# IEI Integration Corp.

**MODEL:**

# TANK-820-H61 Series

Embedded System with 2nd Generation Intel® Core™ desktop processor, VGA, DVI-I, Two Gigabit Ethernet, Four USB 2.0, Two USB 3.0, RS-232/422/485, RoHS Compliant

# User Manual

Rev. 2.03 – 27 December 2013

RoHS Lead Free

# Revision

| Date | Version | Changes |
|---|---|---|
| 27 December 2013 | 2.03 | Update BIOS version<br>Updated Section 3.4: System Fan Installation |
| 16 July 2013 | 2.02 | Update Section 1.4: Technical Specifications<br>(Operating Temperature : -20°C ~ 55°C) |
| 19 June 2013 | 2.01 | Update Section 1.2: Model Variations |
| 22 May 2013 | 2.00 | Change to fanless design |
| 2 April 2013 | 1.01 | Add backplane max. size |
| 12 December 2012 | 1.00 | Initial release |

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## TRADEMARKS

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Chapter

1

Introduction

## 1.1 Overview



**Figure 1-1: TANK-820-H61**

The TANK-820-H61 is an embedded system for wide range temperature environments. It is powered by the 2nd Generation Intel® Core™ low power desktop processor, uses the Intel® H61 chipset and has 2.0 GB of DDR3 memory on-board. The TANK-820-H61 series includes one VGA port, one DVI-I port, two GbE LAN ports, four USB 2.0 ports, two USB 3.0 ports, six RS-232 connectors and two RS-422/485 connectors.

## 1.2 Model Variations

The model variations of the TANK-820-H61 series are listed below.

| Model No. | Variations | CPU | Expansion Slots |
|---|---|---|---|
| TANK-820-H61 | TANK-820-H61-i5/2G/2P1E-R10 | Intel® Core™ i5 2xxT | Two PCI slots One PCIe x16 slot (PCIe x8 signal) |
| | TANK-820-H61-i3/2G/2P1E-R10 | Intel® Core™ i3 2xxT | |
| | TANK-820-H61-P/2G/2P1E-R10 | Intel® Pentium® G6xxT | |
| | TANK-820-H61-i5/2G/1P2E-R10 | Intel® Core™ i5 2xxT | One PCI slot One PCIe x4 slot (PCIe x1 signal) One PCIe x16 slot (PCIe x8 signal) |
| | TANK-820-H61-i3/2G/1P2E-R10 | Intel® Core™ i3 2xxT | |
| | TANK-820-H61-P/2G/1P2E-R10 | Intel® Pentium® G6xxT | |

**Table 1-1: TANK-820-H61 Model Variations**

## 1.3 Features

The TANK-820-H61 features are listed below:

- 2nd Generation Intel® Core™ low power desktop processors for TANK-820
- On-board 2GB DDR3 memory and one DDR3 SO-DIMM slot (system max. 10GB)
- Redundant dual wild range DC power support (9 ~ 24 VDC)
- Flexible PCI/PCIe expansion slots satisfy customized requirements
- Rich I/O functions satisfy various applications
- Dual PCIe GbE LAN for high speed network applications
- One CompactFlash® socket

## 1.4 Technical Specifications

The TANK-820-H61 technical specifications are listed in **Table 1-2**.

| Specifications | |
|---|---|
| System | |
| CPU | 2nd Generation Intel® Core™ low power desktop processor |
| Chipset | Intel® H61 |

| Specifications | |
|---|---|
| Memory | 1 x 204-pin DDR3 SDRAM SO-DIMM slot (Max. to 10G) <br> On-board 2GB DDR3 memory |
| Ethernet Controller | Dual Realtek RTL8111E PCIe GbE controllers with ASF 2.0 support |
| I/O and Indicators | |
| Ethernet | 2 x RJ-45 GbE ports |
| RS-232 | 4 x RS-232 serial ports (DB-9) <br> 2 x RS-232 serial ports (DB-9 with isolation) |
| RS-422/RS-485 | 2 x RS-422/485 serial ports (RJ-45) |
| USB Interfaces | 4 x USB 2.0 ports on front side <br> 2 x USB 3.0 ports on rear side |
| Display | 1 x VGA port (2048 x 1536 @ 75Hz) <br> 1 x DVI-I port (1920 x 1080 @ 60Hz) |
| Audio Connector | 1 x Line-out port <br> 1 x Mic-in port |
| Digital I/O | 1 x DB-9 port on rear side |
| Interior Expansions | Either one PCIe x8 (via PCIe x16 slot) and two PCI <br> or one PCIe x1 (via PCIe x4 slot), one PCIe x8 (via PCIe x16 slot) and one PCI |
| LED Indicators | AT power mode LED <br> ATX power mode LED <br> CPU temperature alert LED <br> HDD LED <br> Power 1 LED <br> Power 2 LED |
| Storage | |
| SATA | 2.5" SATA HDD bay |
| CompactFlash® | One CompactFlash® Type II socket |

| Specifications | |
|---|---|
| Power | |
| Power Supply | Redundant dual DC input<br><br>Terminal Block: 9 ~ 24V<br><br>DC Jack: 9 ~ 24V |
| Power Consumption | 19V@3.5A (Intel® Core™ i3-2100 processor with 6GB DDR3<br><br>memory) without add-on card |
| Environmental and Mechanical | |
| Operating Temperature | -20°C ~ 55°C with air flow |
| Storage Temperature | -30°C~80°C |
| Humidity | 5% ~ 95%, non-condensing |
| Mounting | Desktop, wall mount |
| Color | Black C + Silver |
| Chassis Construction | Extruded Aluminum Alloy |
| Physical Dimensions | 133 mm x 206 mm x 269 mm (W x H x D) |
| Operating Shock | Half-sine wave shock 5G, 11ms, 3 axis |
| Operating Vibration | Meet MIL-STD-810F 514.5C-2 (with SSD) |
| Weight (Net/Gross) | 4.2 Kg / 6.3 Kg |
| Safety & EMC | CE / FCC |

**Table 1-2: Technical Specifications**

## 1.5 Front Panel

The front panel of the TANK-820-H61 has the following features (**Figure 1-2**):
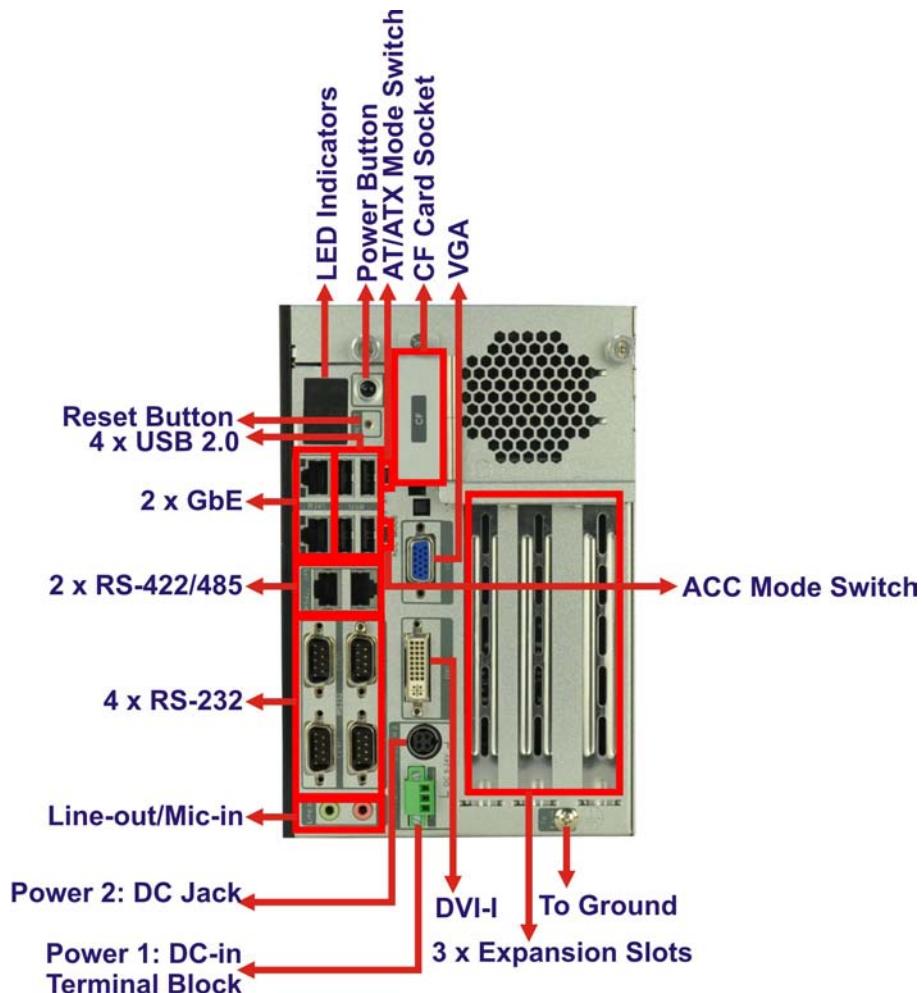


**Figure 1-2: TANK-820-H61 Front Panel**

Connectors and buttons on the front panel include the following:

- 1 x 4-pin power DC jack for 9 V ~ 24 V power input
- 1 x Power terminal block for 9 V ~ 24 V power input
- 1 x Mic-in port (pink)
- 1 x Line-out port (green)
- 4 x RS-232 serial ports (DB-9)
- 2 x RS-422/485 serial ports (RJ-45)
- 2 x Gigabit Ethernet ports (RJ-45)

- 4 x USB 2.0 ports
- 1 x Reset button
- 6 x LED indicators (**Section 1.7**)
- 1 x Power button
- 1 x CompactFlash® Type II socket
- 1 x VGA port
- 1 X DVI-I port
- 1 x To Ground
- 3 x Expansion slots
- 1 x ACC mode switch
- 1 x AT/ATX mode switch

## 1.6 Rear Panel

The rear panel of the TANK-820-H61 has the following features (**Figure 1-2**):
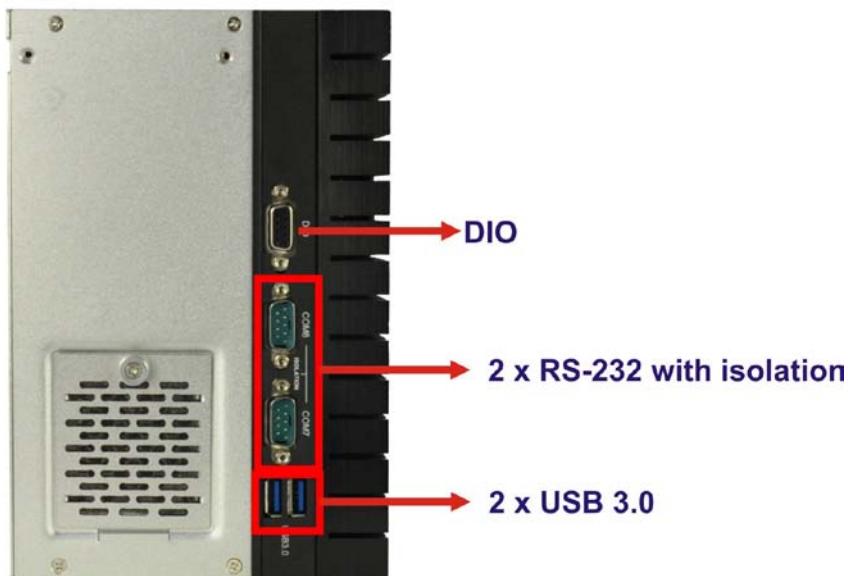


**Figure 1-3: TANK-820-H61 Rear Panel**

Connectors on the front panel include the following:

- 1 x DIO connector
- 2 x RS-232 serial ports (DB-9 with isolation)
- 2 x USB 3.0 ports

## 1.7 LED Indicators

There are several indicators on the rear panel of the TANK-820-H61 as shown in **Figure 1-4**.
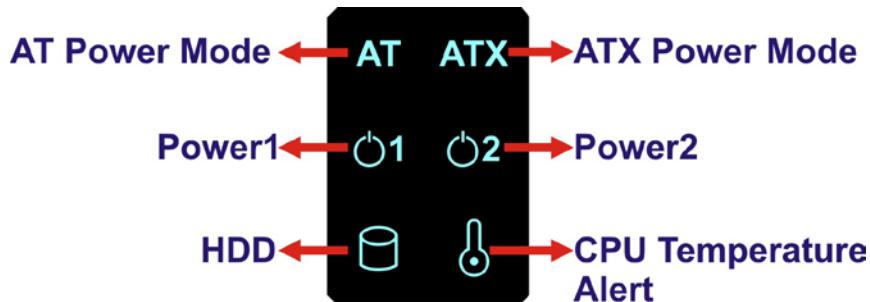


**Figure 1-4: TANK-820-H61 LED Indicators**

The descriptions of each LED indicator are listed below.

| LED Indicator | Description |
|---|---|
| AT Power Mode | The current power mode status is AT mode. Controlled by the AT/ATX power mode switch. |
| ATX Power Mode | The current power mode status is ATX mode. Controlled by the AT/ATX power mode switch. |
| Power 1 | **Breathing orange:** Standby mode. |
| Power 2 | **Solid blue:** Power-on mode. |
| HDD | Shows HDD status. |
| CPU Temperature Alert | BLUE: CPU temperature is normal. RED: CPU temperature is too high. |

**Table 1-3: LED Indicators Description**

![warning icon] **WARNING:**

The CPU Temperature Alert LED turns red when the CPU temperature is too high. If this situation occurs, lower the environment temperature or close some running applications to cool down the CPU.

## 1.8 Backplane Options

The backplane options of the TANK-820-H61 are shown below.
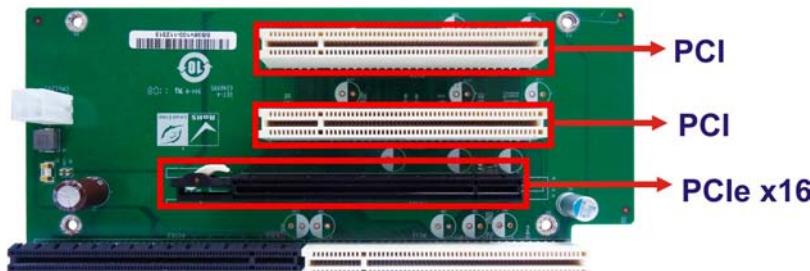


**Figure 1-5: HPE-3S6 (2P1E)**
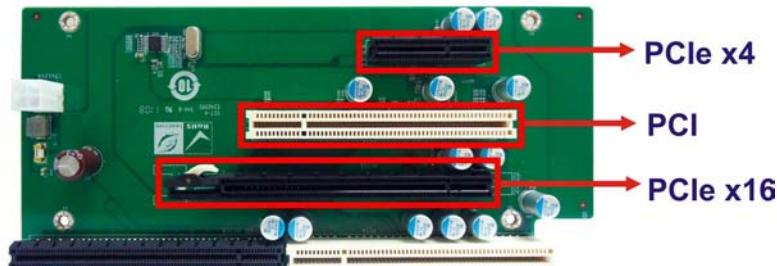


**Figure 1-6: HPE-3S7 (1P2E)**

The supported signals of the backplane slots are listed below.

| Backplane | Slot | Signal |
|---|---|---|
| HPE-3S6 (2P1E) | PCI | PCI |
| | PCIe x16 | PCIe x8 |
| HPE-3S7 (1P2E) | PCI | PCI |
| | PCIe x4 | PCIe x1 |
| | PCIe x16 | PCIe x8 |

**Table 1-4: Supported Signals**

The rated voltage and current of the backplanes are listed below.

| Rated Voltage | Rated Current |
|---|---|
| +5 V | 7 A |

| | |
|---|---|
| +12 V | 3.75 A |
| -12 V | 0.1 A |
| +3.3 V | 8 A |

**Table 1-5: Rated Voltage and Current**

**WARNING:**

The system default power is 120 W. The maximum total power of the backplane to support expansion cards is 45 W. The power of the selected expansion cards can not exceed the max. power (45 W), otherwise, the system may be unstable.

**NOTE:**

When using an expansion card with high power consumption, it is recommended to install an external power supply to the 12V power input connector on the backplane.

The two types of backplane support standard PCI/PCIe cards with maximum dimensions (WxL):111 x 190 mm.

## 1.9 Dimensions

The physical dimensions are shown below:
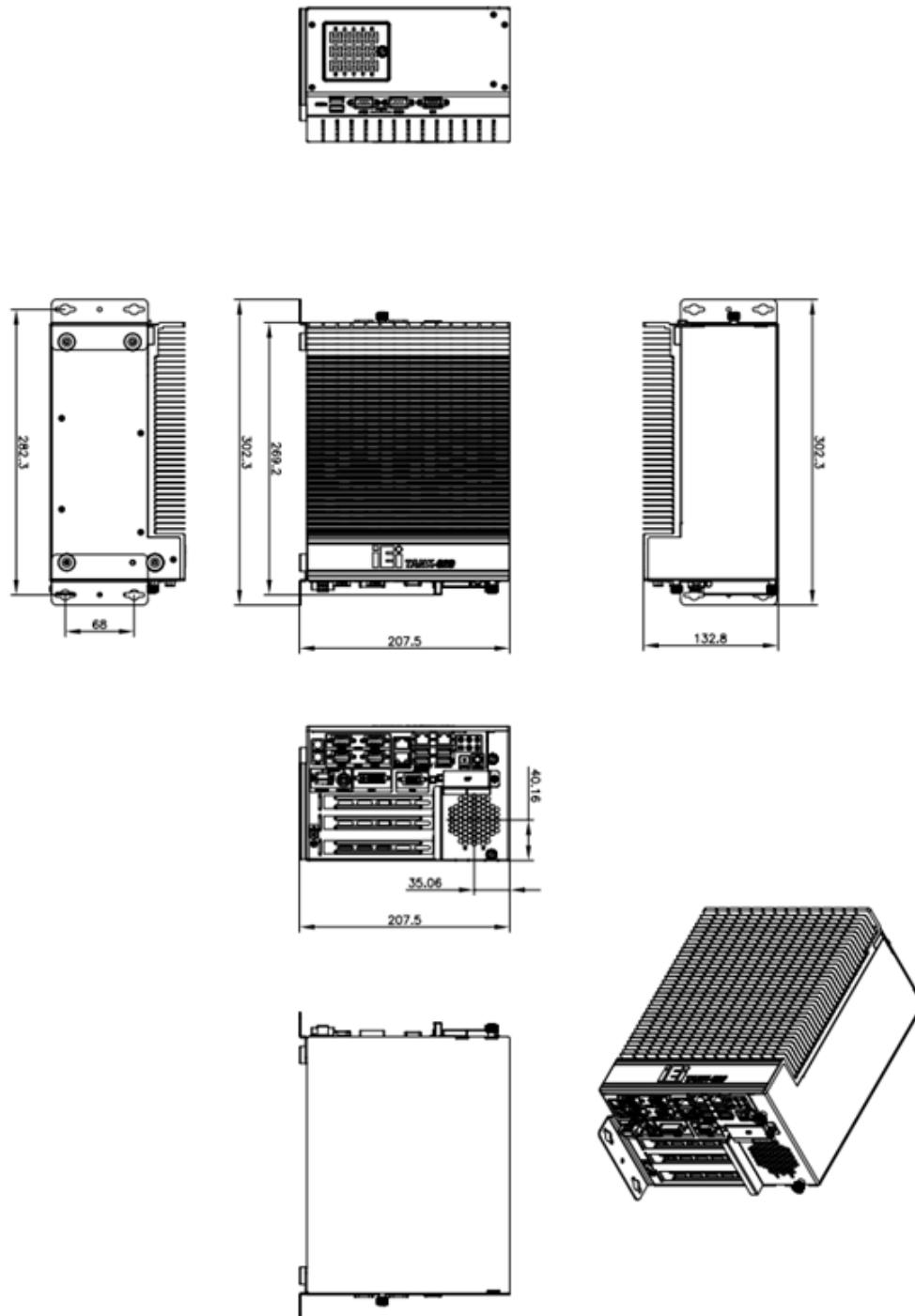


**Figure 1-7: Physical Dimensions (millimeters)**

Chapter

2

Unpacking

## 2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-820-H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-820-H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-820-H61 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-820-H61, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-820-H61.

