



IEI Technology Corp.



MODEL:
ECN-381B

**Fanless Intel® Core™2 Duo Embedded System
with VGA, HDMI, IEEE 1394a, Dual Gigabit Ethernet,
Four USB, RS-232, RoHS Compliant**

User Manual

Rev. 1.00 – 12 May 2010





Revision

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Chapter

1

Introduction

1.1 Overview



Figure 1-1: ECN-381B

The ECN-381B embedded system is a fanless system with VGA and HDMI ports for dual display. It is powered by the 45nm Intel® Core®2 Duo processor, uses the Intel® GM45 chipset and has 1.0 GB of DDR3 memory. The ECN-381B supports three kinds of storage devices including 2.5" SATA HDD with up to 3Gb/s data transfer rate and CompaactFlash® card. The integrated IEEE 1394a port can support industrial high speed camera for a variety of applications.

1.2 Model Variations

The model variations of the ECN-381B series are listed below.

Models	CPU	CPU Speed	Wireless
ECN-381B-R10/CM575/1GB	Intel® Celeron® M 575	2.0 GHz	No
ECN-381B-R10/P8400/1GB	Intel® Core™2 Duo P8400	2.26 GHz	No
ECN-381BW-R10/CM575/1GB	Intel® Celeron® M 575	2.0 GHz	Yes
ECN-381BW-R10/P8400/1GB	Intel® Core™2 Duo P8400	2.26 GHz	Yes

Table 1-1: Model Variations

ECN-381B Multimedia Box

1.3 Features

The ECN-381B features are listed below:

- 45nm Intel® Core®2 Duo/Celeron® M processor
- 1.0 GB of DDR3 SDRAM SO-DIMM preinstalled
- Support 2.5" SATA HDD and CompactFlash® card
- VGA and HDMI interface for dual display
- One IEEE 1394a port
- Two Gigabit Ethernet ports
- Four USB 2.0 ports
- Three RS-232 serial ports
- RoHS compliant

1.4 Technical Specifications

The ECN-381B technical specifications are listed in **Table 1-2**.

System	
CPU and Models	2.26 GHz Intel® Core™2 Duo P8400 CPU or 2.0 GHz Intel® Celeron® M 575 CPU
Northbridge Chipset	Intel® GM45
Southbridge Chipset	Intel® ICH9M
Memory	1.0 GB of DDR3 SO-DIMM preinstalled
Real-time Clock	Battery backup RTC
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Ethernet Controller	Two Realtek RTL8111CP PCIe GbE controllers
Audio	Realtek ALC888 HD 7.1 channel audio codec
Multimedia	<ul style="list-style-type: none"> ▪ MPEG-2 decoding ▪ WMV9 (VC-1) and H.264 (AVC) support ▪ Hardware acceleration for MPEG2 VLD/iDCT ▪ Blu-ray support @ 40 Mb/s ▪ DirectX 10

I/O and Indicators	
Ethernet	2 x 10/100/1000 Mb/s
IEEE 1394	1 x IEEE 1394a port
Serial Ports	3 x RS-232
USB Interfaces	4 x USB 2.0 ports
Display	1 x VGA port 1 x HDMI port supports up to 1080i/p full HD with HDCP
Audio	One Line-out jack; one Mic-in jack
Storage	
HDD	Support one 2.5" SATA 3Gb/s HDD/SSD
CompactFlash®	One CompactFlash® slot
Power	
Power Supply	+12 V DC
Power Consumption	48 W
Power Connector	One power jack One 3-pin terminal block
Power Button	One power button
Environmental and Mechanical	
Operating Temperature	-10°C~45°C (with HDD) with air flow* -20°C~50°C (with CF/SSD) with air flow* *Ambient air speed per IEC-68-2-2 standard
Shock	Half-sine wave shock 3G, 11ms, 3 shocks per axis
Vibration	Operating Random Vibration Mode (MIL-STD-810F 514.5C-2)
Chassis Construction	Aluminum Alloy
Mounting	Wall mount and VESA mount (75 mm and 100 mm)
Physical Dimensions	252 mm x 186 mm x 64 mm (W x D x H)
EMC/Safety	CE, FCC class A

Table 1-2: Technical Specifications

ECN-381B Multimedia Box

1.5 Front Panel

The front panel of the ECN-381B contains one power button to power up the system. The button is also a LED indicator that shows power and HDD status:

- Blue: power on
- Orange: HDD activity

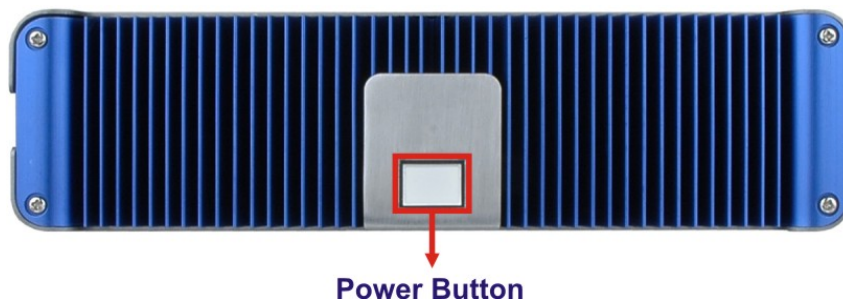


Figure 1-2: ECN-381B Front Panel

1.6 Connector Panel

All external peripheral interface connectors are located on the front panel of the ECN-381B . The peripheral interface connectors are shown in **Figure 1-3**.

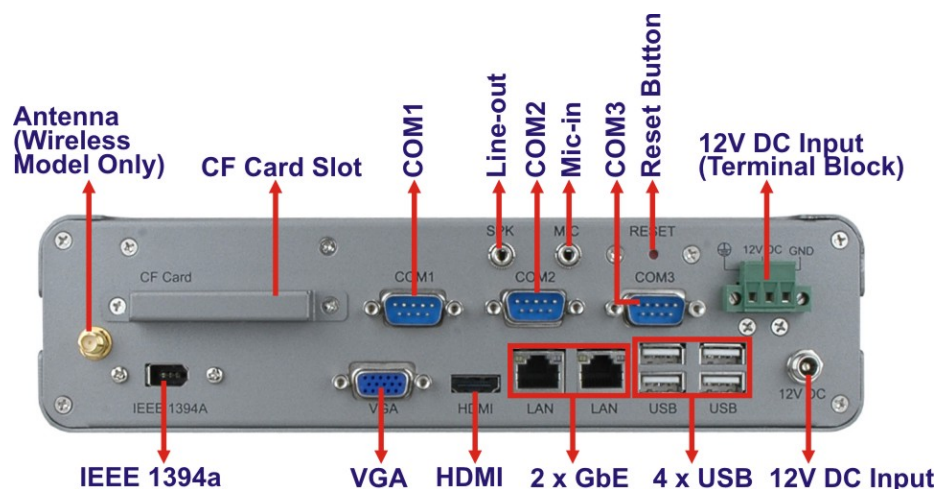


Figure 1-3: ECN-381B Peripheral Connectors

Connectors and buttons on the rear panel include the following.

- 1 x 12 V DC power input jack
- 1 x 12 V DC power input terminal block
- 1 x VGA output
- 1 x HDMI port
- 1 x IEEE 1394a port
- 3 x RS-232 serial ports
- 4 x USB ports
- 2 x Gigabit Ethernet ports
- 1 x Audio line-out
- 1 x Audio mic-in
- 1 x Reset button
- 1 x CompactFlash[®] card slot
- 1 x Wireless antenna connector (wireless model only)

ECN-381B Multimedia Box

1.7 Dimensions

The physical dimensions are shown below:

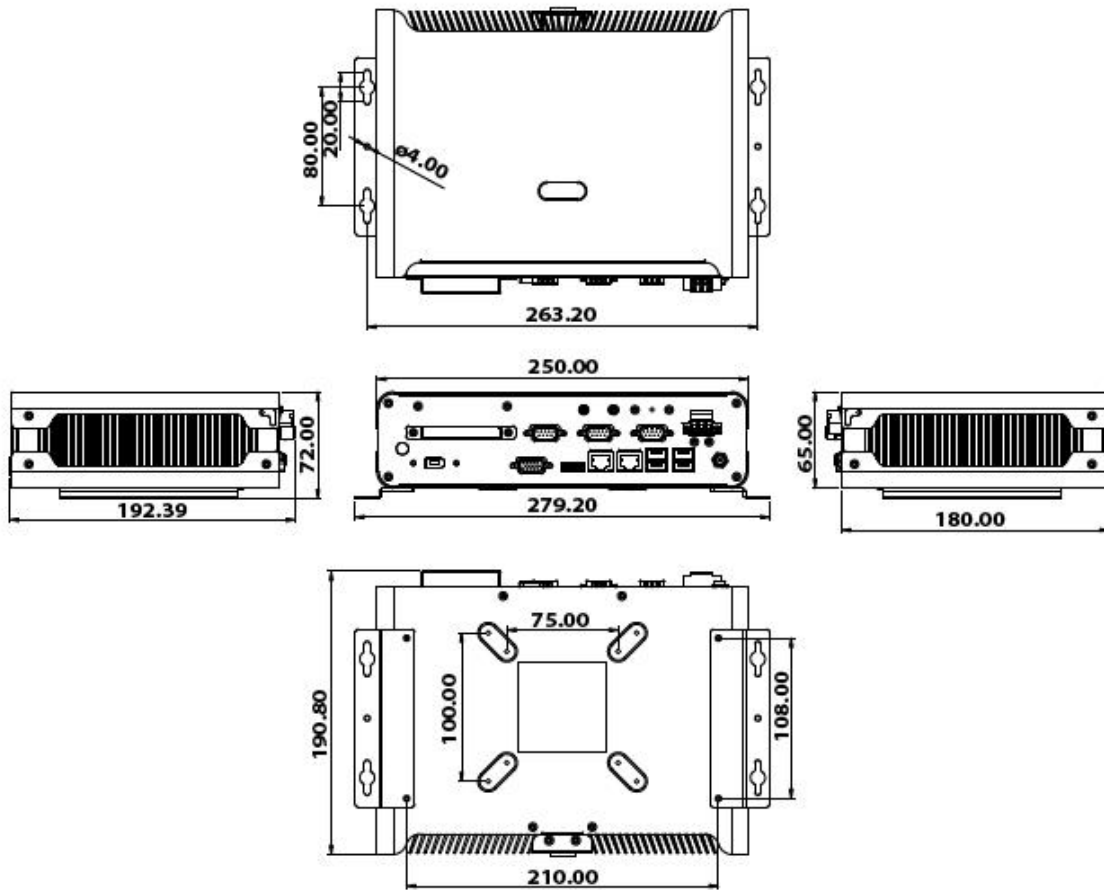


Figure 1-4: Physical Dimensions (millimeters)



Chapter

2

Unpacking

ECN-381B Multimedia Box

2.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the ECN-381B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECN-381B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECN-381B 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 ECN-381B, place it on an anti-static pad. This reduces the possibility of ESD damaging the ECN-381B.

2.2 Unpacking Precautions

When the ECN-381B 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 ECN-381B 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 ECN-381B from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The ECN-381B is shipped with the following components:

Quantity	Item and Part Number	Image
1	ECN-381B multimedia box	
1	Power adapter (12 V DC, 60 W)	
1	Power cord	
4	Foot pads	
1	SATA cable bracket	
2	Wall mount brackets	

ECN-381B Multimedia Box






Quantity	Item and Part Number	Image
4	Screws for wall mount brackets	
4	Screws for HDD installation	
8	Screws for VESA wall mount	
1	2dbi wireless antenna (wireless model only)	
1	User manual and driver CD	

Table 2-1: Package List Contents



Chapter

3

Installation

ECN-381B Multimedia Box

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 ECN-381B, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the ECN-381B 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 ECN-381B is opened while the power cord is still connected to an electrical outlet.
- **DANGER! Hot-Surface Warning:** The external system heat sink (blue) can get very hot during the normal operation. Make sure the heat sink has had sufficient time to cool before touching it.
- **Qualified Personnel:** The ECN-381B must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Grounding:** The ECN-381B 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 ECN-381B.

3.2 CompactFlash® Card Installation

To install a CompactFlash® (CF) card, please follow the steps below.

Step 1: Locate the CF card slot on the rear panel of the ECN-381B.

Step 2: Remove the CF card slot cover by removing the two retention screws.



Figure 3-1: CF Card Slot Retention Screws

Step 3: Inset a CF card into the slot.



Figure 3-2: CF Card Installation

3.3 Hard Disk Drive (HDD) Installation

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

Step 1: Open the top panel by removing two retention screws from both side panels as shown in **Figure 3-3**.

ECN-381B Multimedia Box



Figure 3-3: Top Panel Retention Screws Removal

Step 2: Slide the top panel forward and open the top panel (Figure 3-4).



Figure 3-4: Open the Top Panel

Step 3: Remove the four HDD bracket retention screws (Figure 3-5 and Figure 3-6) and lift the HDD brackets out of the ECN-381B.

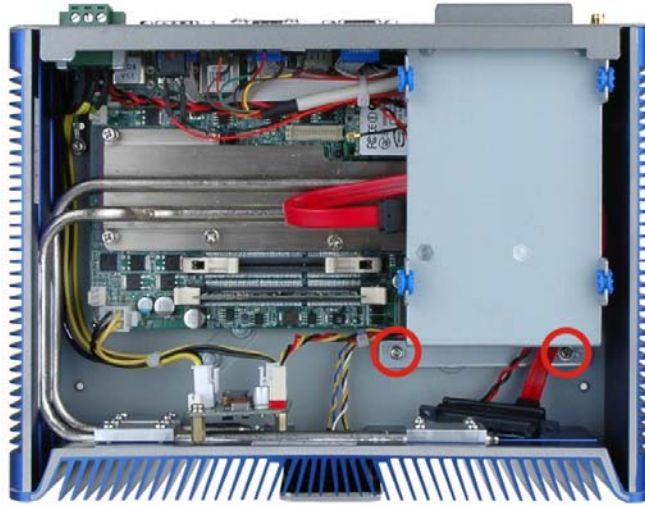


Figure 3-5: HDD Bracket Retention Screws (Inside)



Figure 3-6: HDD Bracket Retention Screws (Rear Panel)

Step 4: Attach the SATA cable bracket to the HDD. Secure the bracket with the HDD by inserting two flat head screws into the bottom of the HDD (**Figure 3-7**).

