IEI Technology Corp.

MODEL:

TANK-GM45

Wide Range Temperature Fanless Embedded System with VGA, Gigabit Ethernet, Four USB, RS-232/422/485, RoHS Compliant

User Manual

Rev. 1.01 – 29 August 2011

RoHS Lead Free

Revision

Date	Version	Changes
29 August 2011	1.01	Changed the supported processor from Intel® Core™2 Duo P8600 to Intel® Core™2 Duo P8400
15 June, 2010	1.00	Initial release

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TRADEMARKS

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Introduction

1.1 Overview

Figure 1-1: TANK-GM45

The TANK-GM45 Series embedded system is a fanless system for wide range temperature environments. It is powered by the Intel® 45nm Core™2 Duo processor, uses the Intel® GM45 chipset and has 2.0 GB of DDR2 memory. The TANK-GM45B in this series is preinstalled with a 32 GB SATA Solid State Disk (SSD) with up to 3Gb/s data transfer rate.

1.2 Model Variations

The model variations of the TANK-GM45 Series are listed below.

Model No.	CPU	Preinstalled SSD
TANK-GM45A-R10/P8400	2.26 GHz Intel® Core™2 Duo P8400	--
TANK-GM45A-R10/CM575	2.0 GHz Intel® Celeron 575	--
TANK-GM45B-T9400	2.53 GHz Intel® Core™2 Duo T9400	32 GB SATA SSD
TANK-GM45B-P8400	2.26 GHz Intel® Core™2 Duo P8400	32 GB SATA SSD
TANK-GM45B-CM575	2.0 GHz Intel® Celeron 575	32 GB SATA SSD

Table 1-1: TANK-GM45 Model Variations

1.3 Benefits

Some of the TANK-GM45 benefits include:

- Wide range storage temperature for various environments.
- Less downtime from overheating because there are not fans to fail

- Cost savings with low power consumption

1.4 Features

The TANK-GM45 features are listed below:

- Intel® 45nm Core™2 Duo processor
- 2.0 GB of DDR2 SDRAM SO-DIMM preinstalled
- One GPIO block terminal for remote control
- Two Gigabit Ethernet ports
- Four USB 2.0 ports
- One RS-232 isolated serial port
- One RS-422/485 isolated serial port
- One VGA port
- AT/ATX power mode supported
- RoHS compliant

1.5 Technical Specifications

The TANK-GM45 technical specifications are listed in **Table 1-2**.

Specifications	
System	
Supported CPU	2.53 GHz Intel® Core™2 Duo T9400 CPU, 2.26 GHz Intel® Core™2 Duo P8400 CPU or 2.0 GHz Intel® Celeron 575 CPU
Memory	2.0 GB of DDR2 SO-DIMM preinstalled
Real-time Clock	Battery backup RTC
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Ethernet Controller	One Intel® 82574L PCIe GbE Controller One Intel® WG82567LM GbE PHY
Supported OS	Windows® XP or Linux
I/O and Indicators	
Ethernet	2 x 10/100/1000 Mb/s

Specifications	
Keyboard/Mouse	One PS/2 keyboard/mouse connector
Serial Ports	1 x RS-232 (isolated) 1 x RS-422/485 (isolated)
USB Interfaces	4 x USB 2.0 ports
VGA	One VGA port
GPIO	One 2-pin terminal block for remote control
LED Indicator	One power LED (green) One HDD LED (red)
Storage	
SDD	Support one 2.5" SATA HDD (TANK-GM45B is preinstalled with one 32 GB SATA 3Gb/s SSD)
Power	
Power Supply	+12 V DC
Power Consumption	45 W
Power Switch	One power switch
Power Mode	AT or ATX power mode (selectable by AT/ATX switch)
Environmental and Mechanical	
Operating Temperature	-20°C~70°C
Storage Temperature	-25°C~75°C
Color	Silver
Physical Dimensions	310 mm x 200 mm x 55 mm (W x D x H)

Table 1-2: Technical Specifications

1.6 Connector Panel

All external peripheral interface connectors are located on the front panel of the TANK-GM45 . The peripheral interface connectors are shown in **Figure 1-2**.
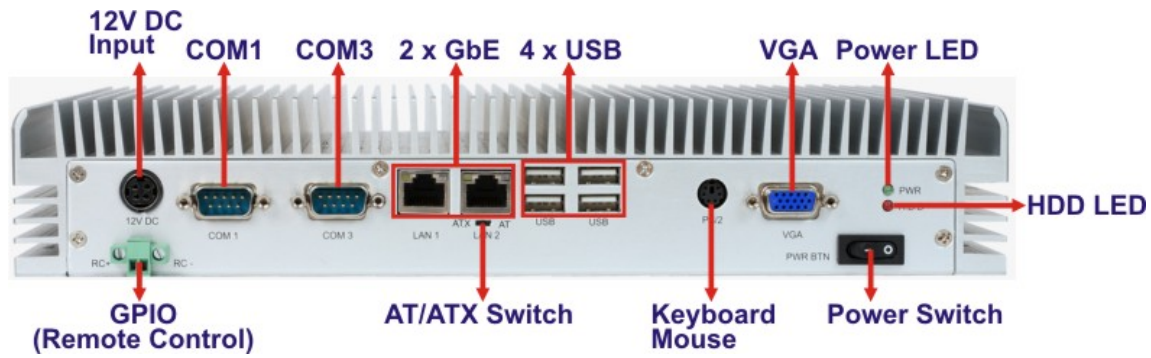
Figure 1-2: TANK-GM45 Peripheral Connectors

Connectors and buttons on the rear panel include the following.

- 1 x 12 V DC power input
- 1 x Power switch
- 1 x VGA output
- 1 x RS-232 port isolated serial port
- 1 x RS-422/485 isolated serial port
- 4 x USB ports
- 2 x Gigabit Ethernet ports
- 1 x GPIO terminal block for remote control
- 1 x PS/2 keyboard/mouse connector
- 1 x Power LED
- 1 x HDD LED
- 1 x AT/ATX power switch

1.7 Dimensions

The physical dimensions are shown below:
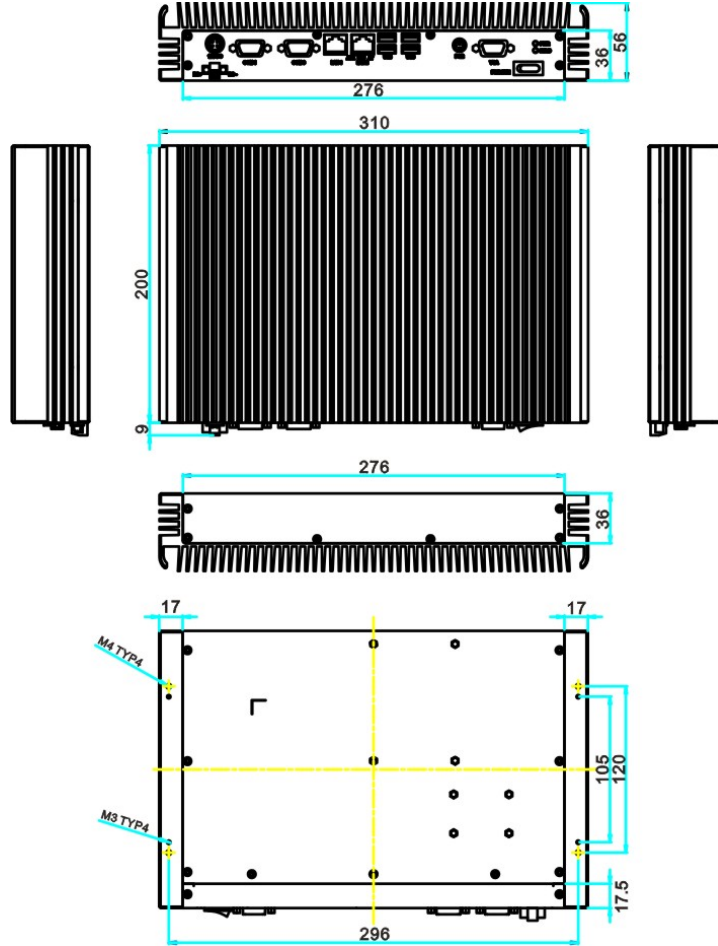
Figure 1-3: Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-GM45 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-GM45. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-GM45 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-GM45, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-GM45.

2.2 Unpacking Precautions

When the TANK-GM45 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-GM45 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-GM45 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-GM45 is shipped with the following components:

Quantity	Item and Part Number	Image
1	TANK-GM45	
1	DC input cable (with terminal block) (TANK-GM45A only)	
1	Power adapter (TANK-GM45B only)	
1	User manual and driver CD	

Table 2-1: Package List Contents

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the TANK-GM45, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-GM45 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-GM45   is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-GM45 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-GM45. The TANK-GM45's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the TANK-GM45. Leave at least 5 cm of clearance around the TANK-GM45 to prevent overheating.
- **Grounding**: The TANK-GM45 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-GM45.

3.2 Hard Disk Drive (HDD) Installation

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

Step 1: Remove the bottom panel by removing 15 retention screws from the rear panel (**Figure 3-1**) and the bottom panel (**Figure 3-2**).

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

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

Step 2: To prevent the internal SATA cable from damage, please open the bottom panel as shown below.

Figure 3-3: Open the Bottom Panel

Step 3: Remove the four HDD bracket retention screws (**Figure 3-4**) and lift the HDD brackets out of the TANK-GM45.
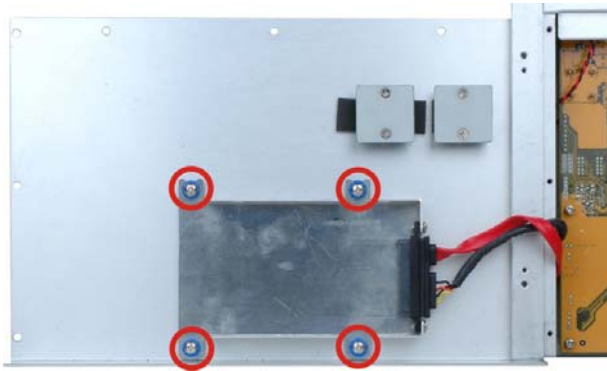
Figure 3-4: HDD Bracket Retention Screws

Step 4: Attach the HDD bracket to the HDD. Slide the HDD to connect the HDD to the
SATA connector. Secure the HDD with the HDD bracket by four retention screws
(**Figure 3-5**).
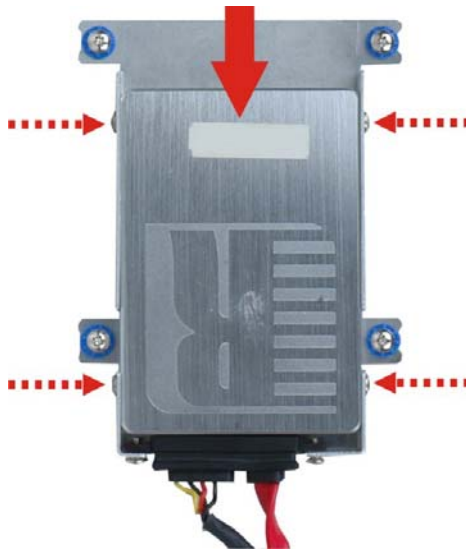
Figure 3-5: HDD Retention Screws

Step 5: Install the HDD bracket in the same position it was before.
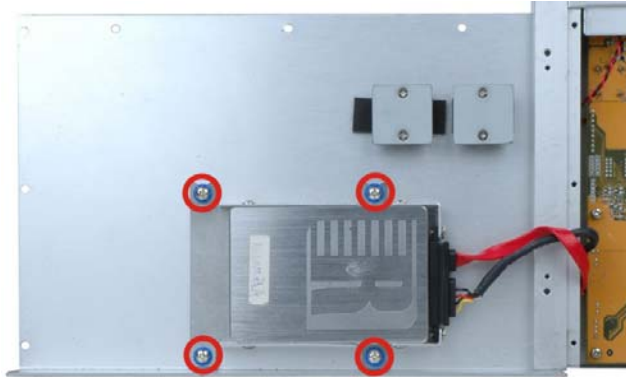
Figure 3–6: HDD Installation

Step 6: Reinstall the bottom panel.

3.3 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.
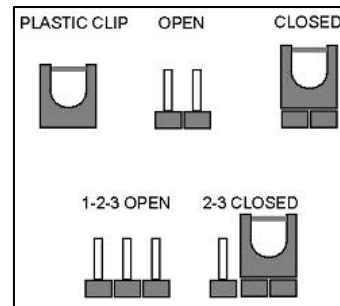
To access jumper, please remove the bottom panel (refer to **Section 3.2**), 12 motherboard retention screws and six front panel retention screws. The motherboard jumper is listed below.

