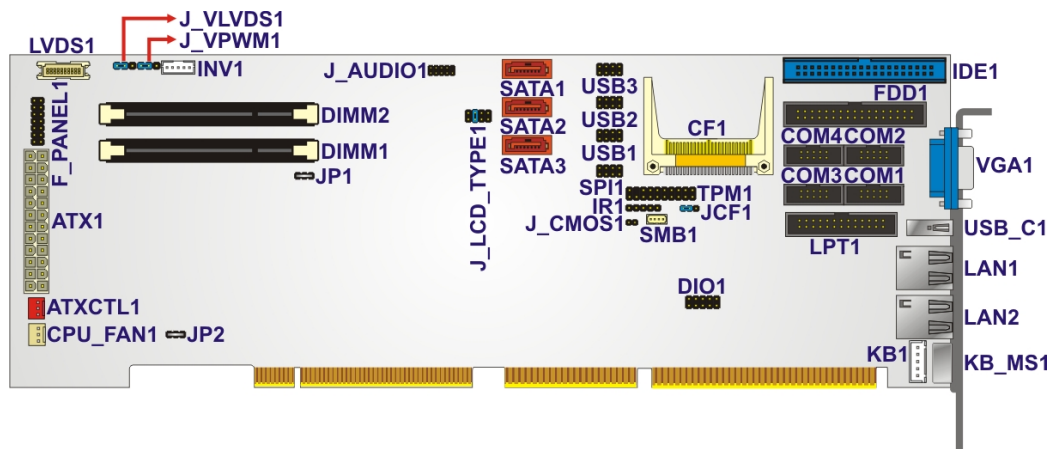


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the WSB-PV-D4251/D5251. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power control connector	3-pin wafer	ATXCTL1
ATX power source connector	24-pin connector	ATX1
Audio connector	10-pin header	J_AUDIO1
CompactFlash® card slot	CF card slot	CF1
Digital I/O connector	10-pin header	DIO1
Fan connector	3-pin wafer	CPU_FAN1

Connector	Type	Label
Front panel connector	14-pin header	F_PANEL1
IDE connector	40-pin box header	IDE1
Internal keyboard connector	5-pin wafer	KB1
Inverter connector	5-pin wafer	INV1
IrDA Infrared Interface connector	5-pin header	IR1
LVDS connector	20-pin crimp	LVDS1
Parallel port connector	25-pin connector	LPT1
RS-232 Serial port connectors	10-pin box header	COM1, COM2, COM3, COM4
SATA drive connectors	SATA connector	SATA1, SATA2, SATA3
SMBus connector	4-pin wafer	SMB1
TPM module 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 rear panel connectors on the WSB-PV-D4251/D5251. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
Keyboard/mouse connector	PS/2	KB/MS1
LAN connectors	RJ-45	LAN1, LAN2
USB connector	USB 2.0 port	USB_C1
VGA connector	15-pin female VGA	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the WSB-PV-D4251/D5251.

3.2.1 ATX Power Control Connector

- CN Label:** ATXCTL1
- CN Type:** 3-pin wafer
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-3**

The connector is for enabling an ATX power supply. When connected to the power supply, the power can be turned on and off with the front panel switch.

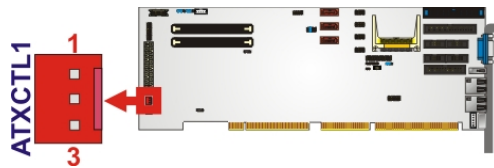


Figure 3-2: ATX Power Control Connector Location

Pin	Description
1	5VSB
2	PS_ON#
3	GND

Table 3-3: ATX Power Control Pinouts

3.2.2 ATX Power Source Connector

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

The ATX power connector connects to an ATX power supply.

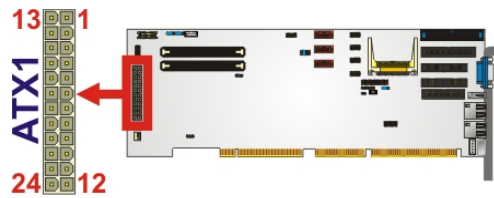


Figure 3-3: ATX Power Source Connector Location

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

Table 3-4: ATX Power Source Pinouts

3.2.3 Audio Connector

- CN Label:** J_AUDIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-4**
- CN Pinouts:** See **Table 3-5**

This connector connects to an audio kit that provides connection for speakers, a microphone and an audio input.



Figure 3-4: Audio Connector Location

Pin	Description	Pin	Description
1	AC97_SYNC	2	AC97_BITCLK
3	AC97_SDOUT	4	AC97_PCBEEP
5	AC97_SDIN	6	AC97_RST#
7	AC97_VCC	8	AC97_GND
9	AC97_12V	10	AC97_GND

Table 3-5: Audio Connector Pinouts

3.2.4 CompactFlash® Slot

CN Label: CF1
CN Type: CompactFlash® card slot
CN Location: See Figure 3-5
CN Pinouts: See Table 3-6



NOTE:

1. Both CompactFlash® Type I and Type II cards are supported.
2. To use SATA and CF, CF must be set to slave.

WSB-PV-D4251/D5251 SBC

A CompactFlash® Type I or Type II card can be used in this slot.

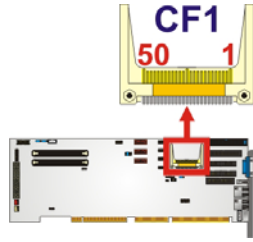


Figure 3-5: CompactFlash® Slot Location

Pin	Description	Pin	Description
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16#	49	D10

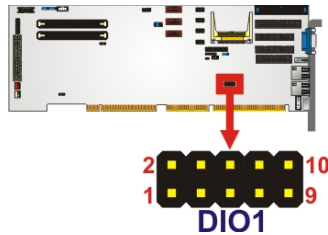
Pin	Description	Pin	Description
25	CD2#	50	GND2

Table 3-6: CompactFlash® Slot Pinouts

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 3-7**

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


Figure 3-6: Digital I/O Connector Location

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

Table 3-7: Digital I/O Connector Pinouts

3.2.6 Fan Connector

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

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

The fan connector attaches to a cooling fan.

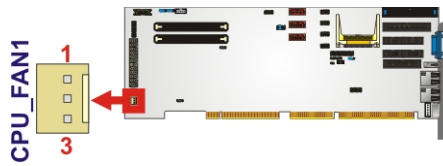


Figure 3-7: Fan Connector Locations

Pin	Description
1	Ground
2	+12V (PWM)
3	FANIO1

Table 3-8: Fan Connector Pinouts

3.2.7 Front Panel Connector

CN Label: F_PANEL1

CN Type: 14-pin header

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

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

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

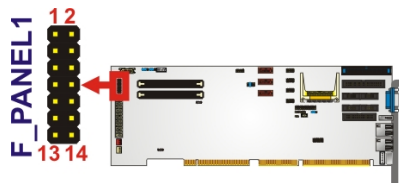


Figure 3-8: Front Panel Connector Location

Function	Pin	Description	Pin	Description	Function
Power LED	1	VCC	2	VCC	Speaker
	3	N/C	4	N/C	

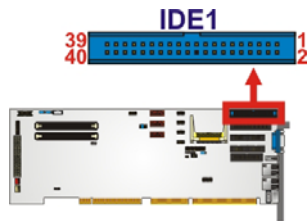
Function	Pin	Description	Pin	Description	Function
	5	GND	6	N/C	RESET
PWRBTN	7	PWRBTSW-	8	Speaker	
	9	GND	10	N/C	
HDDLED	11	VCC	12	Reset-	
	13	HDLED-	14	GND	

Table 3-9: Front Panel Connector Pinouts

3.2.8 IDE Connector

- CN Label:** IDE1
- CN Type:** 40-pin box header
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-10**

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


Figure 3-9: IDE Connector Location

Pin	Description	Pin	Description
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15

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Pin	Description	Pin	Description
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	BALE - DEFAULT
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
35	SA0	36	SA2
37	HDC CD0#	38	HDC CSI #
39	HDD ACTIVE#	40	GND

Table 3-10: IDE Connector Pinouts

3.2.9 Keyboard Connector

- CN Label:** KB1
- CN Type:** 5-pin wafer
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-11**

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



Figure 3-10: Keyboard Connector Location

Pin	Description
1	Keyboard Clock
2	Keyboard Data
3	N/C
4	GND

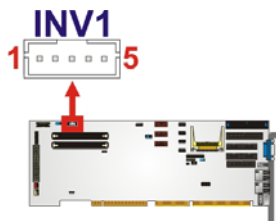
Pin	Description
5	VCC

Table 3-11: Keyboard Connector Pinouts

3.2.10 Inverter Connector

- CN Label:** INV1
- CN Type:** 5-pin wafer
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-12**

The backlight inverter connector provides power to an LCD panel.


Figure 3-11: Inverter Connector Location

PIN	Description
1	ADJ
2	GND
3	+12V
4	GND
5	ON/OFF

Table 3-12: Inverter Connector Pinouts

3.2.11 IrDA Infrared Interface Connector

- CN Label:** IR1
- CN Type:** 5-pin header
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-13**

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

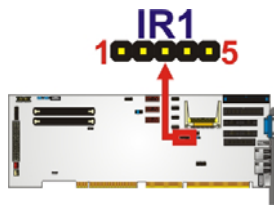


Figure 3-12: IrDA Infrared Interface Connector Location

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

Table 3-13: IrDA Infrared Interface Connector Pinouts

3.2.12 LVDS Connector

- CN Label:** LVDS1
- CN Type:** 20-pin crimp
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-14**

The LVDS connector is for an LCD panel connected to the board.

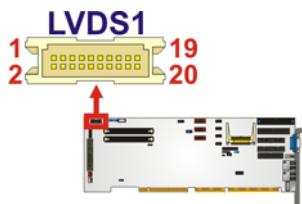


Figure 3-13: LVDS Connector Location

Pin	Description	Pin	Description
1	GND	2	GND

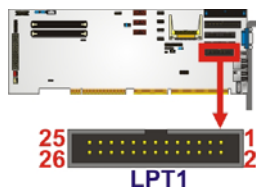
Pin	Description	Pin	Description
3	D0+	4	D0-
5	D1+	6	D1-
7	D2+	8	D2-
9	CLK+	10	CLK-
11	NC	12	NC
13	GND	14	GND
15	NC	16	NC
17	LCD Power	18	LCD Power
19	LCD Power	20	LCD Power

Table 3-14: LVDS Connector Pinouts

3.2.13 Parallel Port Connector

- CN Label:** LPT1
- CN Type:** 25-pin box header
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-15**

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


Figure 3-14: Parallel Port Connector

Pin	Description	Pin	Description
1	STROBE#	2	DATA0
3	DATA1	4	DATA2
5	DATA3	6	DATA4
7	DATA5	8	DATA6
9	DATA7	10	ACKNOWLEDGE#

Pin	Description	Pin	Description
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	26	N/C

Table 3-15: Parallel Port Connector Pinouts

3.2.14 RS-232 Serial Port Connector

CN Label: COM1, COM2, COM3, COM4

CN Type: 10-pin box header

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

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

The connectors provide RS-232 communications.

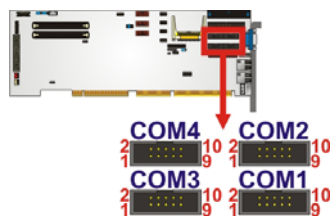


Figure 3-15: RS-232 Serial Port Connector Location

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

Table 3-16: RS-232 Serial Port Connector Pinouts

3.2.15 SATA Drive Connectors

- CN Label:** SATA1, SATA2, SATA3
- CN Type:** 8-pin SATA drive connectors
- CN Location:** See **Figure 3-16**
- CN Pinouts:** See **Table 3-17**

The SATA connectors connect to SATA hard drives or optical drives.

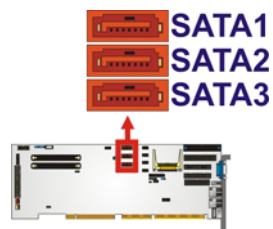


Figure 3-16: SATA Drive Connector Location

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
8	N/C

Table 3-17: SATA Drive Connector Pinouts

3.2.16 SMBus

- CN Label:** SMB1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-18**

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

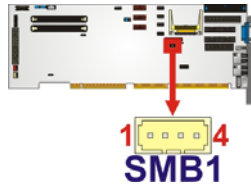


Figure 3-17: SMBus Connector Locations

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

Table 3-18: SMBus Connector Pinouts

3.2.17 TPM Module Connector

- CN Label:** TPM1
- CN Type:** 20-pin header
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-19**

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

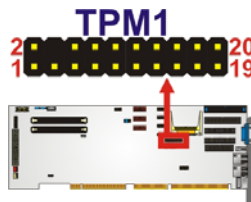


Figure 3-18: TPM Module Connector Locations

Pin	Description	Pin	Description
1	Clock	2	GND
3	Frame#	4	NC(KEY)

Pin	Description	Pin	Description
5	Reset#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB CLK	14	SMB DATA
15	+3.3V Standby	16	Serial IRQ
17	GND	18	Clock Run#
19	Power Down#	20	DREQ#

Table 3-19: TPM Module Connector Pinouts

3.2.18 USB Connectors

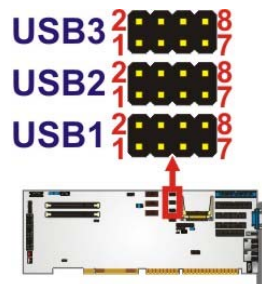
CN Label: USB1, USB2, USB3

CN Type: 8-pin header

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

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

The USB header can connect to two USB devices.


Figure 3-19: USB Connector Location

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

Table 3-20: USB Port Connector Pinouts

3.3 External Interface Connectors

Figure 3-20 shows the WSB-PV-D4251/D5251 motherboard external interface connectors. The WSB-PV-D4251/D5251 on-board external interface connectors are shown in Figure 3-20.

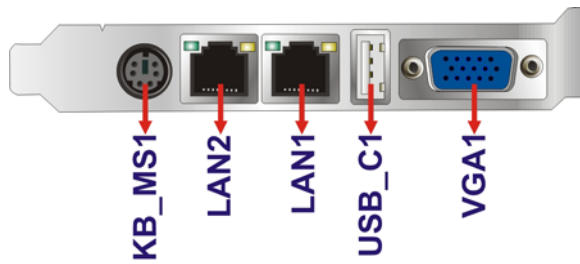


Figure 3-20: External Interface Connectors

3.3.1 Keyboard/Mouse Connector

- CN Label:** KB/MS1
- CN Type:** PS/2
- CN Location:** See **Figure 3-21**
- CN Pinouts:** See **Table 3-21**

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

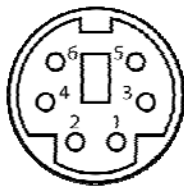


Figure 3-21: Keyboard Pinout and Configuration

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

Table 3-21: Keyboard Connector Pinouts

3.3.2 Ethernet Connectors

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

A 10/100/1000 Mb/s connection can be made to a Local Area Network.

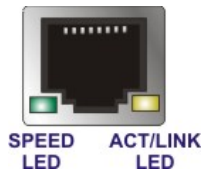


Figure 3-22: Ethernet Connector

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

Table 3-22: LAN Connector Pinouts

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-23**.

SPEED LED		ACT/LINK LED	
STATUS	DESCRIPTION	STATUS	DESCRIPTION
OFF	10Mbps connection	OFF	No link
GREEN	100Mbps connection	YELLOW	Linked
ORANGE	1Gbps connection	BLINKING	Data Activity

Table 3-23: RJ-45 Ethernet Connector LEDs

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3.3.3 USB Port

- CN Label:** USB_C1
CN Type: 4-pin
CN Pinouts: See **Table 3-24**

The USB port attaches to standard USB devices.

Pin	Description
1	VCC
2	DATA-
3	DATA+
4	GND

Table 3-24: USB Connector Pinouts

3.3.4 VGA Connector

- CN Label:** VGA1
CN Type: D-sub 15-pin female connector
CN Location: See **Figure 3-23**
CN Pinouts: See **Table 3-25**

The standard 15-pin female VGA connector connects to a CRT or LCD monitor.

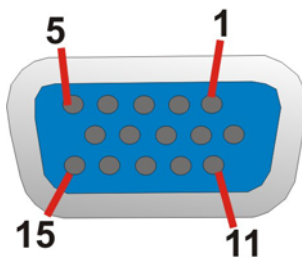


Figure 3-23: VGA Connector

Pin	Description	Pin	Description	Pin	Description
1	RED	6	CRT_PLUG#	11	NC
2	GREEN	7	GROUND	12	DDCDAT

Pin	Description	Pin	Description	Pin	Description
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	VCC	14	VSYNC
5	GROUND	10	GROUND	15	DDCCLK

Table 3-25: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WSB-PV-D4251/D5251. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the WSB-PV-D4251/D5251, or any other electrical component, is handled.

