IEI Integration Corp.

MODEL:

TANK-6000-C226

Embedded system supports 22nm LGA1155 Intel® Xeon® E3 / Core™ i3 CPU, HDMI, VGA, GbE, Two USB 2.0, Four USB 3.0, Two COM and RoHS Compliant

User Manual

Rev. 1.00 – 14 March 2014

RoHS Lead Free

Revision

Date	Version	Changes
14 March 2014	1.00	Initial release

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1

Introduction

1.1 Overview

Figure 1-1: TANK-6000-C226

The TANK-6000-C226 embedded system is with one VGA port and one HDMI port for dual display. It accepts an Intel® Xeon® E3 / Core™ i3 CPU and supports four 240-pin DDR3 U-DIMM modules up to 64 GB. The TANK-6000-C226 supports one 2.5" SATA HDD with up to 3 Gb/s data transfer rate and two 2.5" SATA HDDs with up to 6 Gb/s data transfer rate. Two serial ports, two external USB 2.0 ports and four external USB 3.0 ports ensure simplified connectivity to a variety of external peripheral devices.

1.2 Model Variations

The model variations of the TANK-6000-C226 series are listed below.

Models	CPU
TANK-6000-C226i-E3/4G-R10	Intel® quad-core Xeon® E3-1225 v3 3.2GHz (TDP 84W)
TANK-6000-C226i-i3/4G-R10	Intel® dual-core Core™ i3- 4330 3.5GHz (TDP 54W)

Table 1-1: Model Variations

1.3 Features

The TANK-6000-C226 features are listed below:

- LGA1155 socket supports Intel® Xeon® E3 / Core™ i3 CPU (up to 95W CPU)
- 4 x 240-pin DDR3 U-DIMM (system max: 64GB)
- Extended temperature design supports -20°C to 55°C
- Easy to install Hard Disk Drive (HDD)
- USB 3.0 for high super speed data transfer
- Programmable OLED display
- RoHS compliant

1.4 Technical Specifications

The TANK-6000-C226 technical specifications are listed in **Table 1-2**.

Chassis	
Color	Black
Dimensions (WxHxD)	310 mm x 199.5 mm x 112 mm
System Fan	92 x 92 mm Fan
Chassis Construction	Extruded aluminum alloy Heavy duty steel sheet
Motherboard	
CPU	LGA1155 socket supports Intel® Xeon® E3 / Core™ i3 CPU (up to 95W CPU)
Chipset	Intel® C226
Memory	4 x 240-pin DDR3 U-DIMM (system max: 64GB)
Storage	
SATA	3 x 2.5" HDD/SSD storage (1 x SATA 3Gb/s, 2 x SATA 6Gb/s)

I/O interfaces	
USB	4 x USB 3.0 2 x USB 2.0
Ethernet	1 x RJ-45 for Intel® i217 PHY with AMT 8.0 supported 3 x RJ-45 for Intel® i210
RS-232	2 x RS-232 (DB-9 connector)
Display	1 x HDMI 1 x VGA
Audio	1 x Line out 1 x Mic
Other	SFP Fiber, COMBO with LAN1 & LAN2
Expansions	
PCIe	2 x PCIe by 8
Power	
Power Supply	19V/24V DC
Reliability	
Mounting	Wall mount
Operating Temperature	-20°C ~ 55°C with air flow (SSD)
Operating Humidity	10% ~ 90%, non-condensing
Operating Shock	Half-sine wave shock 5G, 11ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Safety/EMC	CE/FCC
Supported OS	Microsoft® WES7E Microsoft® Windows® XP Embedded

Table 1-2: Technical Specifications

1.5 Front Panel

The front panel of the TANK-6000-C226 has the following features (**Figure 1-2**):

- ▪ 2 x HDD/SSD bay
- ▪ 1 x OLED display
- ▪ 1 x Power button
- ▪ 2 x USB 3.0 connectors
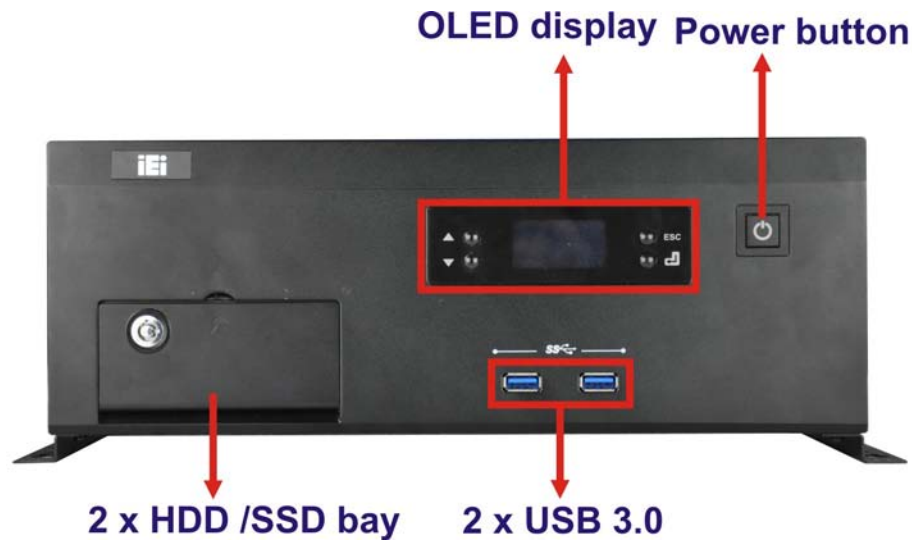
Figure 1-2: TANK-6000-C226 Front Panel

1.6 Rear Panel

The rear panel of the TANK-6000-C226 has the following features (**Figure 1-3**):

- ▪ 1 x 4-pin power jack for 19V/24V power input
- ▪ 1 x 4-pin terminal block for 19V/24V power input
- ▪ 1 x AT/ATX Switch
- ▪ 1 x HDMI port
- ▪ 1 x Line-out port (green)
- ▪ 1 x Mic-in port (pink)
- ▪ 1 x Reset button
- ▪ 2 x RJ-45 combo Gigabit LAN ports
- ▪ 2 x RJ-45 LAN connectors
- ▪ 2 x RS-232 (DB-9 connector)
- ▪ 2 x SFP Fiber combo Gigabit LAN ports
- ▪ 2 x USB 2.0 connectors
- ▪ 2 x USB 3.0 ports
- ▪ 1 x VGA port
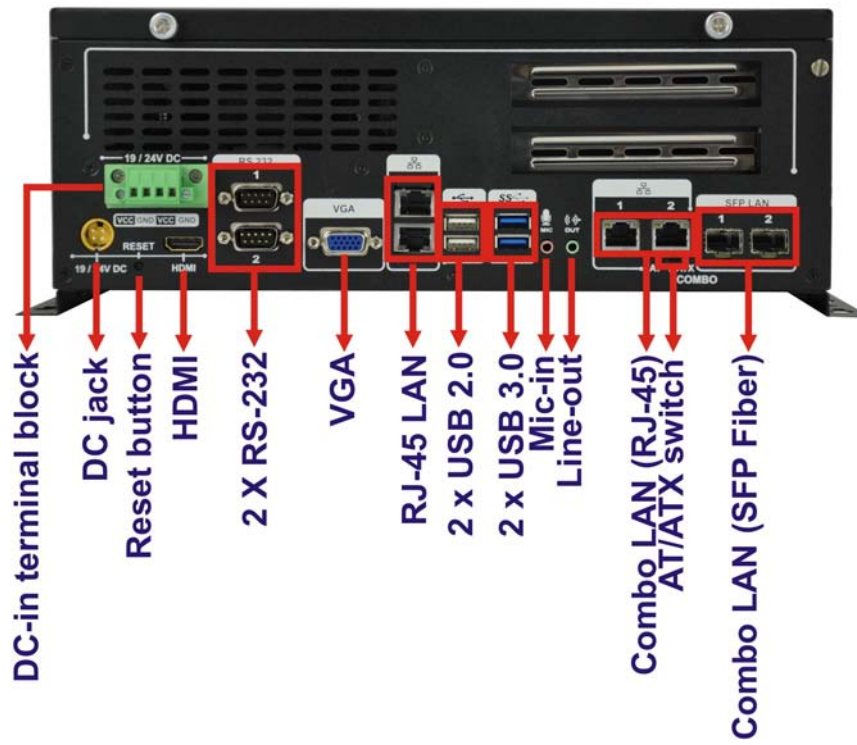
Figure 1-3: TANK-6000-C226 Rear Panel

1.7 Dimensions

The physical dimensions are shown below:
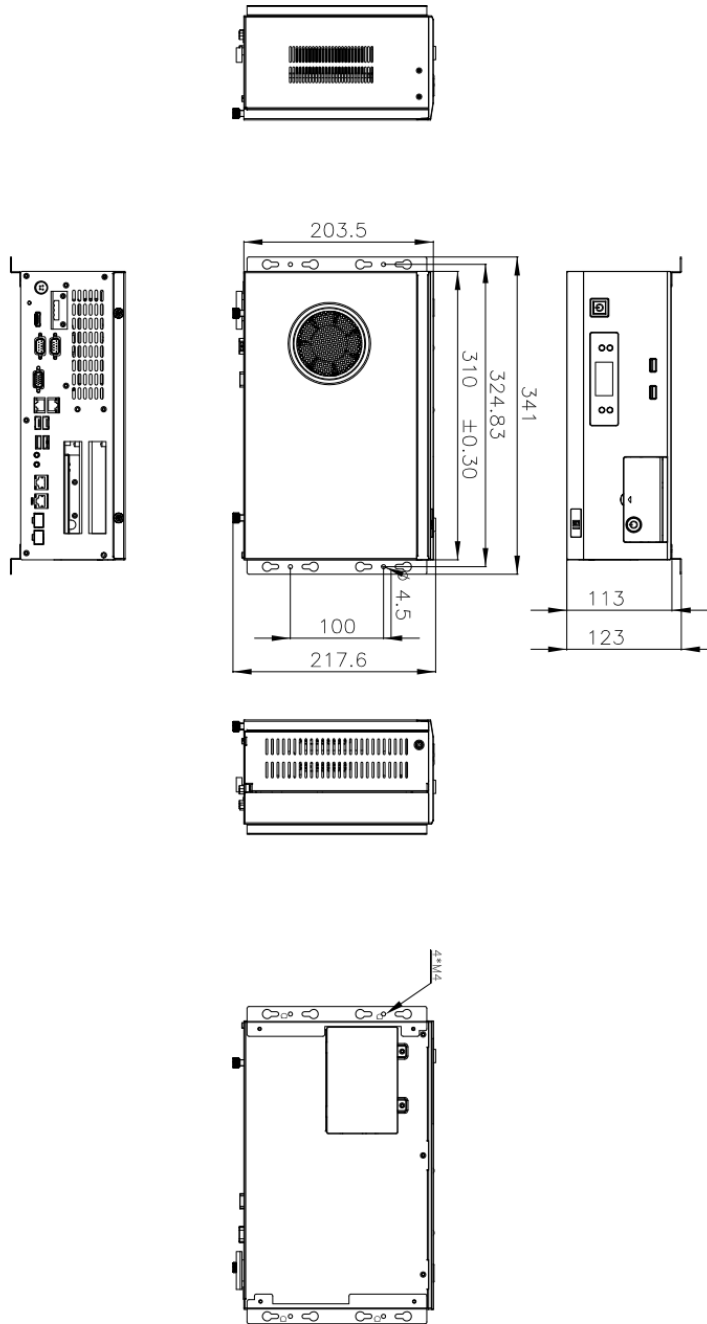
Figure 1-4: Physical Dimensions (mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-6000-C226 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-6000-C226. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-6000-C226 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband**: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding**: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad**: When configuring the TANK-6000-C226, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-6000-C226.

2.2 Unpacking Precautions

When the TANK-6000-C226 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the TANK-6000-C226 does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the TANK-6000-C226 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The TANK-6000-C226 is shipped with the following components:

Quantity	Item and Part Number	Image
1	TANK-6000-C226 embedded system	
1	Power adapter (**P/N**: 63040-010220-000-RS)	
1	Power cord (**P/N**:32702-000200-100-RS)	
2	Mounting brackets (**P/N**: 41020-0378C2-00-RS)	
2	Keys	

Quantity	Item and Part Number	Image
1	Utility CD	
1	One Key Recovery CD	

Table 2-1: Package List Contents

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the TANK-6000-C226, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-6000-C226 must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the TANK-6000-C226 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-6000-C226 must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Grounding**: The TANK-6000-C226 should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the TANK-6000-C226.

3.2 Installation and Configuration Steps

The following installation steps must be followed.

Step 1:   Unpack the TANK-6000-C226.

Step 2:   Install the HDD.

Step 3:   Install the PCIe expansion card (Optional).

Step 4:   Configure the system.

Step 5:   Mount the TANK-6000-C226.

Step 6:   Connect peripheral devices to the TANK-6000-C226.

3.3 Hard Disk Drive (HDD) Installation

3.3.1 Serial ATA 2.0 Drive Installation

To install the hard disk drive to the SATA 2.0 driver bay, please follow the steps below:

Step 1: Remove two retention screws from the HDD cover, as shown in **Figure 3-1**.

Figure 3-1: HDD Cover Retention Screws

Step 2: Remove the HDD cover from the device.

Step 3: Loosen two HDD bracket retention screws (**Figure 3-2**).

Figure 3-2: HDD Bracket Retention Screws

Step 4: Lift the HDD bracket out of the TANK-6000-C226 and slide the HDD to the HDD bracket (**Figure 3-3**).

Figure 3-3: Inserting the HDD

Step 5: Install the HDD bracket in the same position it was before and tighten the HDD bracket retention screws.

Step 6: Reinstall the HDD cover.

3.3.2 Serial ATA 3.0 Drive Installation

To install the hard disk drive to the SATA 3.0 driver bay, please follow the steps below:

Step 1: Unlock the HDD drive bay using the key. The keys can be found in the packing list.

Figure 3-4: HDD Drive Bay

Step 2: Loosen two HDD bracket retention screws and lift the HDD bracket out of the TANK-6000-C226.

Figure 3-5: HDD Bracket Retention Screws

Step 3: Slide the HDD to the HDD bracket and secure the HDD to the bracket using four retention screws.
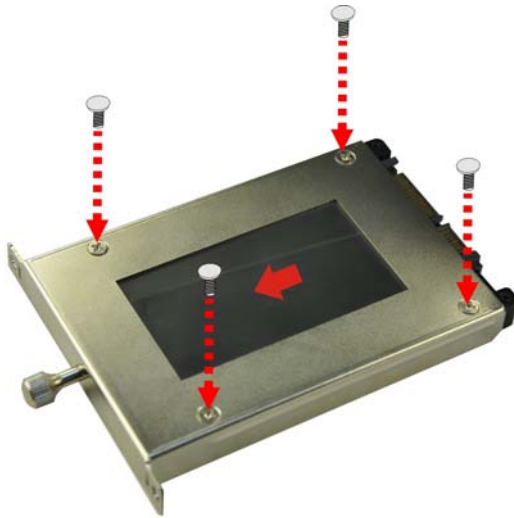
Figure 3-6: Installing the HDD

Step 4:   Install the HDD bracket in the same position it was before and tighten the HDD
           bracket retention screws.

Step 5:   Lock the HDD drive bay using the key

3.4 PCIe Expansion Card Installation (Optional)

To install a PCIe expansion card, please do the following.

Step 1:   Loosen the two thumbscrews on the rear panel and remove the top cover. Then
           remove the two retention screws and open the side cover.

Figure 3-7: Unscrew the cover

Step 2:   Remove the expansion slot cover. The expansion slot cover is secured to the

system with a single retention screw. Remove the screw.

Figure 3-8: Expansion Slot Retention Screw

Step 3:   Insert the expansion card. Align the PCIe expansion card edge connector with

the PCIe expansion slot on the PCIe riser card. Gently insert the PCIe card into

the PCIe expansion slot.

Step 4:   Secure the expansion card. Once the PCIe card is correctly installed in the

system, reinsert the previously removed retention screw to secure the card to

the I/O interface panel.

Figure 3-9: Install PCIe Card

3.5 AT/ATX Mode Selection

AT or ATX power mode can be used on the TANK-6000-C226. The selection is made through an AT/ATX switch located on the rear panel. To select AT mode or ATX mode, follow the steps below.

Step 1:   Locate the AT/ATX switch on the rear panel (**Figure 3-10**).

Figure 3-10: AT/ATX Switch Location

Step 2:   Adjust the AT/ATX switch.