- ▪ COM3 RS-422/485 selection

3.3.1 COM3 RS-422/485 Setup

Jumper Label:	**J5**, **J9** and **J10**
Jumper Type:	Pin headers
Jumper Settings:	See **Table 3-1, Table 3-2** and **Table 3-3**

This serial port can be set to use RS-422 or RS-485 communication methods. Set all the jumpers to the same settings.

J5	Description
2-3, 5-6, 8-9, 11-12	RS-422/485 (Default)

Table 3-1: COM3 RS-422/485 Setup

J9	Description
3-4	RS-422 (Default)
5-6	RS-485

Table 3-2: COM3 RS-422/485 Setup

J10	Description
1-3, 2-4	RS-422 (Default)
3-5, 4-6	RS-485

Table 3-3: COM3 RS-422/485 Setup

3.4 External Peripheral Interface Connectors

The TANK-GM45 has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- Ethernet
- Keyboard/Mouse
- Power button
- Power input
- GPIO for remote control
- RS-232

- RS-422/485
- USB
- VGA
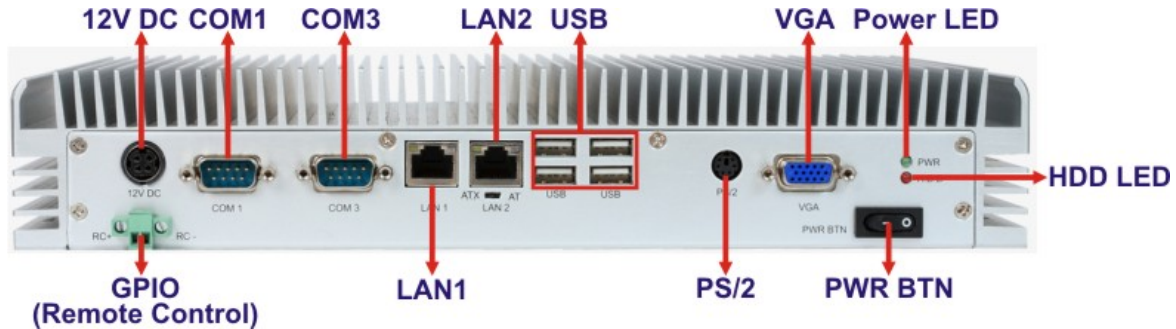
Figure 3-7: Peripheral Connectors (Rear)

3.4.1 LAN Connectors

CN Label:	**LAN1** and **LAN2**
CN Type:	RJ-45
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-4**

The LAN connectors allow connection to an external network.

Step 1: **Locate the RJ-45 connectors**. The locations of the RJ-45 connectors are shown above.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-GM45. See **Figure 3-8**.
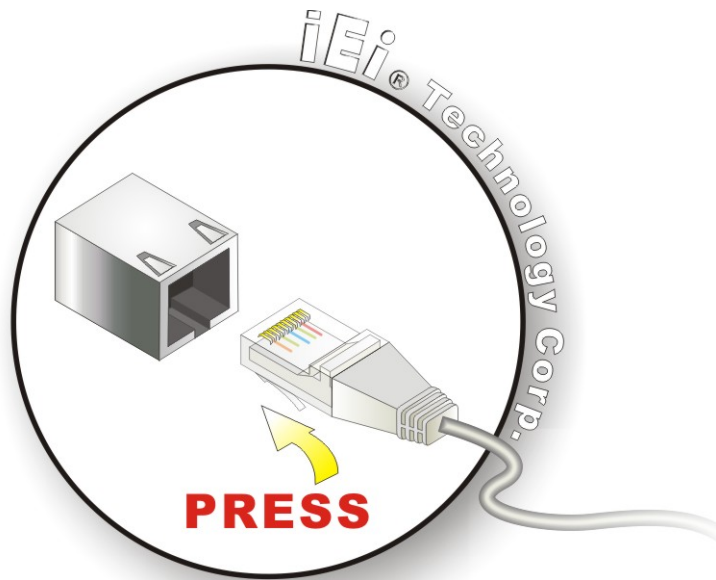
Figure 3-8: LAN Connection

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

cable RJ-45 connector into the on-board RJ-45 connector.

Pin	Description	Pin	Description
1	TRD1P0	5	TRD1P2
2	TRD1N0	6	TRD1N2
3.	TRD1P1	7	TRD1P3
4.	TRD1N1	8	TRD1N3

Table 3-4: LAN Pinouts

Figure 3-9: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See Table 3-5.

Activity/Link LED		Speed LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-5: RJ-45 Ethernet Connector LEDs

3.4.2 Keyboard/Mouse Connector

CN Label: **PS/2**

CN Type: PS/2

CN Location: See **Figure 3-7**

CN Location: See **Figure 3-10**

The PS/2 connector connects to a keyboard and a mouse.
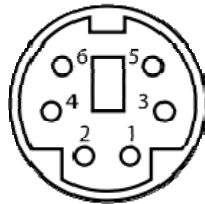
Figure 3-10: PS/2 Keyboard/Mouse Connector

3.4.3 Power Input

CN Label: **12VDC**

CN Type: 4-pin DIN connector

CN Location: See **Figure 3-7**

CN Pinouts: See **Figure 3-11**

The power connector connects to the 12 V DC power adapter.
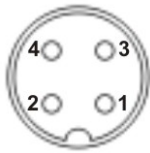
Figure 3-11: Power Input Connector

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

Table 3-6: Power Input Pinouts

3.4.4 Remote Control Connector

CN Label: **GPIO (Remote Control)**

CN Type: 2-pin terminal block

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-7** and **Figure 3-12**

The GPIO terminal block connects to a remote control device. Users can control the system power on/off by inputting high or low voltage into the terminal block.

- **Turn off** the system: **more than 1 V** input
- **Turn on** the system: **less than 0.5 V** input

Pin	Description
1	RC+
2	RC-

Table 3-7: Remote Control Terminal Block Pinouts
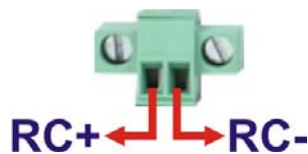
Figure 3-12: Remote Control Terminal Block Pinout Location

3.4.5 RS-232 Serial Port Connector

CN Label:	**COM1**
CN Type:	DB-9 connectors
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-8** and **Figure 3-14**

RS-232 serial port devices can be attached to the DB-9 ports on the rear panel.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Figure 3-7**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 3-13.
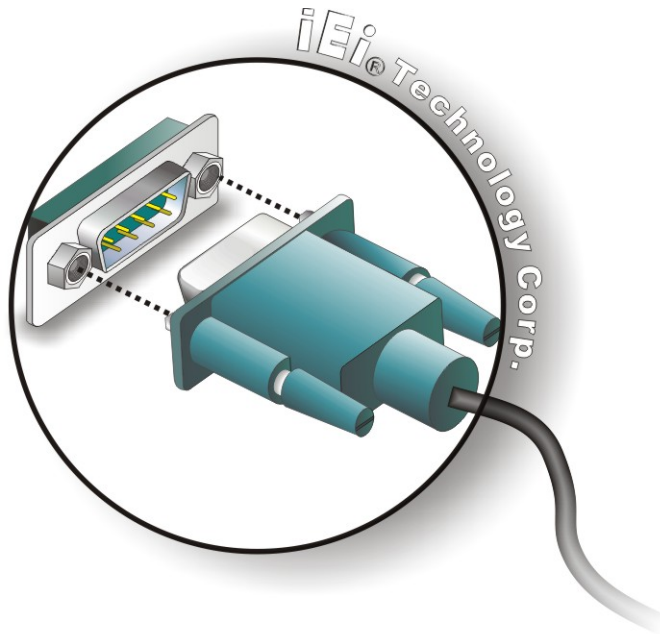
Figure 3-13: Serial Device Connector

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

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

Table 3-8: COM1 Serial Port Pinouts
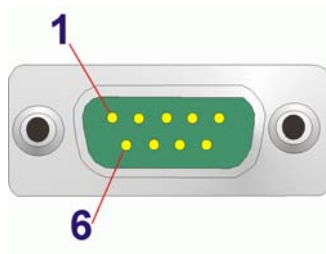
Figure 3-14: Serial Port Pinout Location

3.4.6 RS-422/485 Serial Port Connector

CN Label:	**COM3**
CN Type:	DB-9 connectors
CN Location:	See **Figure 3-7**
CN Pinouts:	See **Table 3-9** and **Table 3-10**

RS-422/485 serial port devices can be attached to the DB-9 ports on the rear panel. The COM3 serial port is a RS-422 serial port by default. To change to RS-485, please refer to the jumper setting (**Section 3.3.1**).

COM 3	RS-422 Description
Pin 1	**TX-**
Pin 2	**TX+**
Pin 6	**RX-**
Pin 7	**RX+**

Table 3-9: RS-422 Pinouts

COM 3	RS-485 Description
Pin 1	Data-
Pin 2	Data+

Table 3-10: RS-485 Pinouts
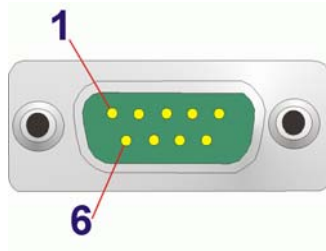
Figure 3-15: Serial Port Pinout Location

3.4.7 USB Connector

CN Label: **USB**

CN Type: USB port

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-11**

The USB ports are for attaching USB peripheral devices to the system.

Step 1: **Located 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. See **Figure 3-16**.
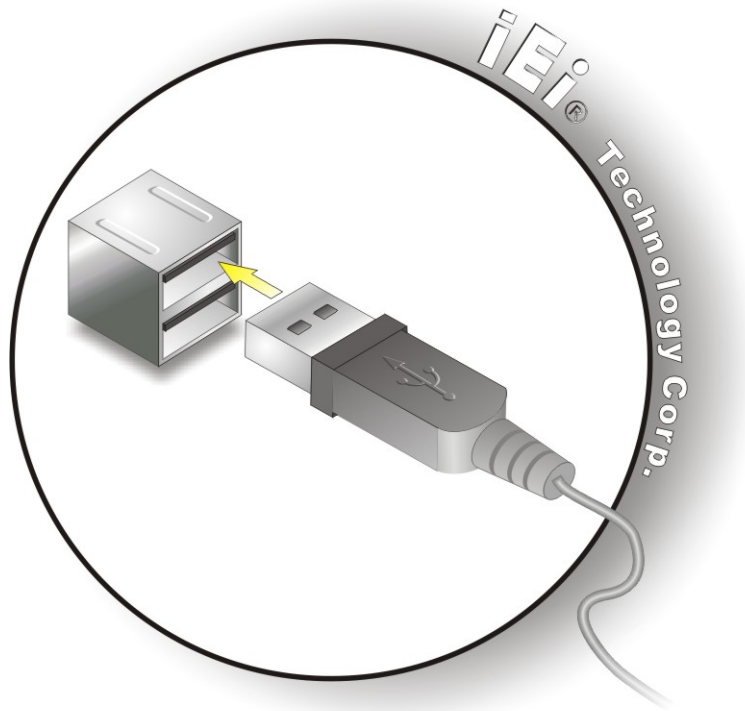
Figure 3-16: USB Device Connection

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

connector into the on-board connector.