## 2.2 Unpacking Precautions

When the TANK-820-H61 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-820-H61 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-820-H61 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-820-H61 is shipped with the following components:

| Quantity | Item and Part Number | Image |
|---|---|---|
| Standard | | |
| 1 | TANK-820-H61 | |
| 1 | Power Adapter (**P/N**: 63000-FSP120AAB-RS) | |
| 1 | Power Cord (**P/N**: 32702-000401-100-RS) | |
| 1 | Power Transfer Cord (**P/N**: 32702-000300-100-RS) | |
| 4 | Mounting Bracket Screws (**P/N**: 44033-040062-RS) | |

| Quantity | Item and Part Number | Image |
|---|---|---|
| Standard | | |
| 2 | Mounting Brackets<br>(**P/N**: 41020-0366E4-00-RS) | |
| 4 | HDD Screws<br>(**P/N**: 44043-030051-RS) | |
| 4 | Rubber Foot Pad Screws<br>(**P/N**: 44033-040061-RS) | |
| 4 | Rubber Foot Pads<br>(**P/N**: 46015-006300-RS) | |
| 2 | RJ-45 to DB-9 COM Port Cable<br>(**P/N**: 32005-000200-200-RS) | |
| 1 | Pluggable DC-in Terminal Block<br>(**P/N**: 33502-000007-RS) | |
| 1 | One Key Recovery CD<br>(**P/N**: 7B000-000724-RS) | |
| 1 | User Manual and Driver CD | |
| 4 | Fan Screws<br>(**P/N**: 44003-030151-RS) | |

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

| Optional | |
|---|---|
| System Fan (50mmx50mmx15mm)<br>(**P/N**: 31100-000340-RS) |  |
| OS: Win CE 6.0 (128MB CF Card)<br>(**P/N**: TANKCF-820-H61-CE060-128M-R10) | |
| OS: Win XPE (4GB CF Card)<br>(**P/N**: TANKCF-820-H61-XPE-4G-R10) | |
| OS: Linux (2GB CF Card)<br>(**P/N**: TANKCF-820-H61-LNX-2G-R10) | |
| OS: Win 7 Embedded (4GB CF Card)<br>(**P/N**: TANKCF-820-H61-WES7E-4G-R10) | |

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-820-H61, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-820-H61 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-820-H61 is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-820-H61 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-820-H61. The TANK-820-H61's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the TANK-820-H61. Leave at least 5 cm of clearance around the TANK-820-H61 to prevent overheating.
- **Grounding**: The TANK-820-H61 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-820-H61.

## 3.2 CF Card Installation

To install the CF card, please follow the steps below:

Step 1:   Locate the CF card socket, and then loosen the thumbscrew (**Figure 3-1**).

**Figure 3-1: CF Card Socket**

Step 2: Open the CF card socket cover (**Figure 3-2**).
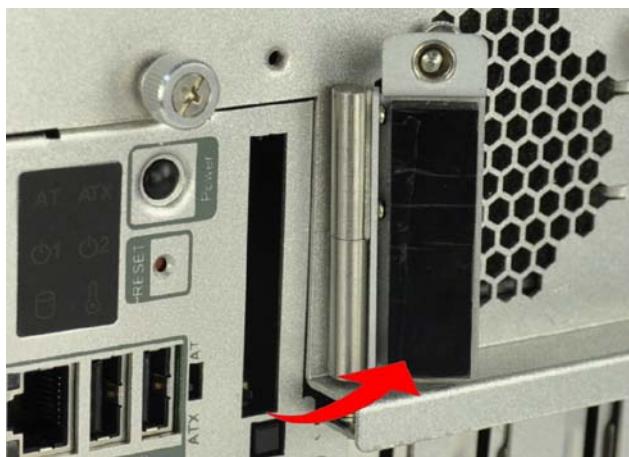


**Figure 3-2: CF Card Socket Cover**

Step 3: Correctly align the CF card with the socket and insert the CF card into the socket

(**Figure 3-3**).

**Figure 3-3: CF Card Installation**

Step 4:    Reinstall the cover.

## 3.3 Hard Disk Drive (HDD) Installation

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

Step 1:    Remove the two retention screws on the rear panel and loosen the two
thumbscrews on the front panel, slide the cover inwards, and then lift the cover
up gently (**Figure 3-4**).



**Figure 3-4: Unscrew the Cover**

Step 2: Unplug the SATA signal and power cables connected to the TANK-820-H61, and then put the cover on a flat surface (**Figure 3-5**).
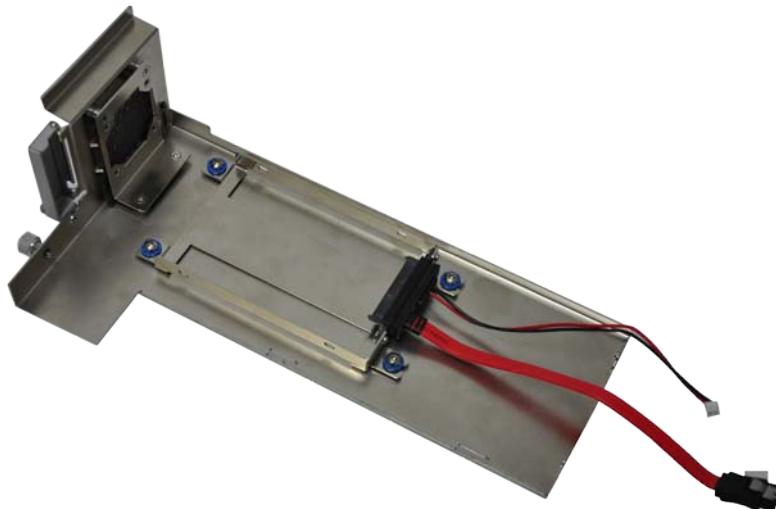


**Figure 3-5: Remove the Cover from TANK-820-H61**

Step 3: Attach the HDD to the HDD bracket, and then slide the HDD to connect the HDD to the SATA connector (**Figure 3-6**).
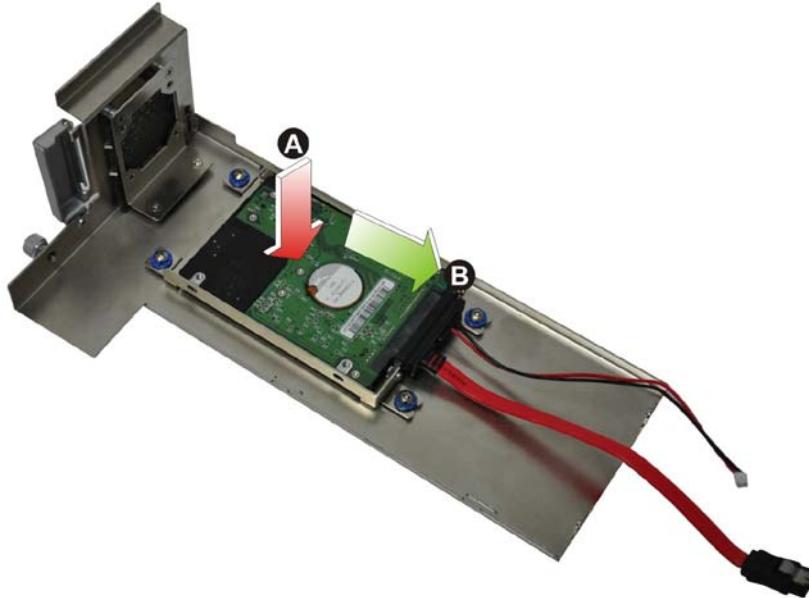


**Figure 3-6: HDD Installation**

Step 4: Secure the HDD with the HDD bracket by four retention screws (**Figure 3-7**).
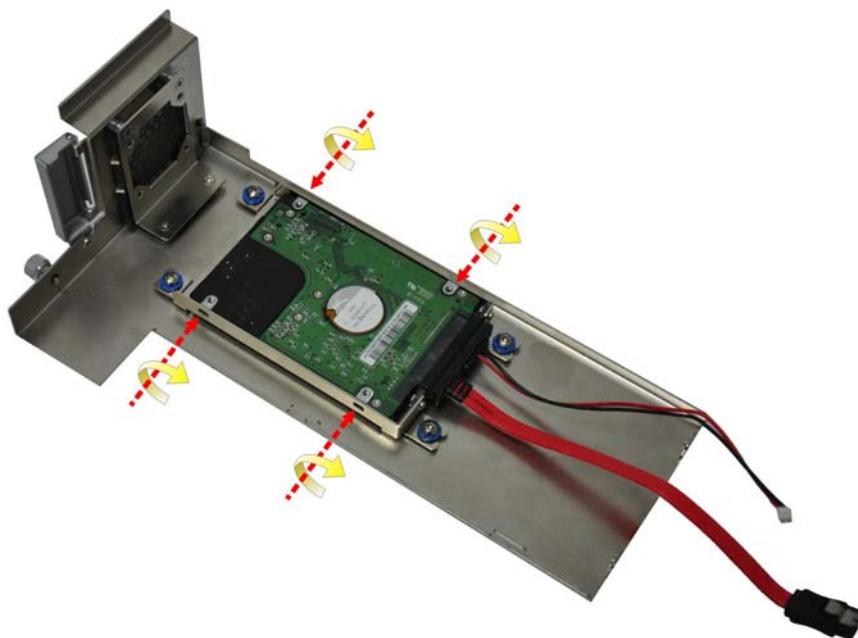


**Figure 3-7: HDD Retention Screws**

Step 5: Reconnect the SATA signal and power cables to the TANK-820-H61.

Step 6: Reinstall the cover.

## 3.4 System Fan Installation

To install the optional system fan, please follow the steps below:

Step 1: Remove the two retention screws on the rear panel and loosen the two thumbscrews on the front panel, slide the cover inwards, and then lift the cover up gently (**Figure 3-4**).

Step 2: Unplug the SATA signal and power cables connected to the TANK-820-H61, and then place the cover on a flat surface (**Figure 3-5**).

Step 3: Attach the system fan to the TANK-820-H61 and secure it by four retention screws (**Figure 3-8**).
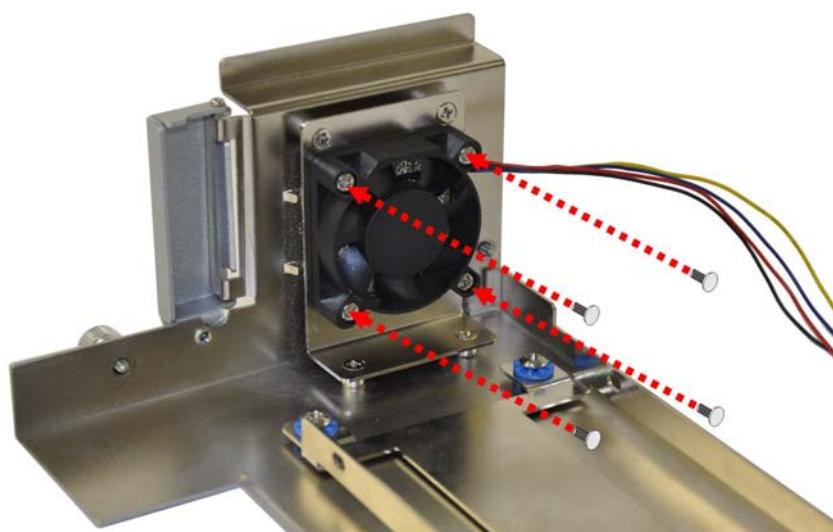
**Figure 3-8: System Fan Installation**

Step 4:   Connect the system fan cable to the **CPU_FAN1** connector on the motherboard of TANK-820-H61.

Step 5:   Reconnect the SATA signal and power cables to the TANK-820-H61.

Step 6:   Reinstall the cover.

## 3.5 Mounting the System with Mounting Brackets

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

Step 1:   Turn the embedded system to the left side panel.

Step 2:   Align the two retention screw holes in each bracket with the corresponding retention screw holes on the bottom surface or the left side panel (**Figure 3-9**).

**Left Side Panel**

**Figure 3-9: Mounting Bracket Retention Screws**

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket (**Figure 3-9**).

Step 4: Drill holes in the intended installation surface.

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

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

## 3.6 Foot Pad Installation

The TANK-820-H61 is shipped with four foot pads. To install the foot pads, follow the instructions below.

Step 1: Turn the TANK-820-H61 to the left side panel.

Step 2: Locate the four retention screw holes for the food pad in the bottom surface.

Step 3: Align the hole of the foot pad with the retention screw holes on the bottom surface.

Step 4: Secure the foot pad to the chassis by inserting the retention screw.

**Figure 3-10: Foot Pad Installation**

## 3.7 External Peripheral Interface Connectors

The TANK-820-H61 has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- ACC mode switch
- AT/ATX power mode switch
- Audio
- CompactFlash® Type II
- DIO
- DVI-I
- Ethernet
- Power button
- Power DC jack
- Power terminal block
- Reset button
- RS-232

- RS-422/485
- USB
- VGA

### 3.7.1 ACC Mode Selection

The TANK-820-H61 allows turning the ACC mode on or off. The setting can be made through the ACC mode switch on the external peripheral interface panel as shown below.
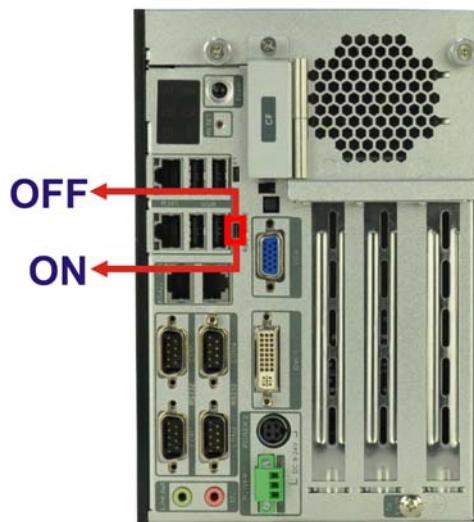


**Figure 3-11: ACC Mode Switch**

### 3.7.2 AT/ATX Power Mode Selection

The TANK-820-H61 supports AT and ATX power modes. The setting can be made through the AT/ATX power mode switch on the external peripheral interface panel as shown below.
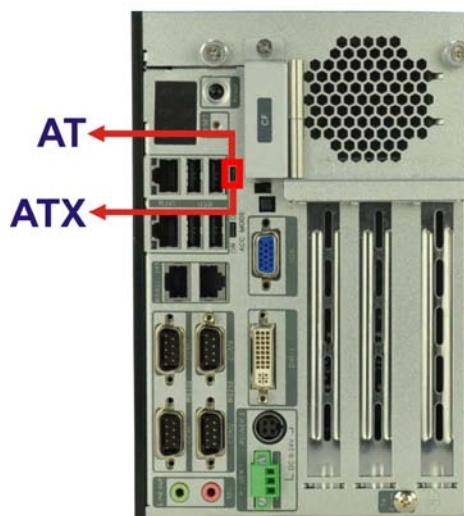
**Figure 3-12: AT/ATX Power Mode Switch**

### 3.7.3 Audio Connector

The audio jacks connect to external audio devices.

- **Line Out port (Green):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.



**Figure 3-13: Audio Connector**

### 3.7.4 CompactFlash® Type II

The TANK-820-H61 has one CF Type II socket. The location of the socket is shown in **Figure 1-2**. To install the CF card, refer to **Section 3.2**.

### 3.7.5 Digital Input/Output Connector

The digital I/O connector provides programmable input and output for external devices. The pinouts for the digital I/O connector are listed in the table below.
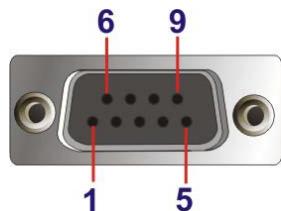


**Figure 3-14: DIO Connector**

### 3.7.6 DVI Connector

The TANK-820-H61 has one female DVI-I connector on the front panel. The DVI connectors are connected to digital display devices. To connect a digital display device to the TANK-820-H61, please follow the instructions below.

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

Step 2: **Align the DVI connector**. Align the male DVI connector on the digital display device cable with the female DVI connector on the external peripheral interface.

Step 3: **Insert the DVI connector**. Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the TANK-820-H61. See **Figure 3-15.**
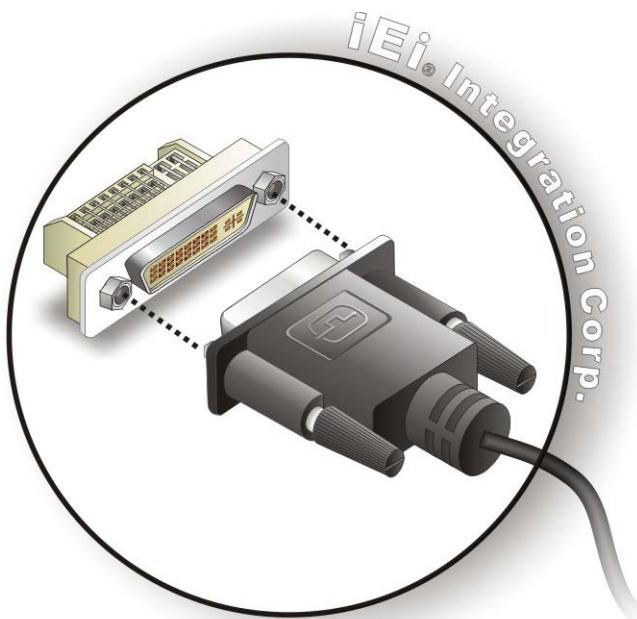
**Figure 3-15: DVI Connector**

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

### 3.7.7 LAN Connectors

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 in **Figure 1-2**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-820-H61. See **Figure 3-16**.
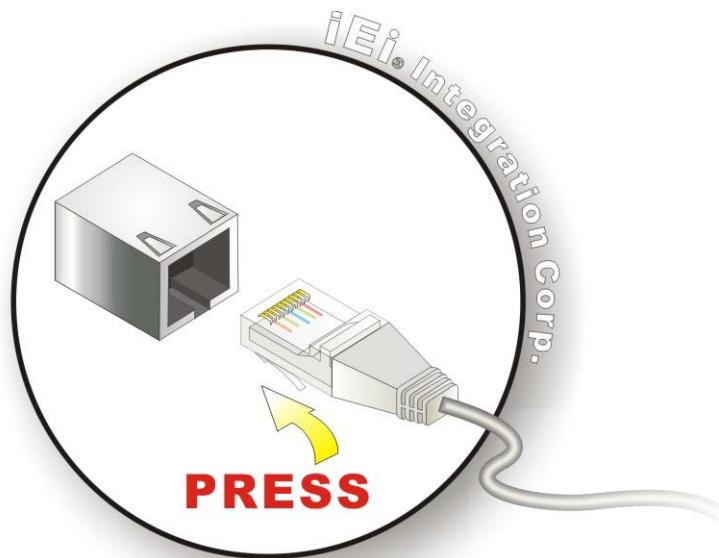
**Figure 3-16: LAN Connection**

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



**Figure 3-17: 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 3-1**.

| 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 3-1: RJ-45 Ethernet Connector LEDs**

### 3.7.8 Power Input, 3-pin Terminal Block

The power connector connects the leads of a 9 V~24 V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector.
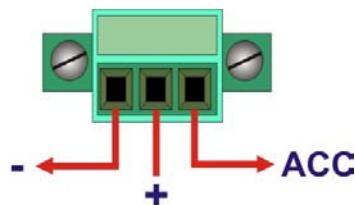


**Figure 3-18: 3-pin Terminal Block**

### 3.7.9 Power Input, 4-pin DIN Connector

The power connector connects to the 9 V~24 V DC power adapter.
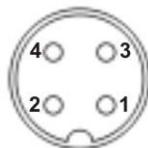


**Figure 3-19: Power Input Connector**

### 3.7.10 RJ-45 RS-422/485 Serial Ports

RS-422/485 serial port devices can be attached to the RJ-45 RS-422/485 serial ports on the rear panel.