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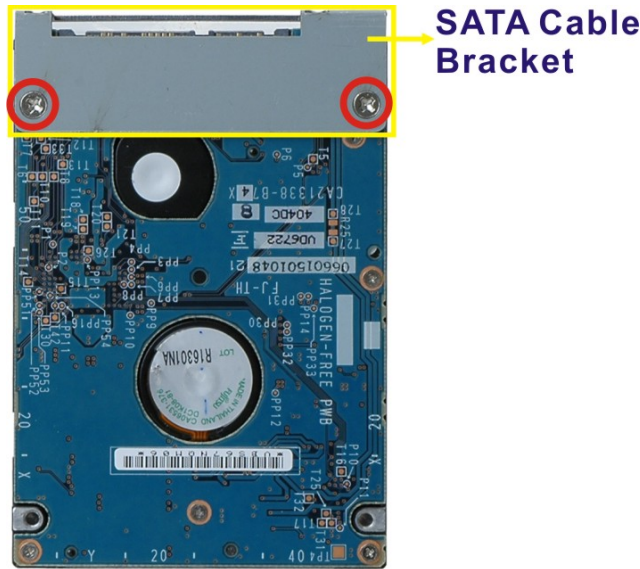


Figure 3-7: SATA Cable Bracket Retention Screws

- Step 5:** Connect the SATA cable in the ECN-381B to the HDD. Secure the SATA cable with the HDD by fastening two round head screws (**Figure 3-8 ①**).
- Step 6:** Attach the HDD bracket to the HDD. Secure the HDD with the HDD bracket by fastening four retention screws (**Figure 3-8 ②**).

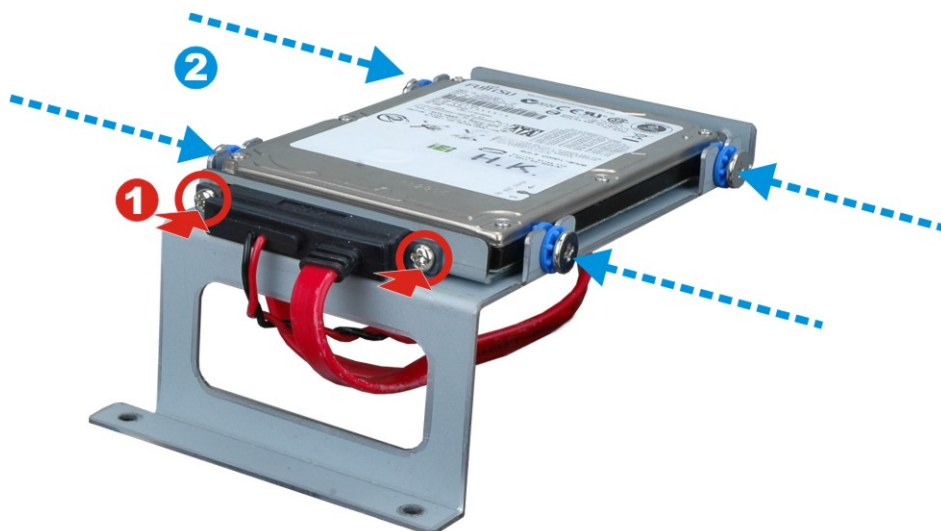


Figure 3-8: HDD Retention Screws

Step 7: Install the HDD bracket in the same position it was before.

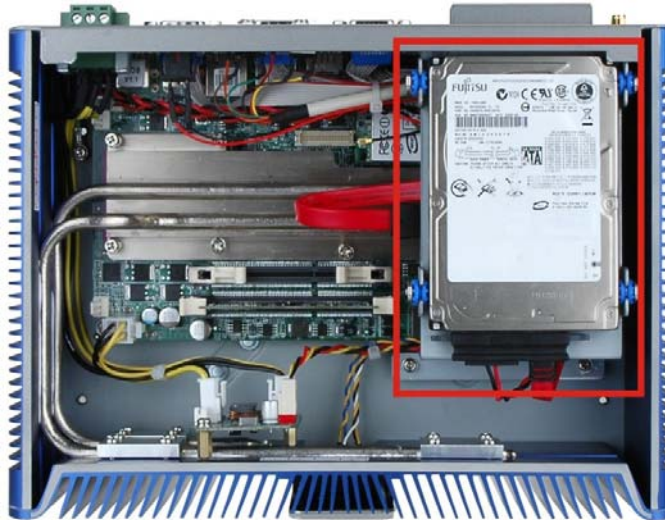


Figure 3-9: HDD Installation

Step 8: Reinstall the top panel.

3.4 Foot Pad Installation

The ECN-381B is shipped with four foot pads. To install the foot pads, follow the instructions below.

Step 1: Turn the ECN-381B over.

Step 2: Locate the four retention screw holes for the foot 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.

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Figure 3-10: Foot Pad Installation

3.5 Mount the System

The ECN-381B supports wall mount and VESA mount. The bottom panel of the ECN-381B contains several screw holes for mounting (**Figure 3-11**).



Figure 3-11: Mounting Screw Holes

3.5.1 Mounting the System with Mounting Brackets

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

- Step 1:** Turn the embedded system over.
- Step 2:** Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface.
- Step 3:** Secure the brackets to the system by inserting two retention screws into each bracket.

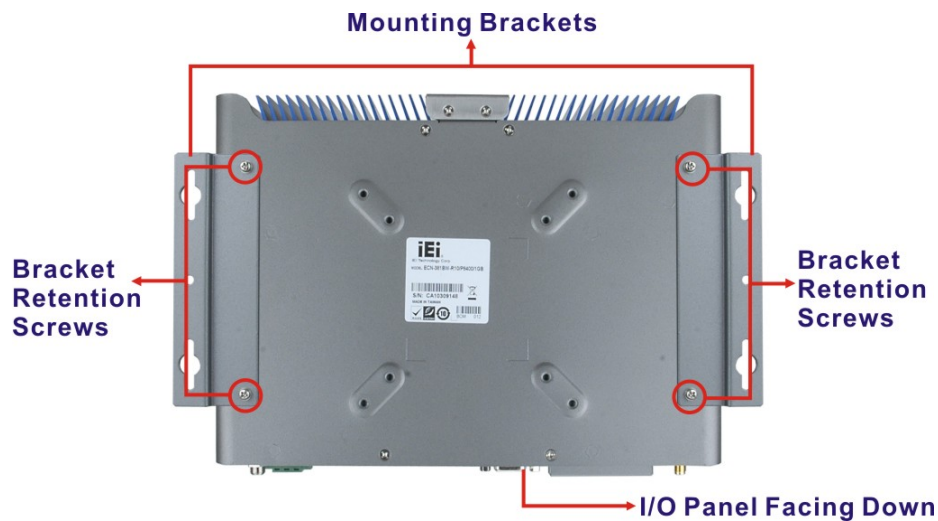


Figure 3-12: Mounting Bracket Retention Screws

- Step 4:** Drill holes in the intended installation surface.
- Step 5:** Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.



NOTE:

To have the best system heat dissipation, please make sure to face down the I/O panel (**Figure 3-12**) when mounting the system.

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

3.5.2 Mounting the System with Wall Mount Kit

To mount the embedded system onto a wall using the optional VESA MIS-D 75 or MIS-D 100 wall mount kit, please follow the steps below.

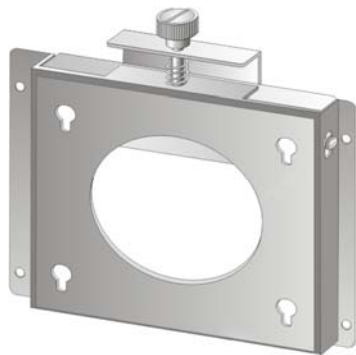


Figure 3-13: Wall Mount Kit (Optional)

- Step 1:** Select the location on the wall for the wall-mounting bracket.
- Step 2:** Carefully mark the locations of the four brackets screw holes on the wall.
- Step 3:** Drill four pilot holes at the marked locations on the wall for the bracket retention screws.
- Step 4:** Align the wall-mounting bracket screw holes with the pilot holes.
- Step 5:** Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (Figure 3-14).

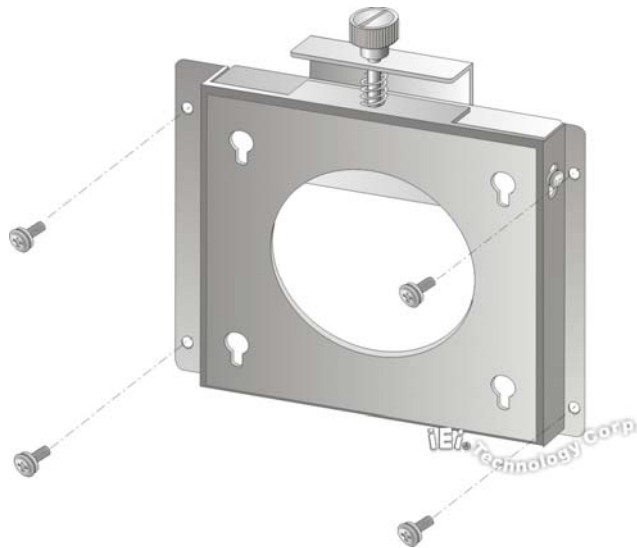


Figure 3-14: Wall-mounting Bracket

- Step 6:** Insert the four mounting screws provided in the package into the four screw holes on the bottom panel of the ECN-381B and tighten until the screw shank is secured against the bottom panel (Figure 3-15).
- Step 7:** Align the mounting screws on the bottom panel with the mounting holes on the bracket.
- Step 8:** Carefully insert the screws through the holes and gently pull the system downwards until the system rests securely in the slotted holes (Figure 3-15). Ensure that all four of the mounting screws fit snugly into their respective slotted holes.

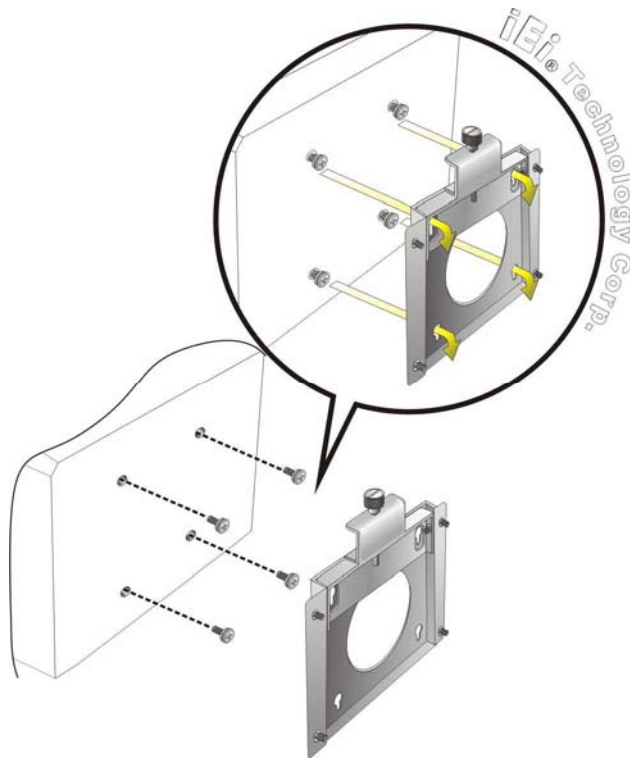


Figure 3-15: Chassis Support Screws

Step 9: Secure the ECN-381B by fastening the retention screw of the wall-mounting bracket. (Figure 3-16).



NOTE:

To have the best system heat dissipation, please make sure to face down the I/O panel when mounting the system.



NOTE:

In the diagram below the bracket is already installed on the wall.

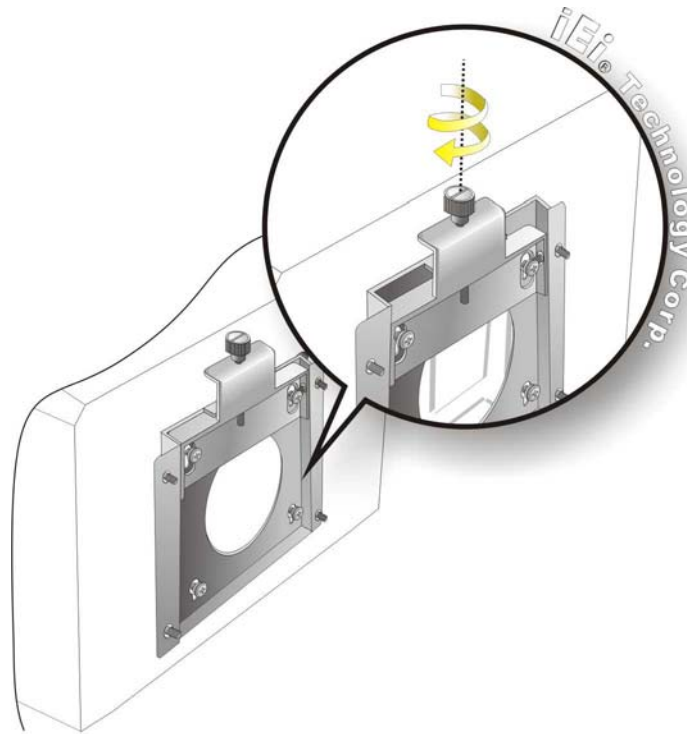


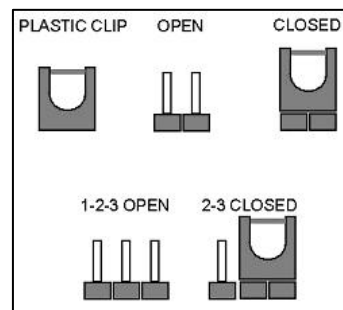
Figure 3-16: Secure the ECN-381B

3.6 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



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To access jumper, please remove the top cover. The motherboard jumper is listed below.

- Clear CMOS jumper

3.6.1 Clear CMOS

Jumper Label:	CLR_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 3-1
Jumper Location:	See Figure 3-17

If the ECN-381B fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

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

The clear CMOS jumper settings are shown in **Table 3-1**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 3-1: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 3-17** below.