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

Table 3-11: USB Port Pinouts

3.4.8 VGA Connector

CN Label: **VGA**

CN Type: 15-pin Female

CN Location: See **Figure 3-7**

CN Pinouts: See **Figure 3-18** and **Table 3-12**

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

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15

connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen

cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the

insert the male connector from the VGA screen into the female connector on the

TANK-GM45. See **Figure 3-17**.
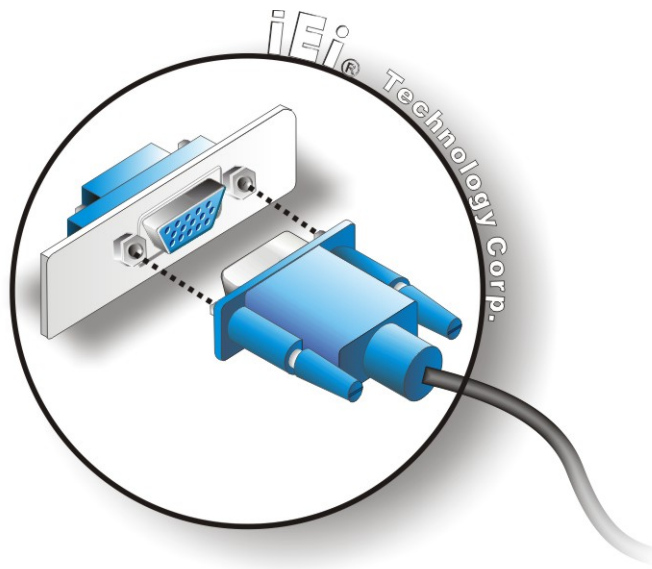
Figure 3-17: VGA Connector
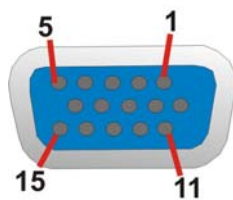
Figure 3-18: VGA Connector

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

Table 3-12: VGA Connector Pinouts

3.4.9 AT/ATX Power Mode Selection

The TANK-GM45 supports AT and ATX power modes. The setting can be made through the AT/ATX switch on the external peripheral interface panel as shown below.
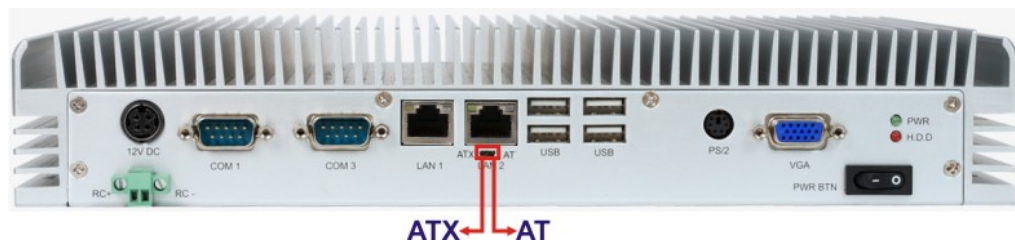
Figure 3-19: AT/ATX Switch

Chapter

4

BIOS

4.1 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.

4.1.1 Starting Setup

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

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

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

4.1.2 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
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
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors.　F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 4-1: BIOS Navigation Keys

4.1.3 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.

4.1.4 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.

4.1.5 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.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- 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.

4.2 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 SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 System Overview                                  Use [ENTER], [TAB] or
 _____ [SHIFT-TAB] to select a
 AMIBIOS                                          field.
 Version    :08.00.15
 Build Date :01/15/10                             Use [+] or [-] to
 ID:        :SA11MR13                             configure system time.

 Processor
 Intel(R) Core(TM)2 Duo CPU   P8400 @ 2.26GHz
 Speed      :2400MHz
 Count      :1
                                                 ←→   Select Screen
 System Memory                                   ↑↓   Select Item
 Size       :2013MB                              Enter Go to SubScreen
                                                 F1    General Help
 System Time                   [16:38:10]        F10   Save and Exit
 System Time                   [Fri 02/15/2010]  ESC   Exit

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```
BIOS Menu 1: Main

▪ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- ▪ AMI BIOS: Displays auto-detected BIOS information
  - o **Version:** Current BIOS version
  - o **Build Date:** Date the current BIOS version was made
  - o **ID:** Installed BIOS ID
- ▪ Processor: Displays auto-detected CPU specifications
  - o **Type:** Names the currently installed processor
  - o **Speed:** Lists the processor speed
  - o **Count:** The number of CPUs on the motherboard
- ▪ System Memory: Displays the auto-detected system memory.
  - o **Size:** Lists memory size

The System Overview field also has two user configurable fields:

▪ **System Time [xx:xx:xx]**

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

▪ **System Date [xx/xx/xx]**

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

4.3 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.

▪ CPU Configuration (see **Section 4.3.1**)
▪ IDE Configuration (see **Section 4.3.2**)
▪ Super IO Configuration (see **Section 4.3.3**)
▪ Hardware Health Configuration (see **Section 4.3.4**)
▪ AHCI Configuration (see **Section 4.3.5**)
▪ Remote Access Configuration (see **Section 4.3.6**)
▪ USB Configuration (see **Section 4.3.7**)
▪ Power Configuration (see **Section 4.3.8**)

```
                          BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security   Chipset     Exit

 Advanced Settings                                  Configure CPU
 _____
 WARNING: Setting wrong values in below sections may cause
 system to malfunction

 > CPU Configuration
 > IDE Configuration
 > SuperIO Configuration                    ←→    Select Screen
 > Hardware Health Configuration            ↑ ↓   Select Item
 > AHCI Configuration                       Enter Go to SubScreen
 > Remote Access Configuration              F1    General Help
 > USB Configuration                        F10   Save and Exit
 > Power Configuration                      ESC   Exit

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```
        BIOS Menu 2: Advanced

4.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.

```
                          BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security   Chipset     Exit

 Configure advanced CPU settings
 Module Version:3F.15
 _____
 Manufacturer: Intel
 Intel(R) Core(TM)2 Duo CPU   P8400 @ 2.26GHz
 Frequency: 2.4GHz
 FSB Speed: 1066MHz
 Cache L1: 64 KB                            ←→    Select Screen
 Cache L2: 3072 KB                          ↑ ↓   Select Item
 Ratio Actual Value:8.5                     Enter Go to SubScreen
                                            F1    General Help
                                            F10   Save and Exit
                                            ESC   Exit

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```
        BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

   ▪   Manufacturer: Lists the name of the CPU manufacturer

   ▪   Brand String: Lists the brand name of the CPU being used

- Frequency: Lists the CPU processing speed

- FSB Speed: Lists the FSB speed

- Cache L1: Lists the CPU L1 cache size

- Cache L2: Lists the CPU L2 cache size

4.3.2 IDE Configuration

Use the **IDE Configuration** menu (BIOS Menu 4) to change and/or set the configuration of the IDE devices installed in the system.

```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security  Chipset     Exit

 IDE Configuration                                        Disabled
 _____     Compatible
 SATA#1 Configuration              [Compatible]          Enhanced
    Configure SATA#1 as            [IDE]

 > Primary IDE Master           : [Not Detected]
 > Primary IDE Slave            : [Not Detected]          ←→    Select Screen
 > Secondary IDE Master         : [Not Detected]          ↑ ↓   Select Item
 > Secondary IDE Slave          : [Not Detected]          Enter Go to SubScreen
 > Third IDE Master             : [Not Detected]          F1    General Help
                                                          F10   Save and Exit
                                                          ESC   Exit


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```

BIOS Menu 4: IDE Configuration

- **Parallel ATA IDE devices**

Displays the settings for all the IDE devices. The devices listed below are available.

- Primary IDE Master

- Primary IDE Slave

- Secondary IDE Master

- Secondary IDE Slave

- Third IDE Master

▪ **SATA#1 Configuration [Compatible]**

Use the **SATA#1 Configuration** option to configure the ATA/IDE controller.

➔ **Disabled**   Disables the on-board ATA/IDE controller.

➔ **Compatible** **DEFAULT**   Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced**   Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

▪ **Configure SATA#1 as [IDE]**

Use the **Configure SATA#1 as** option to configure SATA devices as normal IDE devices.

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

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

4.3.2.1 SATA Channel

Sets the IDE configuration of the SATA channels.

```
                        BIOS SETUP UTILITY
    Main     Advanced    PCIPNP      Boot     Security   Chipset      Exit

 Primary IDE Master                                       Select the type of device
 _____     connected to the system
 Device        :Not Detected

 Type                          [Auto]
 LBA/Large Mode                [Auto]
 Block (Multi-Sector Transfer) [Auto]
 PIO Mode                      [Auto]          ←→   Select Screen
 DMA Mode                      [Auto]          ↑↓   Select Item
 S.M.A.R.T.                    [Auto]          Enter Go to SubScreen
 32Bit Data Transfer           [Enabled]       F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit

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```

BIOS Menu 5: IDE Master and IDE Slave Configuration

▪ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** DEFAULT The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD**   This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

ZIP

LS-120

▪ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**   BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto**   DEFAULT   BIOS auto detects the LBA mode control on the specified channel.

▪ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**   BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto**   DEFAULT   BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

▪ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** DEFAULT BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s

➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

▪ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto** DEFAULT BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s

➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s

➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s

➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s

➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s

➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA0** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA1**   Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s

➔ **UDMA2**   Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

➔ **UDMA3**   Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA4**   Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA5**   Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

▪ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**   DEFAULT   BIOS auto detects HDD SMART support.

➔ **Disabled**   Prevents BIOS from using the HDD SMART feature.

➔ **Enabled**   Allows BIOS to use the HDD SMART feature

▪ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**   Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled**   DEFAULT   Allows BIOS to use 32-bit data transfers on supported hard disk drives.

4.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (BIOS Menu 6) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
                         BIOS SETUP UTILITY
    Main    Advanced   PCIPNP    Boot    Security  Chipset     Exit

 Configure Super I/O Chipset                       Allows BIOS to select
 ─────────────────────────────────────────────     Serial Port Base
 Serial Port1 Address           [3F8/IRQ4]         Addresses
 Serial Port3 Address           [3E8]
   Serial Port3 IRQ             [10]
 Select RS232 or RS422/RS485    [RS422/485]

                                                   ←→   Select Screen
                                                   ↑ ↓  Select Item
                                                   Enter Go to SubScreen
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit

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```

BIOS Menu 6: Super IO Configuration

▪ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**　　　　　　　No base address is assigned to Serial Port 1

➔ **3F8/IRQ4**　　DEFAULT　Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

➔ **2F8/IRQ3**　　　　　　　Serial Port 1 I/O port address is 2F8 and the interrupt address is IRQ3

➔ **3E8/IRQ4**　　　　　　　Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3**　　　　　　　Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

▪ **Serial Port3 Address [3E8]**

Sets the port address of serial port 3.

- ▪ Disabled
- ▪ 3E8 DEFAULT
- ▪ 2E8

▪ **Serial Port3 IRQ [10]**

Sets the interrupt request for serial port 3.

- ▪ 10 DEFAULT

4.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.

```
                         BIOS SETUP UTILITY
   Main      Advanced   PCIPNP      Boot     Security   Chipset    Power      Exit

 Hardware Health Event Monitoring
 ――――――――――――――――――――――――――――――――――――――――――――――
 CPU Temperature 1                :37°C/98°F
 System Temperature 2             :32°C/89°F
 PWM Temperature                  :39°C/102°F


 CPU Core                         :1.120 V
 +1.05V                           :1.040 V
 +3.30V                           :3.312 V
 +5.00V                           :5.187 V
 +12.0V                           :11.968 V
 +1.5V                            :1.456 V        ←→    Select Screen
 +1.8V                            :1.792 V        ↑ ↓   Select Item
 +5VSB                            :5.187 V        Enter Go to SubScreen
 VBAT                             :3.200 V        F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

BIOS Menu 7: Hardware Health Configuration

▪ **Hardware Health Monitoring**

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

- ▪ System Temperatures:
  - ○ CPU Temperature 1
  - ○ System Temperature 2
  - ○ PWM Temperature
- ▪ Voltages:
  - ○ CPU Core
  - ○ +1.05V
  - ○ +3.30V
  - ○ +5.00V
  - ○ +12.0V
  - ○ +1.5V
  - ○ +1.8V
  - ○ +5VSB
  - ○ VBAT

4.3.5 AHCI Configuration

NOTE:

Advanced Host Controller Interface (AHCI) is a new programming interface for SATA host controllers. AHCI systems do not have master/slave designation for SATA devices, each device is treated as a master, and hardware-assisted native command queuing.

Use the **AHCI Settings** menu (**BIOS Menu 8**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.

```
                         BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security  Chipset     Power       Exit

 AHCI Settings                                       While entering setup
 _____ BIOS auto detects the
                                                      presence of IDE devices.
 > AHCI Port0 [Not Detected]                          This displays the status
 > AHCI Port1 [Not Detected]                          of auto detection of IDE
                                                      devices.



                                                 ←→   Select Screen
                                                 ↑ ↓  Select Item
                                                 Enter Go to SubScreen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit
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```

BIOS Menu 8: AHCI Configuration

▪ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected to a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. "**AHCI Port 1**" opens a new window.