- **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 WSB-PV-D4251/D5251, place it on an anti-static pad. This reduces the possibility of ESD damaging the WSB-PV-D4251/D5251.
- **Only handle the edges of the PCB:-** When handling the PCB, hold it by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the WSB-PV-D4251/D5251 is installed. All installation notices pertaining to the installation of WSB-PV-D4251/D5251 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the WSB-PV-D4251/D5251 and injury to the person installing the motherboard.



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the WSB-PV-D4251/D5251, WSB-PV-D4251/D5251 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 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 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 off:**
 - Make sure the product is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the WSB-PV-D4251/D5251 **DO NOT**:

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 SO-DIMM Installation

To install a SO-DIMM, please follow the steps below and refer to Error! Reference source not found..

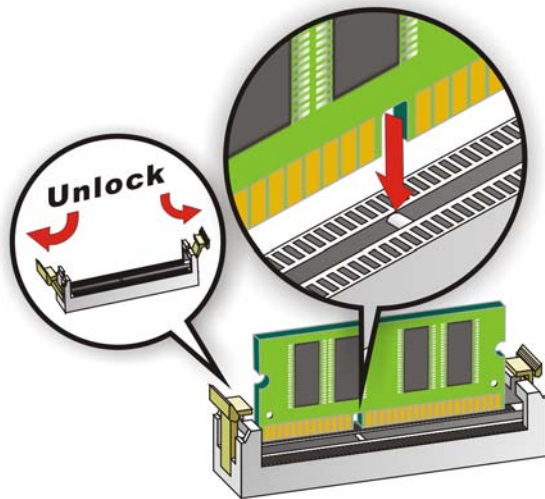


Figure 4-1: SO-DIMM Installation

Step 1: **Open the SO-DIMM socket handles.** Open the two handles outwards as far as they can. See Error! Reference source not found..

Step 2: **Align the SO-DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See Error! Reference source not found..

Step 3: **Insert the SO-DIMM.** Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See Error! Reference source not found..

Step 4: Removing a SO-DIMM. To remove a SO-DIMM, push both handles outward.

The memory module is ejected by a mechanism in the socket.

4.4 CompactFlash® Installation



NOTE:

Both CompactFlash® Type I and Type II cards are supported.

To install the CompactFlash® card, please follow the steps below.

Step 1: Locate the CF card socket. Locate the CompactFlash® slot.

Step 2: Align the CF card. Align the CompactFlash® card. The label side should be facing away from the board. The grooves on the CompactFlash® slot ensure that the card cannot be inserted the wrong way.

Step 3: Insert the CF card. Push until the CompactFlash® card is firmly seated in the slot. See Figure 4-2.

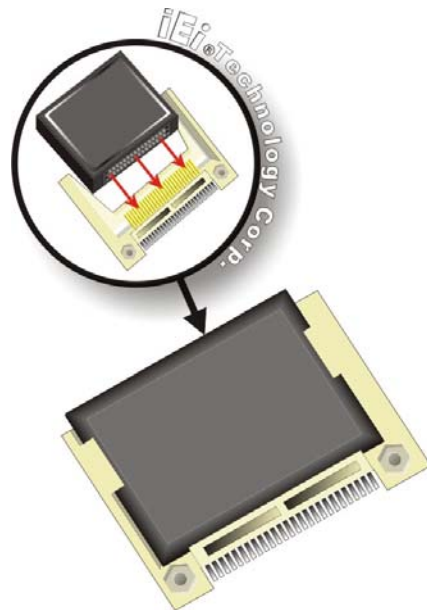


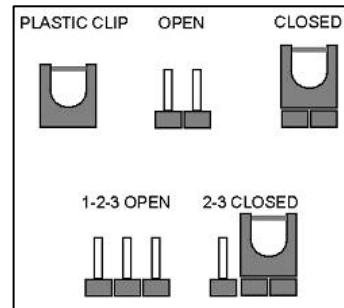
Figure 4-2: CompactFlash® Card Installation

4.5 Jumper Settings



NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two 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.



Before the WSB-PV-D4251/D5251 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the WSB-PV-D4251/D5251 are listed in Table 4-1.

Description	Label	Type
Clear CMOS setting	J_CMOS1	2-pin header
CF Card setting	JCF1	3-pin header
LCD Panel Resolution setting	J_LCD_TYPE1	8-pin header
LCD Voltage Select setting	J_VLVDS1	3-pin header

Table 4-1: Jumpers

4.5.1 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	2-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-3

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If the WSB-PV-D4251/D5251 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

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

The clear CMOS jumper settings are shown in Table 4-2.

Pin	Description
Open	Keep CMOS Setup (Default)
Short	Clear CMOS Setup

Table 4-2: Clear CMOS Jumper Settings

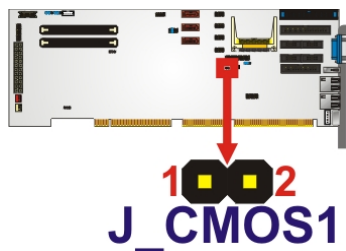


Figure 4-3: Clear CMOS Jumper Location

4.5.2 CF Card Jumper

Jumper Label:	JCF1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-3
Jumper Location:	See Figure 4-4

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

The clear CF card jumper settings are shown in **Table 4-3**.

Pin	Description
Short 1-2	Slave (Default)
Open 2-3	Master

Table 4-3: CF Card Jumper Settings

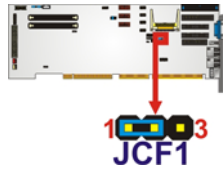


Figure 4-4: CF Card Jumper Location

4.5.3 LCD Panel Resolution Jumper

Jumper Label:	J_LCD_TYPE1
Jumper Type:	8-pin header
Jumper Settings:	See Table 4-4
Jumper Location:	See Figure 4-5

The LVDS Panel Resolution jumper configures the resolution of the LVDS output. The LVDS Panel Resolution jumper settings are shown in **Table 4-4**.

Pin	Description
Open	640 x 480 (18-bit)
Short 1-2	800 x 600 (18-bit)
Short 3-4	1024 x 768 (18-bit)
Short 1-2, 3-4	1024 x 768 (24-bit)
Short 5-6	1024 x 768 (48-bit)
Short 1-2, 5-6	1280 x 1024 (48-bit)
Short 3-4, 5-6	1600 x 1200 (48-bit)
Short 1-2, 3-4, 5-6	1280 x 768 (18-bit)

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Pin	Description
Short 7-8	1280 x 800 (18-bit)
Short 1-2, 7-8	1366 x 768 (24-bit)
Short 3-4, 7-8	1440 x 900 (36-bit)
Short 1-2, 3-4, 7-8	1440 x 900 (48-bit)
Short 5-6, 7-8	1680 x 1050 (48-bit)
Short 1-2, 5-6, 7-8	1920 x 1080 (48-bit)
Short 3-4, 5-6, 7-8	1920 x 1200 (48-bit)

Table 4-4: LCD Panel Resolution Jumper Settings



Figure 4-5: LCD Panel Resolution Jumper Location

4.5.4 LCD Voltage Select Jumper

Jumper Label:	J_VLVDS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-5
Jumper Location:	See Figure 4-6

Selects the voltage of the LVDS connector.

Pin	Description
Short 1-2	+3.3V LVDS
Short 2-3	+5V LVDS

Table 4-5: LCD Voltage Selection



Figure 4-6: LCD Voltage Select Jumper Location

4.6 Chassis Installation

4.6.1 Airflow



WARNING:

Airflow is critical for keeping components within recommended operating temperatures. The chassis should have fans and vents as necessary to keep things cool.

The WSB-PV-D4251/D5251 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.

4.6.2 Motherboard Installation

To install the WSB-PV-D4251/D5251 motherboard into the chassis please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

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

4.7.1 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.

WSB-PV-D4251/D5251 SBC

- Step 1:** **Locate the connectors.** The locations of the RS-232 connectors are shown in **Chapter 3.**
- Step 2:** **Insert the cable connectors.** Insert one connector into each serial port box headers. See **Figure 4-7.** A key on the front of the cable connectors ensures the connector can only be installed in one direction.

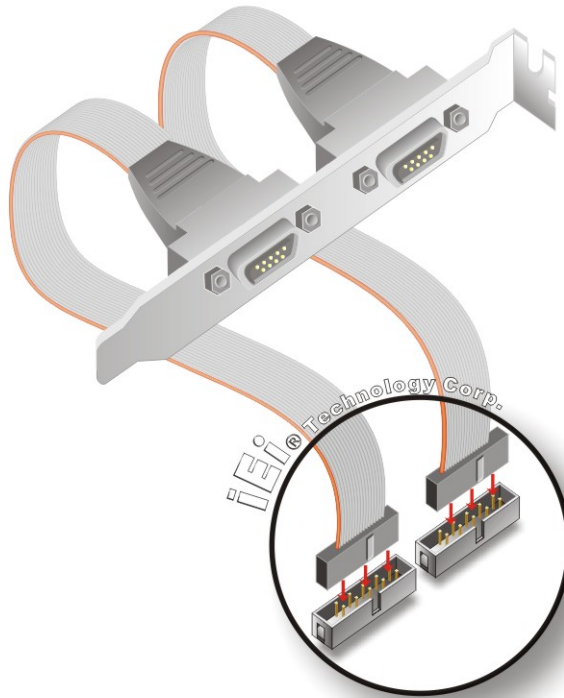


Figure 4-7: Dual RS-232 Cable Installation

- 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.

4.7.2 SATA Drive Connection

The WSB-PV-D4251/D5251 is shipped with two SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

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

Step 2: **Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector. See **Figure 4-8**.

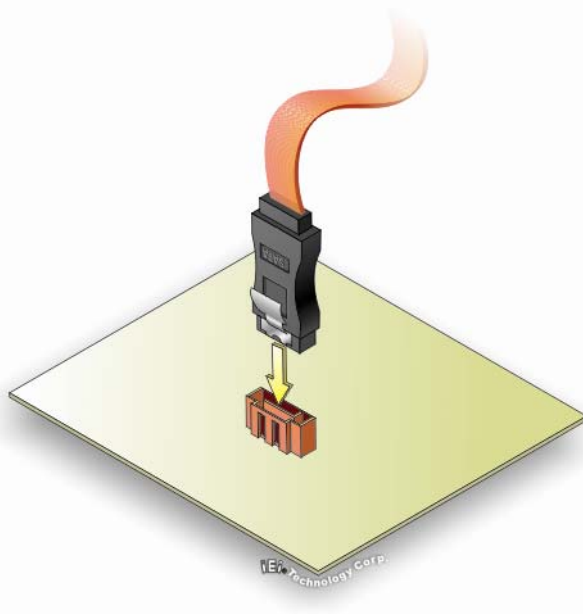


Figure 4-8: SATA Drive Cable Connection

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 4-9**.

Step 4: **Connect the SATA power cable.** Connect the SATA power connector to the back of the SATA drive. See **Figure 4-9**.

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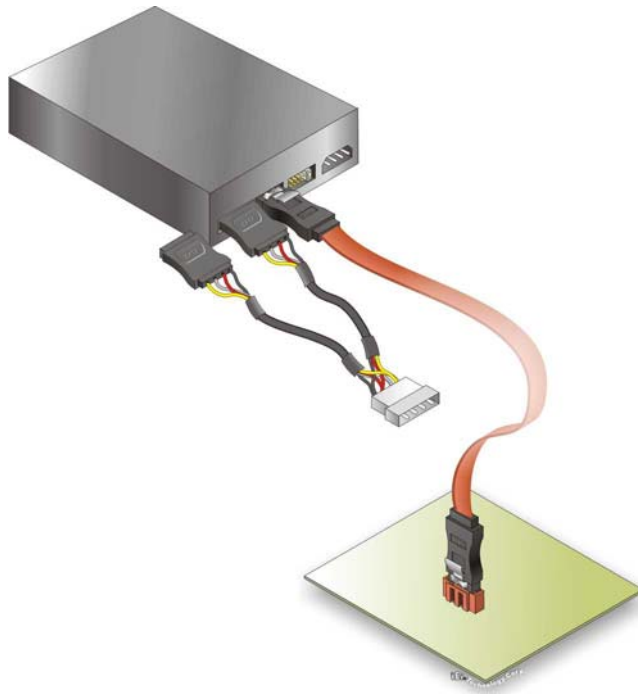


Figure 4-9: SATA Power Drive Connection

4.7.3 USB Cable (Dual Port) with Slot Bracket

The WSB-PV-D4251/D5251 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 WSB-PV-D4251/D5251 USB connector.

Step 3: Insert the cable connectors Once the cable connectors are properly aligned with the USB connectors on the WSB-PV-D4251/D5251, connect the cable connectors to the on-board connectors. See **Figure 4-10**.

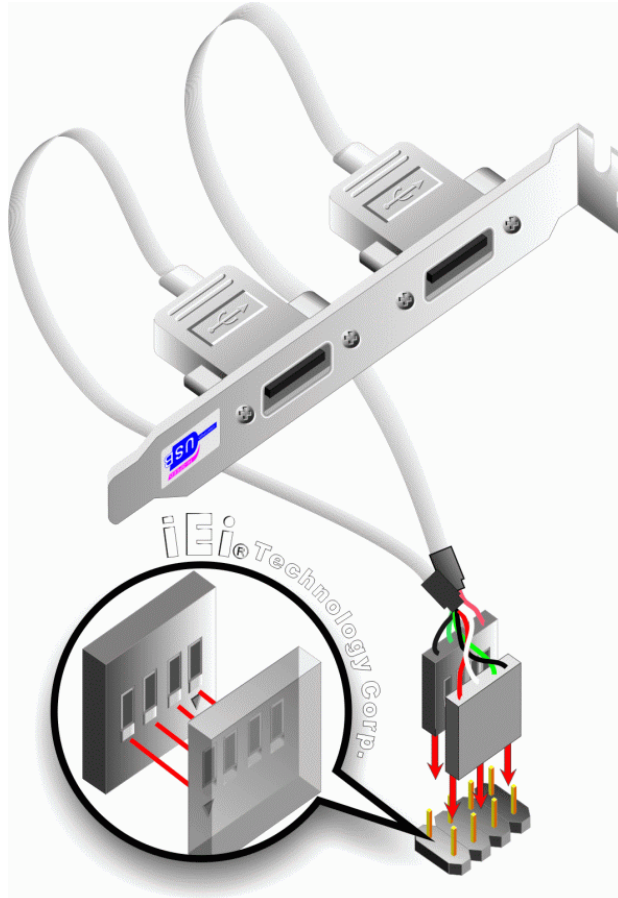


Figure 4-10: Dual USB Cable Connection

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.

4.8 External Peripheral Interface Connection

Devices can be connected to the external connectors. To install external devices, follow the directions in the subsections below.

WSB-PV-D4251/D5251 SBC

4.8.1 PS/2 Keyboard/Mouse Connection

The WSB-PV-D4251/D5251 has a single PS/2 connector on the external peripheral interface panel. The PS/2 connector is connected to a keyboard/Mouse. To connect a keyboard/Mouse to the WSB-PV-D4251/D5251, please follow the instructions below.

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

Step 2: Align the PS/2 connector. Align the PS/2 connector on the keyboard/Mouse cable with the PS/2 connector on the external peripheral interface.

Step 3: Insert the PS/2 connector Once the connectors are properly, insert the PS/2 connector from the keyboard/Mouse into the PS/2 connector on the WSB-PV-D4251/D5251. See **Figure 4-11**.

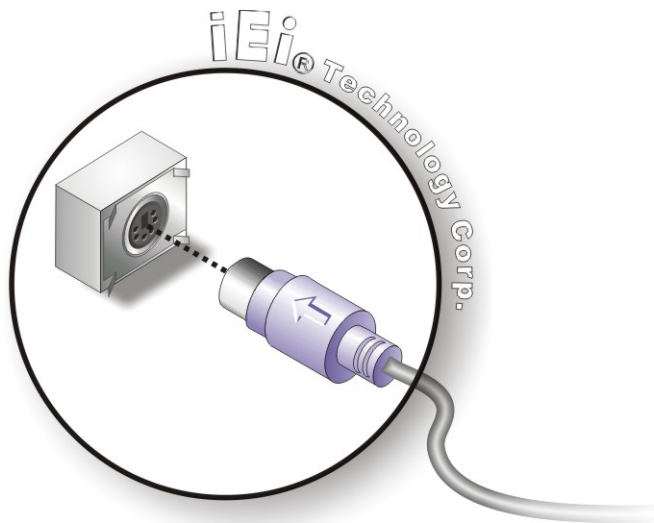


Figure 4-11: PS/2 Connector

4.8.2 LAN Connection (Single Connector)

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

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

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the WSB-PV-D4251/D5251. See Figure 4-12.