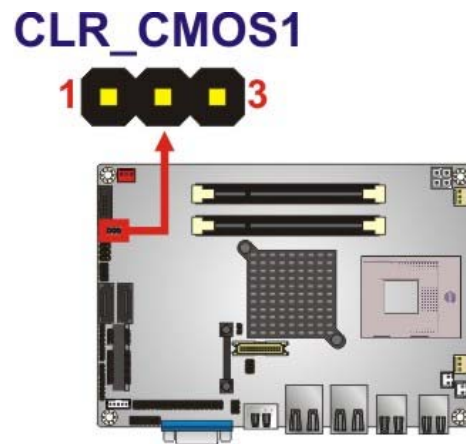


Figure 3-17: Clear CMOS Jumper

3.7 External Peripheral Interface Connectors

The ECN-381B has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- Ethernet
- Power input
- RS-232
- USB
- VGA
- HDMI
- Audio line-out
- Audio mic-in
- IEEE 1394a port
- Reset button

ECN-381B Multimedia Box

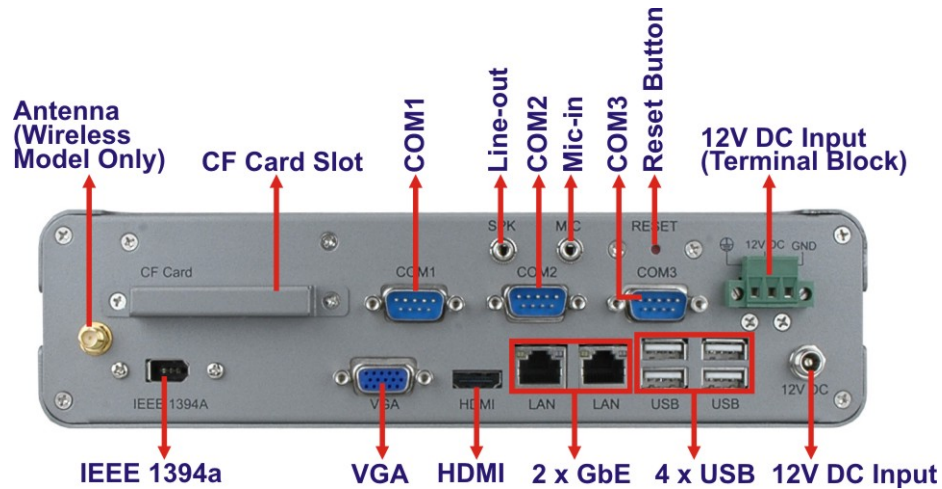


Figure 3-18: Peripheral Connectors (Rear)

3.7.1 LAN Connectors

CN Label:	LAN
CN Type:	RJ-45
CN Location:	See Figure 3-18
CN Pinouts:	See Table 3-2

The LAN connectors allow connection to an external network.

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

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the ECN-381B. See **Figure 3-19**.

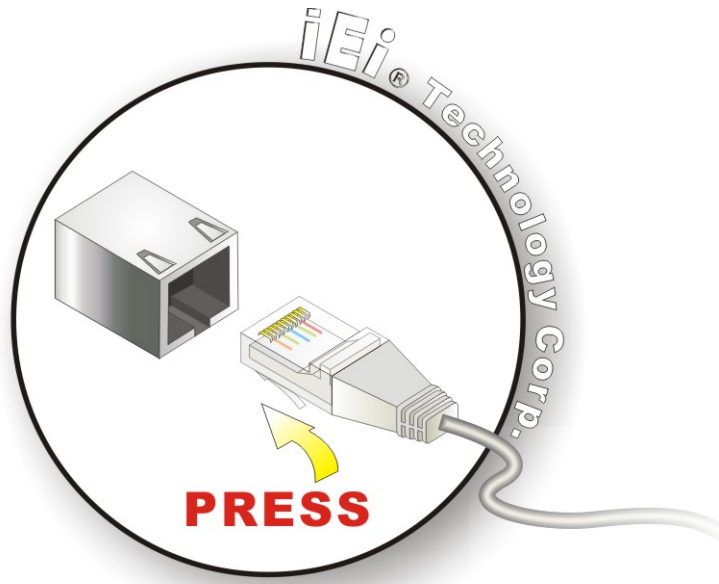


Figure 3-19: LAN Connection

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

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

Table 3-2: LAN Pinouts



Figure 3-20: 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 3-3.

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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 3-3: RJ-45 Ethernet Connector LEDs

3.7.2 HDMI Connector

- CN Label:** HDMI
- CN Type:** HDMI type A connector
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-4**

The HDMI (High-Definition Multimedia Interface) connector connects to digital audio or video sources.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+V5S
19	HDMI_HPD		

Table 3-4: HDMI Connector Pinouts

3.7.3 Power Input Terminal Block

- CN Label:** 12V DC
- CN Type:** 3-pin terminal block
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-5** and **Figure 3-21**

The power input terminal block connects to a power source.

Pin	Description
1	GND
2	12V DC
3	GND

Table 3-5: Power Input Terminal Block Pinouts

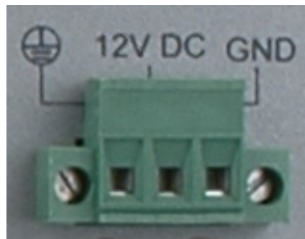


Figure 3-21: Power Input Terminal Block Pinout Location

3.7.4 RS-232 Serial Port Connector

- CN Label:** COM1, COM2, COM3
- CN Type:** DB-9 connectors
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-6** and **Figure 3-23**

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

Step 1: **Locate the DB-9 connector.** The location of the DB-9 connector is shown in **Figure 3-18**.

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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.

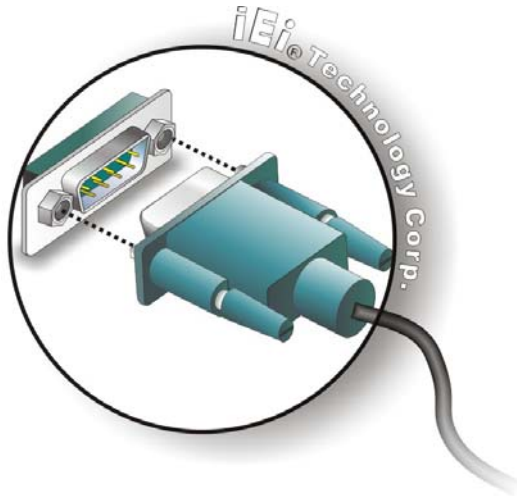


Figure 3-22: Serial Device Connector

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.

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

Table 3-6: COM1 Serial Port Pinouts

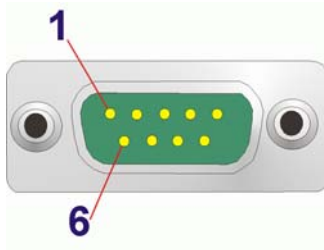


Figure 3-23: Serial Port Pinout Location

3.7.5 USB Connector

CN Label:	USB
CN Type:	USB port
CN Location:	See Figure 3-18
CN Pinouts:	See Table 3-7

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

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

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

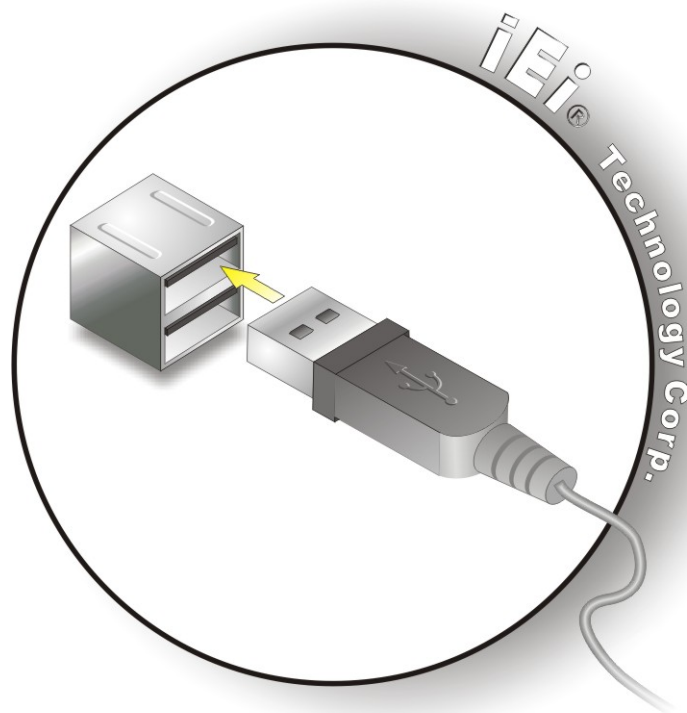


Figure 3-24: USB Device Connection

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

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

Table 3-7: USB Port Pinouts

3.7.6 VGA Connector

- CN Label:** VGA
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Figure 3-26** and **Table 3-8**

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

- Step 1: Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 3: Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the ECN-381B. See **Figure 3-25**.

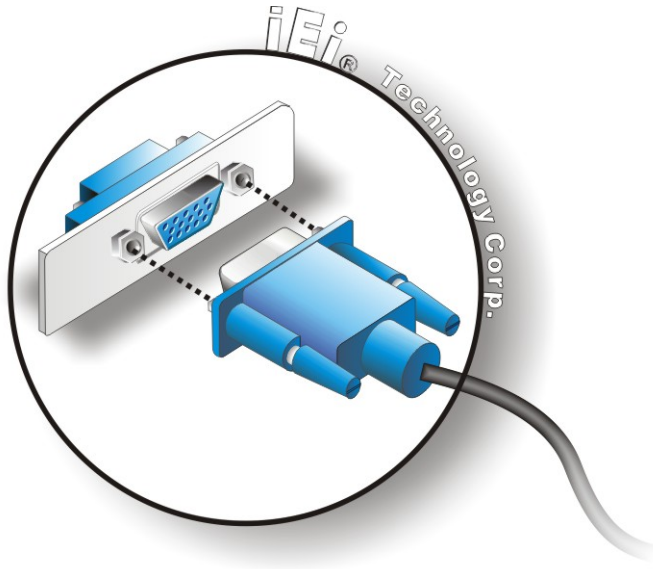


Figure 3-25: VGA Connector

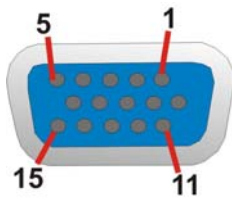


Figure 3-26: VGA Connector

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

Table 3-8: VGA Connector Pinouts

Chapter

4

BIOS

4.1 Introduction

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

4.1.1 Starting Setup

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

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

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

4.1.2 Using Setup

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

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

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

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

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

4.1.4 Unable to Reboot After Configuration Changes

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

4.1.5 BIOS Menu Bar

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

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

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

4.2 Main

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

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
System Overview
-----
AMIBIOS
Version      :08.00.15
Build Date   :04/14/10
ID:          :Z117MR10

Processor
Type         :Intel® Core™2 Duo CPU T9400 @ 2.53GHz
Speed        :2266MHz
Count        :1

System Memory
Size         :989MB

System Time   [14:20:27]
System Time   [Tue 3/26/2010]

Use [ENTER], [TAB] or
[SHIFT-TAB] to select a
field.

Use [+] or [-] to
configure system time.

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

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```

BIOS Menu 1: Main

→ System Overview

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

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

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The System Overview field also has two user configurable fields:

→ **System Time [xx:xx:xx]**

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

→ **System Date [xx/xx/xx]**

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

4.3 Advanced

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



WARNING!

