IEI Technology Corp.

MODEL:

TANK-600 Series

Fanless Embedded System with Intel® Dual Core D2550 1.86 GHz processor / Intel® Dual Core N2600 1.6 GHz processor, VGA, Two Gigabit Ethernet, Six USB 2.0, RS-232/422/485, RoHS Compliant

User Manual

Rev. 1.02 – 7 June 2013

RoHS Lead Free

Revision

Date	Version	Changes
7 June 2013	1.02	Add Section 3.3 Mounting the System with Mounting Brackets
24 May 2013	1.01	Update power input in spec.
7 April 2013	1.00	Initial release

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Table of Contents

List of Figures

List of Tables

Chapter

1

Introduction

1.1 Overview

Figure 1-1: TANK-600

The TANK-600 is a fanless embedded system for wide range temperature environments. It is powered by the Intel® dual core D2550 1.86 GHz processor for TANK-600-D2550 or Intel® dual core N2600 1.6 GHz processor for TANK-600-N2600. It has 4.0 GB of DDR3 memory on-board for TANK-600-D2550 and 2.0 GB of DDR3 memory on-board for TANK-600-N2600. The TANK-600 series includes one VGA port, two GbE LAN ports, six USB 2.0 ports, six RS-232 connectors via DB-9, two RS-232/422/485 connectors via DB-9 and eight RS-232 connectors via DB-78 (optional).

1.2 Model Variations

The model variations of the TANK-600 series are listed below.

Model No.	CPU	Memory
TANK-600-CV-D2550-R10	Intel® dual core D2550 1.86 GHz processor	4G DDR3 RAM onboard
TANK-600-CV-N2600-R10	Intel® dual core N2600 1.6 GHz processor	2G DDR3 RAM onboard

Table 1-1: TANK-600 Model Variations

1.3 Features

The TANK-600 features are listed below:

- Intel® dual core™ D2550 1.86 GHz processor
  Intel® dual core™ N2600 1.6 GHz processor
- Default : 8 x COM ports (6 x RS-232, 2 x RS-232/422/485)
- Optional: 8 x COM ports via DB-78 (8 x RS-232)
- 6 x USB2.0
- Dual PCIe GbE LAN for high speed network applications

1.4 Technical Specifications

The TANK-600 technical specifications are listed in **Table 1-2**.

Specifications	
Chassis	
Color	Black C + Silver
Dimension (WxDxH)	200 x 193.4 x 57 mm
System Fan	Fanless
Chassis Construction	Aluminum alloy

Specifications	
Motherboard	
CPU	Intel® dual core™ D2550 1.86 GHz processor (TANK-600-CV-D2550-R10) Intel® dual core™ N2600 1.6 GHz processor (TANK-600-CV-N2600-R10)
Chipset	Intel® NM10
System Memory	On-board DDR3 4GB (TANK-600-CV-D2550-R10) On-board DDR3 2GB (TANK-600-CV-N2600-R10)
Storage	
Hard Drive	1 x 2.5” SATA HDD Bay
I/O interfaces	
USB 2.0	6 x USB2.0
Ethernet	2 x RJ-45 Realtek 8111E GbE LAN
RS-232	Default: 6 x DB-9 Optional: 8 x RS-232 by DB-78
RS-232/422/485	2 x DB-9
Display	1 x VGA
Resolution	Up to 2048 x 1536 @ 75Hz
Audio	1 x Line-out, 1 x Mic-in
Expansions	
PCIe Mini	1 x Full Size (Support mSATA) 1 x Half Size
Power	
Power Input	DC Jack: 9~36V DC
Power Consumption	12V @ 2.1A
Reliability	
Mounting	VESA 100, DIN-Rail

Specifications	
Operating Temperature	-20°C ~ 70°C with air flow
Operating Shock	Half-sine wave shock 5G, 11ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Weight (Net/Gross)	2.2 Kg / 3 Kg
Safety/EMC	CE / FCC
OS	
Supported OS	Microsoft® WES7E, Microsoft® Windows® XP Embedded

Table 1-2: Technical Specifications

1.5 Front Panel

The front panel of the TANK-600 has the following features (**Figure 1-2**):

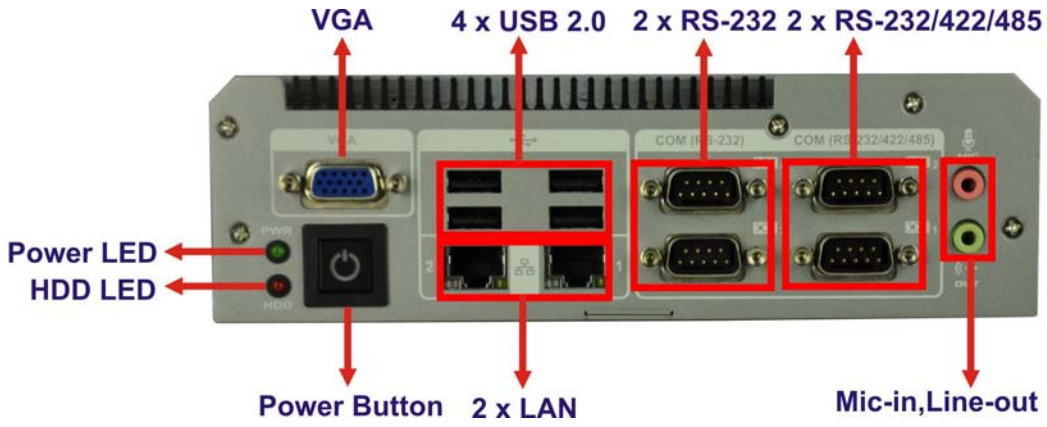


Figure 1-2: TANK-600 Front Panel

Connectors and buttons on the front panel include the following:

- 1 x HDD LED
- 2 x LAN ports by RJ-45
- 1 x Line-out port (green)
- 1 x Mic-in port (pink)
- 1 x Power button
- 1 x Power LED
- 2 x RS-232 serial ports by DB-9

- 2 x RS-232/422/485 serial ports by DB-9
- 4 x USB 2.0 ports
- 1 x VGA port

1.6 Rear Panel

The rear panel of the TANK-600 has the following features (**Figure 1-2**):

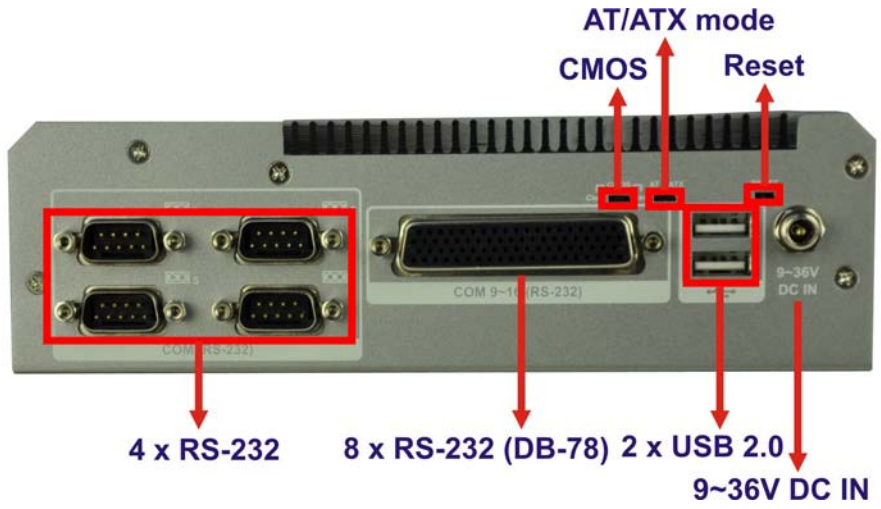


Figure 1-3: TANK-600 Rear Panel

Connectors and buttons on the front panel include the following:

- 1 x 9 V ~ 36 V DC IN
- 1 x AT/ATX mode switch
- 1 x CMOS switch
- 1 x Reset button
- 4 x RS-232 serial ports by DB-9
- 8 x RS-232 serial ports by DB-78 (Optional)
- 2 x USB 2.0 ports

1.7 Dimensions

The physical dimensions are shown below:

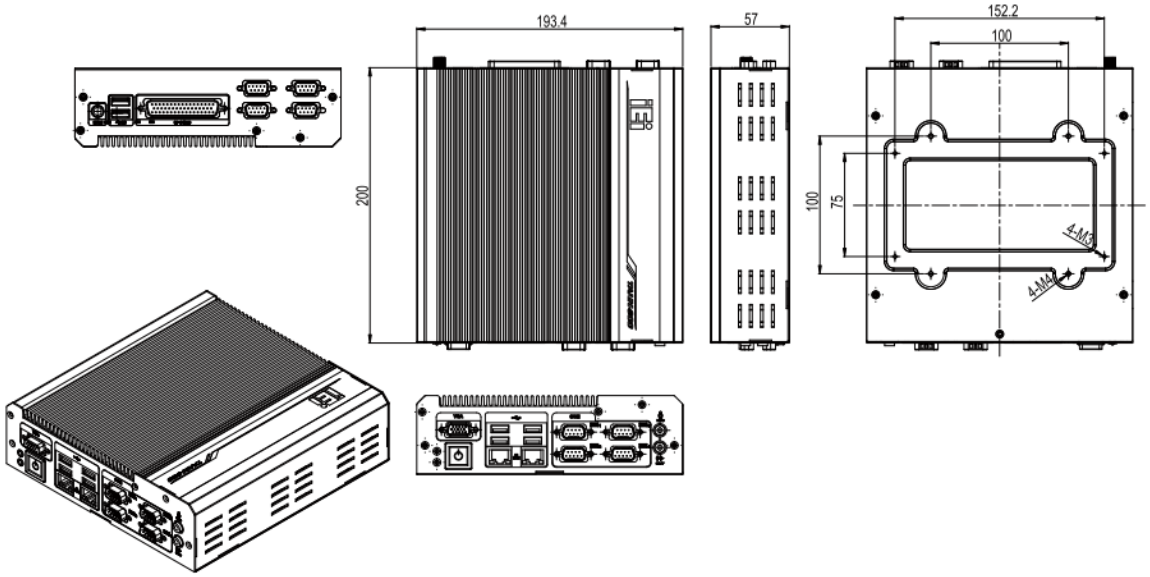


Figure 1-4: Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-600 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-600. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-600 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-600, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-600.

2.2 Unpacking Precautions

When the TANK-600 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-600 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-600 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-600 is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	TANK-600	
1	Power Adapter (**P/N**: 63040-010065-010-RS)	
1	Power Cord (**P/N**: 32702-000200-100-RS)	
4	Wall Mounting Bracket Screws	
2	Wall Mounting Brackets	

Quantity	Item and Part Number	Image
Standard		
4	Screw Set	
1	DIN-rail mount (**P/N**: DK-84MB)	
1	One Key Recovery CD (**P/N**: 7B000-000724-RS)	
1	Utility CD	

The following table lists the optional items that can be purchased separately.

Optional	
DB-78	
VESA Kit	

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-600, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-600 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-600 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-600 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.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the TANK-600. The TANK-600's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the TANK-600. Leave at least 5 cm of clearance around the TANK-600 to prevent overheating.
- **Grounding**: The TANK-600 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-600.

3.2 Hard Disk Drive (HDD) Installation

To install the hard drive, please follow the steps below:

Step 1: Remove five retention screws from the rear panel, as shown in **Figure 3-1**.

Figure 3-1: Remove Retention Screws (Rear Panel)

Step 2: Remove five retention screws from the bottom panel, as shown in **Figure 3-2**.

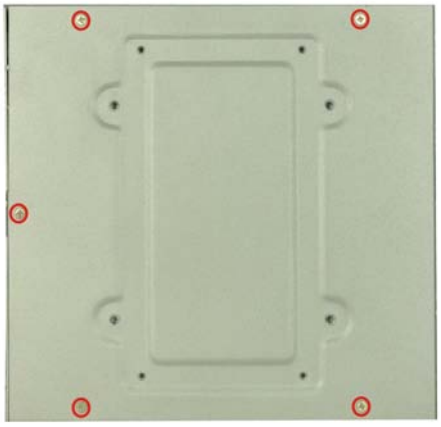


Figure 3-2: Remove Retention Screws (Bottom Panel)

Step 3: Remove ten hex head screws on either side of the connectors from the rear panel, as shown in **Figure 3-3**.

Figure 3-3: Remove Hex Head Screws (Rear Panel)

Step 4: Remove the bottom cover from the device.

Step 5: Remove the four HDD bracket retention screws (**Figure 3-4**).

Figure 3-4: HDD Bracket Retention Screws

Step 6: Lift the HDD bracket out of the TANK-600.

Step 7: Slide the HDD to the HDD bracket and secure the HDD to the HDD bracket using four retention screws (**Figure 3-5**).

Figure 3-5: Inserting the HDD

Step 8: Install the HDD bracket in the same position it was before and fasten the HDD bracket retention screws.

Step 9: Reinstall the bottom cover.

3.3 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 to the bottom panel.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the bottom panel (**Figure 3-6**).

Figure 3-6: Mounting Bracket Retention Screws

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket (**Figure 3-6**).

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.

3.4 AT/ATX Mode Selection

AT or ATX power mode can be used on the TANK-600. The selection is made through an AT/ATX switch located on the bottom panel. To select AT mode or ATX mode, follow the steps below.

Step 1: Locate the AT/ATX switch on the bottom panel (**Figure 3-7**).

Figure 3-7: AT/ATX Switch Location

Step 2: Adjust the AT/ATX switch.

3.4.1 AT Power Mode

With the AT mode selected, the power is controlled by a central power unit rather than a power switch. The TANK-600 system turns on automatically when the power is connected. The AT mode benefits a production line to control multiple systems from a central management center and other applications including:

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

3.4.2 ATX Power Mode

With the ATX mode selected, the TANK-600 system goes in a standby mode when it is turned off. The system 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 system can be set individually and controlled remotely. Other possible application includes

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

3.5 Clear CMOS

If the TANK-600 fails to boot due to improper BIOS settings, the clear CMOS switch clears the CMOS data and resets the system BIOS information. To do this, adjust the clear CMOS switch to clear CMOS mode for a few seconds then reinstall the clear CMOS switch back to keep CMOS mode.

Step 1: Locate the clear CMOS switch on the bottom panel (**Figure 3-8**).

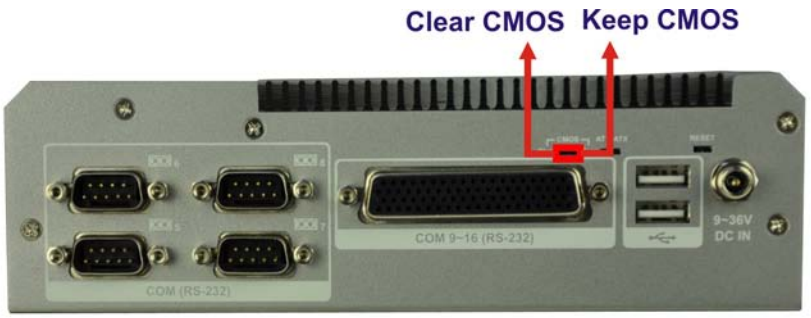


Figure 3-8: Clear CMOS Switch Location

Step 2: Adjust the clear CMOS switch.

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 bottom panel (**Figure 3-9**).

Figure 3-9: Reset Button Location

Step 2: Press the reset button.

3.7 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 3 seconds
- **Power off** the system: press the power button for 6 seconds

Figure 3-10: Power Button

3.8 External Peripheral Device Connection

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

- Audio devices
- RJ-45 Ethernet cable
- Serial port devices
- USB devices
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding TANK-600 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-600 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.

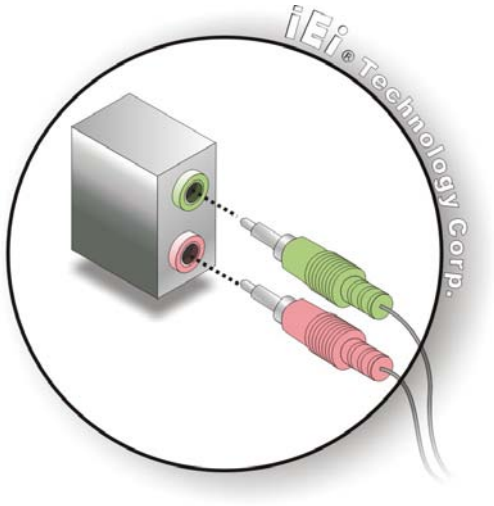


Figure 3-11: Audio Connector

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 LAN Connection

There are two external RJ-45 LAN connectors on the TANK-600. 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-600. See **Figure 3-12**.

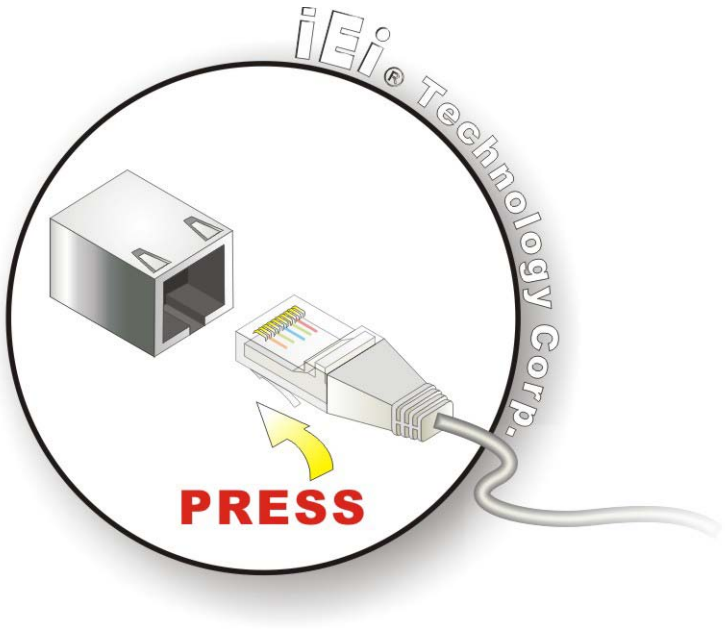


Figure 3-12: LAN Connection

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

3.8.3 Serial Device Connection

There are six RS-232 connectors via DB-9, two RS-232/422/485 connectors via DB-9 and eight RS-232 connectors via DB-78 (optional) for serial device connection. Follow the steps below to connect a serial device to the TANK-600.

3.8.3.1 DB-9 Serial Port Connection

Follow the steps below to connect a serial device to the DB-9 connector of the TANK-600 system.

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 bottom panel. See **Figure 3-13**.