Step 1: **Locate the RJ-45 RS-422/RS485 connectors**. The locations of the RJ-45 RS-422/RS-485 connectors are shown in **Figure 1-2**.

Step 2: **Insert the RJ-45 connector.** Insert the RJ-45 connector on the RJ-45 to DB-9 COM port cable to one of the RJ-45 RS-422/485 connectors on the TANK-820-H61. See **Figure 3-20**.
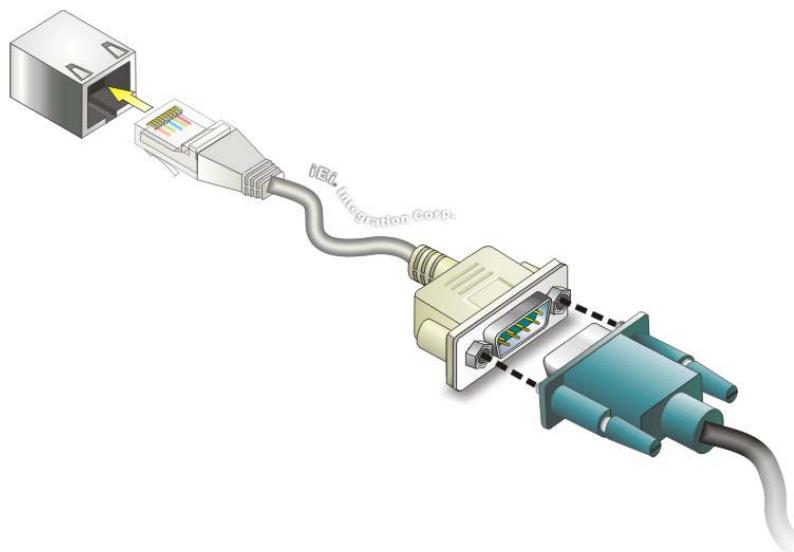
**Figure 3-20: RJ-45 RS-422/485 Serial Device Connection**

Step 3: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the RJ-45 to DB-9 COM port cable.

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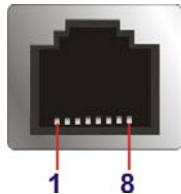


**Figure 3-21: RJ-45 RS-422/485 Serial Port Connector**

### 3.7.11 RS-232 Serial Port Connectors

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 locations of the DB-9 connectors are shown in **Figure 1-2**.

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 3-22**.
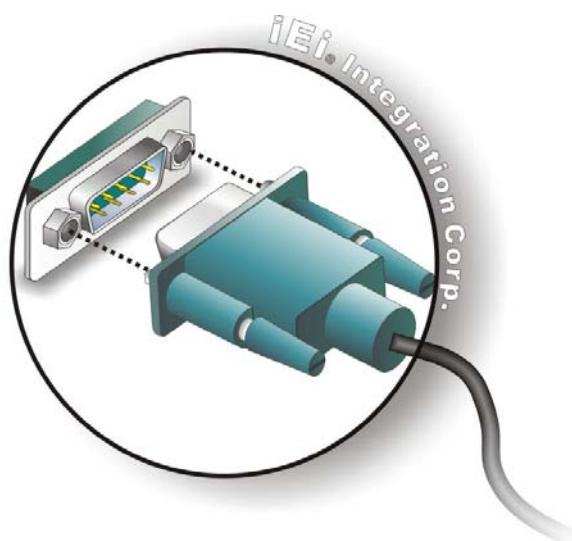
**Figure 3-22: Serial Device Connector**

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.
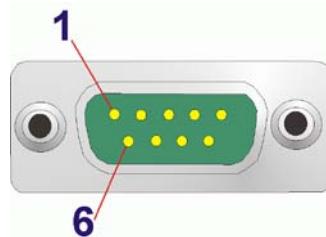


**Figure 3-23: DB-9 RS-232 Serial Port Connector**

## 3.7.12 USB Connectors

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

Step 1: **Locate the USB connectors**. The locations of the USB connectors are shown in **Figure 1-2**.

Step 2: **Align the connectors.** Align the USB device connector with one of the connectors. See **Figure 3-24**.
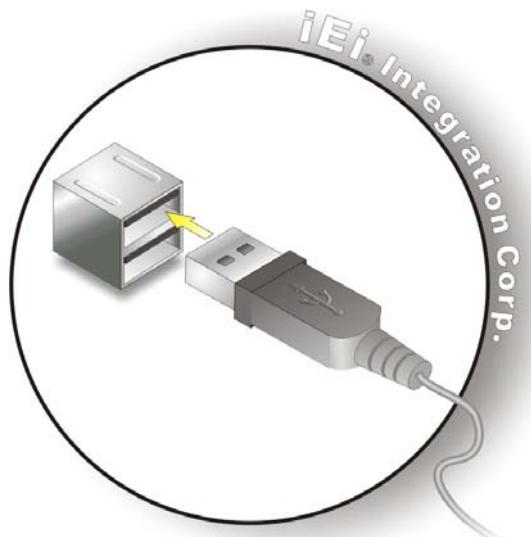
**Figure 3-24: USB Device Connection**

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

### 3.7.13 VGA Connector

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 **Figure 1-2**.

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, insert the male connector from the VGA screen into the female connector on the TANK-820-H61. See **Figure 3-25**.
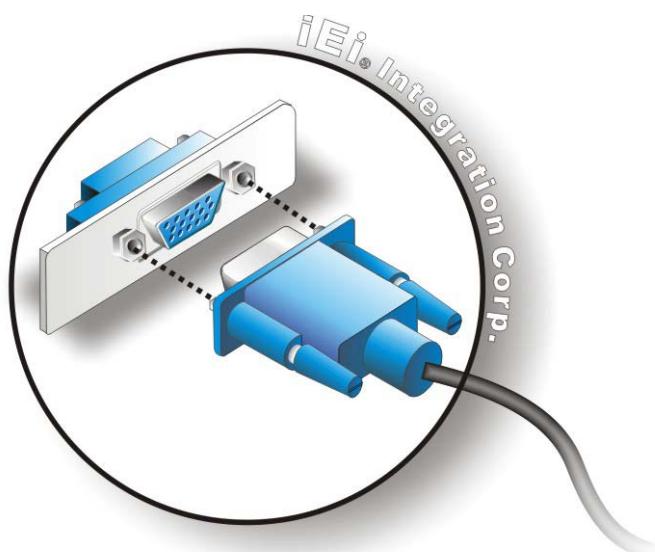
**Figure 3-25: VGA Connector**

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

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

side of the connector.
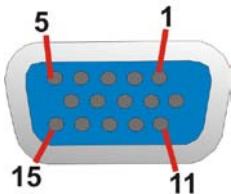


**Figure 3-26: VGA Connector**

## 3.8 Powering On/Off the System

⚠ **WARNING:**

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

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



**Figure 3-27: Power Button**

## 3.9 Power

The TANK-820-H61 embedded system supports single DC power input mode, but can be simultaneously connected to two power sources. When both power connectors are connected to power sources, prior to use the corresponding power supply which with higher voltage.

There are two power connectors on the rear panel. Power 1 connector is a 3-pin terminal block that supports ACC On signal. Power 2 connector is a DIN connector that can directly connect to a power adapter. The supported power input voltages are:

- **Power 1 (terminal block)**: 9 V~ 24 V
- **Power 2 (DC jack)**: 9 V ~ 24 V
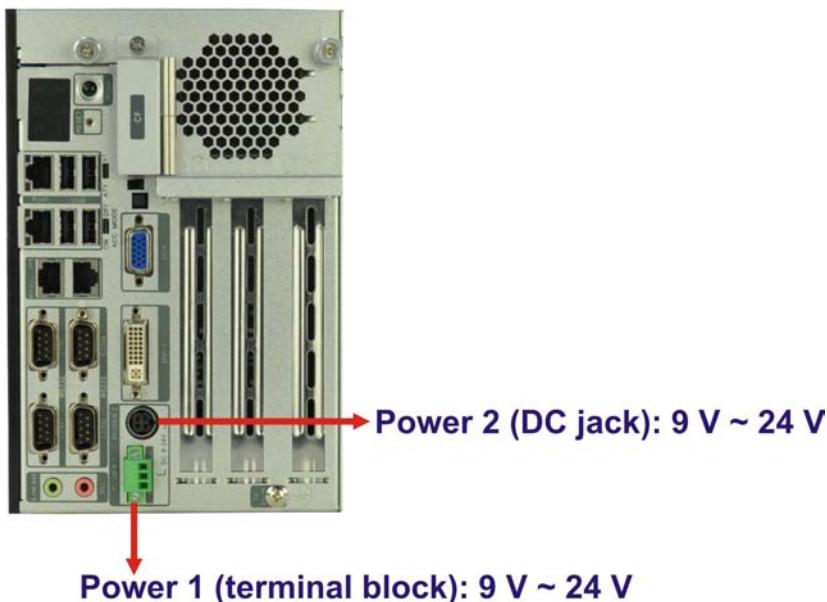
**Figure 3-28: Power Connectors**

| LED Indicator | Description |
|---|---|
| Power 1 | **Breathing Orange:** Standby mode. |
| Power 2 | **Solid blue:** Power-on mode. |

**Table 3-2: Power LED Indicators Description**

## 3.9.1 ACC ON

**NOTE:**

In ACC On mode, the Power 1 connector must connect to ACC on signal to be able to control the system power.

The ACC On mode is designed for vehicle applications.

### 3.9.1.1 Boot-up

When both power connectors are connected to power source with over 9 V power input, the two power LEDs on the front panel remain off until **the ACC ON signal jump from**

**low to high**. The system will detect the Power1 and Power2 voltages and prior to use the corresponding power supply which with higher voltage. The user can choose to use AT power mode or ATX power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.
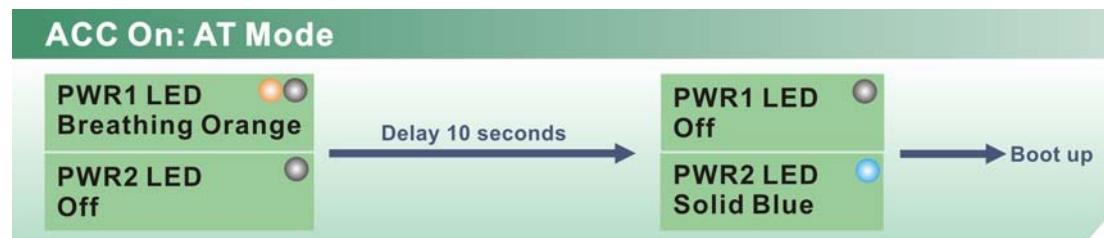


**Figure 3-29: ACC On: AT Mode**
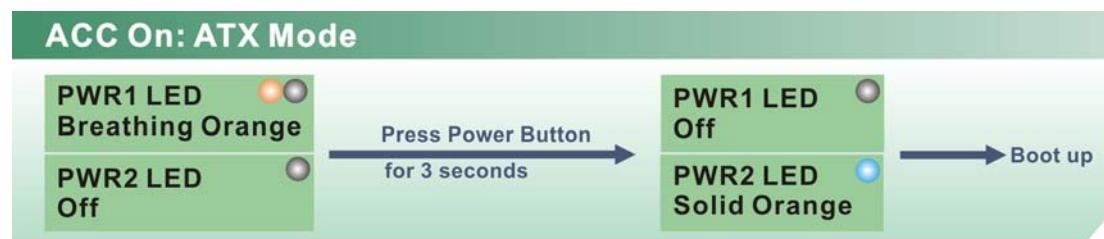


**Figure 3-30: ACC On: ATX Mode**

### 3.9.1.2 Shutdown

The system will shutdown in the following situations:

- Power 1 < 9 V and Power 2 < 9 V
- ACC ON signal jump from high to low
- Press Power button for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.

**Figure 3-31: ACC On: Shutdown**

---

  **NOTE:**

To turn on the system in the ATX power mode, press the Power button for three seconds. Press the Power button for six seconds to turn off the system.

---

## 3.9.2 ACC OFF

When the TANK-820-H61 is in the ACC Off mode, the system does not require an external ACC on signal.

### 3.9.2.1 Boot-up

When both power connectors are connected to power source with over 9 V power input, the Power 1 LED blinks breathing orange and the Power 2 LED shows off. The user can choose to use AT power mode or ATX power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.
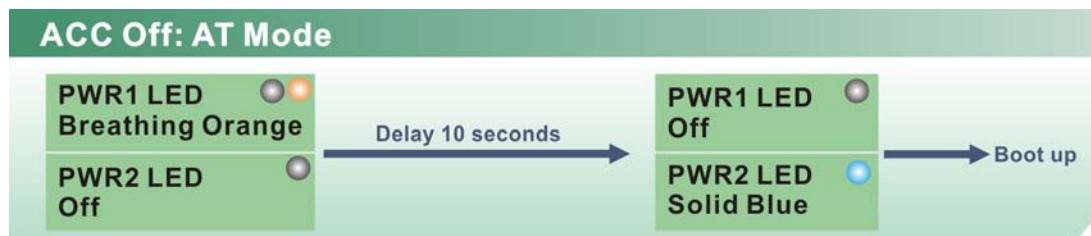


**Figure 3-32: ACC Off: AT Mode**
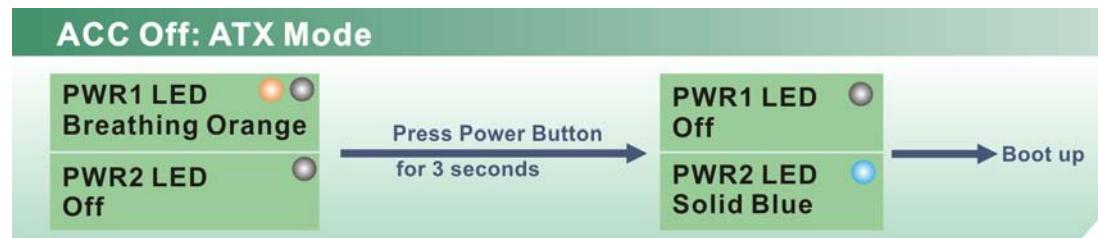
**Figure 3-33: ACC Off: ATX Mode**

### 3.9.2.2 Shutdown

The system will shutdown in the following situations:

- Power 1 < 9 V and Power 2 < 9 V
- Press Power buttons for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.
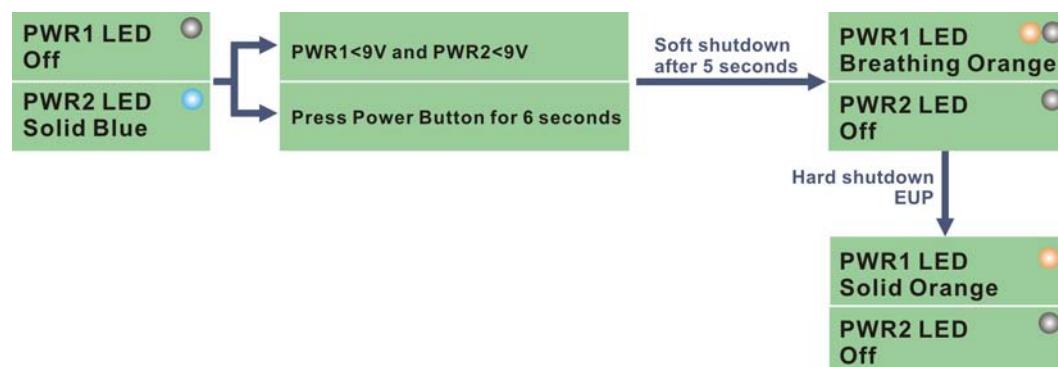


**Figure 3-34: ACC Off: Shutdown**

 **NOTE:**

The power LED turns off when the power cable is unplugged from the system.

Chapter

4

# System Motherboard

## 4.1 Overview

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

### 4.1.1 Layout

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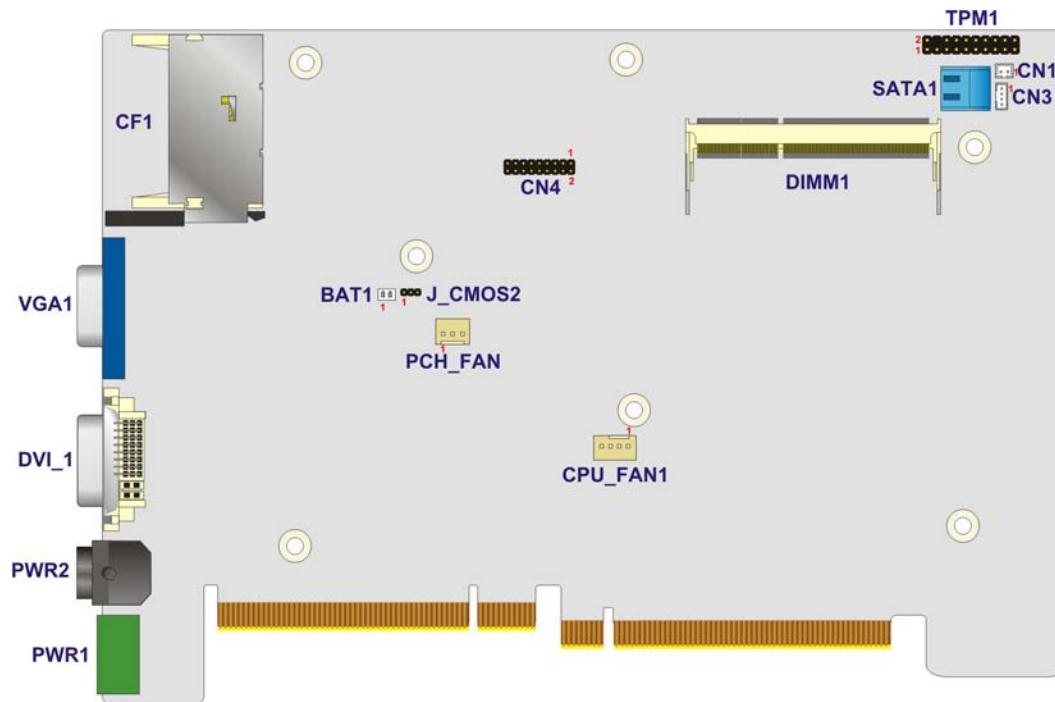


**Figure 4-1: System Motherboard (Front)**
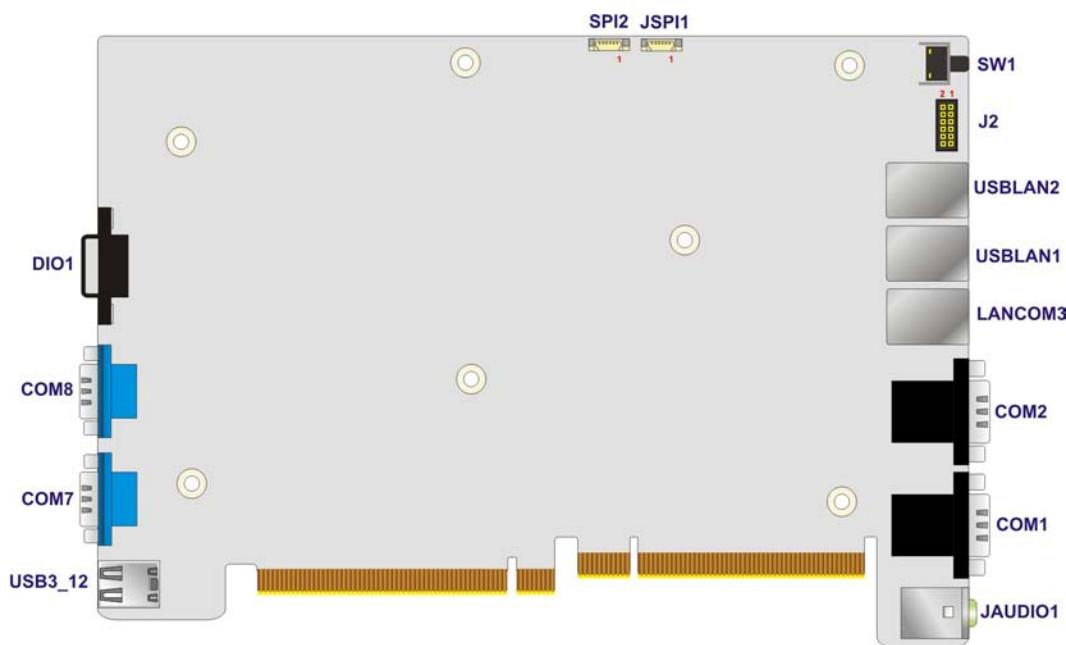
**Figure 4-2: System Motherboard (Rear)**