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

-
- CPU Configuration (see **Section 4.3.1**)
 - IDE Configuration (see **Section 4.3.2**)
 - AHCI Configuration (see **Section 4.3.3**)
 - Remote Access Configuration (see **Section 4.3.4**)
 - USB Configuration (see **Section 4.3.5**)
 - Power Configuration (see **Section 4.3.6**)
 - Super IO Configuration (see **Section 4.3.6.1**)


```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Advanced Settings
-----
WARNING: Setting wrong values in below sections may cause
system to malfunction

> CPU Configuration
> IDE Configuration
> AHCI Configuration
> Remote Access Configuration
> USB Configuration
> Power Configuration
> SuperIO Configuration

Configure CPU

<=>  Select Screen
↑↓   Select Item
Enter Go to SubScreen
F1   General Help
F10  Save and Exit
ESC  Exit

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```

BIOS Menu 2: Advanced
4.3.1 CPU Configuration

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

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Configure Advanced CPU Settings
Module Version:3F.15
-----
Manufacturer :Intel®
Intel® Core™2 Duo CPU P8400 @ 2.26GHz
Frequency    :2.26GHz
FSB Speed    :1066MHz
Cache L1     : 64 KB
Cache L2     : 3072 KB
Ratio Actual Value:8.5

<=>  Select Screen
↑↓   Select Item
Enter Go to SubScreen
F1   General Help
F10  Save and Exit
ESC  Exit

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```

BIOS Menu 3: CPU Configuration

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

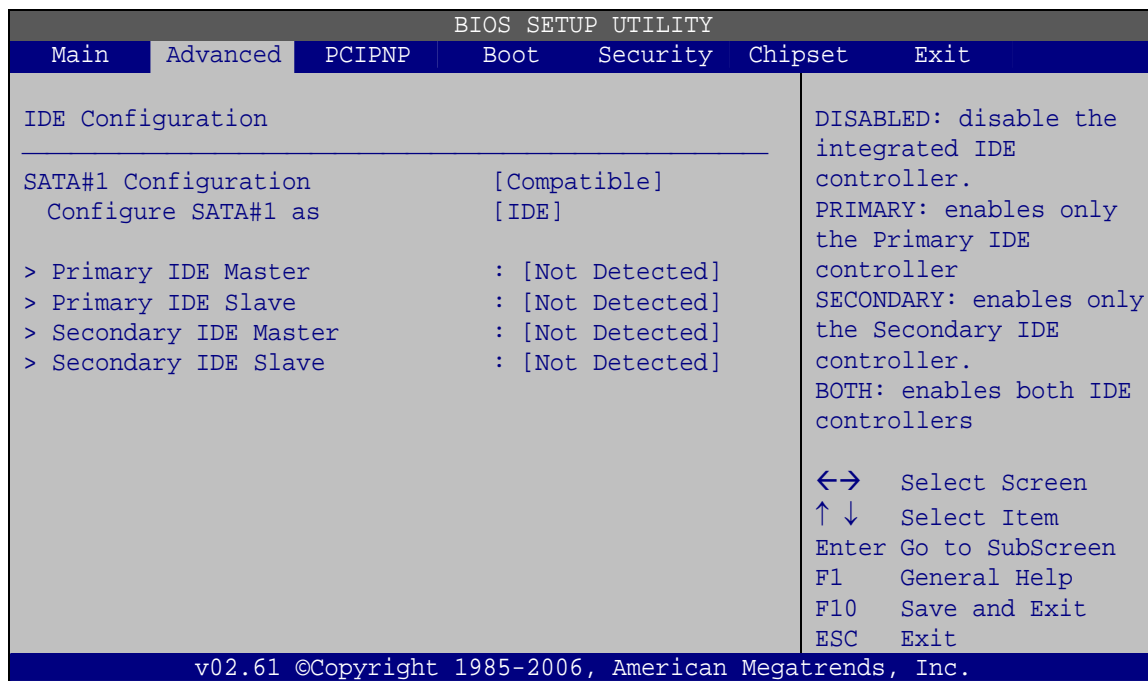
- Manufacturer: Lists the name of the CPU manufacturer
- Brand String: Lists the brand name of the CPU being used

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- Frequency: Lists the CPU processing speed
- FSB Speed: Lists the FSB speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

4.3.2 IDE Configuration

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



BIOS Menu 4: IDE Configuration

→ SATA#1 Configurations [Compatible]

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

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

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

→ **Configure SATA as [IDE]**

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

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

→ **IDE Master and IDE Slave**

When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

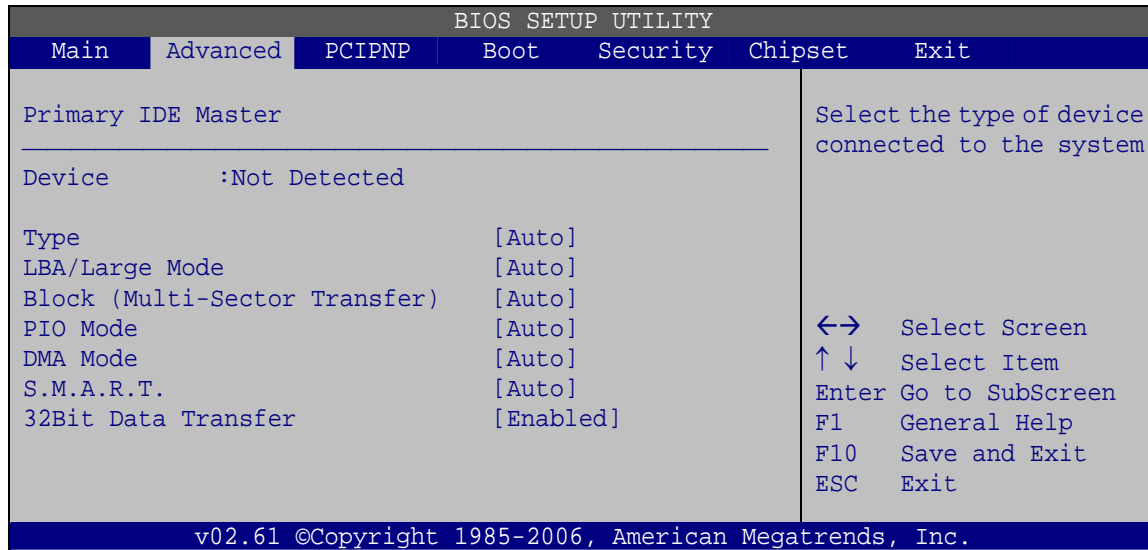
- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 4.3.2.1** appear.

4.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

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BIOS Menu 5: IDE Master and IDE Slave Configuration

→ Auto-Detected Drive Parameters

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

- 32Bit Data Transfer: Enables 32-bit data transfer.

→ **Type [Auto]**

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

- **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.
- **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
- **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
- **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:
 - ZIP
 - LS-120

→ **LBA/Large Mode [Auto]**

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

- **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.
- **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

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→ Block (Multi Sector Transfer) [Auto]

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

- **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
- **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

→ PIO Mode [Auto]

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

- **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
- **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
- **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
- **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
- **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
- **4** PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s
(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

→ DMA Mode [Auto]

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

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

→ **S.M.A.R.T [Auto]**

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

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

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

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

→ **32Bit Data Transfer [Enabled]**

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

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

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

4.3.3 AHCI Configuration

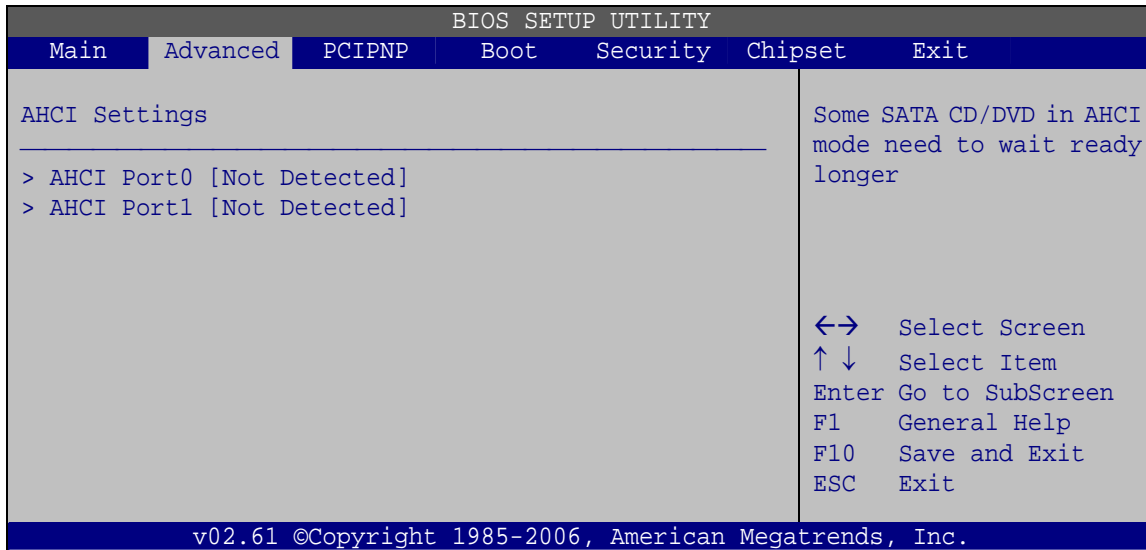


NOTE:

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

Use the **AHCI Settings** menu (**BIOS Menu 6**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.

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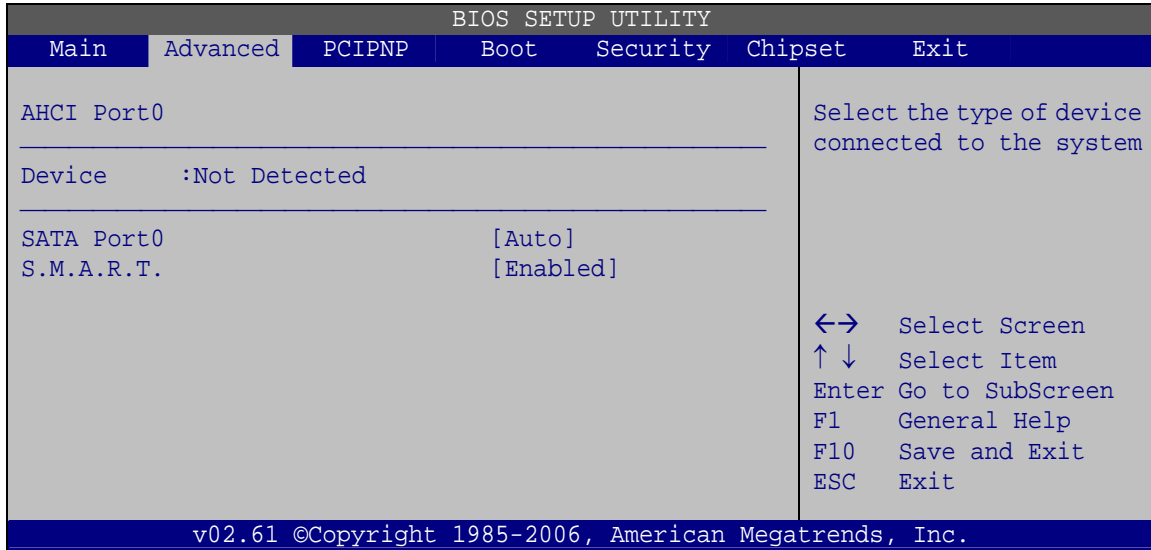
BIOS Menu 6: AHCI Configuration

→ AHCI Port n [Not Detected]

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected to a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. “**AHCI Port 3**” opens a new window.

4.3.3.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 7**) to configure the drive connected to SATA connector n.



BIOS Menu 7: AHCI Port n Configuration Menu

→ SATA Port n [Auto]

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

→ S.M.A.R.T [Enabled]

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

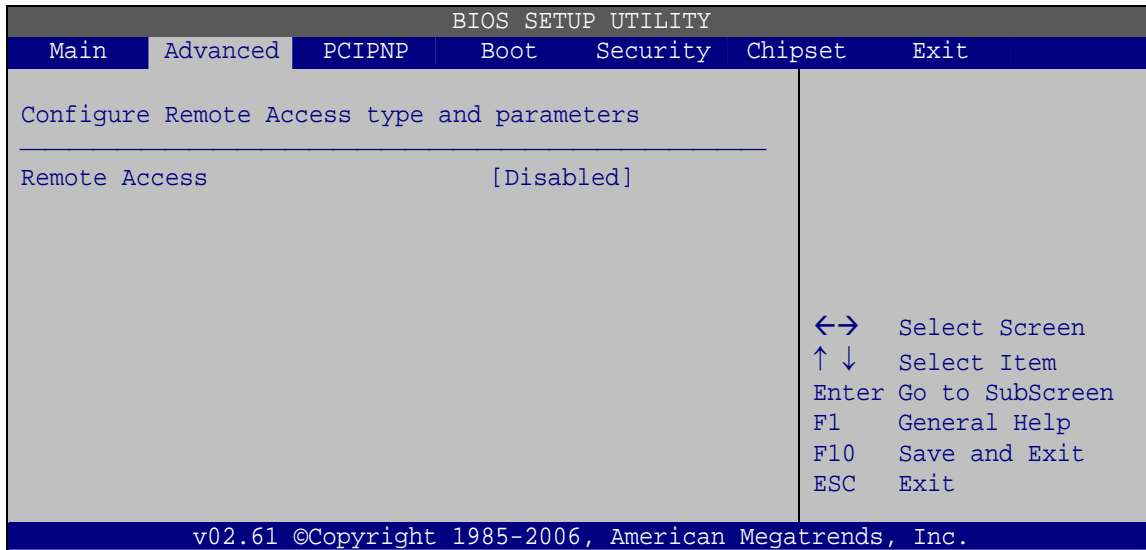
→ **Enabled** **DEFAULT** S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

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

4.3.4 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

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BIOS Menu 8: Remote Access Configuration

→ Remote Access [Disabled]

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

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

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

Serial Port Number

Serial Port Mode

Redirection after BIOS POST

Terminal Type

These configuration options are discussed below.

→ Serial Port Number [COM1]

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

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

→ **COM2** System is remotely accessed through COM2

→ **COM3** System is remotely accessed through COM3

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

→ **Base Address, IRQ [3E8h, A]**

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

→ **Serial Port Mode [115200 8,n,1]**

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

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



NOTE:

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

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

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

- **Disabled** The console is not redirected after POST
- **Boot Loader** Redirection is active during POST and during Boot Loader
- **Always** **DEFAULT** Redirection is always active (Some OSes may not work if set to Always)

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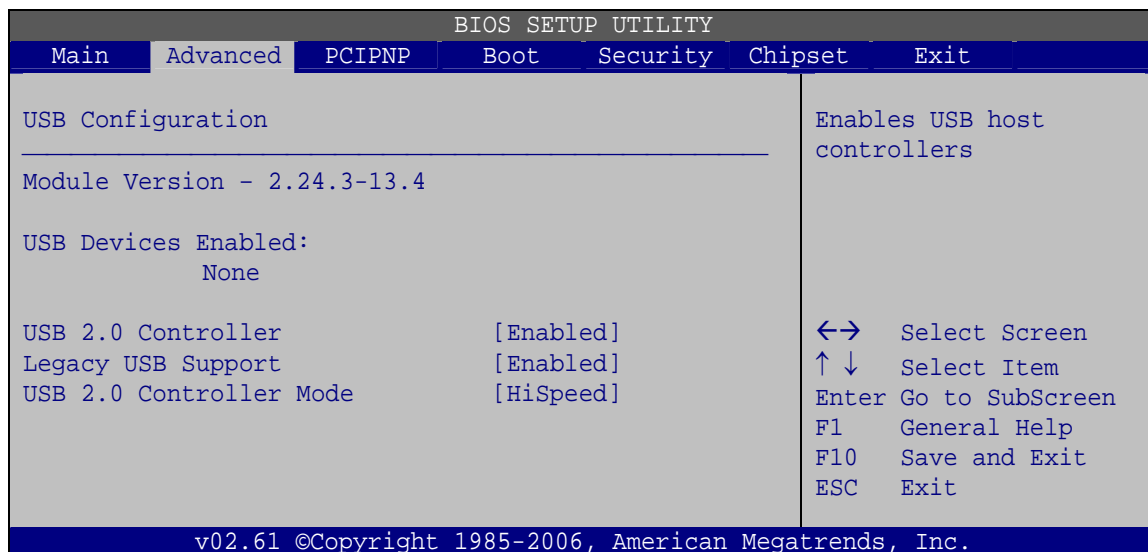
→ Terminal Type [ANSI]

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

- **ANSI** **DEFAULT** The target terminal type is ANSI
- **VT100** The target terminal type is VT100
- **VT-UTF8** The target terminal type is VT-UTF8

4.3.5 USB Configuration

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



BIOS Menu 9: USB Configuration

→ USB Configuration

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

→ USB Devices Enabled

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

→ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option is enabled.

→ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

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

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

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

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

- **FullSpeed** The controller is capable of operating at 12 Mb/s
- **HiSpeed** **DEFAULT** The controller is capable of operating at 480 Mb/s

4.3.6 Power Configuration

The **Power Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.

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```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
Power Supply Status          [ATX]
-----
> ACPI Configuration

                                  Go into On/Off, or
                                  Suspend when Power
                                  button is pressed

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

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```

BIOS Menu 10: APM Configuration

→ Power Supply Status [ATX]

The **Power Supply Status** BIOS option is set to ATX and can not be changed.

4.3.6.1 ACPI Configuration

Use the **ACPI Configuration** menu (**BIOS Menu 11**) to select the ACPI state when the system is suspended.