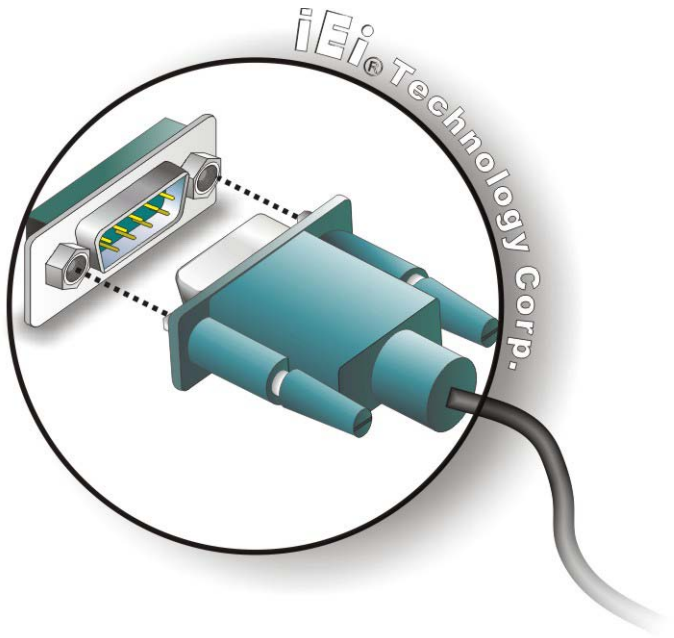


Figure 3-13: DB-9 Serial Port Connection

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.

3.8.3.2 DB-78 Serial Port Connection (Optional)

Follow the steps below to connect a serial device to the DB-78 serial port connector of the TANK-600 system.

Step 1: **Locate the DB-78 serial port**. The location of the DB-78 serial port is shown in **Chapter 1**.

Step 2: **Connect the DB-78 to COM port cable to the system**. Insert the DB-78 connector end of cable into the DB-78 serial port. See **Figure 3-14**.

Figure 3-14: DB-78 to COM port cable

Step 3: **Connect the serial device.** Connect a serial device to the DB-9 connector end of the cable. See **Figure 3-13**.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

3.8.4 USB Device Connection

There are six USB 2.0 connectors on the TANK-600. 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 TANK-600. See **Figure 3-15**.

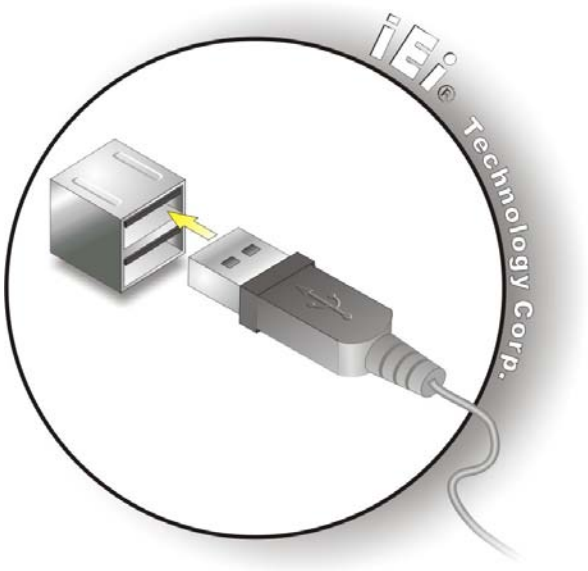


Figure 3-15: USB Device Connection

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

3.8.5 VGA Monitor Connection

The TANK-600 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the TANK-600, 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-600. See **Figure 3-16**.

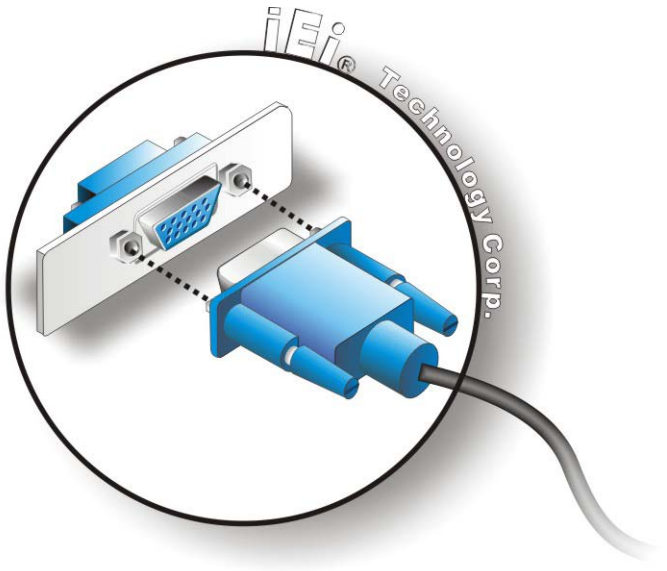


Figure 3-16: VGA Connector

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 Overview

This chapter details all the jumpers and connectors of the system motherboard.

4.1.1 Layout

The figures below show all the connectors and jumpers of the system motherboard. The Pin 1 locations of the on-board connectors are also indicated in the diagram below.

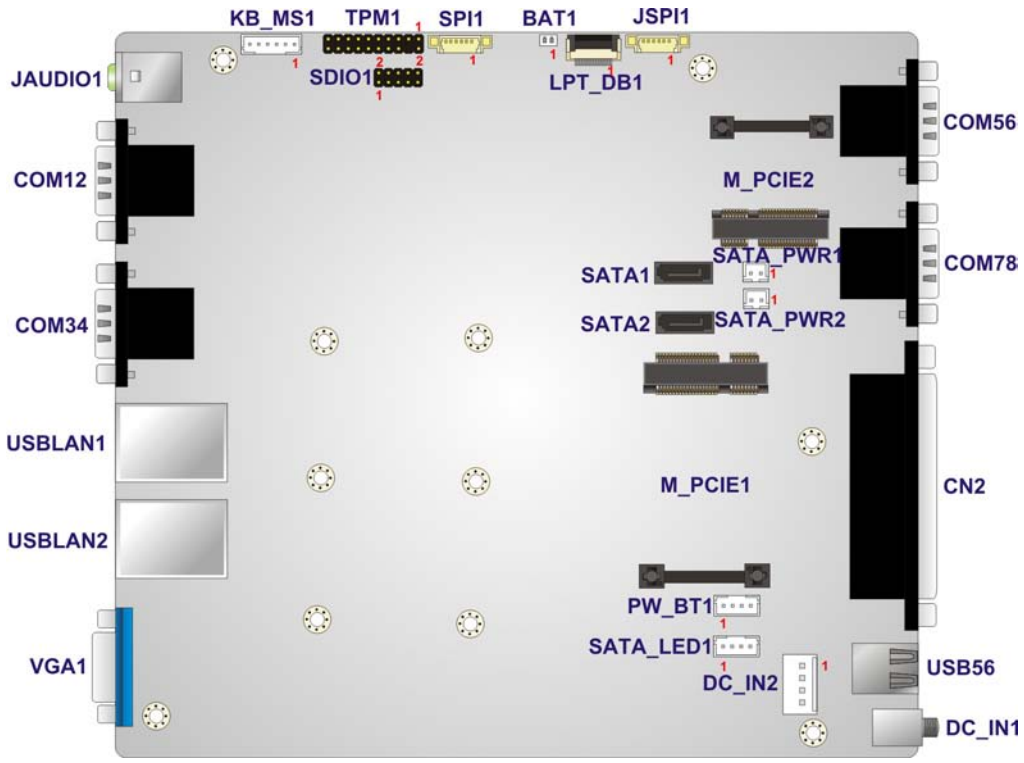


Figure 4-1: System Motherboard

4.2 Internal Peripheral Connectors

The table below shows a list of the internal peripheral interface connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Battery connector	2-pin wafer	BAT1
BIOS programming connector	6-pin wafer	SPI1

Connector	Type	Label
Digital I/O connector	10-pin header	SDIO1
EC Debug connector	20-pin wafer	LPT_DB1
EC programming connector	6-pin wafer	JSPI1
Keyboard/mouse connector	6-pin wafer	KB_MS1
PCIe Mini card slot	PCIe Mini card slot	M_PCIE1, M_PCIE2
Power button connector	4-pin wafer	PW_BT1
Power connector	4-pin wafer	DC_IN2
SATA 3Gb/s drive connectors	7-pin SATA connector	SATA1, SATA2
SATA power connector	2-pin wafer	SATA_PWR1, SATA_PWR2
SATA LED connector	4-pin wafer	SATA_LED1
TPM connector	20-pin header	TPM1

Table 4-1: Peripheral Interface Connectors

4.2.1 Battery Connector (BAT1)

PIN NO.	DESCRIPTION
1	+VBAT
2	GND

Table 4-2: Battery Connector Pinouts (BAT1)

4.2.2 BIOS Programming Connector (SPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V3.3A_SPI	2	SPI_2N_CS#
3	SPI_2N_MISO	4	SPI_2N_CLK
5	SPI_2N_MOSI	6	GND

Table 4-3: BIOS Programming Connector Pinouts (SPI1)

4.2.3 Digital I/O Connector (SDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DGPO3	4	DGPO2
5	DGPO1	6	DGPO0
7	DGPI3	8	DGPI2
9	DGPI1	10	DGPI0

Table 4-4: Digital I/O Connector Pinouts (SDIO1)

4.2.4 EC Debug Connector (LPT_DB1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_KSI0	2	EC_KSO0
3	EC_KSO1	4	EC_KSO2
5	EC_KSO3	6	EC_KSO4
7	EC_KSO5	8	EC_KSO6
9	EC_KSO7	10	EC_KSO8
11	EC_KSO9	12	EC_KSO10
13	EC_KSO12	14	EC_KSI1
15	EC_KSO11	16	EC_KSI2
17	EC_KSI3	18	GND
19	GND	20	GND

Table 4-5: EC Debug Connector Pinouts (LPT_DB1)

4.2.5 EC Programming Connector (JSPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC	2	FSCE#_S
3	FMISO_S	4	FSCK_S
5	FMOSI_S	6	GND

Table 4-6: EC Programming Connector Pinouts (JSPI1)

4.2.6 Keyboard/Mouse Connector (KB_MS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power	2	MSDATA_T
3	MSCLK_T	4	KBDATA_T
5	KBCLK_T	6	GND

Table 4-7: Keyboard/Mouse Connector Pinouts (KB_MS1)

4.2.7 Power Button Connector (PW_BT1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWRBTN_SW#	2	GND
3	GND	4	POWER (3.3V)

Table 4-8: Power Button Connector Pinouts (PW_BT1)

4.2.8 Power Connector (DC_IN2)

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

Table 4-9: Power Connector Pinouts (DC_IN2)

4.2.9 SATA 3Gb/s Drive Connectors (SATA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA0_T_TX+
3	SATA0_T_TX-	4	GND
5	SATA0_T_RX-	6	SATA0_T_RX+
7	GND		

Table 4-10: SATA 3Gb/s Drive Connectors Pinouts (SATA1)

4.2.10 SATA 3Gb/s Drive Connectors (SATA2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SATA_T_CN_TX+

3	SATA_T_CN_TX-	4	GND
5	SATA_T_CN_RX--	6	SATA_T_CN_RX+
7	GND		

Table 4-11: SATA 3Gb/s Drive Connectors Pinouts (SATA2)

4.2.11 SATA Power Connector (SATA_PWR1, SATA_PWR2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND

Table 4-12: SATA Power Connector Pinouts (SATA_PWR1, SATA_PWR2)

4.2.12 SATA LED Connector (SATA_LED1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	POWER	2	GND
3	SATA_LED	4	POWER

Table 4-13: SATA LED Connector Pinouts (SATA_LED1)

4.2.13 TPM Connector (TPM1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CLK_LPC_HEADER	2	GND
3	LPC_FRAME#	4	NC
5	RST#_LPC	6	+5V
7	LPC_AD3	8	LPC_AD2
9	+3.3V	10	LPC_AD1
11	LPC_AD0	12	GND
13	SMBCLK	14	SMBDATA
15	+V3.3SB	16	INT_SERIRQ
17	GND	18	PM_CLKRUN#
19	PM_SUS_STAT#	20	LPC_DRQ0#

Table 4-14: TPM Connector Pinouts (TPM1)

4.3 External Interface Panel Connectors

The table below shows a list of the external interface panel connectors on the system motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Audio jack (mic, line-out)	Audio jack	JAUDIO1
Ethernet and USB2.0 connectors	RJ-45, USB 2.0 port	USBLAN1, USBLAN2
Power connector	3-pin DC jack	DC_IN1
RS-232/422/485 serial port connectors	DB-9	COM12
RS-232 serial port connectors	DB-9	COM34, COM56,COM78
RS-232 serial port connectors	DB-78	CN2
USB 2.0 connectors	USB 2.0 port	USB56
VGA connector	DB-15	VGA1

Table 4-15: Rear Panel Connectors

4.3.1 Audio Jack (JAUDIO1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	LMIC1-L
3	GND	4	MIC1_JD
5	LMIC1-R	22	LINE_OUTL
23	GND	24	LINE1_JD
25	LINE1_JD		

Table 4-16: Audio Jack Pinouts (JAUDIO1)

4.3.2 Ethernet and USB2.0 Connectors (USBLAN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	NC	P2	LAN1_MDI0+
P 3	LAN1_MDI0-	P 4	LAN1_MDI1+

P 5	LAN1_MDI1-	P 6	LAN1_MDI2+
P 7	LAN1_MDI2-	P 8	LAN1_MDI3+
P 9	LAN1_MDI3-	P 1 0	GND
P 11	LAN1_LED_100M	P 12	LAN1_LED_1000M
P 13	LAN1_LED_ACT	P 14	Power
1	+V5A_IO_USB01	2	USB0_T_D-
3	USB0_T_D+	4	GND
5	+V5A_IO_USB01	6	USB1_T_D-
7	USB1_T_D+	8	GND

Table 4-17: Ethernet and USB2.0 Connectors Pinouts (USBLAN1)

4.3.3 Ethernet and USB2.0 Connectors (USBLAN2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	NC	P2	LAN2_MDI0+
P 3	LAN2_MDI0-	P 4	LAN2_MDI1+
P 5	LAN2_MDI1-	P 6	LAN2_MDI2+
P 7	LAN2_MDI2-	P 8	LAN2_MDI3+
P 9	LAN2_MDI3-	P 1 0	GND
P 11	LAN2_LED_100M	P 12	LAN2_LED_1000M
P 13	LAN2_LED_ACT	P 14	Power
1	+V5A_IO_USB23	2	USB2_T_D-
3	USB2_T_D+	4	GND
5	+V5A_IO_USB23	6	USB3_T_D-
7	USB3_T_D+	8	GND

Table 4-18: Ethernet and USB2.0 Connectors Pinouts (USBLAN2)

4.3.4 Power Connector (DC_IN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DC_IN	2	GND
3	GND		

Table 4-19: Power Connector Pinouts (DC_IN1)

4.3.5 RS-232 Serial Port Connector (COM1)

PIN NO.	RS-232	RS-422	RS-485
1	COM1_DCD#	TXD422#1	TXD485#1
2	COM1_RXD	TXD422+1	TXD485+1
3	COM1_TXD	RXD422+1	NA
4	COM1_DTR#	RXD422#1	NA
5	GND	NA	NA
6	COM1_DSR#	NA	NA
7	COM1_RTS#	NA	NA
8	COM1_CTS#	NA	NA
9	COM1_RI#	NA	NA

Table 4-20: RS-232 Serial Port Connector Pinouts (COM1)

4.3.6 RS-232 Serial Port Connector (COM2)

PIN NO.	RS-232	RS-422	RS-485
1	COM2_DCD#	TXD422#2	TXD485#2
2	COM2_RXD	TXD422+2	TXD485+2
3	COM2_TXD	RXD422+2	NA
4	COM2_DTR#	RXD422#2	NA
5	GND	NA	NA
6	COM2_DSR#	NA	NA
7	COM2_RTS#	NA	NA
8	COM2_CTS#	NA	NA
9	COM2_RI#	NA	NA

Table 4-21: RS-232 Serial Port Connector Pinouts (COM2)

4.3.7 RS-232 Serial Port Connector (COM3)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM3_DCD#	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR#
5	GND	6	COM3_DSR#

7	COM3_RTS#	8	COM3_CTS#
9	COM3_RI#		

Table 4-22: RS-232 Serial Port Connector Pinouts (COM3)

4.3.8 RS-232 Serial Port Connector (COM4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM4_DCD#	2	COM4_RXD
3	COM4_TXD	4	COM4_DTR#
5	GND	6	COM4_DSR#
7	COM4_RTS#	8	COM4_CTS#
9	COM4_RI#		

Table 4-23: RS-232 Serial Port Connector Pinouts (COM4)

4.3.9 RS-232 Serial Port Connector (COM5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM5_DCD#	2	COM5_RXD
3	COM5_TXD	4	COM5_DTR#
5	GND	6	COM5_DSR#
7	COM5_RTS#	8	COM5_CTS#
9	COM5_RI#		

Table 4-24: RS-232 Serial Port Connector Pinouts (COM5)

4.3.10 RS-232 Serial Port Connector (COM6)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM6_DCD#	2	COM6_RXD
3	COM6_TXD	4	COM6_DTR#
5	GND	6	COM6_DSR#
7	COM6_RTS#	8	COM6_CTS#
9	COM6_RI#		

Table 4-25: RS-232 Serial Port Connector Pinouts (COM6)

4.3.11 RS-232 Serial Port Connector (COM7)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM7_DCD#	2	COM7_RXD
3	COM7_TXD	4	COM7_DTR#
5	GND	6	COM7_DSR#
7	COM7_RTS#	8	COM7_CTS#
9	COM7_RI#		

Table 4-26: RS-232 Serial Port Connector Pinouts (COM6)

4.3.12 RS-232 Serial Port Connector (COM8)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM8_DCD#	2	COM8_RXD
3	COM8_TXD	4	COM8_DTR#
5	GND	6	COM8_DSR#
7	COM8_RTS#	8	COM8_CTS#
9	COM8_RI#		

Table 4-27: RS-232 Serial Port Connector Pinouts (COM6)

4.3.13 RS-232 Serial Port Connector (COM9~16)

COM16	COM15	COM14	COM13	COM12	COM11	COM10	COM9
77	75	72	70	67	65	62	60
78	76	73	71	68	66	63	61
20	17	15	12	10	7	5	2
39	37	34	32	29	27	24	22
19	16	14	11	9	6	4	1
59	56	54	51	49	46	44	41
38	36	33	31	28	26	23	21
58	55	53	50	48	45	43	40
18	57	13	52	8	47	3	42

Table 4-28: RS-232 Serial Port Connector Pinouts (COM9~16)

4.3.14 USB 2.0 Connectors (USB56)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+V5A_IO_USB45	2	-DATA6
3	+DATA6	4	GND
5	+V5A_IO_USB45	6	-DATA7
7	+DATA7	8	GND

Table 4-29: USB 3.0 Connectors Pinouts (USB56)

4.3.15 VGA Connector (VGA1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED_VGA	2	GREEN_VGA
3	BLUE_VGA	4	GND
5	NC	6	GND
7	GND	8	GND
9	+V5_VGA	10	DET#_VGA
11	NC	12	DDC_DATA_VGA
13	HSYNC_VGA	14	VSYNC_VGA
15	DDC_CLK_VGA		

Table 4-30: VGA Connector Pinouts (VGA1)

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

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

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

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter 2.