## 4.2 Internal Peripheral Connectors

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

| Connector | Type | Label |
|---|---|---|
| Battery connector | 2-pin wafer | BAT1 |
| BIOS programming connector | 6-pin wafer | SPI2 |
| CompactFlash® Type II socket | CompactFlash® Type II socket | CF1 |
| CPU fan connector | 4-pin wafer | CPU_FAN1 |
| DDR3 SO-DIMM slot | DDR3 SO-DIMM slot | DIMM1 |
| EC debug connector | 18-pin header | CN4 |
| EC programming connector | 6-pin wafer | JSPI1 |
| LED connector | 12-pin header | J2 |
| PCH fan connector | 3-pin wafer | PCH_FAN |
| SATA 3Gb/s drive connectors | 14-pin SATA connector | SATA1 |

| Connector | Type | Label |
|---|---|---|
| SATA power connector | 2-pin wafer | CN1 |
| SMBus connector | 4-pin wafer | CN3 |
| TPM connector | 20-pin header | TPM1 |

**Table 4-1: Peripheral Interface Connectors**

### 4.2.1 Battery Connector (BAT1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VBATT |
| 2 | GND |

**Table 4-2: Battery Connector Pinouts (BAT1)**

### 4.2.2 BIOS Programming Connector (SPI2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +SPI_VCC | 2 | SPI_CS#0_CN |
| 3 | SPI_SO0_CN | 4 | SPI_CLK0_CN |
| 5 | SPI_SI0_CN | 6 | GND |

**Table 4-3: BIOS Programming Connector Pinouts (SPI2)**

### 4.2.3 CPU Fan Connector (CPU_FAN1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | VCC |
| 3 | FANPWM1 | 4 | FANIN1 |

**Table 4-4: CPU Fan Connector Pinouts (CPU_FAN1)**

### 4.2.4 EC Debug Connector (CN4)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | EC_EPP_STB# | 2 | EC_EPP_AFD# |
| 3 | EC_EPP_PD0 | 4 | EC_EPP_ERR# |

| 5 | EC_EPP_PD1 | 6 | EC_EPP_INIT# |
|---|---|---|---|
| 7 | EC_EPP_PD2 | 8 | EC_EPP_SLIN# |
| 9 | EC_EPP_PD3 | 10 | GND |
| 11 | EC_EPP_PD4 | 12 | EC_EPP_ACK# |
| 13 | EC_EPP_PD5 | 14 | EC_EPP_BUSY |
| 15 | EC_EPP_PD6 | 16 | EC_EPP_PE |
| 17 | EC_EPP_PD7 | 18 | EC_EPP_SLCT |

**Table 4-5: EC Debug Connector Pinouts (CN4)**

### 4.2.5 EC Programming Connector (JSPI1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | +V3.3A_EC_CONN | 2 | FSCE#_S |
| 3 | FMISO_S | 4 | FSCK_S |
| 5 | FMOSI_S | 6 | GND |

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

### 4.2.6 LED Connector (J2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | VCC3_IO | 2 | ISBAT_ORANGE# |
| 3 | ICPU_LED02# | 4 | +V3.3A_EC_IO |
| 5 | ICPU_LED01# | 6 | IDISKLED- |
| 7 | IPWRLED02# | 8 | IATX_LED# |
| 9 | IPWRLED01# | 10 | IAT_LED# |
| 11 | IRST_PD# | 12 | IMPWR_ORANGE# |

**Table 4-7: LED Connector Pinouts (J2)**

### 4.2.7 PCH Fan Connector (PCH_FAN)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | FANOUT2 |
| 3 | FANIO2 |  |  |

**Table 4-8: PCH Fan Connector Pinouts (PCH_FAN)**

### 4.2.8 SATA 3Gb/s Drive Connectors (SATA1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | SATA20_PTX_C_DRX_P2 |
| 3 | SATA20_PTX_C_DRX_N2 | 4 | GND |
| 5 | SATA20_PRX_C_DTX_N2 | 6 | SATA20_PRX_C_DTX_P2 |
| 7 | GND | 8 | GND |
| 9 | SATA20_PTX_C_DRX_P3 | 10 | SATA20_PTX_C_DRX_N3 |
| 11 | GND | 12 | S ATA20_PRX_C_DTX_N3 |
| 13 | SATA20_PRX_C_DTX_P3 | 14 | GND |

**Table 4-9: SATA 3Gb/s Drive Connectors Pinouts (SATA1)**

### 4.2.9 SATA Power Connector (CN1)

| PIN NO. | DESCRIPTION |
|---|---|
| 1 | VCC5 |
| 2 | GND |

**Table 4-10: SATA Power Connector Pinouts (CN1)**

### 4.2.10 SMBus Connector (CN3)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | SMBDATA_MAIN |
| 3 | SMBCLK_MAIN | 4 | +V5S |

**Table 4-11: SMBus Connector Pinouts (CN3)**

### 4.2.11 TPM Connector (TPM1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | TPMPCLK | 2 | GND |
| 3 | LPC_FRAME# | 4 | NC |
| 5 | BUF_PLT_RST# | 6 | +V5S |

| 7 | LPC_AD3 | 8 | LPC_AD2 |
|---|---------|---|---------|
| 9 | +V3.3S | 10 | LPC_AD1 |
| 11 | LPC_AD0 | 12 | GND |
| 13 | SMBCLK_MAIN | 14 | SMBDATA_MAIN |
| 15 | +V3.3A | 16 | INT_SERIRQ |
| 17 | GND | 18 | PM_CLKRUN# |
| 19 | PM_SUS_STAT# | 20 | SIO_DRQ#0 |

**Table 4-12: TPM Connector Pinouts (TPM1)**

## 4.3 External Interface Panel Connectors

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

| Connector | Type | Label |
|-----------|------|-------|
| Audio jack (mic, line-out) | Audio jack | JAUDIO1 |
| DIO connector | DB-9 | DIO1 |
| DVI connector | 24-pin female | DVI_1 |
| Ethernet and USB2.0 connectors | RJ-45, USB 2.0 port | USBLAN1, USBLAN2 |
| Power connector | 4-pin DC jack | PWR2 |
| Power connector | 3-pin terminal block | PWR1 |
| RS-232 serial port connectors | DB-9 | COM1,COM2, COM7,COM8 |
| RS-422/485 serial port connectors | Dual RJ-45 | LANCOM3 |
| USB 3.0 connectors | USB 3.0 port | USB3_12 |
| VGA connector | DB-15 | VGA1 |

**Table 4-13: Rear Panel Connectors**

### 4.3.1 Audio Jack (JAUDIO1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|

| 1 | GND | 2 | ILMIC1-L |
|---|---|---|---|
| 3 | GND | 4 | IMIC1_JD |
| 5 | ILMIC1-R | 22 | ILINE_OUTL |
| 23 | GND | 24 | ISPK_JD |
| 25 | ILINE_OUTR | | |

**Table 4-14: Audio Jack Pinouts (AUDIO1)**

### 4.3.2 DIO connector (DIO1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | DIN1 | 2 | DOUT1 |
| 3 | DIN2 | 4 | DOUT2 |
| 5 | DIN3 | 6 | DOUT3 |
| 7 | DIN4 | 8 | DOUT4 |
| 9 | VCC5 | | |

**Table 4-15: DIO connector Pinouts (DIO1)**

### 4.3.3 DVI Connector (DVI_1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | DVI_TMDS_C_DATA2# | 2 | DVI_TMDS_C_DATA2 |
| 3 | GND | 4 | NC |
| 5 | NC | 6 | DVI_VGA_DDC_SCLK |
| 7 | DVI_VGA_DDC_SDATA | 8 | VSYNC-2 |
| 9 | DVI_TMDS_C_DATA1# | 10 | DVI_TMDS_C_DATA1 |
| 11 | GND | 12 | NC |
| 13 | NC | 14 | VCC |
| 15 | GND | 16 | DVI_HPD |
| 17 | DVI_TMDS_C_DATA0# | 18 | DVI_TMDS_C_DATA0 |
| 19 | GND | 20 | NC |
| 21 | NC | 22 | GND |
| 23 | DVI_TMDS_C_CLK | 24 | DVI_TMDS_C_CLK# |
| 25 | GND | 26 | GND |
| C1 | BR-2 | C2 | BG-2 |

| C3 | BB-2 | C4 | HSYNC-2 |
|----|------|----|---------|
| C5 | GND | | |

**Table 4-16: DVI Connector Pinouts (DVI_1)**

### 4.3.4 Ethernet and USB2.0 Connectors (USBLAN1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| P1 | NC | P2 | ILAN1_MDI0+ |
| P 3 | ILAN1_MDI0- | P 4 | ILAN1_MDI1+ |
| P 5 | ILAN1_MDI1- | P 6 | ILAN1_MDI2+ |
| P 7 | ILAN1_MDI2- | P 8 | ILAN1_MDI3+ |
| P 9 | ILAN1_MDI3- | P 1 0 | GND |
| P 11 | ILAN1_LINK100 | P 12 | ILAN1_LINK1000 |
| P 13 | ILAN1_ACT-1 | P 14 | ILAN1_P |
| 1 | IUSBV1L | 2 | IDATA0_N |
| 3 | IDATA0_P | 4 | GND |
| 5 | IUSBV1L | 6 | IDATA1_N |
| 7 | IDATA1_P | 8 | GND |

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

### 4.3.5 Ethernet and USB2.0 Connectors (USBLAN2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| P1 | NC | P2 | ILAN2_MDI0+ |
| P 3 | ILAN2_MDI0- | P 4 | ILAN2_MDI1+ |
| P 5 | ILAN2_MDI1- | P 6 | ILAN2_MDI2+ |
| P 7 | ILAN2_MDI2- | P 8 | ILAN2_MDI3+ |
| P 9 | ILAN2_MDI3- | P 1 0 | GND |
| P 11 | ILAN2_LINK100 | P 12 | ILAN2_LINK1000 |
| P 13 | ILAN2_ACT-1 | P 14 | ILAN2_P |
| 1 | IUSBV2L | 2 | IDATA2_N |
| 3 | IDATA2_P | 4 | GND |
| 5 | IUSBV2L | 6 | IDATA3_N |
| 7 | IDATA3_P | 8 | GND |

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

### 4.3.6 Power Connector (PWR2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | VCC | 2 | GND |
| 3 | VCC | 4 | GND |
| 5 | GND | | |

**Table 4-19: Power Connector Pinouts (PWR2)**

### 4.3.7 Power Connector (PWR1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | ACCON | 2 | VCC |
| 3 | GND | | |

**Table 4-20: Power Connector Pinouts (PWR1)**

### 4.3.8 RS-232 Serial Port Connector (COM1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | INDCD1 | 2 | INRX1 |
| 3 | INTX1 | 4 | INDTR1 |
| 5 | GND | 6 | INDSR1 |
| 7 | INRTS1 | 8 | INCTS1 |
| 9 | INRI1 | 10 | INDCD2 |
| 11 | INRX2 | 12 | INTX2 |
| 13 | INDTR2 | 14 | GND |
| 15 | INDSR2 | 16 | INRTS2 |
| 17 | INCTS2 | 18 | INRI2 |

**Table 4-21: RS-232 Serial Port Connector Pinouts (COM1)**

### 4.3.9 RS-232 Serial Port Connector (COM2)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | INDCD3 | 2 | INRX3 |

| 3 | INTX3 | 4 | INDTR3 |
|---|-------|---|--------|
| 5 | GND | 6 | INDSR3 |
| 7 | INRTS3 | 8 | INCTS3 |
| 9 | INRI3 | 10 | INDCD4 |
| 11 | INRX4 | 12 | INTX4 |
| 13 | INDTR4 | 14 | GND |
| 15 | INDSR4 | 16 | INRTS4 |
| 17 | INCTS4 | 18 | INRI4 |

**Table 4-22: RS-232 Serial Port Connector Pinouts (COM2)**

### 4.3.10 RS-232 Serial Port Connector (COM7)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | -NDCD7 | 2 | NSIN7 |
| 3 | NSOUT7 | 4 | -NDTR7 |
| 5 | GND | 6 | -NDSR7 |
| 7 | -NRTS7 | 8 | -NCTS7 |
| 9 | -XRI7 | | |

**Table 4-23: RS-232 Serial Port Connector Pinouts (COM7)**

### 4.3.11 RS-232 Serial Port Connector (COM8)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | -NDCD8 | 2 | NSIN8 |
| 3 | NSOUT8 | 4 | -NDTR8 |
| 5 | GND | 6 | -NDSR8 |
| 7 | -NRTS8 | 8 | -NCTS8 |
| 9 | -XRI8 | | |

**Table 4-24: RS-232 Serial Port Connector Pinouts (COM8)**

### 4.3.12 RS-422/485 Serial Port Connectors (LANCOM3)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| A1 | N/A | A2 | ITXD5485# |

| A3 | N/A | A4 | ITXD5485+ |
|----|-----|----|-----------|
| A5 | N/A | A6 | IRXD5485# |
| A7 | N/A | A8 | IRXD5485+ |
| B1 | N/A | B2 | ITXD6485# |
| B3 | N/A | B4 | ITXD6485+ |
| B5 | N/A | B6 | IRXD6485# |
| B7 | N/A | B8 | IRXD6485+ |

**Table 4-25: RS-422/485 Serial Port Connectors Pinouts (LANCOM3)**

### 4.3.13 USB 3.0 Connectors (USB3_12)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | USB3_PWR1 | 2 | USB2P0_DM1_L |
| 3 | USB2P0_DP1_L | 4 | GND |
| 5 | USB3P0_RXDN1 | 6 | USB3P0_RXDP1 |
| 7 | GND | 8 | USB3P0_TXDN1 |
| 9 | USB3P0_TXDP1 | 10 | USB3_PWR1 |
| 11 | USB2P0_DM2_L | 12 | USB2P0_DP2_L |
| 13 | GND | 14 | USB3P0_RXDN2 |
| 15 | USB3P0_RXDP2 | 16 | GND |
| 17 | USB3P0_TXDN2 | 18 | USB3P0_TXDP2 |

**Table 4-26: USB 3.0 Connectors Pinouts (USB3_12)**

### 4.3.14 VGA Connector (VGA1)

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | CRT_RED | 2 | CRT_GREEN |
| 3 | CRT_BLUE | 4 | NC |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | CRT_VCC | 10 | CRT_PLUG# |
| 11 | NC | 12 | CRT_DDC_DATA |
| 13 | CRT_HSYNC | 14 | CRT_VSYNC |
| 15 | CRT_DDC_CLK | | |

## 4.4 Jumper Settings

The jumpers on the system motherboard are listed in **Table 4-28**.

| Connector | Type | Label |
|---|---|---|
| Clear CMOS setup | 3-pin header | J_CMOS2 |

**Table 4-28: Jumper**

### 4.4.1 Clear CMOS Setup (J_CMOS2)

| Pin | Description |
|---|---|
| Short 1-2 | Keep CMOS Setup (Default) |
| Short 2-3 | Clear CMOS Setup |

**Table 4-29: Clear CMOS Setup Jumper Settings (J_CMOS2)**

Chapter

5

BIOS

## 5.1 Introduction

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

---

 **NOTE:**

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

---

### 5.1.1 Starting Setup

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

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

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

### 5.1.2 Using Setup

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

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

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

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

### 5.1.3 Getting Help

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

### 5.1.4 Unable to Reboot after Configuration Changes

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

### 5.1.5 BIOS Menu Bar

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

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

▪ Save & Exit – Selects exit options and loads default settings.