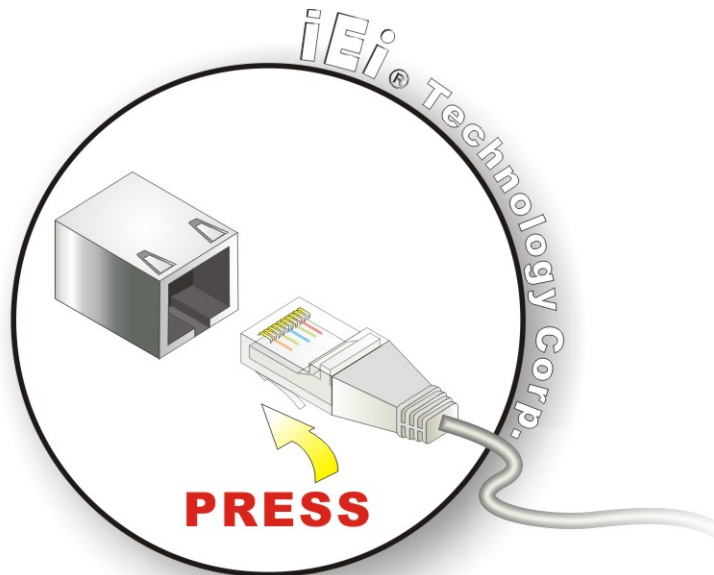


Figure 4-12: LAN Connection

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.

4.8.3 USB Device Connection (Single Connector)

There are one external USB 2.0 connector. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: Located the USB connector. The location of the USB connectors is shown in Chapter 4.

Step 2: Align the connectors. Align the USB device connector with the connector on the WSB-PV-D4251/D5251. See Figure 4-13.

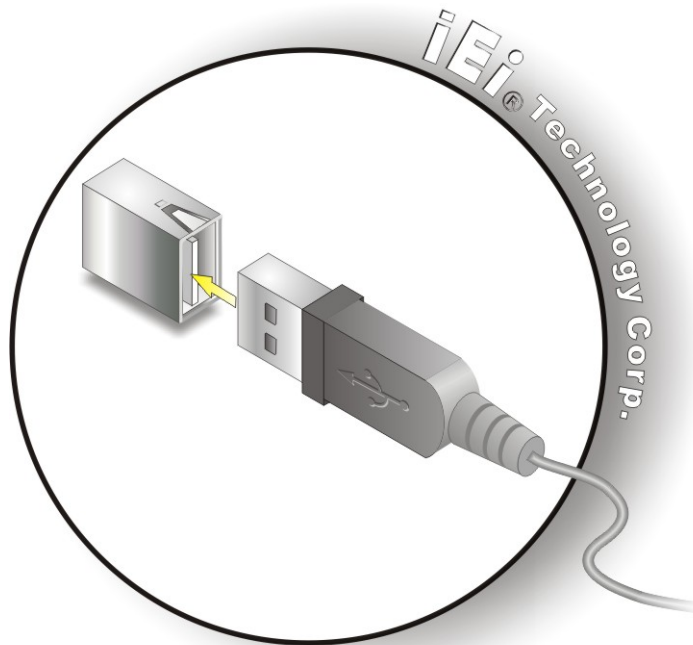


Figure 4-13: USB Device Connection

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

4.8.4 VGA Monitor Connection

The WSB-PV-D4251/D5251 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 WSB-PV-D4251/D5251, 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 WSB-PV-D4251/D5251. See Figure 4-14.

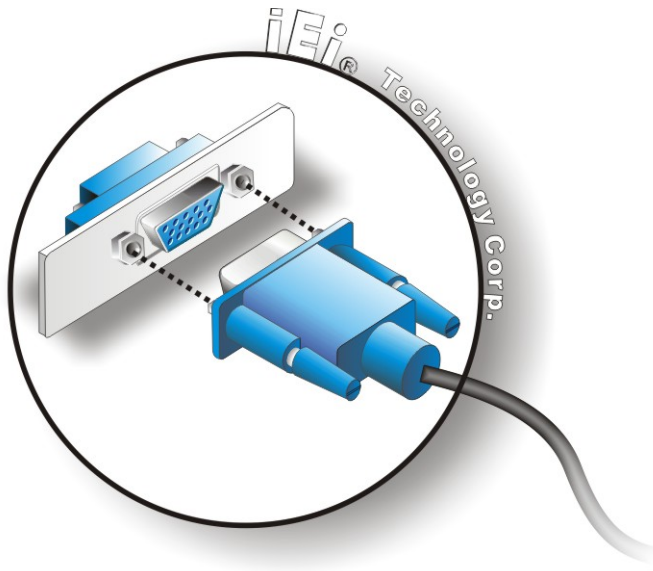


Figure 4-14: VGA Connector

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.

4.9 Software Installation

All the drivers for the WSB-PV-D4251/D5251 are on the CD that came with the system. To install the drivers, please follow the steps below.

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



NOTE:

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

Step 2: The driver main menu appears (Figure 4-15).

WSB-PV-D4251/D5251 SBC

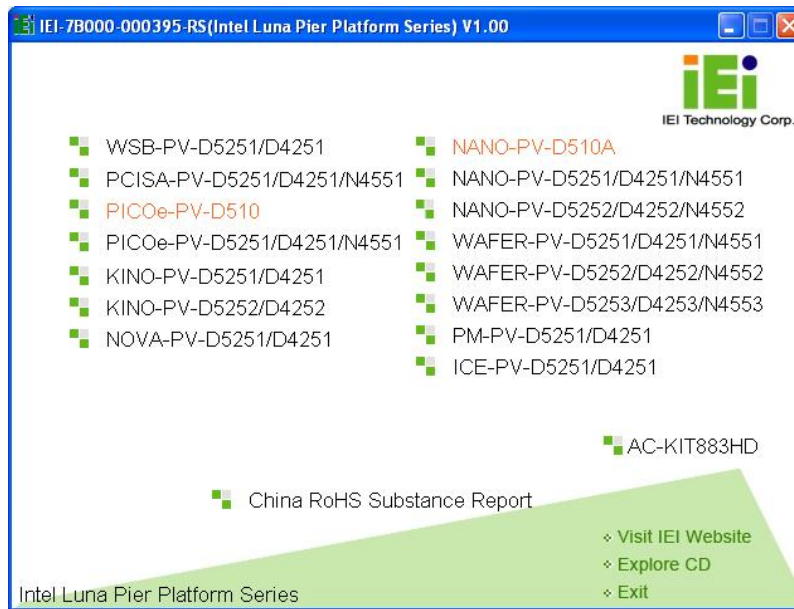


Figure 4-15: Introduction Screen

Step 3: Click WSB-PV-D4251/D5251.

Step 4: A new screen with a list of available drivers appears (Figure 4-16).

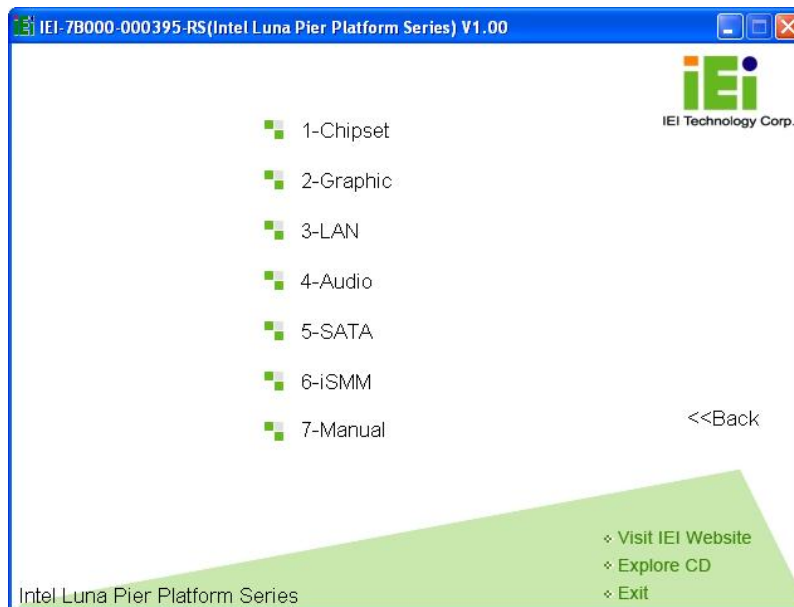


Figure 4-16: Available Drivers

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

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, 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 the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot After Configuration Changes

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

5.1.5 BIOS Menu Bar

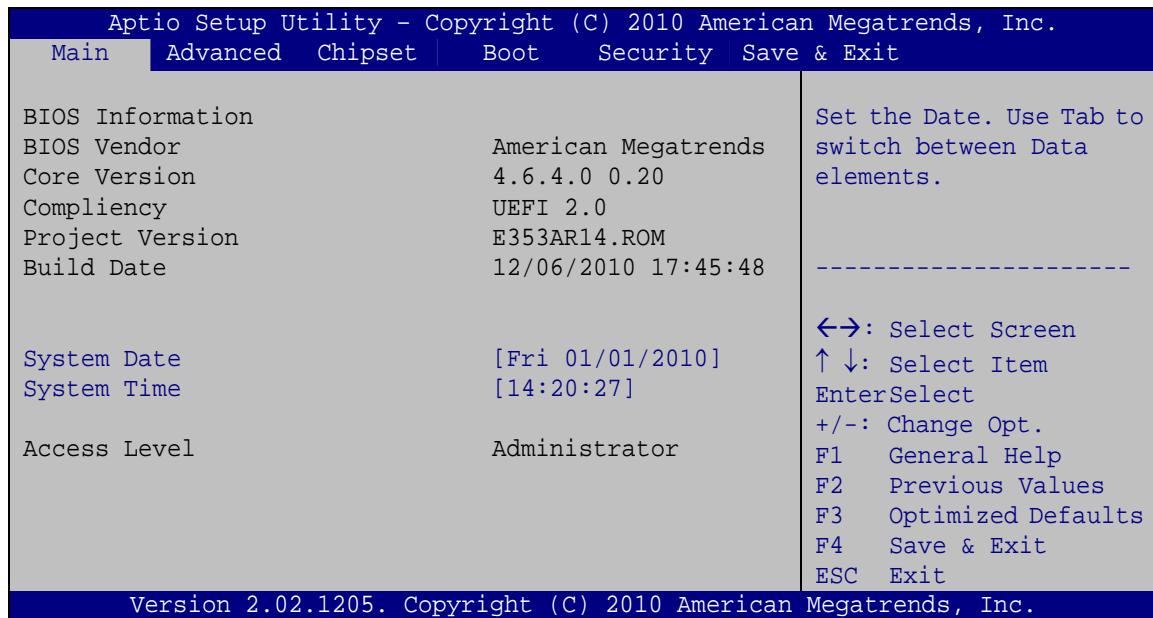
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

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

5.2 Main

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



BIOS Menu 1: Main

→ BIOS Information

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

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

The System Overview field also has two user configurable fields:

→ System Date [xx/xx/xx]

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

→ **System Time [xx:xx:xx]**

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

5.3 Advanced

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



WARNING!

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

```

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit

> ACPI Settings
> Trusted Computing
> CPU Configuration
> IDE Configuration
> USB Configuration
> Super IO Configuration
> H/W Monitor
> Serial Port Console Redirection

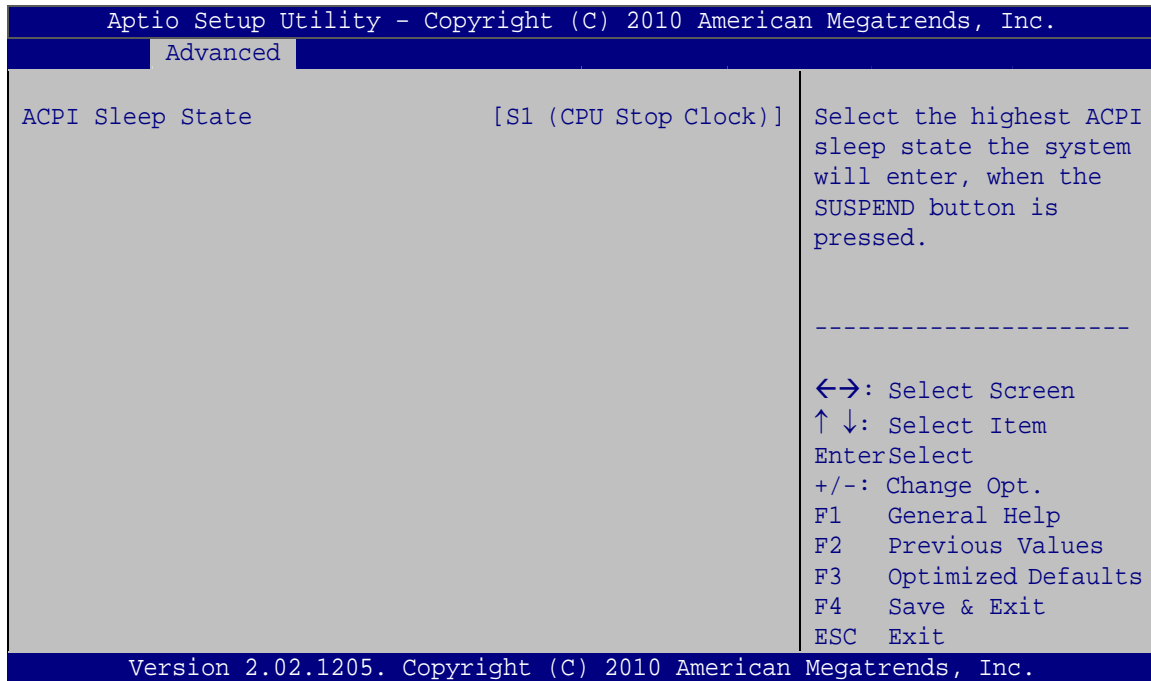
System ACPI Parameters
-----
<=>: Select Screen
↑ ↓: Select Item
Enter>Select
+/-: Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit

Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.
    
```

BIOS Menu 2: Advanced

5.3.1 ACPI Configuration

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



BIOS Menu 3: ACPI Configuration

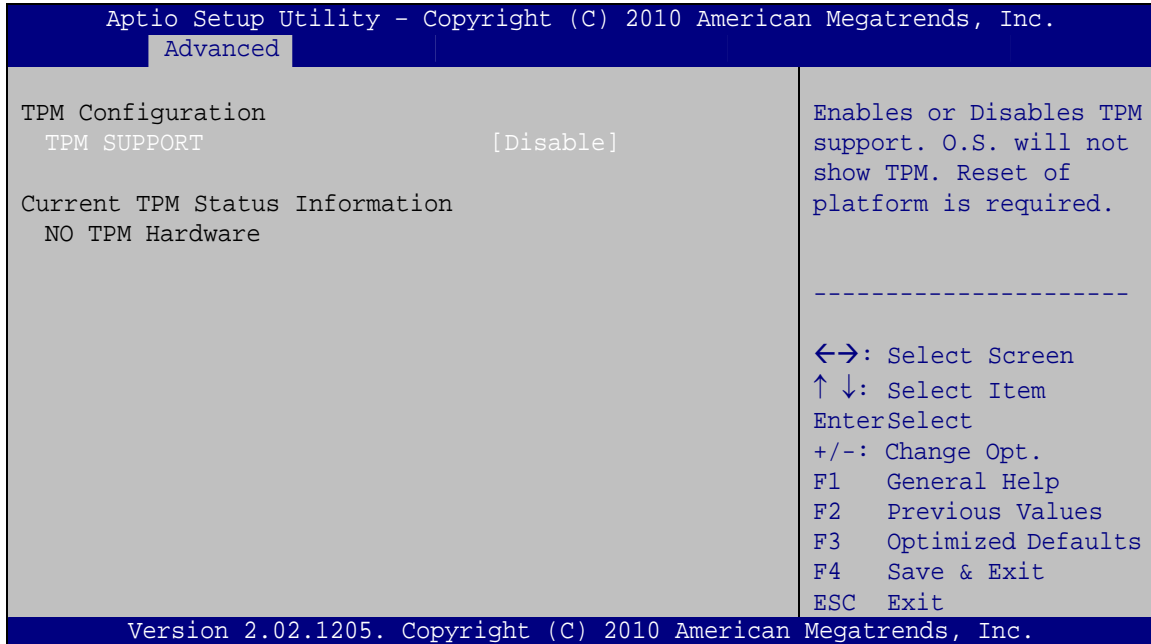
➔ **ACPI Sleep State [S1 (CPU Stop Clock)]**

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

- ➔ **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 4: TPM Configuration

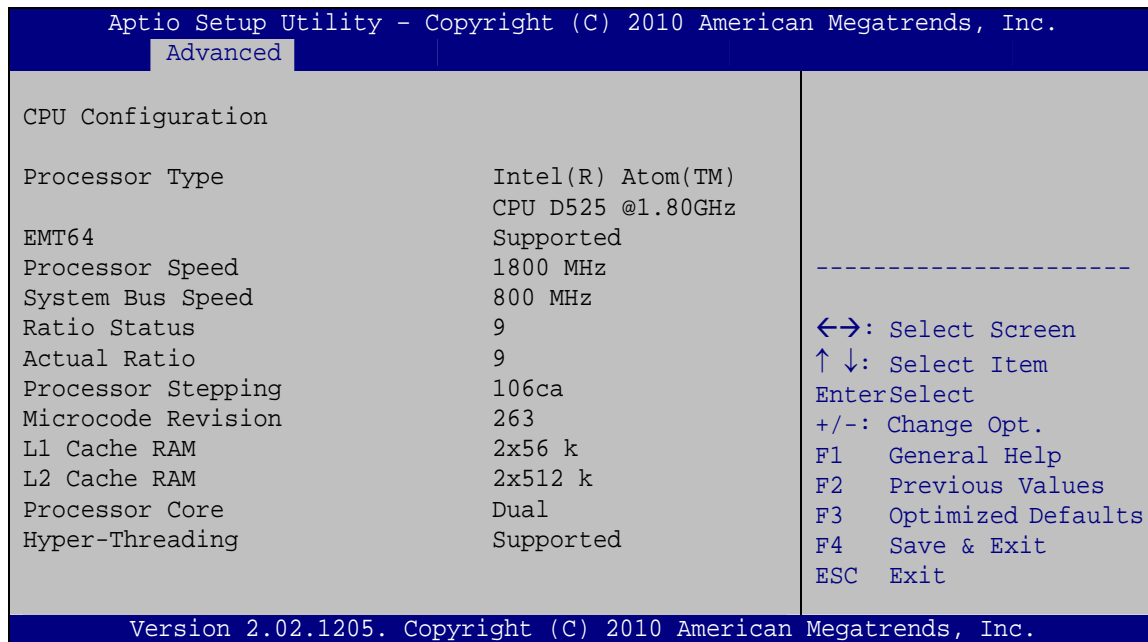
→ TPM Support [Disable]

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

- **Disable** **DEFAULT** TPM support is disabled.
- **Enable** TPM support is enabled.