5.1.5 BIOS Menu Bar

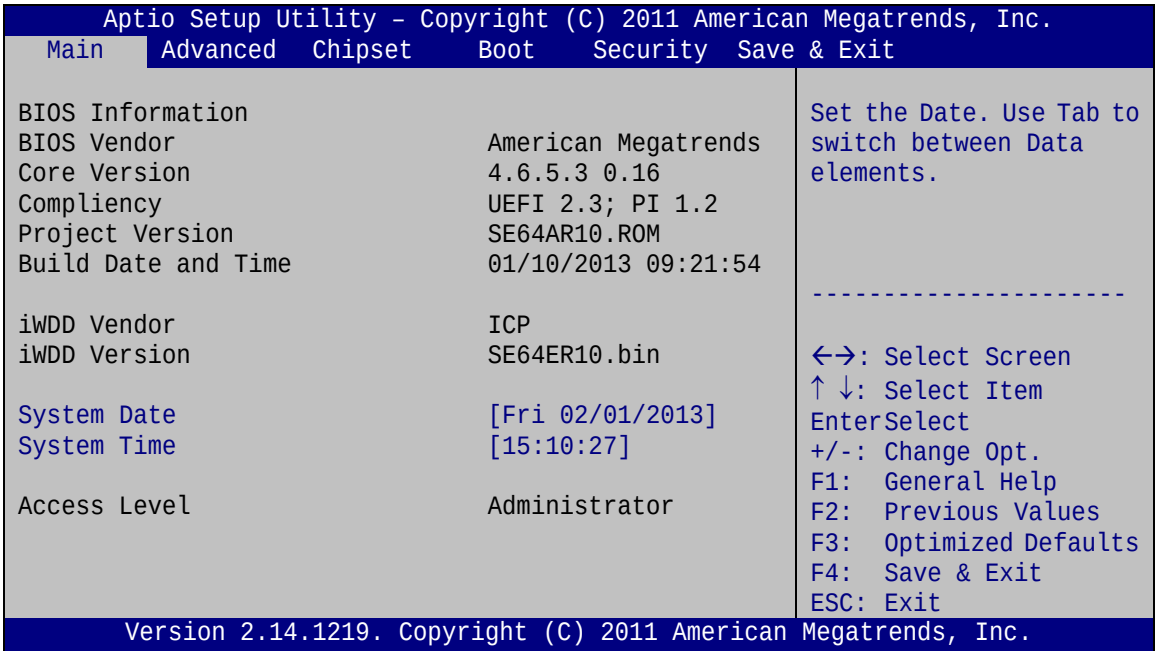
The **menu bar** on top of the BIOS screen has the following main items:

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

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

5.2 Main

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



BIOS Menu 1: Main

➔ System Overview

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

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

➔ iWDD Vendor

- The **iWDD Vendor** displays the installed iWDD vendor. The fields in **iWDD Vendor** cannot be changed.

➔ iWDD Version

- The **iWDD Version** displays the current iWDD version. The fields in **iWDD Version** cannot be changed.

The System Overview field also has two user configurable fields:

➔ System Date [xx/xx/xx]

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

➔ System Time [xx:xx:xx]

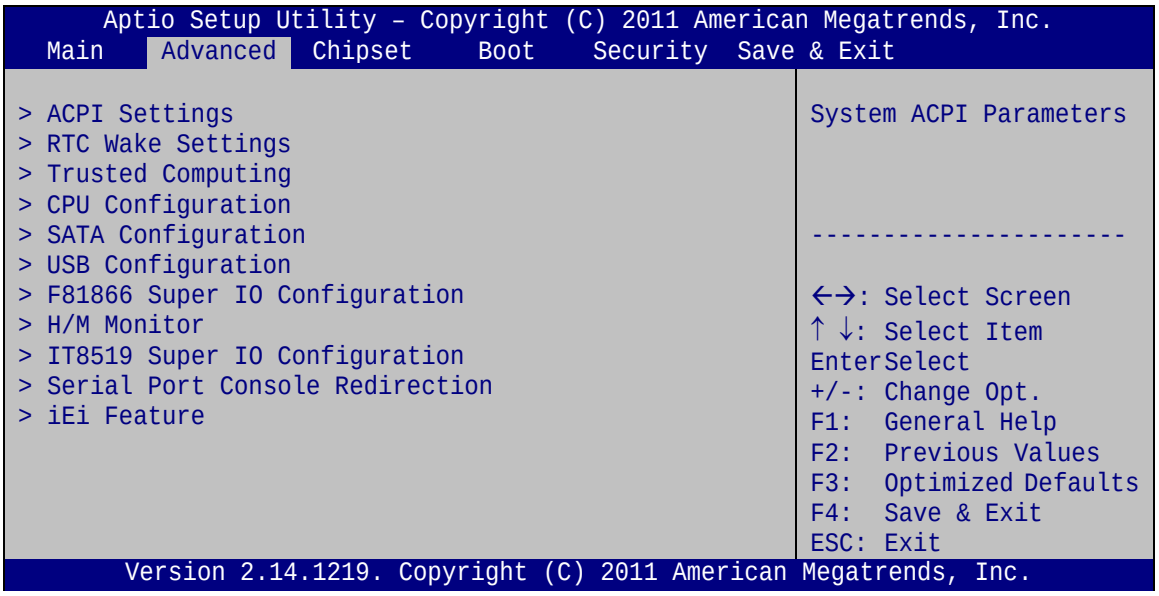
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

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

WARNING!

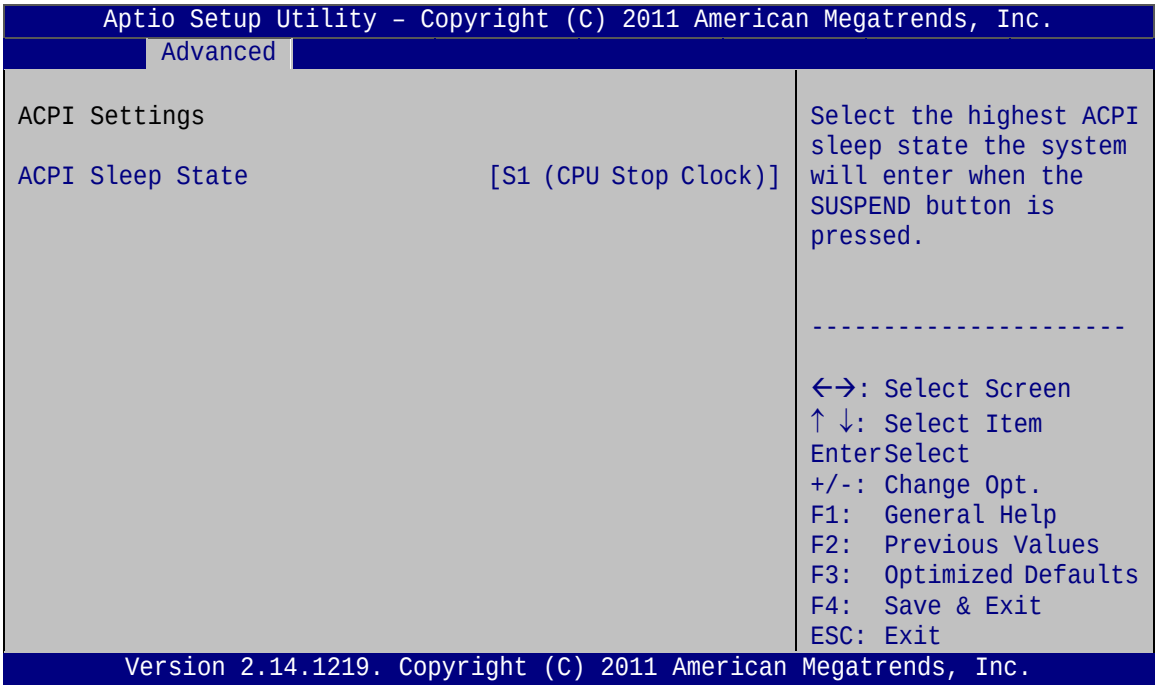
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Configuration

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

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

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

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
Wake system with Fixed Time      [Disabled]

                                 Enable or disable System
                                 wake on alarm event. When
                                 enabled, System will
                                 wake on the
                                 dat::hr::min::sec
                                 specified

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

                                 ←→: Select Screen
                                 ↑ ↓: Select Item
                                 EnterSelect
                                 +/-: 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 4: RTC Wake Settings

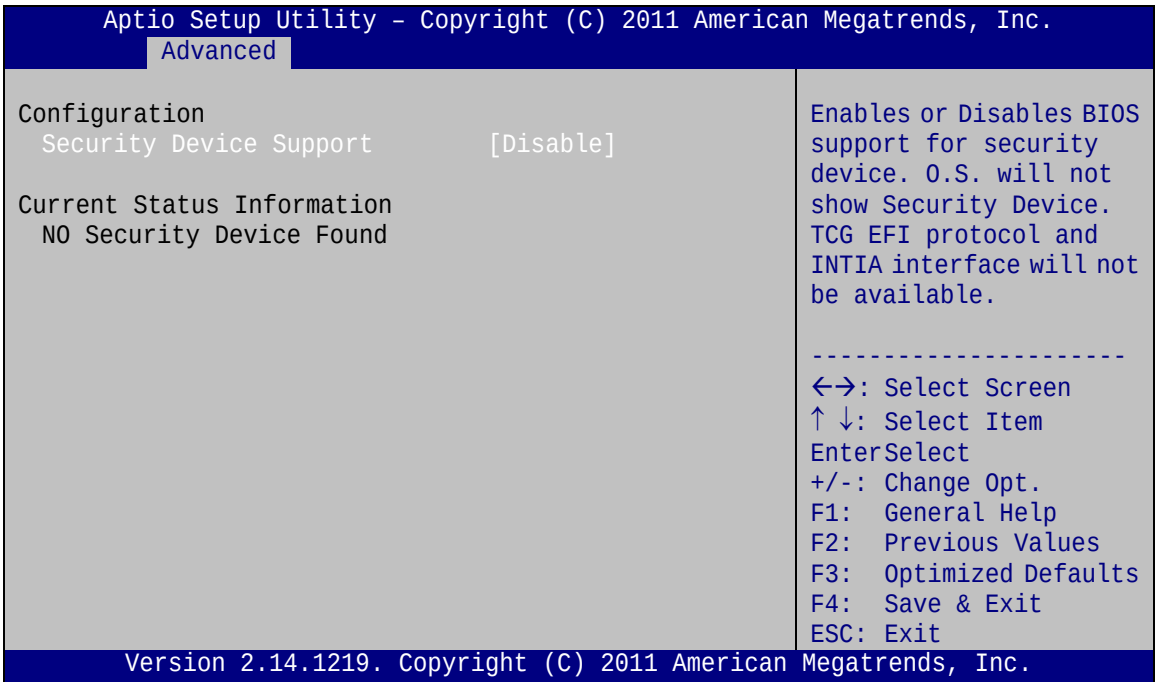
➔ Wake System with Fixed Time [Disabled]

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 Trusted Computing

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



BIOS Menu 5: Trusted Computing

➔ Security Device Support [Disable]

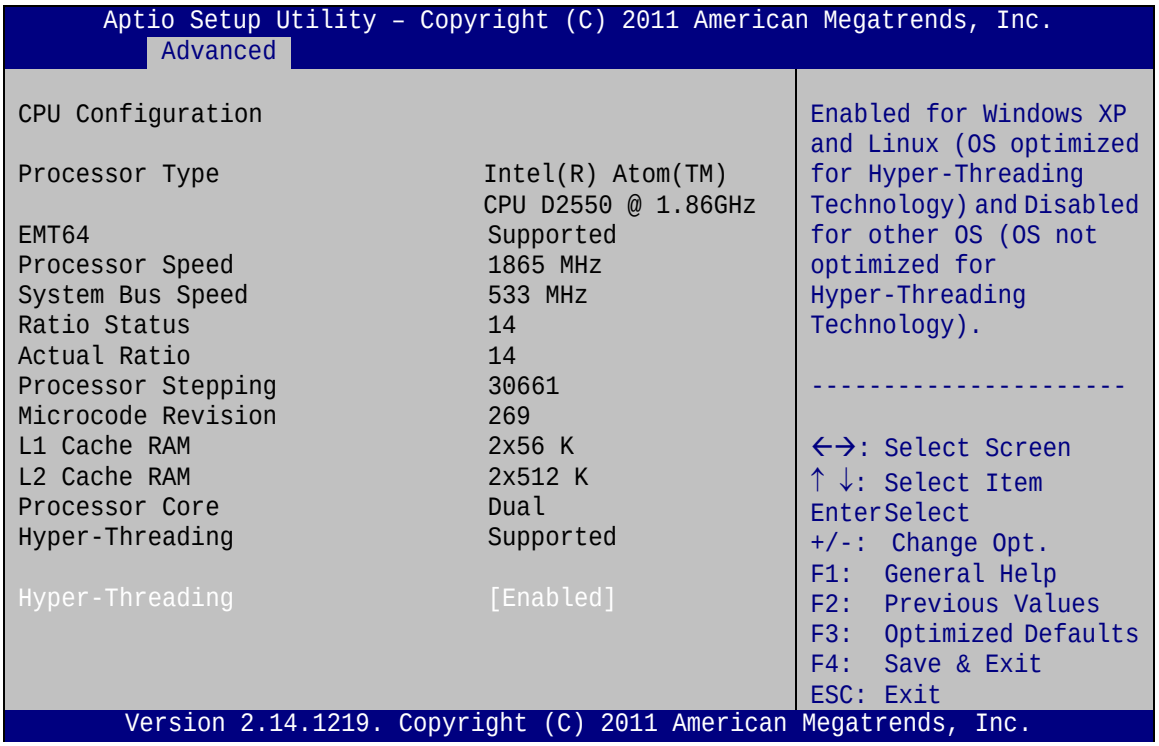
Use the **Security Device Support** option to configure support for the security device.

➔ **Disable** **DEFAULT** Security device support is disabled.

➔ **Enable** Security device support is enabled.

5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to enter the **CPU Information** submenu or enable Intel Virtualization Technology.



BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- **Processor Type**: Lists the brand name of the CPU being used.
- **EMT64**: Indicates if EMT64 is supported by the CPU.
- **Processor Speed**: Lists the CPU processing speed.
- **System Bus Speed**: Lists the system bus speed.
- **Ratio Status**: Lists the ratio status.
- **Actual Ratio**: Lists the ratio of the frequency to the clock speed.
- **Processor Stepping**: Lists the CPU ID.
- **Microcode Revision**: Lists the microcode revision.
- **L1 Cache RAM**: Lists the CPU L1 cache size.
- **L2 Cache RAM**: Lists the CPU L2 cache size.
- **Processor Core**: Lists the number of the processor core.
- **Hyper-Threading**: Indicates if Intel HT Technology is supported by the CPU.

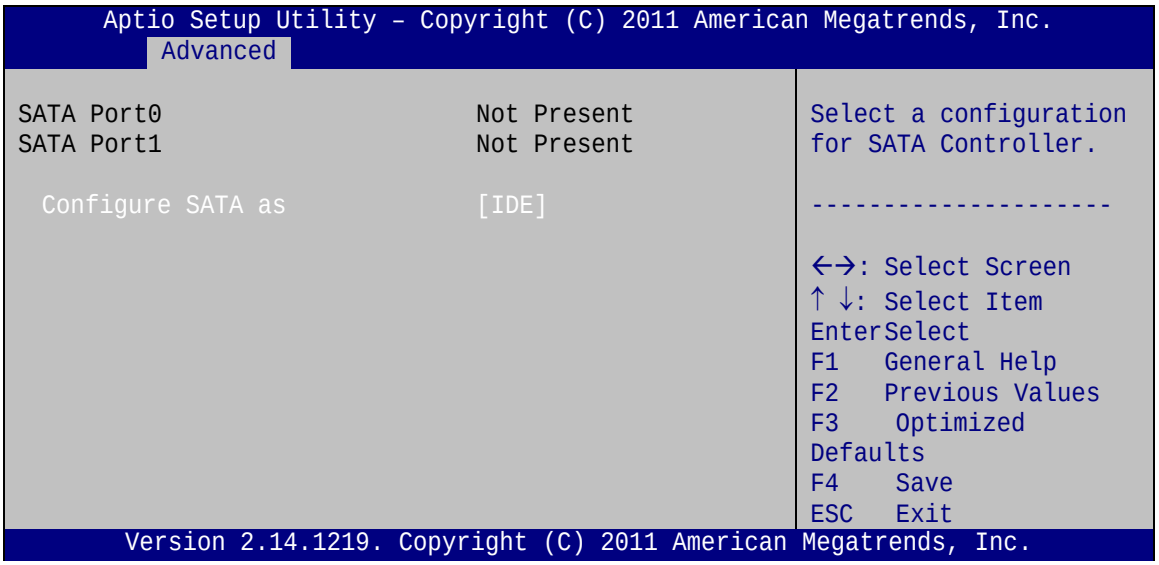
➔ Hyper-Threading [Enabled]

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.

5.3.5 SATA Configuration

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



BIOS Menu 7: IDE Configuration

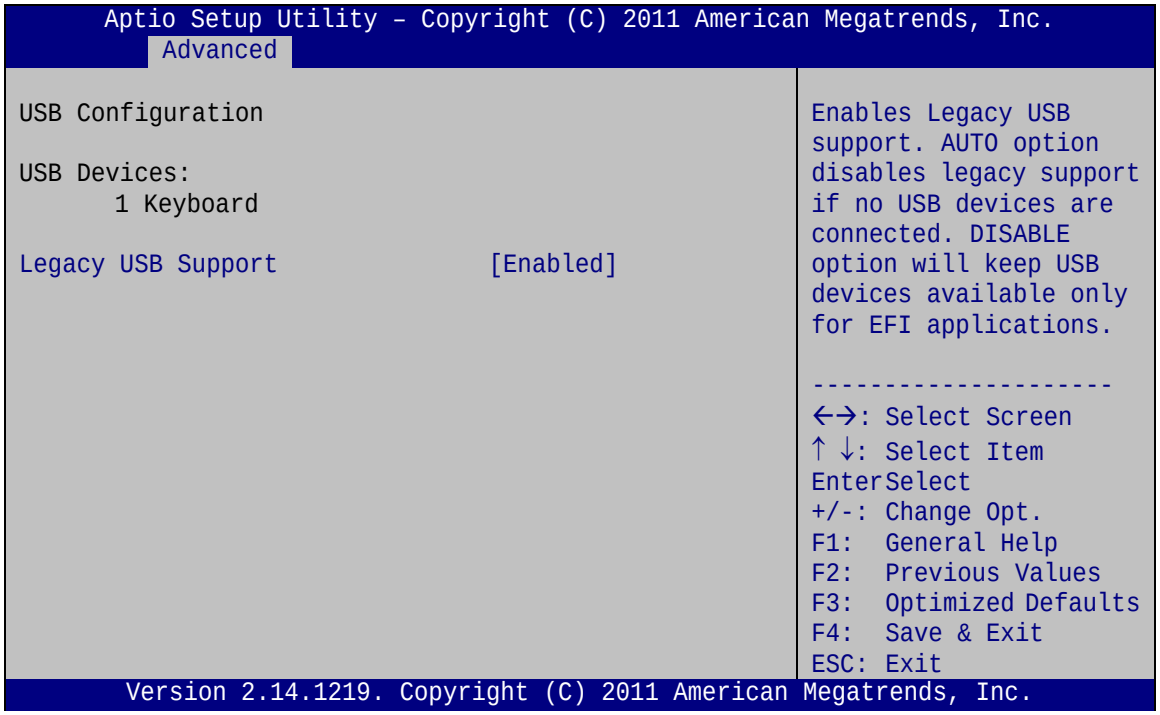
➔ Configure SATA as [IDE]

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

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

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.