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

## 5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

```
         Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Main    Advanced   Chipset    Boot    Security  Save & Exit
 BIOS Information
 BIOS Vendor                        American Megatrends   Set the Date. Use Tab to
 Core Version                       4.6.5.3-0.19          switch between Data
 Compliency                         UEFI 2.3; PI 1.2      elements.
 Project Version                    SE21AR33.ROM
 Build Date                         08/28/2013 16:11:35

 Processor Information
 Name                               IvyBridge
 Brand String                       Genuine Intel(R) CPU
 Frequency                          2400 MHz
 Processor ID                       306a5
 Stepping                           K0/M0
 Number of Processors               2Core(s) / 4Thread(s)
 Microcode Revision                 7
 GT Info                            GT2 (900 MHz)

 IGFX VBIOS Version                 2137
 Memory RC Version                  1.2.0.0
 Total Memory                       2048 MB (DDR3 1333)
 Memory Frequency                   1333 MHz

 PCH Information
 Name                               CougarPoint
 Stepping                           05/B3
 TXT Capability of Platform/PCH     Unsupported
 LAN PHY Revision                   N/A                   --------------------

 ME FW Version                      8.0.3.1427            ←→: Select Screen
 ME Firmware SKU                    1.5MB                 ↑ ↓: Select Item
                                                          Enter Select
 SPI Clock Frequency                                      +/-: Change Opt.
 DOFR Support                       Supported             F1:  General Help
 Read Status Clock Frequnecy        33 MHz                F2:  Previous Values
 Write Status Clock Frequnecy       33 MHz                F3:  Optimized Defaults
 Fast Read Status Clock Frequnecy   33 MHz                F4:  Save & Exit
                                                          ESC: Exit
 iWDD Vendor                        iEi
 iWDD Version                       SE21ER10.bin

 System Date                        [Thu 12/26/2013]
 System Time                        [15:43:27]
 Access Level                       Administrator
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 1: Main**

The Main menu lists the following system details:

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

The Main menu has two user configurable fields:

➔ System Date [xx/xx/xx]

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

➔ System Time [xx:xx:xx]

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

## 5.3 Advanced

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

WARNING!

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

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

 > ACPI Settings                                  System ACPI Parameters
 > RTC Wake Settings
 > Trusted Computing
 > CPU Configuration
 > SATA Configuration                             ---------------------
 > Intel TXT(LT) Configuration
 > USB Configuration                              ←→: Select Screen
 > F81216 Secondary Super IO Configuration        ↑↓: Select Item
 > F81866 Super IO Configuration                  Enter Select
 > F81866 H/M Monitor                             +/-: Change Opt.
 > Serial Port Console Redirection                F1:  General Help
 > iEi Feature                                    F2:  Previous Values
                                                  F3:  Optimized Defaults
                                                  F4:  Save & Exit
                                                  ESC: Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 2: Advanced**

### 5.3.1 ACPI Settings

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

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

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


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

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

**BIOS Menu 3: ACPI Configuration**

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

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

➔ **S1 (CPU Stop Clock)** DEFAULT

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

➔ **S3 (Suspend to RAM)**

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

### 5.3.2 RTC Wake Settings

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

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

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

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

                                                                ←→: Select Screen
                                                                ↑ ↓: Select Item
                                                                Enter Select
                                                                +/-: Change Opt.
                                                                F1:  General Help
                                                                F2:  Previous Values
                                                                F3:  Optimized Defaults
                                                                F4:  Save & Exit
                                                                ESC: Exit
           Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 4: RTC Wake Settings**

➔ Wake System with Fixed Time [Disabled]

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

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

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

*Wake up every day

*Wake up date

*Wake up hour

*Wake up minute

*Wake up second

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

### 5.3.3 Trusted Computing

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

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

Configuration                                           Enables or Disables BIOS
  Security Device Support          [Disable]            support for security
                                                        device. O.S. will not
Current Status Information                              show Security Device.
  NO Security Device Found                              TCG EFI protocol and
                                                        INT1A interface will not
                                                        be available.
                                                        ----------------------
                                                        ←→: Select Screen
                                                        ↑ ↓: Select Item
                                                        Enter Select
                                                        +/-: Change Opt.
                                                        F1:  General Help
                                                        F2:  Previous Values
                                                        F3:  Optimized Defaults
                                                        F4:  Save & Exit
                                                        ESC: Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 5: TPM Configuration**

➔ Security Device Support [Disable]

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

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

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

## 5.3.4 CPU Configuration

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

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

CPU Configuration

> CPU Information                                   ----------------------
                                                    ←→: Select Screen
Hyper-threading                  [Enabled]          ↑ ↓: Select Item
Intel Virtualization Technology  [Disabled]         Enter Select
                                                    +/-:  Change Opt.
                                                    F1:   General Help
                                                    F2:   Previous Values
                                                    F3:   Optimized Defaults
                                                    F4:   Save & Exit
                                                    ESC: Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
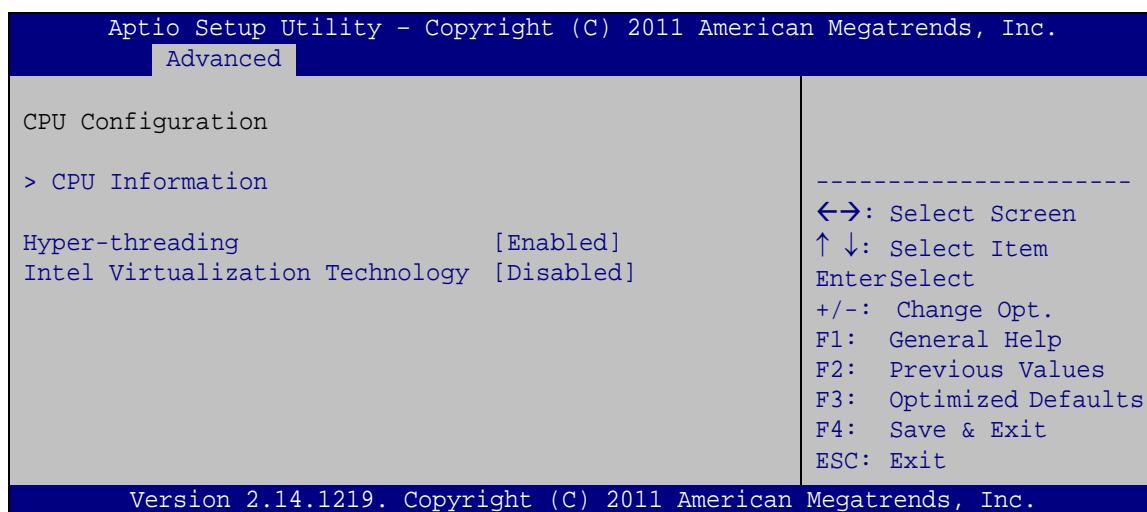
**BIOS Menu 6: CPU Configuration**

➔ **Hyper-threading [Enabled]**

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

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

➔ **Intel Virtualization Technology [Disabled]**

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

- ➔ **Disabled**    **DEFAULT**    Disables Intel Virtualization Technology.
- ➔ **Enabled**             Enables Intel Virtualization Technology.

### 5.3.4.1 CPU Information

Use the **CPU Information** submenu (**BIOS Menu 7**) to view detailed CPU specifications and configure the CPU.

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

CPU Information

Genuine Intel(R) CPU @ 2.40GHz
CPU Signature                    306a5                  --------------------
Microcode Patch                  7
Max CPU Speed                    2400 MHz
Min CPU Speed                    1600 MHz               ←→: Select Screen
CPU Speed                        2400 MHz               ↑ ↓: Select Item
Processor Cores                  2                      Enter Select
Intel HT Technology              Supported              +/-:  Change Opt.
Intel VT-x Technology            Supported              F1:   General Help
Intel SMX Technology             Not Supported          F2:   Previous Values
64-bit                           Supported              F3:   Optimized Defaults
                                                        F4:   Save & Exit
L1 Data Cache                    32 kB x 2              ESC: Exit
L1 Code Cache                    32 kB x 2
L2 Cache                         256 kB x 2
L3 Cache                         3072 kB

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

BIOS Menu 7: CPU Configuration

The CPU Configuration menu (**BIOS Menu 7**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- 64-bit: Indicates if 64-bit is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.

- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

## 5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 8**) to change and/or set the configuration of the SATA devices installed in the system.

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

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

Serial ATA Port 1               Empty                --------------------
                                                     ←→: Select Screen
                                                     ↑↓: Select Item
                                                     Enter Select
                                                     +/-: Change Opt.
                                                     F1:  General Help
                                                     F2:  Previous Values
                                                     F3:  Optimized Defaults
                                                     F4:  Save & Exit
                                                     ESC: Exit

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 8: IDE Configuration**

➔ **SATA Controller(s) [Enabled]**

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

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

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

## 5.3.6 Intel TXT(LT) Configuration

Use the **Intel TXT(LT) Configuration** menu (**BIOS Menu 9**) to configure Intel Trusted Execution Technology support.

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

Intel Trusted Execution Technology Configuration

Intel TXT support only can be enabled/disabled if SMX
is enabled. VT and VT-d support must also be enabled prior   --------------------
to TXT.                                                      ←→: Select Screen
                                                             ↑ ↓: Select Item
Secure Mode Extensons (SMX)      Enabled                     Enter Select
                                                             +/-:  Change Opt.
Intel TXT(LT) Support            [Disabled]                  F1:  General Help
                                                             F2:  Previous Values
                                                             F3:  Optimized Defaults
                                                             F4:  Save & Exit
                                                             ESC: Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 9: Intel TXT(LT) Configuration**

### 5.3.7 USB Configuration

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

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

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

                                                             --------------------
                                                             ←→: Select Screen
                                                             ↑ ↓: Select Item
                                                             Enter Select
                                                             +/-: Change Opt.
                                                             F1:  General Help
                                                             F2:  Previous Values
                                                             F3:  Optimized Defaults
                                                             F4:  Save & Exit
                                                             ESC: Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 10: USB Configuration**

➔ USB Devices

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

➔ Legacy USB Support [Enabled]

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

➔ **Enabled** DEFAULT Legacy USB support enabled

➔ **Disabled** Legacy USB support disabled

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

## 5.3.8 F81216 Secondary Super IO Configuration

Use the **F81216 Secondary Super IO Configuration** menu (**BIOS Menu 11**) to set or change the configurations for the serial ports.

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

F81216 Secondary Super IO Configuration              Set Parameters of Serial
                                                     Port 7 (COMA)
Second Super IO Chip            F81216 SecondIO

> Serial Port 7 Configuration                        --------------------
> Serial Port 8 Configuration                        ←→: Select Screen
                                                     ↑↓: Select Item
                                                     EnterSelect
                                                     +/-: Change Opt.
                                                     F1:  General Help
                                                     F2:  Previous Values
                                                     F3:  Optimized Defaults
                                                     F4:  Save & Exit
                                                     ESC: Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
BIOS Menu 11: Secondary Super IO Configuration

### 5.3.8.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 12**) to configure the serial port n.

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

Serial Port n Configuration                            Enable or Disable Serial
                                                       Port (COM)
Serial Port                    [Enabled]
Device Settings                IO=2C0h; IRQ=11
                                                       --------------------
Change Settings                [Auto]                  ←→: Select Screen
Device Mode                    [RS232]                 ↑ ↓: Select Item
                                                       Enter Select
                                                       +/-: Change Opt.
                                                       F1:  General Help
                                                       F2:  Previous Values
                                                       F3:  Optimized Defaults
                                                       F4:  Save & Exit
                                                       ESC: Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 12: Serial Port n Configuration Menu**

### 5.3.8.1.1 Serial Port 7 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**                Disable the serial port

➔ **Enabled**   DEFAULT    Enable the serial port

➔ Change Settings [Auto]

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

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

➔ **IO=2C0h;**             Serial Port I/O port address is 2C0h and the interrupt **IRQ=11**                address is IRQ11

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

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

➔ Device Mode [RS232]

The **Device Mode** shows Serial Port 7 provides RS-232 communications.

### 5.3.8.1.2 Serial Port 8 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

➔ **Auto** DEFAULT The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2C8h;** Serial Port I/O port address is 2C8h and the interrupt
**IRQ=11** address is IRQ11
➔ **IO=2C0h;** Serial Port I/O port address is 2C0h and the interrupt
**IRQ=10, 11** address is IRQ10, 11
➔ **IO=2C8h;** Serial Port I/O port address is 2C8h and the interrupt
**IRQ=10, 11** address is IRQ10, 11

➔ Device Mode [RS232]

The **Device Mode** shows Serial Port 8 provides RS-232 communications.

### 5.3.9 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 13**) to set or change the configurations for the serial ports.

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

F81866 Super IO Configuration                          Set Parameters of Serial
                                                       Port 1 (COMA)
F81866 Super IO Chip              F81866

> Serial Port 1 Configuration                          --------------------
> Serial Port 2 Configuration                          ←→: Select Screen
> Serial Port 3 Configuration                          ↑ ↓: Select Item
> Serial Port 4 Configuration                          EnterSelect
> Serial Port 5 Configuration                          +/-: Change Opt.
> Serial Port 6 Configuration                          F1:  General Help
                                                       F2:  Previous Values
                                                       F3:  Optimized Defaults
                                                       F4:  Save & Exit
                                                       ESC: Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 13: F81866 Super IO Configuration**

#### 5.3.9.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 14**) to configure the serial port n.

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

Serial Port n Configuration                            Enable or Disable Serial
                                                       Port (COM)
Serial Port                       [Enabled]
Device Settings                   IO=3F8h; IRQ=4

Change Settings                   [Auto]               --------------------
Device Mode                       [RS232]              ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       EnterSelect
                                                       +/-: Change Opt.
                                                       F1:  General Help
                                                       F2:  Previous Values
                                                       F3:  Optimized Defaults
                                                       F4:  Save & Exit
                                                       ESC: Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 14: Serial Port n Configuration Menu**

### 5.3.9.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**             Disable the serial port

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

➔ Change Settings [Auto]

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

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

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

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

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

➔ Device Mode [RS232]

The **Device Mode** shows Serial Port 1 provides RS-232 communications.

### 5.3.9.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**             Disable the serial port

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

➔ Change Settings [Auto]

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

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

➔ Device Mode [RS232]

The **Device Mode** shows Serial Port 2 provides RS-232 communications.

### 5.3.9.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

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

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

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

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

➔ **Device Mode [RS232]**

The **Device Mode** shows Serial Port 3 provides RS-232 communications.

### 5.3.9.1.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

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

➔ **Disabled**            Disable the serial port

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

➔ **Change Settings [Auto]**

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

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

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

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

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

➔ Device Mode [RS232]

The **Device Mode** shows Serial Port 4 provides RS-232 communications.

### 5.3.9.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

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

➔ **Disabled**                       Disable the serial port

➔ **Enabled**        DEFAULT       Enable the serial port

➔ Change Settings [Auto]

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

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

➔ **IO=2D0h;**                     Serial Port I/O port address is 2D0h and the interrupt
    **IRQ=10**                      address is IRQ10

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

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

➔ Device Mode [RS422/485]

The **Device Mode** shows Serial Port 5 provides RS-422/485 communications.

### 5.3.9.1.6 Serial Port 6 Configuration

→ Serial Port [Enabled]

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

→ **Disabled**              Disable the serial port

→ **Enabled**    DEFAULT    Enable the serial port

→ Change Settings [Auto]

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

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

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

→ **IO=2D0h;**             Serial Port I/O port address is 2D0h and the interrupt
   **IRQ=10, 11**           address is IRQ10, 11

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

→ Device Mode [RS422/485]

The **Device Mode** shows Serial Port 6 provides RS-422/485 communications.

### 5.3.10 F81866 H/W Monitor

The **F8186 H/W Monitor** menu (**BIOS Menu 15**) shows the operating temperature, fan speeds and system voltages.

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

PC Health Status                                           Smart Fan Mode Select

> Smart Fan Mode Configuration

CPU Temperature                   :+62 C
System Temperature                :+37 C
Fan1 Speed                        :2325 RPM
Fan2 Speed                        :N/A                      --------------------
                                                            ←→: Select Screen
                                                            ↑ ↓: Select Item
                                                            Enter Select
                                                            +/-: Change Opt.
                                                            F1:  General Help
                                                            F2:  Previous Values
                                                            F3:   Optimized
                                                            Defaults
                                                            F4:   Save & Exit
                                                            ESC:  Exit
         Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 15: Hardware Health Configuration**

➔ **PC Health Status**

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

- System Temperatures:
  - ○ CPU Temperature
  - ○ System Temperature
- Fan Speeds:
  - ○ Fan1 Speed
  - ○ Fan2 Speed

### 5.3.10.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 16**) to configure the smart fan temperature and speed settings.

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

Smart Fan Mode Configuration                              Smart Fan Mode Select


Smart Fan control              [Auto PWM Mode]
Temperature of Off             75
Temperature of Start           80                         --------------------
Start PWM                      30                         ←→: Select Screen
Slope(Duty Cycle)              [4]                        ↑ ↓: Select Item
                                                          Enter Select
System Smart Fan control       [Auto Duty-Cycle Mode]     +/-: Change Opt.
First Boundary Temperature     60                         F1:  General Help
Second Boundary Temperature    50                         F2:  Previous Values
Third Boundary Temperature     40                         F3:  Optimized
Fourth Boundary Temperature    30                         Defaults
                                                          F4:  Save & Exit
                                                          ESC: Exit
      Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 16: FAN Configuration**

➔ Smart Fan control [Auto PWM Mode]

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

➔ **Full Mode**                      Fan is on all the time

➔ **Manual PWM Mode**                The fan spins at the speed set in the manual setting

➔ **Auto PWM Mode**     DEFAULT      The fan adjusts its speed using these settings:

Temperature of Start

Temperature of Off

Start PWM

Slope (Duty Cycle)

➔ Temperature of Off [75]

⚠ **WARNING:**

Setting this value too high may cause the fan to speed up only when

the CPU is at a very high temperature and therefore cause the system to be damaged.

The **Temperature of Off** option can only be set if the **Smart Fan control** option is set to **Auto PWM Mode**. When the **CPU Temperature** is lower than **Temperature of Off**, the fan will be rotate at lowest speed. To set a value, select the **Temperature of Off** option and enter a decimal number between 0 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ Temperature of Start [80]

 WARNING:

Setting this value too high may cause the fan to rotate at full speed only when the CPU is at a very high temperature and therefore cause the system to be damaged.

The **Temperature of Start** option can only be set if the **Smart Fan control** option is set to **Auto PWM Mode**. Use the **Temperature of Start** option to set the CPU temperature at which the cooling fan starts to rotate using the starting pulse width modulation (PWM) specified in the **Start PWM** option below. To set a value, select the **Temperature of Start** option and enter a decimal number between 0 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ Start PWM [30]

The **Start PWM** option can only be set if the **Smart Fan control** option is set to **Auto PWM Mode**. Use the **Start PWM** option to set the PWM start value. To set a value, select

the **Start PWM** option and enter a decimal number between 0 and 100. The temperature range is specified below.

- Minimum Value: 0
- Maximum Value: 100

➔ **Slope (Duty Cycle) [4 (PWM)]**

The **Slope (Duty Cycle)** option can only be set if the **Smart Fan control** option is set to **Auto PWM Mode**. Use the **Slope (Duty Cycle)** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

- 0
- 1
- 2
- 4
- 8
- 16

➔ **System Smart Fan control [Auto Duty-Cycle Mode]**

Use the **System Smart Fan control** BIOS option to configure the System Smart Fan.

➔ **Manual Duty Mode**       The fan spins at the speed set in the manual setting

➔ **Auto    Duty-Cycle  DEFAULT   Mode**       The fan adjusts its speed using these settings:

First Boundary Temperature

Second Boundary Temperature

Third Boundary Temperature

Fourth Boundary Temperature

➔ First Boundary Temperature

Use the + or – key to change the **First Boundary Temperature** value. Enter a decimal number between 1 and 100.

➔ Second Boundary Temperature

Use the + or – key to change the **Second Boundary Temperature** value. Enter a decimal number between 1 and 100.

➔ Third Boundary Temperature

Use the + or – key to change the **Third Boundary Temperature** value. Enter a decimal number between 1 and 100.

➔ Fourth Boundary Temperature

Use the + or – key to change the **Fourth Boundary Temperature** value. Enter a decimal number between 1 and 100.

## 5.3.11 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 17**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

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

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

   COM2
    Console Redirection           [Disabled]
 > Console Redirection Settings

   COM3
    Console Redirection           [Disabled]         --------------------
 > Console Redirection Settings                      ←→: Select Screen
                                                     ↑ ↓: Select Item
   COM4                                              EnterSelect
    Console Redirection           [Disabled]         +/-: Change Opt.
 > Console Redirection Settings                      F1:  General Help
                                                     F2:  Previous Values
   COM5                                              F3:  Optimized Defaults
    Console Redirection           [Disabled]         F4:  Save & Exit
 > Console Redirection Settings                      ESC: Exit

   COM6
    Console Redirection           [Disabled]
 > Console Redirection Settings

   COM7
    Console Redirection           [Disabled]
 > Console Redirection Settings

   COM8
    Console Redirection           [Disabled]
 > Console Redirection Settings

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

**BIOS Menu 17: Serial Port Console Redirection**

➔ Console Redirection [Disabled]

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

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

➔ **Enabled** Enabled the console redirection function

### 5.3.11.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 18**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.

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

COM1                                                Emulation: ANSI:
Console Redirection Settings                        Extended ASCII char set.
                                                    VT100: ASCII char set.
Terminal Type                 [ANSI]                VT100+: Extends VT100 to
Bits per second              [115200]               support color, function
Data Bits                    [8]                    keys, etc. VT-UTF8: Uses
Parity                       [None]                 UTF8 encoding to map
Stop Bits                    [1]                    Unicode chars onto 1 or
                                                    more bytes.

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

**BIOS Menu 18: Console Redirection Settings**


➔ Terminal Type [ANSI]

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

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

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

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

➔ **ANSI**        D<small>EFAULT</small>     The target terminal type is ANSI


➔ Bits per second [115200]

Use the **Bits per second** option to specify the transmission speed of the serial port.

➔ **9600**                           The transmission speed is 9600

➔ **19200**                          The transmission speed is 19200

➔ **38400**                          The transmission speed is 38400

➔ **57600** The transmission speed is 57600

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

➔ Data Bits [8]

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

➔ **7** Sets the data bits at 7.

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

➔ Parity [None]

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

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

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

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

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

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

➔ Stop Bits [1]

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

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

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

## 5.3.12 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 19**) to configure the iEi features.

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

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

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

**BIOS Menu 19: iEi Feature**

➔ Auto Recovery Function [Disabled]

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

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

➔ **Enabled**  Enabled the auto recovery function

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 20**) 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.

---

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

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

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

        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
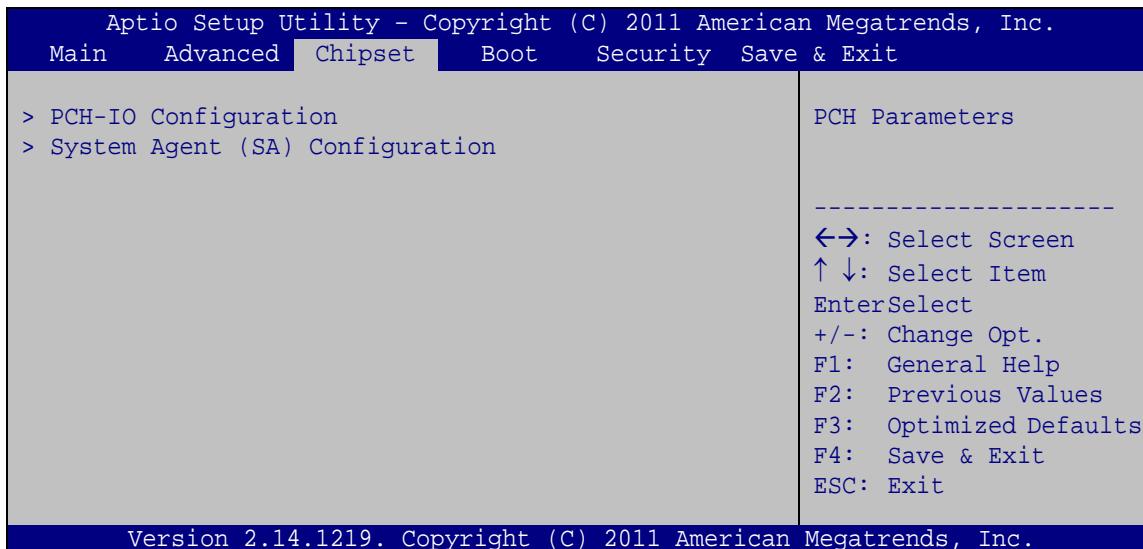
**BIOS Menu 20: Chipset**

5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 21**) to configure the PCH parameters.

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

PCH-IO Configuration                                  High Definition Audio
                                                      Controller.
Auto Power Button Status        [Enabled(AT)]

High Definition Audio Controller [Enabled]            --------------------

Power Saving Function           [Disabled]            →←: Select Screen
                                                      ↑ ↓: Select Item
                                                      Enter: Select
                                                      +/-:  Change Opt.
                                                      F1:   General Help
                                                      F2:   Previous Values
                                                      F3:   Optimized Defaults
                                                      F4:   Save & Exit
                                                      ESC: Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```
**BIOS Menu 21: PCH-IO Configuration**

➔   High Definition Audio Controller [Enabled]

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

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

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

➔   Power Saving Function [Disabled]

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

➔  **Disabled**    DEFAULT   Power saving function is disabled.

➔  **Enabled**               Power saving function is enabled. It will reduce power consumption when the system is off.

### 5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 22**) to configure the graphics setting and memory setting.

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                    Chipset

Memory Information                                        Select which of
                                                         IGFX/PEG/PCI Graphics
Total Memory                    2048 MB (DDR3 1333)      device should be Primary
DIMM#0                          Not Present              Display Or select SG for
DIMM#1                          2048 MB (DDR3 1333)      Switchable Gfx.

VT-d Capability                 Unsupported              --------------------
Primary Display                 [Auto]                   ←→: Select Screen
> Graphics Configuration                                 ↑ ↓: Select Item
                                                         Enter Select
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3    Optimized
                                                         Defaults
                                                         F4    Save
                                                         ESC   Exit
          Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 22: System Agent (SA) Configuration**

➔  **Primary Display [Auto]**

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

  ▪  Auto           **DEFAULT**
  ▪  IGFX
  ▪  PEG
  ▪  PCI
  ▪  SG

### 5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** menu (**BIOS Menu 23**) to configure the video device connected to the system.

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

Graphics Configuration                                 Select DVMT 5.0
                                                       Pre-Allocated (Fixed)
DVMT Pre-Allocated              [256M]                 Graphics Memory size
DVMT Total Gfx Mem              [MAX]                  used by the Internal
                                                       Graphics Device.
Internal Graphics               [Auto]                 ----------------------
                                                       ←→: Select Screen
                                                       ↑↓: Select Item
                                                       Enter Select
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3    Optimized
                                                       Defaults
                                                       F4    Save
                                                       ESC   Exit
     Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 23: Graphics Configuration**

➔ DVMT Pre-Allocated [256MB]

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

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

➔ DVMT Total Gfx Mem [MAX]

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

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

➔ Internal Graphics [Auto]

Use the **Internal Graphics** option to keep IGD enabled based on the setup option. The following options are available:

- Auto **Default**
- Disabled
- Enabled

## 5.5 Boot

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

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

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

**BIOS Menu 24: Boot**

➔ Bootup NumLock State [On]

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

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

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

➔ Quiet Boot [Enabled]

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

➔ **Disabled**    Normal POST messages displayed

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

➔ Launch PXE OpROM [Disabled]

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

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

➔ **Enabled**    Load PXE Option ROMs.

➔ Option ROM Messages [Force BIOS]

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

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

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

➔ UEFI Boot [Disabled]

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

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

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

## 5.6 Security

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

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

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

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

   **BIOS Menu 25: Security**

➔ Administrator Password

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

➔ User Password

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

## 5.7 Exit

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

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

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

   Restore Defaults
   Save as User Defaults
   Restore User Defaults

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

    **BIOS Menu 26:Exit**

➔ **Save Changes and Reset**

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

➔ **Discard Changes and Reset**

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

➔ **Restore Defaults**

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

➔ Save as User Defaults

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

➔ Restore User Defaults

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

Appendix

A

One Key Recovery

## A.1 One Key Recovery Introduction

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

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

The IEI One Key Recovery tool menu is shown below.
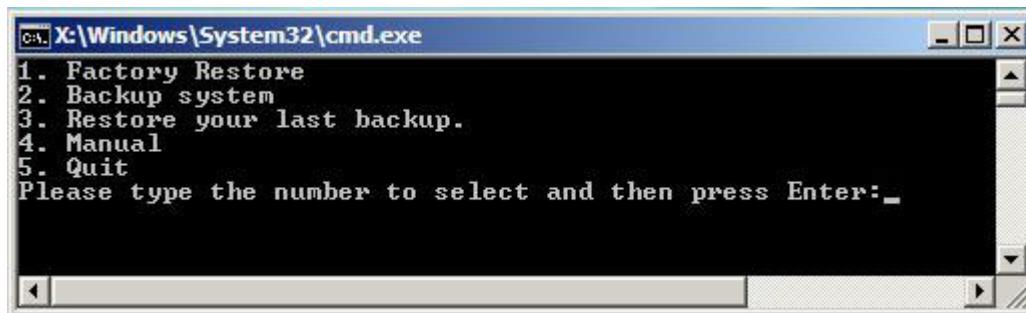


**Figure A-1: IEI One Key Recovery Tool Menu**

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

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

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

![NOTE icon] **NOTE:**

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

## A.1.1 System Requirement

![NOTE icon] **NOTE:**

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



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

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

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

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

**NOTE:**

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

## 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)

o   Ubuntu 8.10 (Intrepid)

o   Ubuntu 7.10 (Gutsy)

o   Ubuntu 6.10 (Edgy)

o   Debian 5.0 (Lenny)

o   Debian 4.0 (Etch)

o   SuSe 11.2

o   SuSe 10.3

---

 **NOTE:**

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

---

## A.2 Setup Procedure for Windows

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

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

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

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

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

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

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

The detailed descriptions are described in the following sections.

---

 **NOTE:**

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

---

### A.2.1 Hardware and BIOS Setup

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

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

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

**Step 4:** Turn on the system.

**Step 5:** Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

**Step 6:** Select the connected optical disk drive as the $1^{st}$ boot device. (**Boot → Boot Device Priority → $1^{st}$ Boot Device**).

**Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

### A.2.2 Create Partitions

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

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

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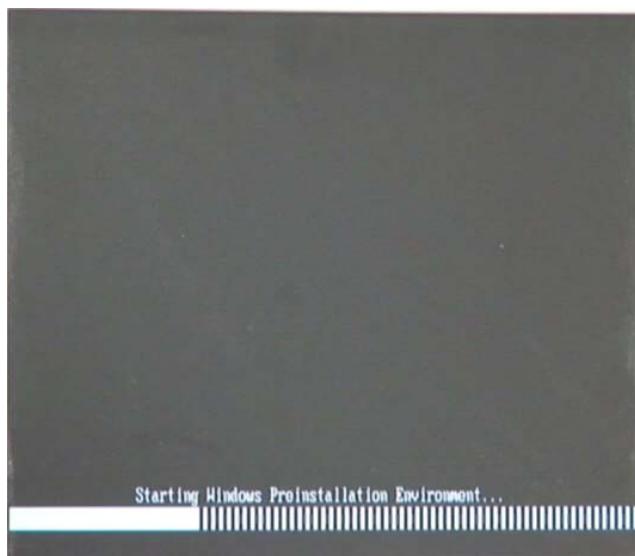
**Figure A-2: Launching the Recovery Tool**

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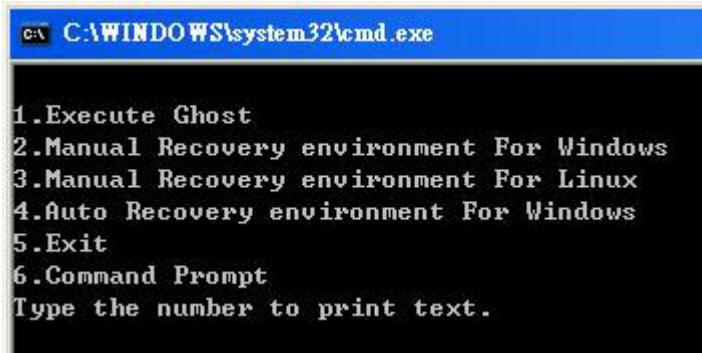


**Figure A-3: Recovery Tool Setup Menu**

Step 4: Press <**6**> then <Enter>.
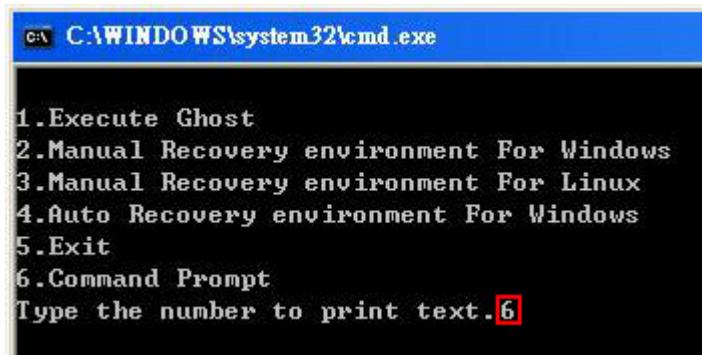
**Figure A-4: Command Mode**

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

(Press <Enter> after entering each line below)

**system32>diskpart**

**DISKPART>list vol**

**DISKPART>sel disk 0**

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

**DISKPART>assign letter=N**

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

**DISKPART>assign letter=F**

**DISKPART>exit**

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

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

**system32>exit**

**Figure A-5: Partition Creation Commands**

**NOTE:**

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