4.3.5.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 9**) to configure the drive connected to SATA connector n.

```
                      BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot   Security  Chipset    Power     Exit

 AHCI Port0                                    Select the type of device
 _____  connected to the system
 Device     :Not Detected
 _____
 SATA Port0                      [Auto]
 S.M.A.R.T.                      [Enabled]


                                              ←→   Select Screen
                                              ↑ ↓  Select Item
                                              Enter Go to SubScreen
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```
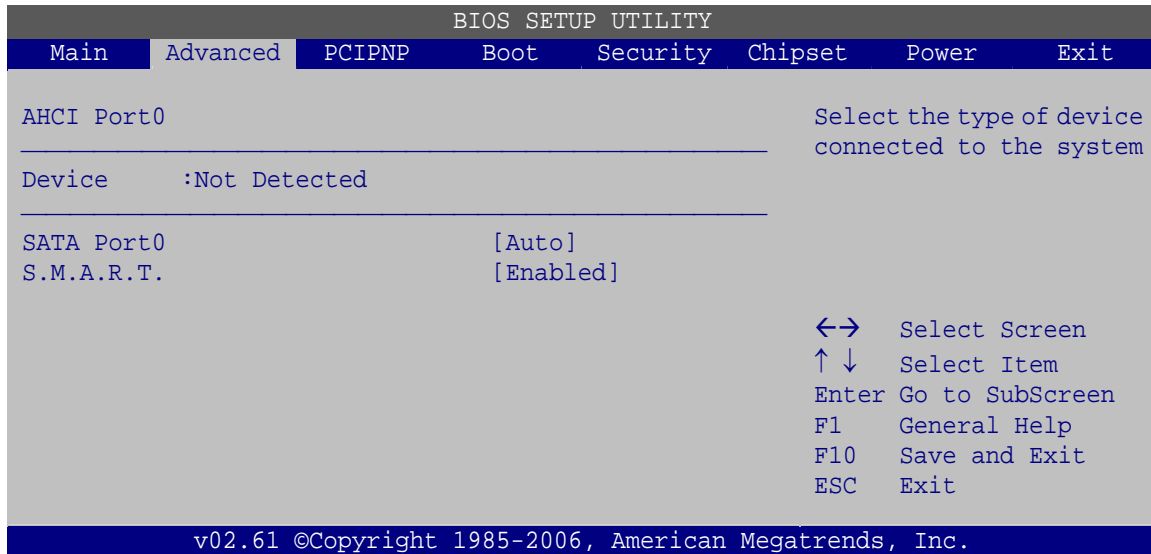
BIOS Menu 9: AHCI Port n Configuration Menu

▪ **SATA Port n [Auto]**

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

▪ **S.M.A.R.T [Enabled]**

Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

➔ **Enabled**   DEFAULT   S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

➔ **Disabled**   S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

4.3.6 Remote Access Configuration

Use the **Remote Access Configuration** menu (BIOS Menu 10) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.
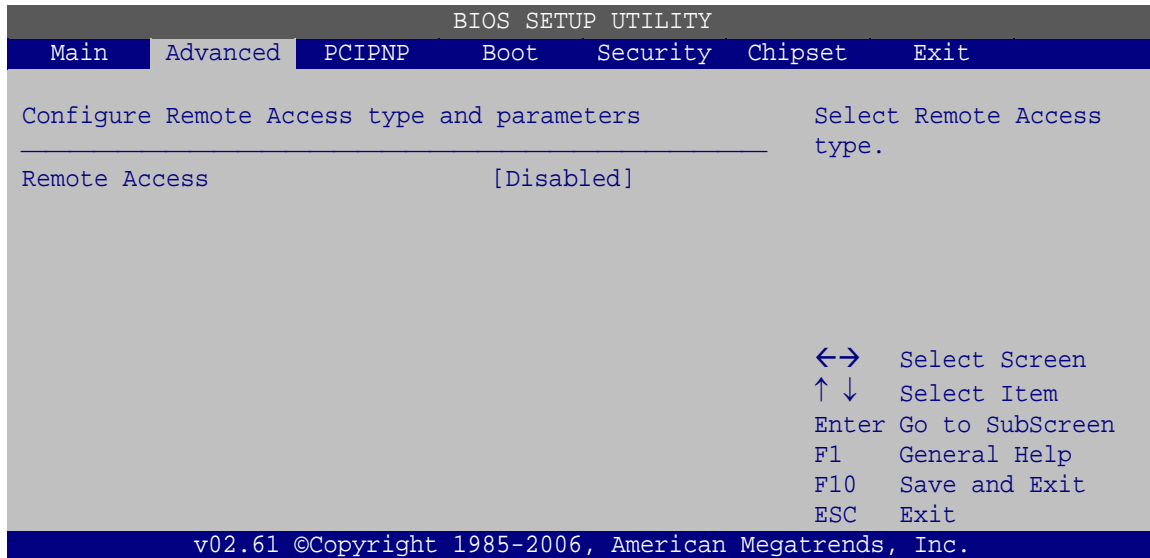
```
                        BIOS SETUP UTILITY
   Main     Advanced   PCIPNP     Boot    Security  Chipset      Exit

Configure Remote Access type and parameters        Select Remote Access
_____    type.
Remote Access                    [Disabled]


                                                ←→   Select Screen
                                                ↑↓   Select Item
                                                Enter Go to SubScreen
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit
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```
**BIOS Menu 10: Remote Access Configuration**

▪ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** DEFAULT Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

> Serial Port Number
> Serial Port Mode
> Redirection after BIOS POST
> Terminal Type

These configuration options are discussed below.

▪ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

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

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

- **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

- **Serial Port Mode [115200 8,n,1]**

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

- 115200 8,n,1   DEFAULT
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

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

- **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**   The console is not redirected after POST

➔ **Boot Loader**   Redirection is active during POST and during Boot Loader

➔ **Always**   DEFAULT   Redirection is always active (Some OSes may not work if set to Always)

▪ **Terminal Type [ANSI]**

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

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

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

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

4.3.7 USB Configuration

Use the **USB Configuration** menu (BIOS Menu 11) to read USB configuration information and configure the USB settings.

```
                        BIOS SETUP UTILITY
   Main     Advanced    PCIPNP     Boot     Security  Chipset     Exit

 USB Configuration                                          Disabled
 _____          Enabled
 Module Version – 2.24.3-13.4

 USB Devices Enabled:
            None
                                                     ←→   Select Screen
 USB Functions               [Enabled]               ↑ ↓  Select Item
 USB 2.0 Controller          [Enabled]               Enter Go to SubScreen
 Legacy USB Support          [Enabled]               F1   General Help
 USB 2.0 Controller Mode     [HiSpeed]               F10  Save and Exit
                                                     ESC  Exit


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```

BIOS Menu 11: USB Configuration

▪ **USB Function [Enabled]**

When enabled, USB devices can be used in the USB slots.

▪ Disabled

▪ Enabled DEFAULT

▪ **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.

➔ **Disabled** Legacy USB support disabled

➔ **Enabled** DEFAULT Legacy USB support enabled

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

▪ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed** The controller is capable of operating at 12 Mb/s

➔ **HiSpeed** DEFAULT The controller is capable of operating at 480 Mb/s

4.3.8 Power Configuration

The **Power Configuration** menu (**BIOS Menu 12**) configures the power options.
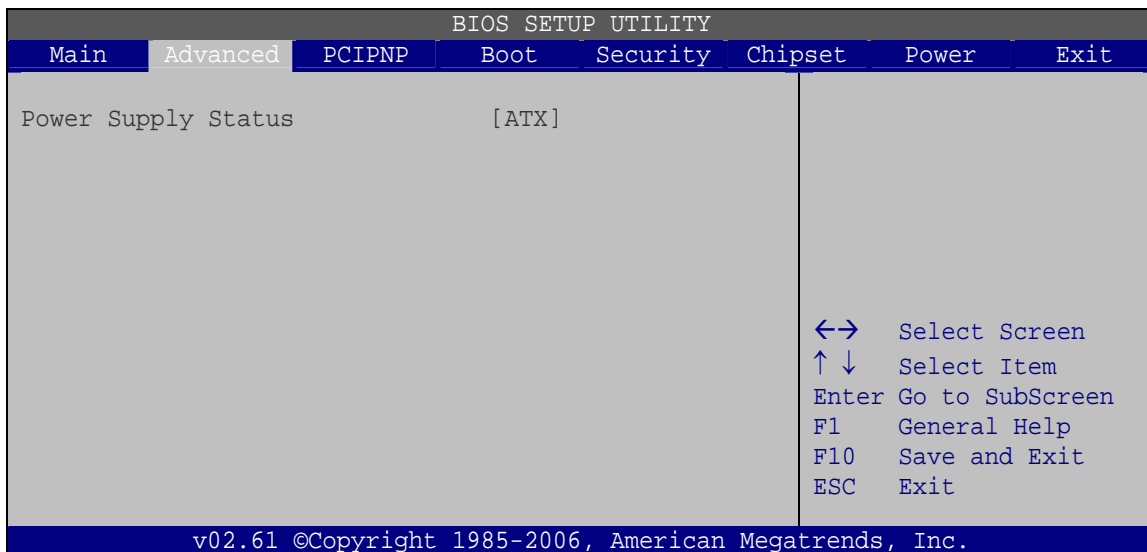
```
                        BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot   Security  Chipset   Power     Exit

 Power Supply Status          [ATX]


                                              ←→   Select Screen
                                              ↑↓   Select Item
                                              Enter Go to SubScreen
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit
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```
BIOS Menu 12: Power Configuration

▪ **Power Supply Status [ATX]**

Shows the setting of the Power Selection Jumper.

4.4 PCI/PnP

Use the **PCI/PnP** menu (BIOS Menu 13) to configure advanced PCI and PnP settings.

⚡ **WARNING!**

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

```
                        BIOS SETUP UTILITY
   Main     Advanced   PCIPNP     Boot    Security  Chipset    Exit

Advanced PCI/PnP Settings                       Available: Specified
_____ IRQ is available to be
                                                used by PCI/PnP
WARNING: Setting wrong values in below sections devices.
         may cause system to malfunction        Reserved: Specified
IRQ3                        [Reserved]          IRQ is reserved for
IRQ4                        [Reserved]          use by Legacy ISA
IRQ5                        [Available]         devices.
IRQ7                        [Available]
IRQ9                        [Available]
IRQ10                       [Available]
IRQ11                       [Available]
IRQ14                       [Available]
IRQ15                       [Available]


DMA Channel 0               [Available]
DMA Channel 1               [Available]
DMA Channel 3               [Available]         ←→   Select Screen
DMA Channel 5               [Available]         ↑ ↓  Select Item
DMA Channel 6               [Available]         Enter Go to SubScreen
DMA Channel 7               [Available]         F1   General Help
                                                F10  Save and Exit
Reserved Memory Size        [Disabled]          ESC  Exit

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```

BIOS Menu 13: PCI/PnP Configuration

▪ **IRQ# [Available]**

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

➔ **Available** DEFAULT The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

   ▪ IRQ3
   ▪ IRQ4
   ▪ IRQ5
   ▪ IRQ7
   ▪ IRQ9
   ▪ IRQ10
   ▪ IRQ 11
   ▪ IRQ 14
   ▪ IRQ 15

▪ **DMA Channel# [Available]**

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

➔ **Available** DEFAULT The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

   ▪ DM Channel 0
   ▪ DM Channel 1
   ▪ DM Channel 3

- DM Channel 5

- DM Channel 6

- DM Channel 7

- **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled** DEFAULT No memory block reserved for legacy ISA devices

➔ **16K** 16 KB reserved for legacy ISA devices

➔ **32K** 32 KB reserved for legacy ISA devices

➔ **64K** 54 KB reserved for legacy ISA devices

4.5 Boot

Use the **Boot** menu (BIOS Menu 14) to configure system boot options.