BIOS Menu 8: USB Configuration

➔ USB Devices

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

➔ Legacy USB Support [Enabled]

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

➔ **Enabled** **DEFAULT** Legacy USB support enabled

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

5.3.7 F81866 Super IO Configuration

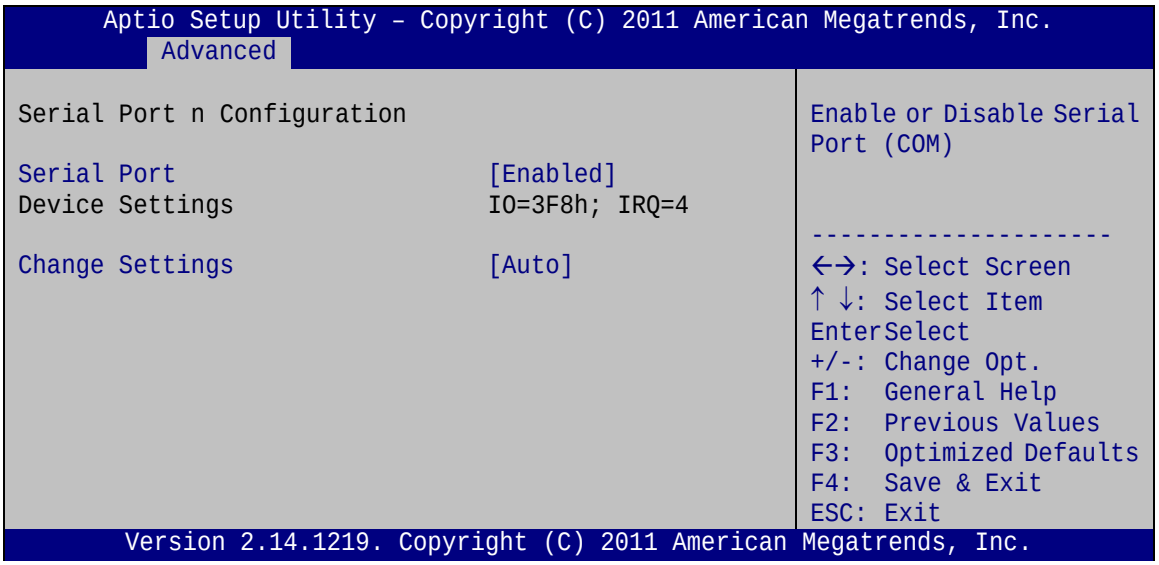
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 9**) to set or change the configurations for the serial ports.

```
Aptio Setup Utility – Copyright (C) 2011 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
> Serial Port 3 Configuration                  ↑ ↓: Select Item
> Serial Port 4 Configuration                  EnterSelect
> Serial Port 5 Configuration                  +/-: Change Opt.
> Serial Port 6 Configuration                  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 9: F81866 Super IO Configuration

5.3.7.1 Serial Port n Configuration

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



BIOS Menu 10: Serial Port n Configuration Menu

5.3.7.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

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

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

➔ Device Mode [RS232]

Use the **Device Mode** option to select the serial port mode.

- **RS232** **DEFAULT** — Enables serial port RS-232 support.
- **RS422** — Enables serial port RS-422 support.
- **RS485** — Enables serial port RS-485 support.

5.3.7.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

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

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

➔ Device Mode [RS232]

Use the **Device Mode** option to select the serial port mode.

➔ **RS232** **DEFAULT** Enables serial port RS-232 support.

➔ **RS422** Enables serial port RS-422 support.

➔ **RS485** Enables serial port RS-485 support.

5.3.7.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled** Disable the serial port

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

➔ Change Settings [Auto]

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

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

➔ **IO=3E8h; IRQ=10** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10

➔ **IO=3E8h; IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11

➔ **IO=2E8h; IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.7.1.4 Serial Port 4 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

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

5.3.7.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=280h; IRQ=10**		Serial Port I/O port address is 280h and the interrupt address is IRQ10
➔ **IO=280h; IRQ=10, 11**		Serial Port I/O port address is 280h and the interrupt address is IRQ10, 11
➔ **IO=288h; IRQ=10, 11**		Serial Port I/O port address is 288h and the interrupt address is IRQ10, 11

5.3.7.1.6 Serial Port 6 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2D8h; IRQ=10**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11

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

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

5.3.8 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 11**) shows the operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
        Advanced
PC Health Status                          Enable or Disable Smart
                                          Fan
CPU Temperature                :+44 C
System Temperature             :+35 C
                                          ----------------------
                                          ←→: Select Screen
                                          ↑ ↓: Select Item
                                          EnterSelect
                                          +/-: Change Opt.
                                          F1:  General Help
                                          F2:  Previous Values
                                          F3:   Optimized
                                          Defaults
                                          F4:   Save & Exit
                                          ESC:  Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 11: Hardware Health Configuration

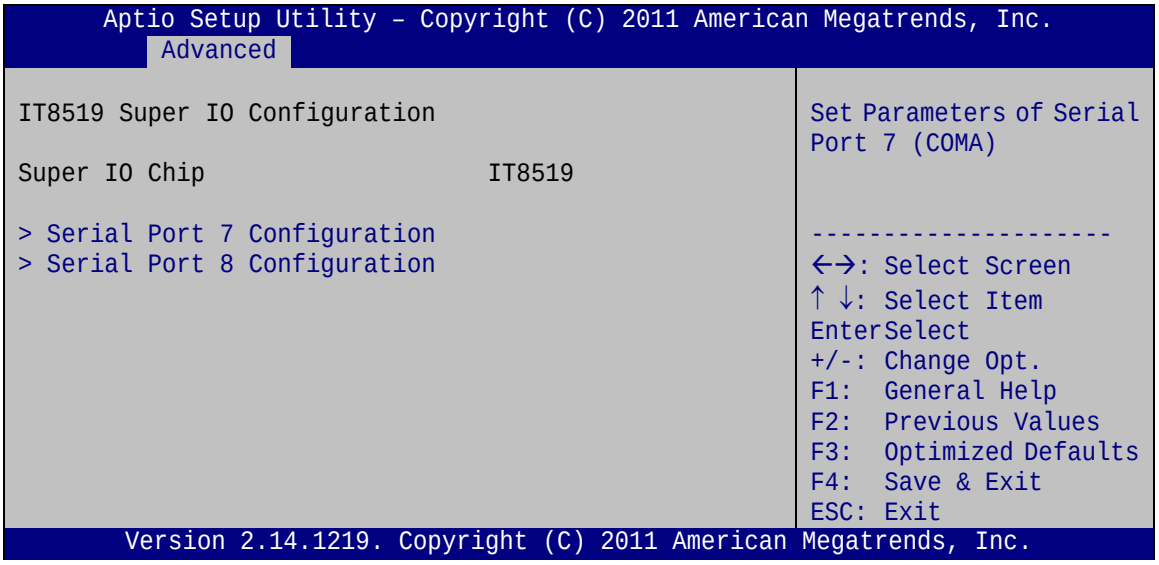
➔ PC Health Status

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

- System Temperatures:
  - CPU Temperature
  - System Temperature

5.3.9 IT8519 Super IO Configuration

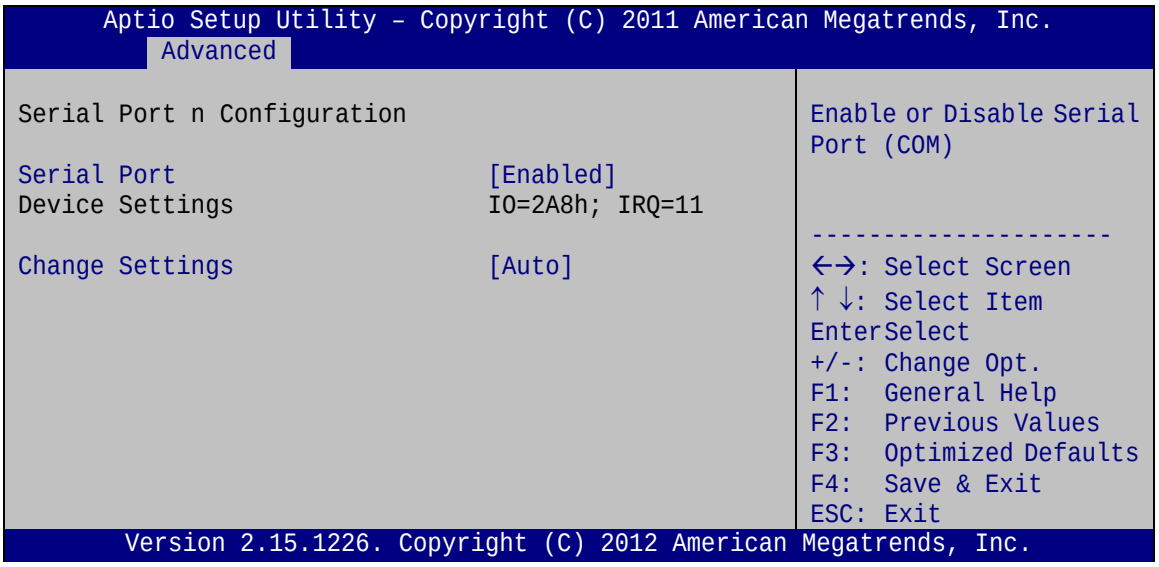
Use the **IT8519 Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the serial ports.



BIOS Menu 12: Secondary Super IO Configuration

5.3.9.1 Serial Port n Configuration

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



BIOS Menu 13: Serial Port n Configuration Menu

5.3.9.1.1 Serial Port 7 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=2A8h; IRQ=11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ11
➔ **IO=2A8h; IRQ=10, 11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

5.3.9.1.2 Serial Port 8 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

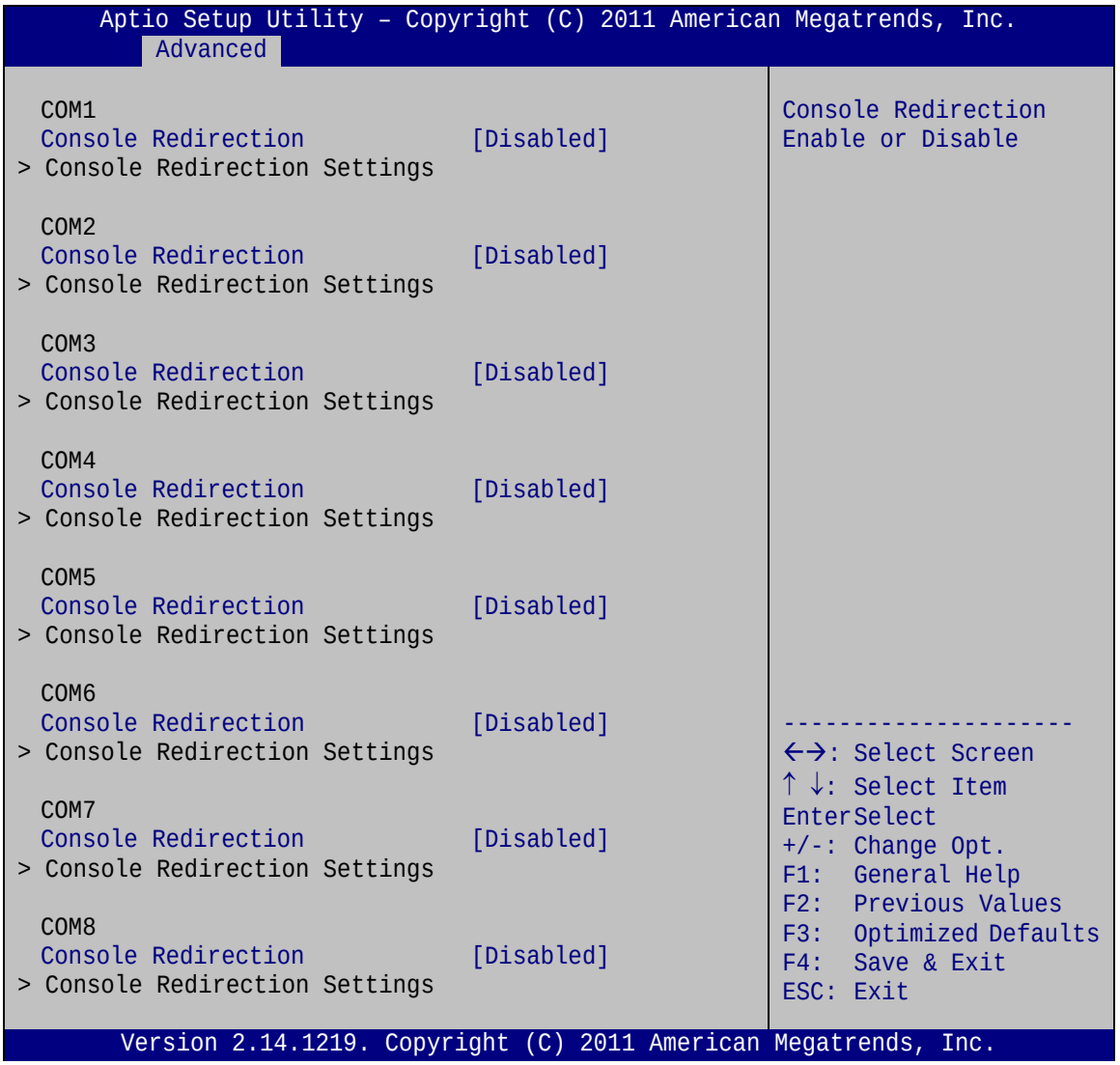
➔ Change Settings [Auto]

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=2B8h; IRQ=11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ11
➔ **IO=2A8h; IRQ=10, 11**		Serial Port I/O port address is 2A8h and the interrupt address is IRQ10, 11