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.



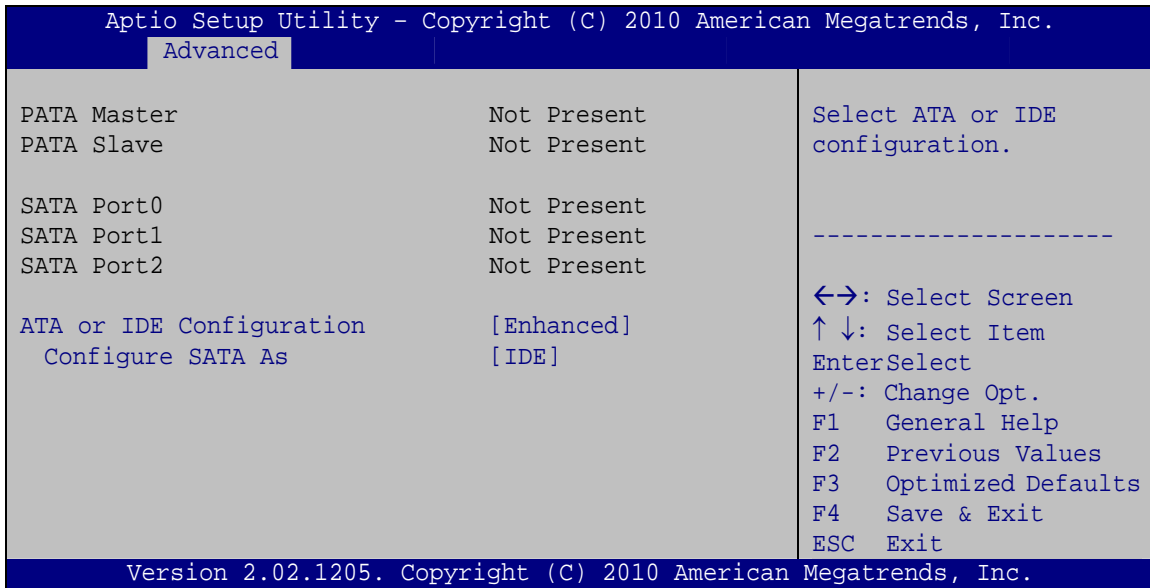
BIOS Menu 5: CPU Configuration

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- EMT64: Indicates if the EM64T is supported by the CPU.
- Processor Speed: Lists the CPU processing speed
- Actual Ratio: Lists the ratio of the frequency to the clock speed
- Processor Stepping: Lists the CPU processing stepping
- Microcode Revision: Lists the microcode revision
- L1 Cache RAM: Lists the CPU L1 cache size
- L2 Cache RAM: Lists the CPU L2 cache size
- Processor Cores: Lists the number of the processor core
- Hyper-Threading: Indicates if the Intel HT Technology is supported by the CPU.

5.3.4 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 6: IDE Configuration

→ ATA or IDE Configurations [Enhanced]

Use the **ATA or IDE Configurations** option to configure the ATA/IDE controller.

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

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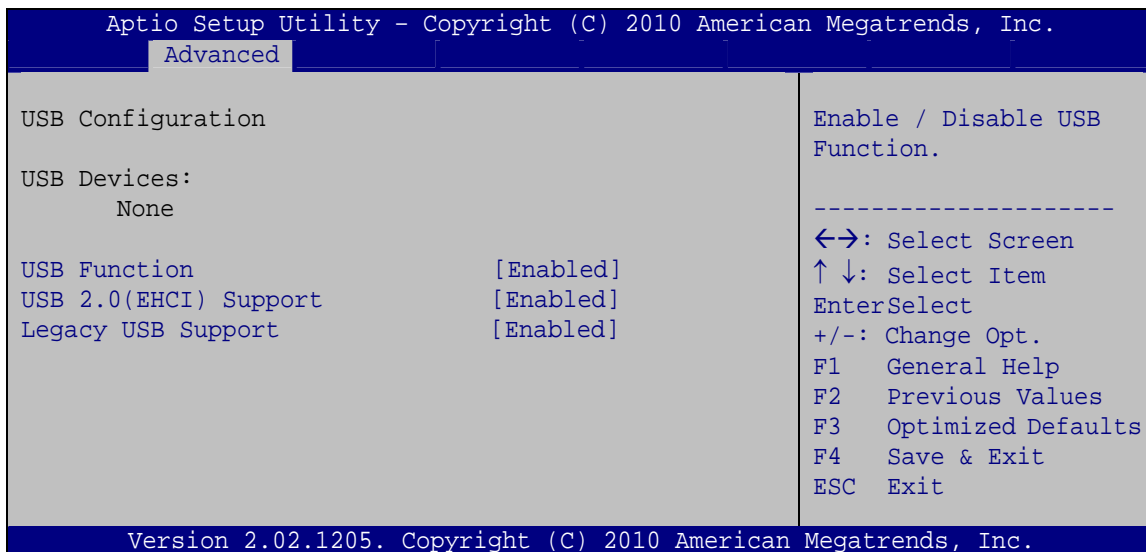
→ Configure SATA As [IDE]

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

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

5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.



BIOS Menu 7: USB Configuration

→ USB Devices

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

→ USB Function [Enabled]

Use the **USB Function** BIOS option to enable or disable USB function support.

- **Enabled** **DEFAULT** USB function support enabled.
- **Disabled** USB function support disabled.

→ USB 2.0 (EHCI) Support [Enabled]

Use the **USB 2.0 (EHCI) Support** BIOS option to enable or disable the USB 2.0 controller.

- **Enabled** **DEFAULT** USB 2.0 controller enabled
- **Disabled** USB 2.0 controller disabled

→ Legacy USB Support [Enabled]

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

- **Enabled** **DEFAULT** Legacy USB support enabled
- **Disabled** Legacy USB support disabled
- **Auto** Legacy USB support disabled if no USB devices are connected

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5.3.6 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
  Advanced
-----
Super IO Configuration
Super IO Chip              Fintek F81865
> Floppy Disk Controller Configuration
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration
> IrDA Configuration
> Parallel Port Configuration

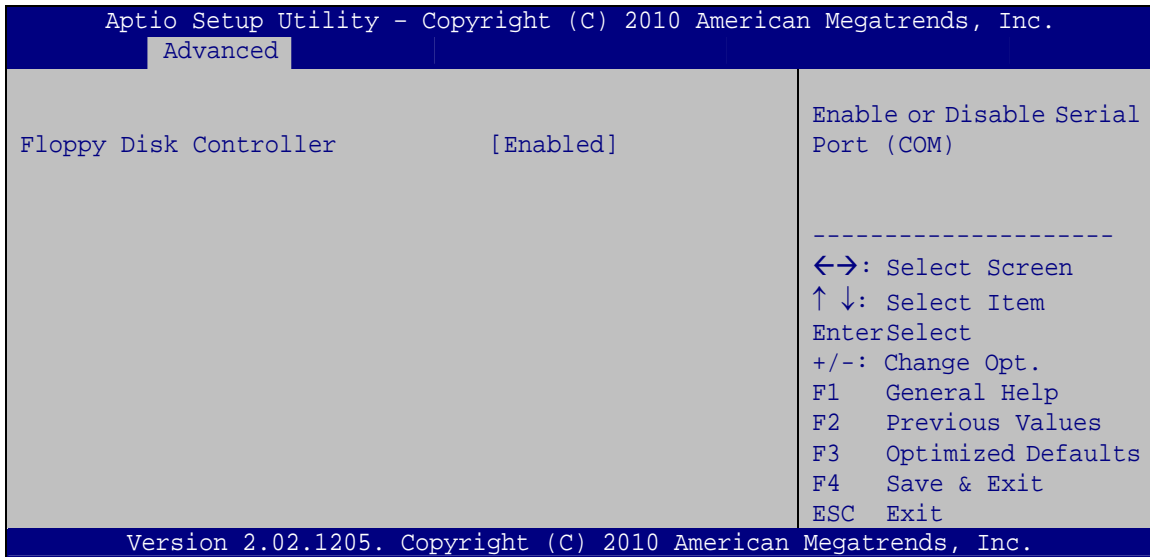
Set Parameters of Floppy
Disk Controller (FDC)
-----
<=>: Select Screen
↑ ↓: Select Item
Enter>Select
+/-: Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save & Exit
ESC Exit

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```

BIOS Menu 8: Super IO Configuration

5.3.6.1 Floppy Disk Controller Configuration

Use the **Floppy Disk Controller Configuration** menu (**BIOS Menu 9**) to configure the floppy disk controller.



BIOS Menu 9: Floppy Disk Controller Configuration Menu

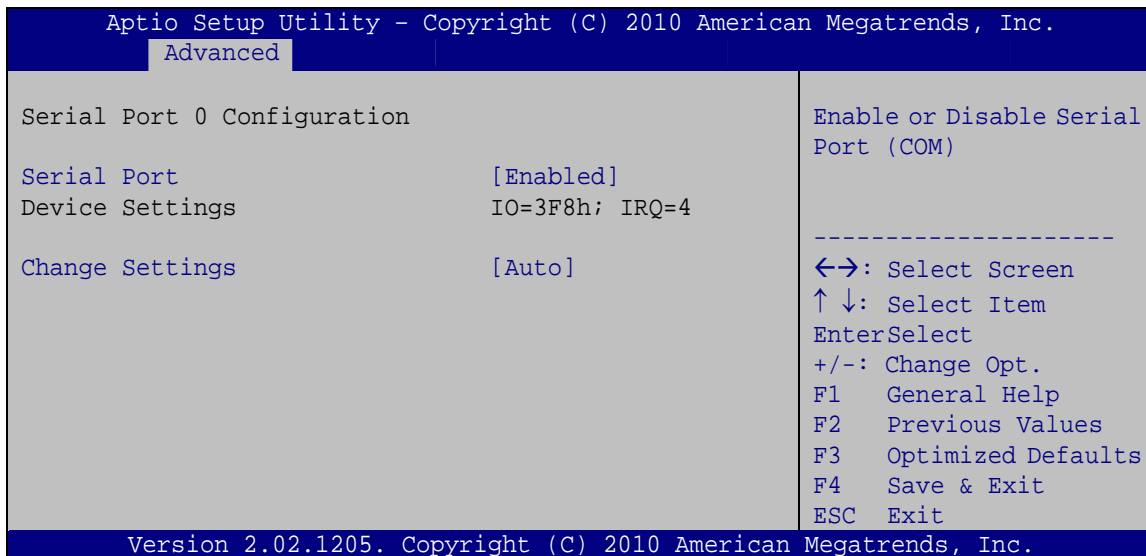
→ Floppy Disk Controller [Enabled]

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

- **Disabled** Disable the floppy disk controller
- **Enabled** **DEFAULT** Enable the floppy disk controller

5.3.6.2 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 10**) to configure the serial port n.



BIOS Menu 10: Serial Port n Configuration Menu

→ 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 3E8h 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

5.3.6.2.1 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=2F8h;**
IRQ=3 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- **IO=3F8h;**
IRQ=3, 4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h;**
IRQ=3, 4 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=2C0h;**
IRQ=3, 4 Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
- **IO=2C8h;**
IRQ=3, 4 Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.6.2.2 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=3E8h;
IRQ=11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ11
- **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

5.3.6.2.3 Serial Port 3 Configuration

→ **Serial Port [Enabled]**

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

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

➔ **Change Settings [Auto]**

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

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E8h;**
IRQ=11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ11
- ➔ **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 2E8h and the interrupt address is IRQ10, 11

5.3.6.2.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [Auto]**

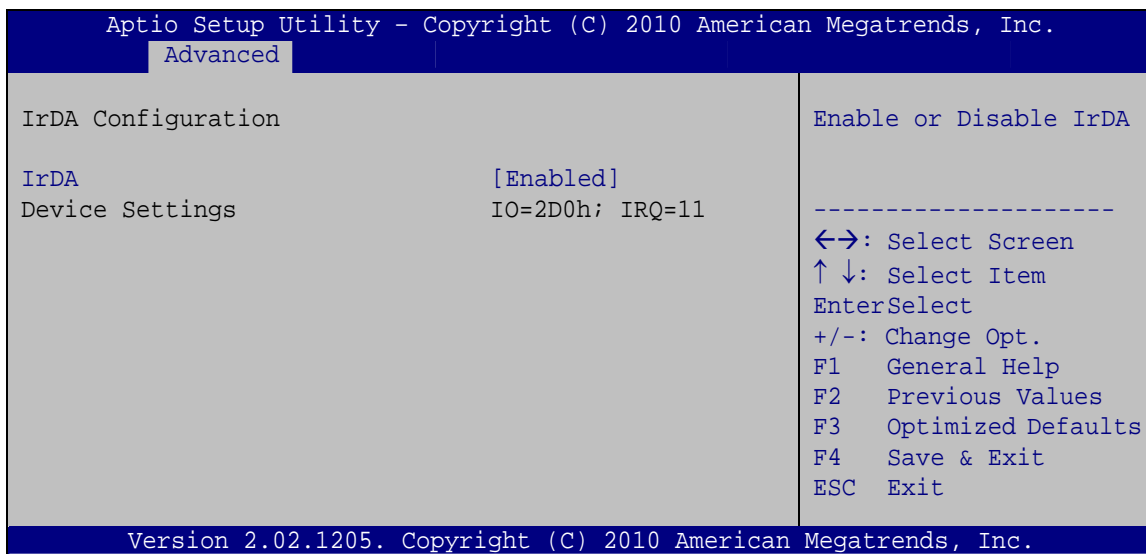
Use the **Change Settings** option to change the serial port IO port address and interrupt address.

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- | | | | |
|---|--------------------------------|----------------|---|
| ➔ | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| ➔ | IO=2E8h;
IRQ=11 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ11 |
| ➔ | 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 2E8h and the interrupt address is IRQ10, 11 |

5.3.6.3 IrDA Configuration

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



BIOS Menu 11: IrDA Configuration Menu

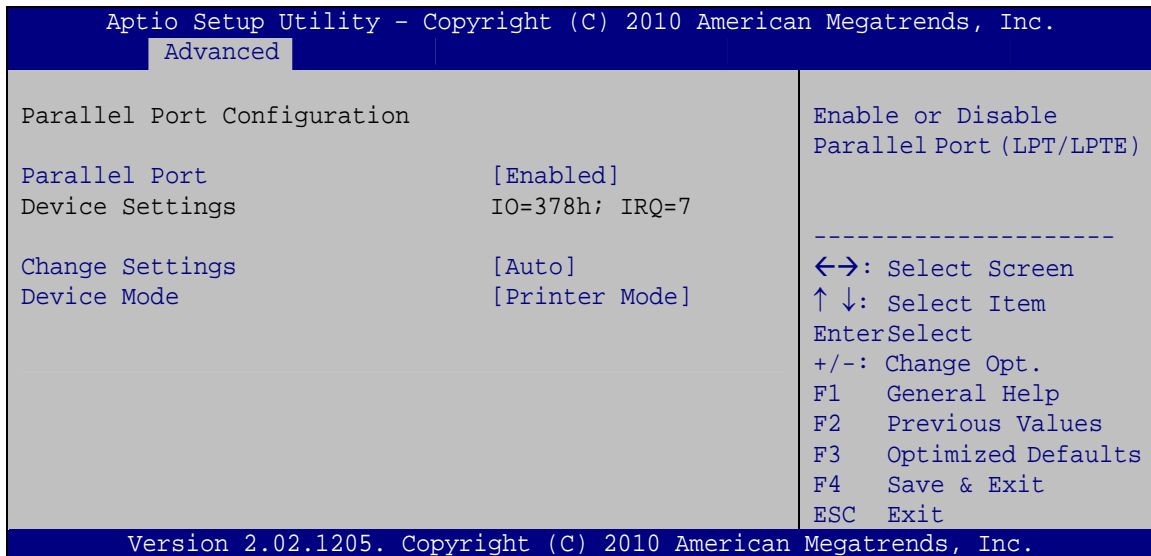
- ➔ **IrDA [Enabled]**

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

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

5.3.6.4 Parallel Port Configuration

Use the **Parallel Port Configuration** menu (**BIOS Menu 12**) to configure the parallel port.