```

BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Power  Exit
-----
ACPI Settings
-----
Suspend Mode          [S1 (POS)]

                                  ←→  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 11: ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

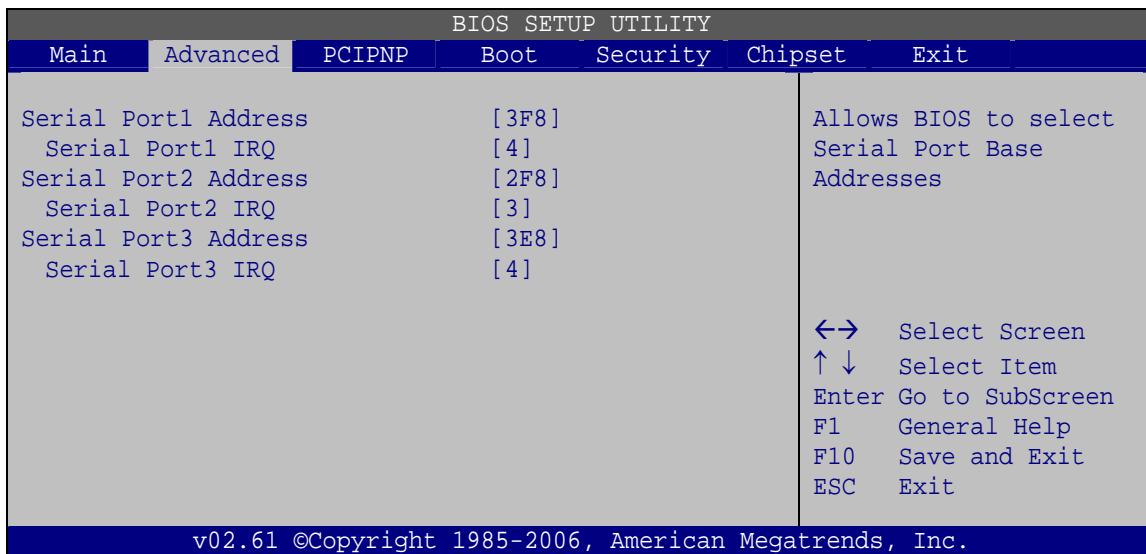
Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS) 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 (STR)** The system enters S3(STR) state.

4.3.7 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 12: Super IO Configuration

➔ **Serial Port1 Address [3F8]**

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

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

➔ **3F8 DEFAULT** Serial Port 1 I/O port address is 3F8

➔ **2F8** Serial Port 1 I/O port address is 2F8

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→ Serial Port1 IRQ [4]

Use the **Serial Port1 IRQ** option to select the interrupt address for serial port 1.

- 4 Serial port 1 IRQ address is 4
- 3 Serial port 1 IRQ address is 3

→ Serial Port2 Address [2F8]

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- 3F8 Serial Port 2 I/O port address is 3F8
- 2F8 Serial Port 2 I/O port address is 2F8

→ Serial Port2 IRQ [3]

Use the **Serial Port2 IRQ** option to select the interrupt address for serial port 2.

- 4 Serial port 2 IRQ address is 4
- 3 Serial port 2 IRQ address is 3

→ Serial Port3 Address [3E8]

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- **Disabled** No base address is assigned to serial port 3
- 3E8 **DEFAULT** Serial port 3 I/O port address is 3E8
- 2E8 Serial port 3 I/O port address is 2E8

→ Serial Port3 IRQ [4]

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- 4 **DEFAULT** Serial port 3 IRQ address is 4
- 3 Serial port 3 IRQ address is 3

- ➔ 10 Serial port 3 IRQ address is 10
- ➔ 11 Serial port 3 IRQ address is 11

4.4 PCI/PnP

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



WARNING!

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

BIOS SETUP UTILITY		
Main	Advanced	PCIPNP
		Boot Security Chipset Exit
Advanced PCI/PnP Settings		Available: Specified IRQ is available to be use the PCI/PnP devices
WARNING: Setting wrong values in below sections may cause system to malfunction		Reserved: Specified IRQ is reserved for use by legacy ISA devices
IRQ3		[Reserved]
IRQ4		[Reserved]
IRQ5		[Available]
IRQ7		[Available]
IRQ9		[Available]
IRQ10		[Available]
IRQ11		[Available]
IRQ14		[Available]
IRQ15		[Available]
DMA Channel 0		[Available]
DMA Channel 1		[Available]
DMA Channel 3		[Available]
DMA Channel 5		[Available]
DMA Channel 6		[Available]
DMA Channel 7		[Available]
Reserved Memory Size		[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 13: PCI/PnP Configuration

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→ IRQ# [Available]

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

- **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices
- **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

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

→ DMA Channel# [Available]

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

- **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices
- **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3

- DM Channel 5
- DM Channel 6
- DM Channel 7

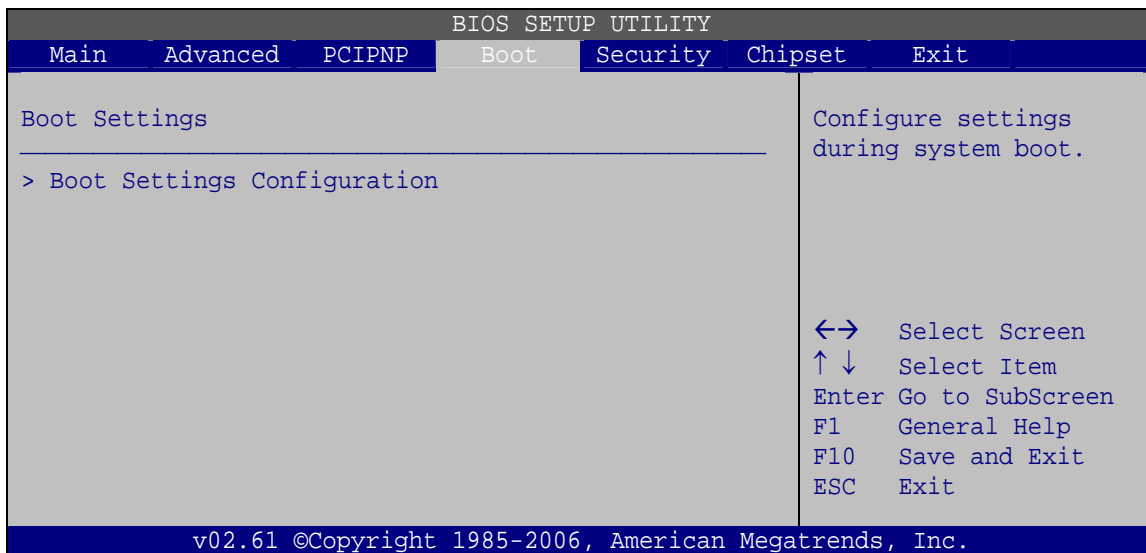
➔ **Reserved Memory Size [Disabled]**

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

- ➔ **Disabled** **DEFAULT** No memory block reserved for legacy ISA devices
- ➔ **16K** 16 KB reserved for legacy ISA devices
- ➔ **32K** 32 KB reserved for legacy ISA devices
- ➔ **64K** 54 KB reserved for legacy ISA devices

4.5 Boot

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

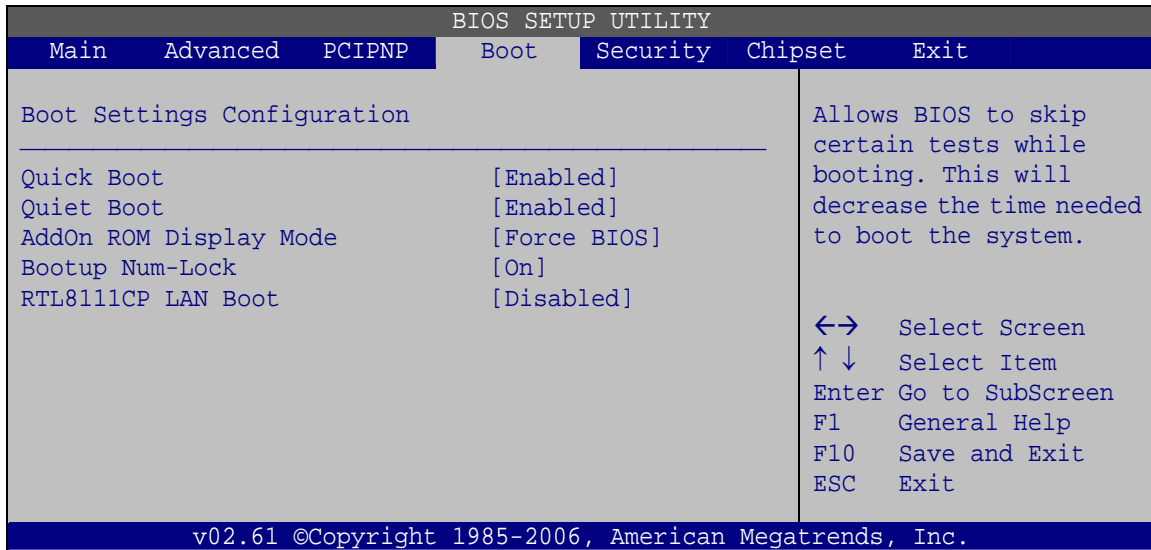


BIOS Menu 14: Boot

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4.5.1 Boot Settings Configuration

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



BIOS Menu 15: Boot Settings Configuration

→ Quick Boot [Enabled]

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

- **Disabled** No POST procedures are skipped
- **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

→ Quiet Boot [Enabled]

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

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

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

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

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

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

→ **Bootup Num-Lock [On]**

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

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

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

→ **RTL8111CP LAN Boot [Disabled]**

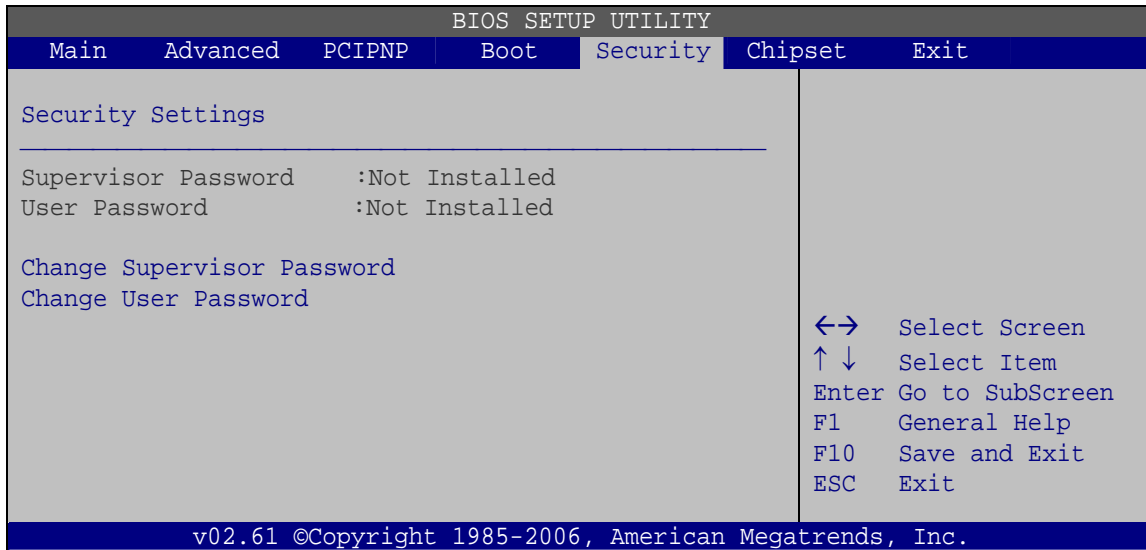
Use the **RTL8111CP LAN Boot** option to enable the Realtek RTL8111CP PCIe GbE controller to boot the system.

→ **Enabled** Can be booted from a remote system through the Realtek RTL8111CP PCIe GbE controller

→ **Disabled** **DEFAULT** Cannot be booted from a remote system through the Realtek RTL8111CP PCIe GbE controller

4.6 Security

Use the **Security** menu (**BIOS Menu 16**) to set system and user passwords.



BIOS Menu 16: Security

→ Change Supervisor Password

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

→ Change User Password

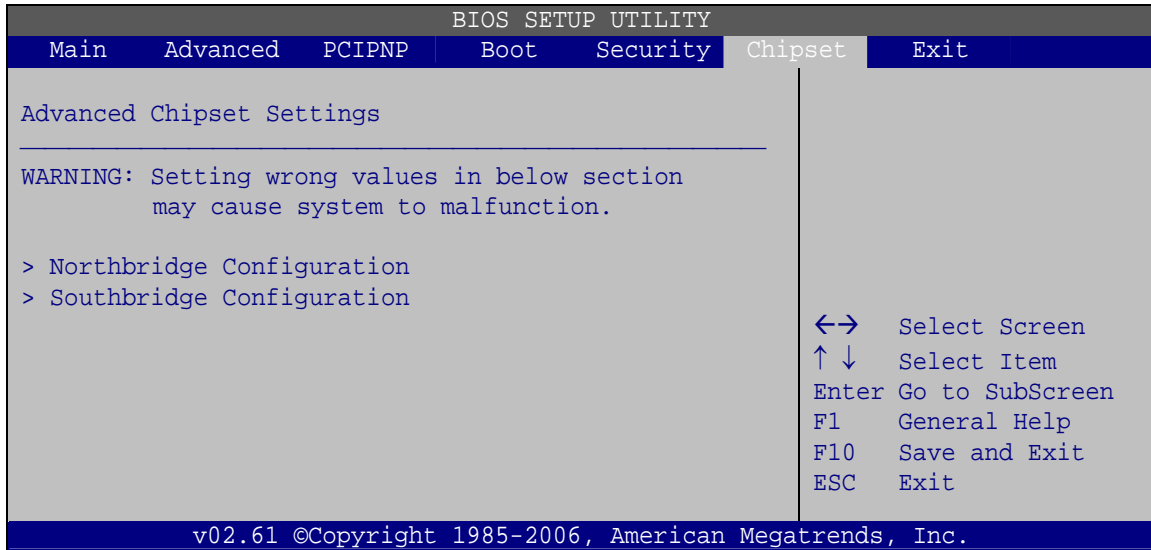
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

4.7 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the Northbridge and Southbridge configuration menus

**WARNING!**

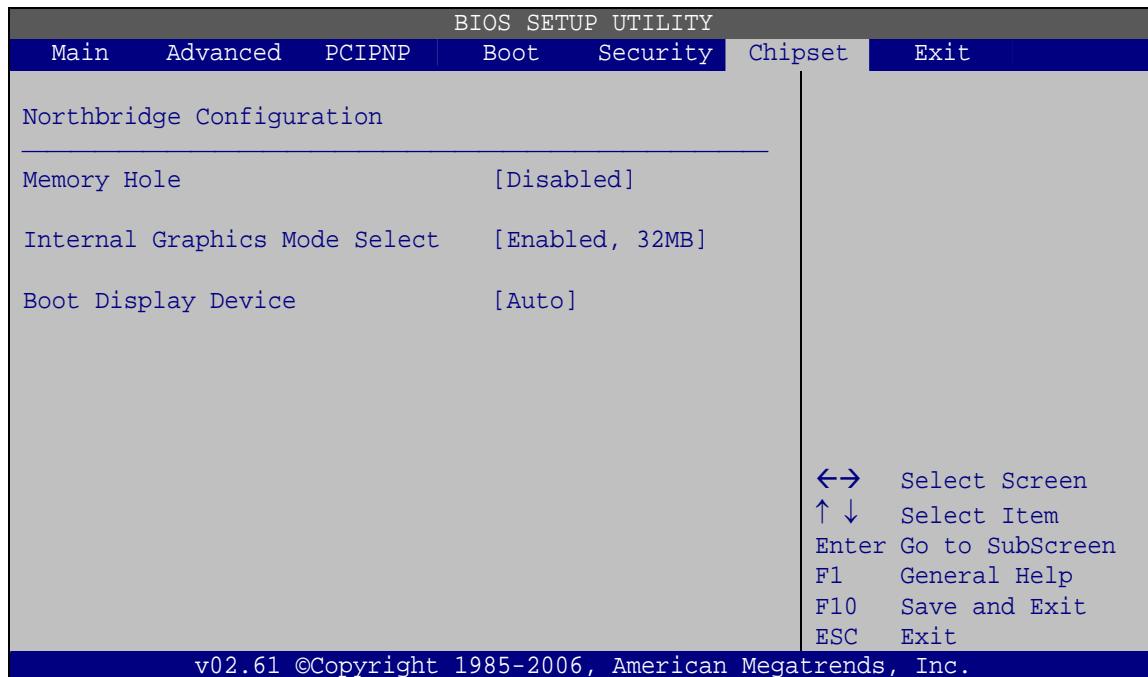
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

**BIOS Menu 17: Chipset**

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4.7.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 18**) to configure the Northbridge chipset.