➔ **IO=2B8h; IRQ=10, 11**		Serial Port I/O port address is 2B8h and the interrupt address is IRQ10, 11

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.



BIOS Menu 14: Serial Port Console Redirection

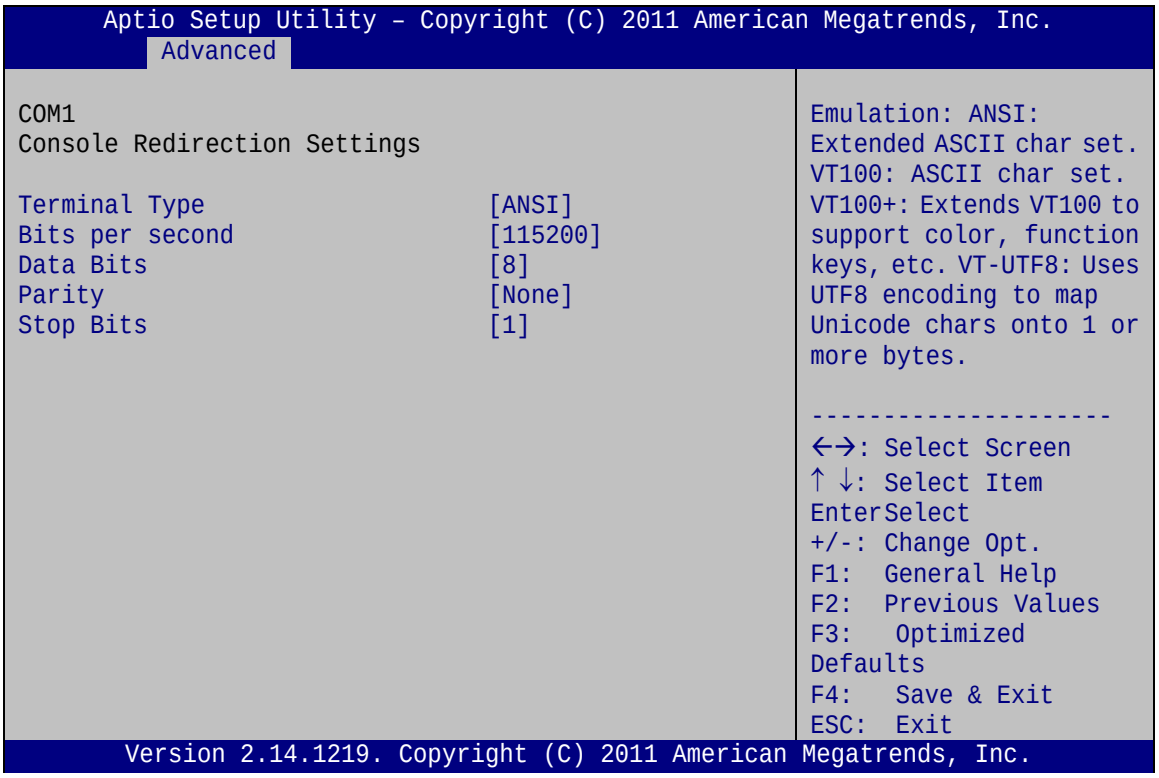
➔ Console Redirection [Disabled]

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

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

5.3.10.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 15**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.



BIOS Menu 15: Console Redirection Settings

➔ 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 transmission speed of the serial port.

➔	**9600**	The transmission speed is 9600
➔	**19200**	The transmission speed is 19200
➔	**38400**	The transmission speed is 38400

➔	**57600**		The transmission speed is 57600
➔	**115200**	**DEFAULT**	The transmission speed is 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.

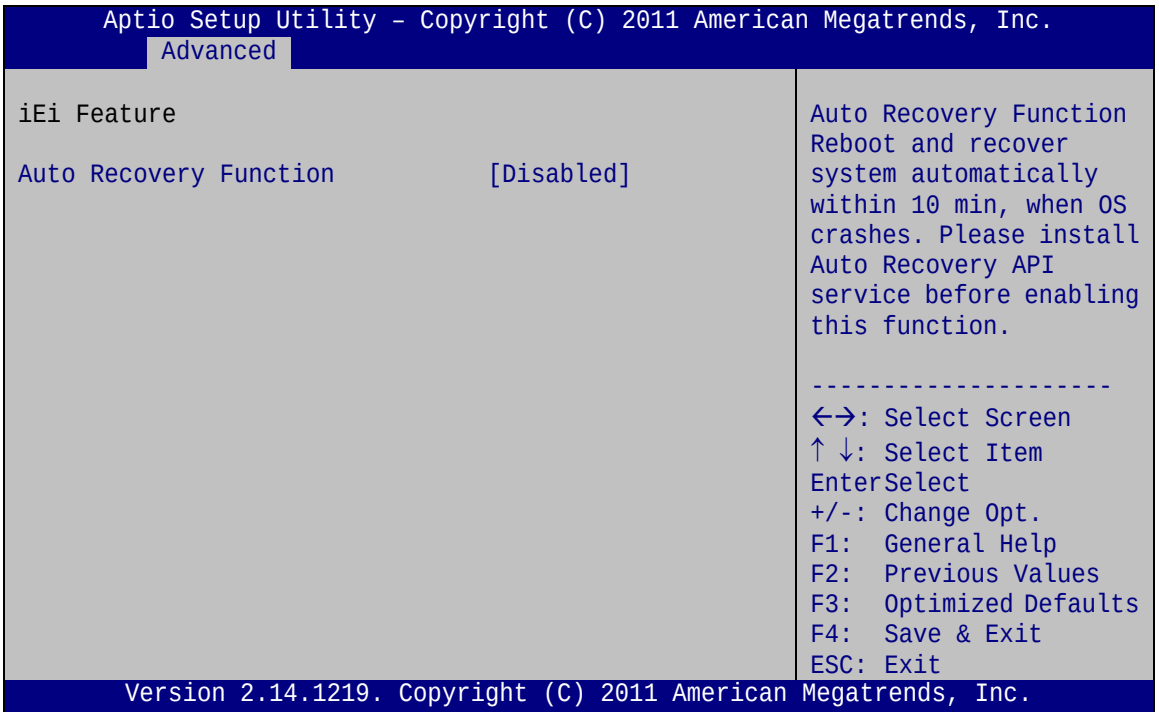
➔ Stop Bits [1]

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 16**) to configure the iEi features.



BIOS Menu 16: iEi Feature

➔ Auto Recovery Function [Disabled]

Use **Auto Recovery Function** option to enable or disable the auto recovery function.

➔ **Disabled** **DEFAULT** Disabled the auto recovery function

➔ **Enabled** Enabled the auto recovery function

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the Host Bridge and South Bridge configuration menus.

WARNING!

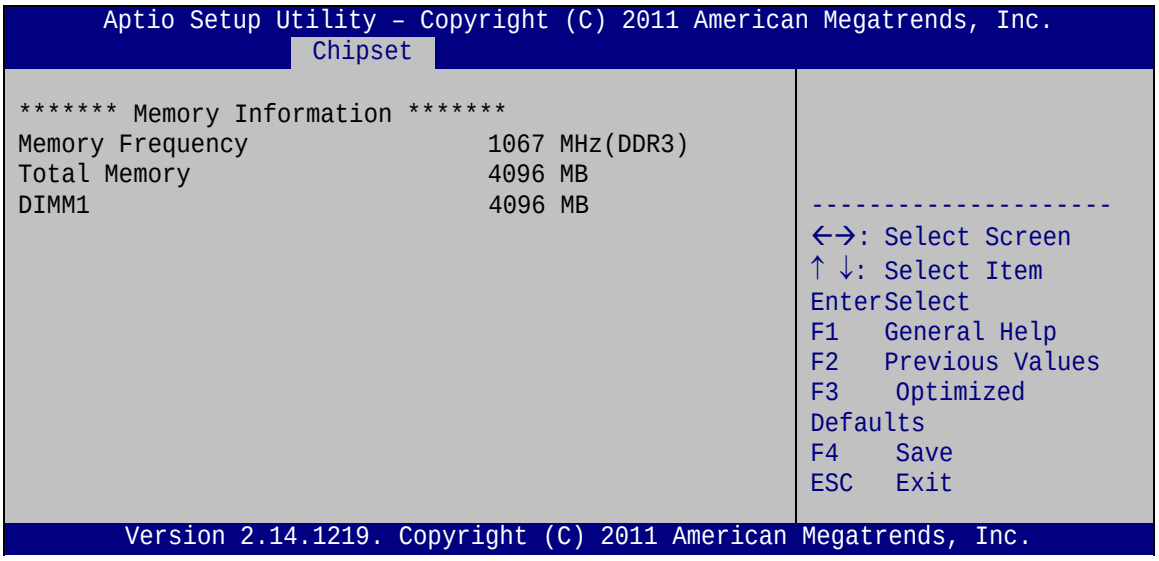
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

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

> Host Bridge                                   Host Bridge Parameters
> South Bridge


                                                ---------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                +/-: 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 17: Chipset

5.4.1 Host Bridge Configuration

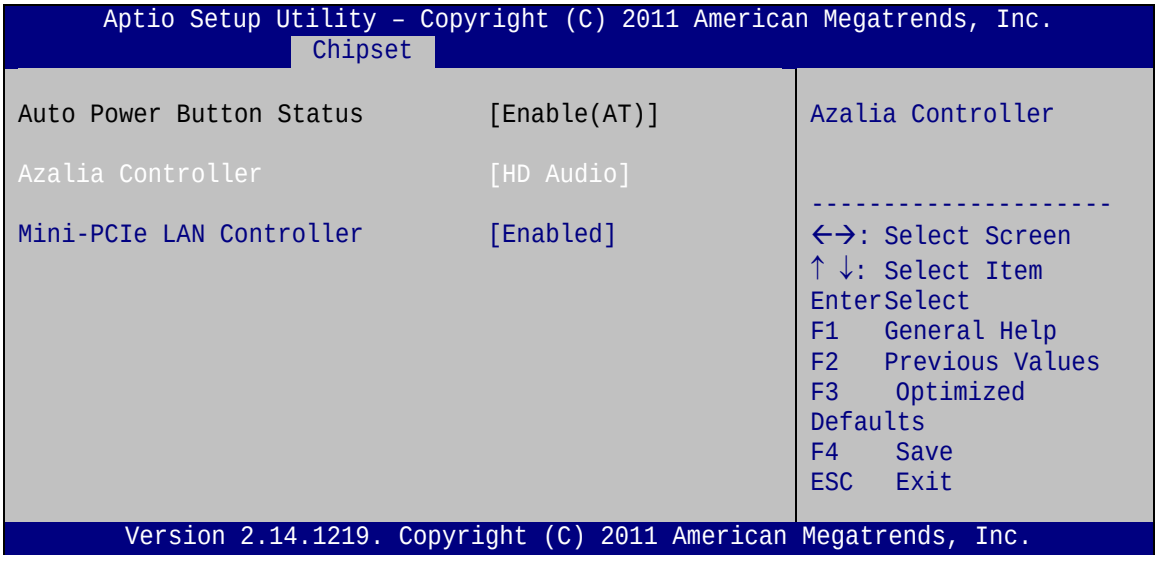
Use the **Host Bridge** menu (**BIOS Menu 18**) to view the memory information.



BIOS Menu 18: Host Bridge

5.4.2 South Bridge Configuration

Use the **South Bridge** menu (**BIOS Menu 19**) to configure the south bridge chipset.



BIOS Menu 19:South Bridge

➔ Azalia Controller [Enabled]

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

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

➔ Mini-PCIe LAN Controller [Enabled]

Use the **Mini-PCIe LAN Controller** option to enable or disable the mini PCIe LAN controller.

➔ **Disabled**		Disables the mini PCIe LAN controller
➔ **Enabled**	**DEFAULT**	Enables the mini PCIe LAN controller

5.5 Boot

Use the **Boot** menu (**BIOS Menu 20**) to configure system boot options.

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

Boot Configuration                          Select the keyboard
Bootup NumLock State            [On]        NumLock state
Quiet Boot                      [Enabled]
Launch PXE OpROM                [Disabled]
Option ROM Messages             [Force BIOS]  ---------------------
UEFI Boot                       [Disabled]  ←→: Select Screen
                                            ↑ ↓: Select Item
Boot Option Priorities                      EnterSelect
                                            +/-: Change Opt.
                                            F1:  General Help
                                            F2:  Previous Values
                                            F3:  Optimized Defaults
                                            F4:  Save & Exit
                                            ESC: Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 20: Boot

➔ Bootup NumLock State [On]

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

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

➔ Quiet Boot [Enabled]

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

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

➔ Launch PXE OpROM [Disabled]

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

➔ **Disabled**	**DEFAULT**	Disables boot from legacy network devices
➔ **Enabled**		Enables boot from legacy network devices

➔ 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.

➔ UEFI Boot [Disabled]

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

➔ **Enabled** Boot from UEFI devices is enabled.

➔ **Disabled** **DEFAULT** Boot from UEFI devices is disabled.

5.6 Security

Use the **Security** menu (**BIOS Menu 21**) to set system and user passwords.

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

Password Description                          Set Setup 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.           ←→: Select Screen
If ONLY the User's password is set, then this ↑ ↓: Select Item
is a power on password and must be entered to EnterSelect
boot or enter Setup. In Setup the User will   +/-: Change Opt.
have Administrator rights.                    F1:  General Help
The password must be 3 to 20 characters long. F2:  Previous Values
                                              F3:  Optimized Defaults
Administrator Password                        F4:  Save & Exit
User Password                                 ESC: Exit
       Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

BIOS Menu 21: Security

➔ Administrator Password