BIOS Menu 12: 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 serial port IO port address and interrupt address.

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

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- ➔ **IO=2E8h;**
IRQ=11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ11
- ➔ **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 2E8h and the interrupt address is IRQ10, 11

➔ **Device Mode [Printer Mode]**

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

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

5.3.7 H/W Monitor

The H/W Monitor menu (**BIOS Menu 13**) shows the operating temperature, fan speeds and system voltages.

```

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

CPU Temperature           :+106 C
SYS Temperature          :+28 C
CPU FAN Speed            :N/A
VCC3V                    :+3.328 V
V_core                   :+1.160 V
+5V                      :+5.003 V
Vcc12                    :+12.320 V
Vcc1_5VDDR               :+1.524 V
VSB3V                    :+3.312 V
VBAT                     :+3.216 V
CPU Smart Fan control    [Auto Mode]
Temperature Bound 1      80
Temperature Bound 2      70
Temperature Bound 3      60
Temperature Bound 4      50

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

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```

BIOS Menu 13: Hardware Health Configuration

→ PC Health Status

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

- System Temperatures:
 - CPU Temperature
 - System Temperature
- Fan Speeds:
 - CPU Fan Speed
- Voltages:
 - VCC3V
 - V_core
 - +5V

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- Vcc12
- Vcc1_5VDDR
- VSB3V
- VBAT

→ CPU Smart Fan control [Auto Mode]

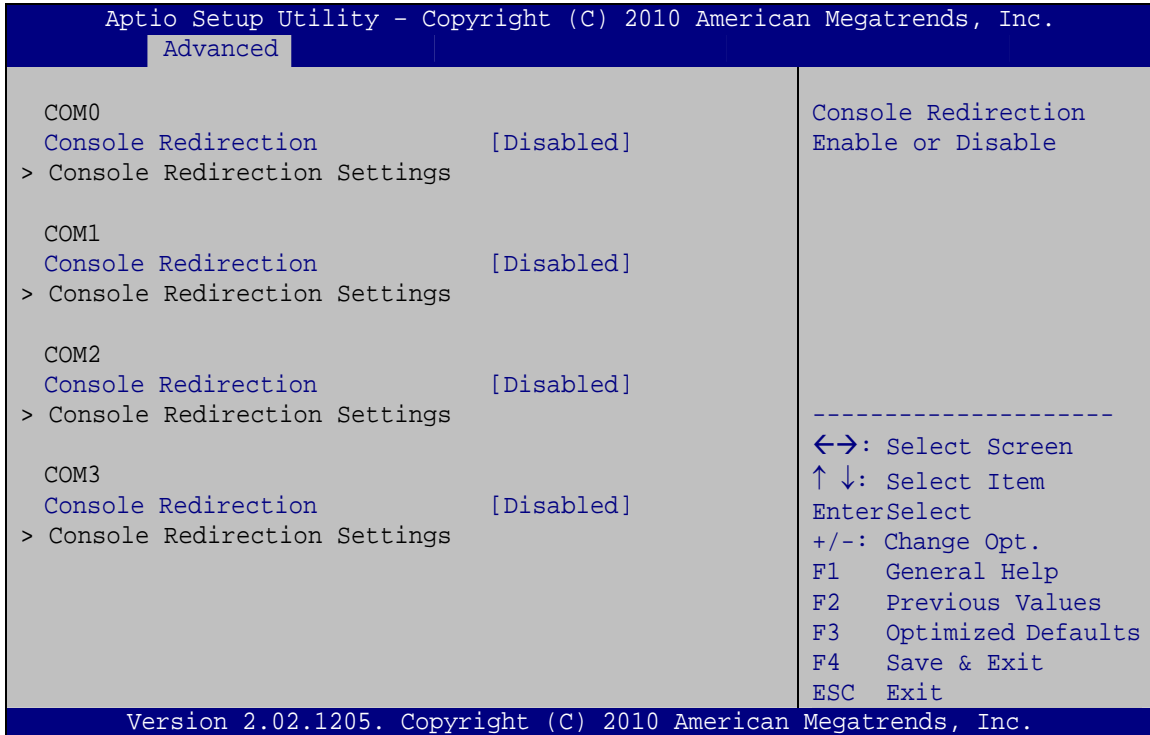
Use the **CPU Smart Fan control** option to configure the CPU fan.

- **Auto Mode** **DEFAULT** The fan adjusts its speed using these settings:
 - Temperature Bound 1
 - Temperature Bound 2
 - Temperature Bound 3
 - Temperature Bound 4

- **Manual Mode** The fan spins at the speed set in:
 - Manual Duty Cycle Setting

5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 14**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 14: 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

5.4 Chipset

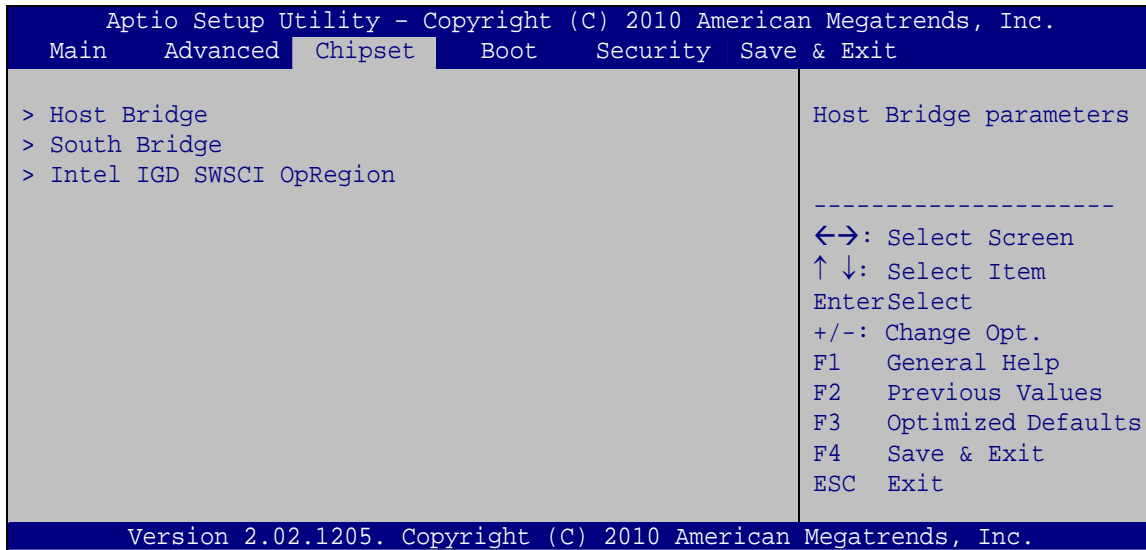
Use the **Chipset** menu (**BIOS Menu 15**) to access the Northbridge and Southbridge configuration menus



WARNING!

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

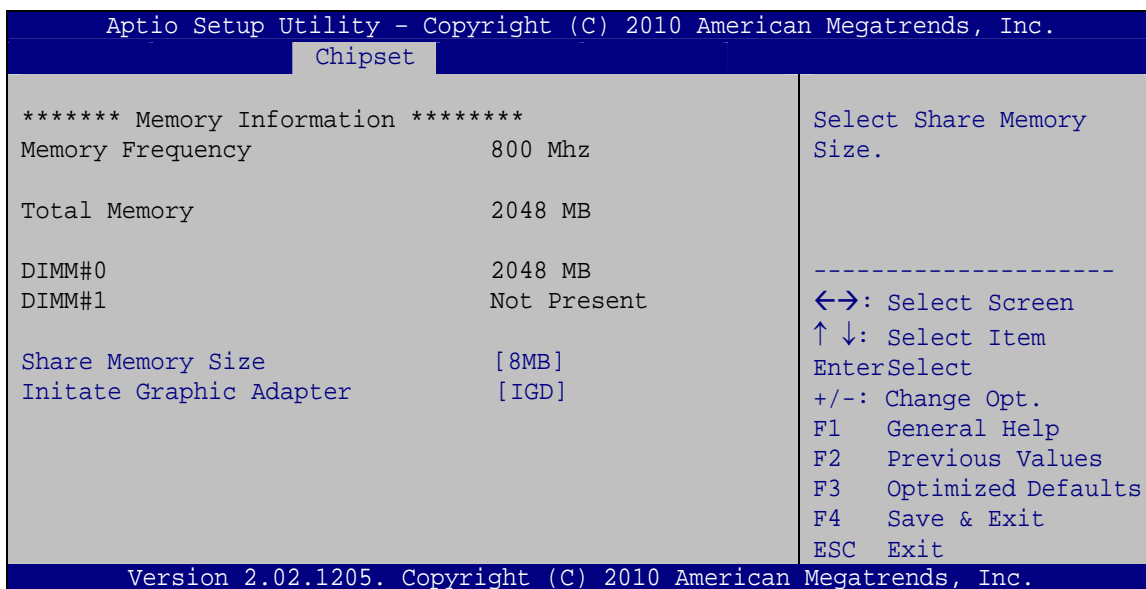
WSB-PV-D4251/D5251 SBC



BIOS Menu 15: Chipset

5.4.1 Host Bridge

Use the **Host Bridge** menu (**BIOS Menu 16**) to configure the host bridge chipset.



BIOS Menu 16:Host Bridge Configuration

→ Share Memory Size [8MB]

Use the **Share Memory Size** 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:

- ➔ **Disabled** Disabled Share Memory.
- ➔ **1 MB** Sets the Share Memory size at 1 MB.
- ➔ **8 MB** **DEFAULT** Sets the Share Memory size at 8 MB.

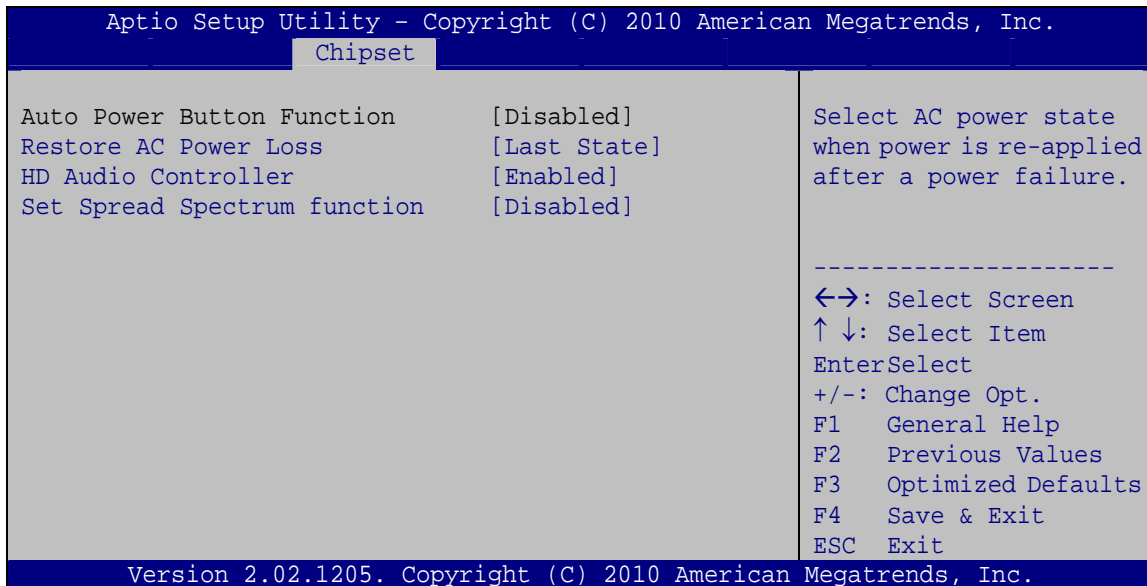
➔ **Initiate Graphics Adapter [PEG/IGD]**

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

- IGD
- PEG/IGD **DEFAULT**

5.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 17**) to configure the Southbridge chipset.



BIOS Menu 17:Southbridge Chipset Configuration

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→ Restore on AC Power Loss [Last State]

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

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

→ HD Audio Controller [Enabled]

The **HD Audio Controller** option enables or disables the HD audio controller.

- **Enabled** **DEFAULT** The onboard HD audio controller automatically detected and enabled
- **Disabled** The onboard HD audio controller is disabled

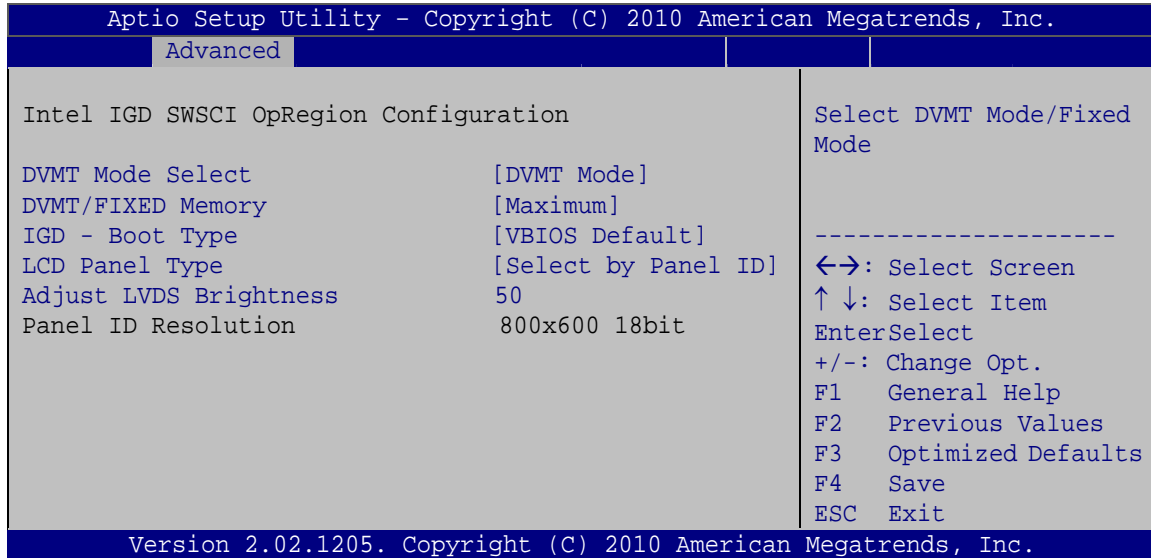
→ Set Spread Spectrum Function [Disabled]

The **Set Spread Spectrum Function** option can help to improve CPU EMI issues.

- **Disabled** **DEFAULT** The spread spectrum function is disabled
- **Enabled** The spread spectrum function is enabled

5.4.3 Intel IGD SWSCI OpRegion

Use the **Intel IGD SWSCI OpRegion** menu to configure the video device connected to the system.



BIOS Menu 18: Intel IGD SWSCI OpRegion

➔ DVMT Mode Select [DVMT Mode]

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

- ➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.
- ➔ **DVMT Mode** **DEFAULT** Graphics memory is dynamically allocated according to the system and graphics needs.

➔ DVMT/FIXED Memory [Maximum]

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

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

➔ IGD - Boot Type [VBIOS Default]

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

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- VBIOS Default **DEFAULT**
- CRT
- LFP
- CRT + LFP

→ LCD Panel Type [Select by Panel ID]

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

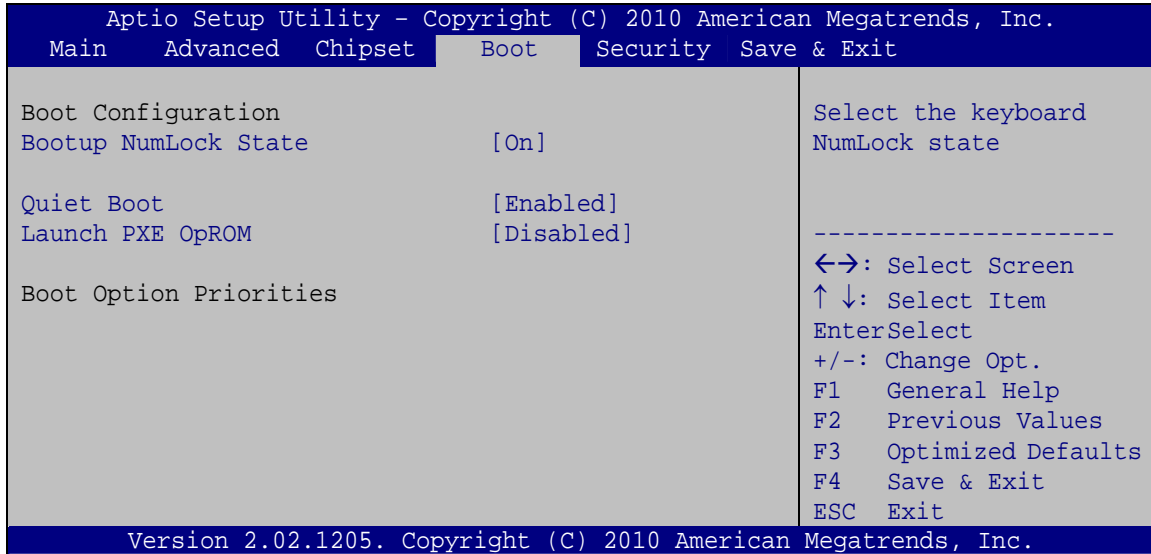
- Select by Panel ID **DEFAULT**
- 640x480 18bit
- 800x480 18bit
- 800x600 18bit
- 1024x768 18bit
- 1280x1024 18bit
- 1366x768 18bit
- 1280x800 18bit
- 1280x600 18bit

→ Adjust LVDS Brightness

Use the **LVDS Brightness** field to adjust screen brightness. Enter a value between 0 and 100 using the keypad or press the spacebar to increase the value.

5.5 Boot

Use the **Boot** menu (**BIOS Menu 19**) to configure system boot options.



BIOS Menu 19: 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.

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→ Quiet Boot [Enabled]