```
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 "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

**NOTE:**

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

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

## A.2.4 Build-up Recovery Partition

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

Step 2:  Start the system.

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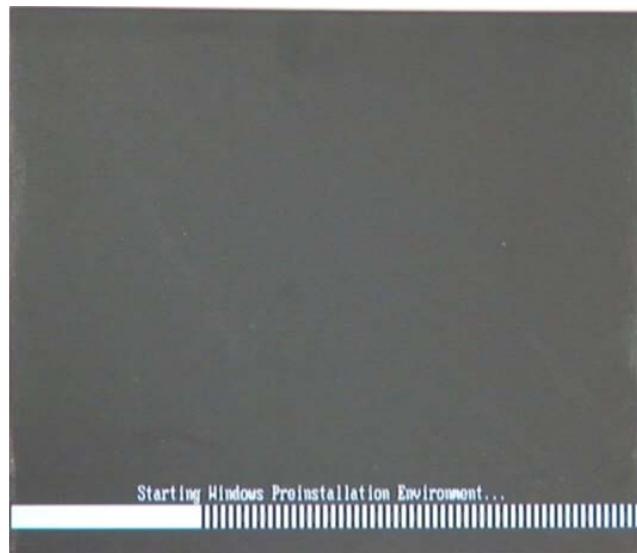


**Figure A-6: Launching the Recovery Tool**

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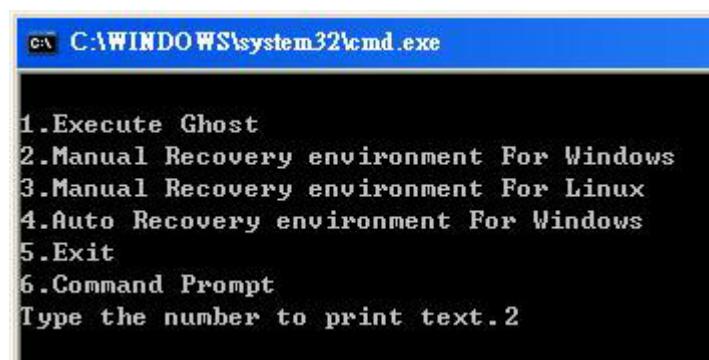


**Figure A-7: System Configuration for Windows**

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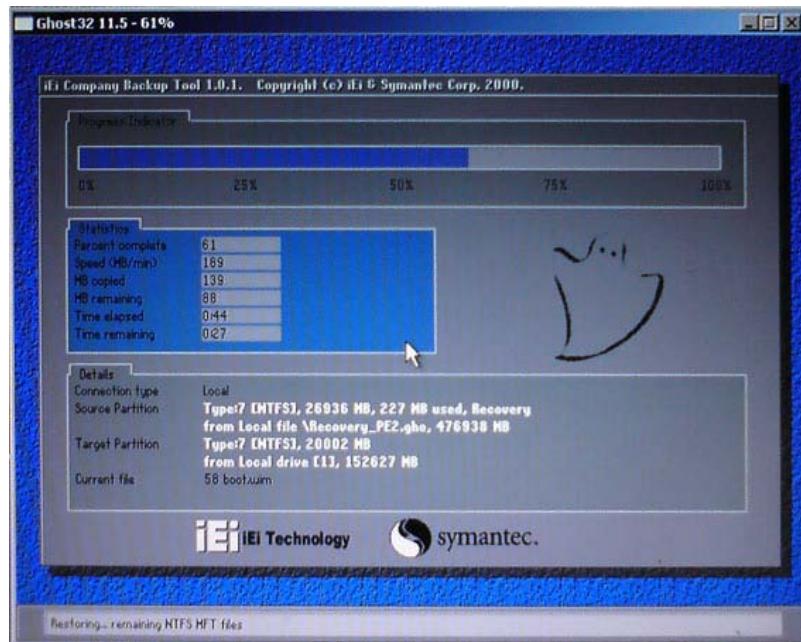


**Figure A-8: Building the Recovery Partition**

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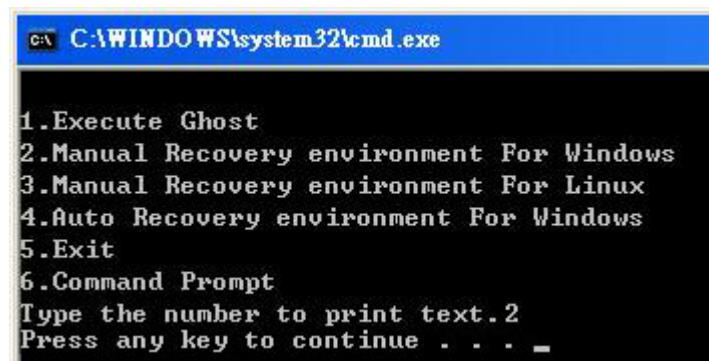


**Figure A-9: Press Any Key to Continue**

Step 7: Eject the recovery CD.

### A.2.5 Create Factory Default Image

---

**NOTE:**

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

---

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

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



Press **F3** to boot into recovery mode...
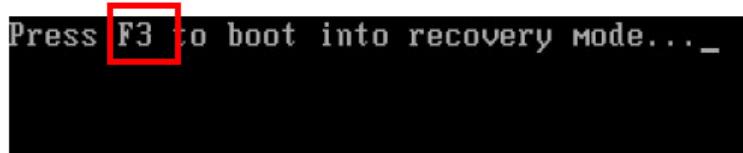
**Figure A-10: Press F3 to Boot into Recovery Mode**

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



```
X:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:4
```
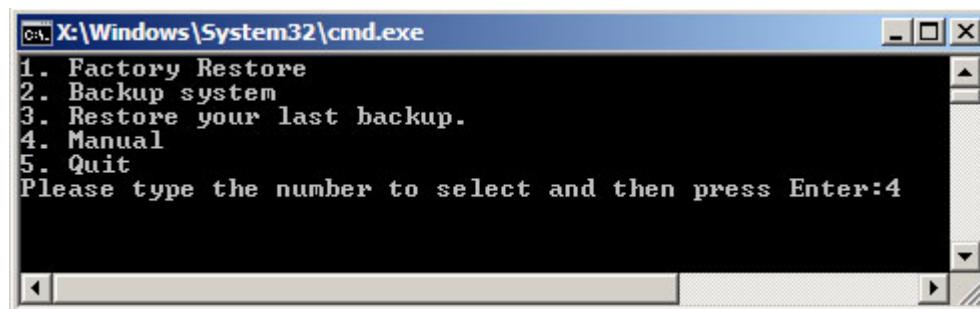
**Figure A-11: Recovery Tool Menu**

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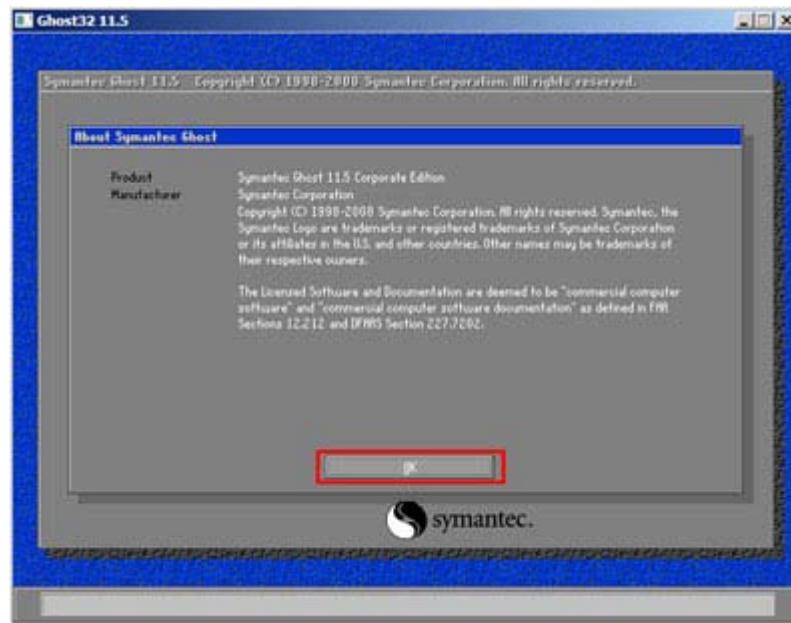
**Figure A-12: About Symantec Ghost Window**

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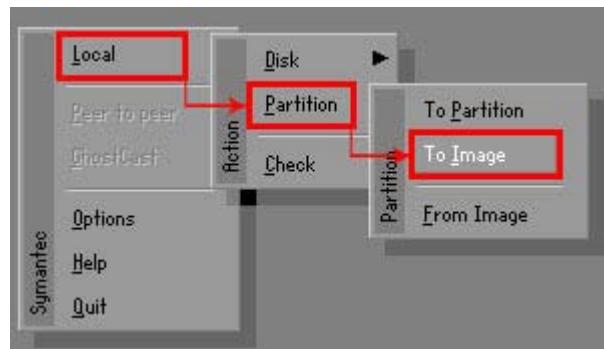


**Figure A-13: Symantec Ghost Path**

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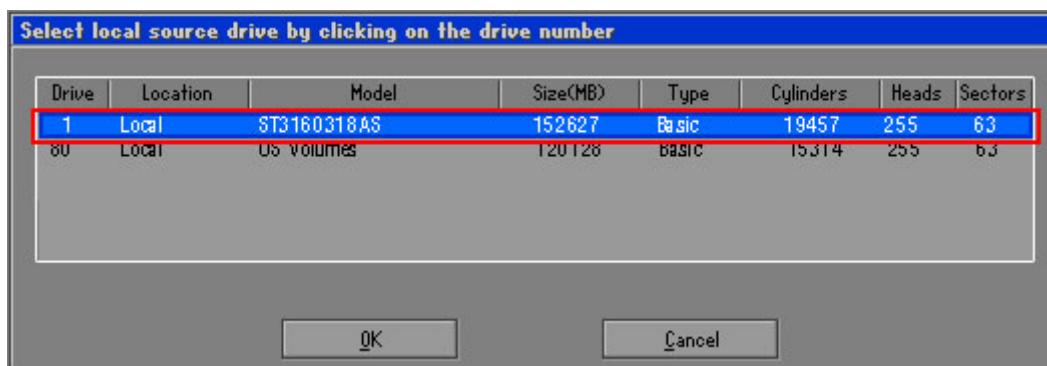
**Figure A-14: Select a Local Source Drive**

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

Then click OK.
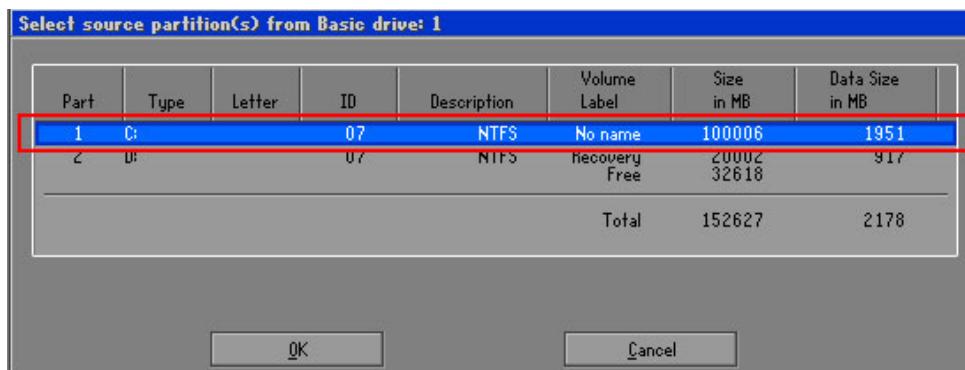


**Figure A-15: Select a Source Partition from Basic Drive**

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

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

selected recovery drive and named IEI.GHO.