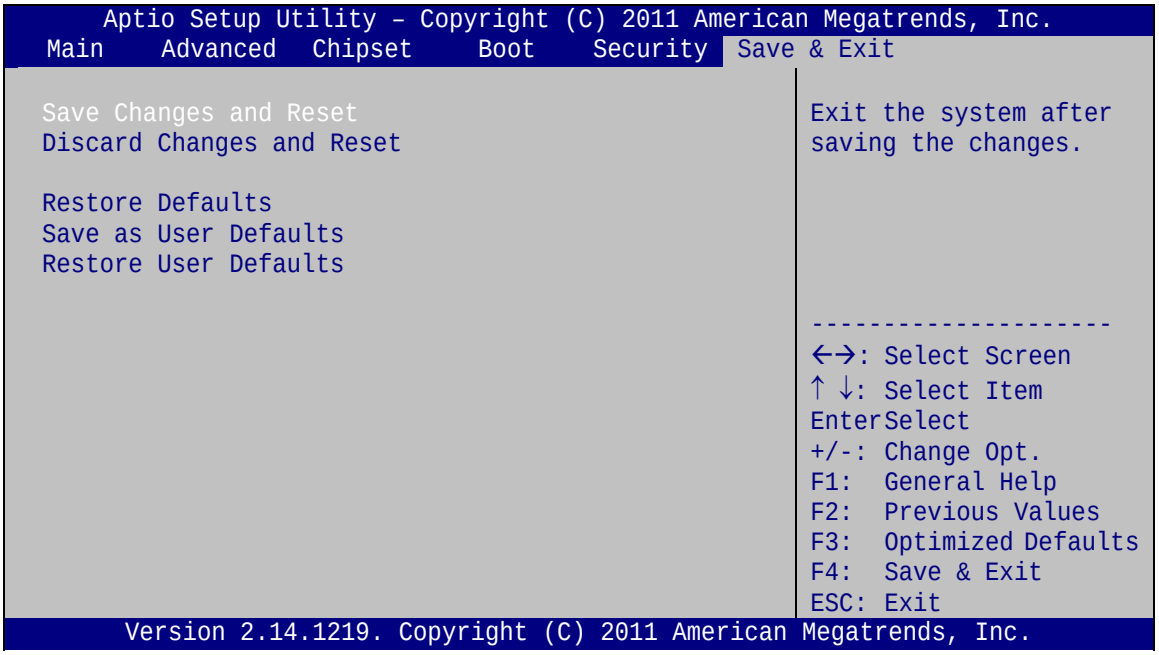
Use the **Administrator Password** to set or change an administrator password.

➔ User Password

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

5.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22:Exit

➔ Save Changes and Reset

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

➔ 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

One Key Recovery

A.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 A.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

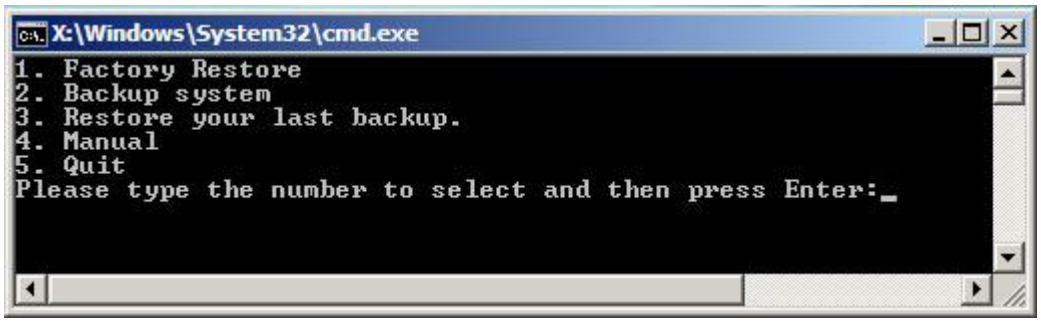


Figure A-1: IEI One Key Recovery Tool Menu

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

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

NOTE:

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

A.1.1 System Requirement

NOTE:

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

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

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

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

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

NOTE:

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

A.1.2 Supported Operating System

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

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

- Ubuntu 8.10 (Intrepid)
- Ubuntu 7.10 (Gutsy)
- Ubuntu 6.10 (Edgy)
- Debian 5.0 (Lenny)
- Debian 4.0 (Etch)
- SuSe 11.2
- SuSe 10.3

NOTE:

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

A.2 Setup Procedure for Windows

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

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

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

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

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

Step 5: Create factory default image (see **Section A.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 A.3**.

A.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.

A.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!

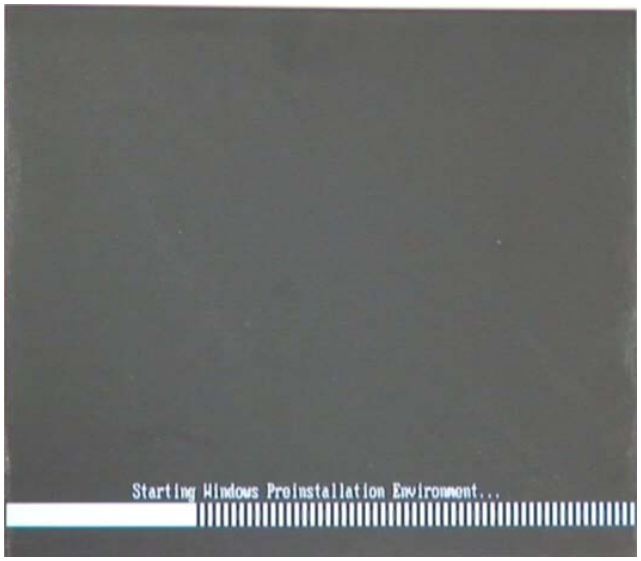


Figure A-2: Launching the Recovery Tool

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

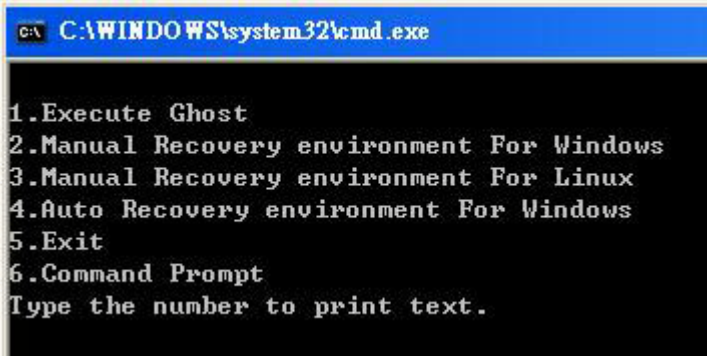


Figure A-3: Recovery Tool Setup Menu

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

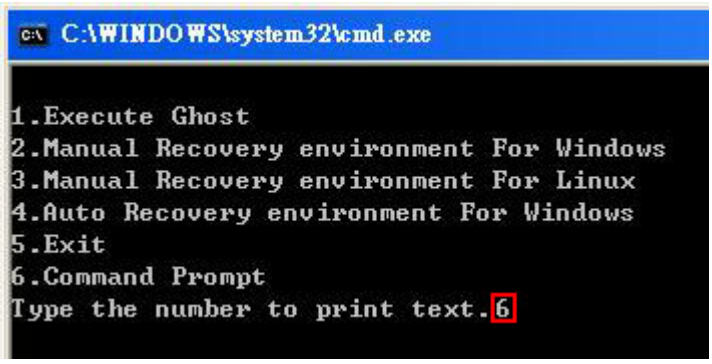


Figure A-4: Command Mode

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

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

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

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

system32>exit

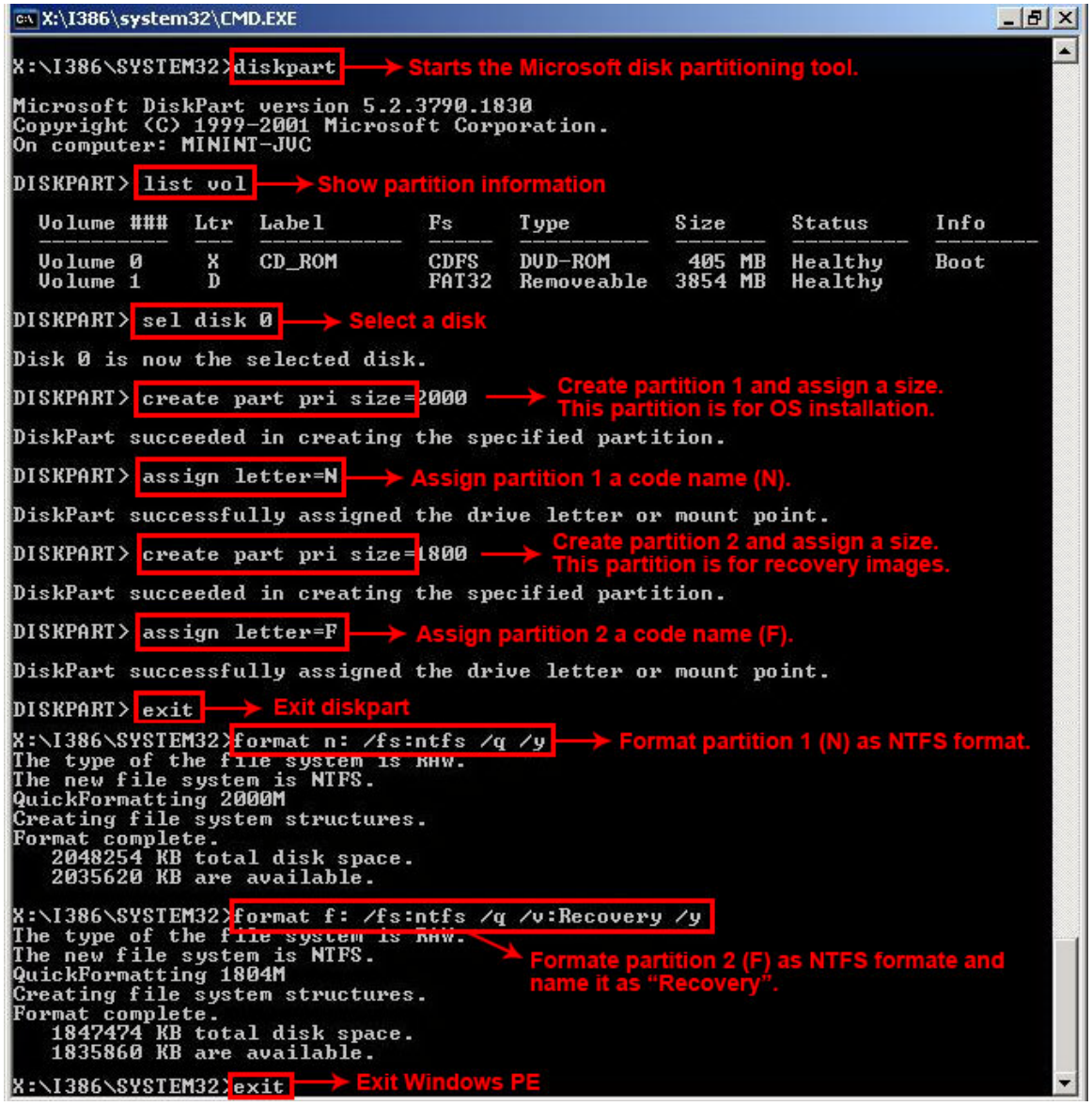
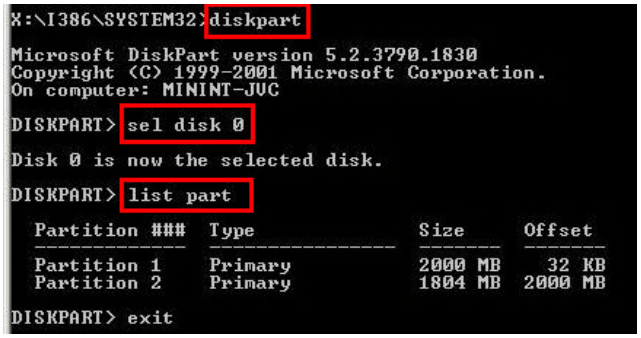


Figure A-5: Partition Creation Commands

NOTE:

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



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

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

A.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.

A.2.4 Build-up Recovery Partition

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

Step 2: Start the system.

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

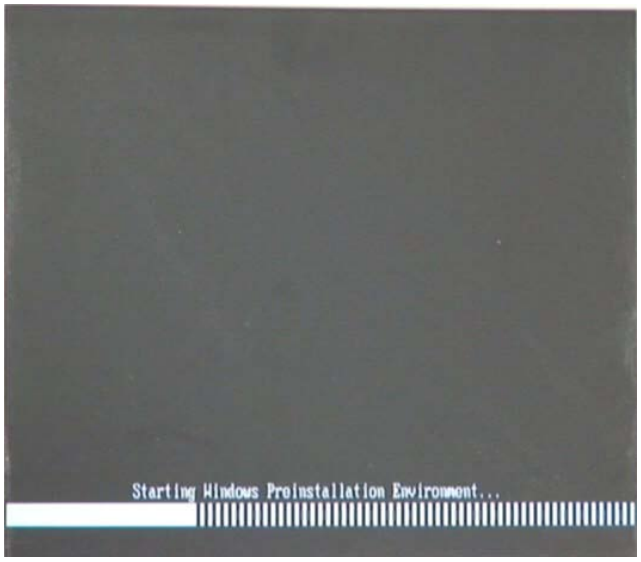


Figure A-6: Launching the Recovery Tool

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

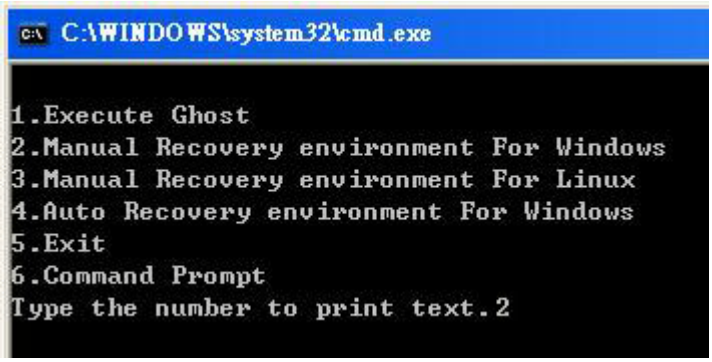


Figure A-7: System Configuration for Windows

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 A.2.2** is hidden and the recovery tool is saved in this partition.

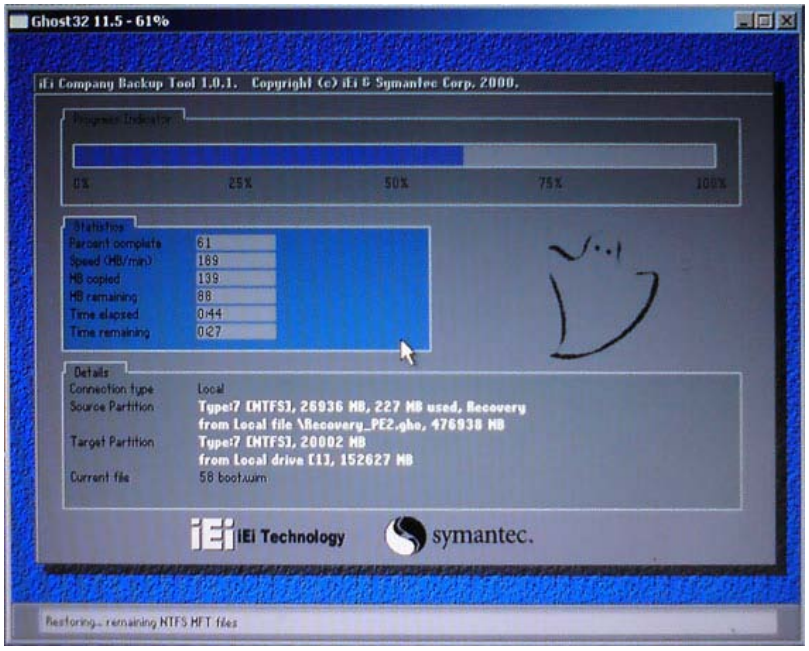


Figure A-8: Building the Recovery Partition

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

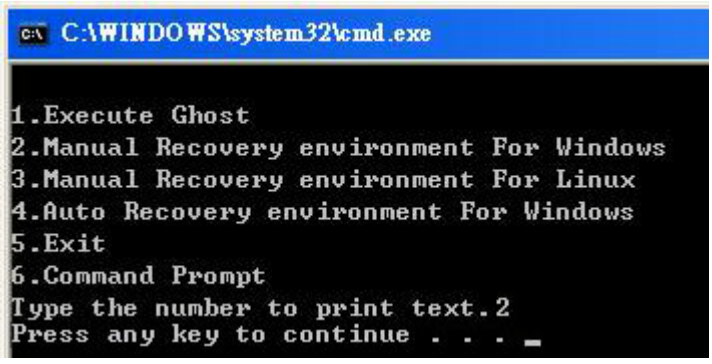


Figure A-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image

NOTE:

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

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

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

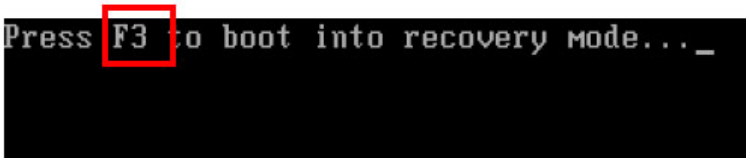


Figure A-10: Press F3 to Boot into Recovery Mode

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

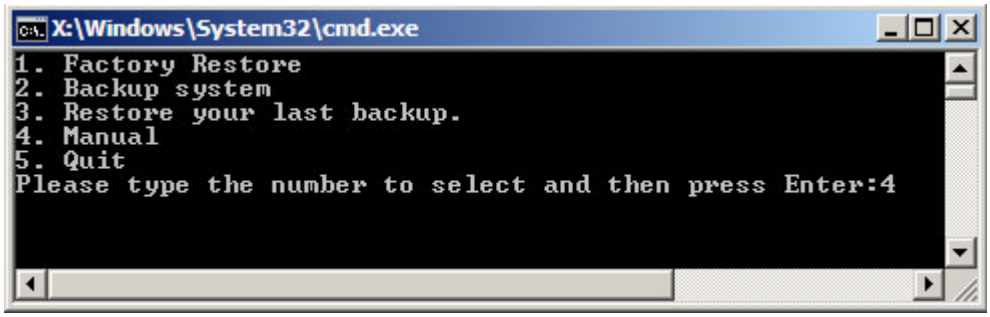


Figure A-11: Recovery Tool Menu

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

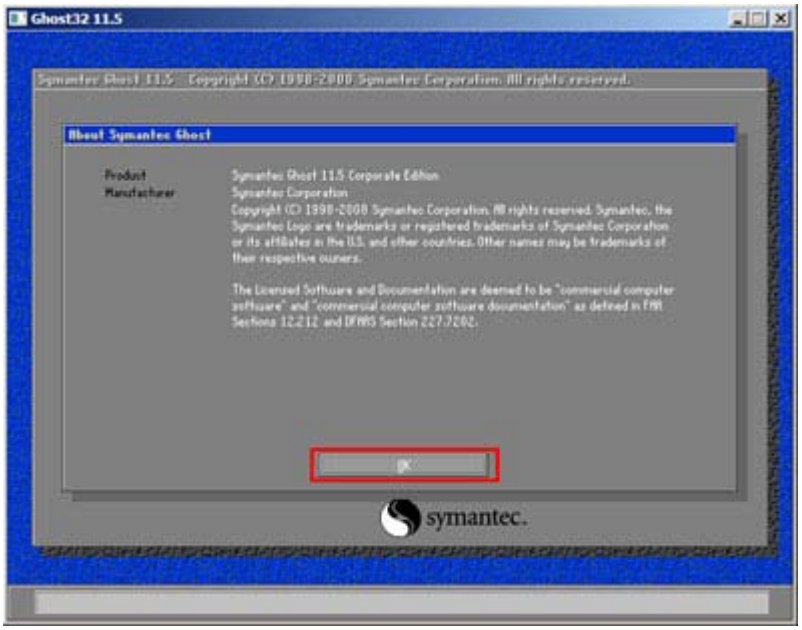


Figure A-12: About Symantec Ghost Window

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

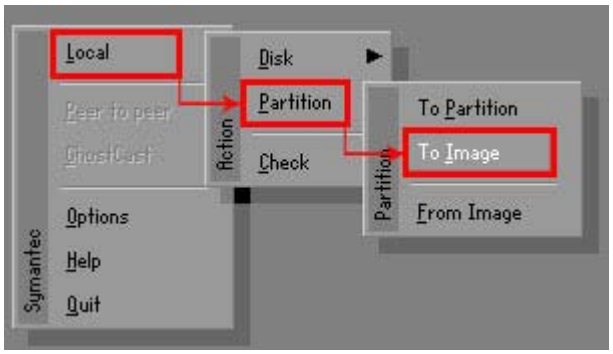


Figure A-13: Symantec Ghost Path

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

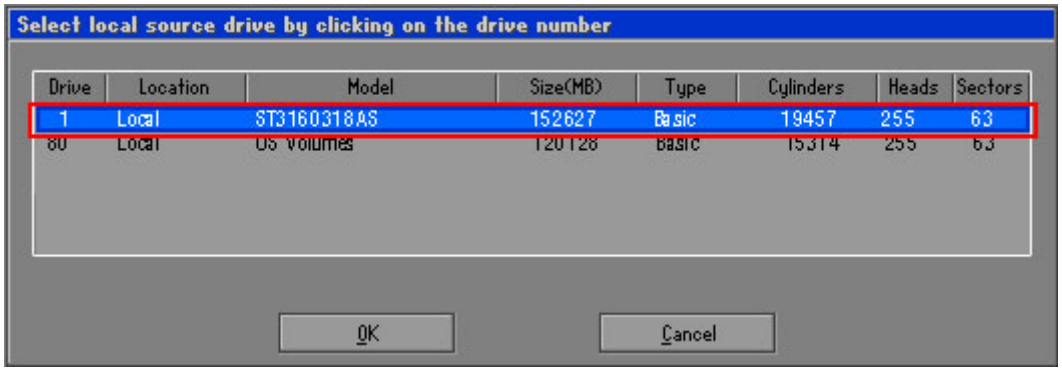


Figure A-14: Select a Local Source Drive

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

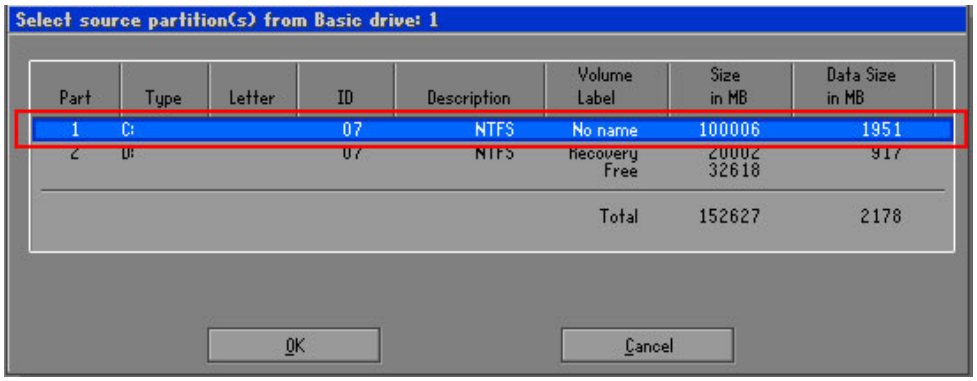


Figure A-15: Select a Source Partition from Basic Drive

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

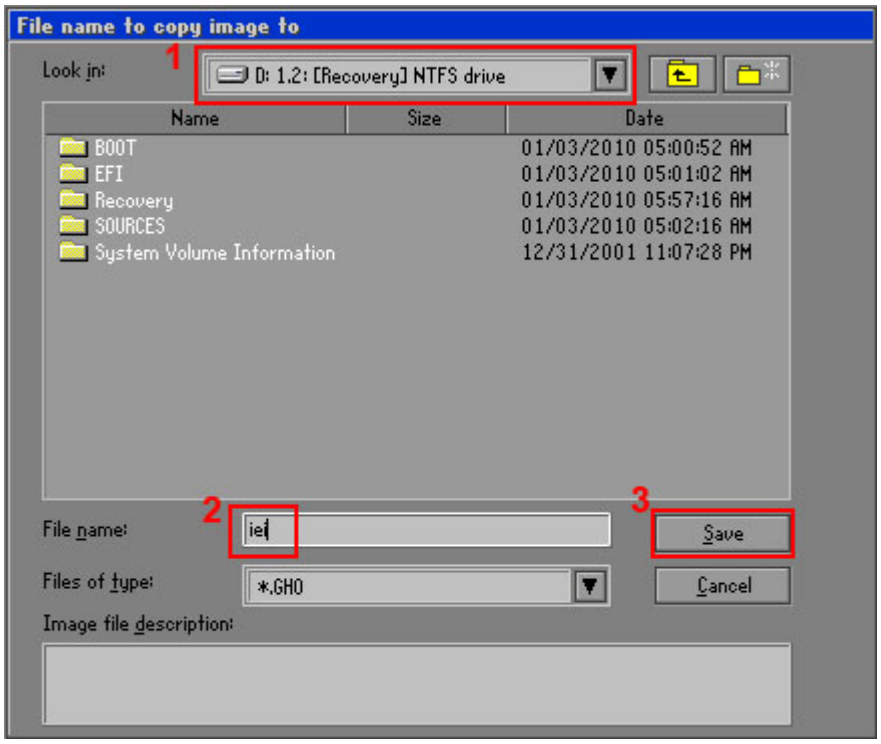


Figure A-16: File Name to Copy Image to

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

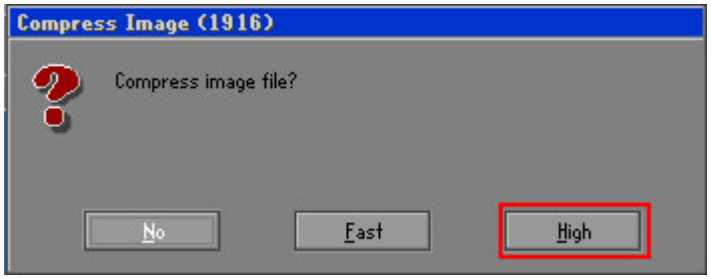


Figure A-17: Compress Image

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

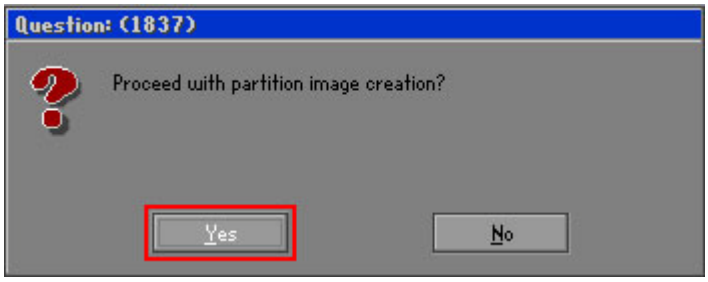


Figure A-18: Image Creation Confirmation

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

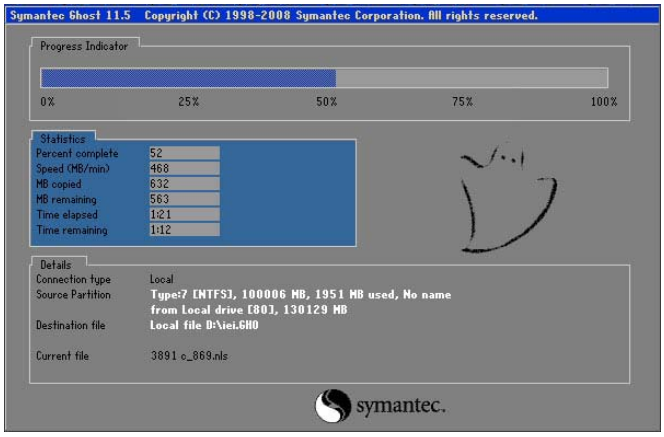


Figure A-19: Image Creation Process

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

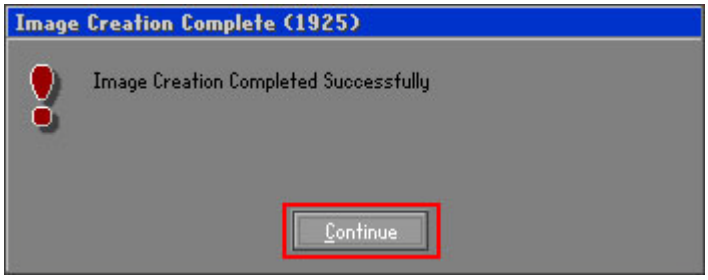