3.5.1 AT Power Mode

With the AT mode selected, the power is controlled by a central power unit rather than a power switch. The TANK-6000-C226 panel PC turns on automatically when the power is connected. The AT mode benefits a production line to control multiple panel PCs from a central management center and other applications including:

- ATM
- Self-service kiosk
- Plant environment monitoring system
- Factory automation platform
- Manufacturing shop flow

3.5.2 ATX Power Mode

With the ATX mode selected, the TANK-6000-C226 panel PC goes in a standby mode when it is turned off. The panel PC can be easily turned on via network or a power switch

in standby mode. Remote power control is perfect for advertising applications since the broadcasting time for each panel PC can be set individually and controlled remotely. Other possible application includes:

- Security surveillance
- Point-of-Sale (POS)
- Advertising terminal

3.6 Reset the System

The reset button enables user to reboot the system when the system is turned on. To reboot the system, follow the steps below.

Step 1: Locate the reset button on the rear panel (**Figure 3-11**).

Figure 3-11: Reset Button Location

Step 2: Press the reset button.

3.7 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface.

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket as illustrated in **Figure 3-12**.

Figure 3-12: Mounting Bracket Retention Screws

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

3.8 External Peripheral Interface Connectors

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- HDMI devices
- RJ-45 Ethernet cable connector
- Serial devices
- USB devices
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding TANK-6000-C226 external peripheral interface connector making sure the pins are properly aligned.

3.8.1 Audio Connection

The audio jacks on the external audio connector enable the TANK-6000-C226 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

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

- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.
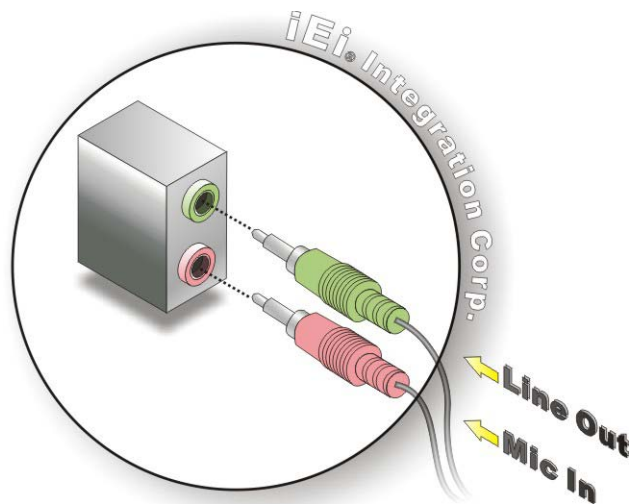
Figure 3-13: Audio Connector

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

3.8.2 HDMI Device Connection

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. To connect the HDMI cable to the TANK-6000-C226, follow the steps below.

Step 1:   **Locate the HDMI connector**. The location is shown in **Chapter 1**.

Step 2:   **Align the connector.** Align the HDMI connector with the HDMI port. Make sure the orientation of the connector is correct.
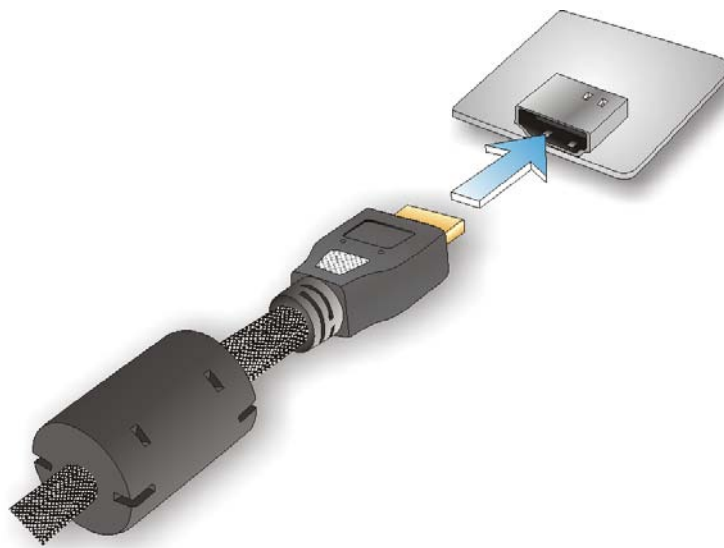
Figure 3-14: HDMI Connection

Step 3:   **Insert the HDMI connector.** Gently insert the HDMI connector. The connector should engage with a gentle push. If the connector does not insert easily, check again that the connector is aligned correctly, and that the connector is being inserted with the right way up.

3.8.3 LAN Connection

There are four external RJ-45 LAN connectors on the TANK-6000-C226. The RJ-45 connector enables 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 location of the LAN connector is shown in **Chapter 1**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-6000-C226. See **Figure 3-15**.
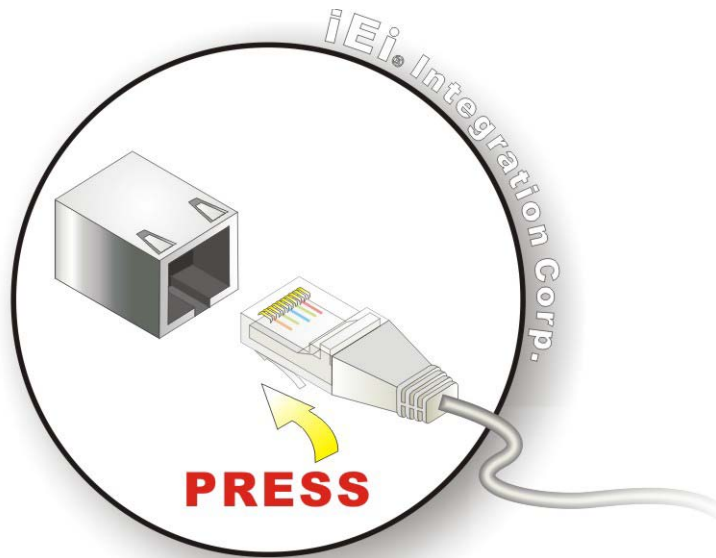
Figure 3-15: LAN Connection

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

3.8.4 DB-9 Serial Port Connection

There are two RS-232 DB-9 connectors on the TANK-6000-C226. Follow the steps below to connect a serial device to the DB-9 connector of the TANK-6000-C226.

Step 1: **Locate the DB-9 connector**. The locations of the DB-9 connectors are shown in **Chapter 1**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the rear panel. See **Figure 3-16**.
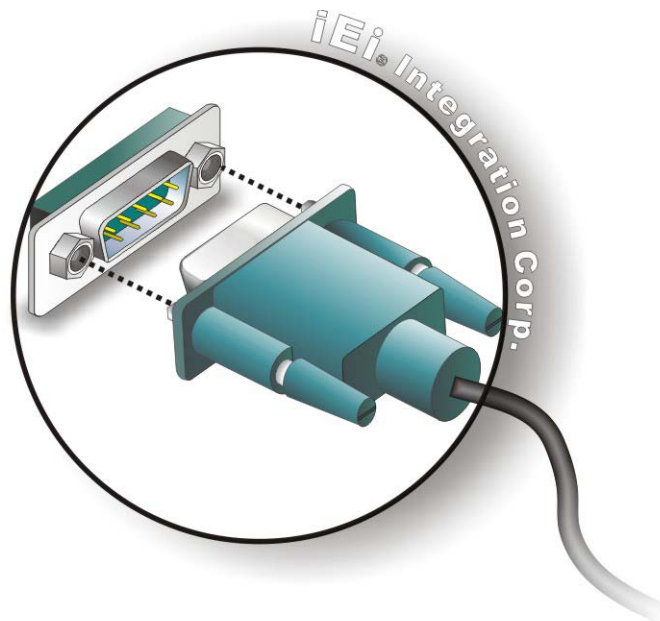
Figure 3-16: DB-9 Serial Port Connector

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

3.8.5 USB Device Connection

NOTE:

User must install the USB 3.0 driver before connecting a USB device to the system or else the system may not recognize the connected device.

There are four USB 3.0 connectors and two USB 2.0 connectors on the TANK-6000-C226. To connect a USB device, please follow the instructions below.

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

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors on the external peripheral interface. See **Figure 3-18**.
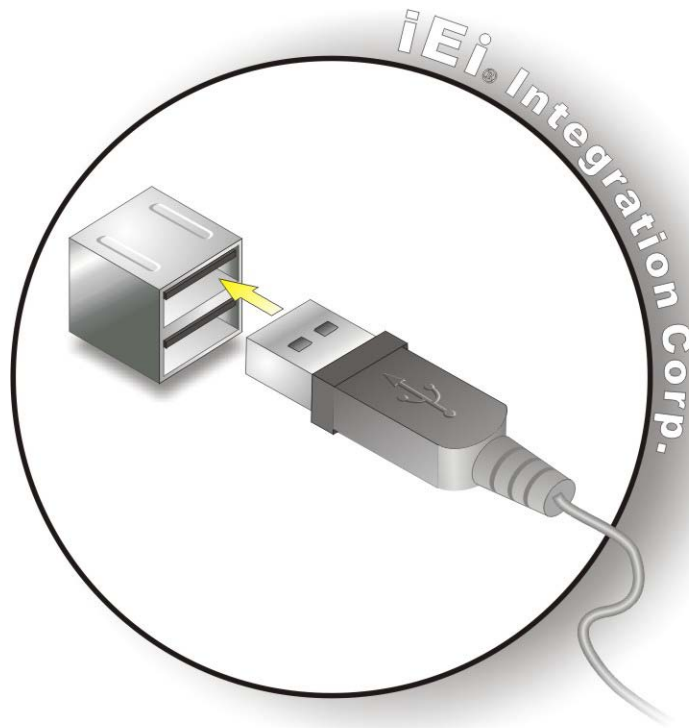
Figure 3-17: USB Device Connection

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

3.8.6 VGA Monitor Connection

The TANK-6000-C226 has one female DB-15 connectors on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the TANK-6000-C226, 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 1**.

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

TANK-6000-C226. See **Figure 3-19**.
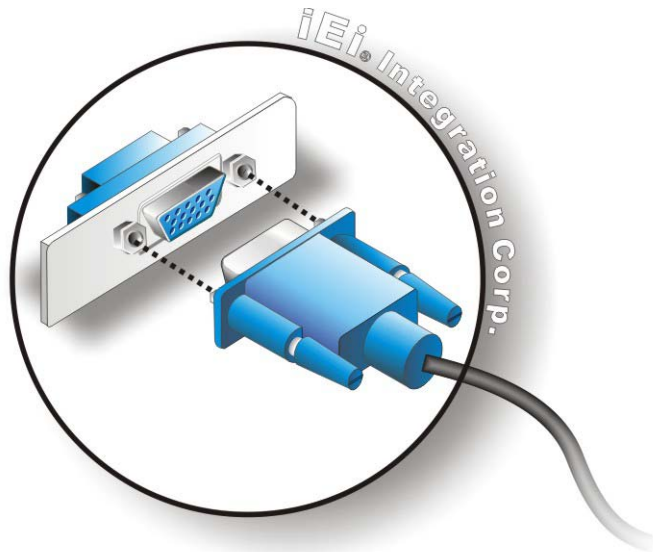
Figure 3-18: VGA Connector

Step 4:   **Secure the connector**. Secure the DB-15 VGA connector from the VGA

monitor to the external interface by tightening the two retention screws on either

side of the connector.

Chapter

4

System Motherboard

4.1 Motherboard Layout

The TANK-6000-C226 embedded system motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams. The connector pinouts for these connectors are listed in the following sections.
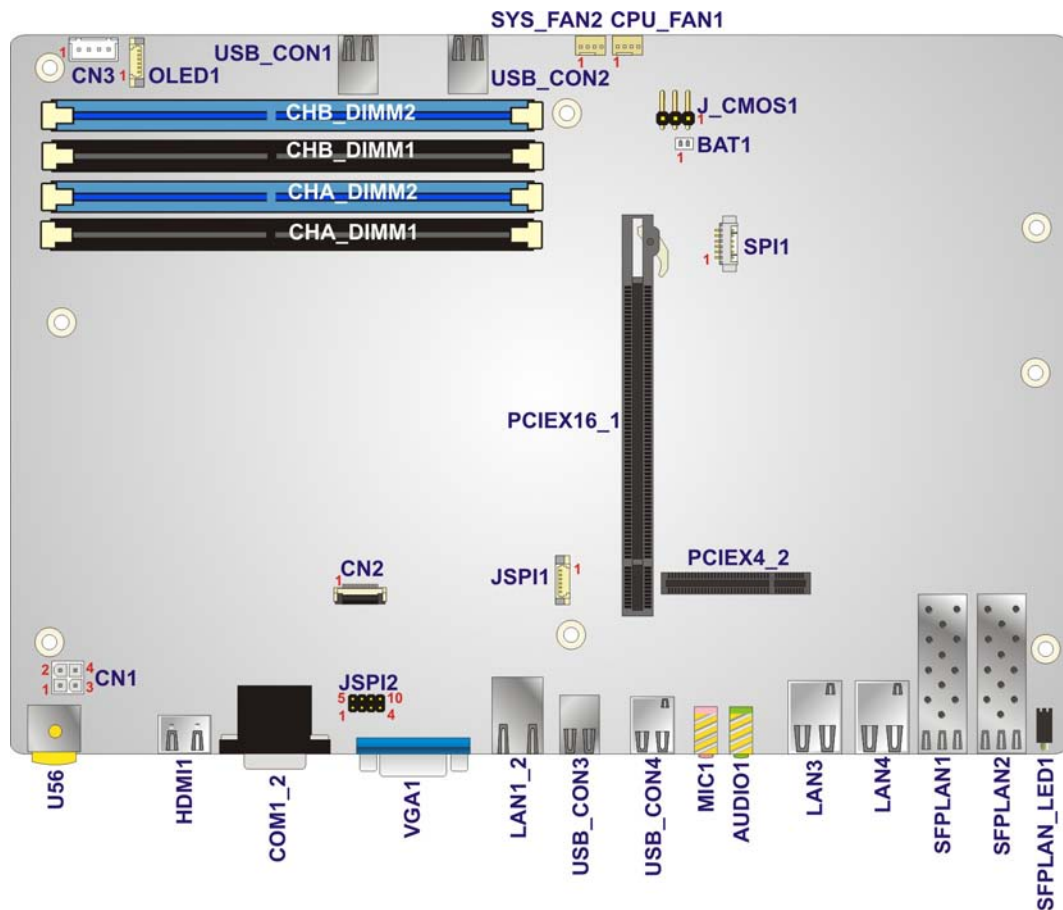
Figure 4-1: Motherboard Layout Diagram

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the TANK-6000-C226 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
12 V power connector	4-pin Molex	CN1
Battery connector	2-pin wafer	BAT1
BMC debug connector	4-pin wafer	J2_BMC
EC debug port connector	20-pin FPC connector	CN2
Fan connectors	4-pin wafer	CPU_FAN1, SYS_FAN2
Flash BIOS ROM connector	6-pin wafer	JSPI1
Flash EC ROM connector	8-pin header	JSPI2
Flash BMC ROM connector	6-pin wafer	SPI1
OLED connector	6-pin wafer	OLED1
Power on connector	4-pin wafer	CN3
Serial ATA 3.0 connectors	Serial ATA 3.0 connector	SATA1

Table 4-1: Peripheral Interface Connectors

4.2.1 12 V Power Connector (CN1)

PIN NO.	DESCRIPTION
1	GND
2	GND
3	VIN
4	VIN

Table 4-2: 12 V Power Connector (CN1) Pinouts

4.2.2 Battery Connector (BAT1)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 4-3: Battery Connector (BAT1) Pinouts

4.2.3 BMC Debug Connector (J2_BMC)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	V_3P3_A	2	BMC_TXD5
3	BMC_RXD5	4	GND

Table 4-4: BMC Debug Connector (J2_BMC) Pinouts

4.2.4 EC Debug Port Connector (CN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_EPP_STB#	2	EC_EPP_PD0
3	EC_EPP_PD1	4	EC_EPP_PD2
5	EC_EPP_PD3	6	EC_EPP_PD4
7	EC_EPP_PD5	8	EC_EPP_PD6
9	EC_EPP_PD7	10	NC
11	EC_EPP_BUSY	12	EC_EPP_KSI5
13	EC_EPP_KSI4	14	EC_EPP_AFD#
15	NC	16	EC_EPP_INIT#
17	EC_EPP_SLIN#	18	GND
19	GND	20	GND

