



IEI Technology Corp.

MODEL:
DRPC-100



Fanless Embedded System with Intel® Atom™ N2800 CPU, DIN Rail Mounting Support, OLED Display or LED Indicators, Dual GbE, USB, DIO, CAN-bus, Serial Ports, 9V~28V DC Power Input, RoHS Compliant

User Manual

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Revision

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30 November, 2012	1.01	Updated the operating temperature range, packing list and DIN rail mounting method
16 November, 2012	1.00	Initial release

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4Chapter

1

Introduction

1.1 Overview



Figure 1-1: DRPC-100

The DRPC-100 fanless embedded system is powered by the Intel® Atom™ N2800 processor and uses the Intel® NM10 chipset. It is designed for harsh environment applications and supports DIN rail mounting method.

The DRPC-100 accepts a wide range of DC power input (9V~28V), allowing it to be powered anywhere. Four USB 2.0, two GbE, two RS-232, two RS-422/485, two CAN-bus and one 8-bit DIO provide rich I/O options for various applications.

1.2 Model Variations

The model variations of the DRPC-100 are listed below.

Model No.	Indicators
DRPC-100-CV-LED-R10	LED
DRPC-100-CV-OLED-R10	OLED

Table 1-1: DRPC-100 Model Variations

DRPC-100 Embedded System

1.3 Features

The DRPC-100 features are listed below:

- Intel® Atom™ N2800 processor
- Low power consumption
- Fanless design
- DIN rail mounting support
- Intel® GMA 3650 with 640 MHz graphics core speed supports Blu-ray 2.0, DirectX 9, MPEG-2, H.264, C-1 and 1080p decoding
- Supports 1066 MHz DDR3 SO-DIMM (up to 4 GB)
- Supports one mSATA, one SATA DOM and one CompactFlash®
- Wide range DC power input (9V~28V)
- Extended temperature fanless design supports -25°C~65°C (with SSD)
- One PCIe Mini card slot
- Serial, CAN-bus and DIO interfaces with isolation protection
- Supports two GbE, four USB 2.0, two RS-232, two RS-422/485, two CAN-bus and one 8-bit DIO
- LED indicators (DRPC-100-CV-LED only)
- Programmable OLED display (DRPC-100-CV-OLED only)
- RoHS compliant

1.4 Connector Panel

1.4.1 Front Panel

The DRPC-100 front panel contains:

- 2 x RJ-45 Gigabit LAN ports
- 2 x RS-232 serial ports with isolation
- 2 x RS-422/485 serial ports with isolation
- 4 x USB 2.0 ports
- LED or OLED indicators
- Function keys (DRPC-100-CV-OLED only)

An overview of the front panel is shown in **Figure 1-2**.

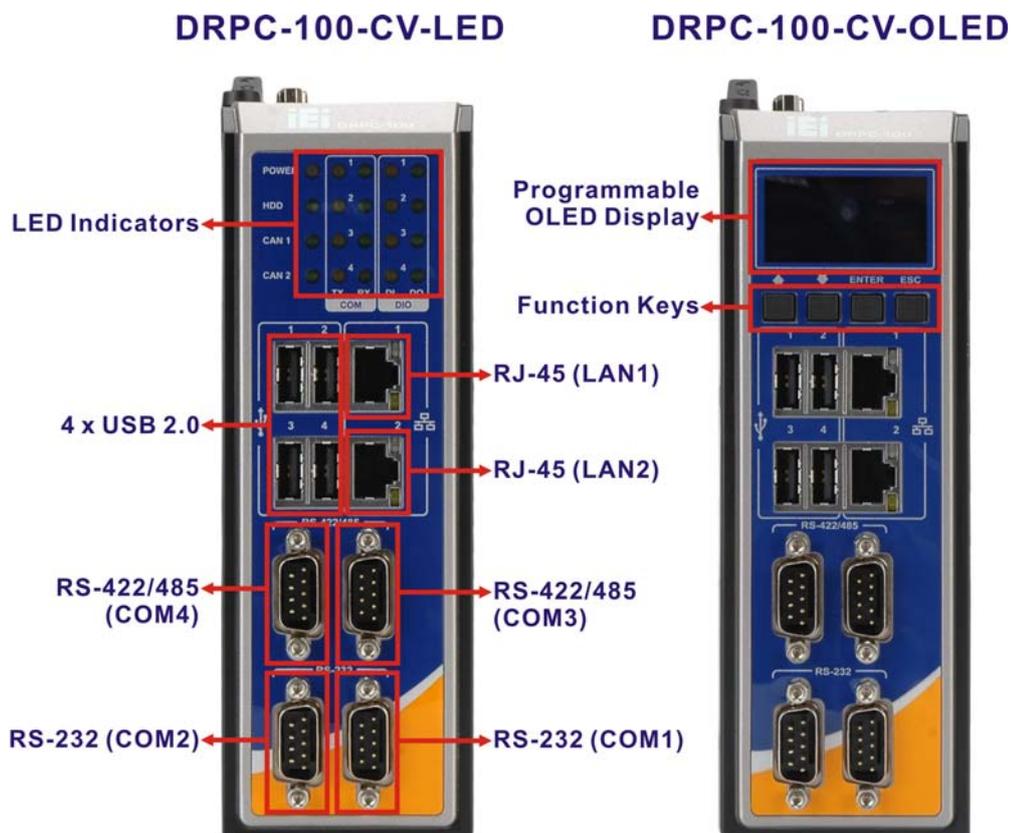


Figure 1-2: DRPC-100 Front Panel

DRPC-100 Embedded System

1.4.2 Top Panel

The DRPC-100 top panel contains:

- 1 x AT/ATX power switch
- 1 x CompactFlash® card slot
- 1 x 9V~28V DC power terminal block
- 1 x Power button
- 1 x Reset button
- 1 x VGA connector
- 2 x CAN-bus (Phoenix terminal block with 3KV isolation protection)
- 1 x 8-bit digital I/O (Phoenix terminal block with 3KV isolation protection, 4-bit input/4-bit output)

An overview of the top panel is shown in **Figure 1-3** below.

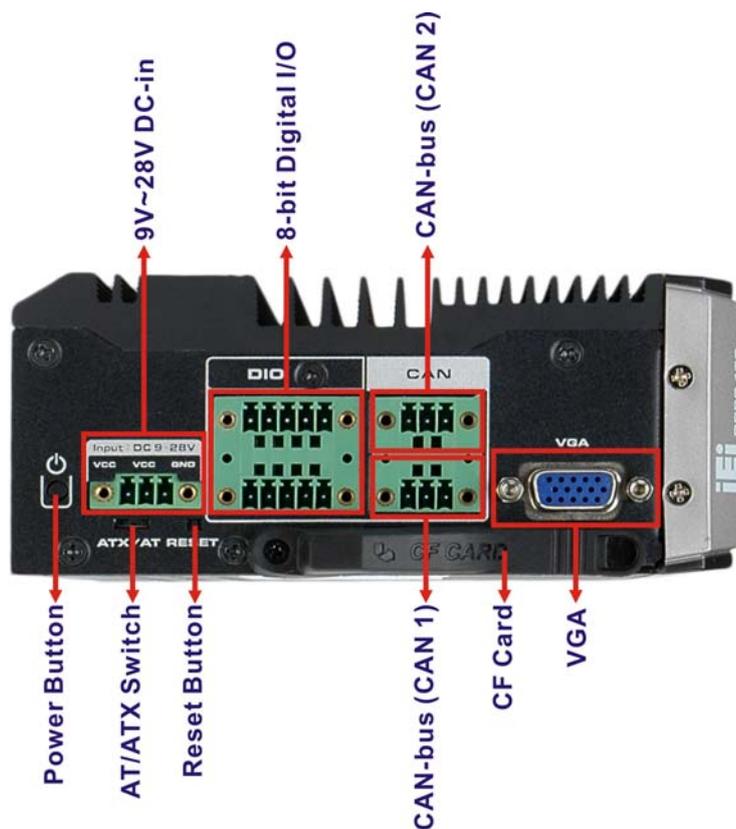


Figure 1-3: DRPC-100 Top Panel

1.5 LED Indicators (DRPC-100-CV-LED Only)

The LED indicators on the front panel of the DRPC-100-CV-LED are shown in **Figure 1-4**.

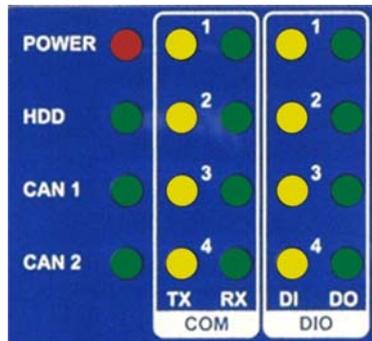


Figure 1-4: DRPC-100-CV-LED LED Indicators

All the LED definitions are listed in **Table 1-2**.

LED	Color	Status	Description
POWER	Red	On	System power is on
		Off	System power is off
HDD	Green	Blinking	Storage device accessing
		Off	Storage device not accessing
CAN 1~2	Green	On	Active
		Off	Inactive
COM TX 1~4	Yellow	On	COM port is transmitting data
		Off	COM port is not transmitting data
COM RX 1~4	Green	On	COM port is receiving data
		Off	COM port is not receiving data
DIO DI 1~4*	Yellow	On	Active
		Off	Inactive
DIO DO 1~4*	Green	On	Active
		Off	Inactive

* When the DIO is set to pull-high, the DIO LED indicators always light up.
When the DIO is set to pull-low, the DIO LED indicators are always off.

Table 1-2: DRPC-100-CV-LED LED Definitions

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1.6 Programmable OLED Display (DRPC-100-CV-OLED Only)

For programming the OLED display on the front panel of the DRPC-100-CV-OLED, refer to **Chapter 6**.

1.7 Technical Specifications

The DRPC-100 technical specifications are listed in **Table 1-3**.

Specifications	
System	
CPU	1.86 GHz Intel® Atom™ N2800 dual-core processor
Chipset	Intel® NM10
Memory	1 x 2 GB 204-pin 1066 MHz DDR3 SO-DIMM (system max. 4 GB)
Ethernet Controller	Dual GbE by Realtek RTL8111E controllers
Storage	
SATA	mSATA and SATA DOM support
CompactFlash®	1 x CompactFlash® card slot
I/O and Indicators	
Ethernet	2 x RJ-45 ports
RS-232	2 x DB-9 serial ports with 3KV isolation protection
RS-422/RS-485	2 x DB-9 serial ports with 3KV isolation protection
USB	4 x USB 2.0 ports
Display	1 x VGA port (supports resolution up to 1920 x 1200@ 60Hz)
Digital I/O	1 x Phoenix terminal block with 3KV isolation protection (8-bit, 4-bit input/4-bit output)
CAN-bus	1 x Phoenix terminal block with 3KV isolation protection (supports 2-port CAN-bus)
Interior Expansion	1 x PCIe Mini card slot (full size)
Indicators	LED (for DRPC-100-CV-LED-R10) OLED (for DRPC-100-CV-OLED-R10)

Specifications	
Buttons	Power button Reset button
Power	
Power Input	9V~28V DC (3-pin terminal block)
Power Consumption	12V@1.85A (1.86 GHz Intel® Atom™ N2800 dual-core CPU with 2 GB 1066 MHz DDR3 SO-DIMM)
AT/ATX Mode	AT/ATX switch
Environmental and Mechanical	
Mounting	DIN rail, desktop
Operating Temperature	-25°C~65°C (with SSD)
Storage Temperature	-25°C~70°C
Humidity	5%~95%, non-condensing
Chassis Construction	Extruded aluminum alloy for fanless support
Chassis Color	Black
Operating Shock	Half-sine shock test 5G/11ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5 C-1 (HDD), MIL-STD-810F 514.5 C-2 (SSD)
Safety	CE/FCC
Weight (Net/Gross)	1 Kg/2 Kg
Physical Dimensions	59.4 mm x 170 mm x 140 mm (W x H x D)

Table 1-3: Technical Specifications

DRPC-100 Embedded System

1.8 Dimensions

The physical dimensions are shown below:

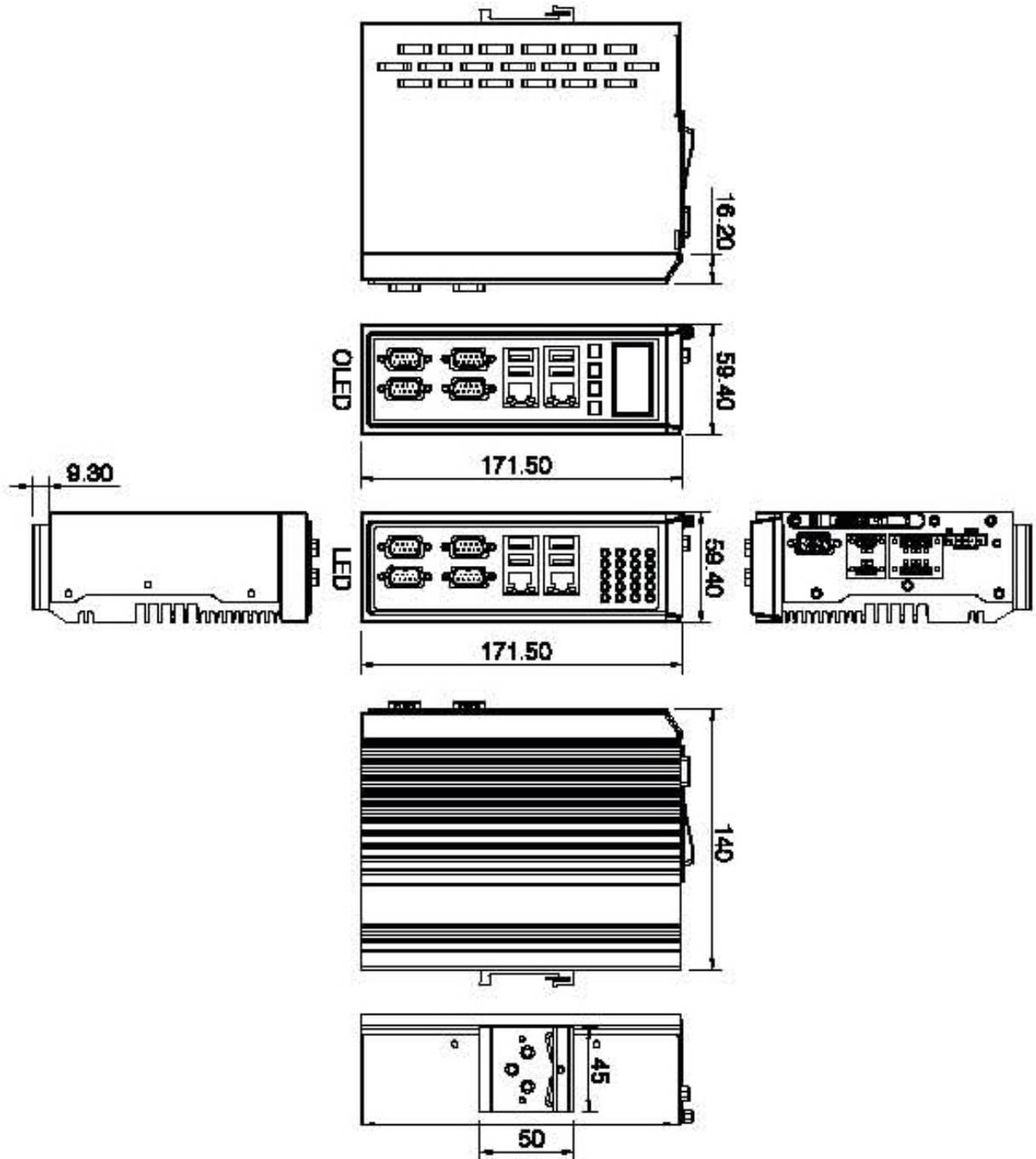


Figure 1-5: Physical Dimensions (millimeters)



Chapter

2

Unpacking

DRPC-100 Embedded System

2.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the DRPC-100 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the DRPC-100. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the DRPC-100 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 DRPC-100, place it on an anti-static pad. This reduces the possibility of ESD damaging the DRPC-100.

2.2 Unpacking Precautions

When the DRPC-100 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 DRPC-100 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 DRPC-100 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The DRPC-100 is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	DRPC-100	 or
3	3-pin terminal block	
2	5-pin terminal block	
1	DIN rail mounting bracket (50 mm x 45 mm x 8.7 mm)	
3	Mounting bracket screw (P/N: 44015-030051-RS)	

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Quantity	Item and Part Number	Image
Standard		
2	Screw (for securing an PCIe Mini card) (P/N: 44003-020031-RS)	
1	One Key Recovery CD	
1	User manual and driver CD	

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

Optional	
Power adapter (P/N: 63000-FSP036RAB610-RS)	
Power cord, European standard, 1830 mm (P/N: 32000-000002-RS)	
Power cord, American standard, 1830 mm (P/N: 32000-000025-RS)	
Power cable, DC jack (5.5x2.5) to 3-pin terminal block, 200 mm (P/N: 32102-026500-100-RS)	
Flash disk, mSATA, 2GB~32GB, 0°C ~ 70°C (P/N: IPE-5200IM-xxx)	
Flash disk, mSATA, 2GB~32GB, -40°C ~ 85°C (P/N: IPE-5200VM-xxx)	



Chapter

3

Installation

DRPC-100 Embedded System

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 DRPC-100, installation instructions and configuration options.
- **DANGER! Disconnect Power:** Power to the DRPC-100 must be disconnected during the installation process. Failing to disconnect the power may cause severe injury to the body and/or damage to the system.
- **Qualified Personnel:** The DRPC-100 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 DRPC-100. The DRPC-100's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the DRPC-100. Leave at least 5 cm of clearance around the DRPC-100 to prevent overheating.
- **Grounding:** The DRPC-100 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 DRPC-100.

3.1.1 High Surface Temperature



WARNING:

Some surfaces of the equipment may become hot during operation.

The surface temperature may be up to several tens of degrees hotter than the ambient temperature. Under these circumstances, the equipment needs to be protected against accidental contact.

The equipment is intended for installation in a RESTRICTED ACCESS LOCATION.

- Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

3.2 CF Card Installation

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

Step 1: Locate the CF card slot on the top panel of the DRPC-100.

Step 2: Release the retention screw that secures the CF card slot cover, and then open the cover as shown in **Figure 3-1**.



Figure 3-1: CF Card Slot Cover

Step 3: Insert the CF card into the slot (**Figure 3-2**).

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Figure 3-2: CF Card Installation

Step 4: Replace the CF card slot cover and secure it with the retention screw (**Figure 3-3**).



Figure 3-3: Replacing the CF Card Slot Cover

3.3 Motherboard Removal

Before the jumper settings can be configured and the mSATA SSD can be installed, the motherboard must be removed from the DRPC-100. Follow the steps below to complete the task.

Step 1: Remove the retention screws indicated in **Figure 3-4**.



Figure 3-4: Retention Screws

Step 2: Remove the hex nuts on the front panel (**Figure 3-5**). Gently pull the front panel out of the DRPC-100.



Figure 3-5: Hex Nuts on the Front Panel

Step 3: Remove the hex nuts on the top panel (**Figure 3-6**). Gently pull the top panel out of the DRPC-100.

DRPC-100 Embedded System



Figure 3-6: Hex Nuts on the Top Panel

Step 4: Lift the motherboard secured with the side cover off the DRPC-100.

Step 5: Release the motherboard from the side cover by removing the four retention screws (**Figure 3-7**) on the solder side of the motherboard.