```
                      BIOS SETUP UTILITY
   Main    Advanced   PCIPNP    Boot    Security  Chipset    Exit

 Boot Settings                             Configure settings
_____  during system boot.
> Boot Settings Configuration

> Boot Device Priority
> Hard Disk Drives

                                           ←→   Select Screen
                                           ↑ ↓  Select Item
                                           Enter Go to SubScreen
                                           F1    General Help
                                           F10   Save and Exit
                                           ESC   Exit

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```
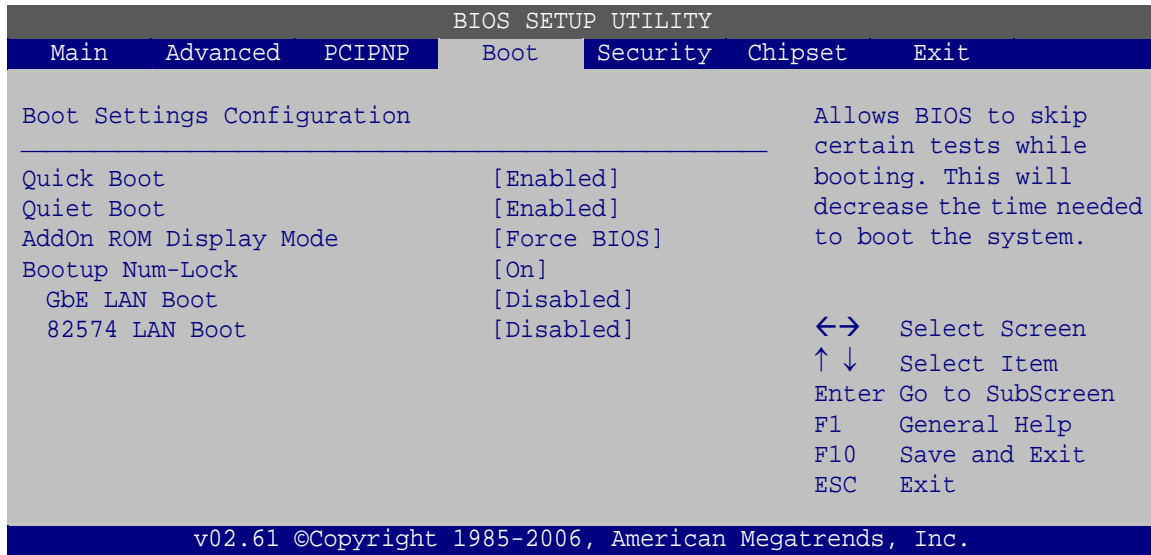
BIOS Menu 14: Boot

4.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (BIOS Menu 15) to configure advanced system boot options.

```
                        BIOS SETUP UTILITY
   Main    Advanced    PCIPNP    Boot    Security   Chipset    Exit

 Boot Settings Configuration                        Allows BIOS to skip
 ───────────────────────────────────────────       certain tests while
 Quick Boot                    [Enabled]            booting. This will
 Quiet Boot                    [Enabled]            decrease the time needed
 AddOn ROM Display Mode        [Force BIOS]         to boot the system.
 Bootup Num-Lock               [On]
  GbE LAN Boot                 [Disabled]
   82574 LAN Boot              [Disabled]           ←→   Select Screen
                                                    ↑↓   Select Item
                                                    Enter Go to SubScreen
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit

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```

BIOS Menu 15: Boot Settings Configuration

▪ **Quick Boot [Enabled]**

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

➔ **Disabled**   No POST procedures are skipped

➔ **Enabled**   DEFAULT   Some POST procedures are skipped to decrease the system boot time

▪ **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

▪ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**   DEFAULT   The system forces third party BIOS to display during system boot.

➔ **Keep Current**   The system displays normal information during system boot.

▪ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **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.

➔ **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.

▪ **GbE LAN Boot [Disabled]**

Use the **GbE LAN Boot** option to enable the system to be booted from a remote system.

➔ **Disabled**   DEFAULT   Cannot be booted from a remote system through the LAN

➔ **Enabled**   Can be booted from a remote system through the LAN

4.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (BIOS Menu 16) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

```
                        BIOS SETUP UTILITY
   Main    Advanced    PCIPNP    Boot    Security   Chipset    Exit

 Boot Device Priority                            Specifies the boot
 _____    sequence from the
 > 1st Boot Device              [1st Boot Device] available devices.



                                                 ←→   Select Screen
                                                 ↑↓   Select Item
                                                 Enter Go to SubScreen
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit
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```
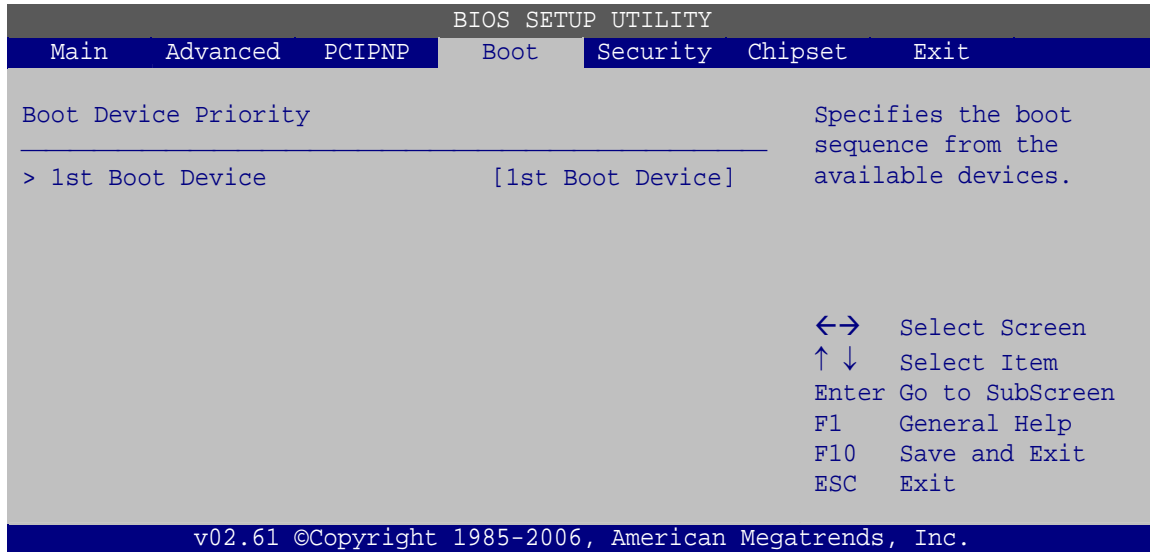
BIOS Menu 16: Boot Device Priority Settings

4.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.

```
                        BIOS SETUP UTILITY
    Main    Advanced   PCIPNP     Boot    Security   Chipset     Exit

 Hard Disk Drives                                    Specifies the boot
 _____        sequence from the
                                                     available devices.
 > 1st Drive                    [Hard Drive 1]



                                                  ←→   Select Screen
                                                  ↑ ↓  Select Item
                                                  Enter Go to SubScreen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```
BIOS Menu 17: Hard Disk Drives

4.6 Security

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

```
                        BIOS SETUP UTILITY
    Main    Advanced   PCIPNP     Boot    Security   Chipset     Exit

 Security Settings
 _____

 Supervisor Password    :Not Installed
 User Password          :Not Installed

 Change Supervisor Password
 Change User Password
                                                  ←→   Select Screen
                                                  ↑ ↓  Select Item
                                                  Enter Go to SubScreen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```
BIOS Menu 18: Security

▪ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

▪ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

4.7 Chipset

Use the **Chipset** menu (BIOS Menu 19) to access the Northbridge and Southbridge configuration menus

---

![WARNING icon] **WARNING!**

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

```
                      BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security   Chipset    Exit

Advanced Chipset Settings                      Options for VIA® VX800
_____
> North Bridge Configuration
> South Bridge Configuration


                                            ←→    Select Screen
                                            ↑ ↓    Select Item
                                            Enter  Go to SubScreen
                                            F1     General Help
                                            F10    Save and Exit
                                            ESC    Exit

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```
       BIOS Menu 19: Chipset

4.7.1 Northbridge Configuration

Use the **Northbridge Configuration** configures the system chipset.

```
                      BIOS SETUP UTILITY
   Main    Advanced   PCIPNP     Boot    Security   Chipset    Exit

North Bridge Configuration                       Options
_____  Disabled
Memory Hole                     [Disabled]        15MB-16MB

Internal Graphics Mode Select   [Enabled, 32MB]

                                            ←→    Select Screen
                                            ↑ ↓    Select Item
                                            Enter  Go to SubScreen
                                            F1     General Help
                                            F10    Save and Exit
                                            ESC    Exit


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```
       BIOS Menu 20:Northbridge Chipset Configuration

▪ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older

ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**   DEFAULT   Memory is not reserved for ISA expansion cards

➔ **15 MB–16 MB**   Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

▪ **Internal Graphics Mode Select [Enable, 32MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

➔ **Enable, 32MB**   DEFAULT   32 MB of memory used by internal graphics device

➔ **Enable, 64MB**   64 MB of memory used by internal graphics device

➔ **Enable, 128MB**   128 MB of memory used by internal graphics device

4.7.2 Southbridge Configuration

The **Southbridge Configuration** configures the system chipset.

```
                        BIOS SETUP UTILITY
  Main     Advanced    PCIPNP     Boot    Security   Chipset     Exit

South Bridge Configuration                        Caution:
_____  Select AT/ATX to AT mode
                                                  will set this item to
Restore on AC Power Loss       [Last State]       Power On.
Spread Spectrum Mode           [Disabled]


                                                  ←→    Select Screen
                                                  ↑ ↓    Select Item
                                                  Enter  Go to SubScreen
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit

       v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```
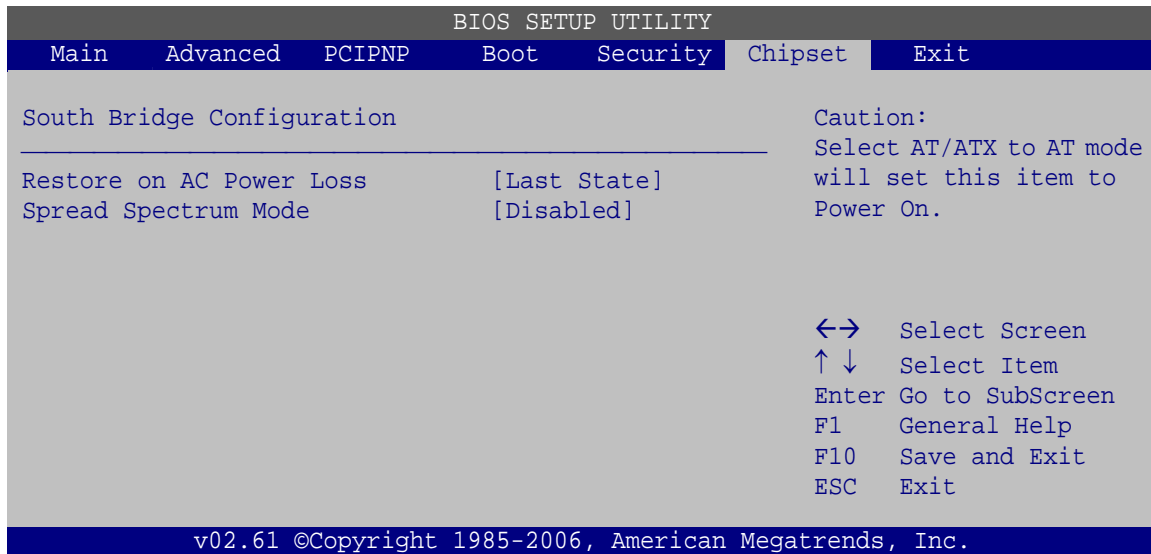
BIOS Menu 21:Southbridge Chipset Configuration

- ▪ **Restore on AC Power Loss [Last State]**

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

➔ **Power Off**   The system remains turned off

➔ **Power On**   The system turns on

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

- ▪ **Spread Spectrum [Disabled]**

Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled**   DEFAULT   EMI not reduced

➔ **Enabled**   EMI reduced

4.8 Exit

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

```
                    BIOS  SETUP  UTILITY
  Main     Advanced   PCIPNP     Boot    Security  Chipset     Exit

Exit Options                                     Exit system setup after
_____        saving the changes.

Save Changes and Exit
Discard Changes and Exit                         F10 key can be used for
Discard Changes                                  this operation

Load Optimal Defaults
Load Failsafe Defaults                           ←→   Select Screen
                                                 ↑ ↓   Select Item
                                                 Enter Go to SubScreen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit

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```

BIOS Menu 22:Exit

▪ **Save Changes and Exit**

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

▪ **Discard Changes and Exit**

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

▪ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

▪ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

▪ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

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

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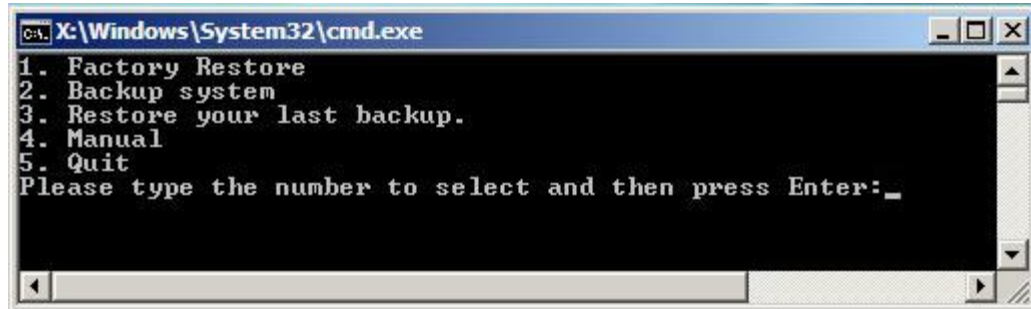
Figure A-1: IEI One Key Recovery Tool Menu

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-up 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.4**.