Table 4-5: EC Debug Port Connector (CN2) Pinouts

4.2.5 Fan Connectors (CPU_FAN1, SYS_FAN2)

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

Table 4-6: Fan Connectors (CPU_FAN1, SYS_FAN2) Pinouts

4.2.6 Flash BIOS ROM Connector (JSPI1)

PIN NO.	DESCRIPTION
1	+V3.3M_SPI_CON
2	SPI_CS#0_CN
3	SPI_SO_SW
3	SPI_CLK_SW
5	SPI_SI_SW
6	GND

Table 4-7: Flash BIOS ROM Connector (JSPI1) Pinouts

4.2.7 Flash EC ROM Connector (JSPI2)

PIN NO.	DESCRIPTION
1	+3.3V
2	SPI_CS#
3	SPI_SO
3	NC
5	GND
6	SPI_CLK
7	SPI_SI
8	NC

Table 4-8: Flash EC ROM Connector (JSPI2) Pinouts

4.2.8 Flash BMC ROM Connector (SPI1)

PIN NO.	DESCRIPTION
1	SPI_VCC
2	FLA_CS0_R
3	FLA_D2_R
3	FLA_D0_R
5	FLA_D1_R
6	GND

Table 4-9: Flash BMC ROM Connector (SPI1) Pinouts

4.2.9 OLED Connector (OLED1)

PIN NO.	DESCRIPTION
1	12VWidth
2	V_3P3_A
3	GND
3	OLED_RX
5	OLED_TX
6	GND

Table 4-10: OLED Connector (OLED1) Pinouts

4.2.10 Power on Connector (CN3)

PIN NO.	DESCRIPTION
1	PWRBTSW_BMC
2	GND
3	GND
4	V_3P3_STBY\G

Table 4-11: Power on Connector (CN3) Pinouts

4.2.11 Serial ATA 3.0 connectors (SATA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
S1	GND	P5	GND
S2	SATA_TX2+_C	P6	GND
S3	SATA_TX2-_C	P7	+5V
S4	GND	P8	+5V
S5	SATA_RX2-_C	P9	+5V
S6	SATA_RX2+_C	P10	GND
S7	GND	P11	GND
P1	+3.3V	P12	GND
P2	+3.3V	P13	+12V
P3	+3.3V	P14	+12V
P4	GND	P15	+12V

Table 4-12: Serial ATA 3.0 connectors (SATA1) Pinouts

4.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the TANK-6000-C226 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Audio input & output connectors	Audio jack	MIC1 , AUDIO1
DC-in power connector	4-pin Mini-DIN	U56
Ethernet connectors	RJ-45 (Combo)	LAN1_2
Ethernet connectors	RJ-45	LAN3, LAN4
External Fiber Connector	Fiber LAN port (Combo)	SFPLAN1 , SFPLAN 2
HDMI Connector	HDMI type A port	HDMI1
RS-232 serial port connector	Dual DB-9 Male	COM1_2
USB 3.0 connectors	USB 3.0 port	USB_CON1, USB_CON2, USB_CON4

Connector	Type	Label
USB 2.0 connector	Dual USB 2.0 port	USB_CON3
VGA connector	15-pin female	VGA1

Table 4-13: Rear Panel Connectors

4.3.1 Audio Input & Output Connectors (MIC1, AUDIO1)

PIN NO.	DESCRIPTION
MIC1 (Line_Out)	Connect this port to headphone or speaker
AUDIO1 (Microphone)	Connect this port to microphone

Table 4-14: Audio Input & Output Connectors (MIC1, AUDIO1) Pinouts

4.3.2 DC-in Power Connector (U56)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Vin	2	Vin
3	GND	4	GND

Table 4-15: DC-in Power Connector (U56) Pinouts

4.3.3 Ethernet Connectors (LAN1_2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	LAN1_MDI0P	B1	LAN2_MDI0P
A2	LAN1_MDI0N	B2	LAN2_MDI0N
A3	LAN1_MDI1P	B3	LAN2_MDI1P
A4	LAN1_MDI1N	B4	LAN2_MDI1N
A5	LAN1_MDI2P	B5	LAN2_MDI2P
A6	LAN1_MDI2N	B6	LAN2_MDI2N
A7	LAN1_MDI3P	B7	LAN2_MDI3P
A8	LAN1_MDI3N	B8	LAN2_MDI3N

Table 4-16: Ethernet Connector (LAN1_2) Pinouts

4.3.4 Ethernet Connectors (LAN3, LAN4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
C1	LAN1_MDI0P	C5	LAN1_MDI2P
C2	LAN1_MDI0N	C6	LAN1_MDI2N
C3	LAN1_MDI1P	C7	LAN1_MDI3P
C4	LAN1_MDI1N	C8	LAN1_MDI3N

Table 4-17: Ethernet Connector (LAN3, LAN4) Pinouts

4.3.5 External Fiber Connectors (SFPLAN1, SFPLAN 2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	11	GND
2	SFP1_TXFAULT	12	PHY1_RX_N
3	SFP1_TXDIS	13	PHY1_RX_P
4	2_SPF0_I2C_DAT	14	GND
5	2_SPF0_I2C_CLK	15	V_3P3_FLAN
6	SFP1_MODDET#	16	V_3P3_FLAN
7	SFP1_RATESEL	17	GND
8	SFP1_LOS	18	PHY1_TX_P
9	GND	19	PHY1_TX_N
10	GND	20	GND

Table 4-18: External Fiber Connectors (SFPLAN1, SFPLAN 2) Pinouts

4.3.6 HDMI Connector (HDMI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD

8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

Table 4-19: HDMI Connector (HDMI1) Pinouts

4.3.7 RS-232 Serial Port (COM1_2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	-NDCD1	10	-NDCD2
2	NSIN1	11	NSIN2
3	NSOUT1	12	NSOUT2
4	-NDTR1	13	-NDTR2
5	GND	14	GND
6	-NDSR1	15	-NDSR2
7	-NRTS1	16	-NRTS2
8	-NCTS1	17	-NCTS2
9	-XRI1	18	-XRI2

Table 4-20: RS-232 Serial Port (COM1_2) Pinouts

4.3.8 USB 3.0 Connectors (USB_CON1, USB_CON2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	USB_DATA-
3	USB_DATA+	4	GND
5	USB3_RX-	6	USB3_RX+
7	GND	8	USB3_TX-
9	USB3_TX+		

Table 4-21: USB 3.0 Connector (USB_CON1, USB_CON2) Pinouts

4.3.9 USB 3.0 Connectors (USB_CON4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION

1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_ DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_ RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 4-22: USB 3.0 Connector (USB_CON4) Pinouts

4.3.10 USB 2.0 Connectors (USB_CON3)

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

Table 4-23: USB 3.0 Connector (USB_CON3) Pinouts

4.3.11 VGA Connector (VGA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDA
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-24: VGA Connector (VGA1) Pinouts

Chapter

5

BIOS

5.1 Introduction

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

![NOTE icon] **NOTE:**

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in **Table 5-1**.

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

Key	Function
-	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
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.

5.1.5 BIOS Menu Bar

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

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

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

5.2 Main

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

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main    Advanced   Chipset     Boot     Security  Save & Exit

  BIOS Information                                            Set the Date. Use Tab to
  BIOS Vendor                 American Megatrends             switch between Data
  Core Version                4.6.5.4                         elements.
  Compliency                  UEFI 2.3.1;PI 1.2
  Project Version             SE71AR07.ROM
  Build Date                  12/20/2013 20:05:21

  iWDD Vendor                 iEi
  iWDD Version                SE71ER16.bin

  IPMI Module State           AST2400 is present

  Processor Information
  Name                        Haswell
  Brand String                Intel(R) Core(TM) i7-477
  Frequency                   3100MHz
  Processor ID                306c3
  Stepping                    C0
  Number of Processors        4Core(s) / 8Thread(s)
  Microcode Revision          16
  GT Info                     GT2 (700MHz)

  IGFX VBIOS Version          2178
  Memory RC Version           1.6.2.1
  Total Memory                4096 MB (DDR3)
  Memory Frequency            1600 Mhz

  PCH Information
  Name                        LynxPoint
  PCH SKU                     C226
  Stepping                    05/C2
  LAN PHY Revision            A3                             ----------------------

  ME FW Version               9.0.22.1467
  ME Firmware SKU             5MB                            ←→: Select Screen
                                                            ↑ ↓: Select Item
  SPI Clock Frequency                                       EnterSelect
  DOFR Support                Supported                     + -: Change Opt.
  Read Status Clock Frequency 50MHz                         F1:  General Help
  Write Status Clock Frequency 50MHz                        F2:  Previous Values
  Fast Read Status Clock      50MHz                         F3:  Optimized Defaults
  Frequency                                                 F4:  Save & Exit
                                                            ESC: Exit
  System Date                      [Tue 01/14/2014]
  System Time                      [15:10:27]
  Access Level                     Administrator

        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 1: Main

The Main menu lists the following system details:

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

The Main menu has two user configurable fields:

➔ System Date [xx/xx/xx]

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

➔ System Time [xx:xx:xx]

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

5.3 Advanced

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

WARNING!

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

```
        Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
   Main   Advanced   Chipset    Boot    Security  Save & Exit

 > ACPI Settings                                     System ACPI Parameters
 > RTC Wake Settings
 > CPU Configuration
 > SATA Configuration
 > Intel(R) Rapid Start Technology                   ---------------------
 > AMT Configuration
 > USB Configuration                                 ←→: Select Screen
 > F81866 Super IO Configuration                     ↑ ↓: Select Item
 > iWDD H/W Monitor                                  EnterSelect
 > Serial Port Console Configuration                 + -  Change Opt.
 > iEi Feature                                       F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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

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

 ACPI Settings                                       Select the highest ACPI
                                                     sleep state the system
 ACPI Sleep State               [S1 only (CPU Stop C…)]  will enter when the
                                                     SUSPEND button is
                                                     pressed.


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

                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     EnterSelect
                                                     + -  Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
         Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 3: ACPI Configuration

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

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

➔ **S1 only (CPU Stop   DEFAULT   Clock)**

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

➔ **S3 only (Suspend to RAM)**

The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event. The RTC wake function is supported in ACPI (S3/S4/S5) and APM soft off modes.

```
          Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
             Advanced

Wake System with Fixed Time      [Disabled]          Enables or Disables
                                                     system wake on alarm
                                                     event. When enabled,
                                                     system will wake on the
                                                     date: hr: min: sec
                                                     specified.


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

                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     Enter Select
                                                     + -  Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
          Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 4: RTC Wake Settings

➔ Wake System with Fixed Time [Disabled]

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

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

➔ **Enabled** If selected, the following appears with values that can be selected:

*Wake up every day

*Wake up date

*Wake up hour

*Wake up minute

*Wake up second

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

5.3.3 CPU Information

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

```
           Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
              Advanced

 CPU Information                                        Enable for Windows XP and
                                                        Linux (OS optimized for
 Intel® COR(TM) i7-4770S CPU @ 3.10GHz                  Hyper-Threading
 CPU Signature                    306c3                 Technology and Disabled
 Microcode Patch                  16                    for other OS (OS not
 Max CPU Speed                    3100 MHz              optimized for
 Min CPU Speed                    800 MHz              Hyper-Threading
 CPU Speed                        3100 MHz              Technology). When
 Processor Cores                  4                     Disabled only one thread
 Intel HT Technology              Supported             per enabled core is
 Intel VT-x Technology            Supported             enabled.
 Intel SMX Technology             Supported
 64-bit                           Supported
 EIST Technology                  Supported             ----------------------

 L1 Data ache                     32 kB x 4            ←→: Select Screen
 L1 Code Cache                    32 kB x 4            ↑ ↓: Select Item
 L2 Cache                         256 kB x 4           Enter Select
 L3 Cache                         8192 kB              + -  Change Opt.
                                                        F1   General Help
 Hyper-Threading                  [Enabled]            F2   Previous Values
 Active Processor Cores           [All]                F3   Optimized Defaults
 Intel Virtualization Technology  [Disabled]           F4   Save & Exit
 EIST                             [Enabled]            ESC  Exit
 Intel TXT(LT) Support            [Disabled]

           Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 5: CPU Information

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

- ▪ Processor Type: Lists the brand name of the CPU being used
- ▪ CPU Signature: Lists the CPU signature value.
- ▪ Microcode Patch: Lists the microcode patch being used.
- ▪ Max CPU Speed: Lists the maximum CPU processing speed.
- ▪ Min CPU Speed: Lists the minimum CPU processing speed.
- ▪ CPU Speed: Lists the CPU processing speed.
- ▪ Processor Cores: Lists the number of the processor core
- ▪ Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- ▪ Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.

- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- EIST Technology: Indicates if Enhanced Intel SpeedStep® Techonology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ Hyper-threading [Enabled]

Use the **Hyper-threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

➔ **Disabled**   Disables the Intel Hyper-Threading Technology.

➔ **Enabled**   DEFAULT   Enables the Intel Hyper-Threading Technology.

➔ Active Processor Cores [All]

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

➔ **All**   DEFAULT   Enable all cores in the processor package.

➔ **1**   Enable one core in the processor package.

➔ **2**   Enable two cores in the processor package.

➔ **3**   Enable three cores in the processor package.

➔ Intel Virtualization Technology [Disabled]

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

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

➔ **Enabled**   Enables Intel Virtualization Technology.

➔ EIST [Enabled]

Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

➔ **Disabled**   Disables Enhanced Intel SpeedStep® Techonology.

➔ **Enabled**   DEFAULT   Enables Enhanced Intel SpeedStep® Techonology.

5.3.4 SATA Configuration

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

```
          Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
            Advanced

SATA Controller(s)              [Enabled]           Enable or disable SATA
SATA Mode Selection             [IDE]               Device

SATA1 Port                      Empty
SATA2 Port                      Empty
SATA3 Port                      Empty


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

                                                    ←→: Select Screen
                                                    ↑ ↓: Select Item
                                                    Enter Select
                                                    + -  Change Opt.
                                                    F1   General Help
                                                    F2   Previous Values
                                                    F3   Optimized Defaults
                                                    F4   Save & Exit
                                                    ESC  Exit
          Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 6: SATA Configuration

➔ SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to enable or disable the serial ATA controller.

➔ **Enabled**   DEFAULT   Enables the on-board SATA controller.

➔ **Disabled**   Disables the on-board SATA controller.

➔ SATA Mode Selection [IDE Mode]

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

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

➔ **AHCI**   Configures SATA devices as AHCI device.

➔ **RAID**   Configures SATA devices as RAID device.

5.3.5 Intel(R) Rapid Start Technology

Use the **Intel(R) Rapid Start Technology** menu to configure Intel® Rapid Start Technology support.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
    Advanced

Intel(R) Rapid Start Technology  [Disabled]             Enable or disable
                                                        Intel(R) Rapid Start
                                                        Technology.


                                                        ---------------------
                                                        ←→: Select Screen
                                                        ↑ ↓: Select Item
                                                        Enter Select
                                                        + -   Change Opt.
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
   BIOS Menu 7: Intel(R) Rapid Start Technology

➔ Intel(R) Rapid Start Technology [Disabled]

Use **Intel(R) Rapid Start Technology** option to enable or disable the Intel® Rapid Start Technology function.

➔ **Disabled**   **DEFAULT**   Intel® Rapid Start Technology is disabled

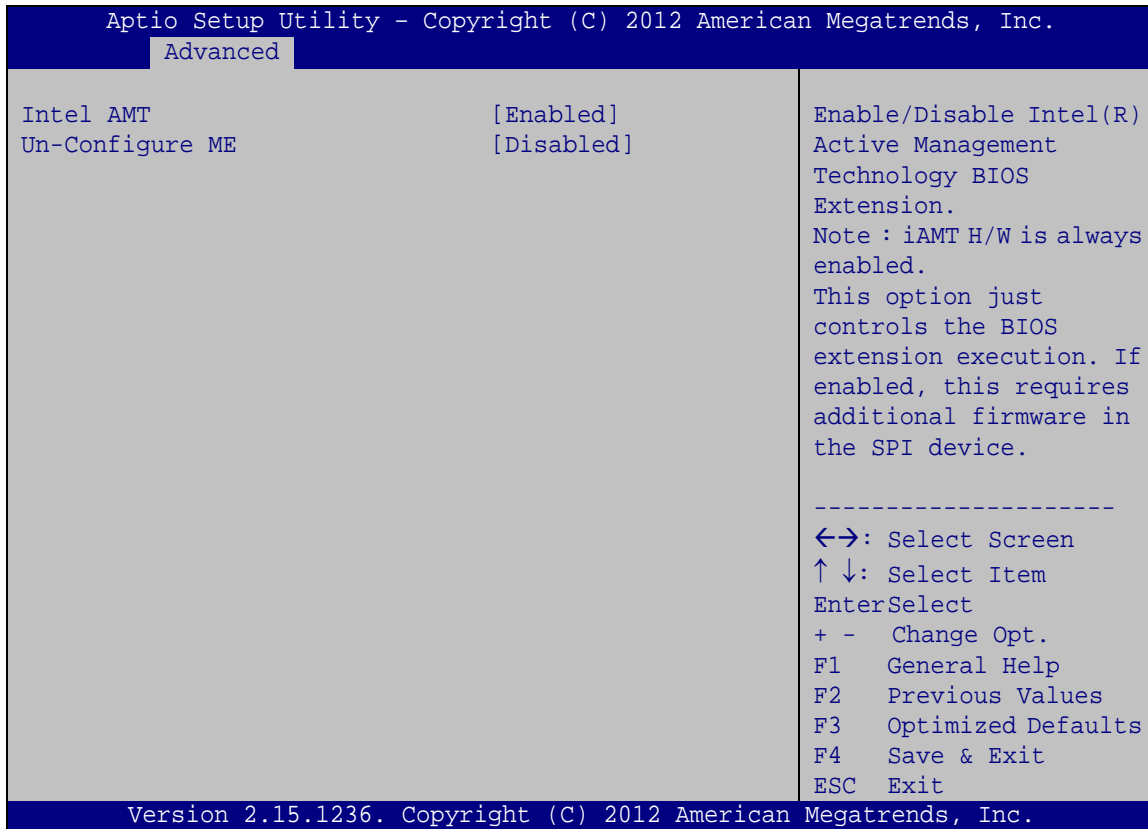→ **Enabled**   Intel® Rapid Start Technology is enabled

5.3.6 AMT Configuration

The **AMT Configuration** submenu (**BIOS Menu 8**) allows Intel® Active Management Technology (AMT) options to be configured.