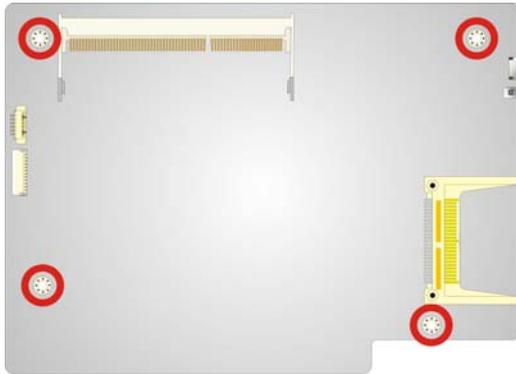


Figure 3-7: Retention Screws on the Motherboard

3.4 mSATA SSD Installation

The DRPC-100 has one PCIe Mini slot on the motherboard for mSATA SSD installation. To install the mSATA SSD, follow the instructions below.

Step 1: Before accessing the motherboard, it has to be removed from the DRPC-100.

Following the instruction described in **Section 3.3** to complete the task.

Step 2: Locate the PCIe Mini slot on the motherboard (**Figure 3-8**).



Figure 3-8: PCIe Mini Slot Location

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20° (Figure 3-9).

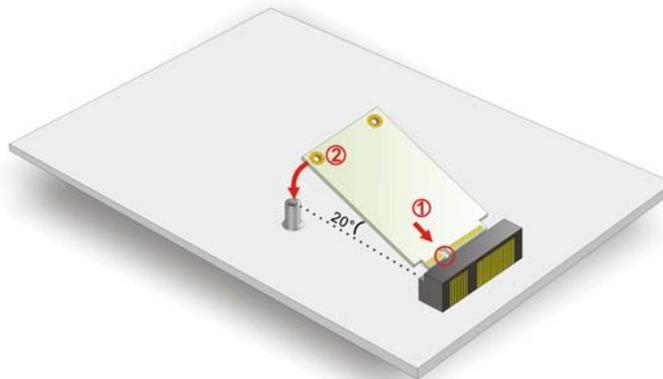


Figure 3-9: Inserting the PCIe Mini Card into the Socket

Step 4: Secure the PCIe Mini card. Secure the PCIe Mini card with the supplied retention screws (Figure 3-10).

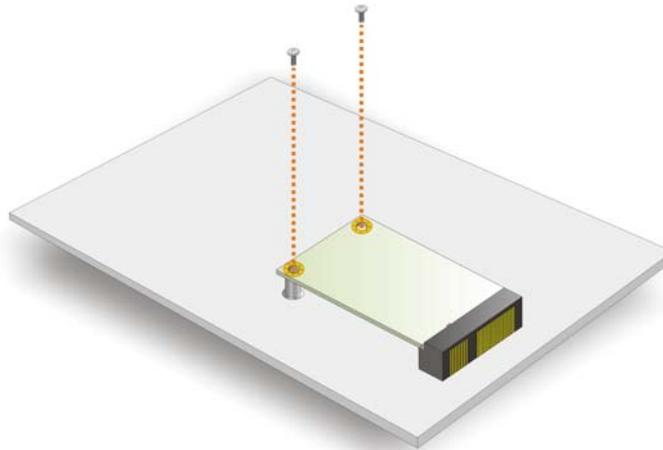


Figure 3-10: Securing the PCIe Mini Card

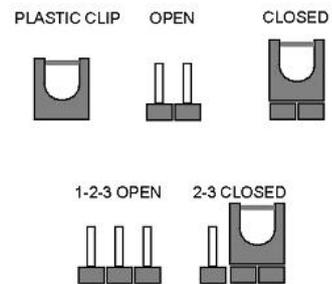
Step 5: Reassemble the whole system.

3.5 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.



The jumpers on the DRPC-100 motherboard are listed in **Table 3-1**. The JP3 and JP4 jumpers are preconfigured for the DRPC-100. Users should not change these jumpers.

Description	Label	Type
Clear CMOS	JP1	3-pin header

CAN-bus 1 long wire transmitting	JP3	2-pin header
CAN-bus 2 long wire transmitting	JP4	2-pin header

Table 3-1: Jumpers

3.5.1 Access the Jumpers

To access the jumpers, the motherboard has to be removed from the DRPC-100. Follow the instruction described in **Section 3.3** to complete the task.

3.5.2 Clear CMOS Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Settings:	See Table 3-2
Jumper Location:	See Figure 3-11

If the DRPC-100 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 the pins for a few seconds then remove the jumper clip.

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 3-2**.

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

Table 3-2: Clear CMOS Jumper Settings

DRPC-100 Embedded System

The clear CMOS jumper location is shown in **Figure 3-11** below.

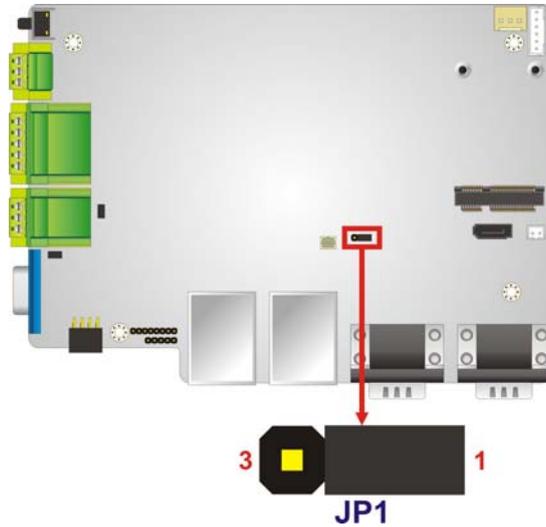


Figure 3-11: Clear CMOS Jumper Location

3.6 AT/ATX Mode Selection

AT and ATX power modes can both be used on the DRPC-100. The selection is made through an AT/ATX switch on the top panel as shown below (**Figure 3-12**).

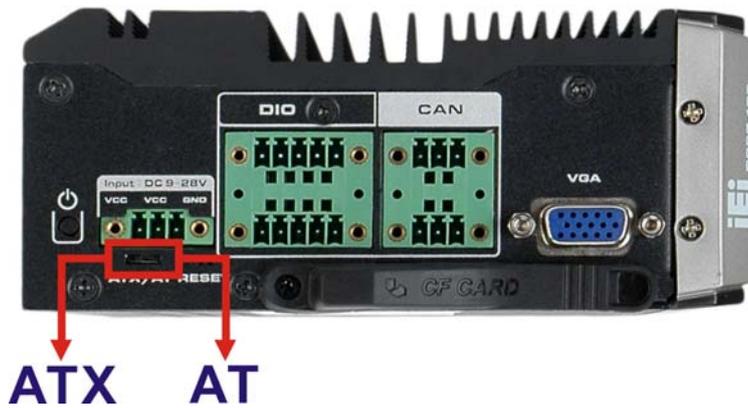


Figure 3-12: AT/ATX Switch Location

3.7 Mounting the System

The DRPC-100 embedded system can be mounted onto a DIN rail. Follow the steps below to complete the task.

- Step 1:** Attach the supplied DIN rail mounting bracket to the rear panel of the embedded system. Secure the bracket to the embedded system with there retention screws (**Figure 3-13**).



Figure 3-13: DIN Rail Mounting Bracket

- Step 2:** Attach the upper edge of the DIN rail to the mounting bracket as shown in **Figure 3-14**.



Figure 3-14: Attach the DIN Rail to the Mounting Bracket

DRPC-100 Embedded System

Step 3: Push the DIN rail inward until it clips in place (**Figure 3-15**).



Figure 3-15: Mounting the DIN Rail

3.8 External Peripheral Interface Connectors

The DRPC-100 has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- 8-bit DIO
- CAN-bus
- Ethernet
- Power input
- RS-232
- RS-422/485
- USB
- VGA

3.8.1 CAN-bus Terminal Block

CN Label:	CAN
CN Type:	2 x 3-pin terminal block
CN Location:	See Figure 1-3
CN Pinouts:	See Table 3-3 and Figure 3-16

The Phoenix terminal block with 3KV isolation protection supports 2-port CAN-bus. The pinouts of the terminal block are shown in the table below.

Pin	Description	Pin	Description
1	CAN1H	2	CAN2H
3	CAN1L	4	CAN2L
5	CAN1_GROUND	6	CAN2_GROUND

Table 3-3: CAN-bus Terminal Block Pinouts

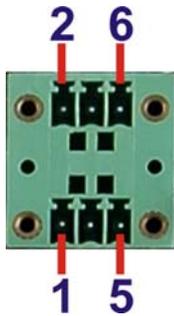


Figure 3-16: CAN-bus Terminal Block Pinout Location

3.8.2 Digital Input/Output Terminal Block

- CN Label:** DIO
- CN Type:** 2 x 5-pin terminal block
- CN Location:** See **Figure 1-3**
- CN Pinouts:** See **Table 3-4** and **Figure 3-17**

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

Pin	Description	Pin	Description
1	DGI_0	2	DGO_0
3	DGI_1	4	DGO_1
5	DGI_2	6	DGO_2
7	DGI_3	8	DGO_3
9	Isolator GND	10	Isolator Vin

Table 3-4: DIO Terminal Block Pinouts

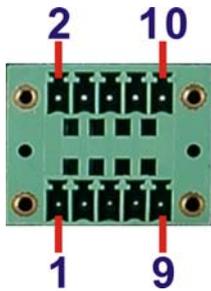


Figure 3-17: DIO Terminal Block Pinout Location

3.8.3 LAN Connectors

- CN Type: RJ-45
- CN Location: See Figure 1-2
- CN Pinouts: See Table 3-5

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 DRPC-100. See **Figure 3-18**.

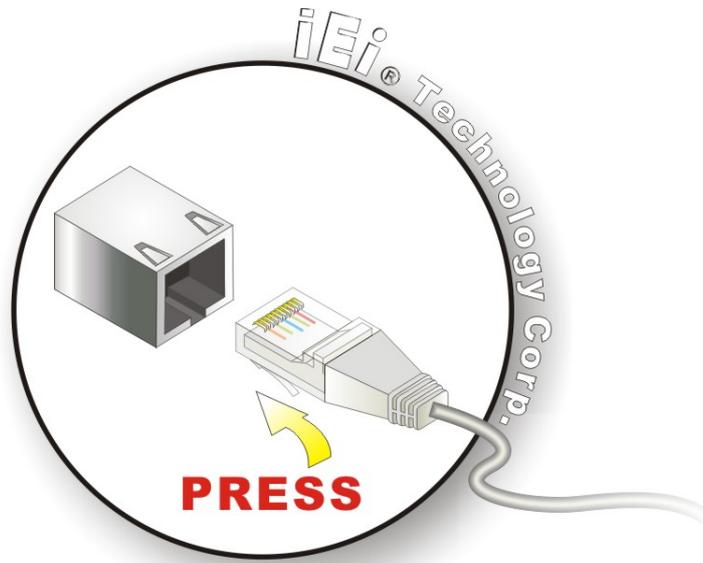


Figure 3-18: LAN Connection

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	MD0+	5	MD2+
2	MD0-	6	MD2-
3.	MD1+	7	MD3+
4.	MD1-	8	MD3-

Table 3-5: LAN Pinouts



Figure 3-19: 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 3-6.

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 3-6: RJ-45 Ethernet Connector LEDs

3.8.4 Power Input, 3-pin Terminal Block

- CN Type:** 3-pin terminal block
- CN Location:** See **Figure 1-3**
- CN Pinouts:** See **Table 3-7** and **Figure 3-20**

Connect the leads of a 9V~28V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector.

Pin	Description	Pin	Description
1	9~28V input	3	GND
2	9~28V input		

Table 3-7: 3-pin Power Terminal Block Pinouts

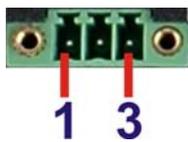


Figure 3-20: 3-pin Power Terminal Block Pinout Location

3.8.5 RS-232 Serial Port Connectors

CN Label:	COM1 and COM2
CN Type:	DB-9 connectors
CN Location:	See Figure 1-2
CN Pinouts:	See Table 3-8 and Figure 3-22

RS-232 serial port devices can be attached to the DB-9 ports on the front 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 3-21**.

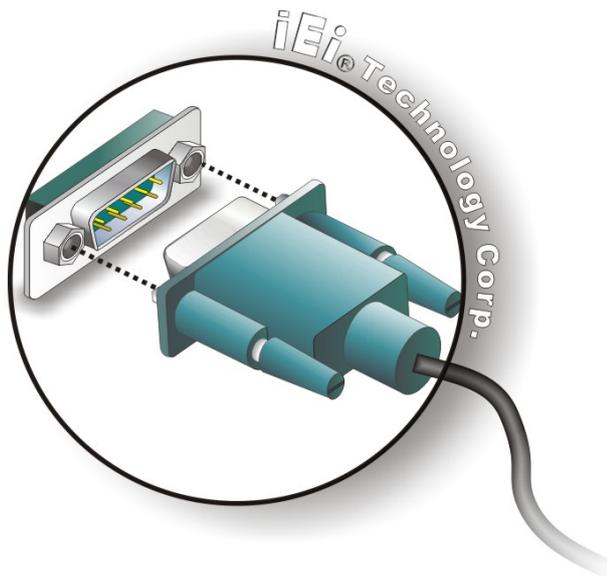


Figure 3-21: RS-232 Serial Device Connector

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.

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

Table 3-8: RS-232 Serial Port Pinouts

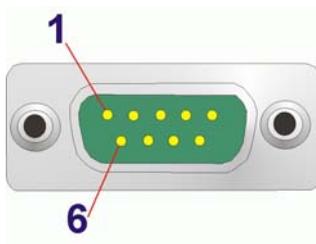


Figure 3-22: RS-232 Serial Port Pinout Location

3.8.6 RS-422/485 Serial Port Connectors

- CN Label:** COM3 and COM4
- CN Type:** DB-9 connectors
- CN Location:** See Figure 1-2
- CN Pinouts:** See Table 3-9 and Figure 3-24

RS-422/485 serial port devices can be attached to the DB-9 ports on the front 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 3-23.

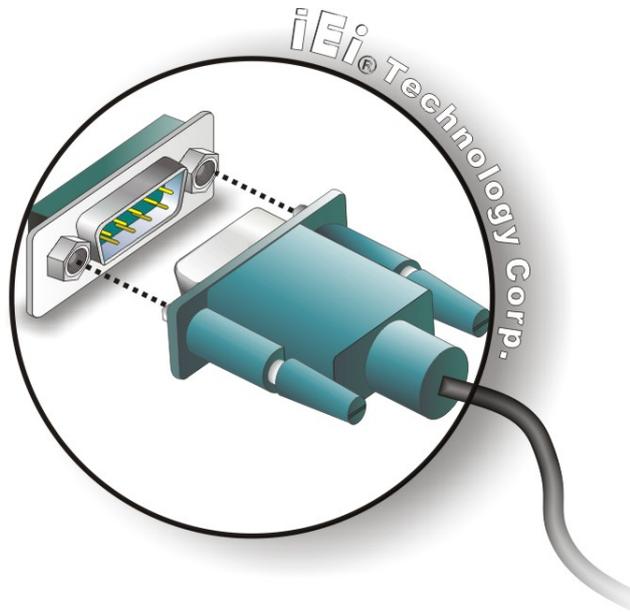


Figure 3-23: RS-422/485 Serial Device Connector

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	RS422TX-/RS485D-	6	NC
2	RS422TX+/RS485D+	7	NC
3	RS422RX+	8	NC
4	RS422RX	9	NC
5	GND		

Table 3-9: RS-422/485 Serial Port Pinouts

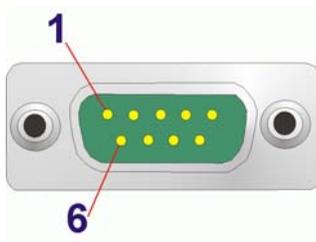


Figure 3-24: RS-422/485 Serial Port Pinout Location

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3.8.7 USB Connectors

CN Type:	USB port
CN Location:	See Figure 1-2
CN Pinouts:	See Table 3-10

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 3-25**.

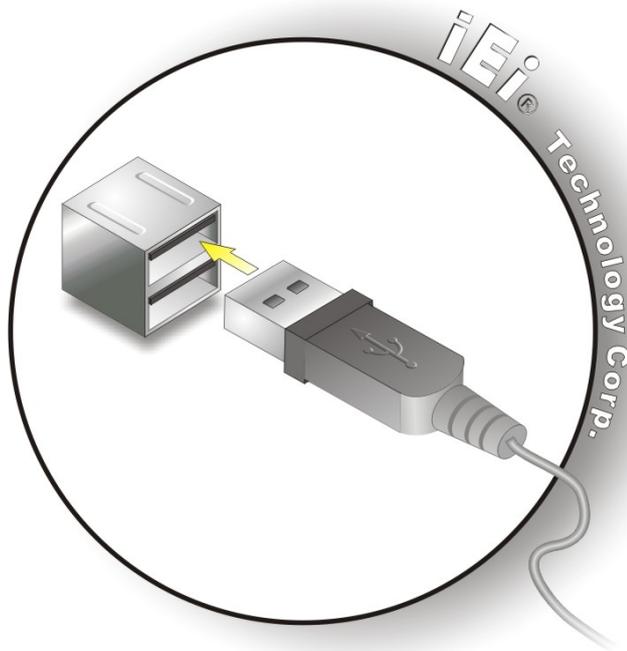


Figure 3-25: USB Device Connection

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

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

Table 3-10: USB Port Pinouts

3.8.8 VGA Connector

- CN Label:** VGA
- CN Type:** 15-pin Female
- CN Location:** See **Figure 1-3**
- CN Pinouts:** See **Figure 3-27** and **Table 3-11**

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 1-3**.
- 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, insert the male connector from the VGA screen cable into the female connector on the DRPC-100. See **Figure 3-26**.

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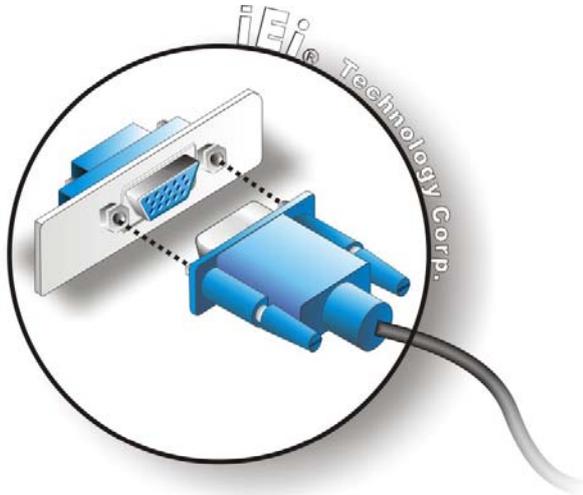


Figure 3-26: VGA Connector

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.

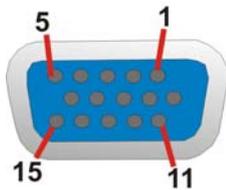


Figure 3-27: VGA Connector

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

Table 3-11: VGA Connector Pinouts

3.9 Driver Installation

**NOTE:**

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset
- VGA
- LAN

To install the drivers, insert the CD into an optical disk drive connected to the system, and then locate the corresponding driver folders to install all the drivers listed above.

Chapter

4

System Maintenance

4.1 System Maintenance Introduction

The following system components may require maintenance.

- Motherboard
- SO-DIMM module

If these components fail, they must be replaced. Please contact the system reseller or vendor to purchase replacement parts. Replacement instructions for the above listed components are described below.



WARNING!