BIOS Menu 18:Northbridge Chipset Configuration

→ Memory Hole [Disabled]

Use the **Memory Hole** option to reserve memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards
- **15 MB – 16 MB** Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

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

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

- **Disable**
- **Enable, 32 MB** **DEFAULT** 32 MB of memory used by internal graphics device
- **Enable, 64 MB** 64 MB of memory used by internal graphics device
- **Enable, 128 MB** 128 MB of memory used by internal graphics device

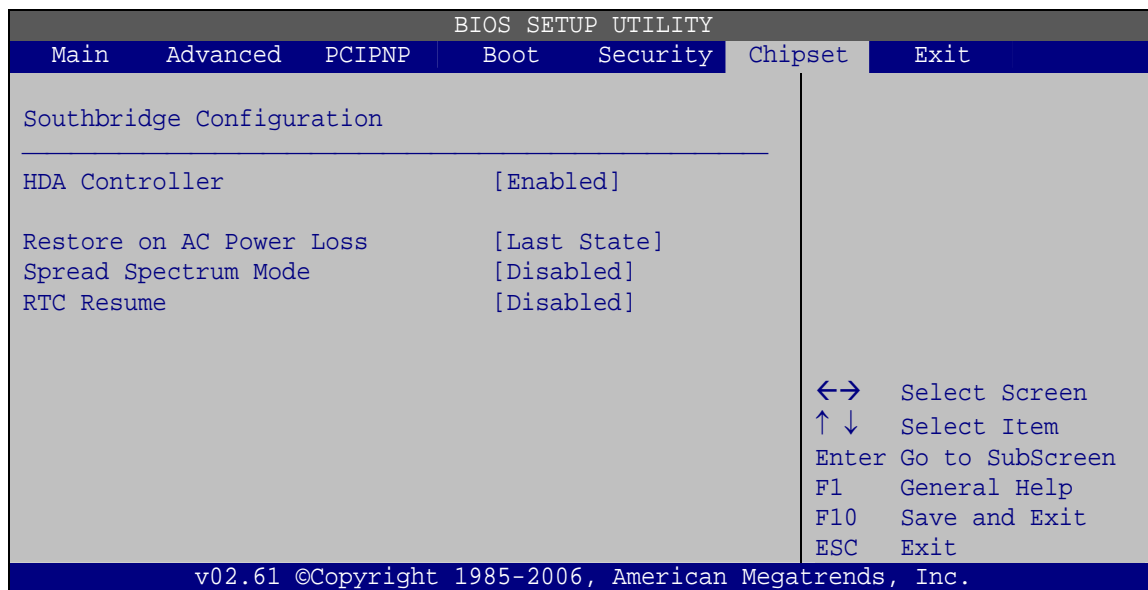
→ **Boot Display Device [Auto]**

Use the **Boot Display Device** BIOS feature to determine what displays are used. Dual display functionality is enabled here. Dual display configuration options are listed below:

- Auto **DEFAULT**
- CRT
- HDMI

4.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 19**) to configure the Southbridge chipset.



BIOS Menu 19:Southbridge Chipset Configuration

→ HDA Controller [Enabled]

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

- **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled
- **Disabled** The onboard High Definition Audio controller is disabled

→ Restore on AC Power Loss [Last State]

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

- **Power Off** The system remains turned off
- **Power On** The system turns on

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

→ **Spread Spectrum [Disabled]**

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

→ **Disabled** **DEFAULT** EMI not reduced

→ **Enabled** EMI reduced

→ **RTC Resume [Disabled]**

Use the **RTC Resume** 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:

→ **RTC Alarm Date (Days)**

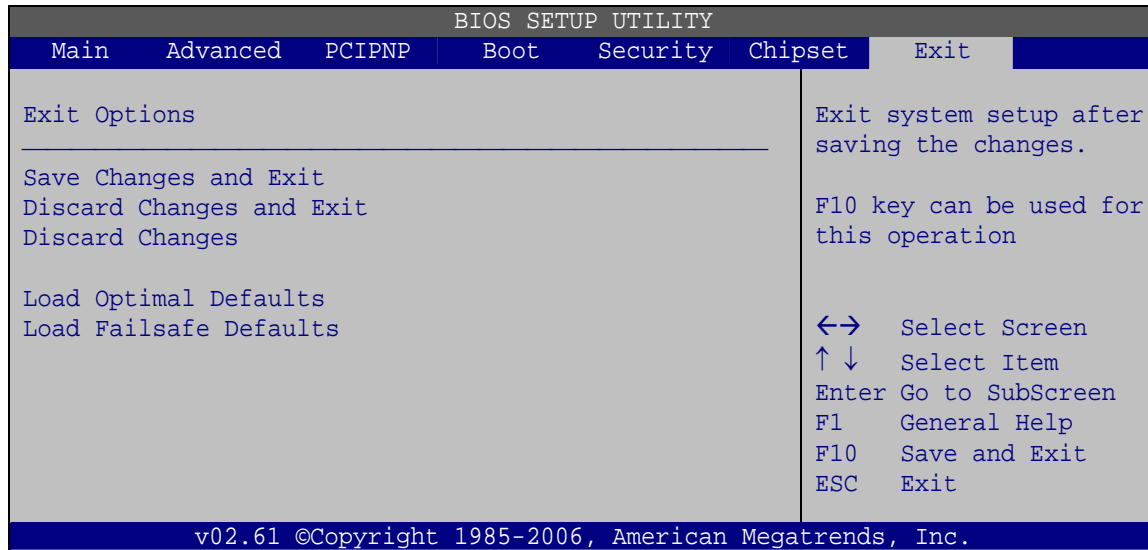
→ **System Time**

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

4.8 Exit

Use the **Exit** menu (**BIOS Menu 20**) to load default BIOS values, optimal failsafe values and to save configuration changes.

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BIOS Menu 20:Exit

→ Save Changes and Exit

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

→ Discard Changes and Exit

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

→ Discard Changes

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

→ Load Optimal Defaults

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

→ Load Failsafe Defaults

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



Appendix

A

One Key Recovery

A.1 One Key Recovery Introduction

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

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.

A.1.1 System Requirement

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

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



NOTE:

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

A.1.2 Supported Operating System

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

- Microsoft Windows
 - Windows XP (Service Pack 2 or 3 required)
 - Windows Vista

- Windows 7
- Windows CE 5.0
- Windows CE 6.0
- Windows XP Embedded
- Linux
 - Fedora Core 12 (Constantine)
 - Fedora Core 11 (Leonidas)
 - Fedora Core 10 (Cambridge)
 - Fedora Core 8 (Werewolf)
 - Fedora Core 7 (Moonshine)
 - RedHat RHEL-5.4
 - RedHat 9 (Ghirke)
 - Ubuntu 8.10 (Intrepid)
 - Ubuntu 7.10 (Gutsy)
 - Ubuntu 6.10 (Edgy)
 - Debian 5.0 (Lenny)
 - Debian 4.0 (Etch)
 - SuSe 11.2
 - SuSe 11.3

**NOTE:**

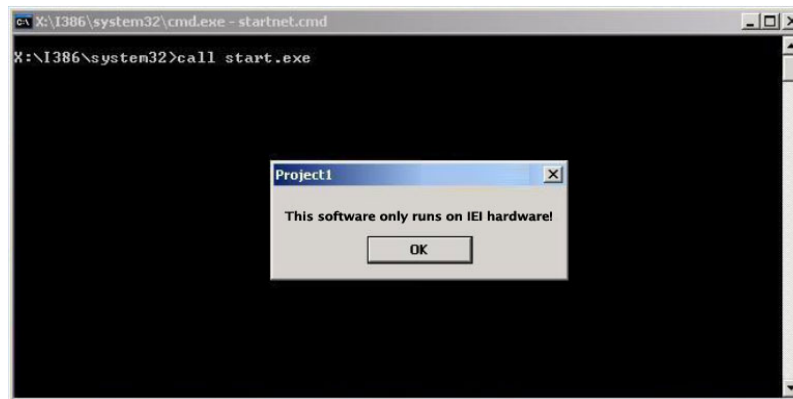
Installing unsupported OS versions may cause the recovery tool to fail.

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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.



A.2 Setup Procedure for Windows

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

- Step 1:** Hardware and BIOS setup
- Step 2:** Create partitions
- Step 3:** Install operating system, drivers and system applications.
- Step 4:** Build-up recovery partition
- Step 5:** Create factory default image

The detailed descriptions are described in the following sections.

**NOTE:**

The setup procedures described below are for Microsoft Windows operating system users. For Linux system, most setup procedures are the same with Microsoft Windows except for several steps which is 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 driver or SSD in the ECN-381B. An unformatted and unpartitioned disk is recommended.
- Step 3:** Connect an optical disk drive to the ECN-381B and insert the recovery CD.
- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

A.2.2 Create Partitions

- Step 1:** Put the recovery CD in the optical drive.
- Step 2:** Turn on the system.
- Step 3:** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient.
- Step 4:** The recovery tool setup menu is shown as below.

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

Figure A-1: Recovery Tool Setup Menu

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

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

Figure A-2: Command Mode

Step 6: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.
(Press <Enter> after entering each line below)

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>create part pri size= ____
DISKPART>assign letter=F
DISKPART>exit
system32>format N: /fs:ntfs /q /y
system32>format F: /fs:ntfs /q /v:Recovery /y
system32>exit
```

```

X:\I386\SYSTEM32\CMD.EXE

X:\I386\SYSTEM32>diskpart → Starts the Microsoft disk partitioning tool.

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

DISKPART>list vol → Show partition information

   Volume ###  Ltr  Label          Fs      Type          Size      Status       Info
   -----  -  -  -  -  -  -  -  -
   Volume 0             X   CD_ROM        CDFS     DUD-ROM        405 MB    Healthy      Boot
   Volume 1             D                   FAT32    Removeable    3854 MB    Healthy

DISKPART>sel disk 0 → Select a disk

Disk 0 is now the selected disk.

DISKPART>create part pri size=2000 → Create partition 1 and assign a size.
                                     This partition is for OS installation.
DiskPart succeeded in creating the specified partition.

DISKPART>assign letter=N → Assign partition 1 a code name (N).
DiskPart successfully assigned the drive letter or mount point.

DISKPART>create part pri size=1800 → Create partition 2 and assign a size.
                                     This partition is for recovery images.
DiskPart succeeded in creating the specified partition.

DISKPART>assign letter=F → Assign partition 2 a code name (F).
DiskPart successfully assigned the drive letter or mount point.

DISKPART>exit → Exit diskpart

X:\I386\SYSTEM32>format n: /fs:ntfs /q /y → Format partition 1 (N) as NTFS format.
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 2000M
Creating file system structures.
Format complete.
 2048254 KB total disk space.
 2035620 KB are available.

X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
 1847474 KB total disk space.
 1835860 KB are available.