Figure A-20: Image Creation Complete

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

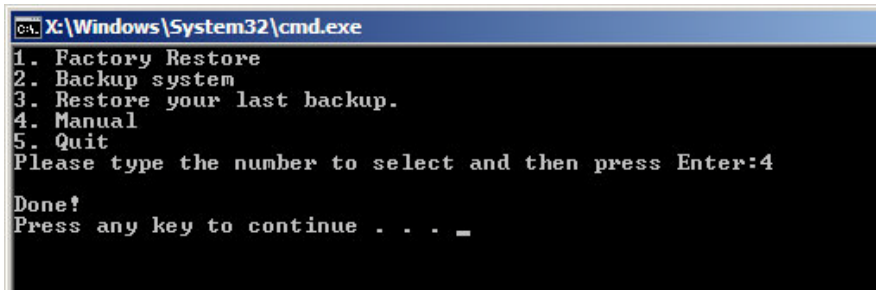


Figure A-21: Press Any Key to Continue

A.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 A.2.1 ~ Section A.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 A-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!

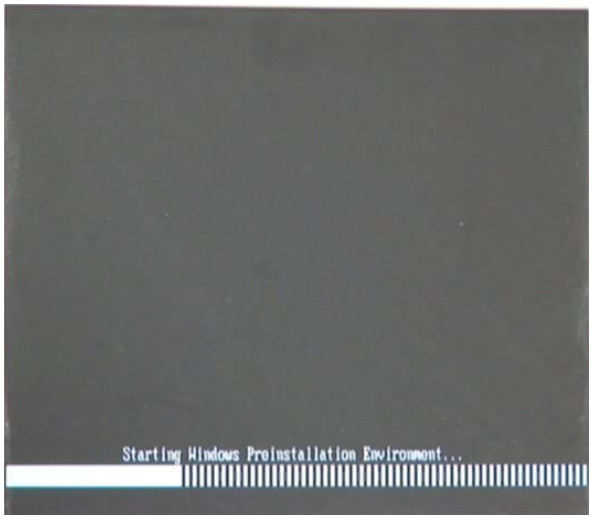


Figure A-23: Launching the Recovery Tool

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

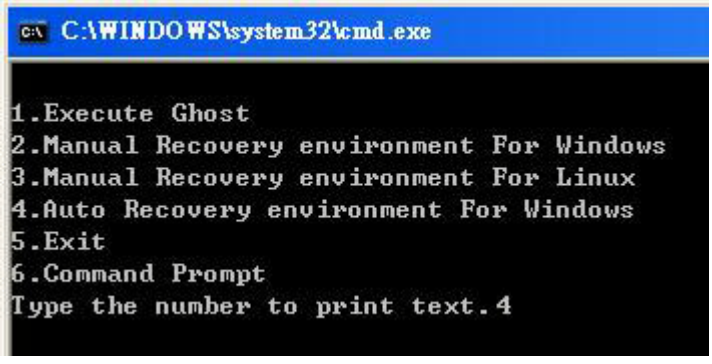


Figure A-24: Auto Recovery Environment for Windows

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 A.2.2** is hidden and the auto recovery tool is saved in this partition.

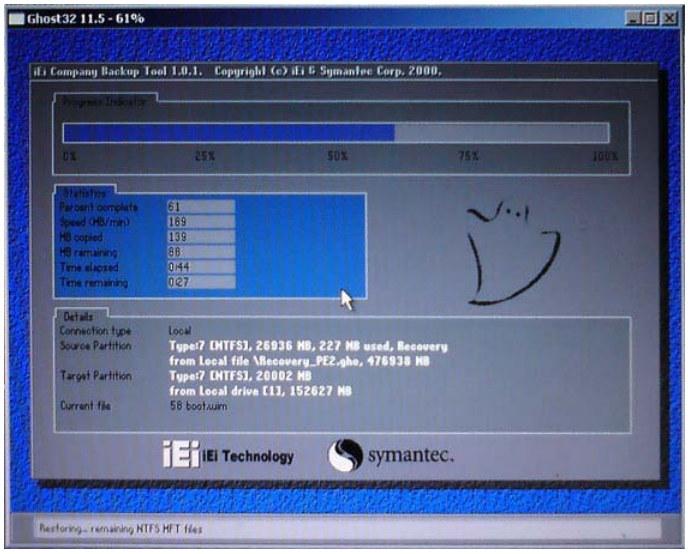


Figure A-25: Building the Auto Recovery Partition

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 A-26: Factory Default Image Confirmation

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

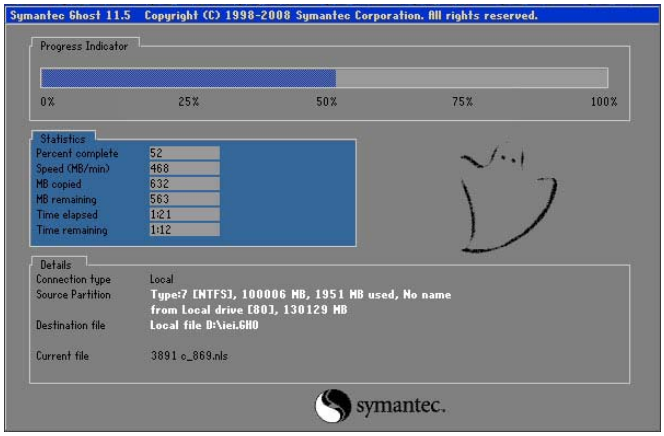


Figure A-27: Image Creation Complete

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

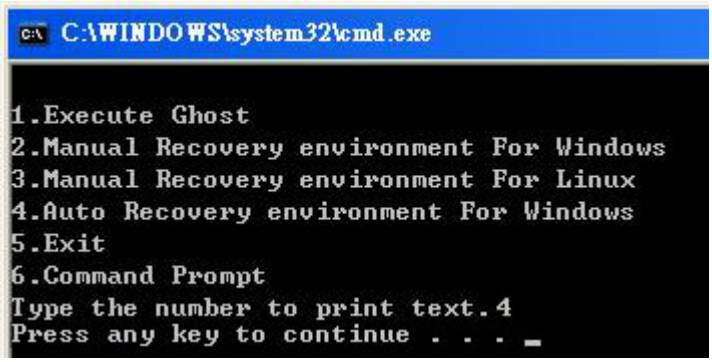
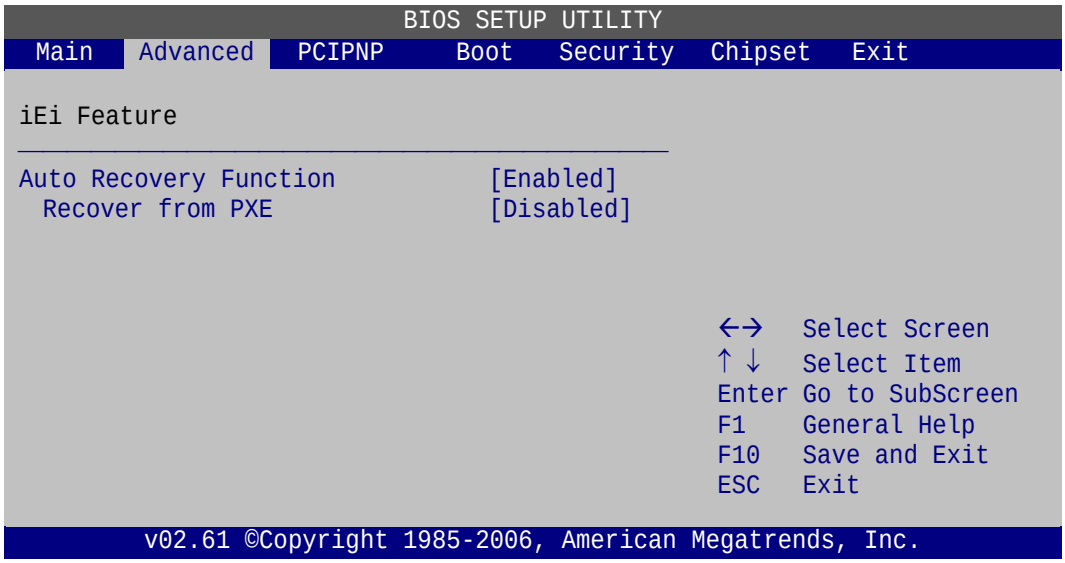


Figure A-28: Press any key to continue

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**).



BIOS Menu 23: 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

A.4 Setup Procedure for Linux

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

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

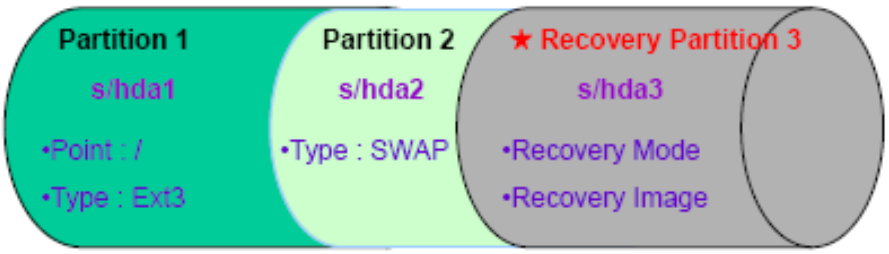


Figure A-29: Partitions for Linux

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

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

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

system32>exit

Step 4: **Build-up recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure A-30**). The Symantec Ghost window appears and starts configuring the system to build-up a recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

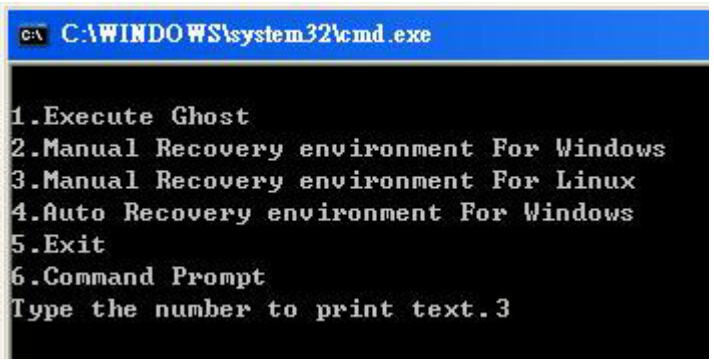


Figure A-30: Manual Recovery Environment for Linux

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

cd /boot/grub

vi menu.lst

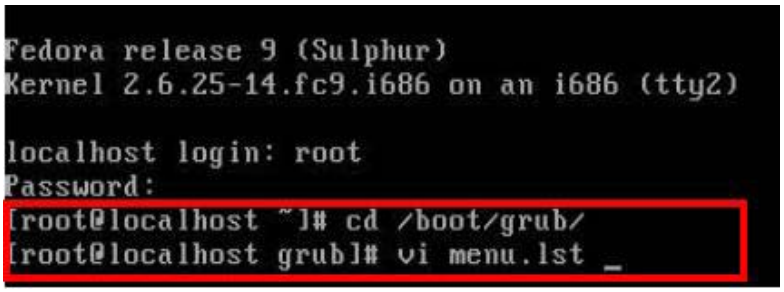
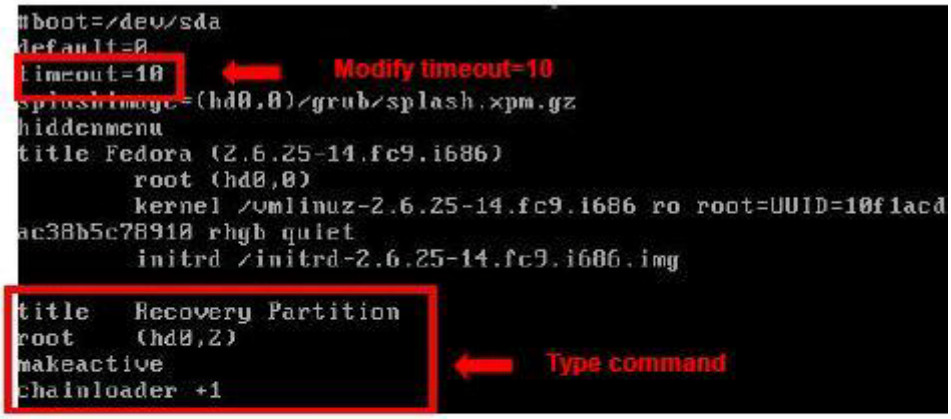


Figure A-31: Access menu.lst in Linux (Text Mode)

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 A-32**)

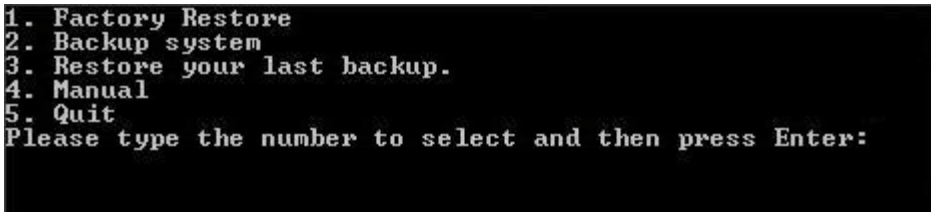


Figure A-32: Recovery Tool Menu

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

A.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 A.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.

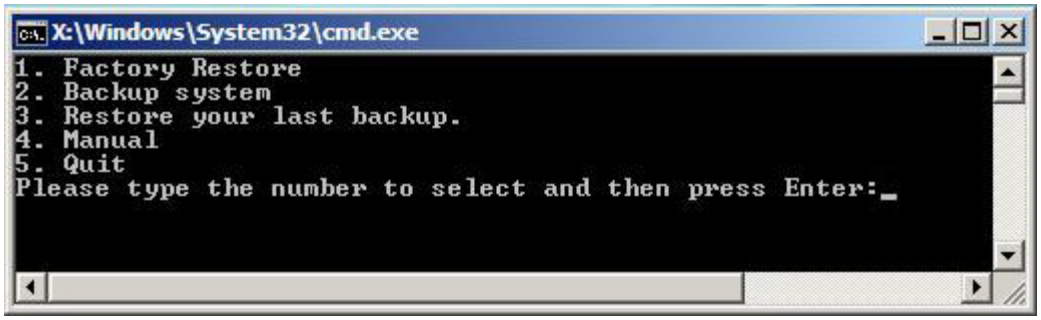


Figure A-33: Recovery Tool Main Menu

The recovery tool has several functions including:

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

WARNING:

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

WARNING:

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

A.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.

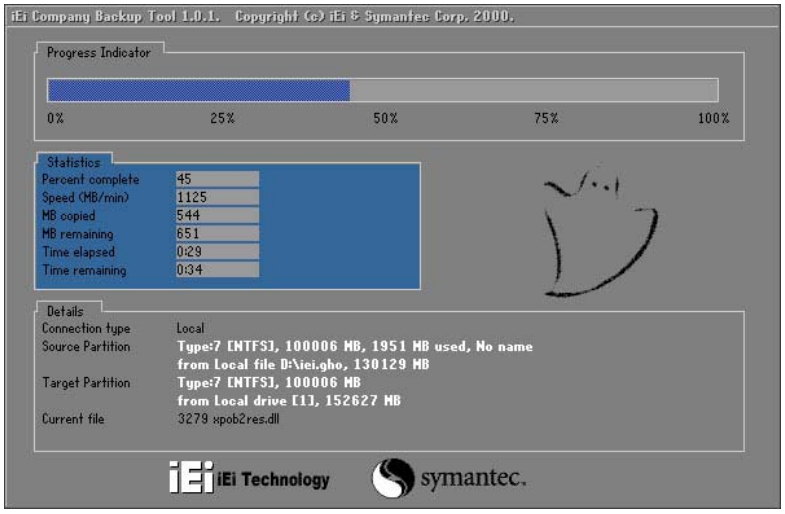


Figure A-34: Restore Factory Default

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

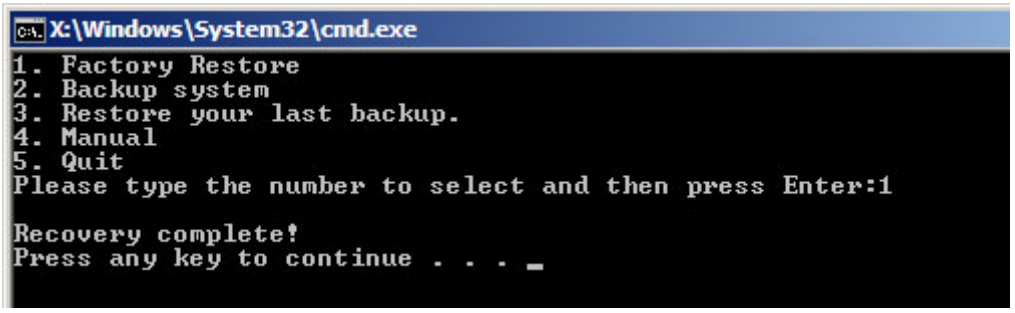


Figure A-35: Recovery Complete Window

A.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.

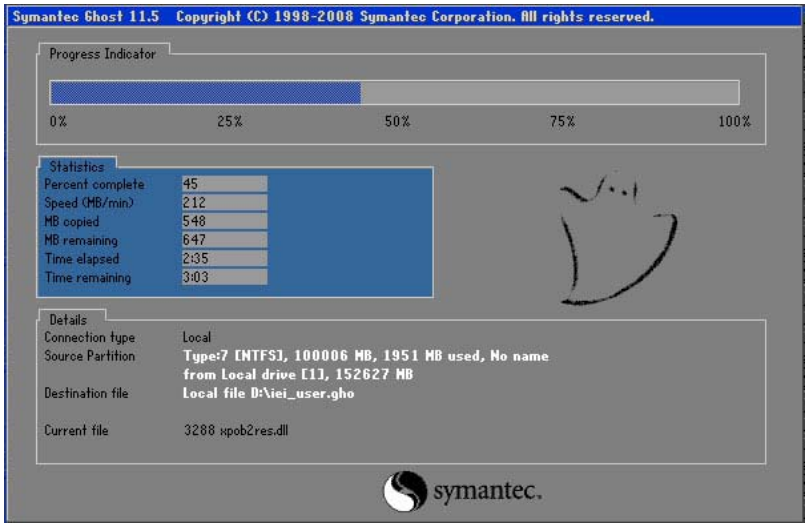


Figure A-36: Backup System

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

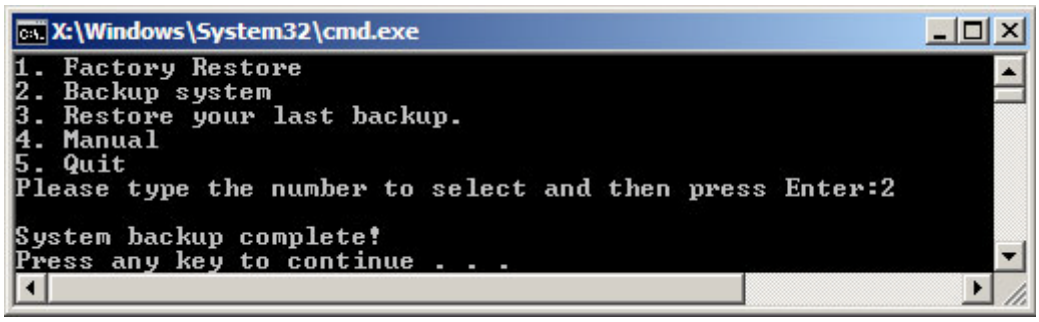


Figure A-37: System Backup Complete Window

A.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).

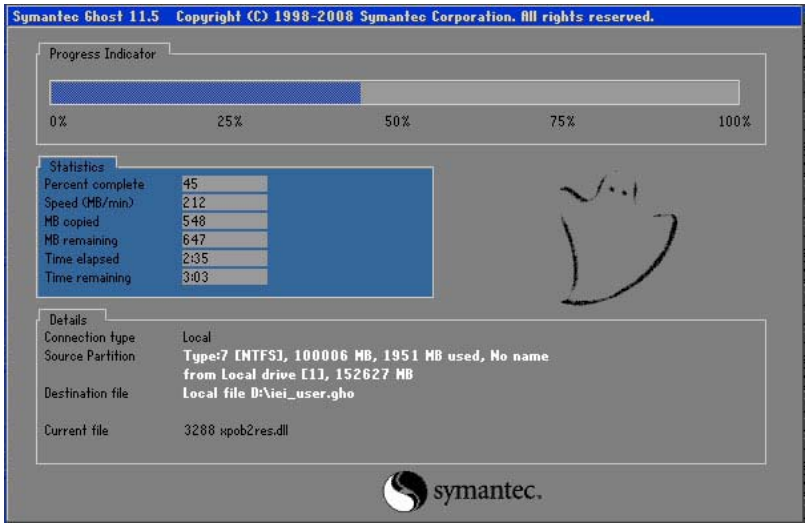


Figure A-38: Restore Backup

Step 3: The screen is shown as in **Figure A-39** when backup recovery is completed. Press any key to reboot the system.

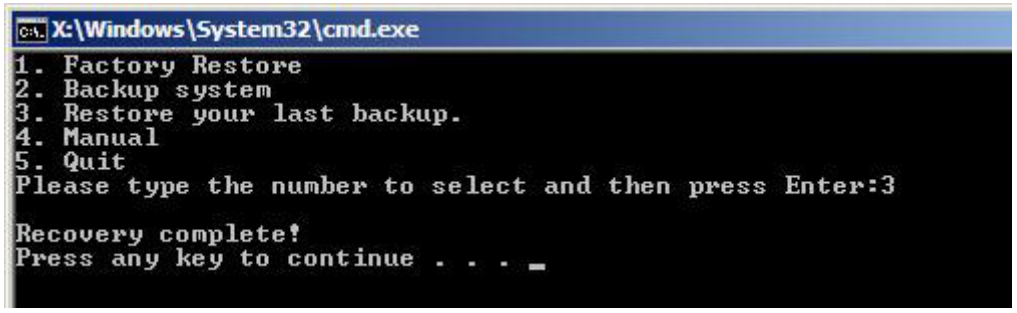


Figure A-39: Restore System Backup Complete Window

A.5.4 Manual

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

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

Step 5: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

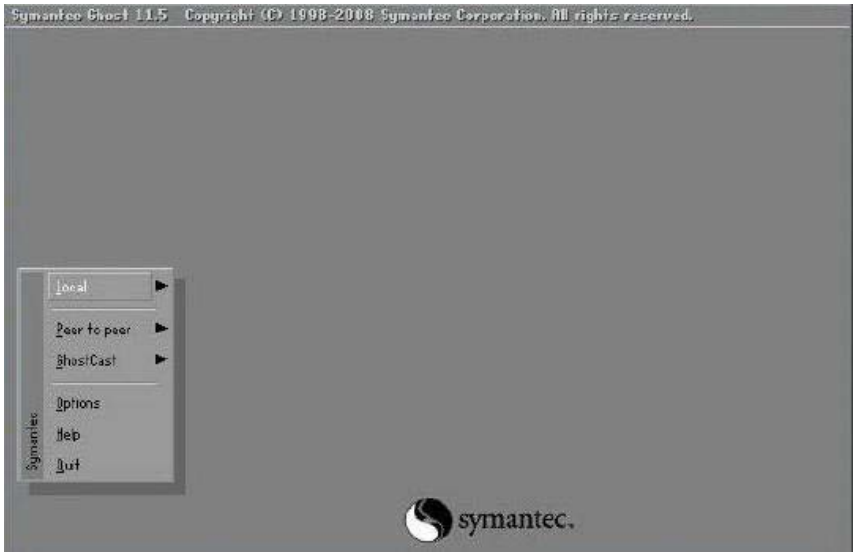
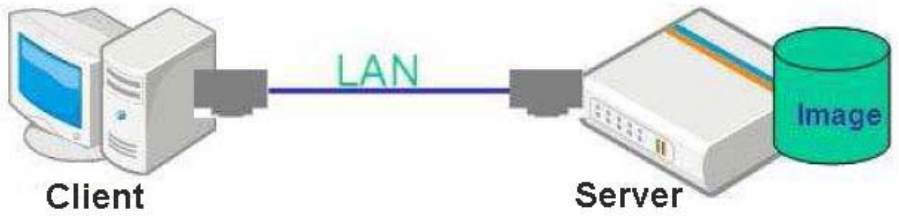


Figure A-40: Symantec Ghost Window

Step 6: When backup or recovery is completed, press any key to reboot the system.

A.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).

A.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:

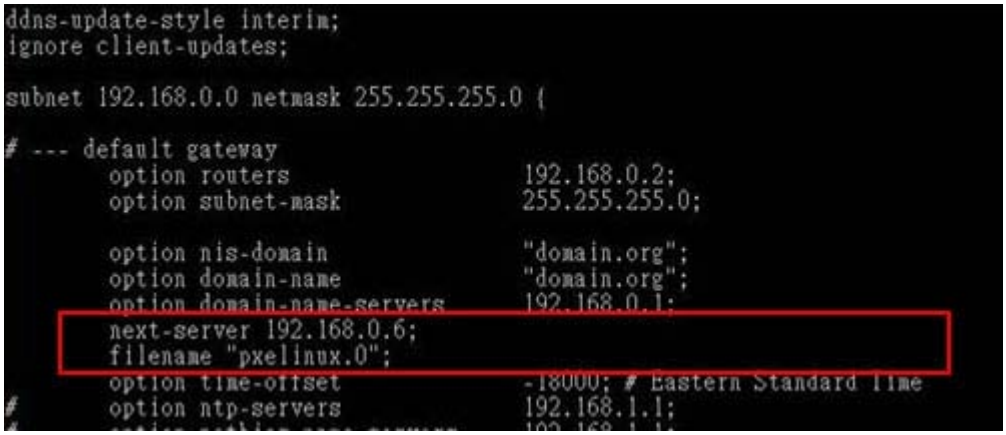
#vi /etc/dhcpd.conf

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



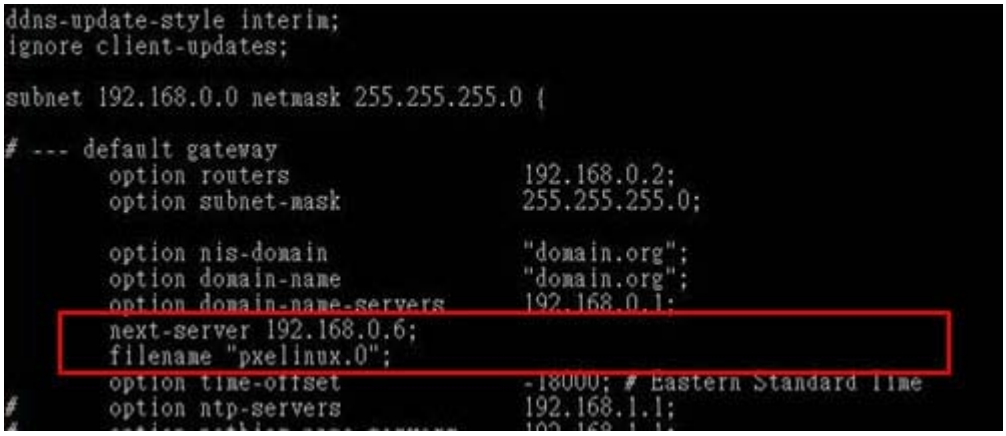
Debian

#vi /etc/dhcpd.conf

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

next-server PXE server IP address;

filename “pxelinux.0”;



A.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:

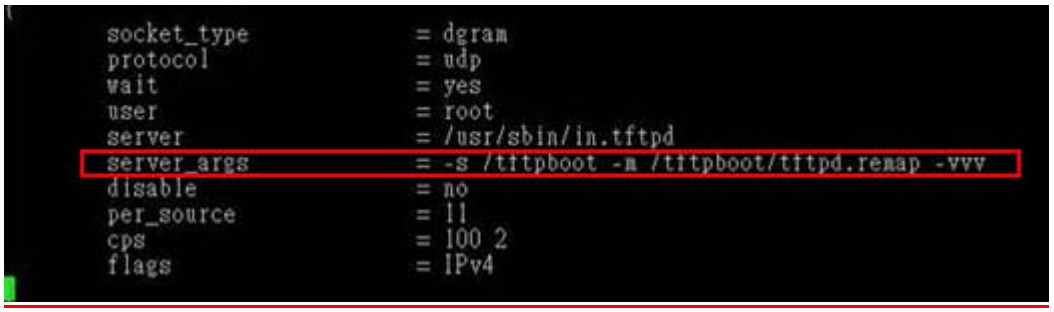
CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

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

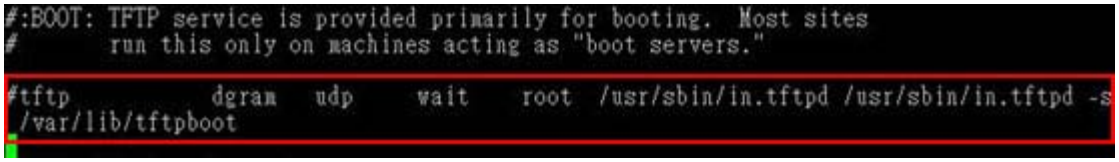


Debian

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

A.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/

A.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

#service xinetd restart

#service httpd restart

#service dhcpd restart

Debian

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

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

A.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
~
```