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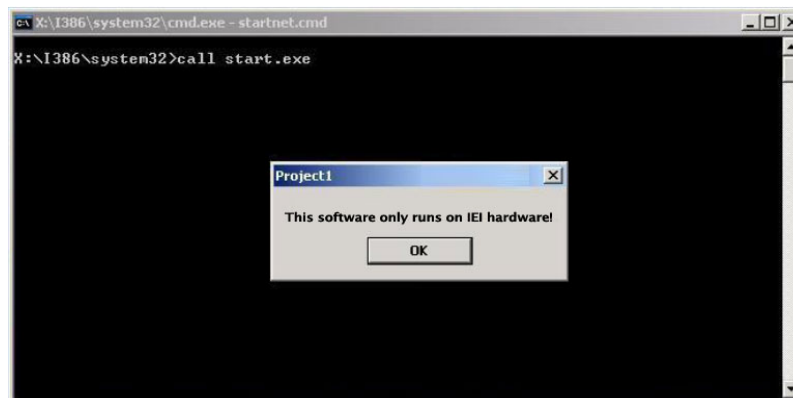
To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

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-up recovery partition (see **Section A.2.4**)

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 system, most setup procedures are the same with Microsoft Windows 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!


Starting Windows Preinstallation Environment...
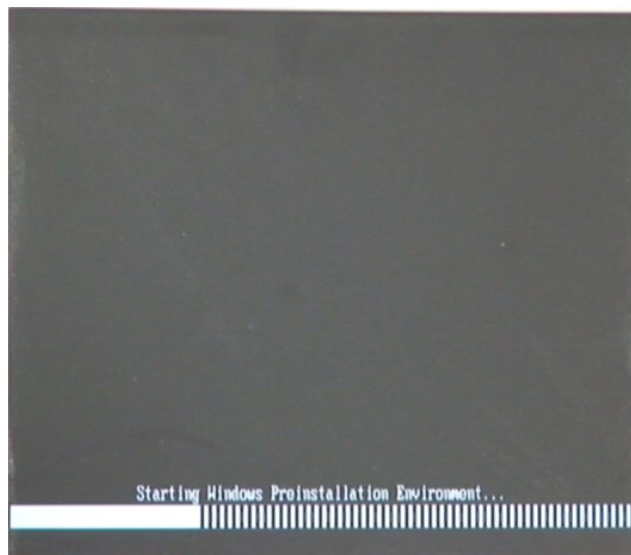
Figure A-2: Launching the Recovery Tool

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

Figure A-3: Recovery Tool Setup Menu

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

```
X:\I386\SYSTEM32>diskpart

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

DISKPART> sel disk 0

Disk 0 is now the selected disk.

DISKPART> list part

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

DISKPART> exit
```

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

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

A.2.3 Install Operating System, Drivers and Applications

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

NOTE:

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

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

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!
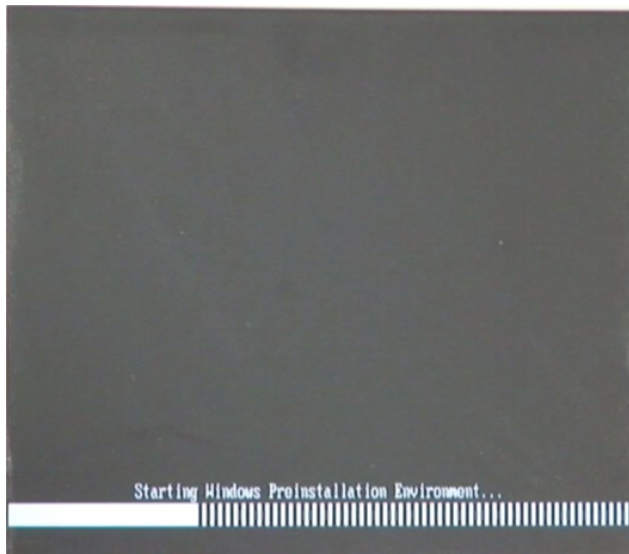
Figure A-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.
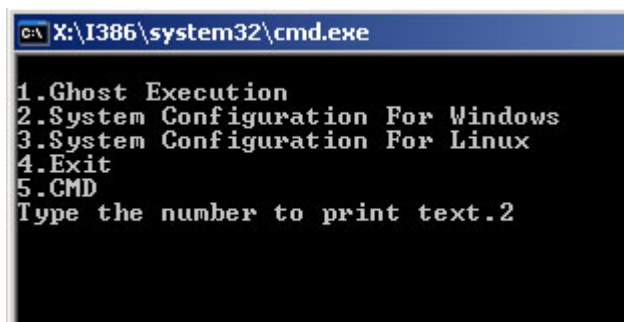
Figure A-7: System Configuration for Windows

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

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

partition.
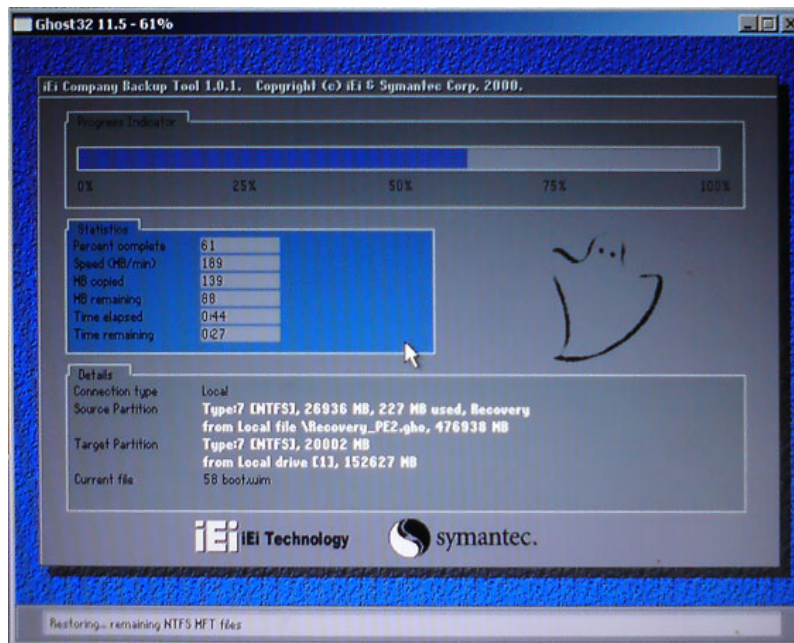
Figure A-8: Build-up Recovery Partition

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

to reboot the system.
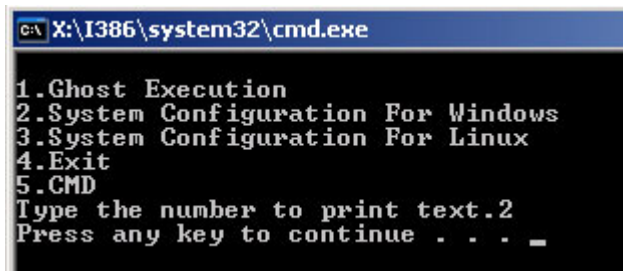
Figure A-9: Press any key to continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image
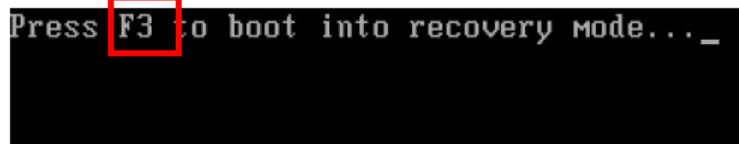
NOTE:

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**)
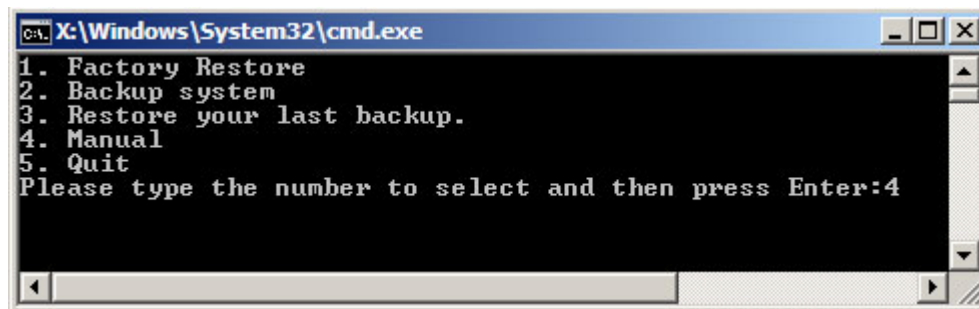
Figure A-11: Recovery Tool Menu

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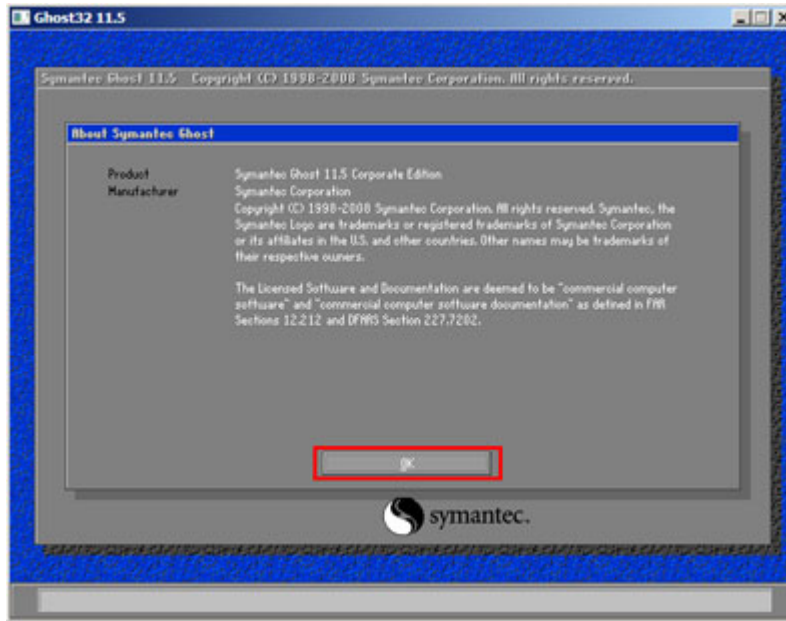
Figure A-12: About Symantec Ghost Window

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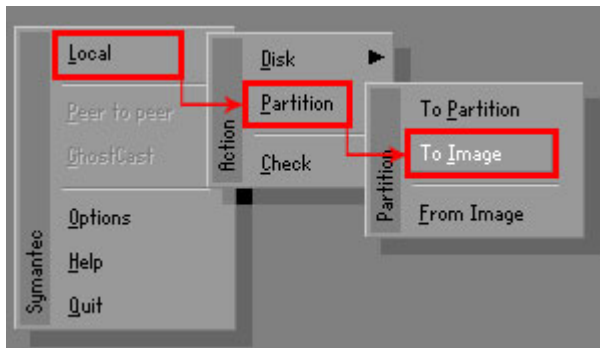
Figure A-13: Symantec Ghost Path

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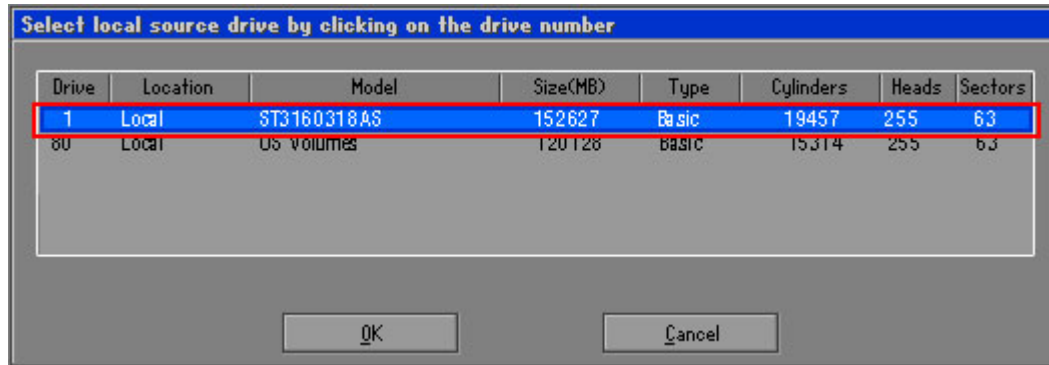
Figure A-14: Select a Local Source Drive