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

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

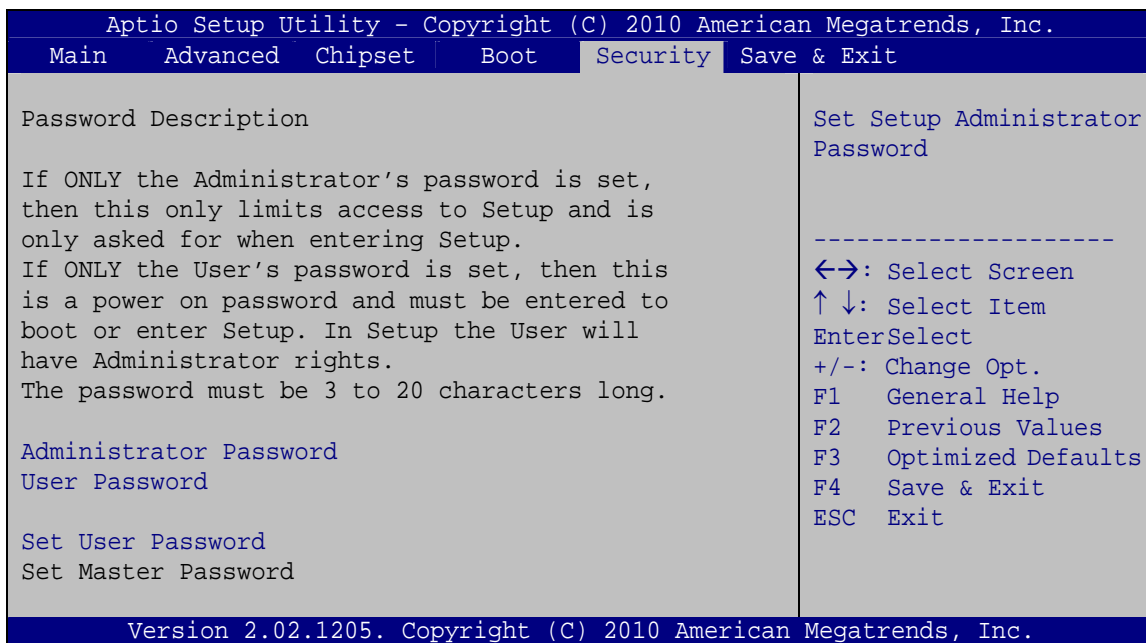
→ Launch PXE OpROM [Disabled]

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

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

5.6 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ **Administrator Password**

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

➔ **User Password**

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

➔ **Set User Password**

Use the **Set User Password** to set or change an HDD user password. After setting an HDD user password, it is recommended that the system be restarted.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```

Aptio Setup Utility - Copyright (C) 2010 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 system setup 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

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```

BIOS Menu 21:Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

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→ Discard Changes and Reset

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

→ Restore Defaults

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

→ Save as User Defaults

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

→ Restore User Defaults

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

Appendix

A

BIOS Options

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

BIOS Information	57
System Date [xx/xx/xx]	57
System Time [xx:xx:xx]	58
ACPI Sleep State [S1 (CPU Stop Clock)]	59
TPM Support [Disable]	60
ATA or IDE Configurations [Enhanced].....	62
Configure SATA As [IDE]	63
USB Devices	63
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USB 2.0 (EHCI) Support.....	64
Legacy USB Support [Enabled].....	64
Floppy Disk Controller [Enabled].....	66
Serial Port [Enabled].....	67
Change Settings [Auto]	67
Serial Port [Enabled].....	68
Change Settings [Auto]	68
Serial Port [Enabled].....	69
Change Settings [Auto]	69
Serial Port [Enabled].....	69
Change Settings [Auto]	70
Serial Port [Enabled].....	70
Change Settings [Auto]	70
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Parallel Port [Enabled].....	72
Change Settings [Auto]	72
Device Mode [Printer Mode].....	73
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CPU Smart Fan control [Auto Mode]	75
Console Redirection [Disabled]	76
Share Memory Size [8MB]	77
Initiate Graphics Adapter [PEG/IGD].....	78
Restore on AC Power Loss [Last State]	79
HD Audio Controller [Enabled].....	79

Set Spread Spectrum Function [Disabled]	79
DVMT Mode Select [DVMT Mode]	80
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IGD - Boot Type [VBIOS Default]	80
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Adjust LVDS Brightness	81
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Administrator Password	84
User Password	84
Set User Password	84
Save Changes and Reset	84
Discard Changes and Reset	85
Restore Defaults	85
Save as User Defaults	85
Restore User Defaults	85

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

The IEI One Key Recovery tool menu is shown below.

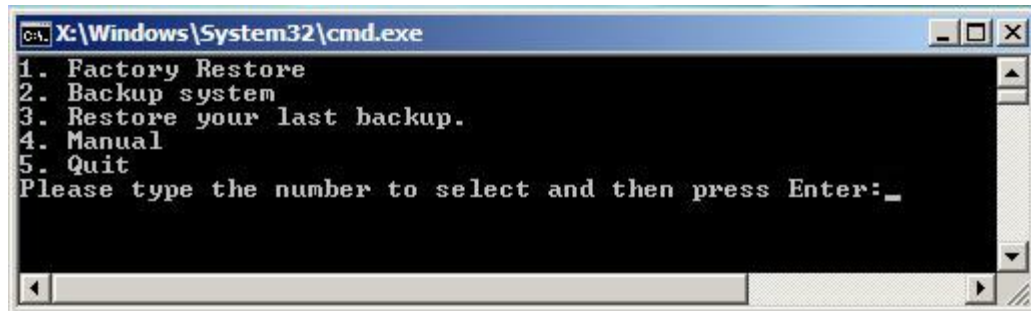


Figure B-1: IEI One Key Recovery Tool Menu

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**)

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.4**.



NOTE:

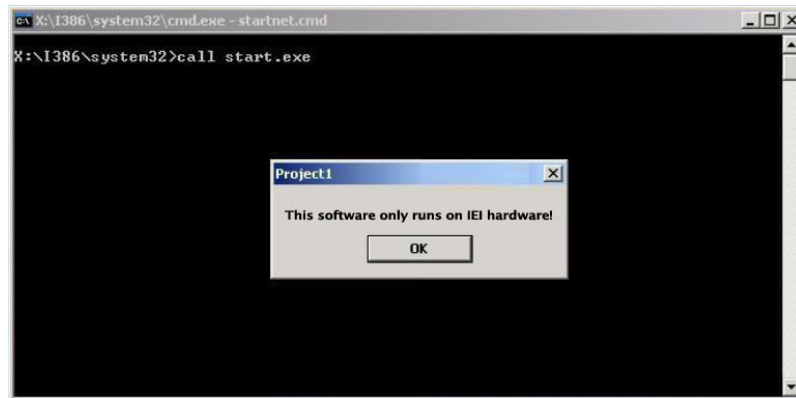
The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement



NOTE:

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



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

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the partitions. Please take the following table as a reference when calculating the size of the partition.

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

**NOTE:**

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

B.1.2 Supported Operating System

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

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

**NOTE:**

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

B.2 Setup Procedure for Windows

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

Step 1: Hardware and BIOS setup (see **Section 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-up recovery partition (see **Section B.2.4**)

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 system, most setup procedures are the same with Microsoft Windows except for several steps which are described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

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

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

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

- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

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

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

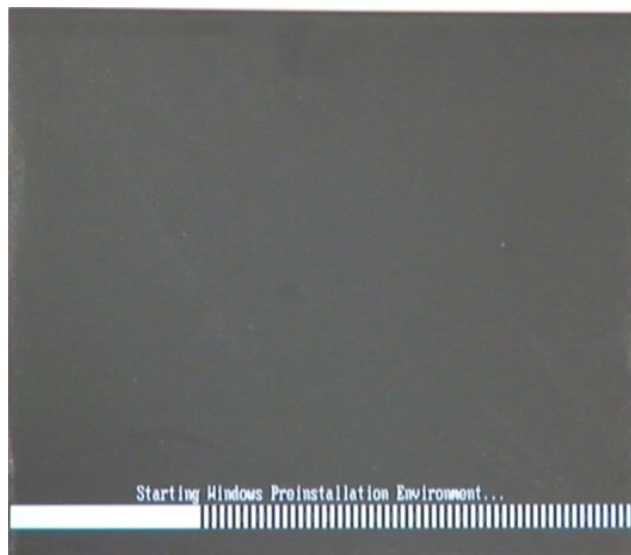
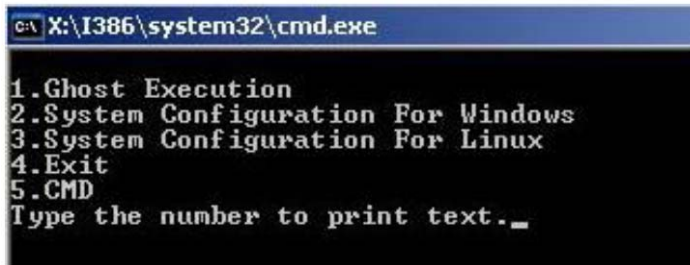


Figure B-2: Launching the Recovery Tool

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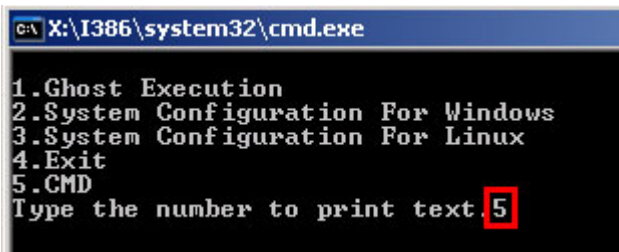
Step 3: The recovery tool setup menu is shown as below.



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

Figure B-3: Recovery Tool Setup Menu

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



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

Figure B-4: Command Mode

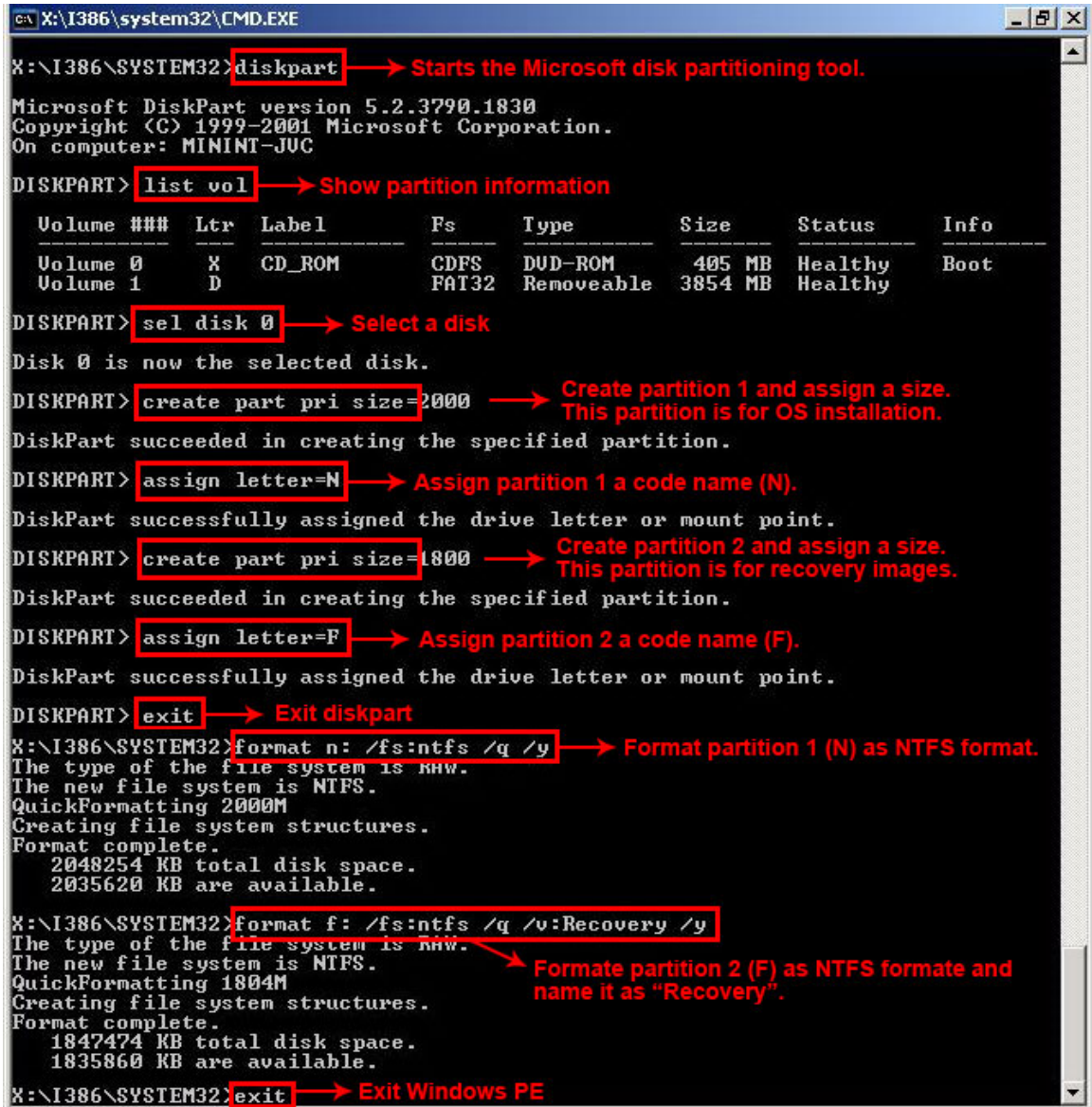
Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(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