Before accessing any DRPC-100 internal components, make sure all power to the system has been disconnected. Failing to do so may cause severe damage to the DRPC-100 and injury to the user.



WARNING!

Please take antistatic precautions when working with the internal components. The interior of the DRPC-100 contains very sensitive electronic components. These components are easily damaged by electrostatic discharge (ESD). Before working with the internal components, make sure all anti-static precautions described earlier have been observed.

4.2 Motherboard Replacement

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to IEI to be replaced. If the system motherboard has failed, please contact the system vendor, reseller or an IEI sales person directly.

4.3 SO-DIMM Replacement

To install/replace the SO-DIMM modules, please follow the steps below.

Step 1: Remove the motherboard from the DRPC-100. Refer to **Section 3.3**.

Step 2: Locate the SO-DIMM module on the motherboard.

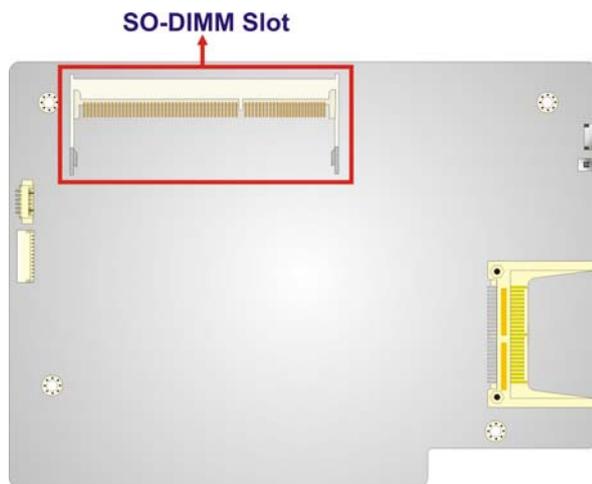


Figure 4-1: SO-DIMM Module Location

Step 3: Release the SO-DIMM module by pulling both the spring retainer clips outward from the socket.

Step 4: Grasp the SO-DIMM module by the edges and carefully pull it out of the socket.

Step 5: Install the new SO-DIMM module by pushing it into the socket at an angle (**Figure 4-2**).

Step 6: Gently push the rear of the SO-DIMM module down (**Figure 4-2**). The spring retainer clips clip into place and secure the SO-DIMM module in the socket.

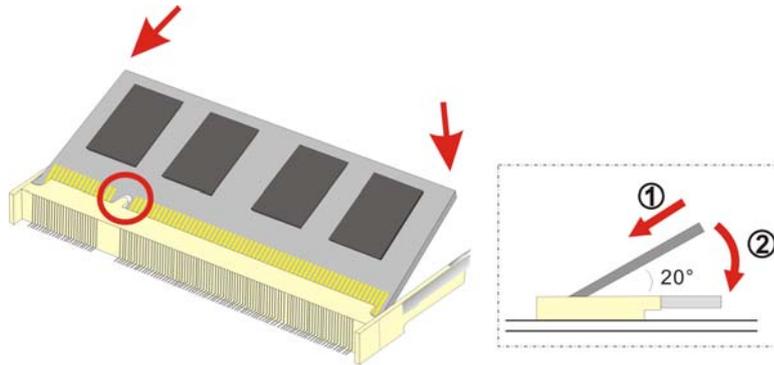


Figure 4-2: SO-DIMM Module Installation

Step 7: Push the new SO-DIMM module until it engages and the white plastic end clips click into place. Make sure the end clips are fully secured after installation.

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

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

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

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load 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 are made, CMOS defaults. Use the jumper described in Chapter 3.

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
Core Version               4.6.5.1 0.13
Compliance                 UEFI 2.3; PI 1.2
Project Version            E407AR06.ROM
Build Date and Time       06/21/2012 11:53:40

System Date                [Wed 10/24/2012]
System Time                [15:10:27]

Access Level               Administrator

Set the Date. Use Tab to
switch between Data
elements.

-----

-><: 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 1: Main

→ System Overview

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

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

The System Overview field also has two user configurable fields:

→ System Date [xx/xx/xx]

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

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→ 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
> CPU Configuration
> IDE Configuration
> USB Configuration
> F81866 Super IO Configuration
> F81866 H/M Monitor
> Serial Port Console Redirection

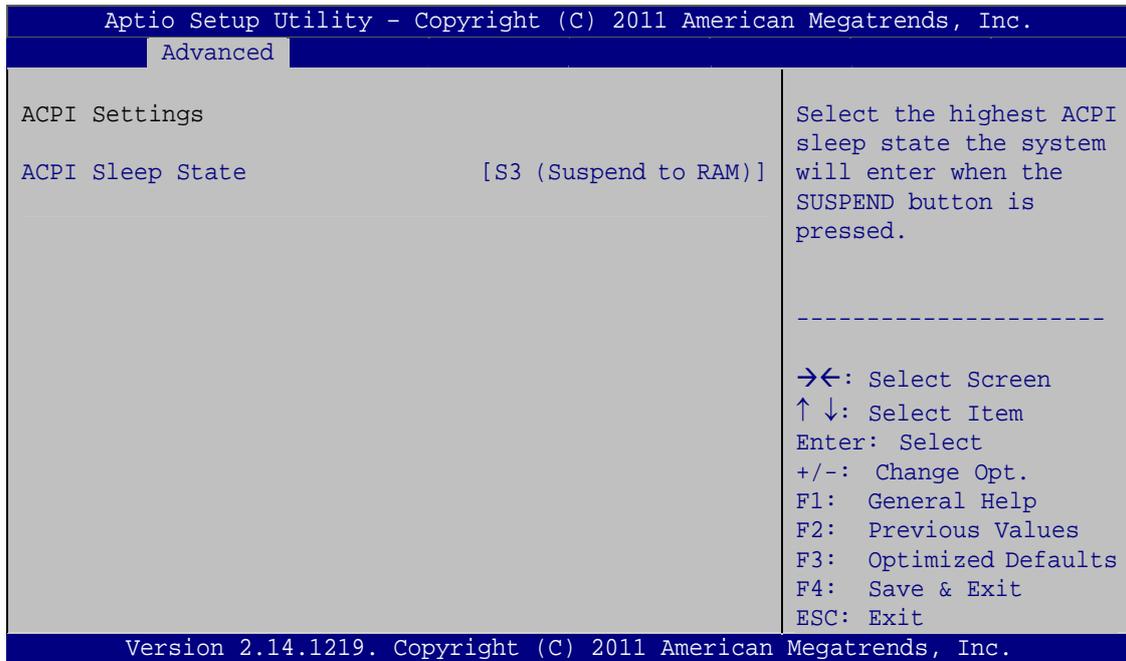
System ACPI Parameters.
-----
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Configuration

→ ACPI Sleep State [S3 (Suspend to RAM)]

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

→ Suspend Disabled

→ S1 (CPU Stop Clock)

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

→ S3 (Suspend to DEFAULT 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.

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5.3.2 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 4**) to view detailed CPU specifications and configure the CPU.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
-----
CPU Configuration
Processor Type           Intel(R) Atom(TM)
                        CPU N2800 @ 1.86GHz
EMT64                   Supported
Processor Speed         1865 MHz
System Bus Speed       533 MHz
Ratio Status            14
Actual Ratio            14
System Bus Speed       533 MHz
Processor Stepping      30661
Microcode Revision      262
L1 Cache RAM            2x56 k
L2 Cache RAM            2x512 k
Processor Core          Dual
Hyper-Threading         Supported

Hyper-Threading         [Enabled]

Enabled for Windows XP
and Linux (OS optimized
for Hyper-Threading
Technology) and Disabled
for other OS (OS not
optimized for
Hyper-Threading
Technology).

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

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

BIOS Menu 4: CPU Configuration

The CPU Configuration menu (**BIOS Menu 4**) lists the following CPU details:

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

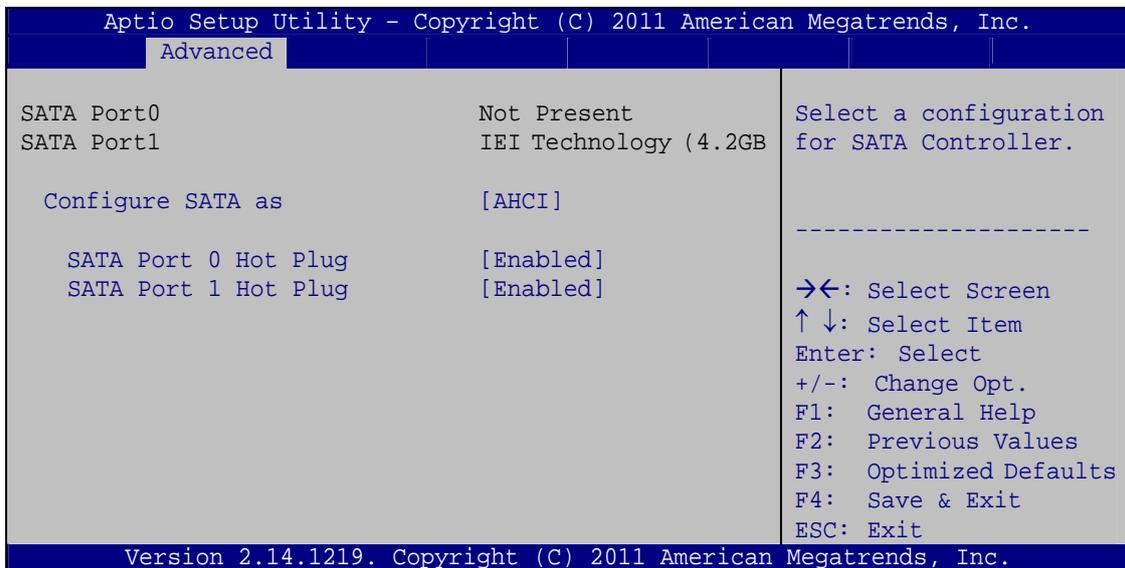
→ Hyper-Threading [Enabled]

Use the **Hyper-Threading** function to enable or disable the Intel Hyper-Threading Technology.

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

5.3.3 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 5**) to change and/or set the configuration of the SATA devices installed in the system.


BIOS Menu 5: IDE Configuration
→ Configure SATA as [AHCI]

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

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

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→ SATA Port 0/1 Hot Plug [Enabled]

Use the **SATA Port 0/1 Hot Plug** option to enable or disable the hot-plug function of the SATA port 0 or 1.

- **Enabled** **DEFAULT** Enables the hot-plug function of the SATA port.
- **Disabled** Disables the hot-plug function of the SATA port..

5.3.4 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 6**) to read USB configuration information and configure the USB settings.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
-----
USB Configuration
USB Devices:
  1 Keyboard, 1 Mouse
Legacy USB Support                      [Enabled]
-----
USB Support Parameters
-----
→←: 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 6: 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

5.3.5 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the serial ports.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
F81866 Super IO Configuration
F81866 Super IO Chip                      F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration
> Serial Port 5 Configuration

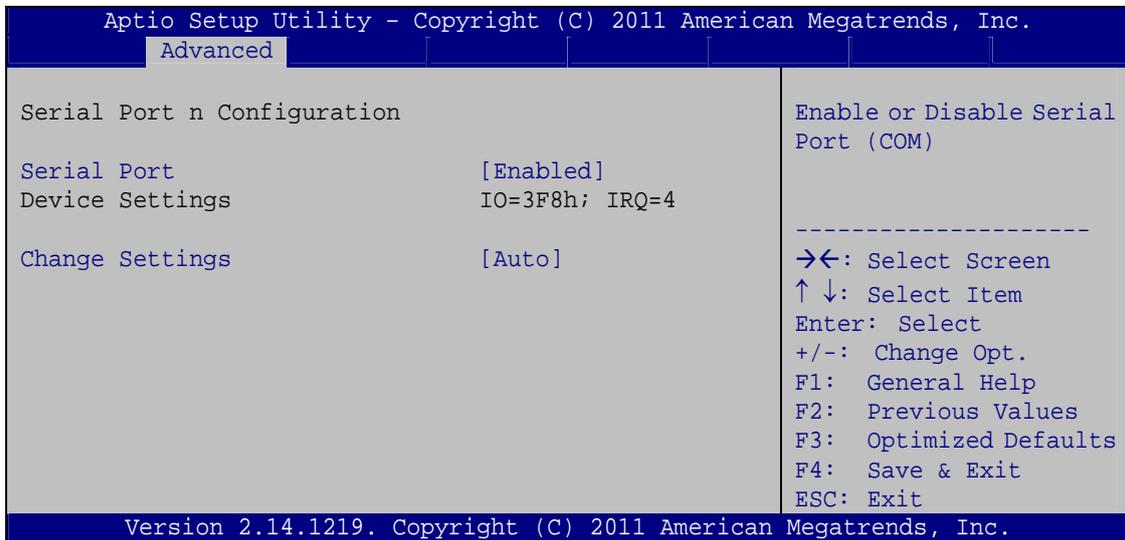
Set Parameters of Serial Port 1 (COMA)
-----
➔⬅: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

BIOS Menu 7: Super IO Configuration

5.3.5.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 8**) to configure the serial port n.



BIOS Menu 8: Serial Port n Configuration Menu

5.3.5.1.1 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,
5, 6, 7, 10,
11, 12

Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2F8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12

Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=3E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12

Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12

Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

5.3.5.1.2 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.

- | | | | |
|---|---|----------------|--|
| → | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| → | IO=3E8h;
IRQ=7 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ7 |
| → | IO=3F8h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |
| → | O=2F8h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |
| → | IO=3E8h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |
| → | IO=2E8h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |
| → | IO=2F0h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |
| → | IO=2E0h;
IRQ=3, 4,
5, 6, 7, 10,
11, 12 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12 |

5.3.5.1.4 Serial Port 4 Configuration

→ **Serial Port [Enabled]**

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

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

→ **Change Settings [Auto]**

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

- **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- **IO=2E8h;**
IRQ=7 Serial Port I/O port address is 2E8h and the interrupt address is IRQ7
- **IO=3F8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **O=2F8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=3E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

- **IO=2F0h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2E0h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

5.3.5.1.5 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=2F0h;**
IRQ=7 Serial Port I/O port address is 2F0h and the interrupt address is IRQ7
- **IO=3F8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

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- **O=2F8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12
Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=3E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12
Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2E8h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12
Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2F0h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12
Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
- **IO=2E0h;**
IRQ=3, 4,
5, 6, 7, 10,
11, 12
Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

5.3.6 F81866 H/W Monitor

The **F81866 H/W Monitor** menu (**BIOS Menu 9**) contains the fan configuration submenus and displays operating temperature, fan speed and system voltages.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
PC Health Status
> Smart Fan Mode Configuration
CPU Temperature           : +51 C
System Temperature       : +49 C
CPU_FAN1 Speed           : N/A
+VCC_CPU                 : +1.200 V
+VCC_GFX                 : +1.680 V
+V1.05S                  : +1.056 V
+V1.5_DDR3               : +1.520 V
VSB5V                    : +4.968 V
+V3.3S                   : +3.360 V
VSB3V                    : +3.328 V
VBAT                     : +3.264 V

Smart Fan Mode Select
-----
-><: 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 9: H/W Monitor
→ PC Health Status

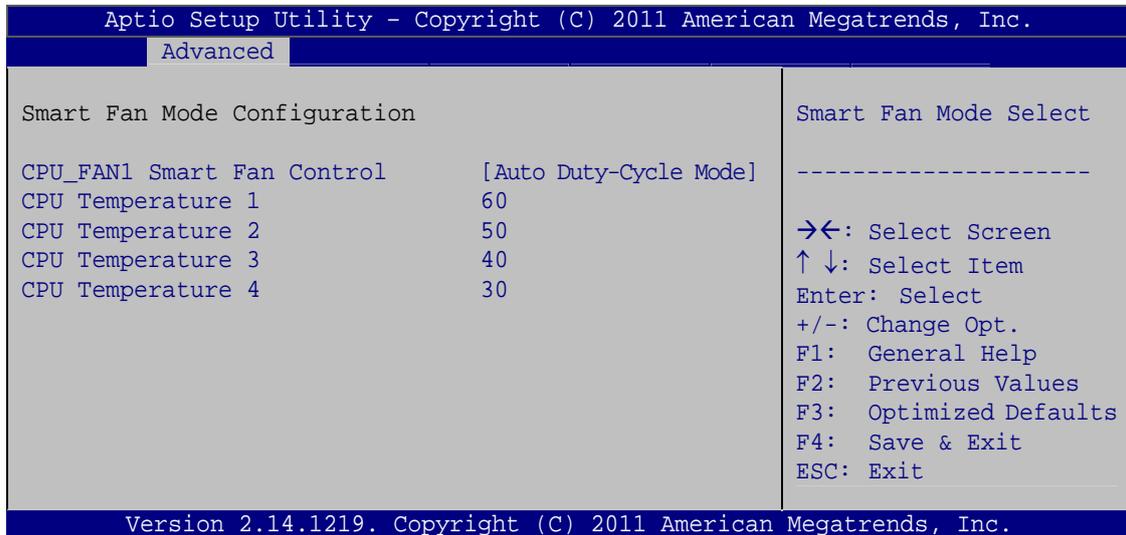
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
 - CPU Temperature
 - System Temperature
- Fan Speeds:
 - CPU Fan Speed
- Voltages:
 - +VCC_CPU
 - +VCC_GFX
 - +V1.05S
 - +1.5_DDR3
 - VSB5V
 - +V3.3S
 - VSB3V
 - VBAT

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5.3.6.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 10**) to configure fan temperature and speed settings.



BIOS Menu 10: Smart Fan Mode Configuration

→ CPU_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]

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

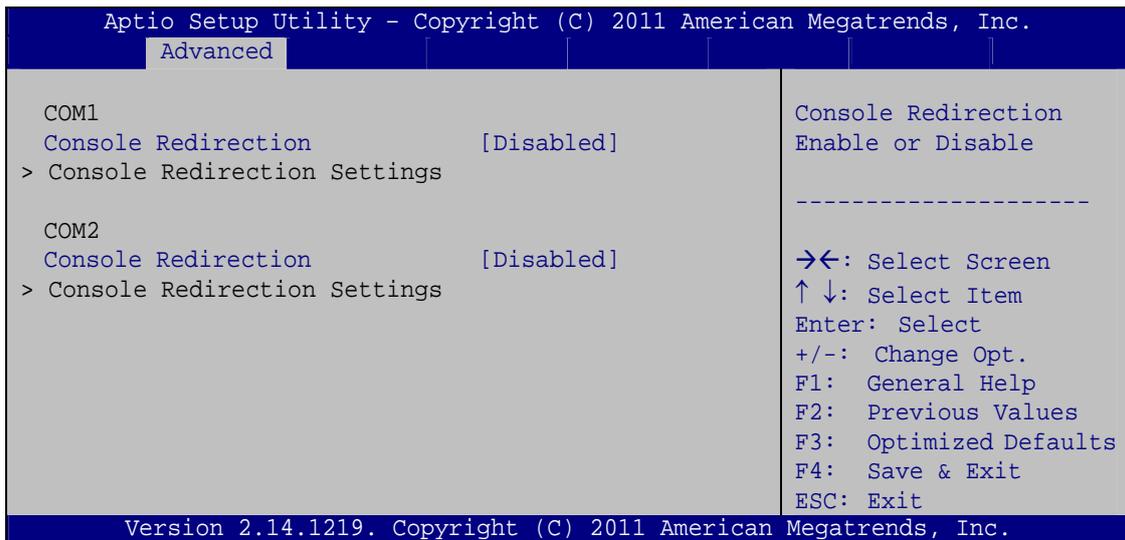
- **Auto Duty-Cycle Mode** **DEFAULT** The fan adjusts its speed using Auto Duty-Cycle settings
- **Manual Duty Mode** The fan spins at the speed set in Manual Duty Mode settings

→ CPU Temperature n

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

5.3.7 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 11**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 11: 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

→ Terminal Type [ANSI]

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

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

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→ Bits per second [115200]

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

- **9600** Sets the serial port transmission speed at 9600.
- **19200** Sets the serial port transmission speed at 19200.
- **38400** Sets the serial port transmission speed at 38400.
- **57600** Sets the serial port transmission speed at 57600.
- **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

→ Data Bits [8]

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

- **7** Sets the data bits at 7.
- **8** **DEFAULT** Sets the data bits at 8.