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
           Advanced

 Intel AMT                          [Enabled]           Enable/Disable Intel(R)
 Un-Configure ME                    [Disabled]          Active Management
                                                        Technology BIOS
                                                        Extension.
                                                        Note : iAMT H/W is always
                                                        enabled.
                                                        This option just
                                                        controls the BIOS
                                                        extension execution. If
                                                        enabled, this requires
                                                        additional firmware in
                                                        the SPI device.

                                                        --------------------
                                                        ←→: Select Screen
                                                        ↑ ↓: Select Item
                                                        Enter Select
                                                        + -   Change Opt.
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 8: AMT Configuration

→ Intel AMT [Enabled]

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

→ **Disabled**   Intel® AMT BIOS Extension is disabled
→ **Enabled**   DEFAULT   Intel® AMT BIOS Extension is enabled
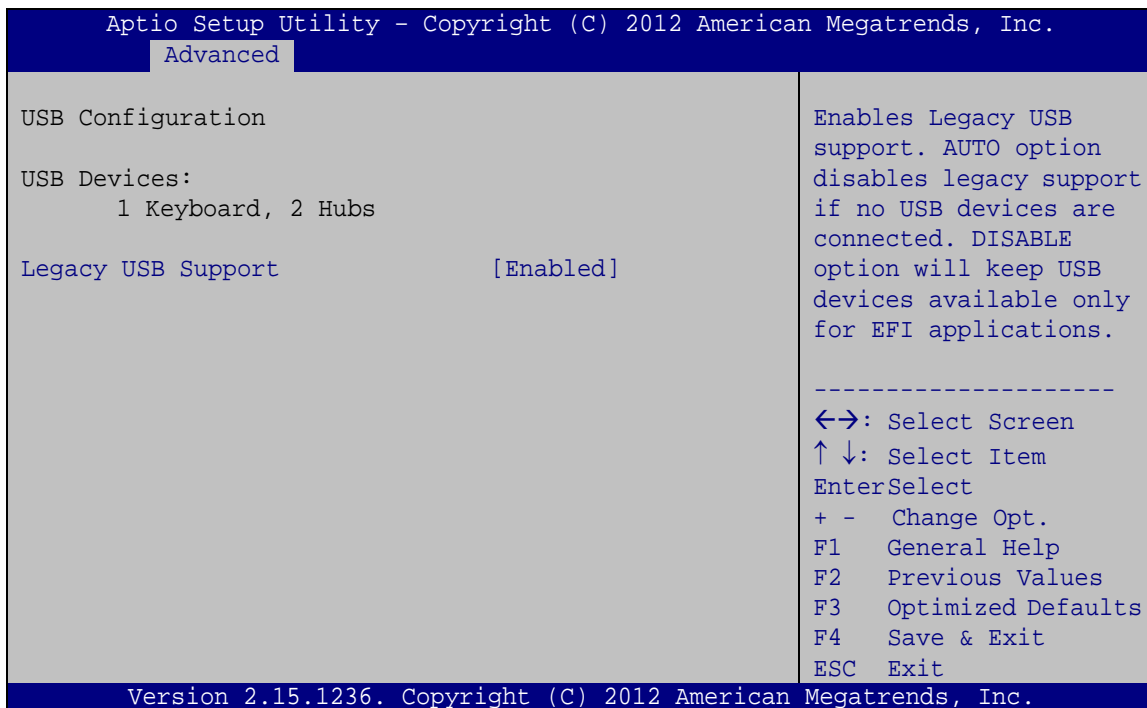
→ Unconfigure ME [Disabled]

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

➔ **Disabled**   DEFAULT   Disable ME unconfigure

➔ **Enabled**   Enable ME unconfigure

5.3.7 USB Configuration

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

```
        Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
          Advanced

USB Configuration                                          Enables Legacy USB
                                                           support. AUTO option
USB Devices:                                               disables legacy support
      1 Keyboard, 2 Hubs                                   if no USB devices are
                                                           connected. DISABLE
Legacy USB Support                     [Enabled]           option will keep USB
                                                           devices available only
                                                           for EFI applications.

                                                           --------------------
                                                           ←→: Select Screen
                                                           ↑ ↓: Select Item
                                                           Enter Select
                                                           + -  Change Opt.
                                                           F1   General Help
                                                           F2   Previous Values
                                                           F3   Optimized Defaults
                                                           F4   Save & Exit
                                                           ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
   BIOS Menu 9: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system
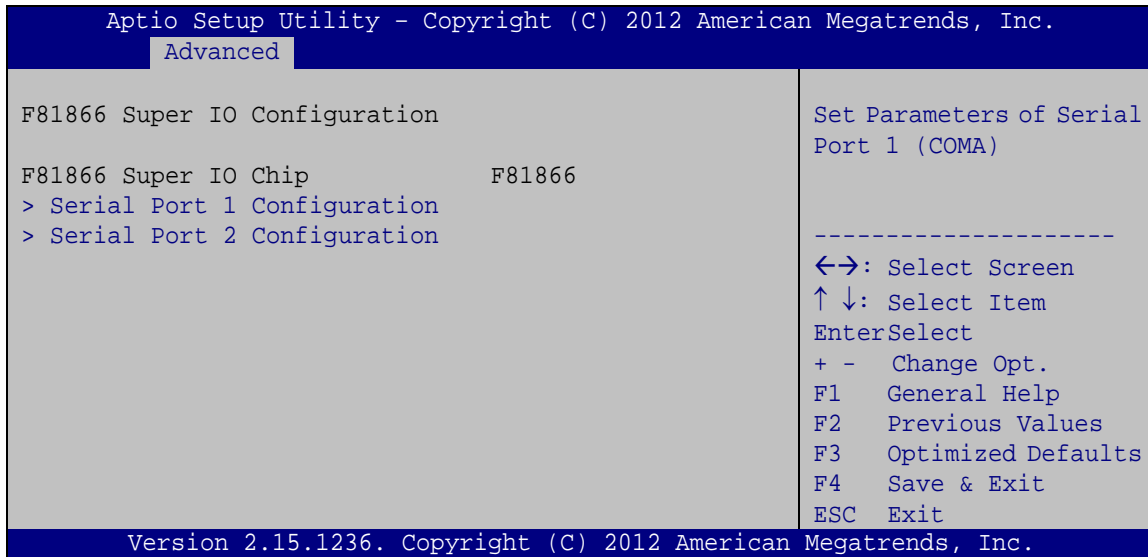
➔ **Legacy USB Support [Enabled]**

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

5.3.8 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 10**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.
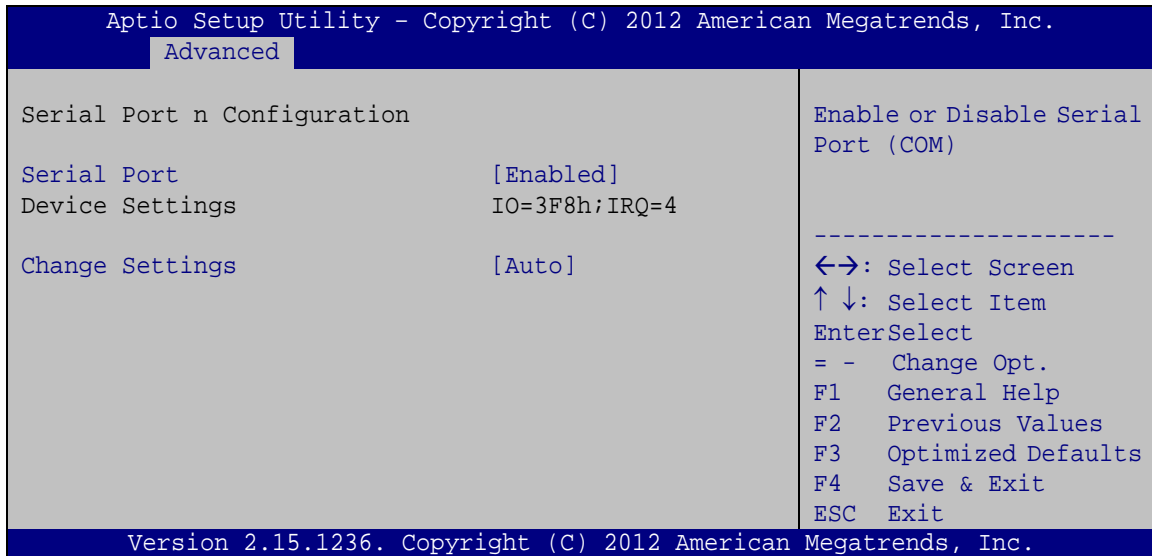
```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
           Advanced

F81866 Super IO Configuration                          Set Parameters of Serial
                                                       Port 1 (COMA)
F81866 Super IO Chip            F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration                          --------------------
                                                       ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       Enter Select
                                                       + -  Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 10: F81866 Super IO Configuration

5.3.8.1 Serial Port n Configuration

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

```
        Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
              Advanced

Serial Port n Configuration                          Enable or Disable Serial
                                                     Port (COM)
Serial Port                     [Enabled]
Device Settings                 IO=3F8h;IRQ=4
                                                     --------------------
Change Settings                 [Auto]               ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     Enter Select
                                                     = -  Change Opt.
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
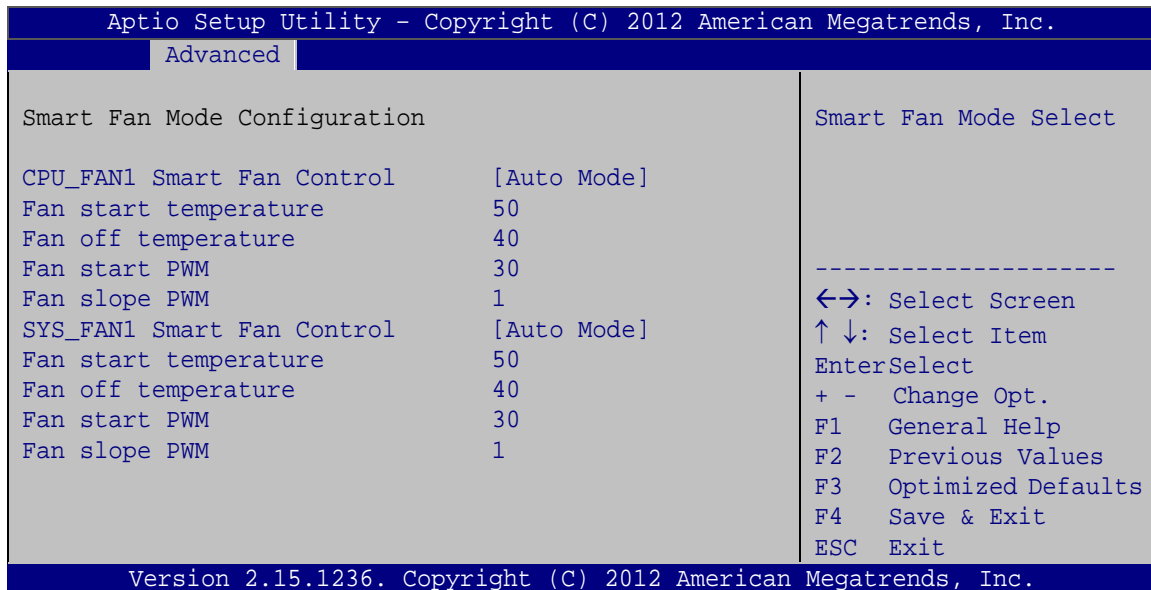
BIOS Menu 11: Serial Port n Configuration Menu

5.3.8.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**   Disable the serial port

➔ **Enabled**   DEFAULT   Enable the serial port

➔ Change Settings [Auto]

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

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

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

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

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

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

5.3.8.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**   Disable the serial port

➔ **Enabled** **DEFAULT**   Enable the serial port

➔ Change Settings [Auto]

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

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

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

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

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

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

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

5.3.9 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 12**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
        Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Advanced

PC Health Status                                      Smart Fan Mode Select

> Smart Fan Mode Configuration
CPU Temperature                 :+49 C
SYS Temperature                 :+27 C
CPU_FAN1 Speed                  :709 RPM             ---------------------
SYS_FAN1 Speed                  :N/A
CPU_CORE                        :+1.743 V            ←→: Select Screen
+5V                             :+5.126 V            ↑ ↓: Select Item
+12V                            :+12.175 V           Enter Select
DDR                             :+1.502 V            + -  Change Opt.
+5VSB                           :+4.896 V            F1   General Help
+3.3V                           :+3.357 V            F2   Previous Values
+3.3VSB                         :+3.276 V            F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 12: iWDD H/W Monitor

➔ **PC Health Status**

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

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - CPU_CORE
  - +5V
  - +12V
  - DDR
  - +5VSB

○ +3.3V

○ +3.3VSB

5.3.9.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 13**) to configure smart fan temperature and speed settings.

```
         Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
          Advanced

Smart Fan Mode Configuration                         Smart Fan Mode Select

CPU_FAN1 Smart Fan Control       [Auto Mode]
Fan start temperature            50
Fan off temperature              40
Fan start PWM                    30                  ---------------------
Fan slope PWM                    1                   ←→: Select Screen
SYS_FAN1 Smart Fan Control       [Auto Mode]         ↑↓: Select Item
Fan start temperature            50                  Enter Select
Fan off temperature              40                  + -  Change Opt.
Fan start PWM                    30                  F1   General Help
Fan slope PWM                    1                   F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 13: Smart Fan Mode Configuration

➔ CPU_FAN1 Smart Fan Control/SYS_FAN1 Smart Fan Control [Auto Mode]

Use the **CPU_FAN1 Smart Fan Control/SYS_FAN1 Smart Fan Control** option to configure the CPU/System Smart Fan.

➔ **Auto Mode**   DEFAULT   The fan adjusts its speed using Auto Mode settings.

➔ **Manual Mode**   The fan spins at the speed set in Manual Mode settings.

➔ Fan start/off temperature

Use the + or – key to change the **Fan start/off temperature** value. Enter a decimal number between 1 and 100.

➔ Fan start PWM

Use the + or – key to change the **Fan start PWM** value. Enter a decimal number between 1 and 128.

➔ Fan slope PWM

Use the + or – key to change the **Fan slope PWM** value. Enter a decimal number between 1 and 64.

