



IEI Technology Corp .



MODEL:

ECW-281B/281B2-R30/N270

IEI Intel® Atom™ Fanless Embedded System

RoHS Compliant, Dual GbE LAN, COM Ports, USB 2.0

User Manual

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Revision

Date	Version	Changes
19 October, 2012	3.01	Added bottom cover screw torque warning
20 April, 2012	3.00	Updated for R30 version
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WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Table of Contents

1 INTRODUCTION.....	1
1.1 OVERVIEW.....	2
1.1.1 Benefits.....	2
1.1.2 Features	2
1.2 MODEL VARIATIONS	3
1.3 TECHNICAL SPECIFICATIONS	4
1.4 POWER MODULE SPECIFICATIONS	5
1.4.1 Power Module Options	5
1.4.2 Power Module Specifications	6
1.5 POWER ADAPTER	7
2 MECHANICAL DESCRIPTION.....	8
2.1 MECHANICAL OVERVIEW	9
2.2 PHYSICAL DIMENSIONS	9
2.2.1 System Dimensions.....	9
2.2.2 Motherboard Dimensions	10
2.2.3 Power Module Dimensions.....	11
2.3 EXTERNAL OVERVIEW.....	12
2.3.1 Front Panel	12
2.3.2 Rear Panel	12
2.3.2.1 ECW-281B-R30/N270 Rear Panel	12
2.3.2.2 ECW-281B2-R30/N270 Rear Panel	13
2.3.3 Bottom Surface.....	14
2.4 INTERNAL OVERVIEW.....	15
3 SYSTEM COMPONENTS	17
3.1 EMBEDDED SYSTEM MOTHERBOARD.....	18
3.1.1 WAFER-945GSE Motherboard Overview.....	18
3.1.2 CPU Support.....	19
3.2 PERIPHERAL INTERFACE CONNECTORS.....	19
3.2.1 Peripheral Interface Connectors	19

3.3 INTERNAL PERIPHERAL CONNECTORS	20
3.3.1 ATX Power Connector	20
3.3.2 ATX Power Supply Enable Connector	21
3.3.3 Audio Connector (10-pin)	22
3.3.4 CompactFlash® Socket	23
3.3.5 LED Connector	24
3.3.6 PCIe Mini Card Slot	25
3.3.7 Power Button Connector	27
3.3.8 Reset Button Connector	28
3.3.9 SATA Drive Connectors	28
3.3.10 Serial Port Connector (COM3, COM4, COM5 and COM6)	29
3.3.11 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)	31
3.3.12 USB Connectors (Internal)	32
3.4 EXTERNAL PERIPHERAL INTERFACE CONNECTOR PANEL	33
3.4.1 LAN Connectors	34
3.4.2 Serial Port Connector (COM1)	35
3.4.3 USB Connectors	36
3.4.4 VGA Connector	36
3.5 WAFER-945GSE MOTHERBOARD ON-BOARD JUMPERS	37
3.5.1 CF Card Setup	38
3.5.2 Clear CMOS Jumper	38
3.5.3 COM 2 Function Select Jumper (ECW-281B Series Only)	40
3.6 CONNECTOR MAPPINGS	41
3.6.1 Power Connector	41
3.6.2 ATX Mode Connector	41
4 INSTALLATION	42
4.1 ANTI-STATIC PRECAUTIONS	43
4.2 INSTALLATION PROCEDURE	43
4.2.1 Installation Procedure Overview	43
4.2.2 Unpacking	44
4.2.3 Bottom Surface Removal	45
4.2.4 Configure the Jumper Settings	46
4.2.5 Hard Drive Installation	46
4.2.6 Mounting the System with Mounting Brackets	50