→ Parity [None]

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

- **None** **DEFAULT** No parity bit is sent with the data bits.
- **Even** The parity bit is 0 if the number of ones in the data bits is even.
- **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- **Mark** The parity bit is always 1. This option does not provide error detection.
- **Space** The parity bit is always 0. This option does not provide error detection.

DRPC-100 Embedded System

5.4.1 Host Bridge Configuration

Use the **Host Bridge Configuration** menu (**BIOS Menu 13**) to configure the Intel IGD Configuration and display the memory information.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Chipset
  > Intel IGD Configuration
  ***** Memory Information *****
  Memory Frequency           1067 MHz(DDR3)
  Total Memory                2048 MB
  DIMM#1                      2048 MB
  Config Intel IGD Settings.
  -----
  →←: 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 13: Host Bridge Configuration

5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** menu (**BIOS Menu 14**) to configure the graphics options.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Chipset
  Intel IGD Configuration
  Fixed Graphics Memory Size [128MB]
  Configure Fixed Graphics Memory Size
  -----
  →←: 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 14: Intel IGD Configuration

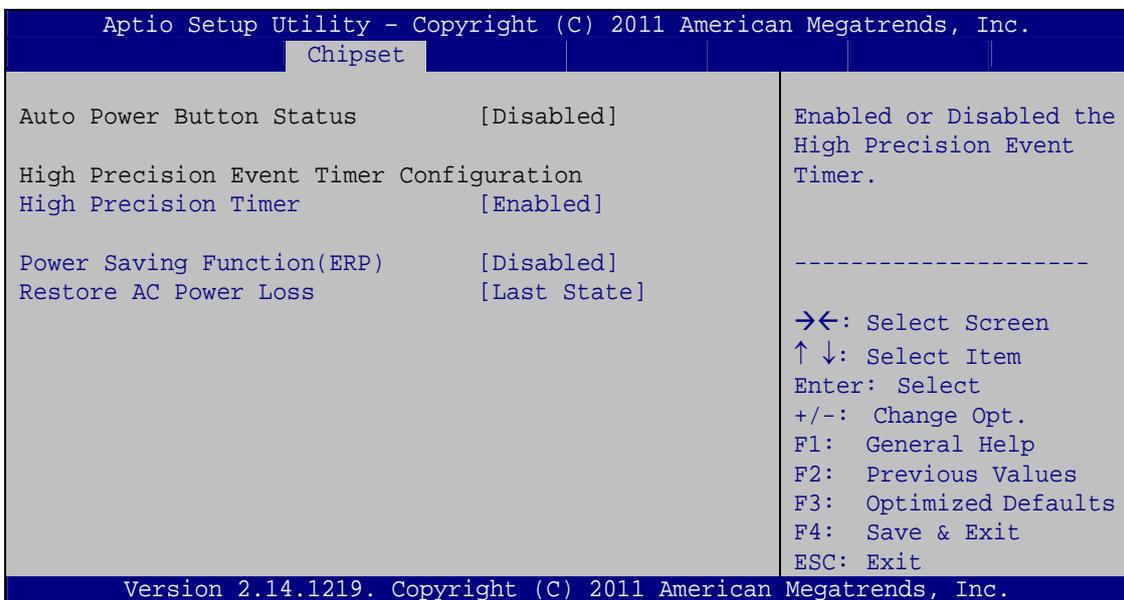
→ Fixed Graphics Memory Size [128MB]

Use the **Fixed Graphics Memory Size** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128MB **DEFAULT**
- 256MB

5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 15**) to configure the Southbridge chipset.


BIOS Menu 15: South Bridge Configuration
→ High Precision Timer [Enabled]

Use the **High Precision Timer** BIOS option to enable or disable the High Precision Event Timer.

- **Disabled** High Precision Event Timer disabled
- **Enabled** **DEFAULT** High Precision Event Timer enabled

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→ Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function(ERP)** option to enable or disable the power saving function.

- **Disabled** **DEFAULT** Disables the power saving function.
- **Enabled** Enables the power saving function.

→ Restore AC Power Loss [Last State]

Use the **Restore 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.

5.5 Boot

Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
Boot Configuration
Bootup NumLock State          [On]
Quiet Boot                    [Enabled]
Launch PXE OpROM              [Disabled]
Option ROM Messages          [Force BIOS]
Boot Option Priorities

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

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```

BIOS Menu 16: 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.

DRPC-100 Embedded System

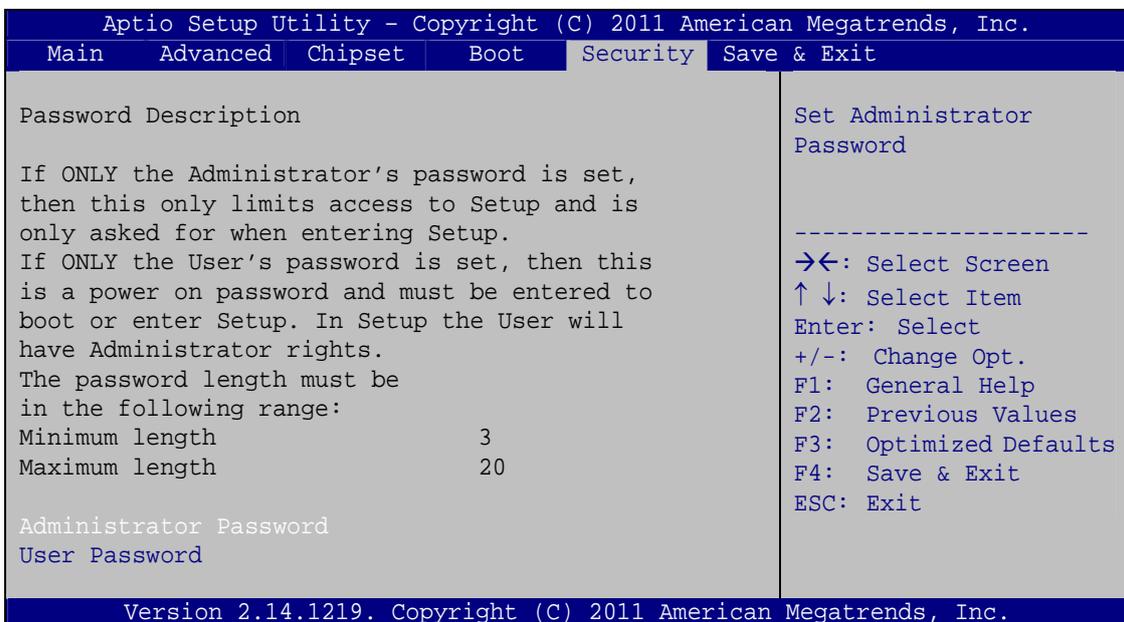
→ Option ROM Messages [Force BIOS]

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

- **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- **Keep Current** Sets display mode to current.

5.6 Security

Use the **Security** menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: 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 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 18**) 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
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Reset the system after
saving the changes.

-----
-><: 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 18: Save & Exit

➔ Save Changes and Reset

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

➔ Discard Changes and Reset

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

➔ Restore Defaults

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

DRPC-100 Embedded System

→ 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.



Chapter

6

Programmable OLED Display (DRPC-100-CV-OLED Only)

DRPC-100 Embedded System

6.1 Overview

The DRPC-100-CV-OLED comes with a programmable OLED display that allows users to program their own APIs to show any information on it in graphic and text formats. The driver CD includes two programs as below:

- **OLED Image Editor:** Allows displaying information in graphic format.
- **DR100 Demo Program:** Allows displaying information in text format.

The following sections will introduce these two programs.

6.2 OLED Image Editor

The OLED Image Editor allows displaying information in graphic format.

6.2.1 OLED Image Editor Installation

To install the OLED Image Editor, please follow the steps below.

- Step 1:** Insert the driver CD into an optical disk drive connected to the system.
- Step 2:** Locate the **setup** file in the **OLEDImageEditor** folder of the driver CD. Double click the setup file to start the installation.
- Step 3:** The OLED Image Editor Setup Wizard welcome window appears (**Figure 6-1**). Click **Next** to start.

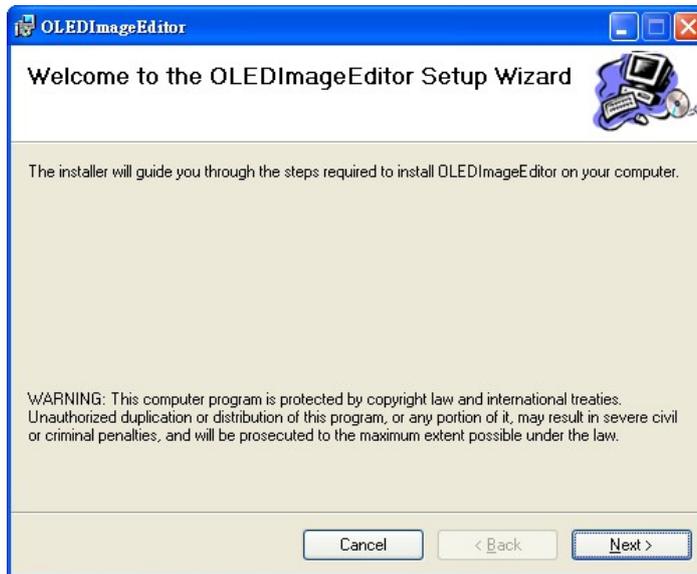


Figure 6-1: OLED Image Editor Setup Wizard

Step 4: Select a folder for OLED Image Editor Installation in **Figure 6-2**. Click **Next** to continue.

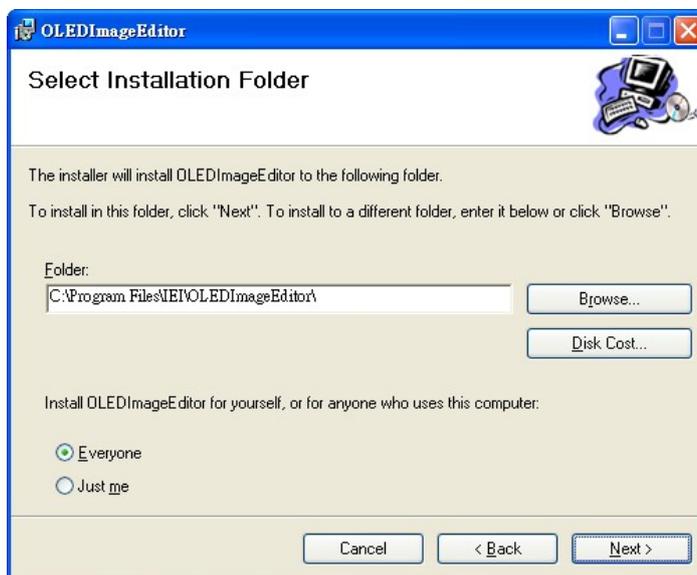


Figure 6-2: Select Installation Folder

Step 5: The following screen appears. Click **Next** to confirm the installation.

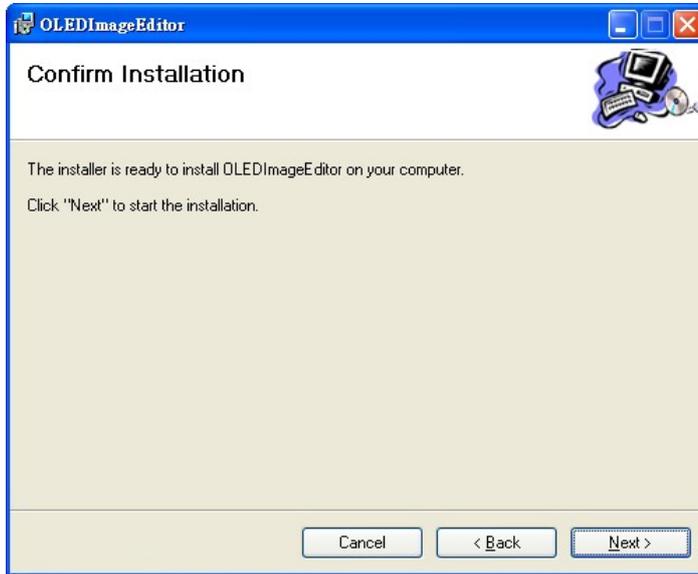


Figure 6-3: Confirm Installation

Step 6: The system starts installing the OLED Image Editor.

Step 7: When the OLED Image Editor is successfully installed, the following window appears. Click **Close** to exit.

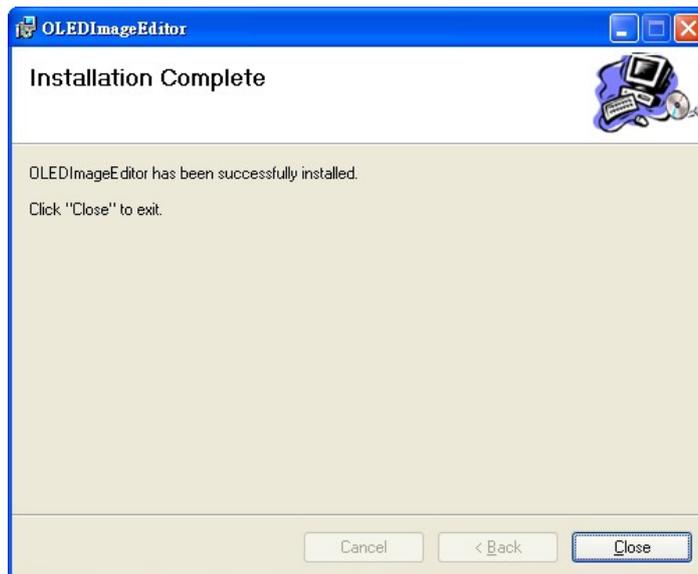


Figure 6-4: Installation Complete

6.2.2 Launching the OLED Image Editor

To launch the OLED Image Editor, double click the OLED Image Editor icon on the desktop.



Figure 6-5: OLED Image Editor

6.2.3 Function List

The OLED Image Editor provides picture drawing function. Users can draw simple pictures on the Canvas field.

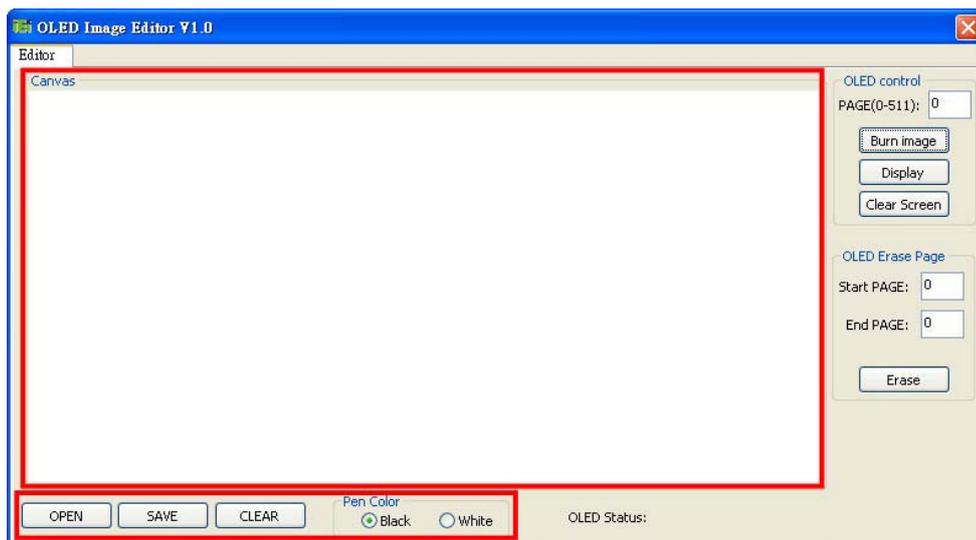


Figure 6-6: Function List

DRPC-100 Embedded System

- **OPEN:**
Allows loading a 24-bit BMP file. The resolution of the 24-bit BMP file must be 128 x 64.
- **SAVE:**
Allows saving as a BMP file. The file must be saved as 24-bit BMP with 128 x 64 resolution.
- **CLEAR:**
Clears the picture drew on the Canvas field.
- **Pen Color:**
Sets the pen color to black or white.

6.2.4 OLED Control

The OLED Control allows setup to the OLED module. Refer to the **DRPC100-OLED UART Protocol** reference manual packaged in the driver CD for detailed setup.

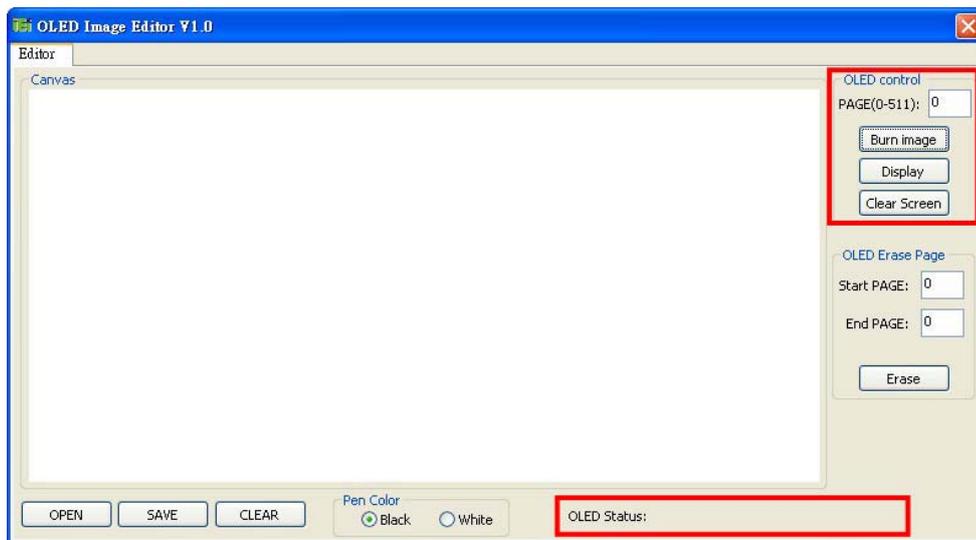


Figure 6-7: OLED Control

- **PAGE(0-511):**
Allows users to indicate a page number to burn or display the image of the page using the function buttons below it. The range of page number is 0 ~ 511.
- **Burn image:**
Clicks to burn the image on the Canvas field into the OLED module according

to the indicated page number. When writing an image into the OLED module, the OLED Status field displays “The page is under writing. Please wait...”. Wait for several seconds. When finished, “Write Page Done” is displayed.

- **Display:**
Clicks to show the corresponding image on the OLED display according to the indicated page number.
- **Clear Screen:**
Clicks to clear the OLED screen.

6.2.5 OLED Erase Page

The OLED Erase Page allows erasing the images in the indicated page numbers. The range of page number is 0 ~ 511. Besides, be noticed that the **Start PAGE** must be smaller than the **End Page**.