5.3.10 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.

```
         Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
           Advanced

  COM1                                            Console Redirection
  Console Redirection           [Disabled]        Enable or Disable
> Console Redirection Settings

  COM2
  Console Redirection           [Disabled]
> Console Redirection Settings

  COM3 (BMC)
  Console Redirection           [Disabled]        --------------------
> Console Redirection Settings                    ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  Enter Select
  iAMT SOL                                         +/-: Change Opt.
                                                  F1   General Help
  COM8(Pci Bus0,Dev22,Func3)                      F2   Previous Values
  Console Redirection           [Disabled]        F3   Optimized Defaults
> Console Redirection Settings                    F4   Save & Exit
                                                  ESC  Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
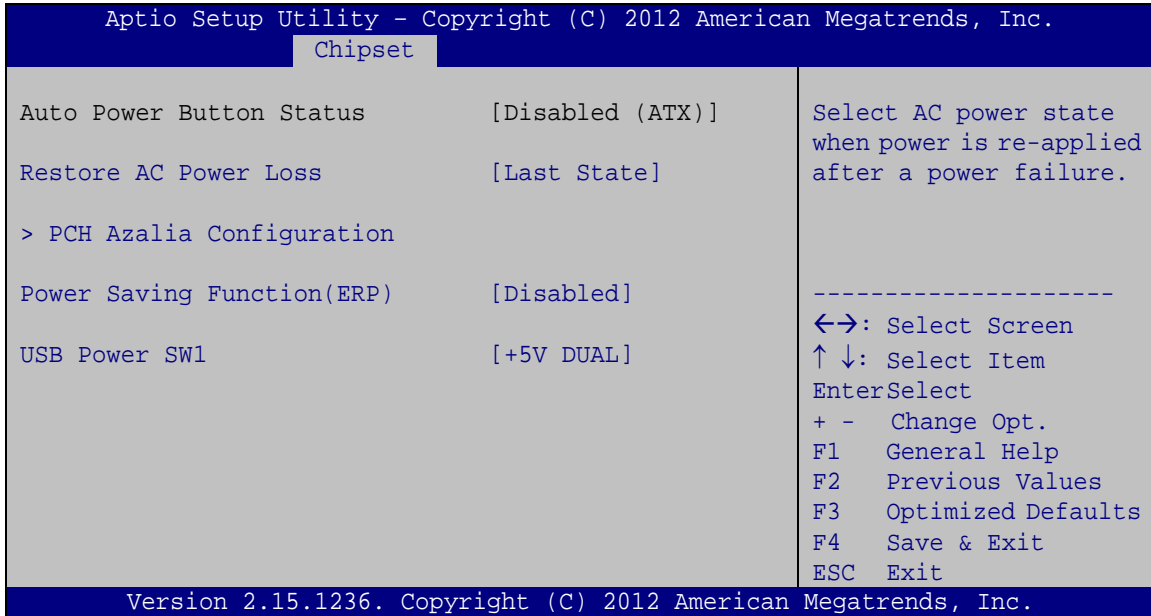
BIOS Menu 14: Serial Port Console Redirection

➔ 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

The following options are available in the **Console Redirection Settings** submenu when the Console Redirection option is enabled.

➔   Terminal Type [ANSI]

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

➔   **VT100**   The target terminal type is VT100

➔   **VT100+**   The target terminal type is VT100+

➔   **VT-UTF8**   The target terminal type is VT-UTF8

➔   **ANSI**   **DEFAULT**   The target terminal type is ANSI

➔   Bits per second [115200]

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

➔   **9600**   Sets the serial port transmission speed at 9600.

➔   **19200**   Sets the serial port transmission speed at 19200.

➔   **57600**   Sets the serial port transmission speed at 57600.

➔   **115200**   **DEFAULT**   Sets the serial port transmission speed at 115200.

➔   Data Bits [8]

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

➔   **7**   Sets the data bits at 7.

➔   **8**   **DEFAULT**   Sets the data bits at 8.

➔   Parity [None]

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

 → **None** DEFAULT No parity bit is sent with the data bits.

 → **Even** The parity bit is 0 if the number of ones in the data bits is even.

 → **Odd** The parity bit is 0 if the number of ones in the data bits is odd.

 → **Mark** The parity bit is always 1. This option does not provide error detection.

 → **Space** The parity bit is always 0. This option does not provide error detection.

→ Stop Bits [1]

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

 → **1** DEFAULT Sets the number of stop bits at 1.

 → **2** Sets the number of stop bits at 2.

5.3.11 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 15**) to configure IEI One Key Recovery function.

```
         Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
           Advanced

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

                                                     --------------------
                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-:  Change Opt.
                                                     F1:   General Help
                                                     F2:   Previous Values
                                                     F3:   Optimized Defaults
                                                     F4:   Save & Exit
                                                     ESC: Exit
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 15: iEi Feature

➔ Auto Recovery Function [Disabled]

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

➔ **Disabled** DEFAULT Auto recovery function disabled

➔ **Enabled** Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 16**) to access the PCH-IO and System Agent (SA) Subsystem configuration menus.

⚡ **WARNING!**

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

```
       Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
   Main    Advanced   Chipset    Boot    Security  Save & Exit

> PCH-IO Configuration                          PCH Parameters.
> System Agent (SA) Configuration

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

         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
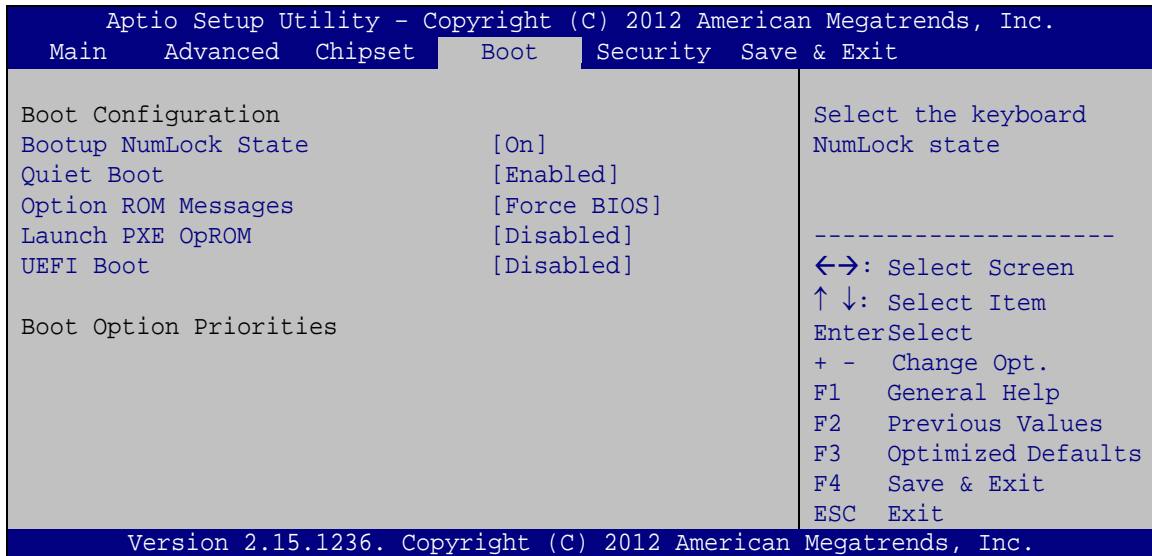   **BIOS Menu 16: Chipset**

5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 17**) to configure the PCH chipset.

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                         Chipset

Auto Power Button Status        [Disabled (ATX)]        Select AC power state
                                                        when power is re-applied
Restore AC Power Loss           [Last State]            after a power failure.

> PCH Azalia Configuration

Power Saving Function(ERP)      [Disabled]              --------------------
                                                        ←→: Select Screen
USB Power SW1                    [+5V DUAL]             ↑ ↓: Select Item
                                                        Enter Select
                                                        + -  Change Opt.
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 17: PCH-IO Configuration

➔ 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.

➔ Power Saving Function [Disabled]

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

➔ **Disabled**   DEFAULT   Power Saving Function support disabled

➔ **Enabled**   Power Saving Function support enabled

➔ USB Power SW1 [+5V DUAL]

Use the **USB Power SW1** BIOS option to configure the USB power source for the corresponding USB connector.

➔ **+5V**   Set the USB power source to +5V
➔ **+5V DUAL**   DEFAULT   Set the USB power source to +5V dual

5.4.1.1 PCH Azalia Configuration

Use the **PCH Azalia Configuration** submenu (**BIOS Menu 18**) to configure the PCH Azalia codec.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
                 Chipset

PCH Azalia Configuration                           Control Detection of the
                                                   Azalia device.
Azalia (HD Audio)                 [Enabled]        Disabled=Azalia will be
                                                   unconditionally
                                                   disabled.
                                                   Enabled=Azalia will be
                                                   unconditionally
                                                   Enabled.

                                                   --------------------
                                                   ←→: Select Screen
                                                   ↑↓: Select Item
                                                   Enter Select
                                                   + -   Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
   BIOS Menu 18: PCH Azalia Configuration

➔ Azalia [Enabled]

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

➔ **Disabled**   The onboard High Definition Audio controller is disabled

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

5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 19**) to configure the video
device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
    Advanced

VT-d                              [Enabled]              Check to enable VT-d
                                                         function on MCH.
> Graphics Configuration
> NB PCIe Configuration
> Memory Configuration                                   --------------------
                                                         ←→: Select Screen
                                                         ↑ ↓: Select Item
                                                         Enter Select
                                                         +/-: Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save
                                                         ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
BIOS Menu 19: System Agent (SA) Configuration

➔ VT-d [Enabled]

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

➔ **Disabled**   Disables VT-d support.

➔ **Enabled**   DEFAULT   Enables VT-d support.

5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** submenu (**BIOS Menu 20**) to configure the graphics settings.

```
           Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
                         Chipset

Graphics Configuration                                        Select which of
                                                             IGFX/PEG/PCI Graphics
Primary Display                    [Auto]                    device should be Primary
DVMT Pre-Allocated                 [256M]                    Display Or select SG for
DVMT Total Gfx Mem                 [MAX]                     Switchable Gfx.
> LCD Control
                                                             --------------------
                                                             ←→: Select Screen
                                                             ↑↓: Select Item
                                                             Enter Select
                                                             + -  Change Opt.
                                                             F1   General Help
                                                             F2   Previous Values
                                                             F3   Optimized Defaults
                                                             F4   Save & Exit
                                                             ESC  Exit
           Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
   BIOS Menu 20: Graphics Configuration

➔ **Primary Display [Auto]**

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

- Auto   **DEFAULT**
- IGFX
- PEG
- PCIE/PCI

➔ **DVMT Pre-Allocated [256M]**

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

➔ **32M**   32 MB of memory used by internal graphics device

➔ **64M** 64 MB of memory used by internal graphics device

➔ **128M** 128 MB of memory used by internal graphics device

➔ **256M** DEFAULT 256 MB of memory used by internal graphics device

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

➔ DVMT Total Gfx Mem [Max]

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

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

5.4.2.1.1 LCD Control

Use the **LCD Control** submenu (**BIOS Menu 21**) to select a display device which will be activated during POST.

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                        Chipset

LCD Control                                      Select the Video Device
                                                 which will be activated
Primary IGFX Boot Display        [VBIOS Default]  during POST. This has no
                                                 effect if external
                                                 graphics present.
                                                 Secondary boot display
                                                 selection will appear
                                                 based on your selection.
                                                 VGA modes will be
                                                 supported only on
                                                 primary display.

                                                 ----------------------
                                                 →←: Select Screen
                                                 ↑ ↓: Select Item
                                                 Enter: Select
                                                 +/-:  Change Opt.
                                                 F1:   General Help
                                                 F2:   Previous Values
                                                 F3:   Optimized Defaults
                                                 F4:   Save & Exit
                                                 ESC: Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 21: LCD Control

➔   Primary IGFX Boot Display [VBIOS Default]

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

- VBIOS Default   DEFAULT
- CRT
- HDMI

5.4.2.2 NB PCIe Configuration

Use the **NB PCIe Configuration** submenu (**BIOS Menu 22**) to configure the northbridge PCIe settings.

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                        Chipset

NB PCIe Configuration                                      Configure PEG0 B0:D1:F0
PEG0                              x0 Gen1                  Gen1-Gen3 (PCIEX16_1
  PEG0-Gen X                      [Gen1]                   Slot)

Enable PEG                        [Enabled]
Detect Non-Compliance Device      [Enabled]                --------------------

                                                           ←→: Select Screen
                                                           ↑ ↓: Select Item
                                                           EnterSelect
                                                           + -  Change Opt.
                                                           F1   General Help
                                                           F2   Previous Values
                                                           F3   Optimized Defaults
                                                           F4   Save & Exit
                                                           ESC  Exit
            Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 22: NB PCIe Configuration

➔ **PEG0-Gen X [Gen1]**

Use the **PEG0-Gen X** option to configure PEG0 B0:D1:F0. Configuration options are listed below.

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

➔ **Enable PEG [Enabled]**

Use the **Enable PEG** option to enable or disable PEG.

➔ **Disabled**   Disables PEG.

➔ **Enabled**   **DEFAULT**   Enables PEG.

➔ **Auto**   Automatically detect PEG

➔ Detect Non-Compliance [Enabled]

Use the **Detect Non-Compliance** option to detect non-compliance PCIe device in PEG.

➔ **Disabled**   Do not detect non-compliance PCIe device in PEG

➔ **Enabled**   DEFAULT   Detect non-compliance PCIe device in PEG

5.4.2.3 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 23**) to configure the Memory settings.

```
 Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
                   Chipset

Memory Information

Total Memory                    4096 MB (DDR3)
CHA_DIMM1                       Not Present              --------------------
CHA_DIMM2                       2048 MB (DDR3)           ←→: Select Screen
CHB_DIMM1                       2048 MB (DDR3)           ↑ ↓: Select Item
CHB_DIMM2                       Not Present              Enter Select
                                                        + -   Change Opt.
                                                        F1    General Help
                                                        F2    Previous Values
                                                        F3    Optimized Defaults
                                                        F4    Save & Exit
                                                        ESC   Exit

   Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 23: Memory Configuration

5.5 Boot

Use the **Boot** menu (**BIOS Menu 24**) to configure system boot options.

```
          Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot     Security  Save & Exit

 Boot Configuration                                     Select the keyboard
 Bootup NumLock State            [On]                   NumLock state
 Quiet Boot                      [Enabled]
 Option ROM Messages             [Force BIOS]
 Launch PXE OpROM                [Disabled]             --------------------
 UEFI Boot                       [Disabled]             ←→: Select Screen
                                                        ↑ ↓: Select Item
 Boot Option Priorities                                 Enter Select
                                                        + -   Change Opt.
                                                        F1    General Help
                                                        F2    Previous Values
                                                        F3    Optimized Defaults
                                                        F4    Save & Exit
                                                        ESC   Exit
          Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```
   BIOS Menu 24: Boot

➔ **Bootup NumLock State [On]**

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

➔ **On**   DEFAULT   Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off**   Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

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

➔ **Disabled**   Normal POST messages displayed

➔ **Enabled**   **DEFAULT**   OEM Logo displayed instead of POST messages

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

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

➔ **Force BIOS**   **DEFAULT**   Sets display mode to force BIOS.

➔ **Keep Current**   Sets display mode to current.

➔ **Launch PXE OpROM [Disabled]**

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

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

➔ **Enabled**   Load PXE Option ROMs

➔ **UEFI Boot [Disabled]**

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

➔ **Disabled**   **DEFAULT**   Disable to boot from a UEFI device.

➔ **Enabled**   Enable to boot from a UEFI device.

➔ **Boot Option Priority**

Use the **Boot Option Priority** function to set the system boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