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

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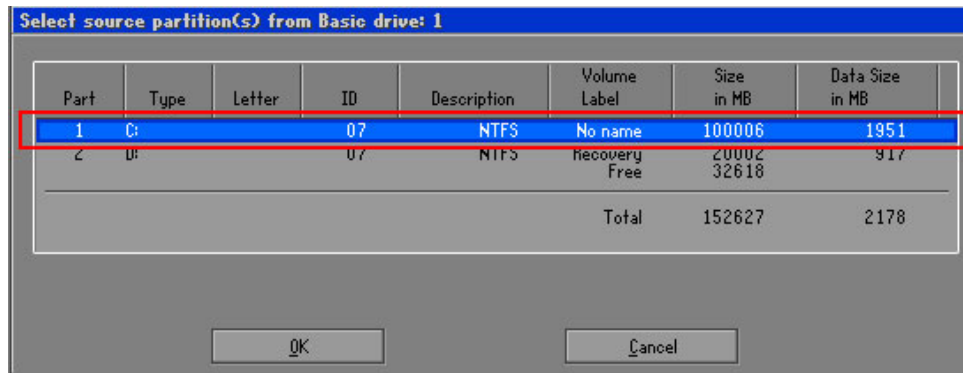
Figure A-15: Select a Source Partition from Basic Drive

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] **WARNING:**

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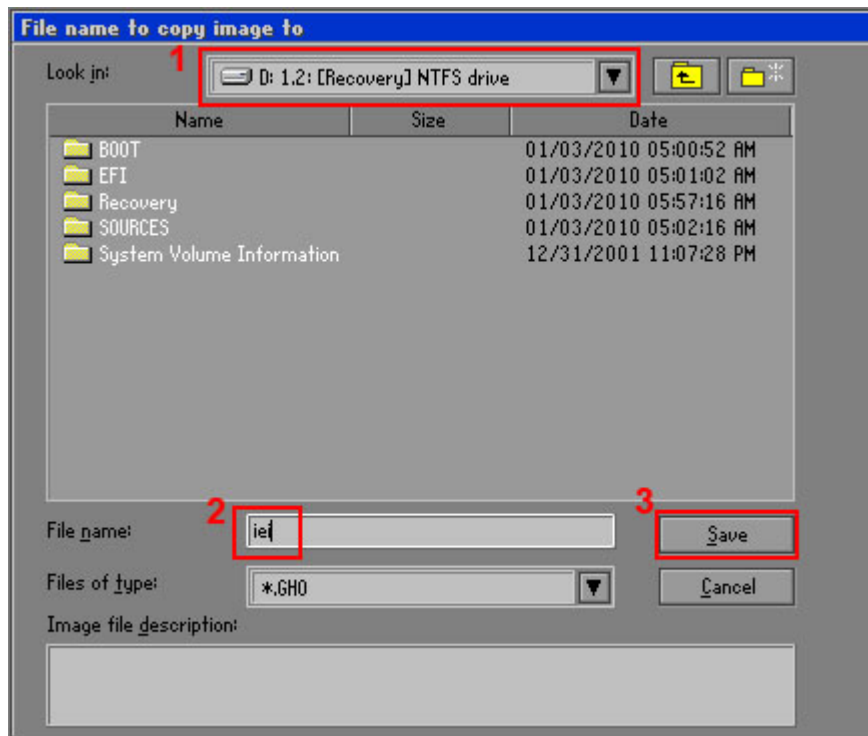
Figure A-16: File Name to Copy Image to

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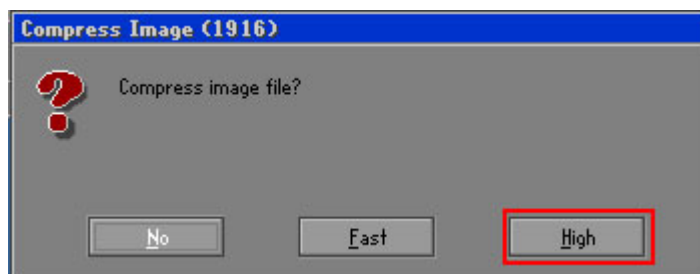
Figure A-17: Compress Image

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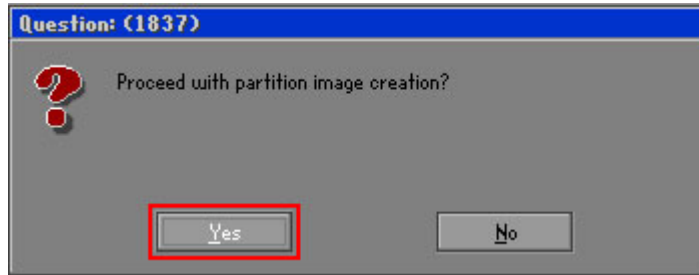
Figure A-18: Image Creation Confirmation

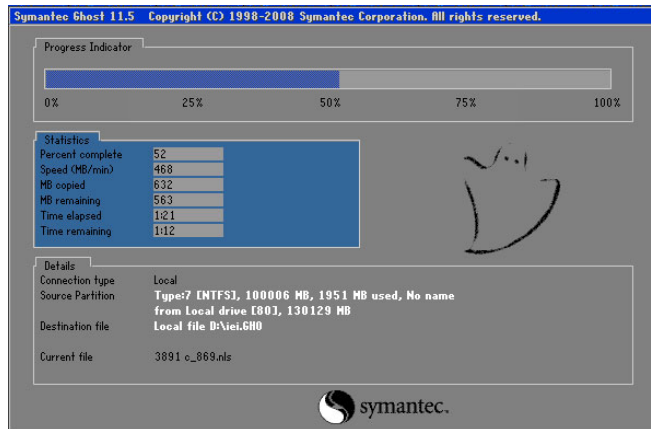**Step 10:** The Symantec Ghost starts to create the factory default image (**Figure A-19**).

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.
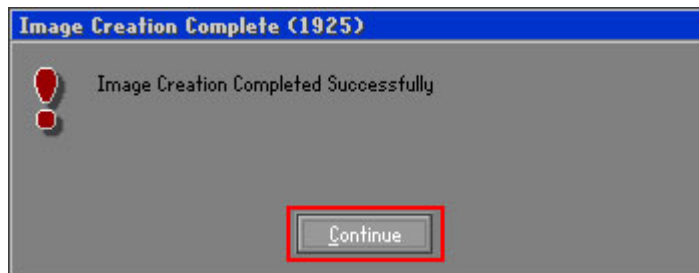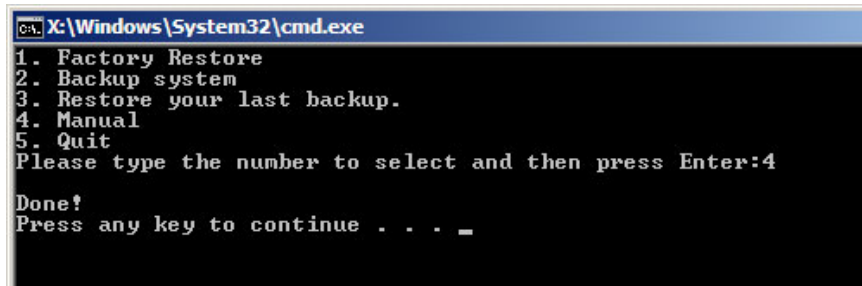

Figure A-20: Image Creation Complete

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 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:**
>
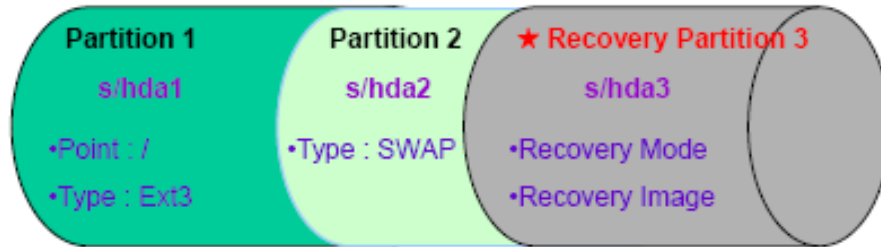> Please reserve enough space for partition 3 for saving recovery
> images.

Figure A-22: Partitions for Linux

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

Follow **Step 1** ~ **Step 3** described in **Section A.2.2**. Then type the following

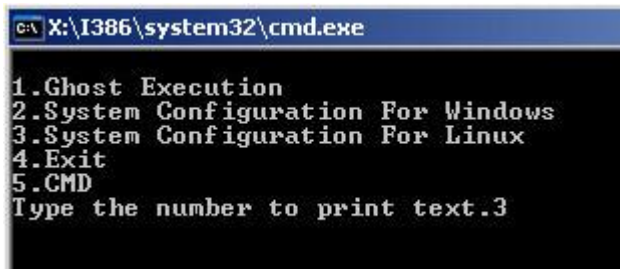commands (marked in red) to create a partition for recovery images.

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-23**). The

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

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

reboot the system. Eject the recovery CD.

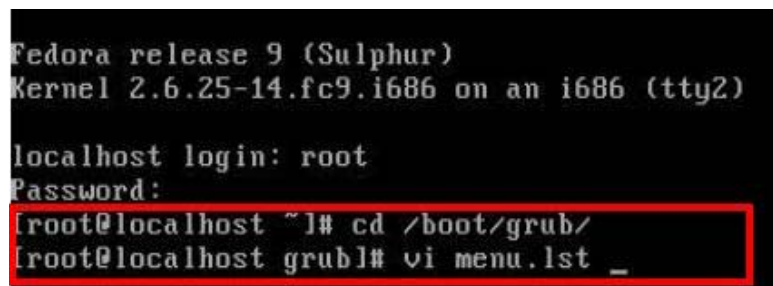**Figure A-23: System Configuration for Linux**

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

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

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

cd /boot/grub

vi menu.lst

Figure A-24: 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-25**)

Figure A-25: 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.4 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The main menu of the recovery tool is shown below.
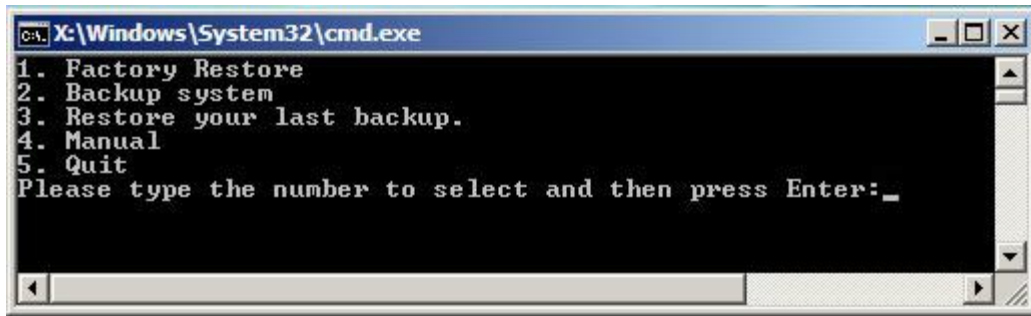
Figure A-26: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section 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.4.1 Factory Restore

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

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

Step 2:   The Symantec Ghost window appears and starts to restore the factory default. A
factory default image called **iei.GHO** is created in the hidden Recovery partition.
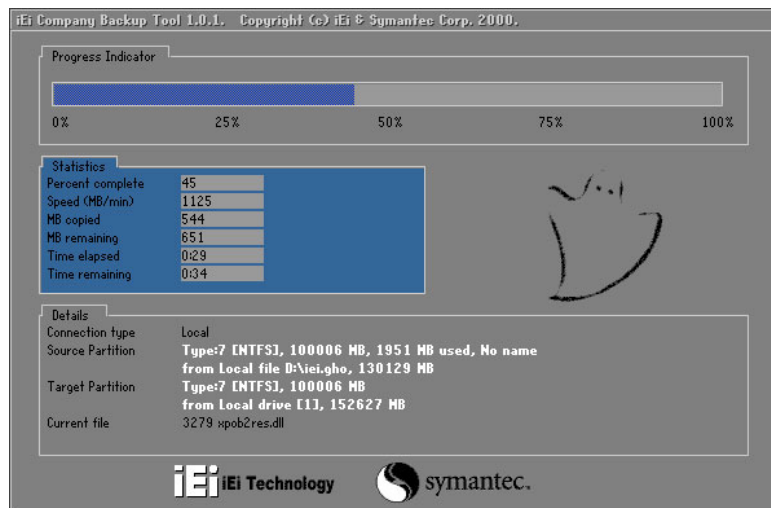
Figure A-27: Restore Factory Default

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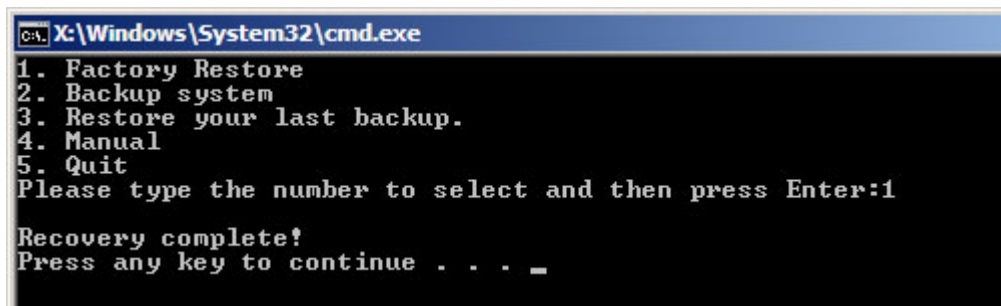
Figure A-28: Recovery Complete Window

A.4.2 Backup System

To backup the system, please follow the steps below.