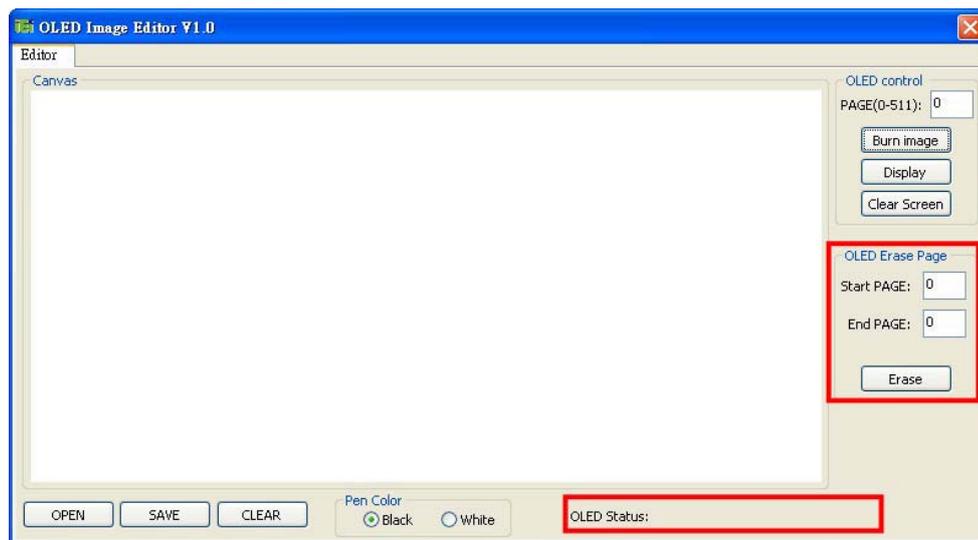


Figure 6-8: OLED Erase Page

When the page number range is set, click **Erase**. A warning message will appear, reminding users the estimated time. Click **Yes** to continue. The OLED Status field will display the erasing status.

To erase all images, set the page number from 0 to 511.

6.3 DRPC100 Demo Program



NOTE:

Refer to the **DRPC100-Matrix LED UART Protocol** reference manual packaged in the driver CD for detailed setup.

The DRPC100 Demo Program allows displaying information in text format.

To launch the DRPC100, double click the **DRPC100_OLED_DEMO** file located in the **DEMO APP** folder of the driver CD. The main menu appears as below.

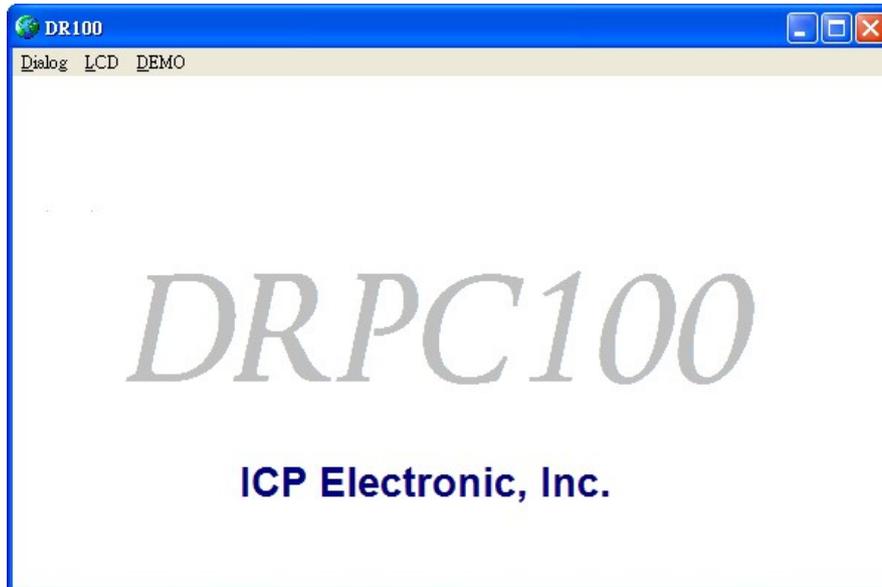


Figure 6-9: DR100 Demo Program Main Menu

6.3.1 Dialog Menu

The Dialog menu allows clearing the OLED screen and getting ID.

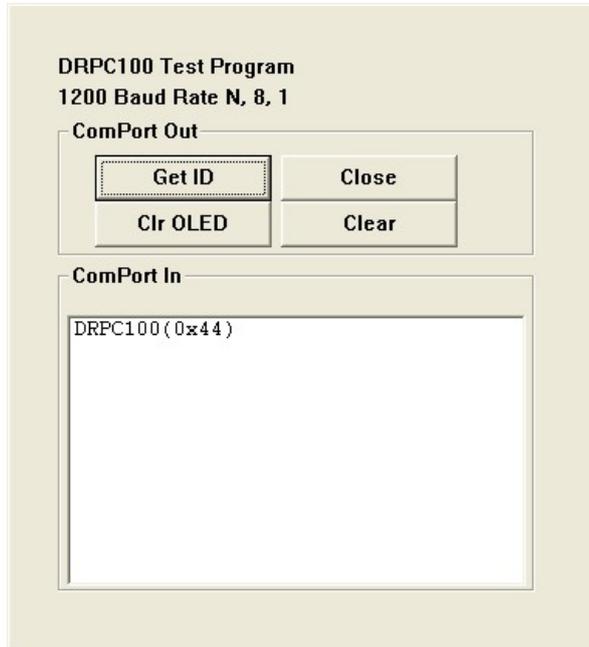


Figure 6-10: Dialog Menu

- **Get ID:** Clicks to get ID.
- **Clr OLED:** Clicks to clear the OLED screen.
- **Close:** Clicks to return to the main menu.
- **Clear:** Clears the messages.

6.3.2 LCD Menu

The LCD menu allows entering text to be displayed on the OLED display.

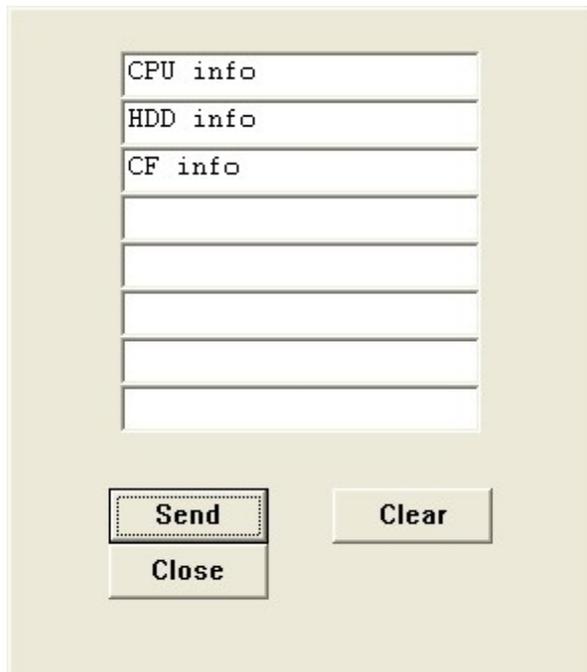


Figure 6-11: LCD Menu

- **Send:** Clicks to send the input text to be displayed on the OLED display.
- **Clear:** Clears the input text.
- **Close:** Clicks to return to the main menu.

6.3.3 DEMO Menu

The DEMO menu lists the activities of the function keys. Click **Close** to return to the main menu.

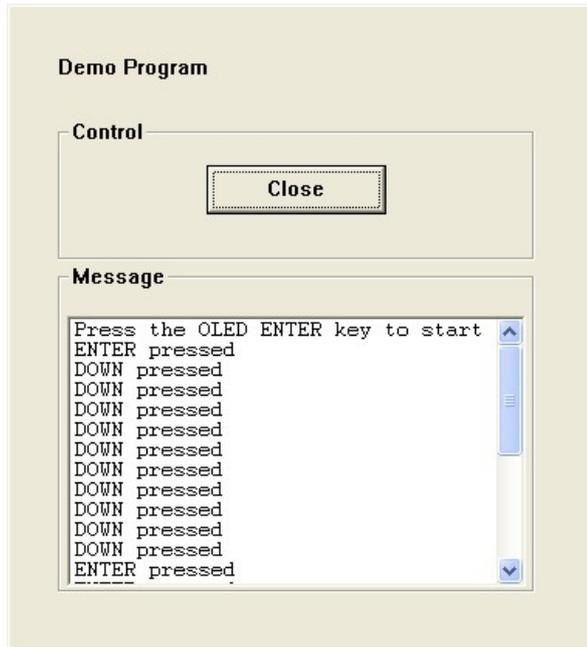


Figure 6-12: DEMO Menu

Chapter

7

Interface Connectors

7.1 Peripheral Interface Connectors

The DRPC-100 embedded system motherboard comes with a number of peripheral interface connectors and configuration jumpers. The connector locations are shown in **Figure 6-1** and **Figure 6-2**. The Pin 1 locations of the on-board connectors are also indicated in the diagrams. The connector pinouts for these connectors are listed in the following sections.

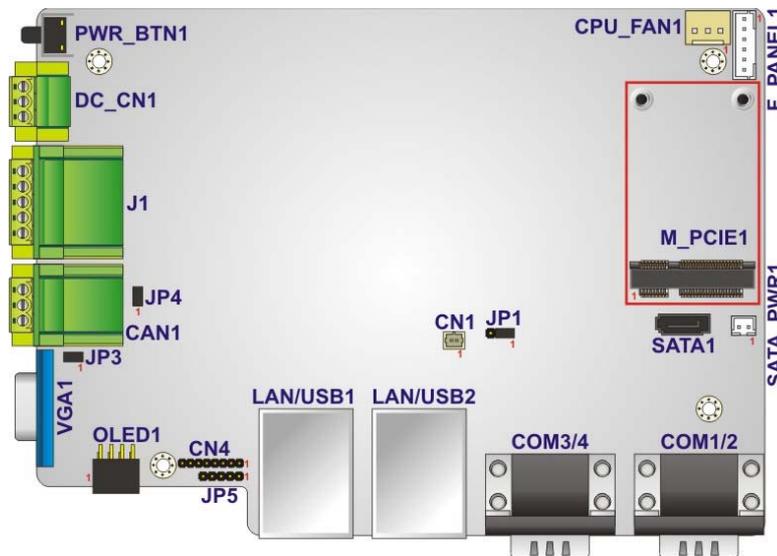


Figure 7-1: Main Board Layout Diagram (Front Side)

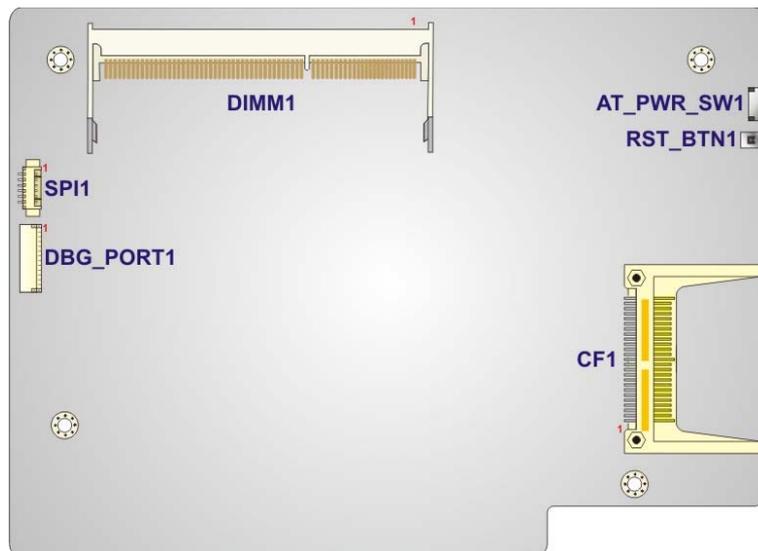


Figure 7-2: Main Board Layout Diagram (Solder Side)

7.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. The table below shows a list of the peripheral interface connectors on the DRPC-100 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
Battery connector	2-pin wafer	CN1
Burn in CAN-bus firmware connector	8-pin header	CN4
Burn in MCU firmware connector	5-pin wafer	JP5
CompactFlash® card slot (solder side)	CF slot	CF1
CPU Fan connector	3-pin wafer	CPU_FAN1
Indicator connector	6-pin wafer	F_PANEL1
OLED/LED signal connector	8-pin header	OLED1
PCIe Mini card slot (supports mSATA)	PCIe Mini card slot	M_PCIE1
SATA 3Gb/s connector	SATA connector	SATA1
SATA power connector	2-pin wafer	SATA_PWR1
SO-DIMM connector	SO-DIMM connector	DIMM1
SPI Flash connector	6-pin wafer	SPI1

Table 7-1: Peripheral Interface Connectors

7.2.1 Battery Connector (CN1)

PIN NO.	DESCRIPTION
1	VBATT
2	GND

Table 7-2: Battery Connector (CN1) Pinouts

7.2.2 Burn in CAN-bus Firmware Connector (CN4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	NC
2	TDO	6	TMS
3	TDI	7	GND
4	NC	8	TCK

Table 7-3: Burn in CAN-bus Firmware Connector (CN4) Pinouts

7.2.3 Burn in MCU Firmware Connector (JP5)

PIN NO.	DESCRIPTION
1	MCLR
2	+V5S
3	GND
4	ICSPDAT
5	ICSPCLK

Table 7-4: Burn in MCU Firmware (JP5) Pinouts

7.2.4 CompactFlash® Card Slot (CF1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	S_IDE_Detect
2	S_D3	27	S_D11
3	S_D4	28	S_D12
4	S_D5	29	S_D13
5	S_D6	30	S_D14
6	S_D7	31	S_D15
7	S_DCS1#	32	S_DCS3#
8	GROUND	33	GROUND
9	GROUND	34	S_IOR#
10	GROUND	35	S_IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	S_INT

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
13	VCC_COM	38	VCC_COM
14	GROUND	39	M/S
15	GROUND	40	NC
16	GROUND	41	S_RST
17	GROUND	42	S_IORDY
18	S_DA2	43	S_DRQ
19	S_DA1	44	S_DACK#
20	S_DA0	45	SIDE_LED#
21	S_D0	46	S_PCBLID
22	S_D1	47	S_D8
23	S_D2	48	S_D9
24	NC	49	S_D10
25	CFD2	50	GROUND

Table 7-5: CompactFlash® Card Slot (CF1) Pinouts

7.2.5 CPU Fan Connector (CPU_FAN1)

PIN NO.	DESCRIPTION
1	CPUFANIN
2	+12V
3	GND

Table 7-6: CPU Fan Connector (CPU_FAN1) Pinouts

7.2.6 Indicator Connector (F_PANEL1)

PIN NO.	DESCRIPTION
1	VCC
2	GND
3	PWR_LED+
3	PWR_LED-
5	HDD_LED+
6	HDD_LED-

Table 7-7: Indicator Connector (F_PANEL1) Pinouts

7.2.7 OLED/LED Signal Connector (OLED1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3V	2	+12V
3	LED_SDA	4	GPIO
5	LED_SCL	6	GPIO
7	GND	8	RESET#

Table 7-8: OLED/LED Signal Connector (OLED1) Pinouts

7.2.8 PCIe Mini Card Slot (M_PCIE1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 7-9: PCIe Mini Card Slot (M_PCIE1) Pinouts

7.2.9 SATA 3Gb/s Connectors(SATA1)

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 7-10: SATA 3Gb/s Connector (SATA1) Pinouts

7.2.10 SATA Power Connector (SATA_PWR1)

PIN NO.	DESCRIPTION
1	5V (supports 1A)
2	GND

Table 7-11: SATA Power Connector (SATA_PWR1) Pinouts

7.2.11 SPI Flash Connector (SPI1)

PIN NO.	DESCRIPTION
1	SPI_VCC
2	SPI_CS#
3	SPI_MISO
4	SPI_CLK
5	SPI_MOSI
6	GND

Table 7-12: SPI Flash Connector (SPI1) Pinouts

7.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the DRPC-100 motherboard. Pinouts of these connectors can be found in the following sections.

Connector	Type	Label
CAN-bus terminal block	2 x 3-pin terminal block	CAN1
Digital I/O terminal block	2 x 5-pin terminal block	J1
Power input terminal block	3-pin terminal block	DC_CN1
RJ-45 LAN and USB 2.0 connectors	RJ-45, USB 2.0	LAN/USB1, LAN/USB2
Power button	Push button	PWR_BTN1
Reset button	Push button	RST_BTN1

Connector	Type	Label
RS-232 serial ports	DB-9	COM1/2
RS-422/485 serial ports	DB-9	COM3/4
VGA connector	15-pin female	GA1

Table 7-13: Rear Panel Connectors

7.3.1 CAN-bus Terminal Block (CAN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CAN1H	2	CAN2H
3	CAN1L	4	CAN2L
5	CAN1_GROUND	6	CAN2_GROUND

Table 7-14: CAN-bus Terminal Block (CAN1) Pinouts

7.3.2 Digital I/O Terminal Block (J1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DGI_0	2	DGO_0
3	DGI_1	4	DGO_1
5	DGI_2	6	DGO_2
7	DGI_3	8	DGO_3
9	Isolator GND	10	Isolator Vin

Table 7-15: Digital I/O Terminal Block (J1) Pinouts

7.3.3 Power Input Terminal Block (DC_CN1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	9~28V input	3	GND
2	9~28V input		

Table 7-16: Power Input Terminal Block (DC_CN1) Pinouts

7.3.4 RJ-45 LAN Connectors (LAN/USB1, LAN/USB2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MD0+	5	MD2+
2	MD0-	6	MD2-
3	MD1+	7	MD3+
4	MD1-	8	MD3-

Table 7-17: RJ-45 LAN Connector Pinouts

7.3.5 RS-232 Serial Ports (COM1/2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Table 7-18: RS-232 Serial Port Pinouts

7.3.6 RS-422/485 Serial Ports (COM3/4)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RS422TX-/RS485D-	6	NC
2	RS422TX+/RS485D+	7	NC
3	RS422RX+	8	NC
4	RS422RX	9	NC
5	GND		

Table 7-19: RS-422/485 Serial Port Pinouts

7.3.7 USB 2.0 Connectors (LAN/USB1, LAN/USB2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	DATA-	11	DATA-
3	DATA+	12	DATA+
4	GROUND	13	GROUND

Table 7-20: USB 2.0 Connectors (LAN/USB1, LAN/USB2) Pinouts

7.3.8 VGA Connector (VGA1)

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

Table 7-21: VGA Connector (VGA1) Pinouts

7.4 Jumper Settings

The JP3 and JP4 jumpers are preconfigured for the DRPC-100. Users should not change these jumpers. It is only for reference.