```

X:\I386\SYSTEM32\CMD.EXE
X:\I386\SYSTEM32>diskpart → Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC
DISKPART> list vol → Show partition information
Volume ### Ltr Label Fs Type Size Status Info
-----
Volume 0 X CD_ROM GDFS DUD-ROM 405 MB Healthy Boot
Volume 1 D FAT32 Removeable 3854 MB Healthy
DISKPART> sel disk 0 → Select a disk
Disk 0 is now the selected disk.
DISKPART> create part pri size=2000 → Create partition 1 and assign a size.
This partition is for OS installation.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=N → Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> create part pri size=1800 → Create partition 2 and assign a size.
This partition is for recovery images.
DiskPart succeeded in creating the specified partition.
DISKPART> assign letter=F → Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.
DISKPART> exit → Exit diskpart
X:\I386\SYSTEM32>format n: /fs:ntfs /q /y → Format partition 1 (N) as NTFS format.
The type of the file system is ntw.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
2048254 KB total disk space.
2035620 KB are available.
X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y → Formate partition 2 (F) as NTFS formate and
name it as "Recovery".
The type of the file system is ntw.
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-up Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

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

**NOTE:**

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

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

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 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!

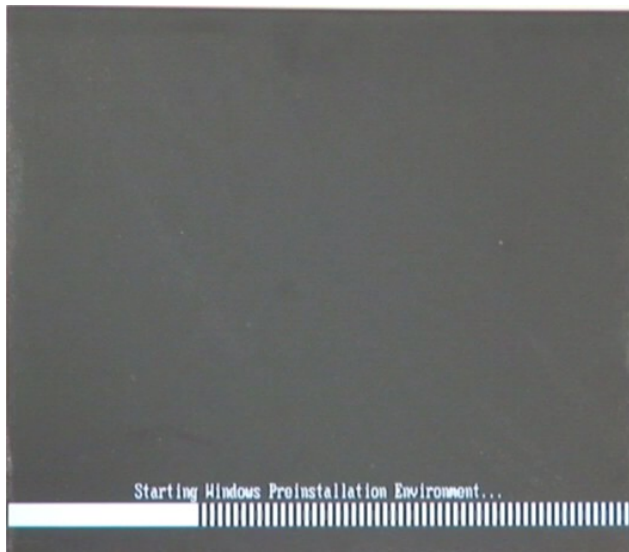


Figure B-6: Launching the Recovery Tool

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

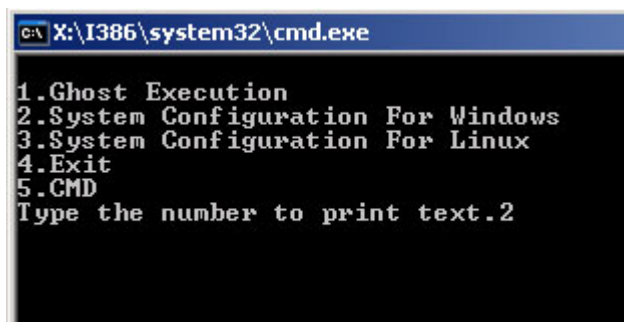


Figure B-7: System Configuration for Windows

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

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

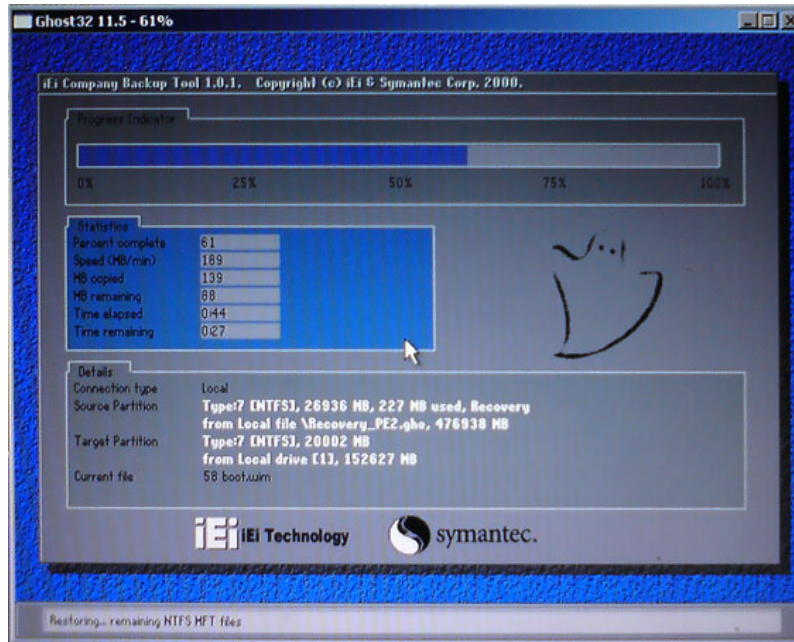


Figure B-8: Build-up Recovery Partition

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

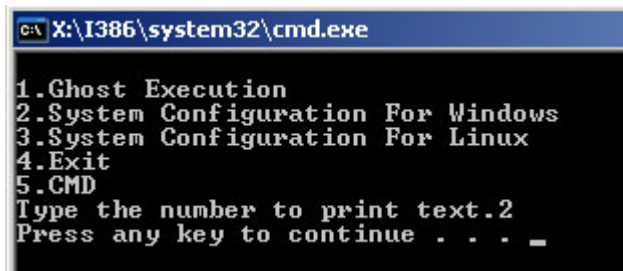


Figure B-9: Press any key to continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

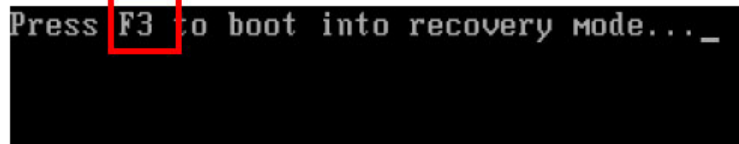


NOTE:

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

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

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



```
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**)

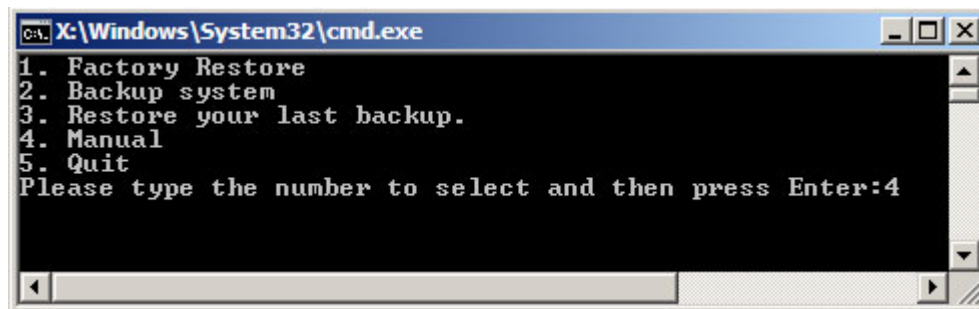


Figure B-11: Recovery Tool Menu

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

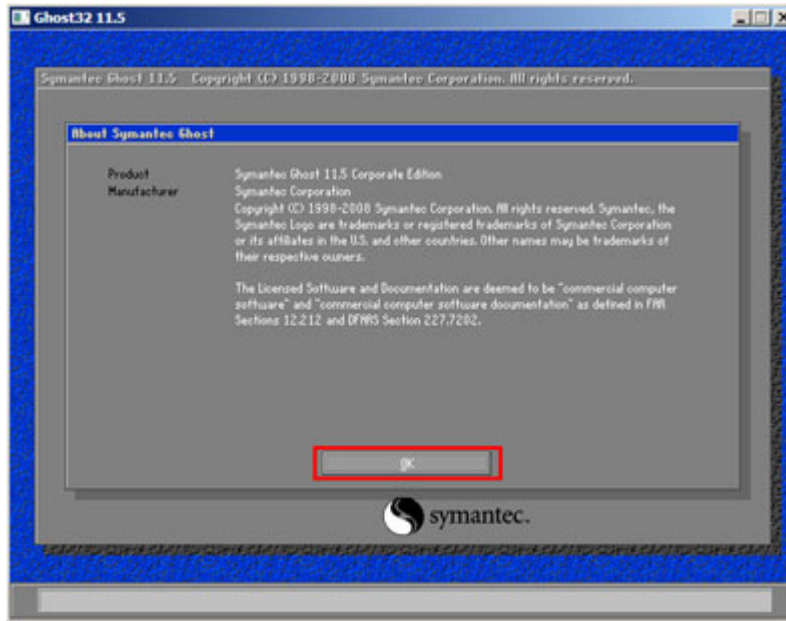


Figure B-12: About Symantec Ghost Window

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

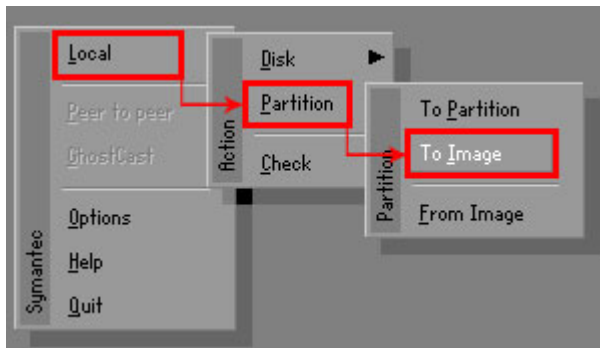


Figure B-13: Symantec Ghost Path

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

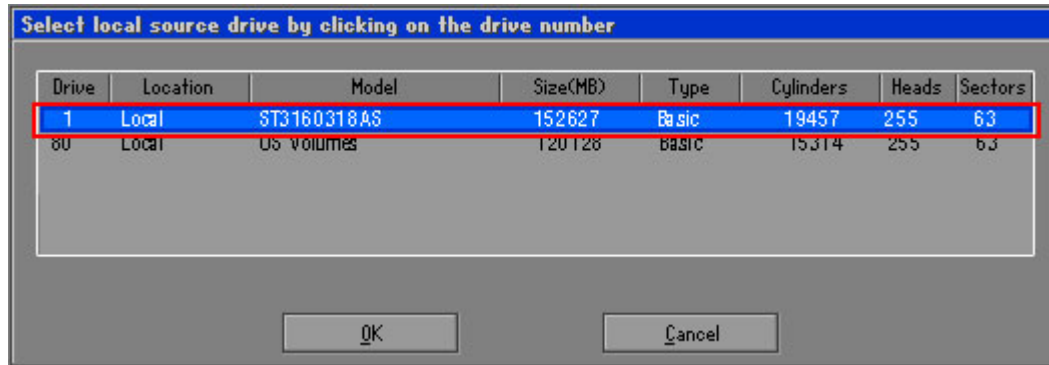


Figure B-14: Select a Local Source Drive

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

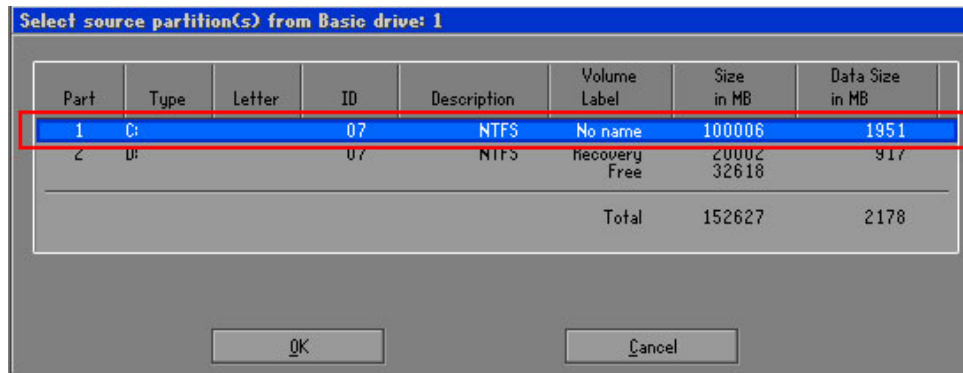


Figure B-15: Select a Source Partition from Basic Drive

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**.

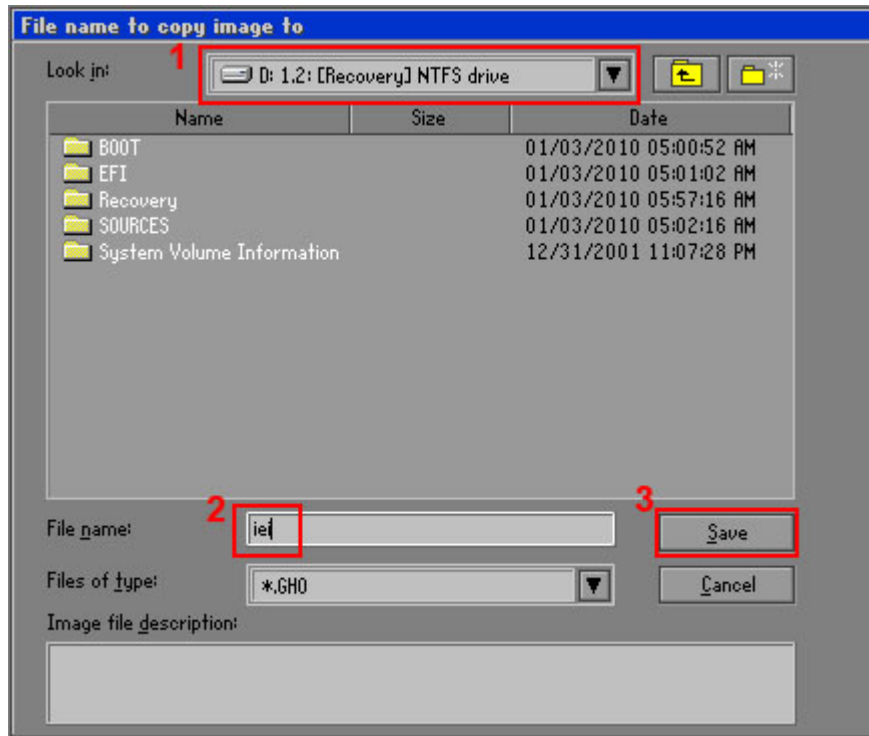


Figure B-16: File Name to Copy Image to

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

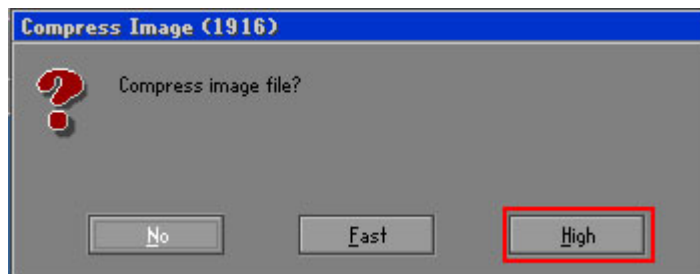


Figure B-17: Compress Image

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

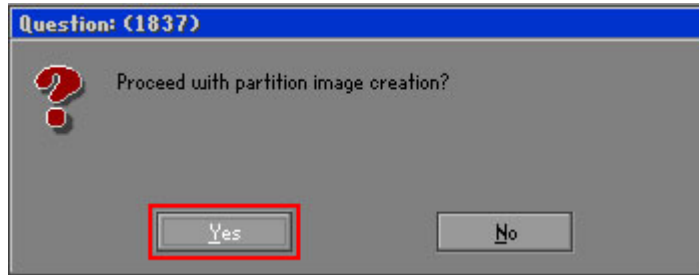


Figure B-18: Image Creation Confirmation

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

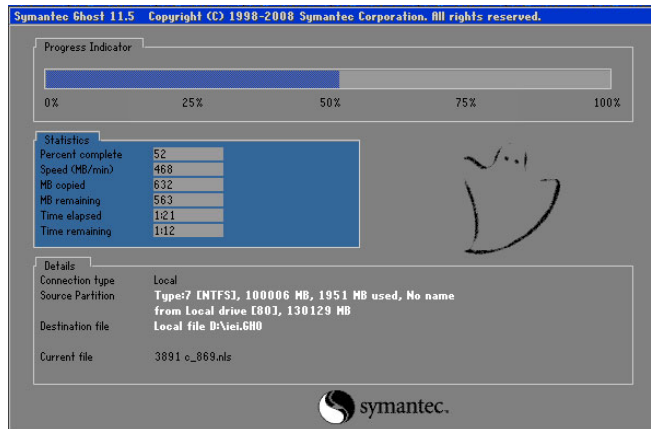


Figure B-19: Image Creation Process

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.

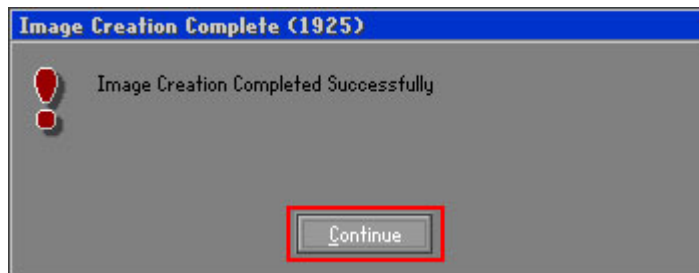
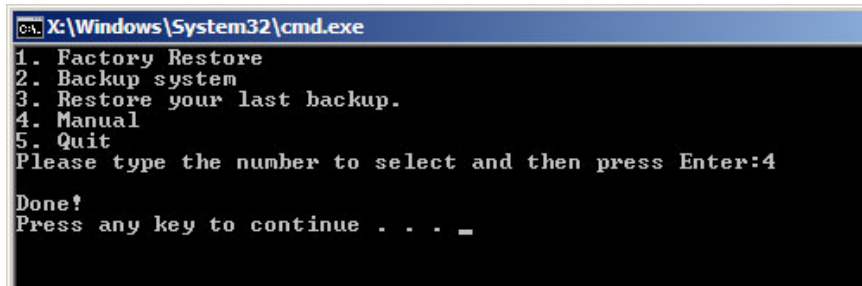


Figure B-20: Image Creation Complete

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 Setup Procedure for Linux

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

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

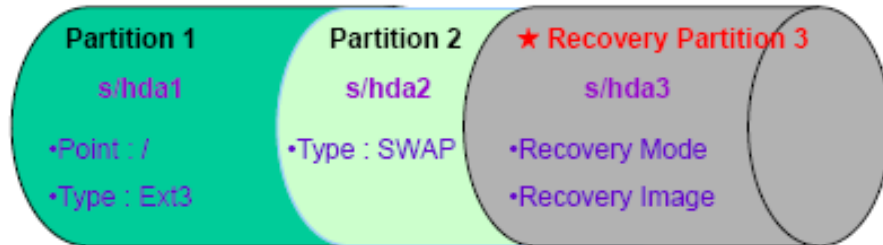


Figure B-22: Partitions for Linux

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

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

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

Figure B-23: System Configuration for Linux

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