5.6 Security

Use the **Security** menu (**BIOS Menu 25**) to set system and user passwords.

```
         Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot    Security  Save & Exit

 Password Description                               Set Administrator
                                                    Password
 If ONLY the Administrator's password is set,
 then this only limits access to Setup and is
 only asked for when entering Setup.               --------------------
 If ONLY the User's password is set, then this
 is a power on password and must be entered to     ←→: Select Screen
 boot or enter Setup. In Setup the User will       ↑ ↓: Select Item
 have Administrator rights.                         Enter Select
 The password must be                              + -  Change Opt.
 In the following range:                           F1   General Help
 Maximum length                   3                F2   Previous Values
 Minimum length                   20               F3   Optimized Defaults
                                                    F4   Save & Exit
 Administrator Password                            ESC  Exit
 User Password
         Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 25: Security

➔ **Administrator Password**

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

➔ **User Password**

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

5.7 Exit

Use the **Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
     Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
  Main    Advanced   Chipset     Boot    Security  Save & Exit

  Save Changes and Reset                           Exit the system after
  Discard Changes and Reset                        saving the changes.

  Restore Defaults
  Save as User Defaults
  Restore User Defaults
                                                   --------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   Enter Select
                                                   + -  Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
        Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

BIOS Menu 26: Exit

➔ **Save Changes and Reset**

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

➔ **Discard Changes and Reset**

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

➔ **Restore Defaults**

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

➔ **Save as User Defaults**

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

➔ **Restore User Defaults**

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

Appendix

A

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed.
Failure to follow these precautions may result in permanent damage to
the TANK-6000-C226.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- *Follow the electrostatic precautions* outlined below whenever the
  TANK-6000-C226 is opened.
- *Make sure the power is turned off and the power cord is disconnected*
  whenever the TANK-6000-C226 is being installed, moved or modified.
- *Do not apply voltage levels that exceed the specified voltage range*.
  Doing so may cause fire and/or an electrical shock.
- *Electric shocks can occur* if the TANK-6000-C226 chassis is opened when
  the TANK-6000-C226 is running.
- *Do not drop or insert any objects* into the ventilation openings of the
  TANK-6000-C226.
- *If considerable amounts of dust, water, or fluids enter the*
  TANK-6000-C226, turn off the power supply immediately, unplug the power
  cord, and contact the TANK-6000-C226 vendor.
- **DO NOT**:
  - Drop the TANK-6000-C226 against a hard surface.
  - Strike or exert excessive force onto the system.
  - Touch any of the system with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-6000-C226 may result in permanent damage to the TANK-6000-C226 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-6000-C226. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-6000-C226 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband**: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- **Self-grounding**: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad**: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- **Only handle the edges of the electrical component**: When handling the electrical component, hold the electrical component by its edges.

A.1.3 Product Disposal

> **⚠ CAUTION:**
>
> Risk of explosion if battery is replaced by and incorrect type. Only certified engineers should replace the on-board battery.
>
> Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:
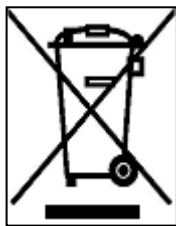
EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-6000-C226, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-6000-C226, please read the details below.

- The interior of the TANK-6000-C226X does not require cleaning. Keep fluids away from the TANK-6000-C226 interior.

- Be cautious of all small removable components when vacuuming the TANK-6000-C226.

- Turn the TANK-6000-C226 off before cleaning the TANK-6000-C226.

- Never drop any objects or liquids through the openings of the TANK-6000-C226.

- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-6000-C226.

- Avoid eating, drinking and smoking within vicinity of the TANK-6000-C226.

A.2.2 Cleaning Tools

Some components in the TANK-6000-C226 may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the TANK-6000-C226.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-6000-C226.

- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-6000-C226.

- **Using solvents** – The use of solvents is not recommended when cleaning the LTANK-6000-C226 as they may damage the plastic parts.

- **Vacuum cleaner** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the TANK-6000-C226. Dust and dirt can restrict the airflow in the TANK-6000-C226 and cause its circuitry to corrode.

- **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.

- **Foam swabs** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

BIOS Menu Options

Appendix

C

One Key Recovery

C.1 One Key Recovery Introduction

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

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

The IEI One Key Recovery tool menu is shown below.
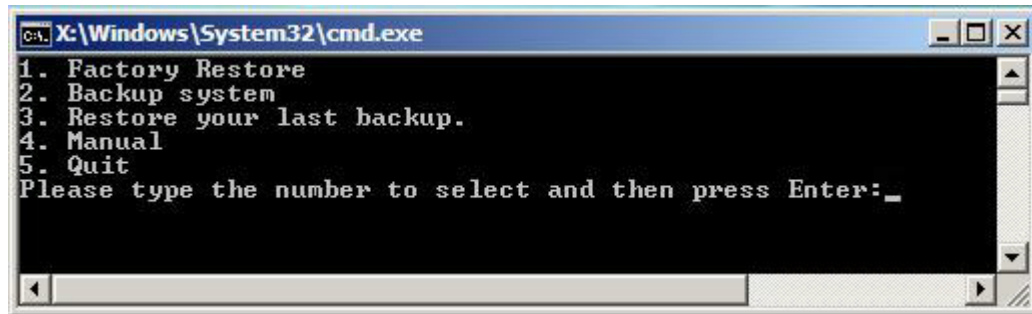
Figure C-1: IEI One Key Recovery Tool Menu

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

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

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

![NOTE icon] **NOTE:**

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

C.1.1 System Requirement

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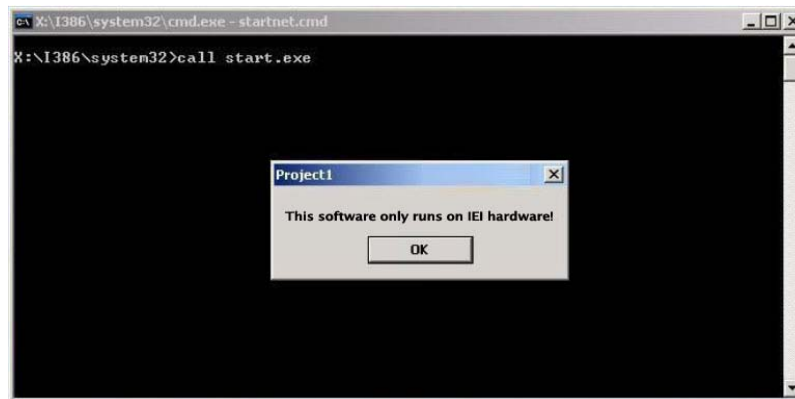
To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

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.

C.1.2 Supported Operating System

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

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

o Ubuntu 8.10 (Intrepid)

o Ubuntu 7.10 (Gutsy)

o Ubuntu 6.10 (Edgy)

o Debian 5.0 (Lenny)

o Debian 4.0 (Etch)

o SuSe 11.2

o SuSe 10.3

 NOTE:

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

C.2 Setup Procedure for Windows

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

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

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

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

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

partition (see **Section C.3**)

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

The detailed descriptions are described in the following sections.

 NOTE:

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

C.2.1 Hardware and BIOS Setup

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

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

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

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.

C.2.2 Create Partitions

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

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

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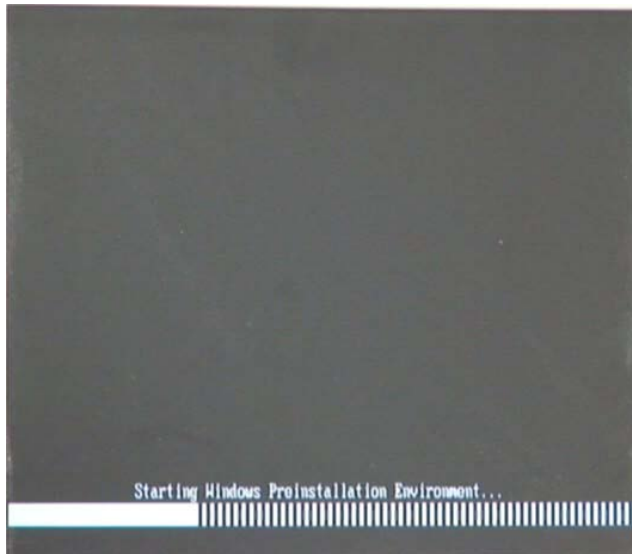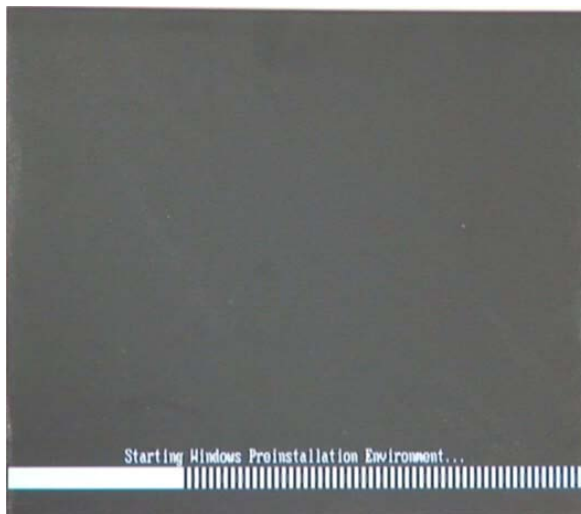
Figure C-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.
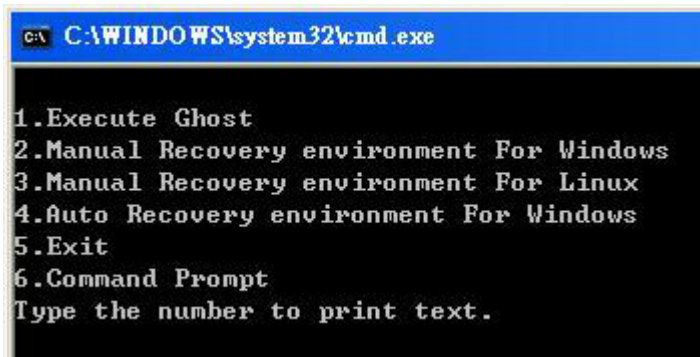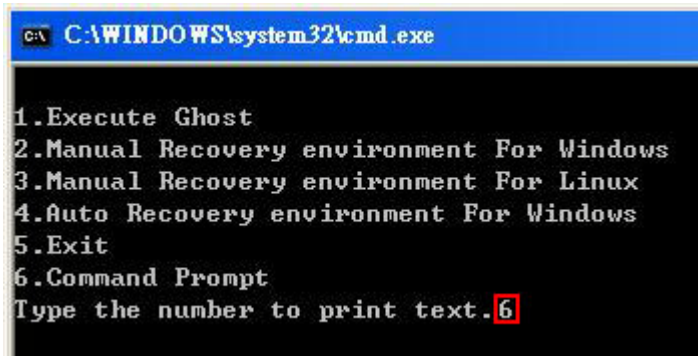
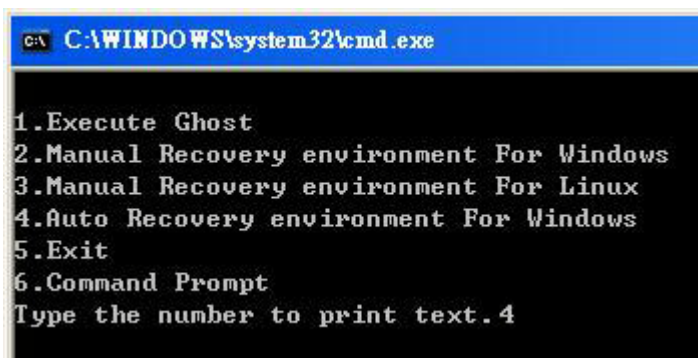**Figure C-3: Recovery Tool Setup Menu**

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

Figure C-4: Command Prompt

Step 5:   The command prompt window appears. Type the following commands (marked

in red) to create two partitions. One is for the OS installation; the other is for

saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

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

system32>exit

Figure C-5: Partition Creation Commands

NOTE:

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

```
X:\I386\SYSTEM32>diskpart

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

DISKPART> sel disk 0

Disk 0 is now the selected disk.

DISKPART> list part

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

DISKPART> exit
```

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

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

C.2.3 Install Operating System, Drivers and Applications

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

NOTE:

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

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

C.2.4 Building the Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from the recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

Figure C-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press **<2>** then <Enter>.
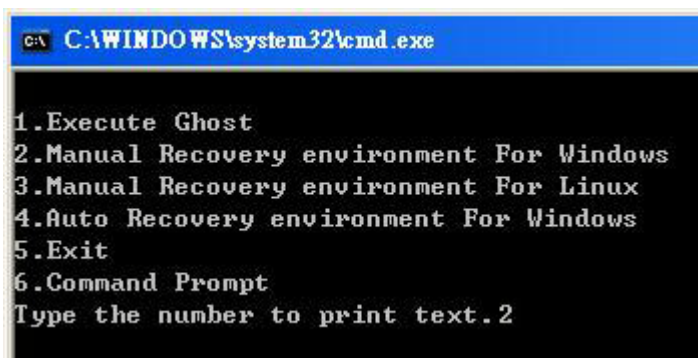
Figure C-7: Manual Recovery Environment for Windows

Step 5:　The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section C.2.2** is hidden and the recovery tool is saved in this partition.
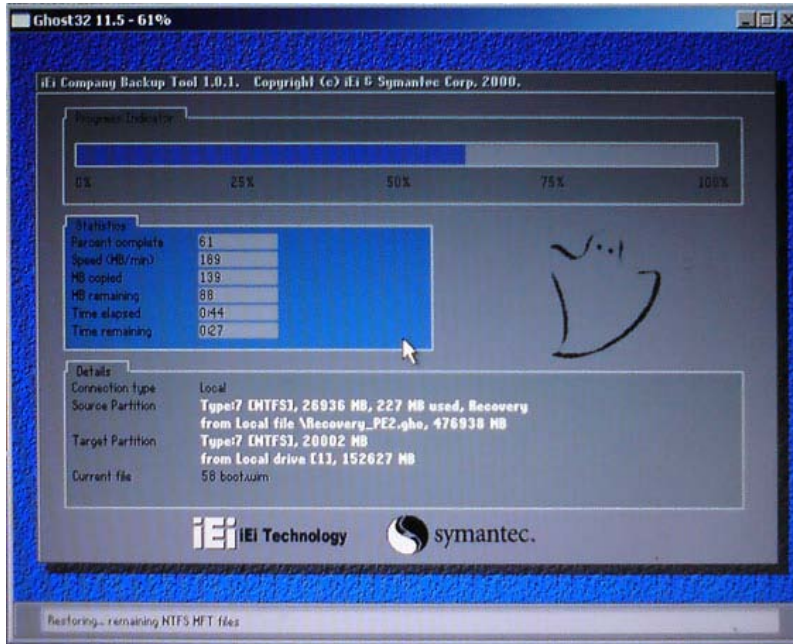
Figure C-8: Building the Recovery Partition

Step 6:　After completing the system configuration, press any key in the following window to reboot the system.
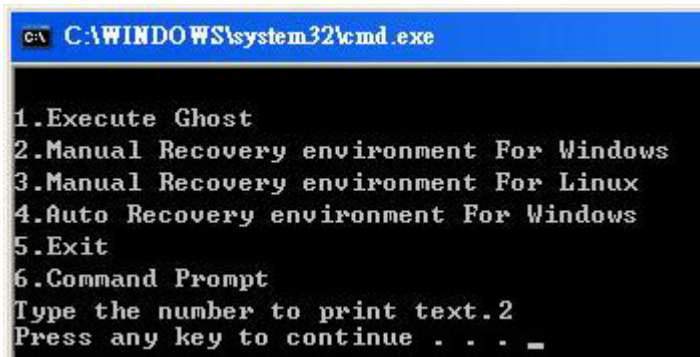
Figure C-9: Press Any Key to Continue

Step 7:　Eject the recovery CD.

C.2.5 Create Factory Default Image

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

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

Press F3 to boot into recovery mode..._
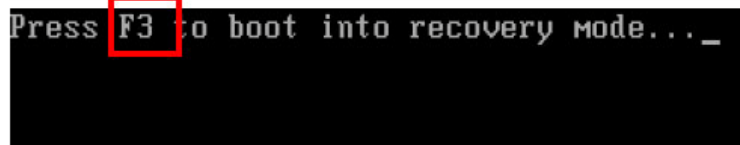
Figure C-10: Press F3 to Boot into Recovery Mode

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