Jumper Name	Label	Type
Clear CMOS	JP1	3-pin header
CAN-bus 1 long wire transmitting	JP3	2-pin header
CAN-bus 2 long wire transmitting	JP4	2-pin header

Table 7-22: Jumpers

7.4.1 Clear CMOS Jumper (JP1)

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

Table 7-23: Clear CMOS Jumper (JP1) Settings

7.4.2 CAN-bus 1 Long Wire Transmitting Jumper (JP3)

Pin	Description
1	CAN1H
2	CAN1L

Table 7-24: C CAN-bus 1 Long Wire Transmitting Jumper (JP3) Settings

7.4.3 CAN-bus 2 Long Wire Transmitting Jumper (JP4)

Pin	Description
1	CAN2H
2	CAN2L

Table 7-25: C CAN-bus 2 Long Wire Transmitting Jumper (JP4) Settings

Appendix

A

One Key Recovery

A.1 One Key Recovery Introduction

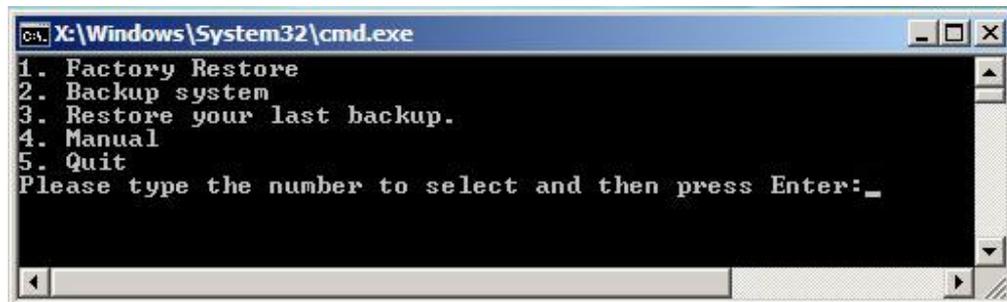
The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.



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.



```
Cmd: 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: _
```

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**)

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



NOTE:

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

A.1.1 System Requirement



NOTE:

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



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

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

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

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


NOTE:

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

A.1.2 Supported Operating System

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

- Microsoft Windows
 - Windows 2000
 - Windows XP (Service Pack 2 or 3 required)
 - Windows Vista
 - Windows 7
 - Windows CE 5.0
 - Windows CE 6.0
 - Windows XP Embedded
 - Windows Embedded Standard 7


NOTE:

The auto recovery function (described in **Section A.3**) and the restore through LAN function (described in **Section A.6**) are not supported in the Windows CE 5.0/6.0 operating system environment.

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- Linux
 - Fedora Core 12 (Constantine)
 - Fedora Core 11 (Leonidas)
 - Fedora Core 10 (Cambridge)
 - Fedora Core 8 (Werewolf)
 - Fedora Core 7 (Moonshine)
 - RedHat RHEL-5.4
 - RedHat 9 (Ghirke)
 - Ubuntu 8.10 (Intrepid)
 - Ubuntu 7.10 (Gutsy)
 - Ubuntu 6.10 (Edgy)
 - Debian 5.0 (Lenny)
 - Debian 4.0 (Etch)
 - SuSe 11.2
 - SuSe 10.3



NOTE:

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

A.2 Setup Procedure for Windows

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

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

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

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

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

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

The detailed descriptions are described in the following sections.

**NOTE:**

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

A.2.1 Hardware and BIOS Setup

- Step 1:** Make sure the system is powered off and unplugged.
- Step 2:** Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.
- Step 3:** Connect an optical disk drive to the system and insert the recovery CD.
- Step 4:** Turn on the system.
- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1st boot device. (**Boot** → **Boot Device Priority** → **1st Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

A.2.2 Create Partitions

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

- Step 1:** Put the recovery CD in the optical drive of the system.
- Step 2:** **Boot the system from recovery CD.** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

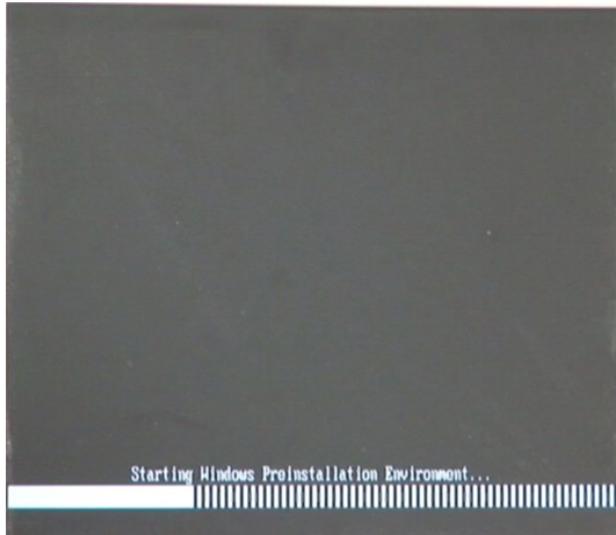


Figure A-2: Launching the Recovery Tool

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

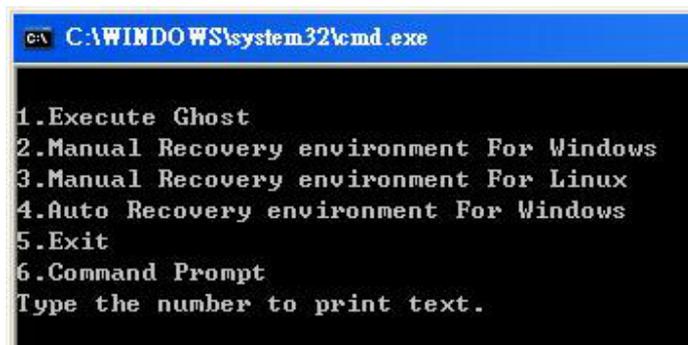
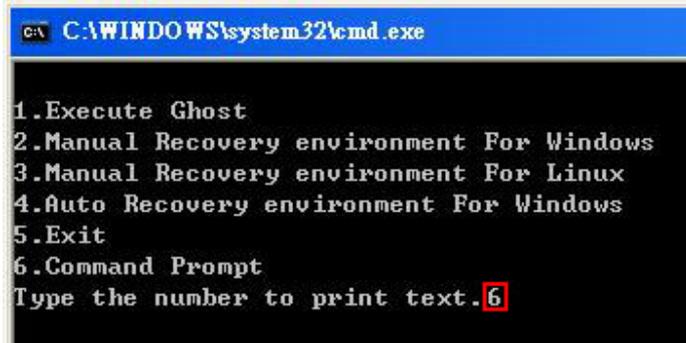


Figure A-3: Recovery Tool Setup Menu

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



```
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. 6
```

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
```

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```

c:\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 → Formate partition 2 (F) as NTFS formate and
                                                         name it as "Recovery".
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-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.

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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!

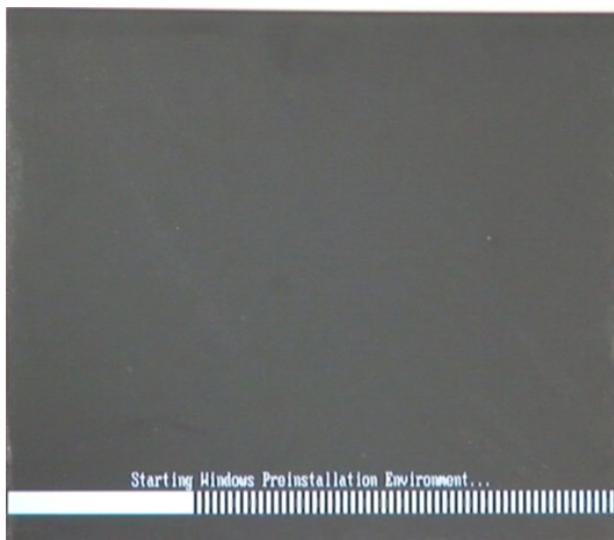


Figure A-6: Launching the Recovery Tool

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

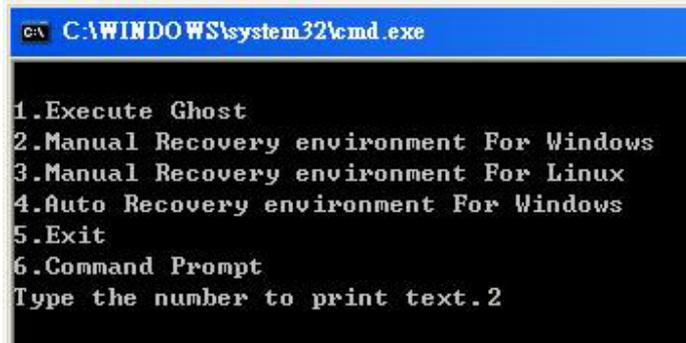


Figure A-7: Manual Recovery Environment for Windows

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

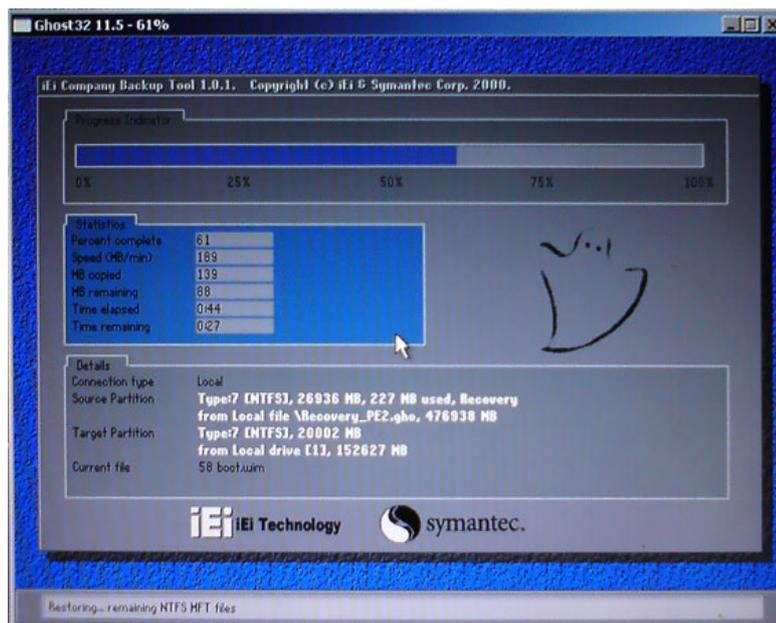


Figure A-8: Building the Recovery Partition

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

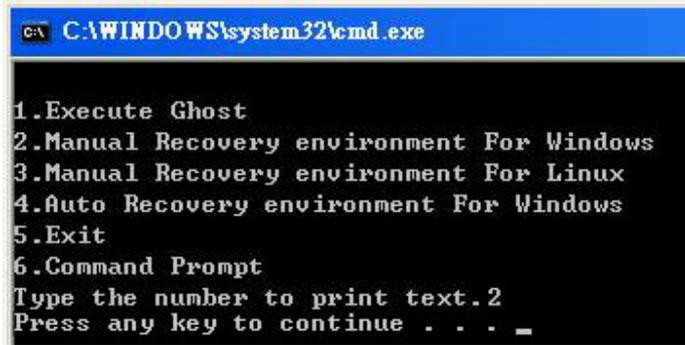


Figure A-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

A.2.5 Create Factory Default Image



NOTE:

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

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

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

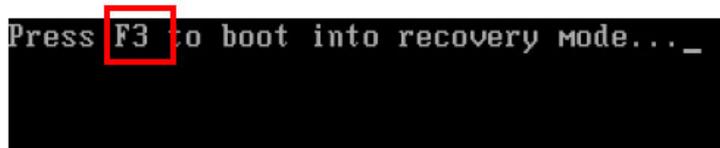


Figure A-10: Press F3 to Boot into Recovery Mode

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

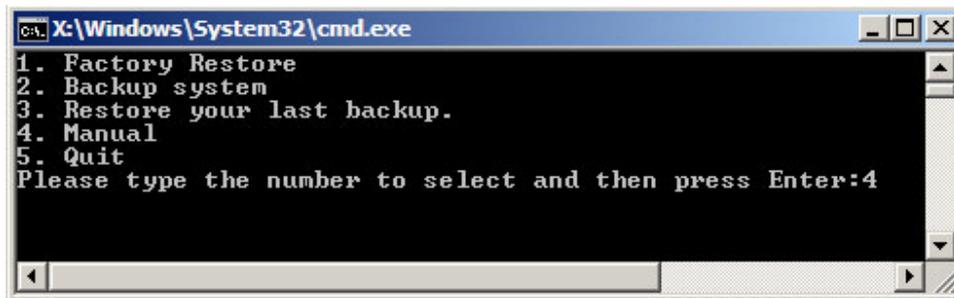


Figure A-11: Recovery Tool Menu

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

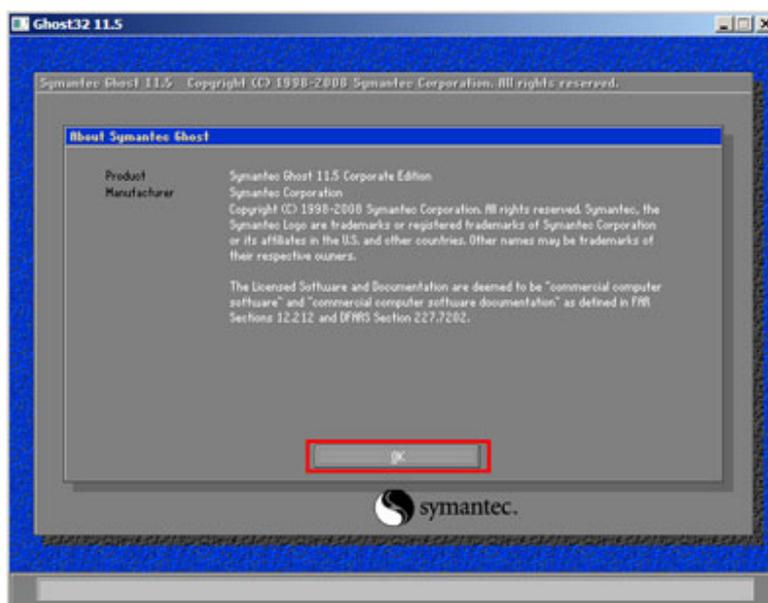


Figure A-12: About Symantec Ghost Window

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

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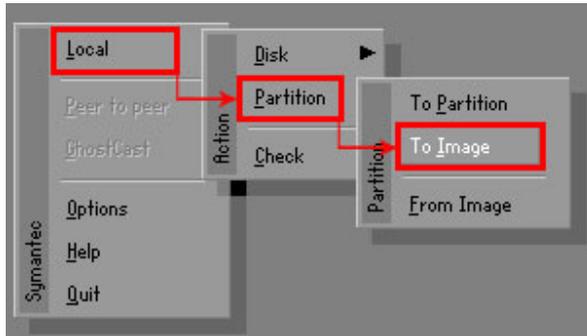


Figure A-13: Symantec Ghost Path

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

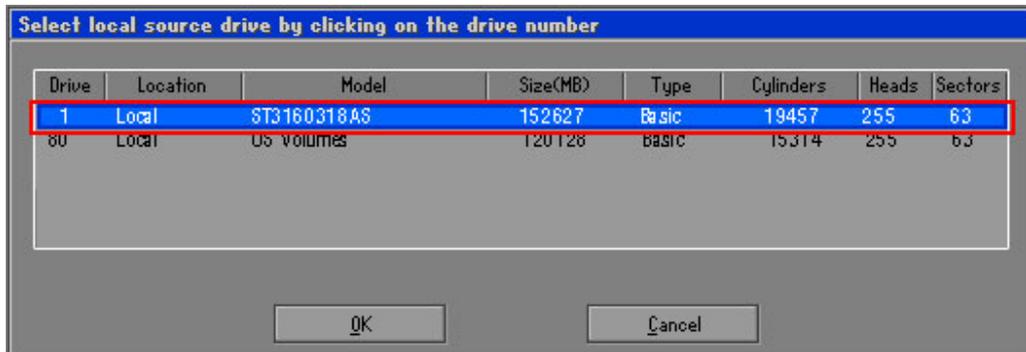


Figure A-14: Select a Local Source Drive

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

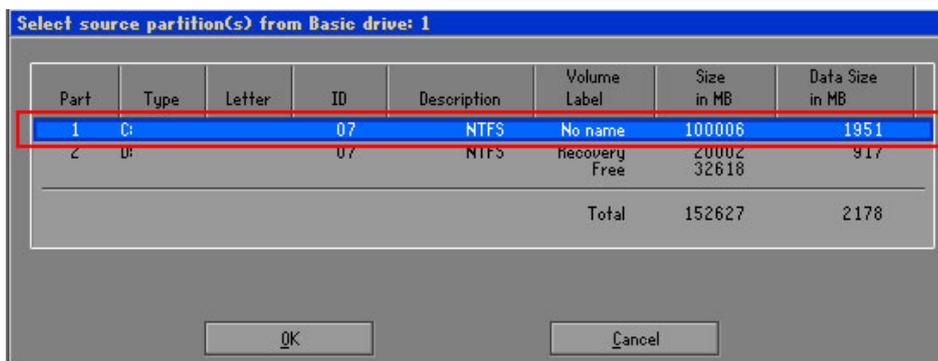


Figure A-15: Select a Source Partition from Basic Drive

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**.

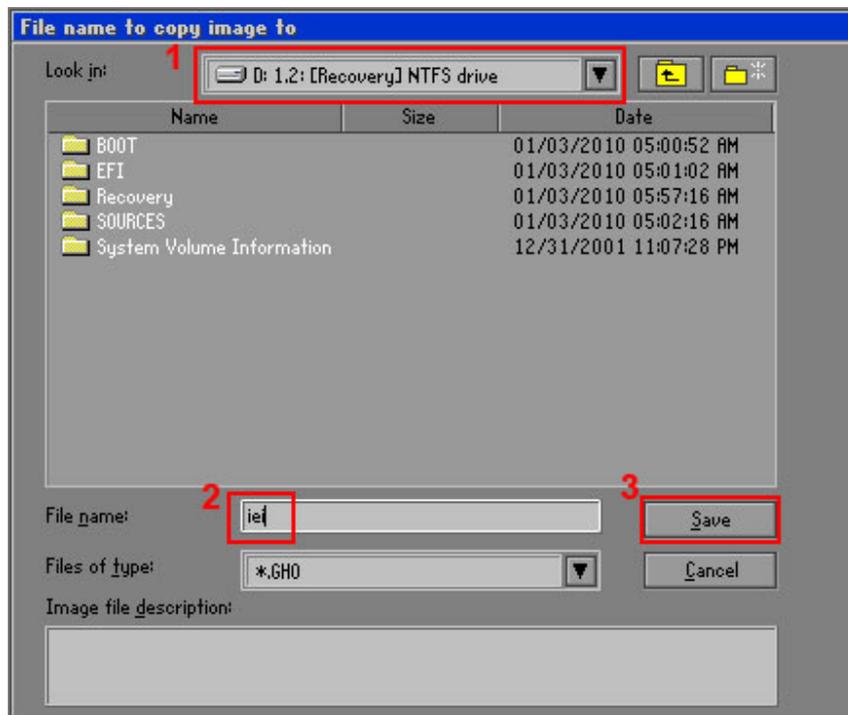


Figure A-16: File Name to Copy Image to

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

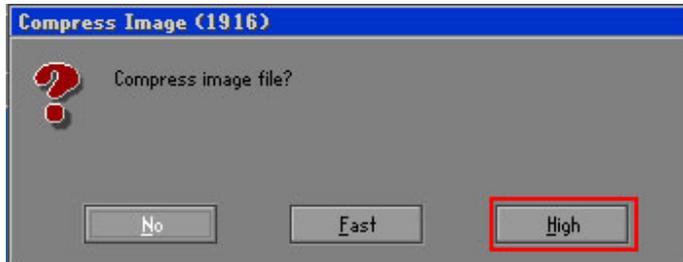


Figure A-17: Compress Image

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

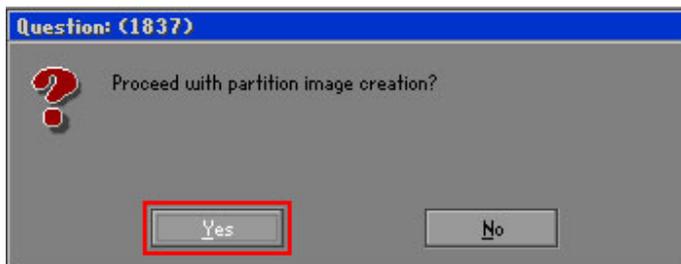


Figure A-18: Image Creation Confirmation

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

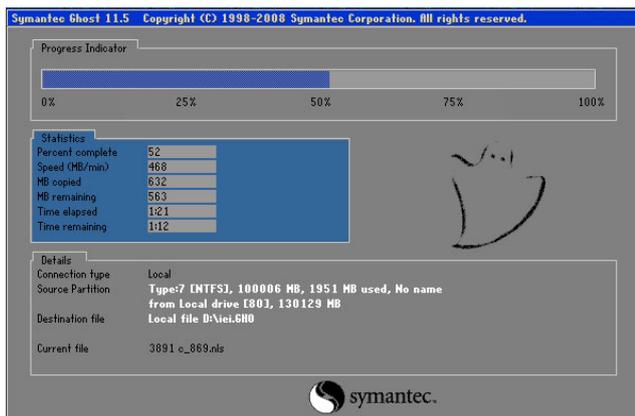


Figure A-19: Image Creation Process

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.

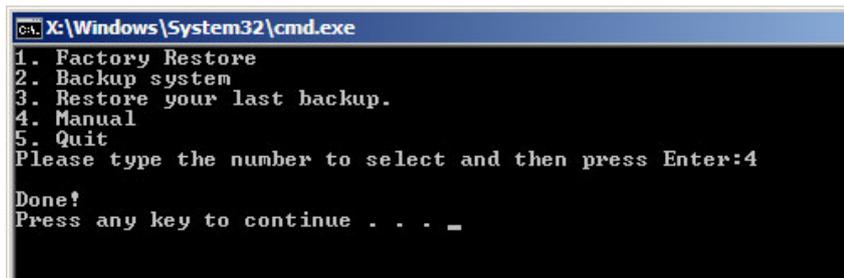


Figure A-21: Press Any Key to Continue

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 auto recovery function can only run on a Microsoft Windows system with the following OS versions:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

**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: **Disable the automatically restart function before creating the factory default image.** Go to: My Computer → Properties → Advanced. Click the

Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure A-23**)

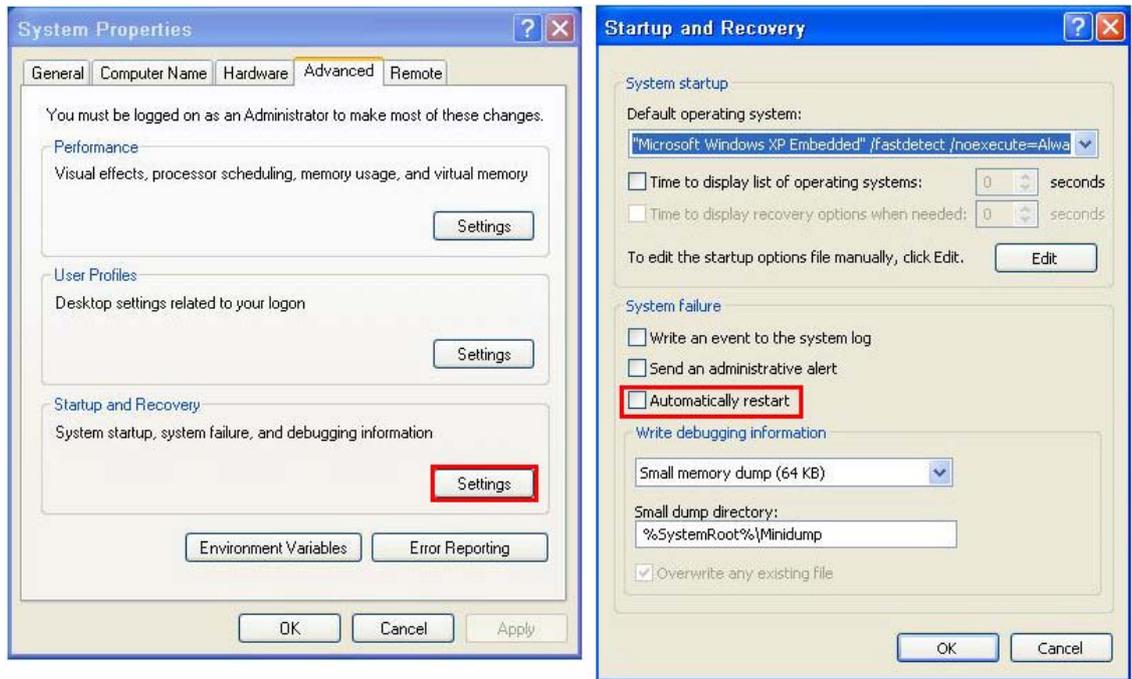
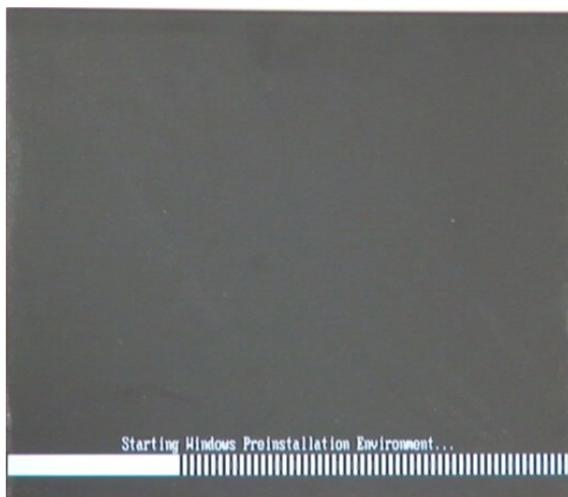


Figure A-23: Disable Automatically Restart

- Step 4:** 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!



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Figure A-24: Launching the Recovery Tool

Step 5: When the recovery tool setup menu appears, press <4> then <Enter>.

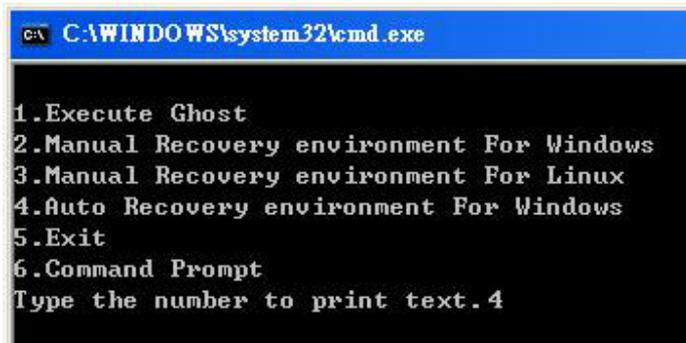


Figure A-25: Auto Recovery Environment for Windows

Step 6: 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.

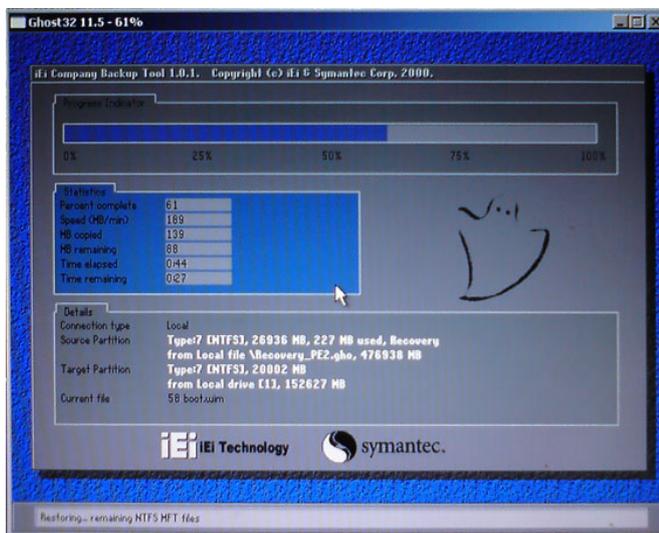


Figure A-26: Building the Auto Recovery Partition

Step 7: 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-27: Factory Default Image Confirmation

Step 8: The Symantec Ghost starts to create the factory default image (**Figure A-28**).

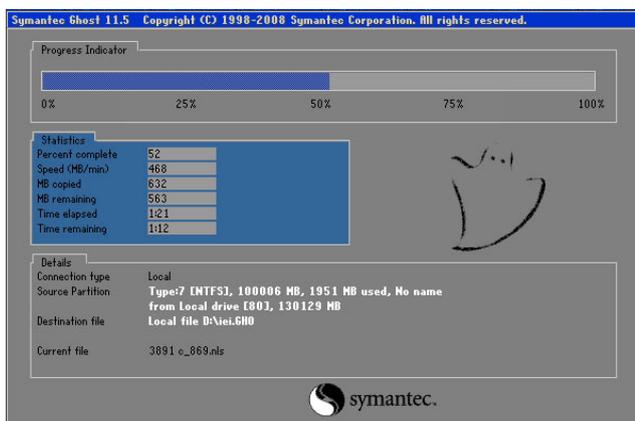


Figure A-28: Image Creation Complete

Step 9: After completing the system configuration, press any key in the following window to restart the system.

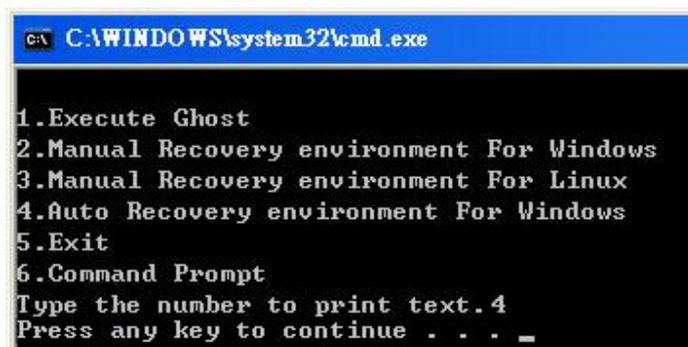


Figure A-29: Press any key to continue

Step 10: Eject the One Key Recovery CD and restart the system.

Step 11: Press the <DELETE> key as soon as the system is turned on to enter the BIOS.

Step 12: Enable the Auto Recovery Function option (**Advanced** → **iEi Feature** → **Auto Recovery Function**).

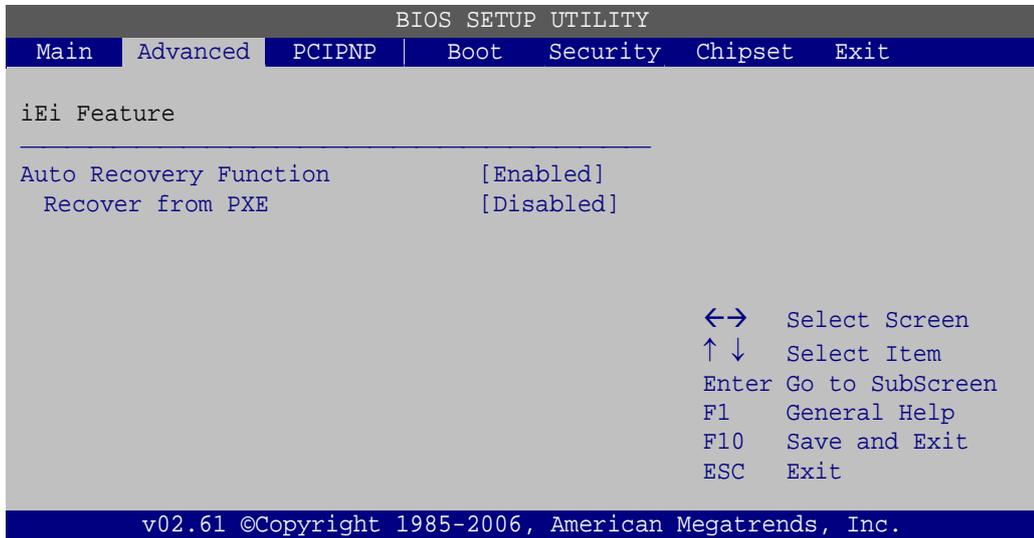


Figure A-30: IEI Feature

Step 13: 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.

A.4 Setup Procedure for Linux

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

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

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


NOTE:

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

While installing Linux OS, please create two partitions:

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


NOTE:

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

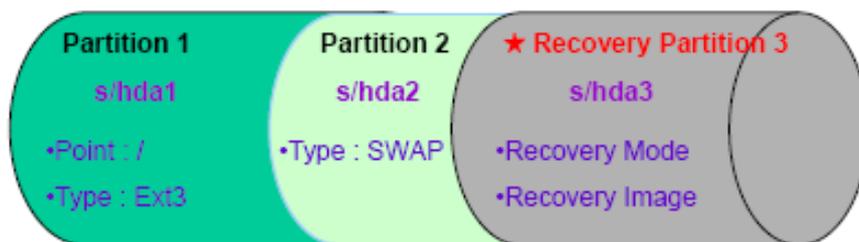


Figure A-31: Partitions for Linux

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

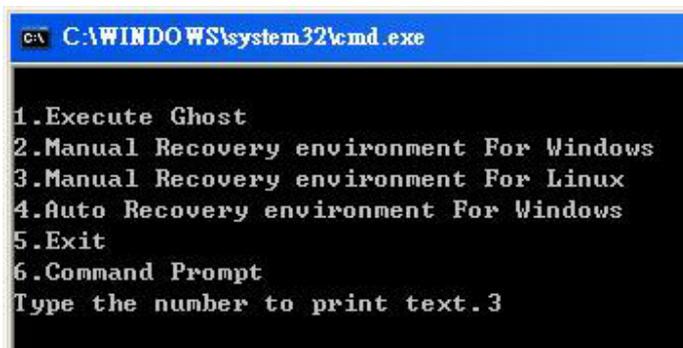
Follow **Step 1 ~ Step 3** described in **Section A.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