```
cd /boot/grub
```

```
vi menu.lst
```

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

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

Figure B-24: 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-25)

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

Figure B-25: 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.4 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing **<F3>** while booting up the system. The main menu of the recovery tool is shown below.

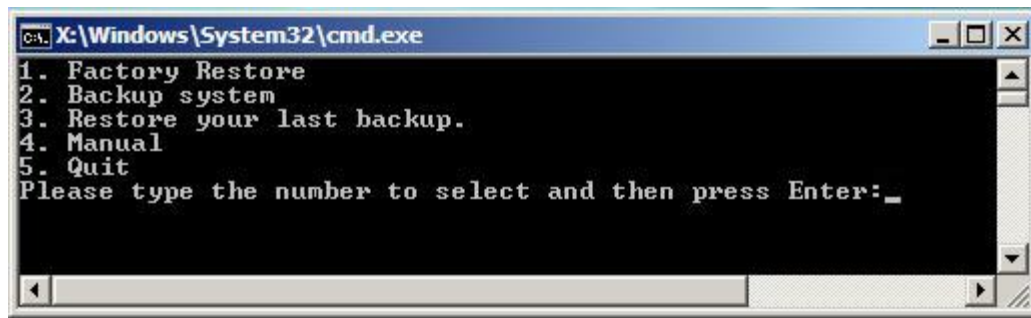


Figure B-26: Recovery Tool Main Menu

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.4.1 Factory Restore

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

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

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

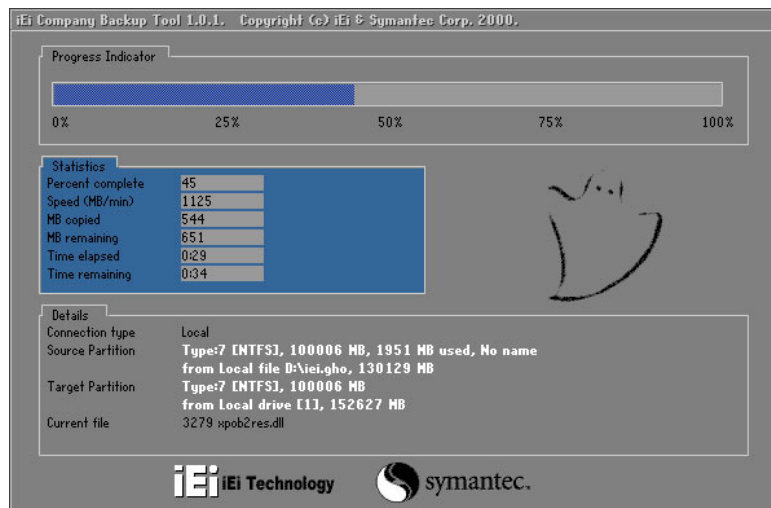


Figure B-27: Restore Factory Default

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

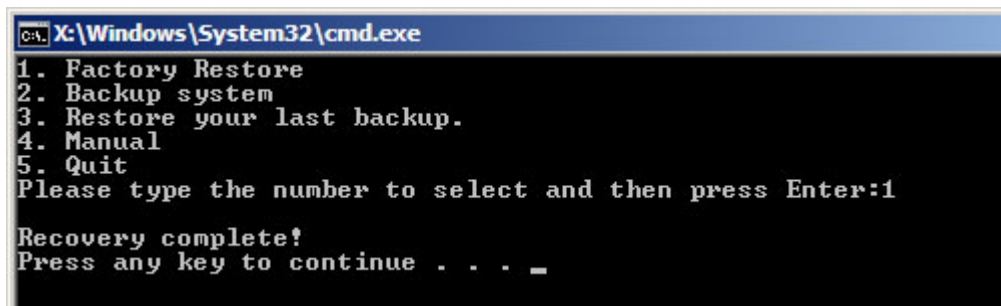


Figure B-28: Recovery Complete Window

B.4.2 Backup System

To backup the system, please follow the steps below.

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

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

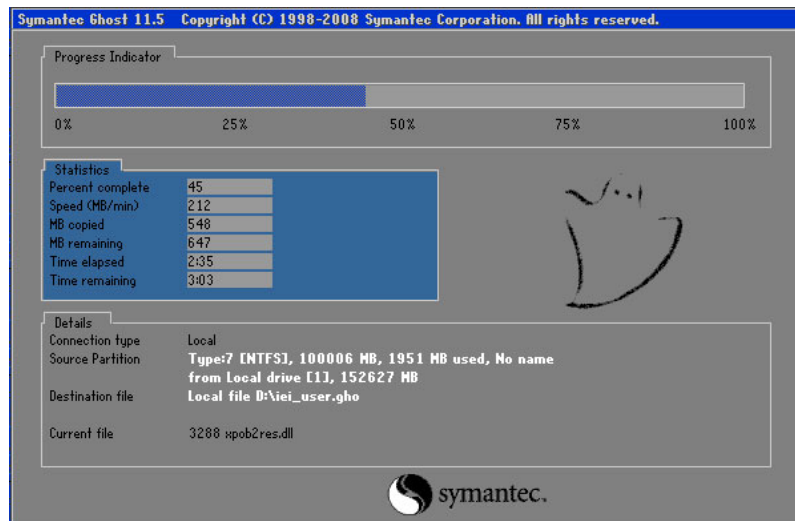


Figure B-29: Backup System

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

Press any key to reboot the system.

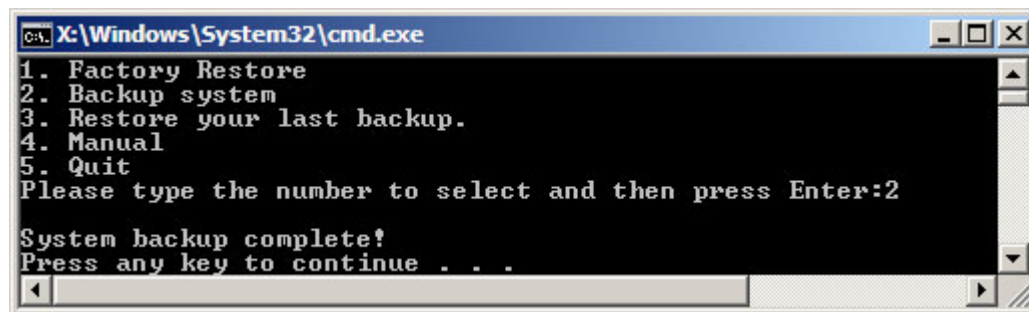


Figure B-30: System Backup Complete Window

B.4.3 Restore Your Last Backup

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

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

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

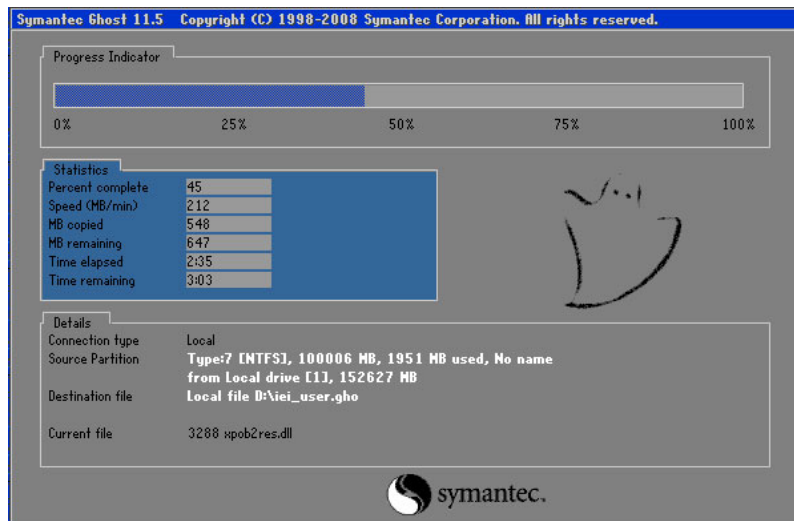


Figure B-31: Restore Backup

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

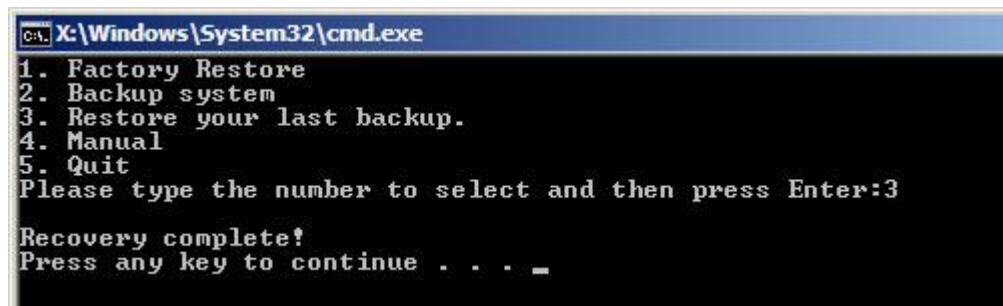


Figure B-32: Restore System Backup Complete Window

B.4.4 Manual

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

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

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

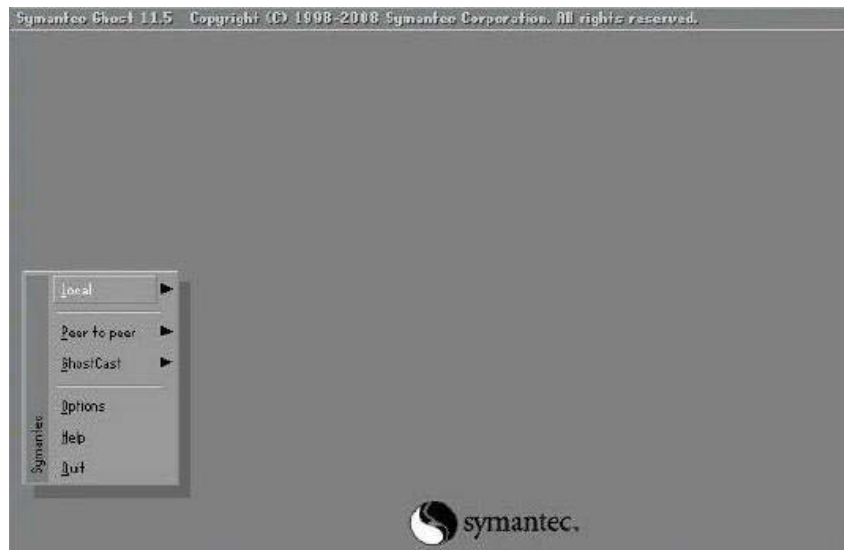


Figure B-33: Symantec Ghost Window

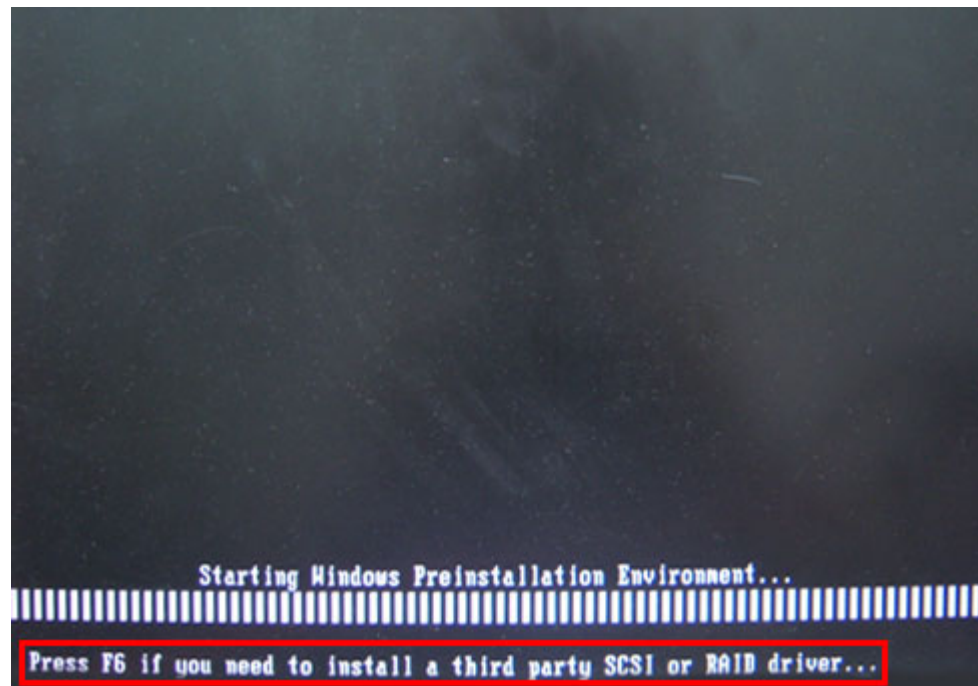
Step 3: When backup or recovery is completed, press any key to reboot the system.

B.5 Other Information

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

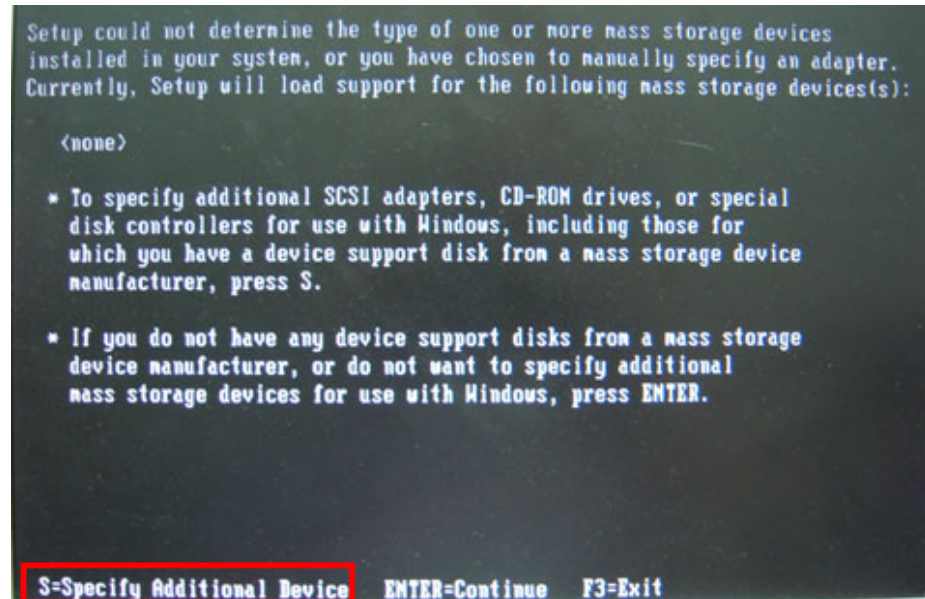
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

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

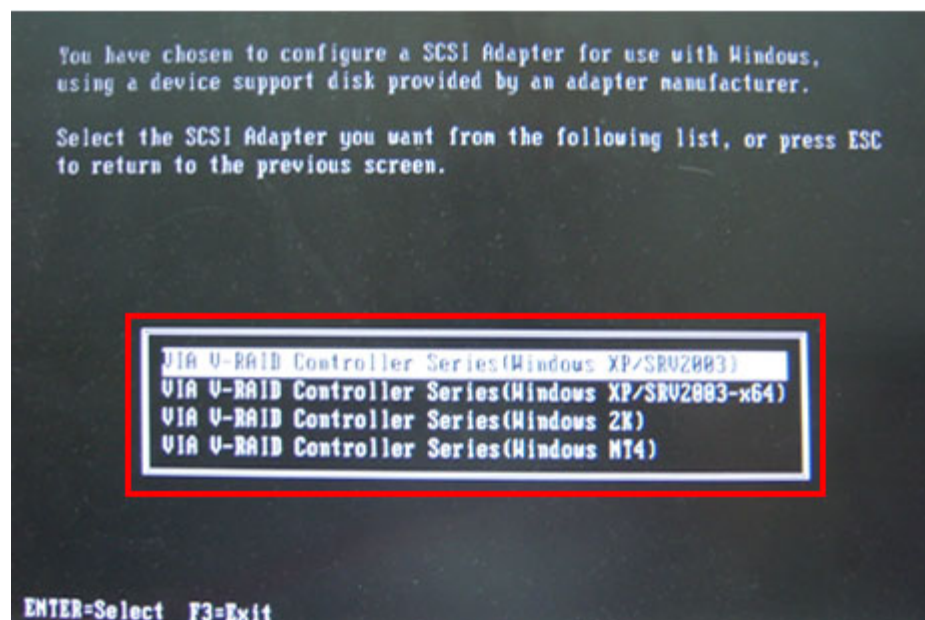


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Step 5: When the following window appears, press <S> to select “Specify Additional Device”.



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.5.2 System Memory Requirement

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

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

Appendix

C

Terminology

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

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

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

Appendix

D

Hazardous Materials Disclosure

D.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.

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

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

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

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

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

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

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