```
X:\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
```
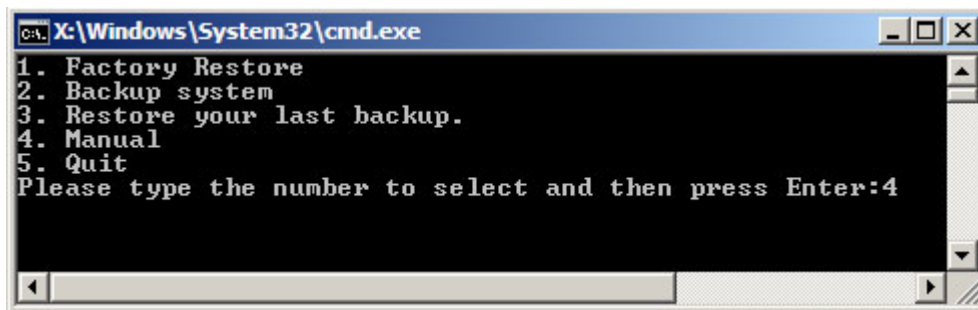
Figure C-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.
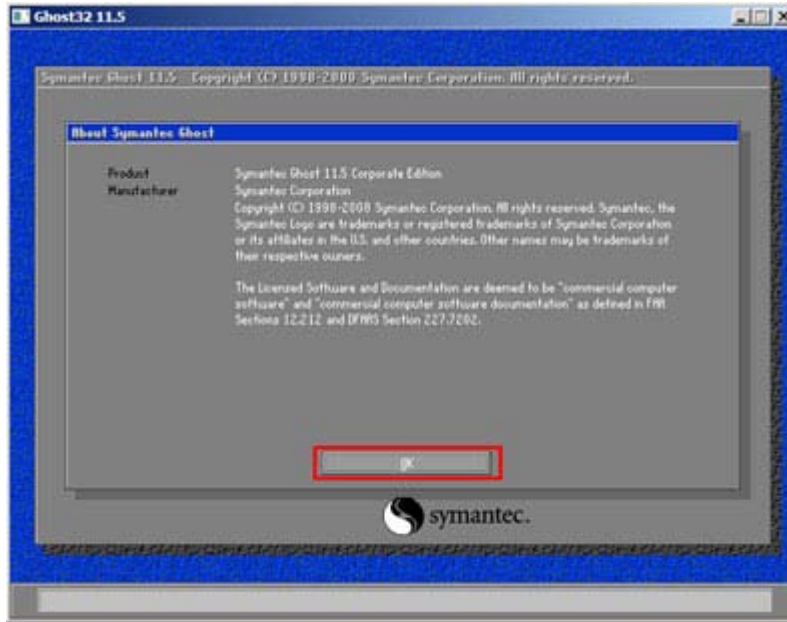
Figure C-12: About Symantec Ghost Window

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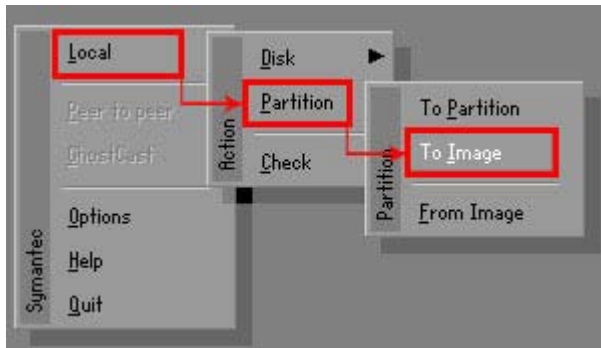
Figure C-13: Symantec Ghost Path

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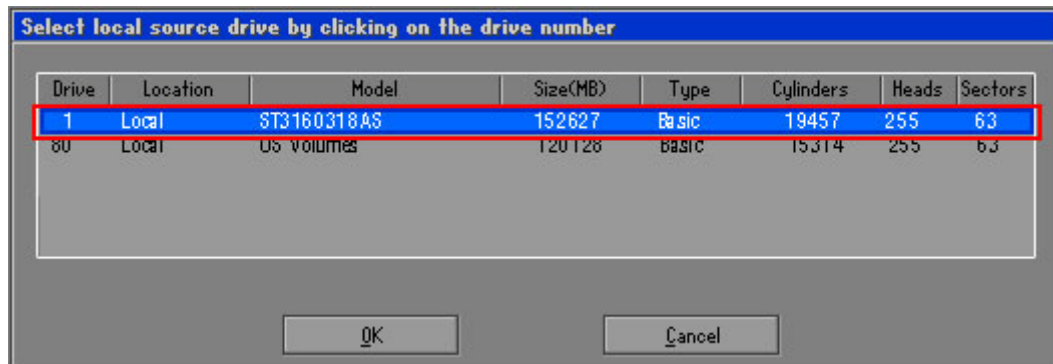
Figure C-14: Select a Local Source Drive

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

Then click OK.
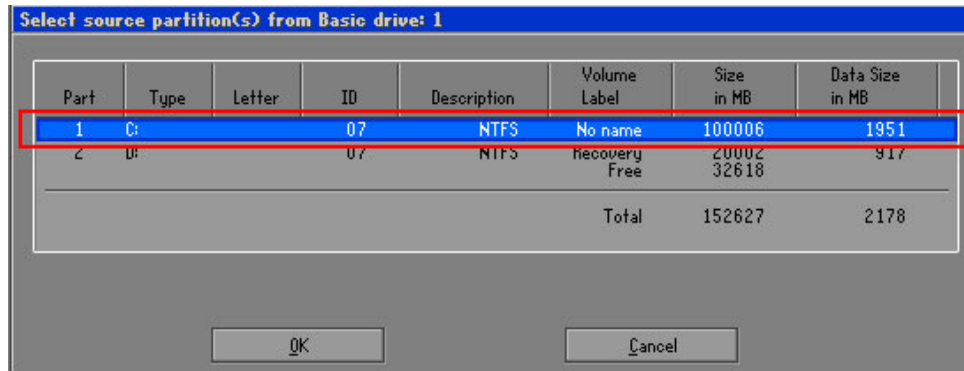
Figure C-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei**

(**Figure C-16**). Click **Save**. The factory default image will then be saved in the

selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.
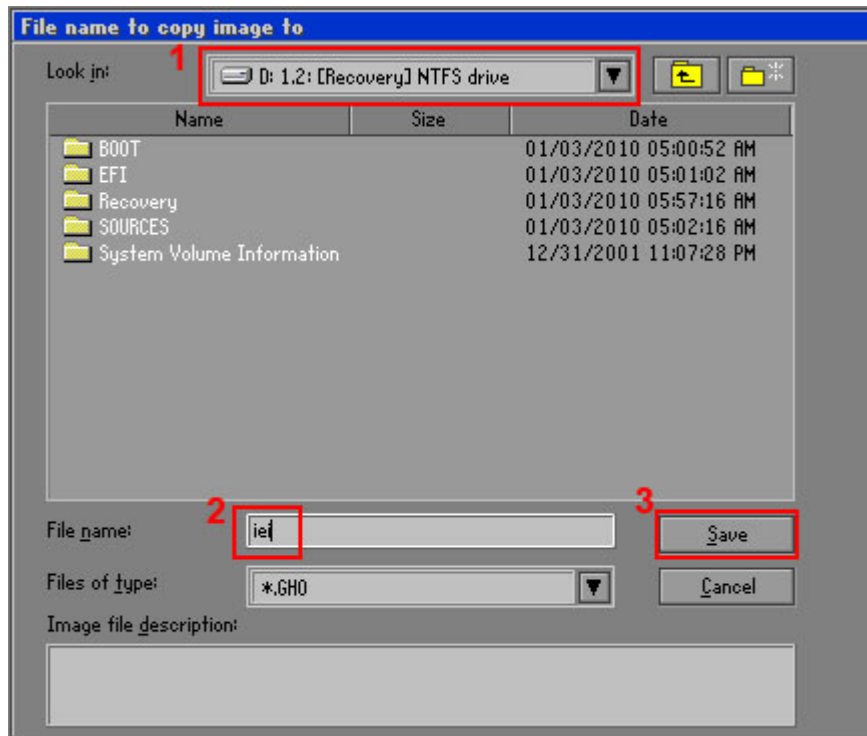
Figure C-16: File Name to Copy Image to

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

the image file smaller.
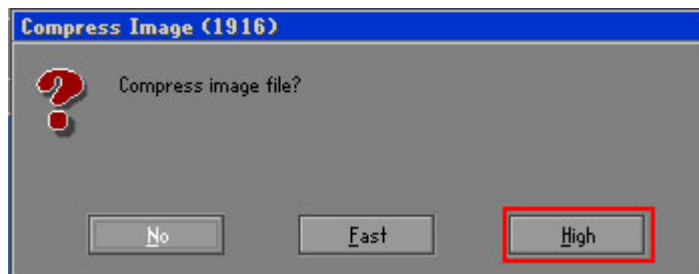
Figure C-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.
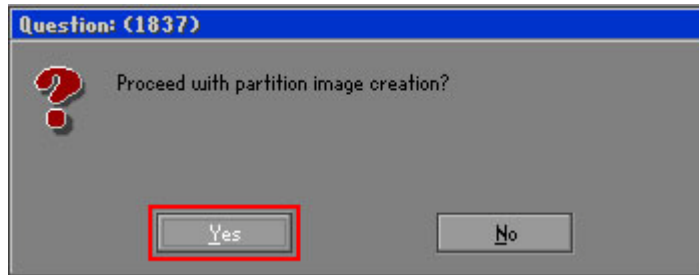
Figure C-18: Image Creation Confirmation

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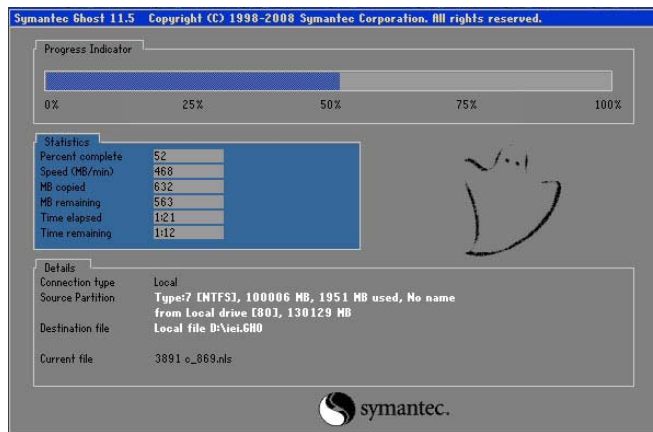
Figure C-19: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure C-20**. Click **Continue** and close the Ghost window to exit the program.
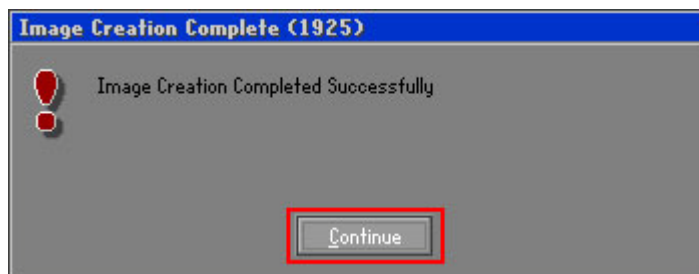
Figure C-20: Image Creation Complete

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

reboot the system.

Figure C-21: Press Any Key to Continue

C.3 Auto Recovery Setup Procedure

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

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

Step 1: Follow the steps described in **Section C.2.1 ~ Section C.2.3** to setup BIOS,

create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the

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

MUST be installed in the system, otherwise, the system will automatically

restore from the factory default image every ten (10) minutes.

Figure C-22: Auto Recovery Utility

Step 3:   Reboot the system from the recovery CD. When prompted, press any key to

boot from the recovery CD. It will take a while to launch the recovery tool. Please

be patient!

Starting Windows Preinstallation Environment...

Figure C-23: Launching the Recovery Tool

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


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

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

Figure C-24: Auto Recovery Environment for Windows

Step 5:   The Symantec Ghost window appears and starts configuring the system to build

an auto recovery partition. In this process the partition created for recovery files

in **Section C.2.2** is hidden and the auto recovery tool is saved in this partition.
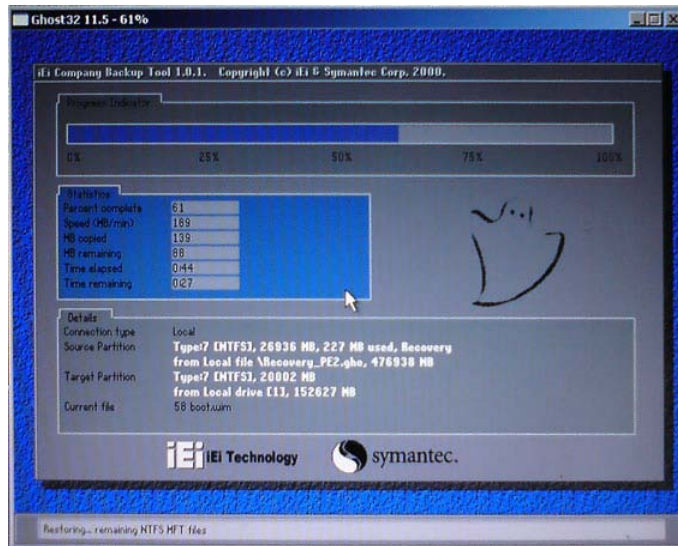
Figure C-25: Building the Auto Recovery Partition

Step 6:   After completing the system configuration, the following message prompts to

confirm whether to create a factory default image. Type **Y** to have the system

create a factory default image automatically. Type **N** within 6 seconds to skip this

process (The default option is YES). It is suggested to choose YES for this

option.

Figure C-26: Factory Default Image Confirmation

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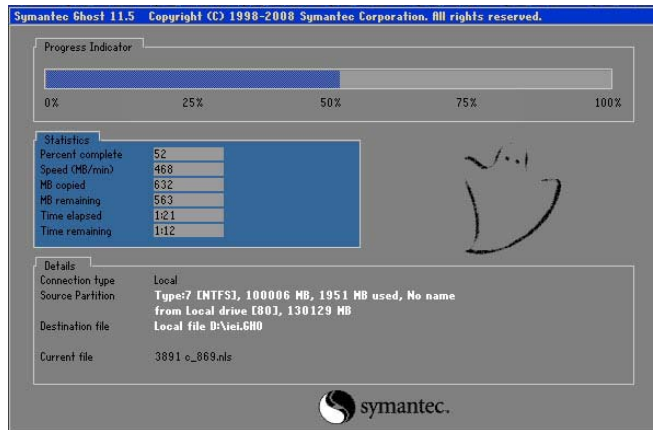
Figure C-27: Image Creation Complete

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

to restart the system.
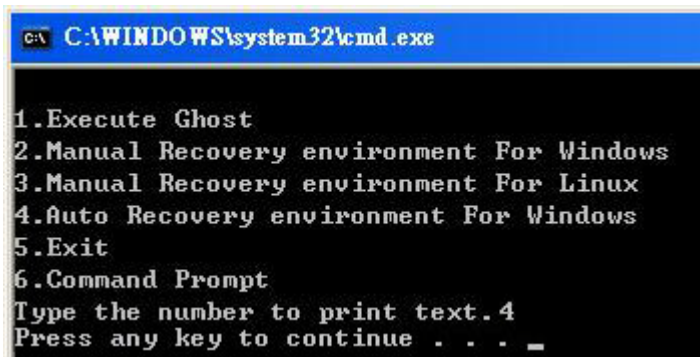
Figure C-28: Press any key to continue

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

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

Step 11: Enable the Auto Recovery Function option (**Advanced → iEi Feature → Auto**

Recovery Function).

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

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

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

BIOS Menu 27: iEi Feature

Step 12: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

CAUTION:

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

- Windows XP
- Windows Vista
- Windows 7

C.4 Setup Procedure for Linux

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

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

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

NOTE:

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

While installing Linux OS, please create two partitions:

- Partition 1: **/**
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.
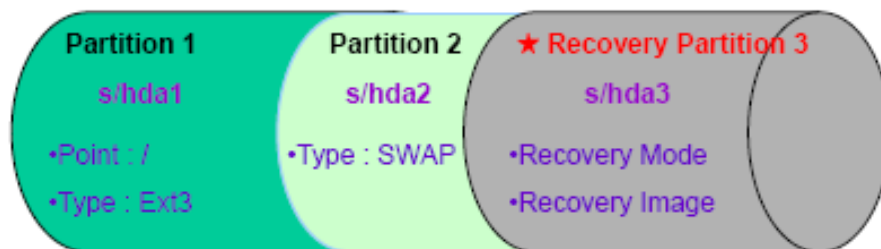
Figure C-29: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section C.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.
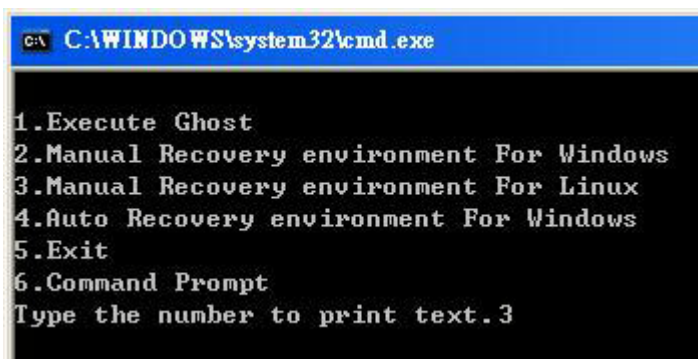
system32>diskpart

DISKPART>list vol

DISKPART>**sel disk 0**

DISKPART>**create part pri size= ___**

DISKPART>**assign letter=N**

DISKPART>**exit**

system32>**format N: /fs:ntfs /q /v:Recovery /y**

system32>**exit**

Step 4:   **Build the recovery partition**. Press any key to boot from the recovery CD. It will

take a while to launch the recovery tool. Please be patient. When the recovery

tool setup menu appears, type **<3>** and press <Enter> (**Figure C-30**). The

Symantec Ghost window appears and starts configuring the system to build a

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

reboot the system. Eject the recovery CD.

Figure C-30: Manual Recovery Environment for Linux

Step 5:   **Access the recovery tool main menu by modifying the "menu.lst"**. To first

access the recovery tool main menu, the menu.lst must be modified. In Linux,

enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

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

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

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

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

Figure C-32: Recovery Tool Menu

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

C.2.5 to create a factory default image.

C.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing **<F3>** while booting up the system. However, if the setup procedure in Section C.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.
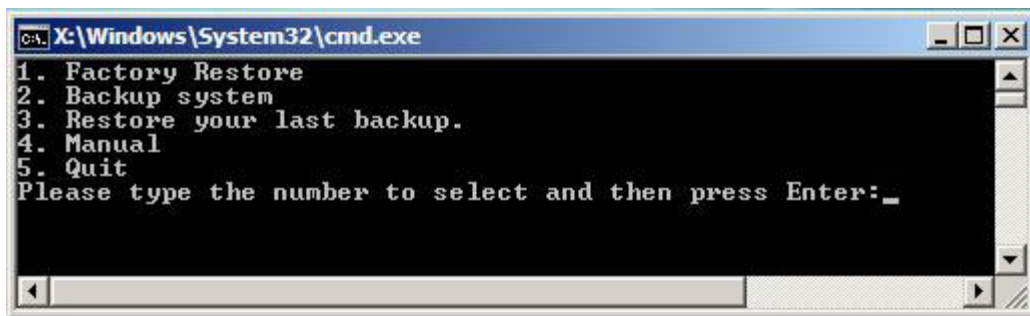
Figure C-33: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section C.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.

> 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).

C.5.1 Factory Restore

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

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

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.
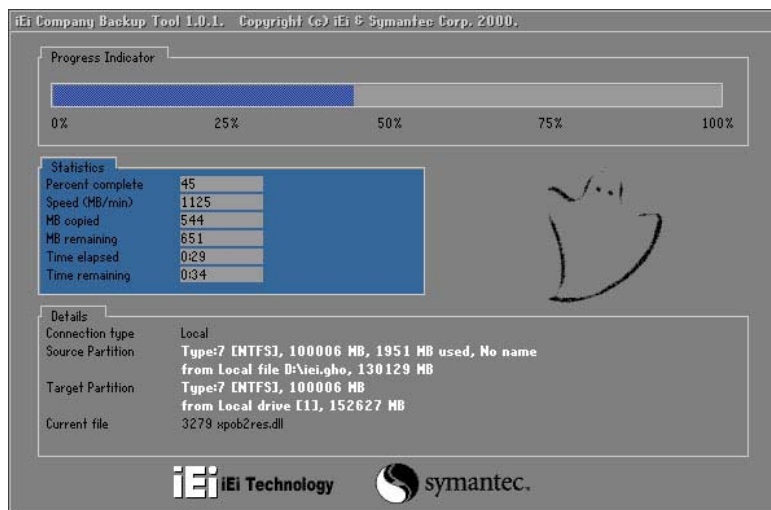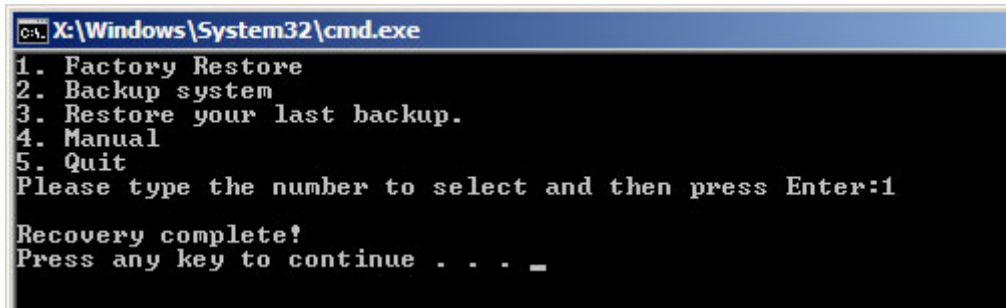
Figure C-34: Restore Factory Default

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

Figure C-35: Recovery Complete Window

C.5.2 Backup System

To backup the system, please follow the steps below.

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

Step 2:   The Symantec Ghost window appears and starts to backup the system. A

backup image called **iei_user.GHO** is created in the hidden Recovery partition.
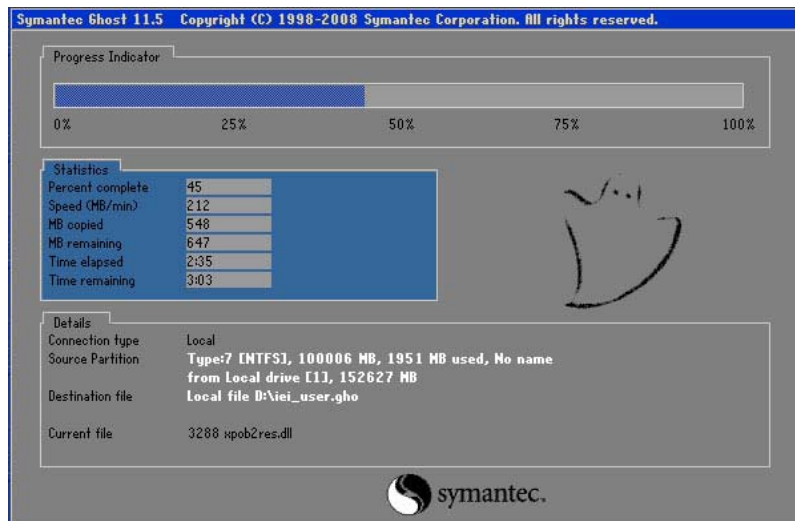
Figure C-36: Backup System

Step 3:   The screen shown in **Figure C-37** appears when system backup is complete.

Press any key to reboot the system.
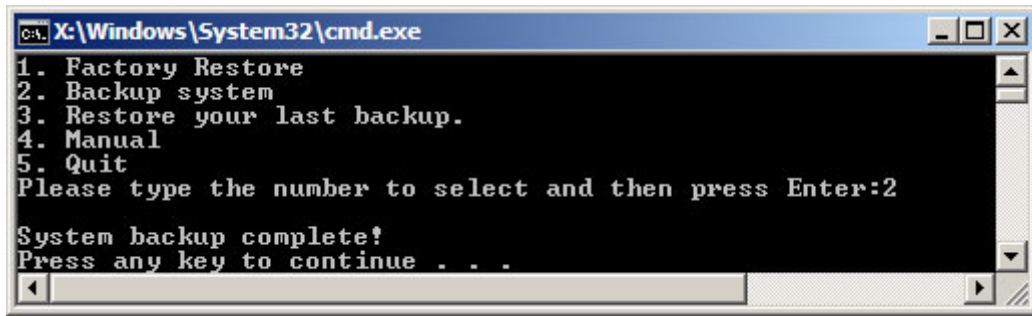
Figure C-37: System Backup Complete Window

C.5.3 Restore Your Last Backup

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

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

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).
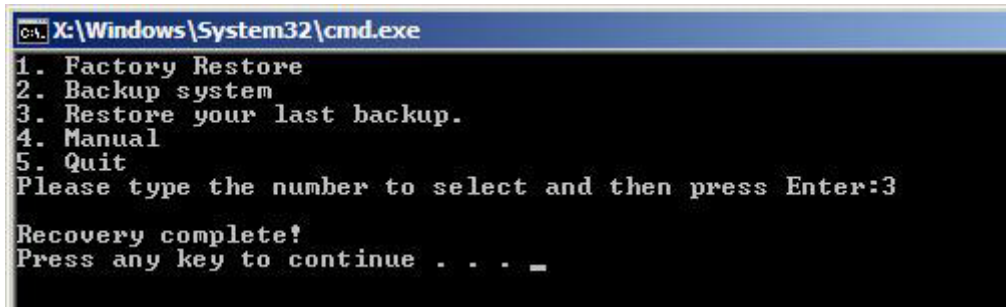
Figure C-38: Restore Backup

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

Figure C-39: Restore System Backup Complete Window

C.5.4 Manual

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

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

Step 2:   The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.
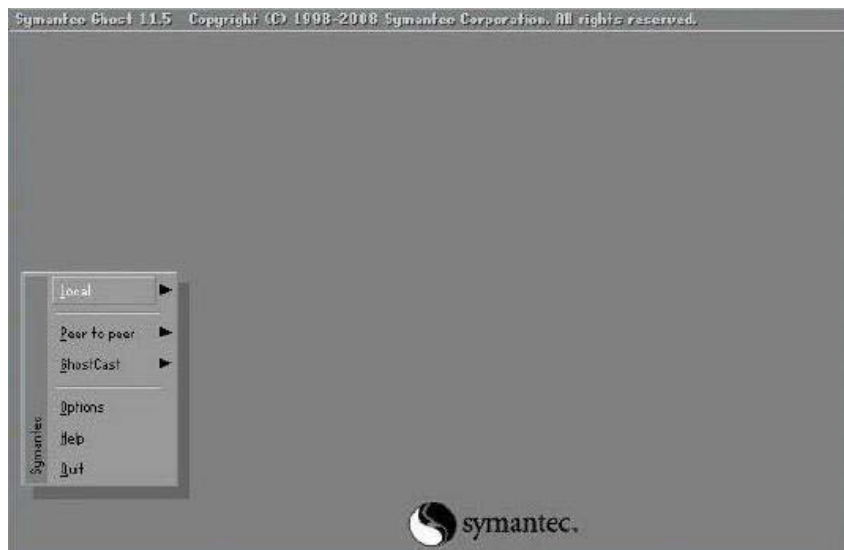
Figure C-40: Symantec Ghost Window

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

C.6 Restore Systems from a Linux Server through LAN

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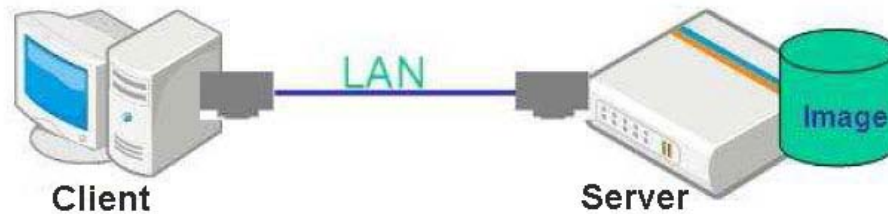
NOTE:

The supported client OS includes:

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

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

Step 1:   Configure DHCP server settings

Step 2:   Configure TFTP settings

Step 3:   Configure One Key Recovery server settings

Step 4:   Start DHCP, TFTP and HTTP

Step 5:   Create a shared directory

Step 6:   Setup a client system for auto recovery

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

C.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

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

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

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

CentOS

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

#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

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

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

#vi /etc/dhcpd.conf

Debian

#vi /etc/dhcpd.conf

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

next-server PXE server IP address;

filename "pxelinux.0";

C.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

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

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

CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

server_args = -s /tftpboot –m /tftpboot/tftpd.remap -vvv

Debian

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

#vi /etc/inetd.conf

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

#vi /etc/xinetd.d/tftp

C.6.3 Configure One Key Recovery Server Settings

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

Step 2: Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

Step 3: Copy "pxelinux.0" from "syslinux" and install to "/tftboot".

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

C.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

<u>CentOS</u>

#service xinetd restart

#service httpd restart

#service dhcpd restart

<u>Debian</u>

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

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

C.6.5 Create Shared Directory

Step 1:   Install the samba.

#yum install samba

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

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

> ⚠️ **WARNING:**
>
> The file name of the factory default image must be **iei.gho**.

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

#vi /etc/samba/smb.conf

Modify:

[image]

    comment = One Key Recovery

    path = /share/image

    browseable = yes

    writable = yes

    public = yes

    create mask = 0644

    directory mask = 0755

Step 4:   Edit "/etc/samba/smb.conf" for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
  security = share
```
```
[image]
  comment = One Key Recovery
  path = /share/image
  browseable = yes
  writable = yes
  public = yes
  create mask = 0644
  directory mask = 0755
```