```
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-32**). 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.



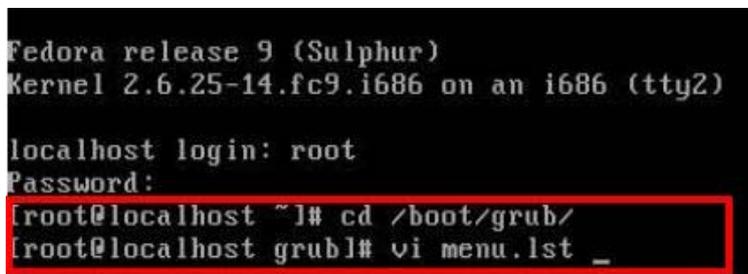
```
C:\WINDOWS\system32\cmd.exe
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
```

Figure A-32: 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
```



```
Fedora release 9 (Sulphur)
Kernel 2.6.25-14.fc9.i686 on an i686 (tty2)
localhost login: root
Password:
[root@localhost ~]# cd /boot/grub/
[root@localhost grub]# vi menu.lst _
```

Figure A-33: Access menu.lst in Linux (Text Mode)

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

```

#boot=/dev/sda
default=0
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
chainloader +1
    
```

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

Step 7: The recovery tool menu appears. (Figure A-34)

```

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-34: 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.

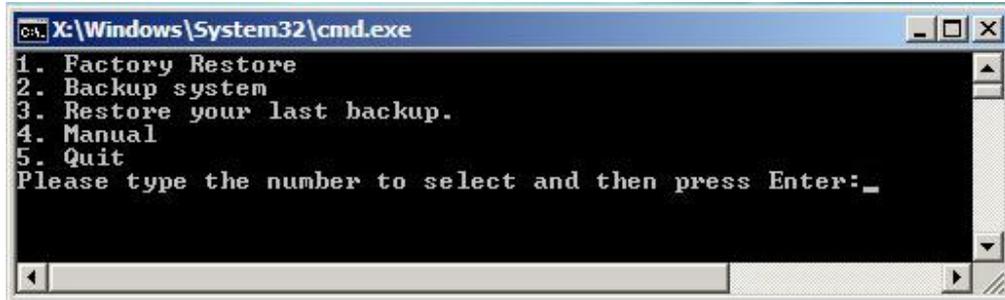


Figure A-35: Recovery Tool Main Menu

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.

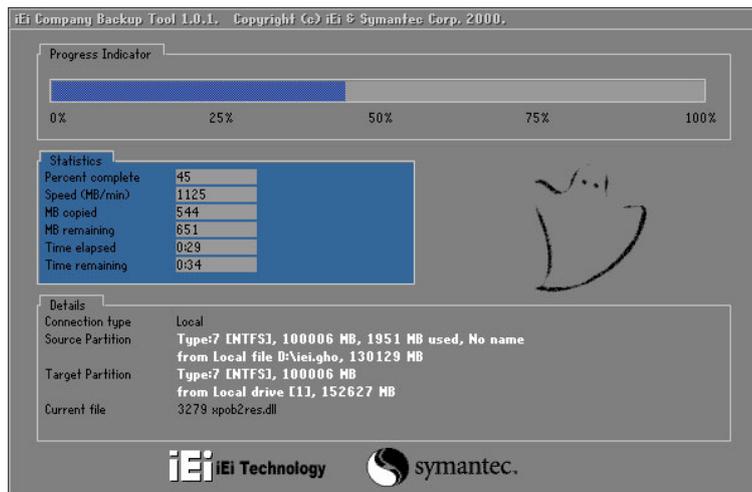


Figure A-36: Restore Factory Default

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

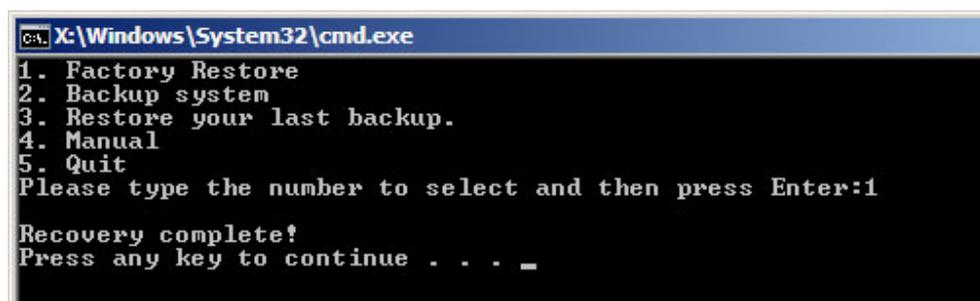


Figure A-37: Recovery Complete Window

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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.

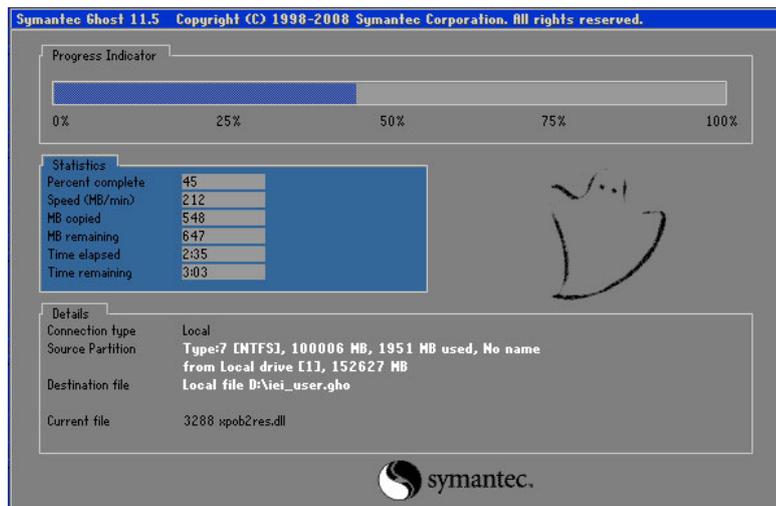


Figure A-38: Backup System

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

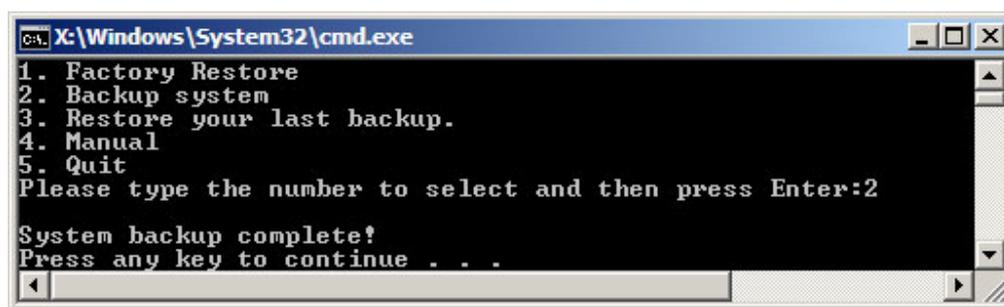


Figure A-39: System Backup Complete Window

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).