X:\I386\SYSTEM32>exit → Exit Windows PE
  
```

Figure A-3: 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 7: Press any key to exit the recovery tool and automatically reboot the system.

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

A.2.3 Install Operating System, Drivers and Applications

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

**NOTE:**

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

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

A.2.4 Build-up Recovery Partition

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

Step 2: Start the system.

Step 3: Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient.

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

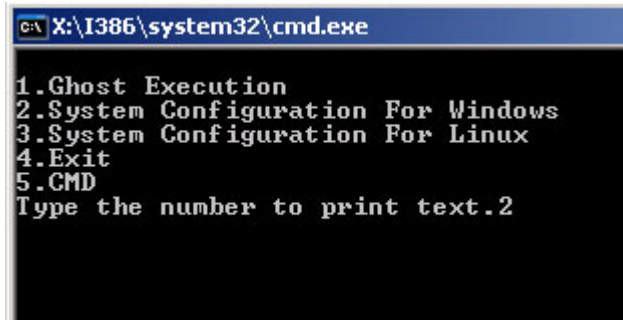


Figure A-4: System Configuration for Windows

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

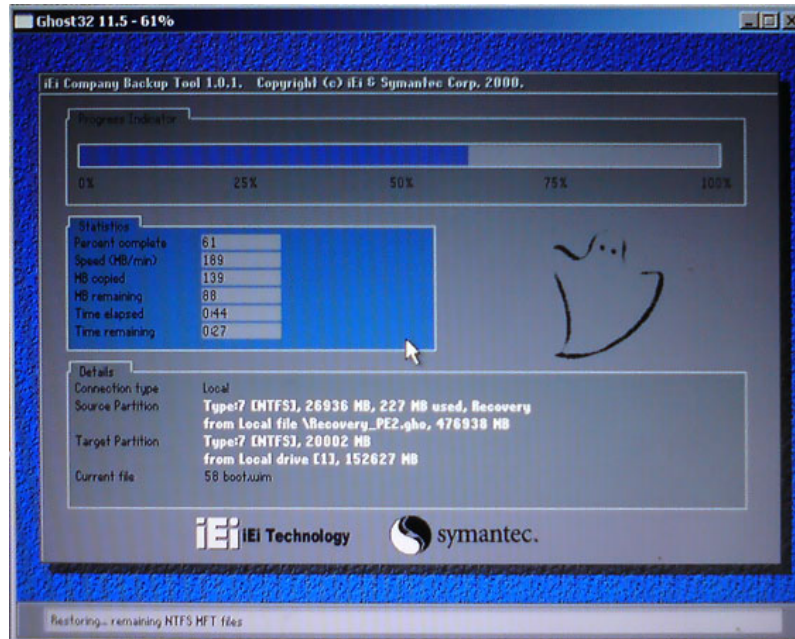
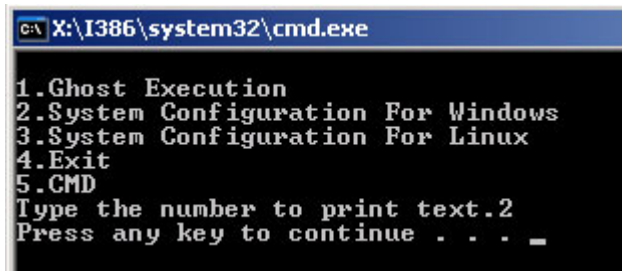


Figure A-5: Build-up Recovery Partition

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



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

Figure A-6: Press any key to continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image

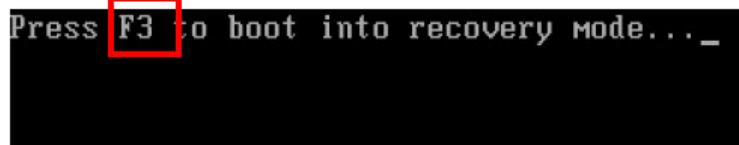


NOTE:

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-7**), 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-7: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <4> and press <Enter>. (**Figure A-8**)

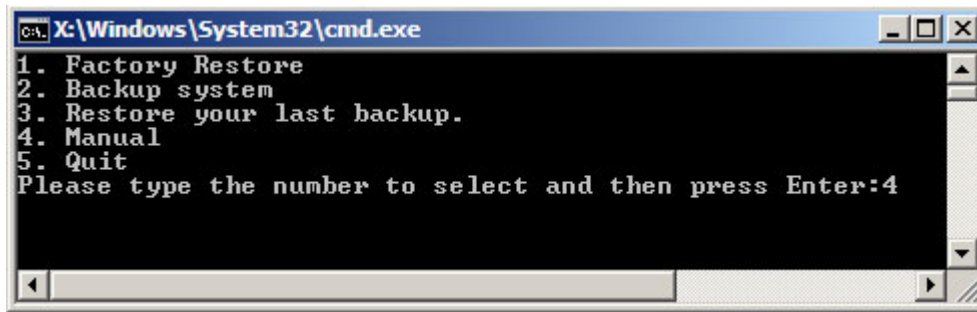


Figure A-8: Recovery Tool Menu

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

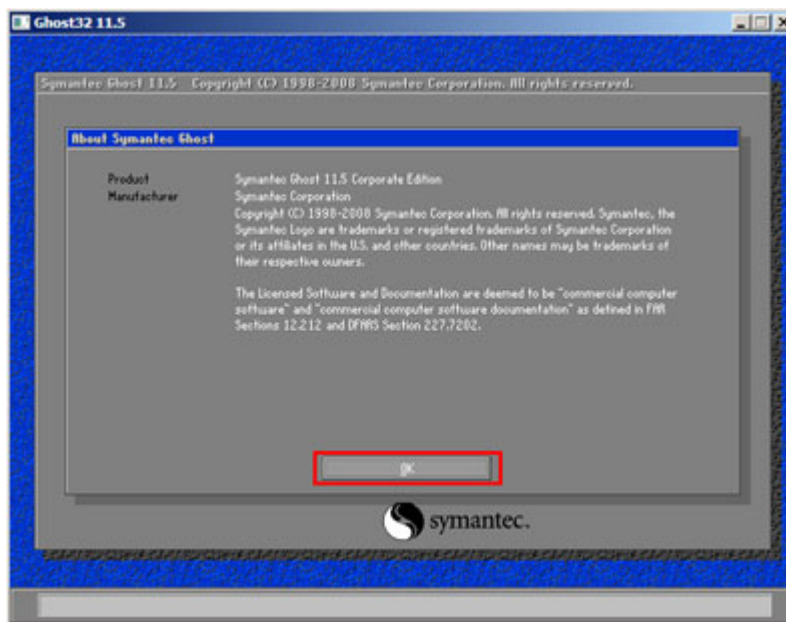


Figure A-9: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure A-10**).

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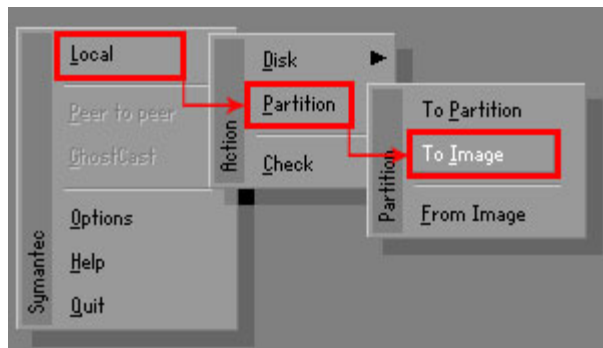


Figure A-10: Symantec Ghost Path

Step 5: Select the local source drive as shown in **Figure A-11**. Then click OK.

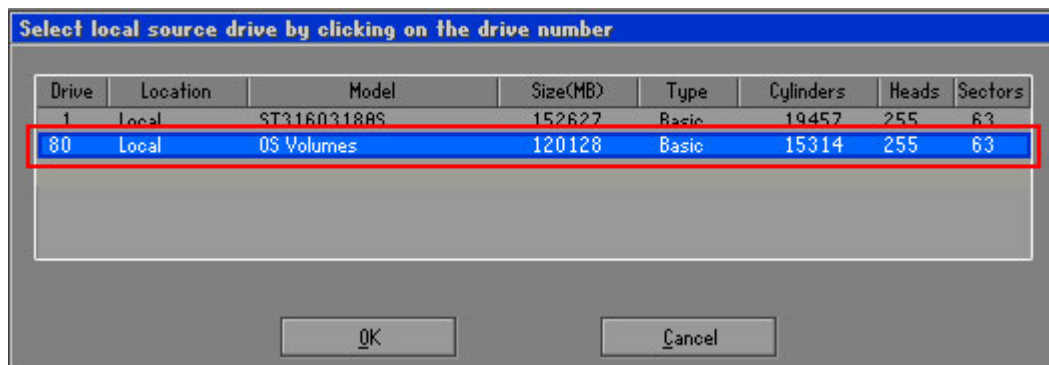


Figure A-11: Select a Local Source Drive

Step 6: Select a source partition from basic drive as shown in **Figure A-12**. Then click OK.

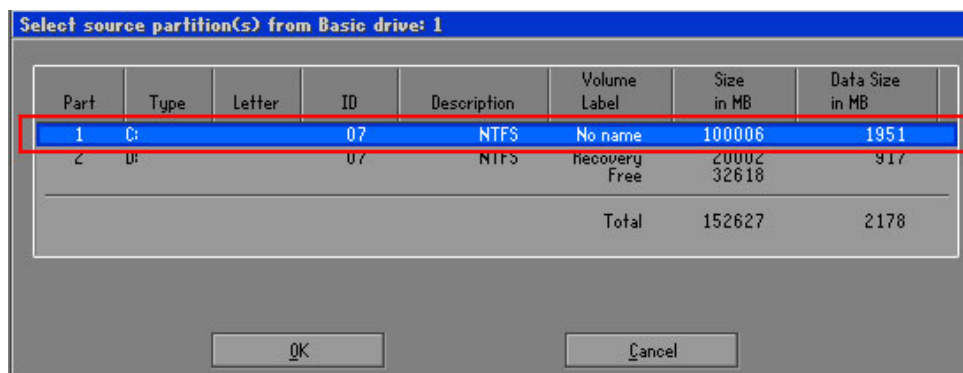


Figure A-12: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (Figure A-13). 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**.

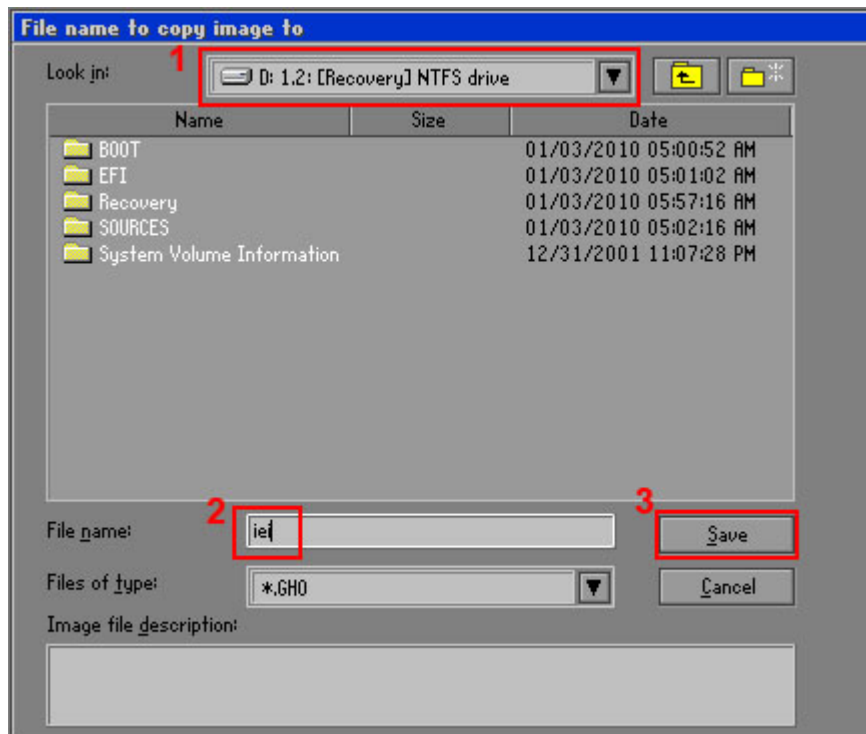


Figure A-13: File Name to Copy Image to

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Step 8: When the Compress Image screen in **Figure A-14** prompts, click **High** to make the image file smaller.

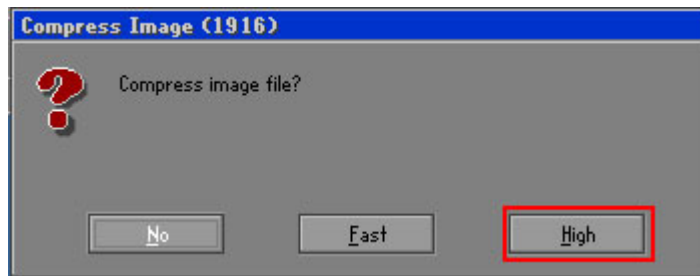


Figure A-14: Compress Image

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

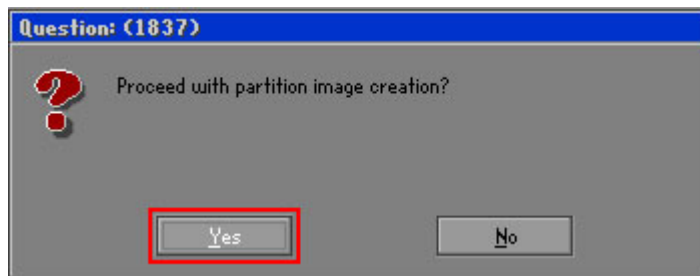


Figure A-15: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure A-16**).

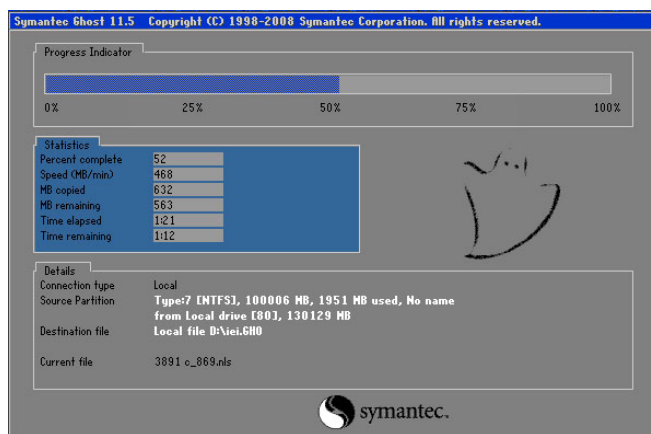


Figure A-16: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure A-18**.

Click **Continue** and close the Ghost window to exit the program.

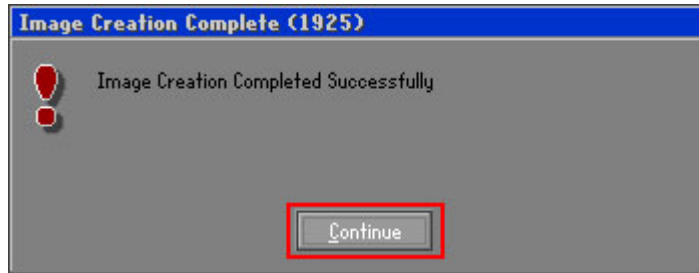


Figure A-17: Image Creation Complete

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

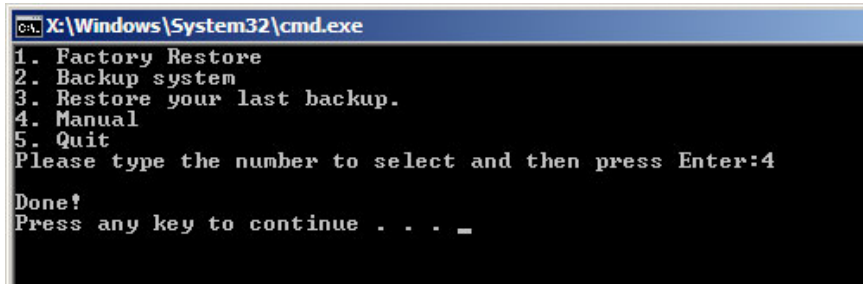


Figure A-18: Press Any Key to Continue

A.3 Setup Procedure for Linux

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

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

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

**NOTE:**

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

While installing Linux OS, please create two partitions:

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

**NOTE:**

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

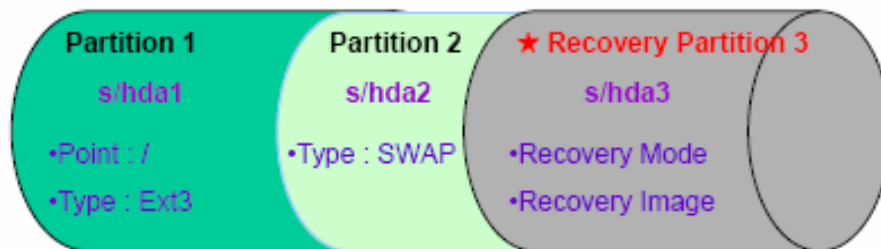


Figure A-19: Partitions for Linux

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-20**). 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.

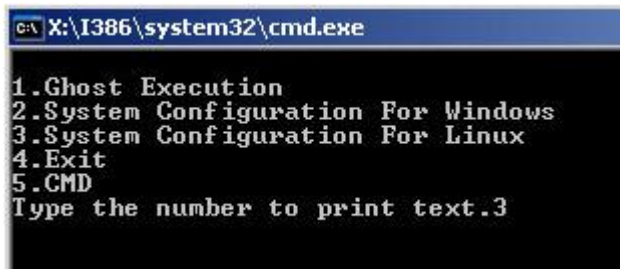


Figure A-20: System Configuration for Linux

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