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

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

Figure A-29: Backup System

Step 3: The screen is shown as in **Figure A-30** when system backup is completed. Press any key to reboot the system.
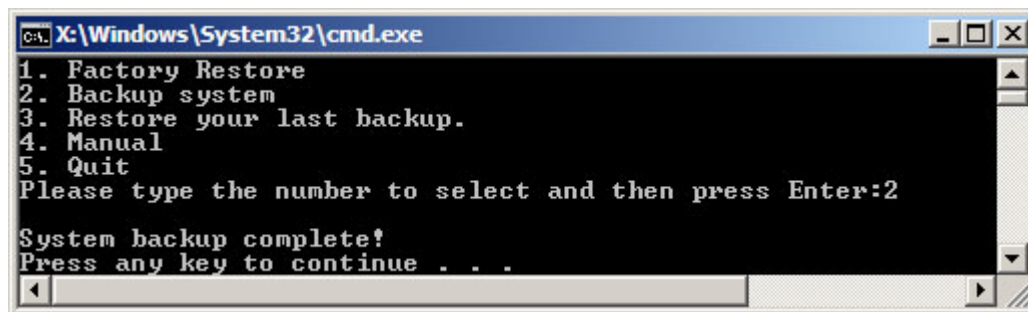
Figure A-30: System Backup Complete Window

A.4.3 Restore Your Last Backup

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

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

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).
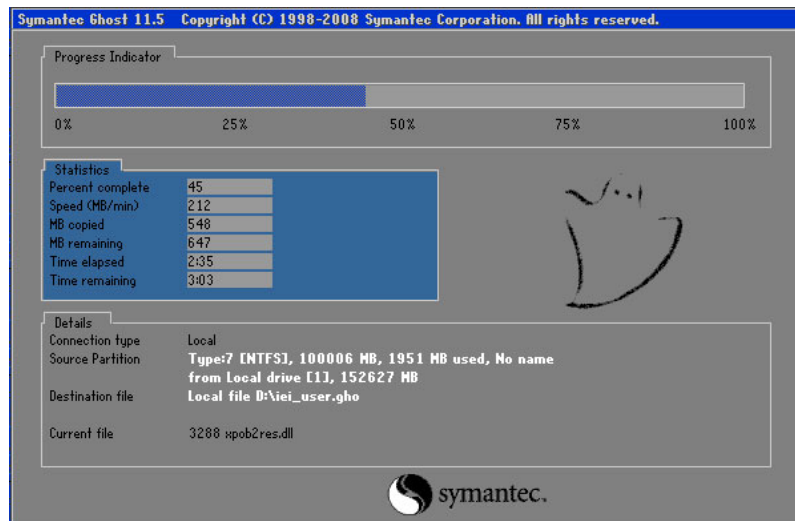
Figure A-31: Restore Backup

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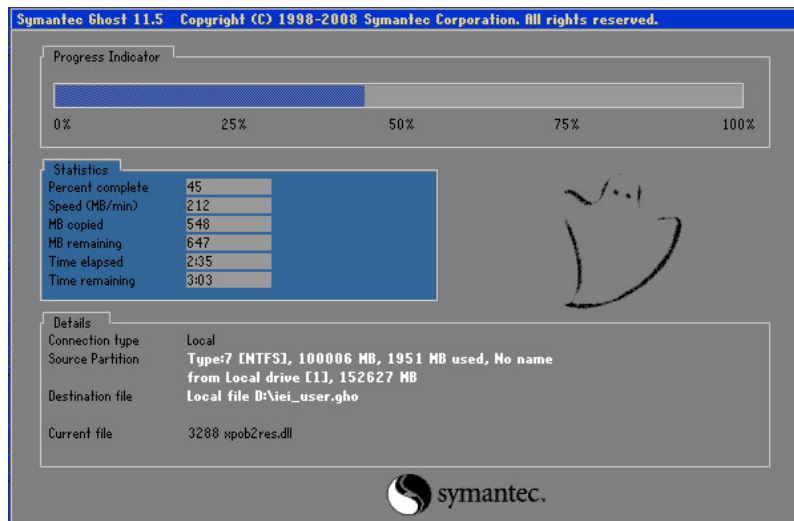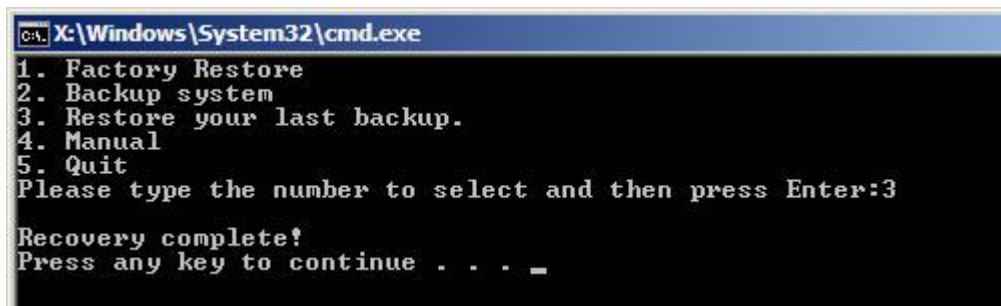

Figure A-32: Restore System Backup Complete Window

A.4.4 Manual

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

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

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.
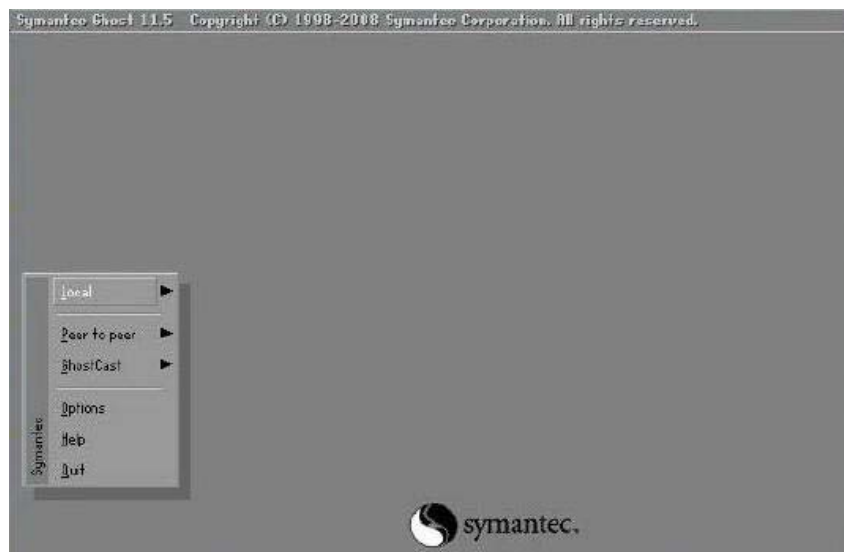
Figure A-33: Symantec Ghost Window

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

A.5 Other Information

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

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

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

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

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

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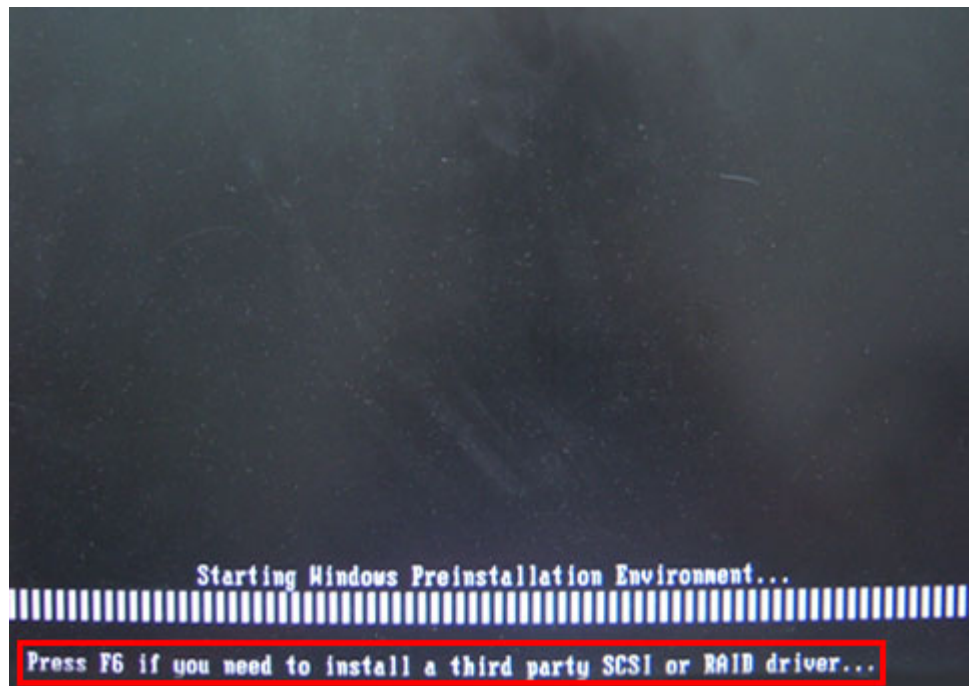
Step 5: When the following window appears, press **<S>** to select "Specify Additional Device".

```
Setup could not determine the type of one or more mass storage devices
installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices(s):

    <none>

  * To specify additional SCSI adapters, CD-ROM drives, or special
    disk controllers for use with Windows, including those for
    which you have a device support disk from a mass storage device
    manufacturer, press S.

  * If you do not have any device support disks from a mass storage
    device manufacturer, or do not want to specify additional
    mass storage devices for use with Windows, press ENTER.



S=Specify Additional Device    ENTER=Continue    F3=Exit
```

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.

```
You have chosen to configure a SCSI Adapter for use with Windows,
using a device support disk provided by an adapter manufacturer.

Select the SCSI Adapter you want from the following list, or press ESC
to return to the previous screen.




        VIA V-RAID Controller Series(Windows XP/SRV2003)
        VIA V-RAID Controller Series(Windows XP/SRV2003-x64)
        VIA V-RAID Controller Series(Windows 2K)
        VIA V-RAID Controller Series(Windows NT4)



ENTER=Select   F3=Exit
```

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.5.2 System Memory Requirement

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

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

Appendix

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-GM45.

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.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - 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-GM45 may result in permanent damage to the TANK-GM45 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-GM45. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-GM45 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.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-GM45, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-GM45, please read the details below.

- The interior of the TANK-GM45 does not require cleaning. Keep fluids away from the TANK-GM45 interior.

- Be cautious of all small removable components when vacuuming the TANK-GM45.
- Turn the TANK-GM45 off before cleaning the TANK-GM45.
- Never drop any objects or liquids through the openings of the TANK-GM45.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-GM45.
- Avoid eating, drinking and smoking within vicinity of the TANK-GM45.

B.2.2 Cleaning Tools

Some components in the TANK-GM45 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-GM45.

- *Cloth* – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-GM45.
- *Water or rubbing alcohol* – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-GM45.
- *Using solvents* – The use of solvents is not recommended when cleaning the TANK-GM45 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-GM45. Dust and dirt can restrict the airflow in the TANK-GM45 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。						