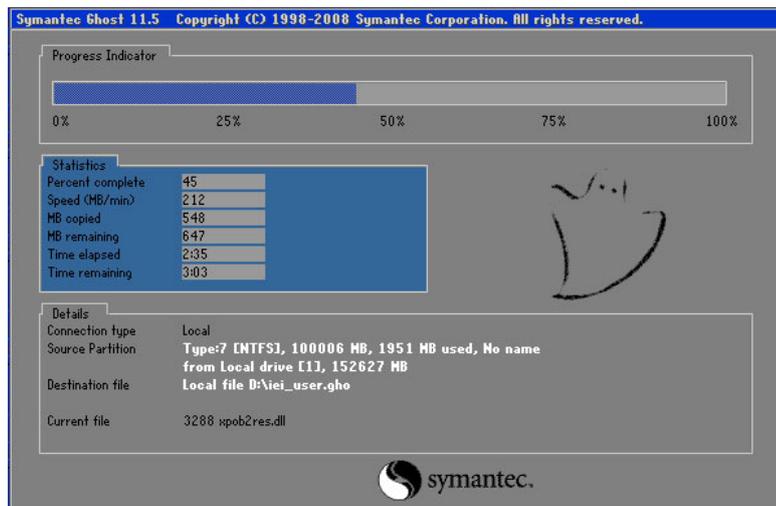


Figure A-40: Restore Backup

Step 3: The screen is shown as in **Figure A-41** when backup recovery is completed.

Press any key to reboot the system.



Figure A-41: Restore System Backup Complete Window

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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.

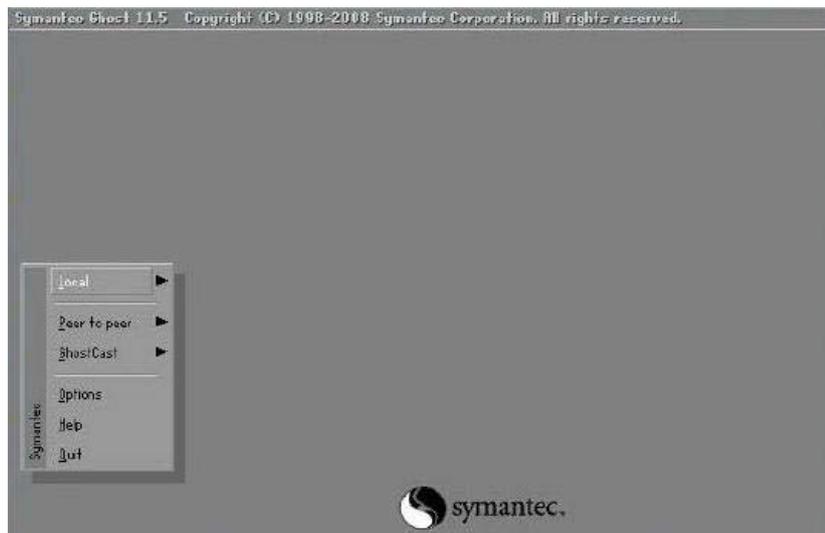
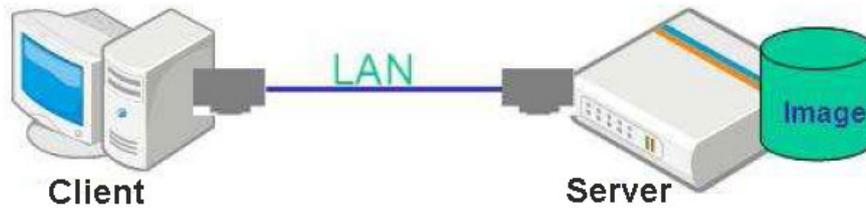


Figure A-42: Symantec Ghost Window

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)

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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:

```
# DHCP Server Configuration file.
# see /usr/share/doc/dhcp*/dhcpd.conf.sample
#
```

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
```

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask           255.255.255.0;

    option nis-domain            "domain.org";
    option domain-name           "domain.org";
    option domain-name-servers   192.168.0.1;
    next-server 192.168.0.6;
    filename "pxelinux.0";
    option time-offset           -18000; # Eastern Standard Time
#
    option ntp-servers            192.168.1.1;
    option bootfile-name          pxelinux.0;
}
```

Debian

```
#vi /etc/dhcpd.conf
```

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

```
next-server PXE server IP address;
```

filename "pxelinux.0";

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {
# --- default gateway
    option routers                192.168.0.2;
    option subnet-mask            255.255.255.0;

    option nis-domain             "domain.org";
    option domain-name            "domain.org";
    option domain-name-servers   192.168.0.1;
    next-server 192.168.0.6;
    filename "pxelinux.0";
    option time-offset            -18000; # Eastern Standard Time
#
    option ntp-servers            192.168.1.1;
}
```

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_`

```
socket_type      = dgram
protocol        = udp
wait            = yes
user            = root
server          = /usr/sbin/in.tftpd
server_args     = -s /tftpboot -m /tftpboot/tftpd.remap -vvv
disable         = no
per_source      = 11
cps             = 100 2
flags           = IPv4
```

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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)

```
#:BOOT: TFTP service is provided primarily for booting. Most sites
# run this only on machines acting as "boot servers."
#tftp      dgram  udp   wait  root  /usr/sbin/in.tftpd /usr/sbin/in.tftpd -s
/var/lib/tftpboot
```

`#vi /etc/xinetd.d/tftp`

```
socket_type      = dgram
protocol        = udp
wait            = yes
user            = root
server          = /usr/sbin/in.tftpd
server_args     = -s /tftpboot -n /tftpboot/tftpd.remap -vvv
disable         = no
per_source      = 11
cps             = 100 2
flags           = IPv4
```

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 “/tftpboot”.

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

A.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

```
#service xinetd restart
```

```
#service httpd restart
```

```
#service dhcpd restart
```

Debian

```
#/etc/init.d/xinetd reload
```

```
#/etc/init.d/xinetd restart
```

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

A.6.5 Create Shared Directory

Step 1: Install the samba.

```
#yum install samba
```

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

```
#mkdir /share
```

```
#cd /share
```

```
#mkdir /image
```

```
#cp iei.gho /image
```



WARNING:

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

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

```
#vi /etc/samba/smb.conf
```

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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/html/docs/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: Disable the automatically restart function before creating the factory default image. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure A-43**).

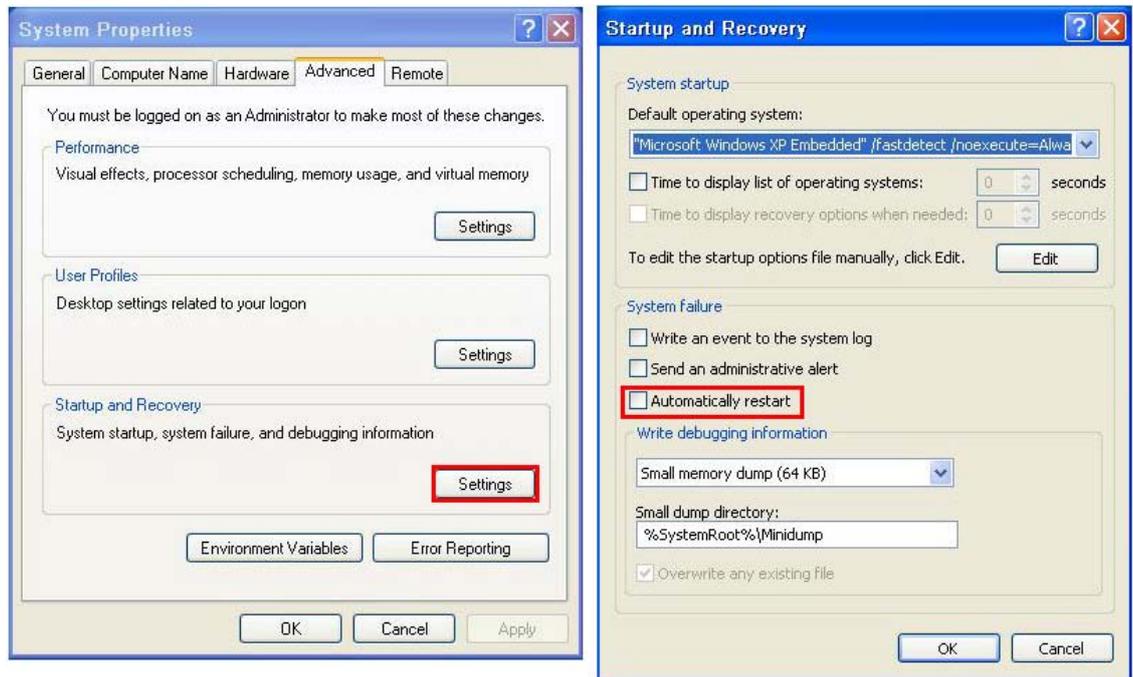


Figure A-43: Disable Automatically Restart

- Step 2:** 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 3:** 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 4:** Save changes and exit BIOS menu.
- Exit → **Save Changes and Exit**
- Step 5:** 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.

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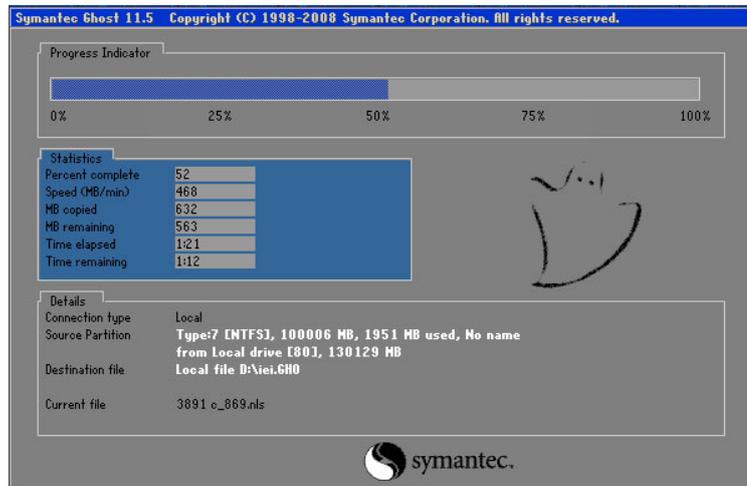


- Step 6:** Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSOD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

```
Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89  GUID: 00020003-0004-0005-0006-0007000800
DHCP. .<
```

```
My IP address seems to be C0A80009 192.168.0.9
ip=192.168.0.9:192.168.0.8:192.168.0.2:255.255.255.0
TFTP prefix:
Trying to load: pxelinux.cfg/00020003-0004-0005-0006-000700080009
Trying to load: pxelinux.cfg/01-00-18-7d-13-e6-89
Trying to load: pxelinux.cfg/C0A80009
Trying to load: pxelinux.cfg/C0A8000
Trying to load: pxelinux.cfg/C0A800
Trying to load: pxelinux.cfg/C0A80
Trying to load: pxelinux.cfg/C0A8
Trying to load: pxelinux.cfg/C0A
Trying to load: pxelinux.cfg/C0
Trying to load: pxelinux.cfg/C
Trying to load: pxelinux.cfg/default
boot:
```

```
Windows is loading files...
IP: 192.168.0.8, File: \Boot\WinPE.wim
```


NOTE:

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

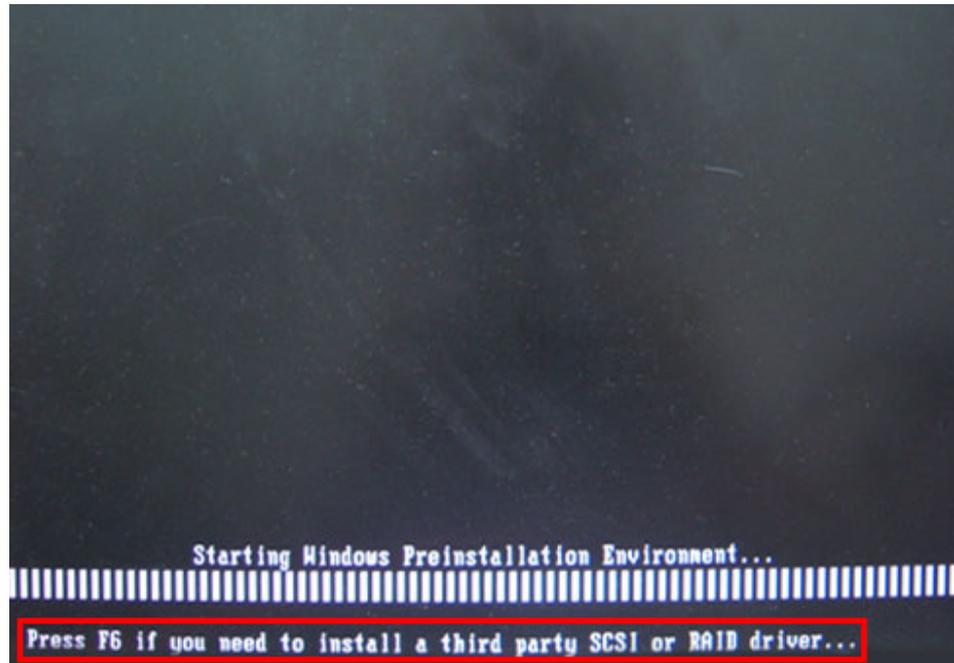
A.7 Other Information

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

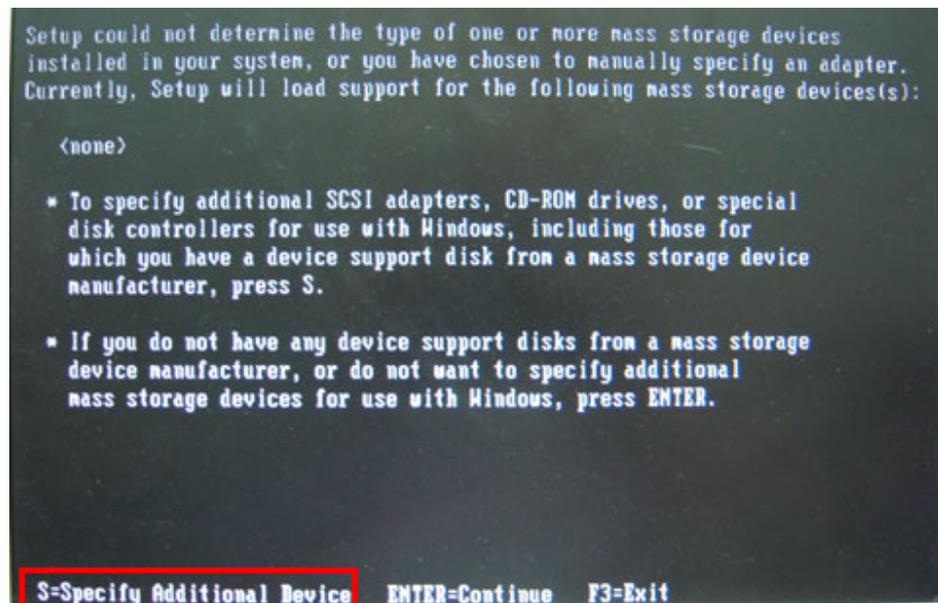
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

- 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>.

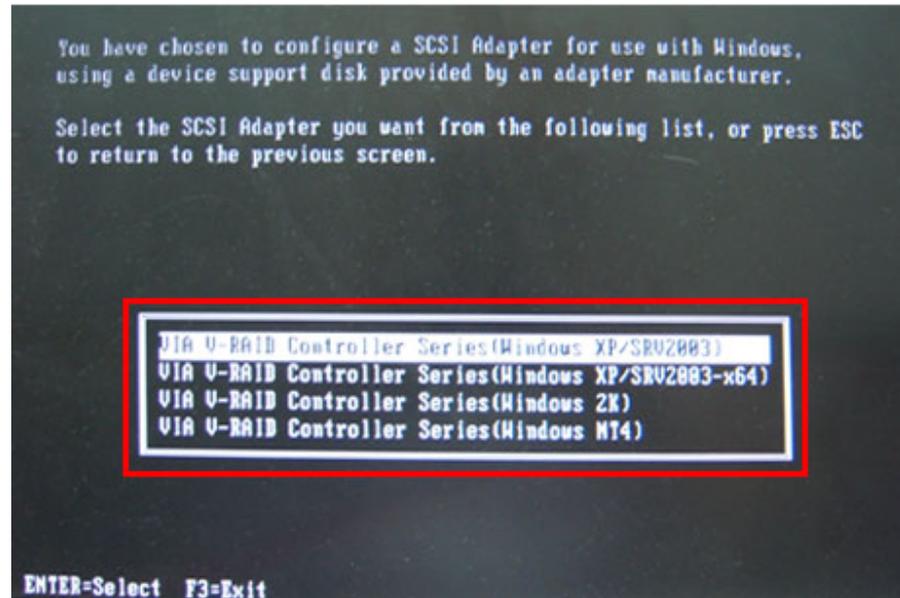
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Step 5: When the following window appears, press <S> to select "Specify Additional Device".



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 DRPC-100.

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 DRPC-100 may result in permanent damage to the DRPC-100 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the DRPC-100. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the DRPC-100 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.1.3 Explanation of Graphical Symbols



This symbol warns the user that the part has this symbol is hot. Therefore, it is dangerous to make any kind of contact with this part.



This symbol alerts the user that important information concerning the operation and maintenance of this unit has been included. Therefore, the information should be read carefully in order to avoid any problems.

B.1.4 Product Disposal



CAUTION:

Risk of explosion if battery is replaced by an 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 DRPC-100, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the DRPC-100, please read the details below.

- The interior of the DRPC-100 does not require cleaning. Keep fluids away from the DRPC-100 interior.

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- Be cautious of all small removable components when vacuuming the DRPC-100.
- Turn the DRPC-100 off before cleaning the DRPC-100.
- Never drop any objects or liquids through the openings of the DRPC-100.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the DRPC-100.
- Avoid eating, drinking and smoking within vicinity of the DRPC-100.

B.2.2 Cleaning Tools

Some components in the DRPC-100 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 DRPC-100.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the DRPC-100.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the DRPC-100.
- **Using solvents** – The use of solvents is not recommended when cleaning the DRPC-100 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 DRPC-100. Dust and dirt can restrict the airflow in the DRPC-100 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

Digital I/O Interface

C.1 Introduction

The DIO connector on the DRPC-100 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2.
9	Input 1	GP21	General purpose I/O port 2 bit 1.
10	Input 0	GP20	General purpose I/O port 2 bit 0.

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

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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。