```
cd /boot/grub
```

```
vi menu.lst
```

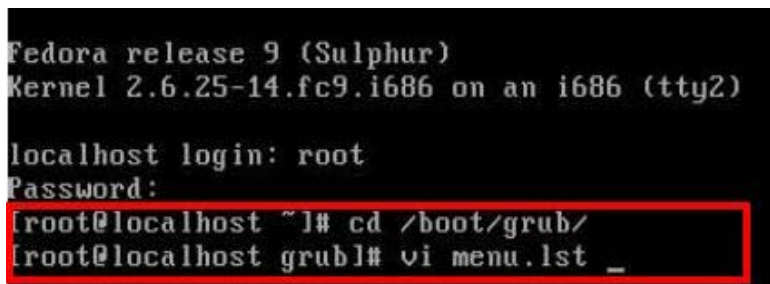


Figure A-21: Access menu.lst in Linux (Text Mode)

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

```
#boot=/dev/sda
default=0
timeout=10 ← Modify timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.25-14.fc9.i686)
    root (hd0,0)
    kernel /vmlinuz-2.6.25-14.fc9.i686 ro root=UUID=10f1acd
ac38b5c78910 rhgb quiet
    initrd /initrd-2.6.25-14.fc9.i686.img

title Recovery Partition
root (hd0,2)
makeactive ← Type command
chainloader +1
```

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

Step 7: The recovery tool menu appears. (Figure A-22)

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

Figure A-22: Recovery Tool Menu

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

A.4 Recovery Tool Functions

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

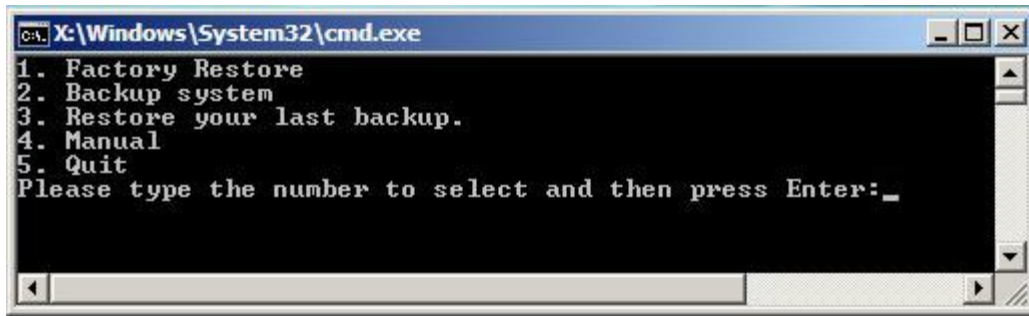


Figure A-23: Recovery Tool Main Menu

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).

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A.4.1 Factory Restore

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

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

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

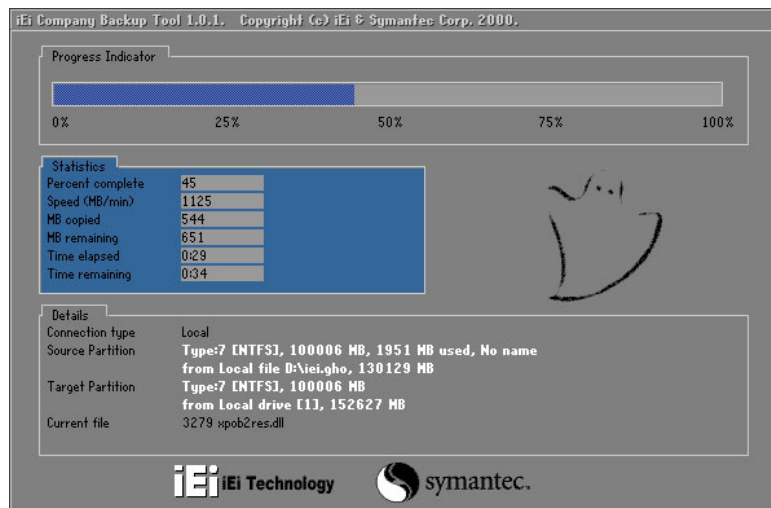


Figure A-24: Restore Factory Default

Step 3: The screen is shown as in **Figure A-25** when completed. Press any key to reboot the system.

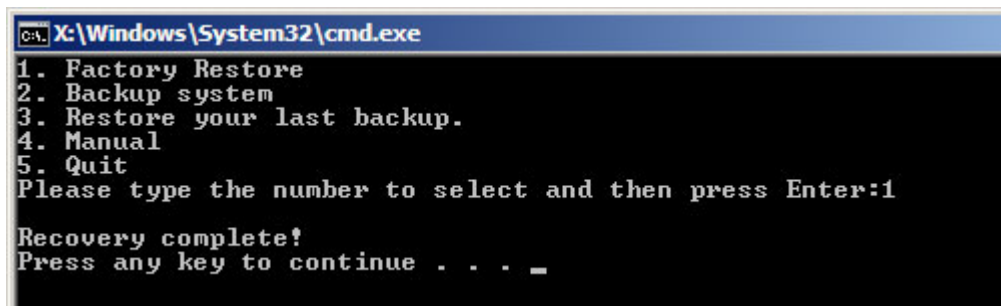


Figure A-25: Recovery Complete Window

A.4.2 Backup System

To backup the system, please follow the steps below.

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

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

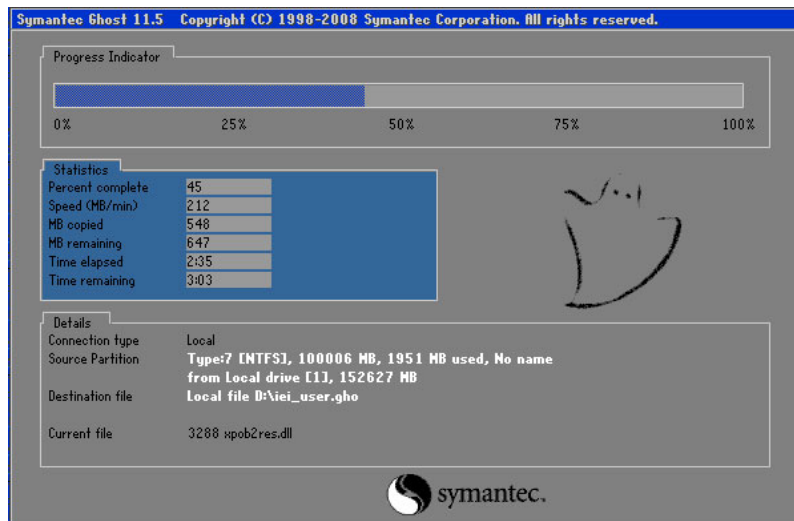


Figure A-26: Backup System

Step 3: The screen is shown as in **Figure A-25** when system backup is completed.

Press any key to reboot the system.

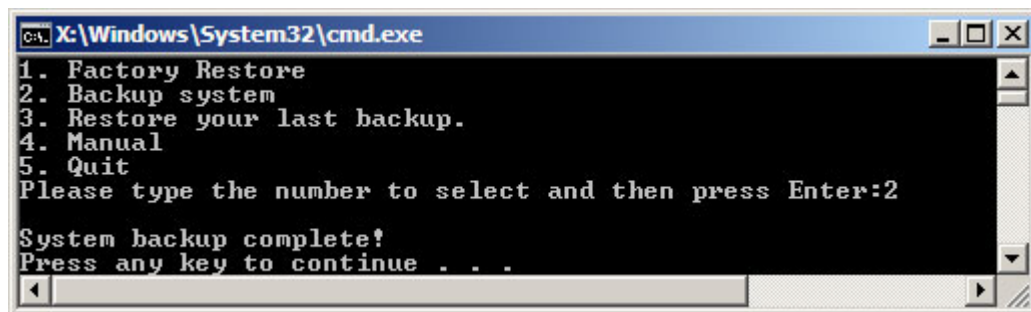


Figure A-27: System Backup Complete Window

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A.4.3 Restore Your Last Backup

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

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

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

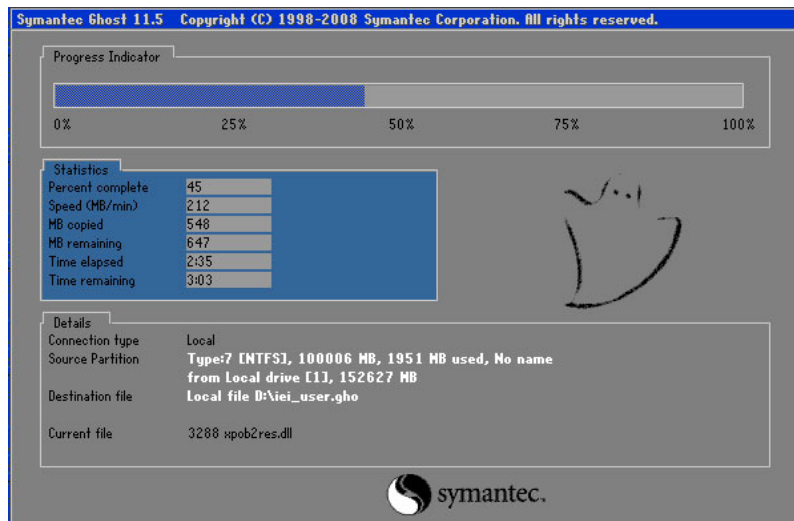


Figure A-28: Restore Backup

Step 3: The screen is shown as in **Figure A-25** when backup recovery is completed. Press any key to reboot the system.

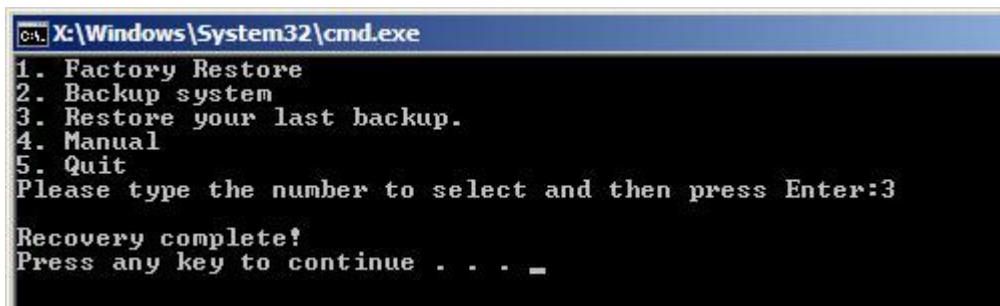


Figure A-29: Restore System Backup Complete Window

A.4.4 Manual

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

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

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

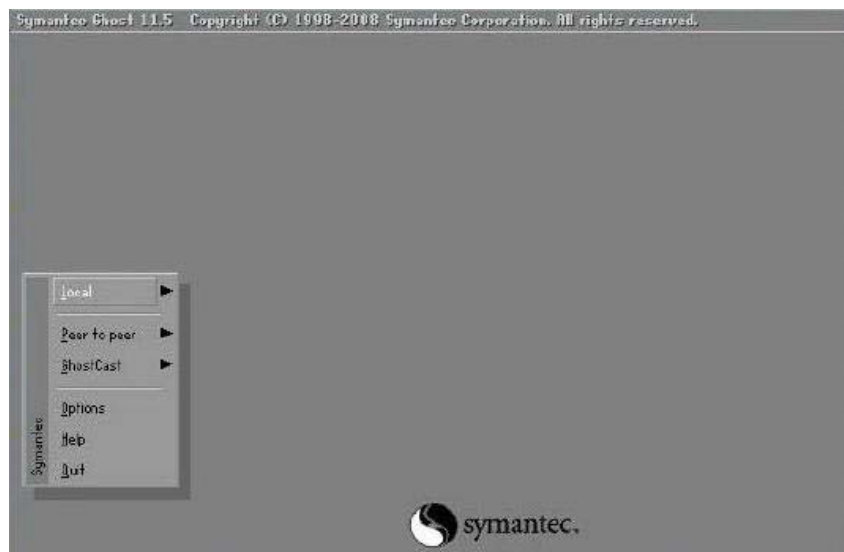


Figure A-30: Symantec Ghost Window

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

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 ECN-381B.

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

B.1.1 General Safety Precautions

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

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

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B.1.2 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the ECN-381B may result in permanent damage to the ECN-381B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECN-381B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECN-381B 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 anti-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component:*** When handling the electrical component, hold the electrical component by its edges.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECN-381B, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECN-381B, please read the details below.

- The interior of the ECN-381B does not require cleaning. Keep fluids away from the ECN-381B interior.

- Be cautious of all small removable components when vacuuming the ECN-381B.
- Turn the ECN-381B off before cleaning the ECN-381B.
- Never drop any objects or liquids through the openings of the ECN-381B.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECN-381B.
- Avoid eating, drinking and smoking within vicinity of the ECN-381B.

B.2.2 Cleaning Tools

Some components in the ECN-381B 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 ECN-381B.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECN-381B.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the ECN-381B.
- **Using solvents** – The use of solvents is not recommended when cleaning the ECN-381B 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 ECN-381B. Dust and dirt can restrict the airflow in the ECN-381B and cause its circuitry to corrode.
- **Cotton swabs** - Cotton swabs 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.

ECN-381B Multimedia Box

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

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

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

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

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

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

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