A.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.

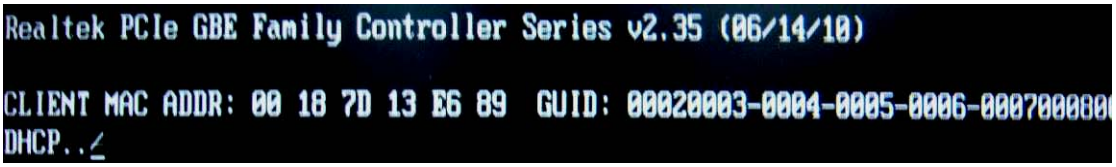
Boot Option #2 → select the boot from LAN option.

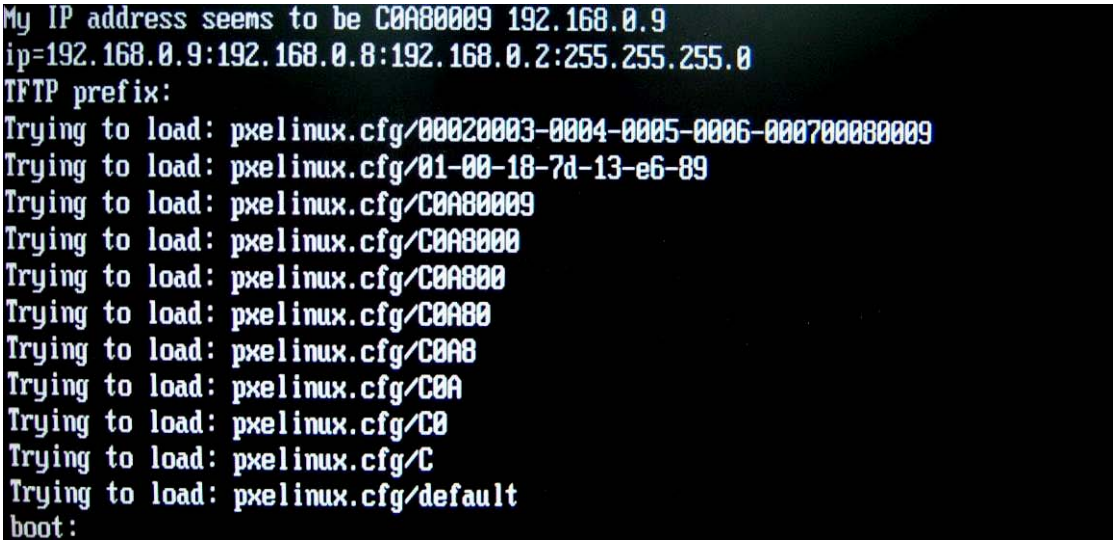
Step 3: Save changes and exit BIOS menu.

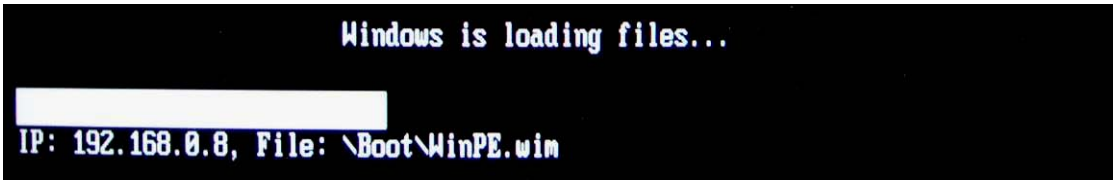
Exit → **Save Changes and Exit**

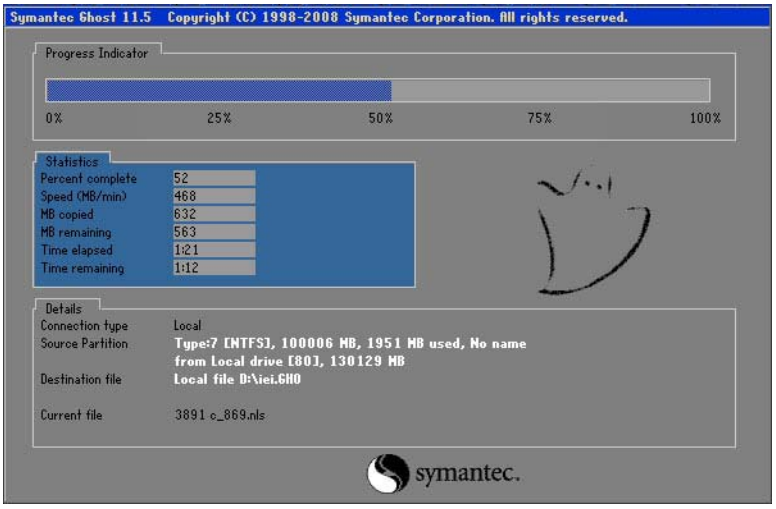
Step 4: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

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:

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.

A.7 Other Information

A.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.

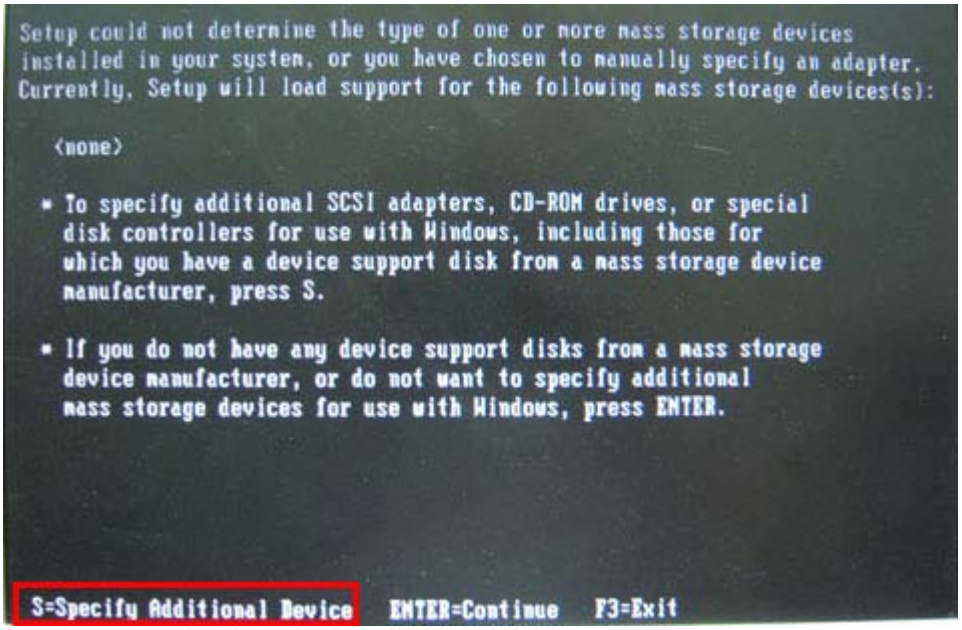
Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

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

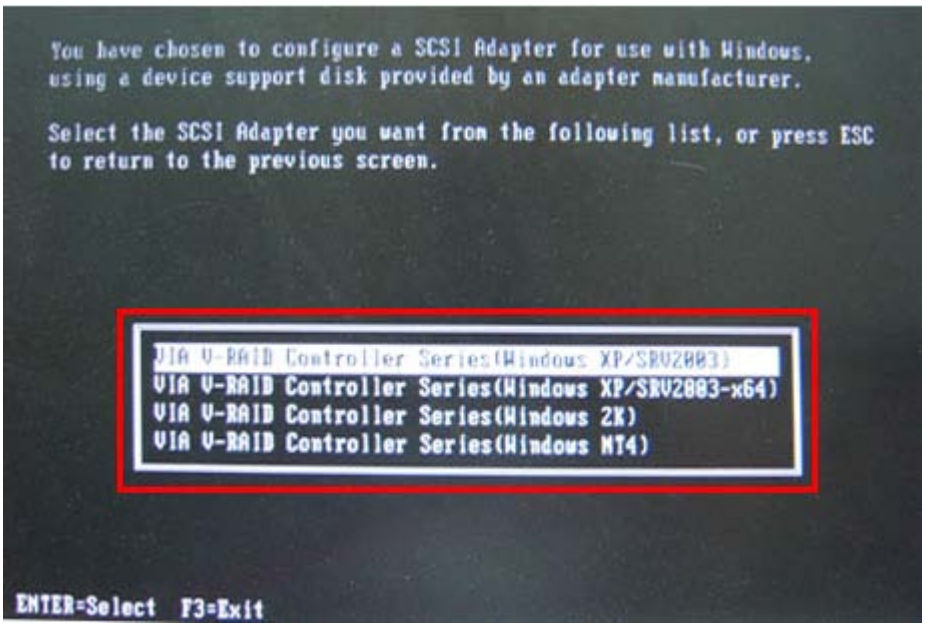
Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

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

A.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

B

Safety Precautions

B.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-600.

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

B.1.1 General Safety Precautions

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

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***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 opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

B.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-600 may result in permanent damage to the TANK-600 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-600. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-600 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.

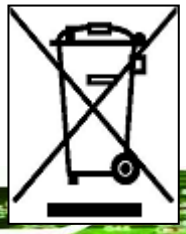
B.1.3 Product Disposal

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.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-600, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-600, please read the details below.

- The interior of the TANK-600 does not require cleaning. Keep fluids away from the TANK-600 interior.
- Be cautious of all small removable components when vacuuming the TANK-600.
- Turn the TANK-600 off before cleaning the TANK-600.
- Never drop any objects or liquids through the openings of the TANK-600.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-600.
- Avoid eating, drinking and smoking within vicinity of the TANK-600.

B.2.2 Cleaning Tools

Some components in the TANK-600 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-600.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-600.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-600.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the TANK-600 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-600. Dust and dirt can restrict the airflow in the TANK-600 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

C

Hazardous Materials Disclosure

C.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。						