Step 5:   Modify the hostname

    #vi /etc/hostname

    Modify: RecoveryServer

```
RecoveryServer
~
```

C.6.6 Setup a Client System for Auto Recovery

Step 1:   Configure the following BIOS options of the client system.

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

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

    Boot → Launch PXE OpROM → **Enabled**

Step 2:   Continue to configure the **Boot Option Priorities** BIOS option of the client

system:

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

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

Step 3:   Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

Step 4:   Install the auto recovery utility into the system by double clicking the

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

MUST be installed in the system, otherwise, the system will automatically

restore from the factory default image every ten (10) minutes.

Step 5:   Restart the client system from LAN. If the system encounters a Blue Screen of

Death (BSoD) or a hang for around 10 minutes, it will automatically restore from

the factory default image. The following screens will show when the system

starts auto recovering.

![NOTE icon] **NOTE:**

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

C.7 Other Information

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

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

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

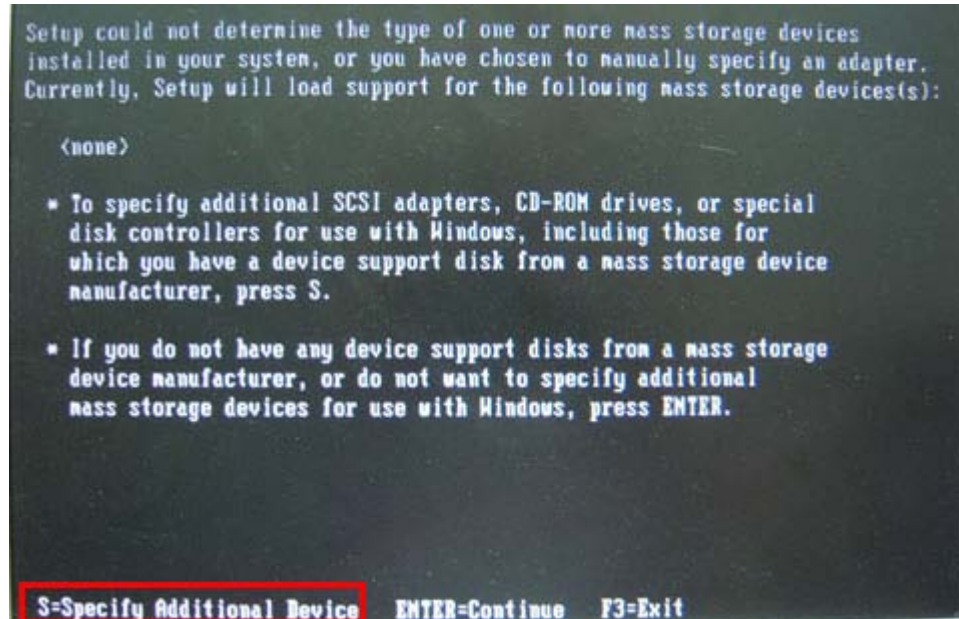Step 2: Connect the USB floppy disk drive to the system.

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

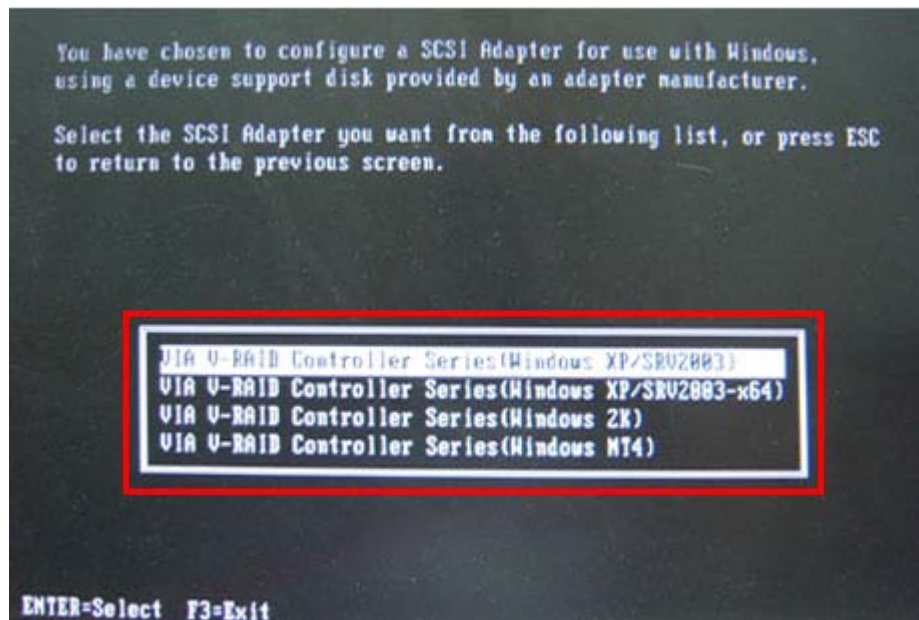Step 4: When launching the recovery tool, press <**F6**>.
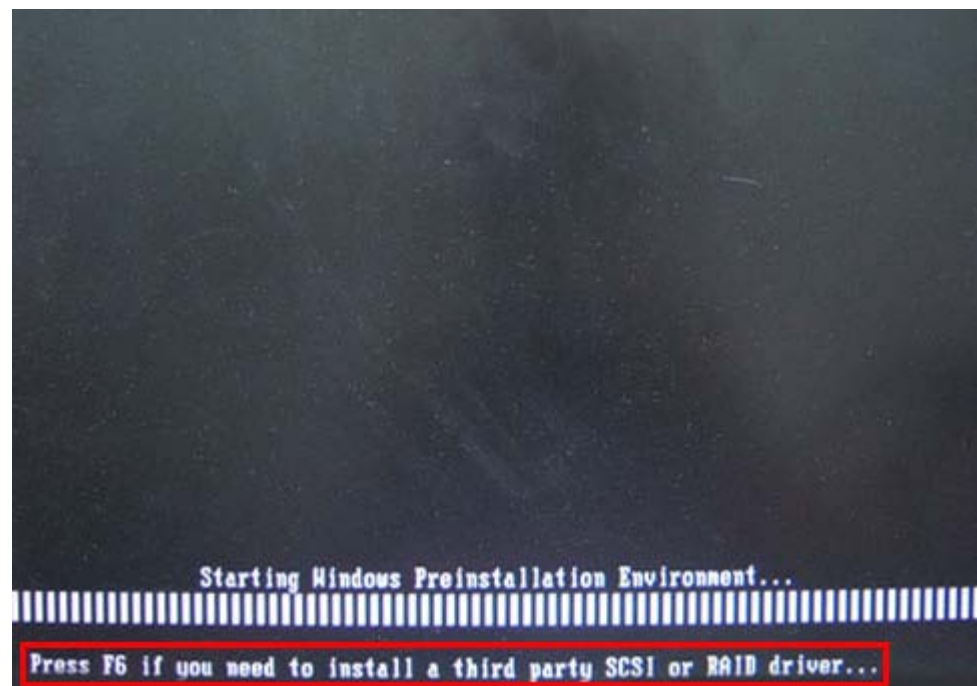
Step 5: When the following window appears, press <**S**> to select "Specify Additional

Device".

Step 6: In the following window, select a SATA controller mode used in the system. Then

press <**Enter**>. The user can now start using the SATA HDD.

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

C.7.2 System Memory Requirement

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

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

Appendix

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.

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。						