---

**WARNING:**

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

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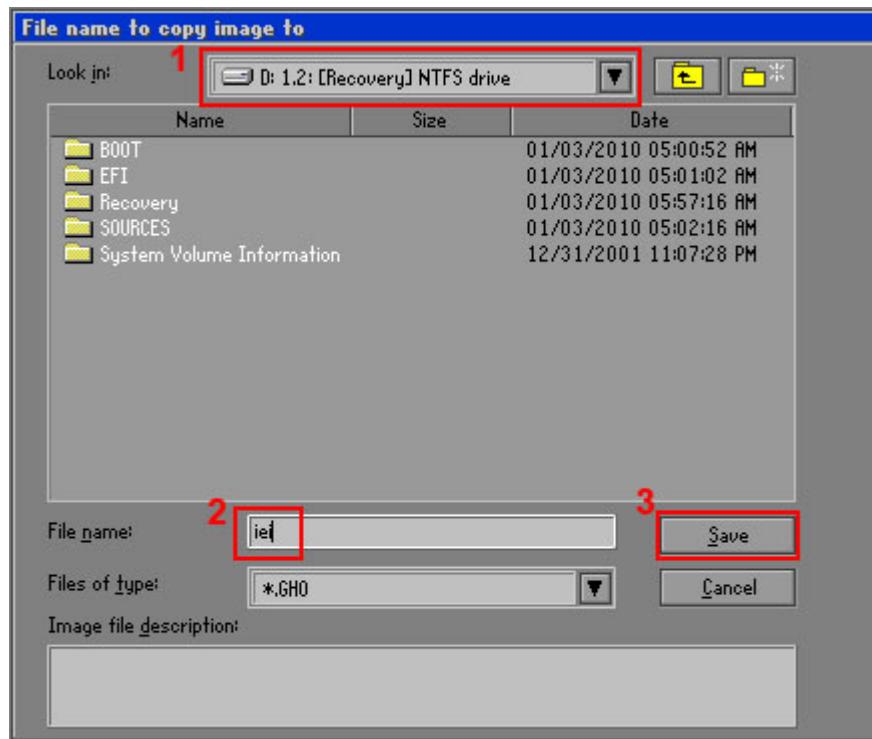
**Figure A-16: File Name to Copy Image to**

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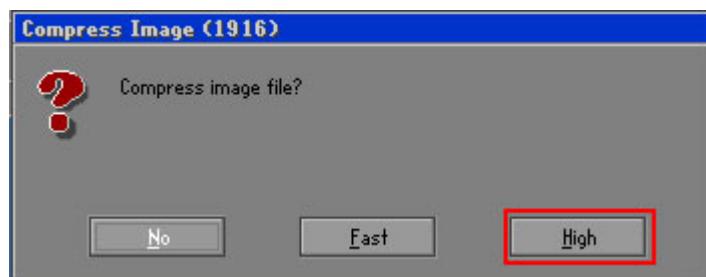


**Figure A-17: Compress Image**

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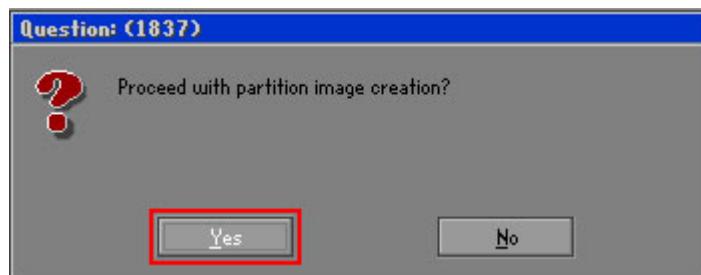


**Figure A-18: Image Creation Confirmation**

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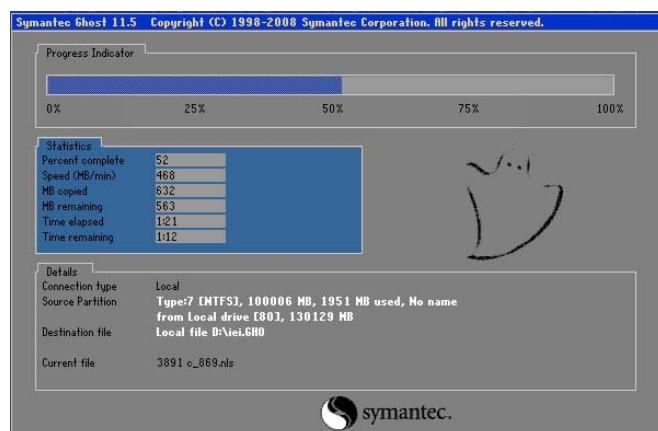


**Figure A-19: Image Creation Process**

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



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

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

reboot the system.



**Figure A-21: Press Any Key to Continue**

## A.3 Auto Recovery Setup Procedure

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

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

Step 1: Follow the steps described in **Section A.2.1 ~ Section A.2.3** to setup BIOS, create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

**Figure A-22: Auto Recovery Utility**

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



Starting Windows Preinstallation Environment...

**Figure A-23: Launching the Recovery Tool**

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



C:\WINDOWS\system32\cmd.exe

1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.4
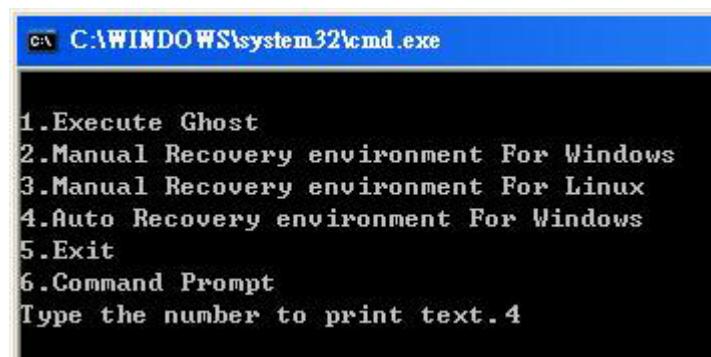
**Figure A-24: Auto Recovery Environment for Windows**

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

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

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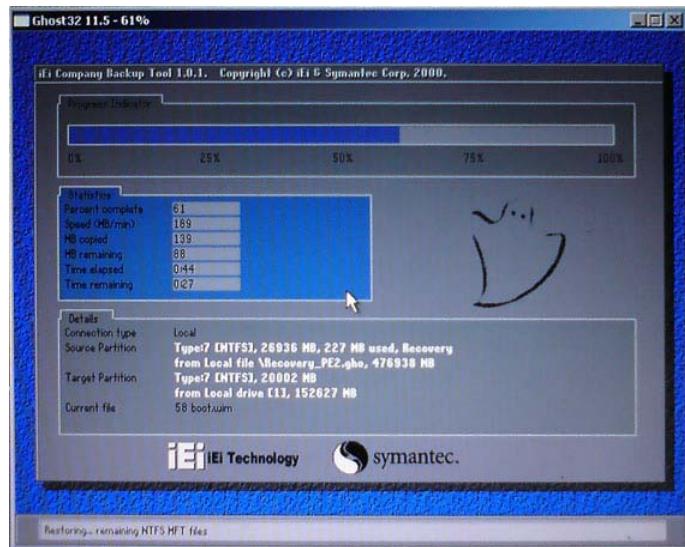


**Figure A-25: Building the Auto Recovery Partition**

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

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

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

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

option.



**Figure A-26: Factory Default Image Confirmation**

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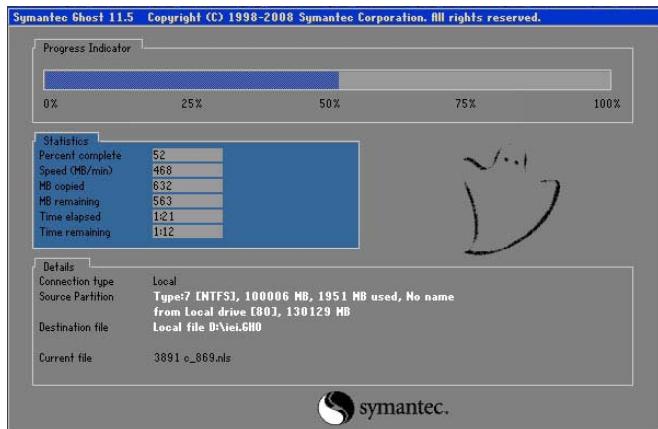


**Figure A-27: Image Creation Complete**

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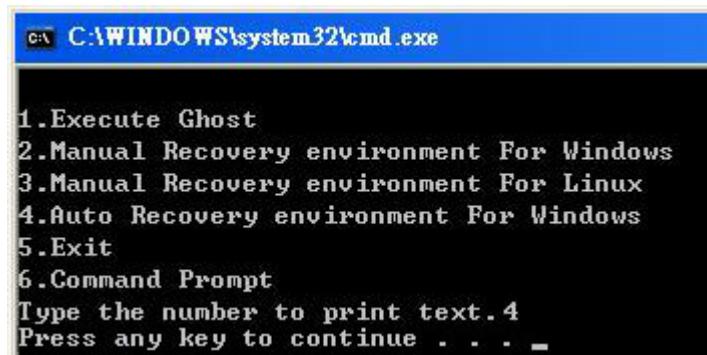


**Figure A-28: Press any key to continue**

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

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

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

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

 iEi Feature
 _____
 Auto Recovery Function          [Enabled]
   Recover from PXE              [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.
```
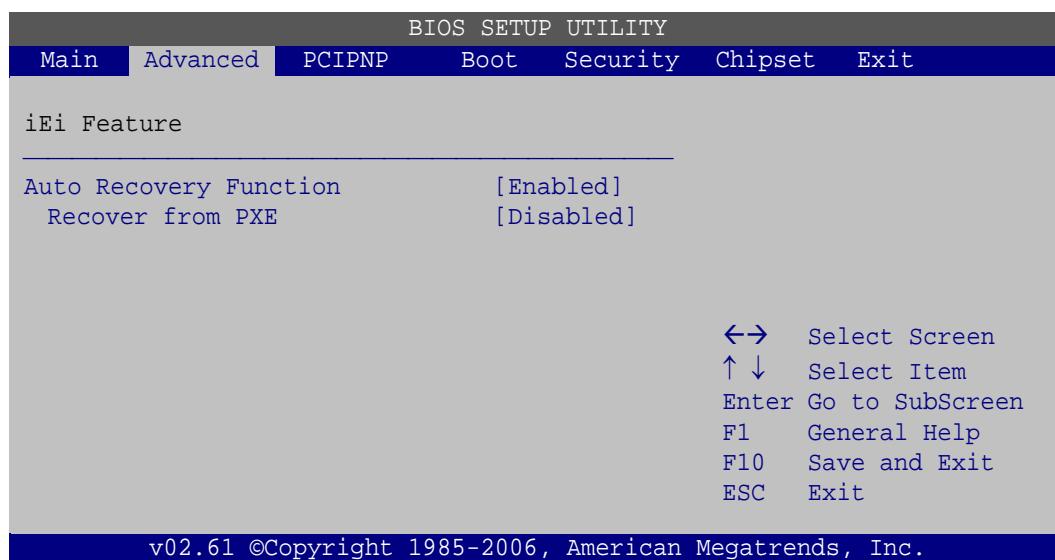
**BIOS Menu 27: IEI Feature**

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

⚠ **CAUTION:**

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

- Windows XP
- Windows Vista
- Windows 7

## A.4 Setup Procedure for Linux

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

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

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

![NOTE icon] **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 icon] **NOTE:**

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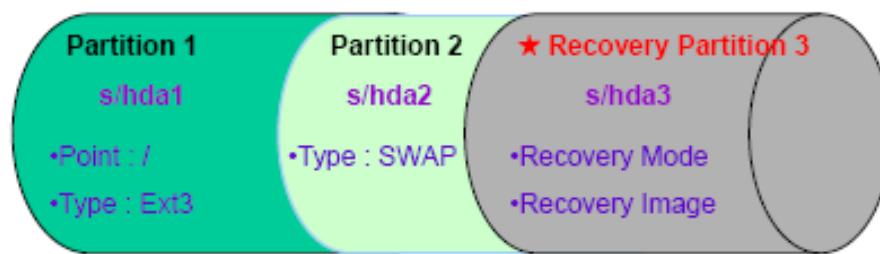


**Figure A-29: Partitions for Linux**

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

**system32>diskpart**

**DISKPART>list vol**

**DISKPART>sel disk 0**

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

**DISKPART>assign letter=N**

**DISKPART>exit**

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

**system32>exit**

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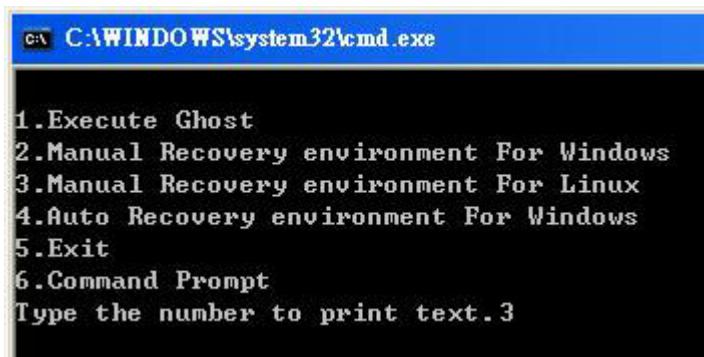


**Figure A-30: Manual Recovery Environment for Linux**

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

**cd /boot/grub**

**vi menu.lst**

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

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



- Type command:

  title Recovery Partition

  root (hd0,2)

  makeactive

  chainloader +1

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



**Figure A-32: Recovery Tool Menu**

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

**Section A.2.5** to create a factory default image.

## A.5 Recovery Tool Functions

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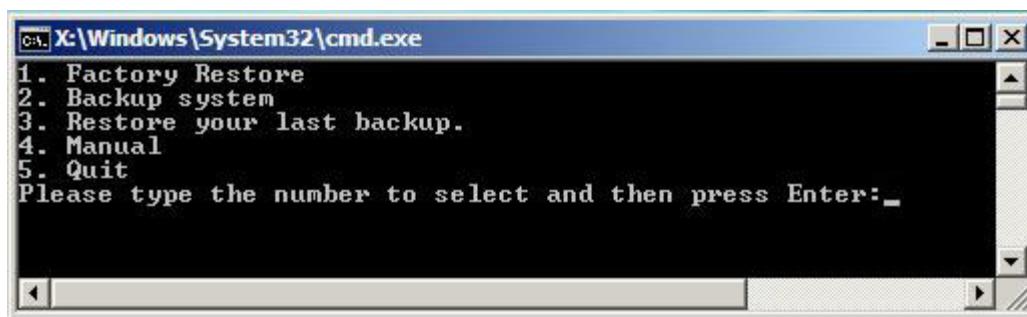


**Figure A-33: Recovery Tool Main Menu**

The recovery tool has several functions including:

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

> ⚠ **WARNING:**
>
> Please do not turn off the system power during the process of system recovery or backup.

---

**WARNING:**

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

---

## A.5.1 Factory Restore

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

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

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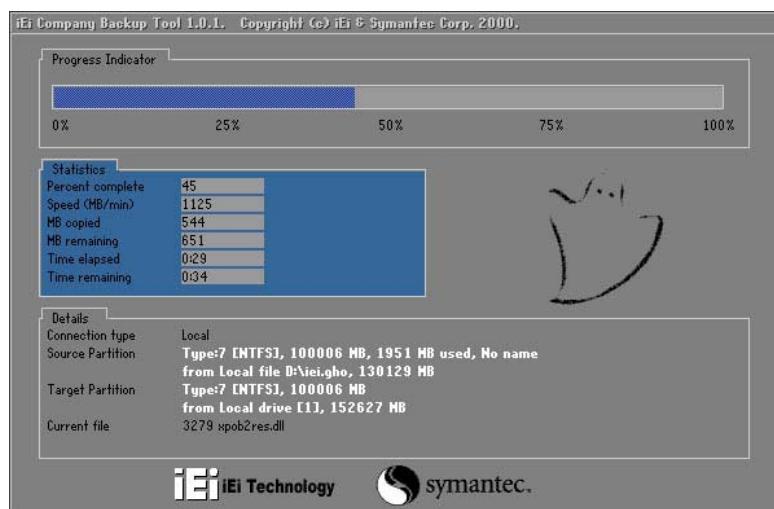
**Figure A-34: Restore Factory Default**

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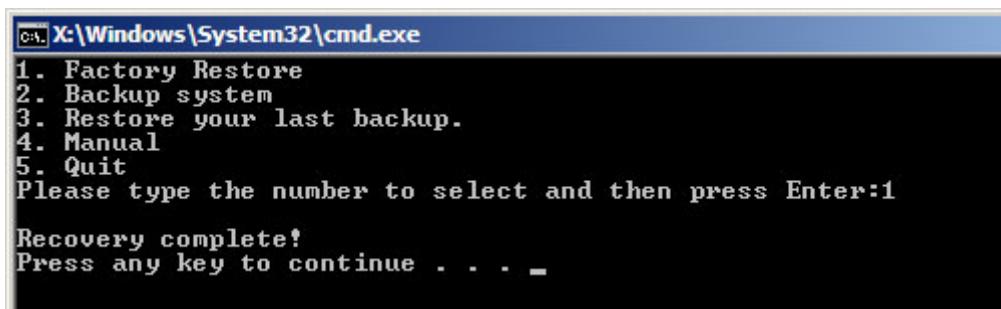
**Figure A-35: Recovery Complete Window**

## A.5.2 Backup System

To backup the system, please follow the steps below.

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

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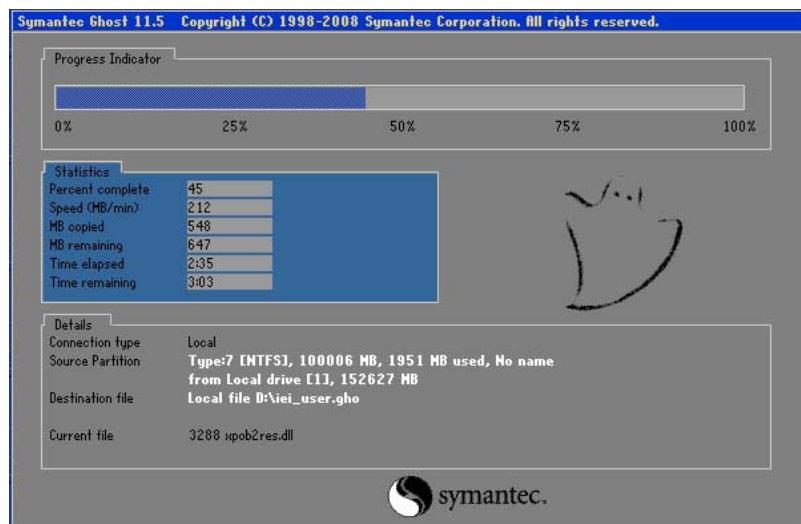


**Figure A-36: Backup System**

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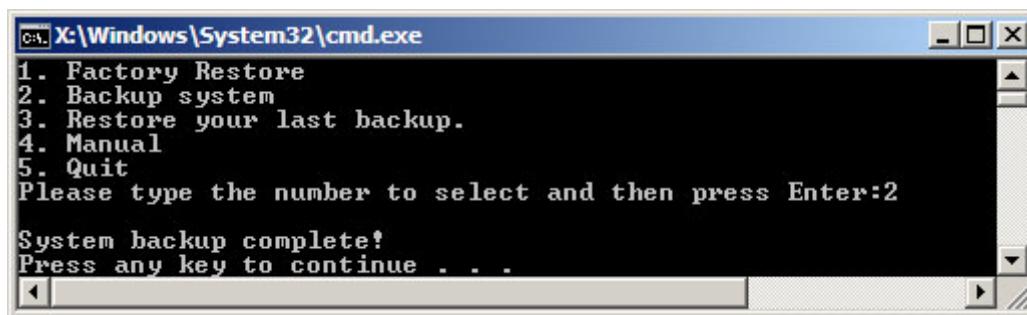
**Figure A-37: System Backup Complete Window**

### A.5.3 Restore Your Last Backup

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

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

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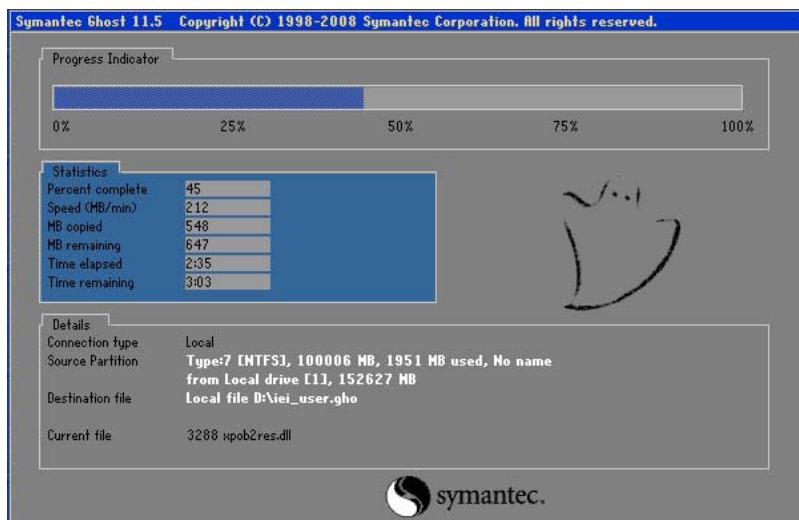


**Figure A-38: Restore Backup**

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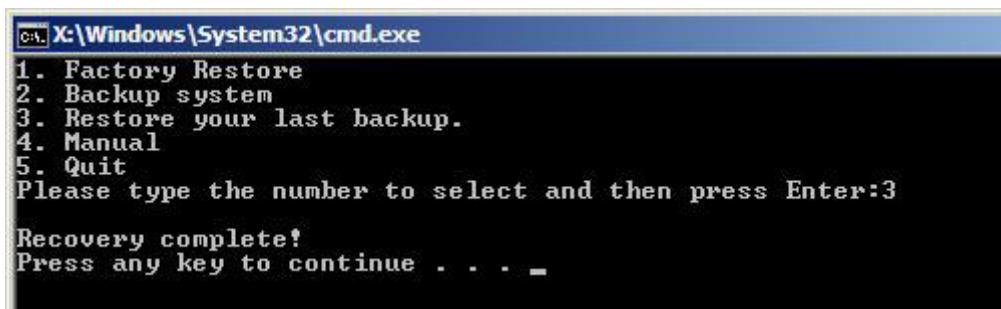
**Figure A-39: Restore System Backup Complete Window**

## A.5.4 Manual

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

Step 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.
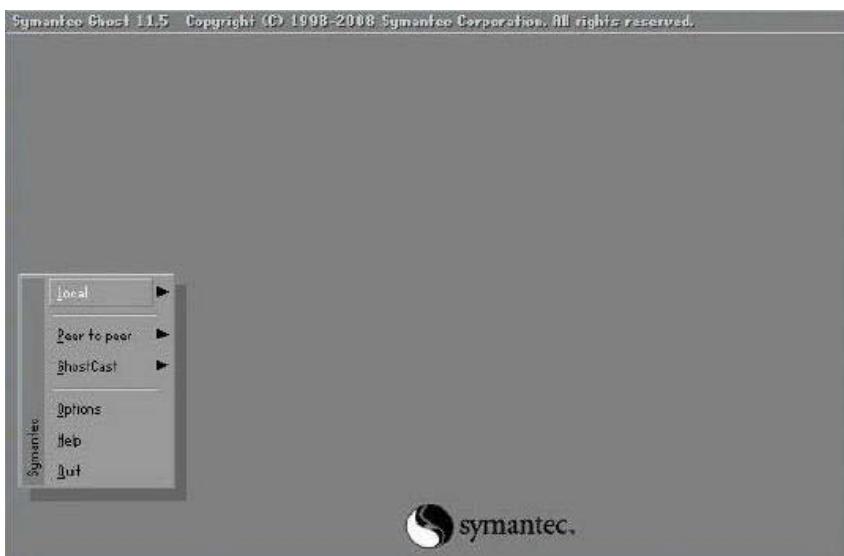


**Figure A-40: Symantec Ghost Window**

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

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

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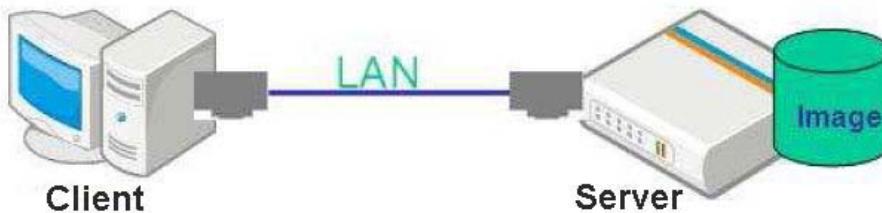


**NOTE:**

The supported client OS includes:

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

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

Step 1:   Configure DHCP server settings

Step 2:   Configure TFTP settings

Step 3:   Configure One Key Recovery server settings

Step 4:   Start DHCP, TFTP and HTTP

Step 5:   Create a shared directory

Step 6:   Setup a client system for auto recovery

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

## A.6.1 Configure DHCP Server Settings

**Step 1:** Install the DHCP

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

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

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

**CentOS**

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

#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:



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

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

#vi /etc/dhcpd.conf



**Debian**

#vi /etc/dhcpd.conf

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

next-server PXE server IP address;

filename "pxelinux.0";



## A.6.2 Configure TFTP Settings

Step 1:   Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

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

Step 2:   Enable the TFTP server by editing the "/etc/xinetd.d/tftp" file and make it use the

remap file. The "-vvv" is optional but it could definitely help on getting more

information while running the remap file. For example:

**CentOS**

#vi /etc/xinetd.d/tftp

Modify:

disable = no

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

**Debian**

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

adding "#".

#vi /etc/inetd.conf

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



#vi /etc/xinetd.d/tftp



## A.6.3 Configure One Key Recovery Server Settings

Step 1:   Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key

Recovery CD to the system (server side).



Step 2:   Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

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

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

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

Start the DHCP, TFTP and HTTP. For example:

**CentOS**

#service xinetd restart

#service httpd restart

#service dhcpd restart

**Debian**

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

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

### A.6.5 Create Shared Directory

Step 1:   Install the samba.

#yum install samba

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

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

---

**⚠ WARNING:**

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

---

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

#vi /etc/samba/smb.conf

Modify:

[image]

    comment = One Key Recovery

    path = /share/image

    browseable = yes

    writable = yes

    public = yes

    create mask = 0644

    directory mask = 0755

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

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

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

Step 5: Modify the hostname

    #vi /etc/hostname

    Modify: RecoveryServer

```
RecoveryServer
~
```

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

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

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

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

    Boot → Launch PXE OpROM → **Enabled**

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

system:

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

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

Step 3:    Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

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

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

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

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



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

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

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

starts auto recovering.
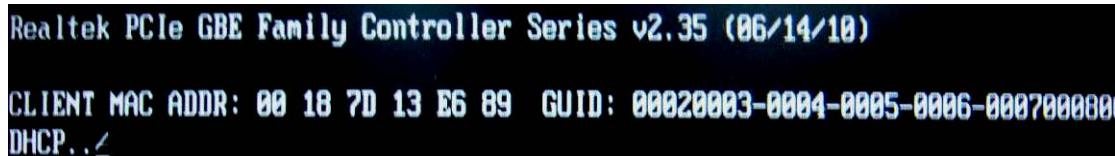


Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)

CLIENT MAC ADDR: 00 18 7D 13 E6 89   GUID: 00020003-0004-0005-0006-000700000
DHCP..∠

---
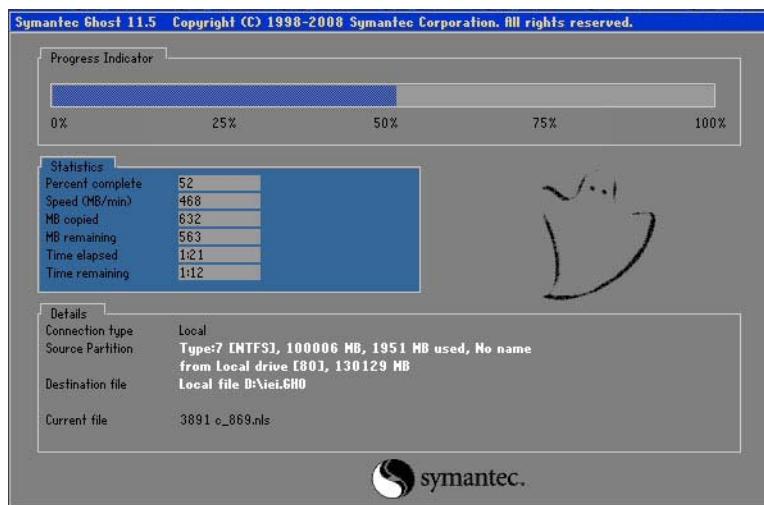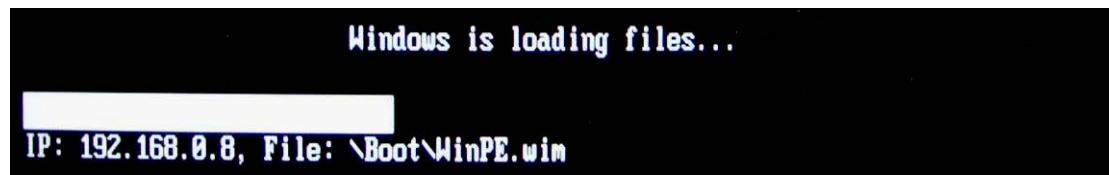
  NOTE:

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

---

## A.7 Other Information

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

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

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

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

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

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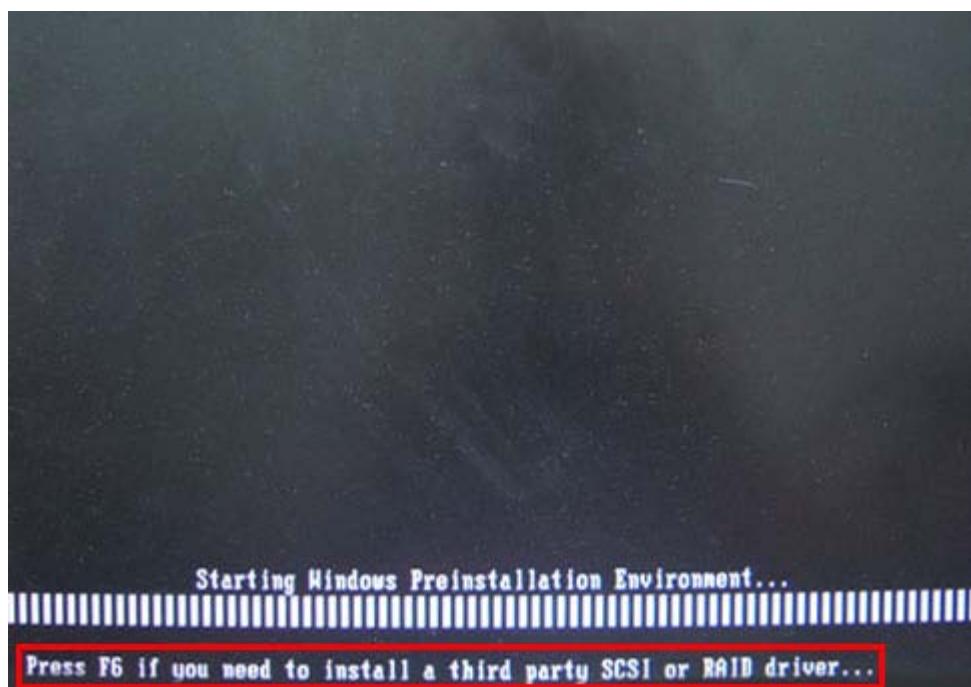
Step 5: When the following window appears, press <**S**> to select "Specify Additional Device".
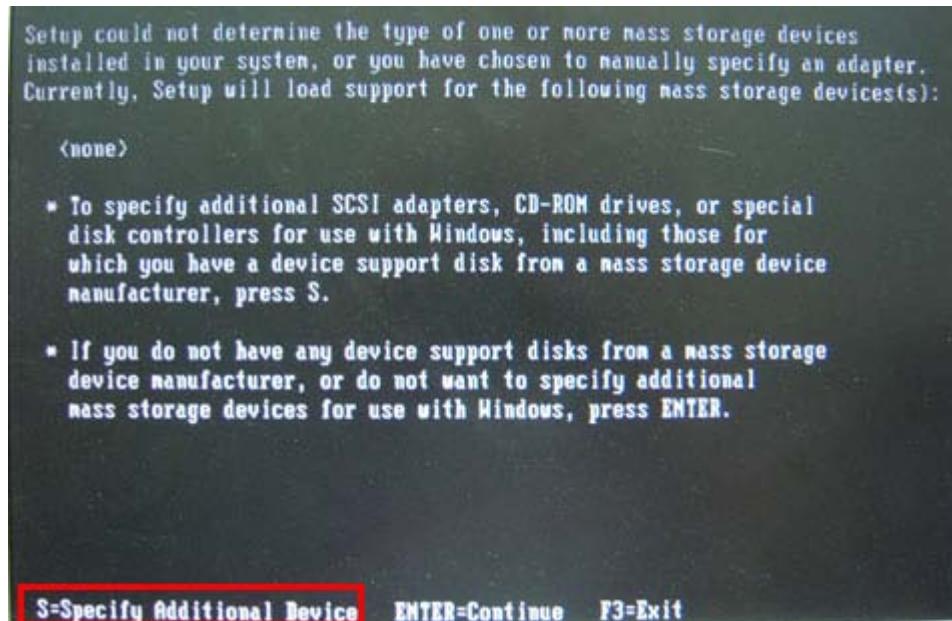


Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.
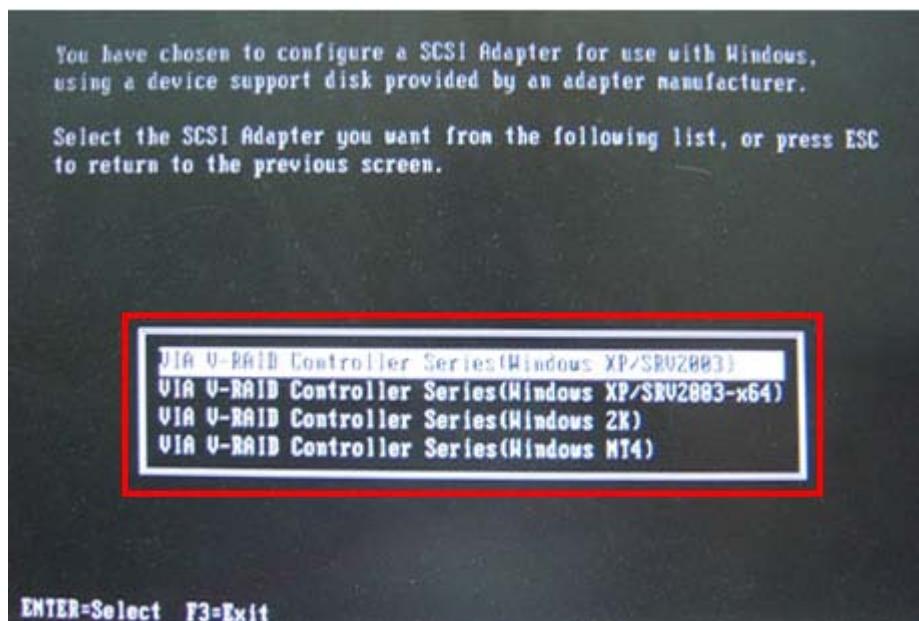
Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section A.2.2 Create Partitions** to finish the whole setup process.

A.7.2 System Memory Requirement

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

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

Appendix

B

Safety Precautions

## B.1 Safety Precautions

**WARNING:**

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-820-H61.

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

### B.1.1 General Safety Precautions

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

- *Make sure the power is turned off and the power cord is disconnected* when moving, installing or modifying the system.
- *Do not apply voltage levels that exceed the specified voltage range*. Doing so may cause fire and/or an electrical shock.
- *Electric shocks can occur* if opened while still powered on.
- *Do not drop or insert any objects* into the ventilation openings.
- *If considerable amounts of dust, water, or fluids enter the system*, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - In a site where the ambient temperature exceeds the rated temperature

### B.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the TANK-820-H61 may result in permanent damage to the TANK-820-H61 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-820-H61. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-820-H61 is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

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

### B.1.3 Product Disposal

⚠️ **CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:
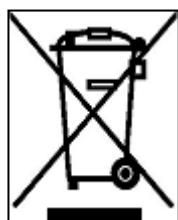
EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes

monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

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

## B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-820-H61, please follow the guidelines below.

### B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-820-H61, please read the details below.

- The interior of the TANK-820-H61 does not require cleaning. Keep fluids away from the TANK-820-H61 interior.
- Be cautious of all small removable components when vacuuming the TANK-820-H61.
- Turn the TANK-820-H61 off before cleaning the TANK-820-H61.
- Never drop any objects or liquids through the openings of the TANK-820-H61.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-820-H61.
- Avoid eating, drinking and smoking within vicinity of the TANK-820-H61.

### B.2.2 Cleaning Tools

Some components in the TANK-820-H61 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-820-H61.

- *Cloth* – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-820-H61.
- *Water or rubbing alcohol* – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-820-H61.
- *Using solvents* – The use of solvents is not recommended when cleaning the TANK-820-H61 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-820-H61. Dust and dirt can restrict the airflow in the TANK-820-H61 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<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(CR(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(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。<br>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。 | | | | | | |