ECW-281B/281B2-R30/N270 Embedded System

4.2.7	<i>Mounting the System with Wall Mount Kit</i>	51
4.2.8	<i>DIN Mounting</i>	53
4.2.9	<i>Wireless Antenna Installation (Wireless Models Only)</i>	55
4.2.10	<i>Cable Connections</i>	55
4.3	POWER-ON PROCEDURE	56
4.3.1	<i>Installation Checklist</i>	56
4.3.2	<i>Terminal Block Pinouts</i>	56
4.3.3	<i>Power-on Procedure</i>	57
5	BIOS SCREENS	58
5.1	INTRODUCTION	59
5.1.1	<i>Starting Setup</i>	59
5.1.2	<i>Using Setup</i>	59
5.1.3	<i>Getting Help</i>	60
5.1.4	<i>Unable to Reboot after Configuration Changes</i>	60
5.1.5	<i>BIOS Menu Bar</i>	60
5.2	MAIN	61
5.3	ADVANCED	62
5.3.1	<i>CPU Configuration</i>	63
5.3.2	<i>IDE Configuration</i>	63
5.3.2.1	<i>IDE Master, IDE Slave</i>	65
5.3.3	<i>Super IO Configuration</i>	70
5.3.4	<i>Hardware Health Configuration</i>	73
5.3.5	<i>Power Configuration</i>	77
5.3.5.1	<i>ACPI Configuration</i>	77
5.3.5.2	<i>APM Configuration</i>	78
5.3.6	<i>Remote Access Configuration</i>	81
5.3.7	<i>USB Configuration</i>	83
5.4	PCI/PNP	85
5.5	BOOT	88
5.5.1	<i>Boot Settings Configuration</i>	88
5.5.2	<i>Boot Device Priority</i>	90
5.6	SECURITY	91
5.7	CHIPSET	92
5.7.1	<i>North Bridge Chipset Configuration</i>	93

5.7.2 South Bridge Chipset Configuration.....	95
5.8 EXIT	96
6 SOFTWARE DRIVERS	98
6.1 AVAILABLE SOFTWARE DRIVERS	99
6.2 STARTING THE DRIVER PROGRAM	99
6.3 CHIPSET DRIVER INSTALLATION.....	100
6.4 VGA DRIVER INSTALLATION.....	104
6.5 LAN DRIVER INSTALLATION	109
6.6 AUDIO DRIVER INSTALLATION	111
7 TROUBLESHOOTING AND MAINTENANCE	115
7.1 ECW-281B/281B2-R30/N270 SYSTEM MAINTENANCE OVERVIEW	116
7.2 SYSTEM TROUBLESHOOTING.....	116
7.2.1 <i>The System Doesn't Turn On</i>	116
7.2.2 <i>The System Doesn't Boot Up</i>	117
7.2.3 <i>More Troubleshooting</i>	118
7.3 COMPONENT REPLACEMENT PROCEDURE	118
7.3.1 <i>SO-DIMM Replacement</i>	119
A SAFETY PRECAUTIONS	121
A.1 SAFETY PRECAUTIONS	122
A.1.1 <i>General Safety Precautions</i>	122
A.1.2 <i>Anti-static Precautions</i>	123
A.1.3 <i>Product Disposal</i>	124
A.2 MAINTENANCE AND CLEANING PRECAUTIONS	124
A.2.1 <i>Maintenance and Cleaning</i>	124
A.2.2 <i>Cleaning Tools</i>	125
B ONE KEY RECOVERY	126
B.1 ONE KEY RECOVERY INTRODUCTION	127
B.1.1 <i>System Requirement</i>	128
B.1.2 <i>Supported Operating System</i>	129
B.2 SETUP PROCEDURE FOR WINDOWS	130
B.2.1 <i>Hardware and BIOS Setup</i>	131
B.2.2 <i>Create Partitions</i>	131

<i>B.2.3 Install Operating System, Drivers and Applications</i>	135
<i>B.2.4 Building the Recovery Partition</i>	136
<i>B.2.5 Create Factory Default Image</i>	138
B.3 AUTO RECOVERY SETUP PROCEDURE	143
B.4 SETUP PROCEDURE FOR LINUX	148
B.5 RECOVERY TOOL FUNCTIONS	151
<i>B.5.1 Factory Restore</i>	153
<i>B.5.2 Backup System</i>	154
<i>B.5.3 Restore Your Last Backup</i>	155
<i>B.5.4 Manual</i>	156
B.6 RESTORE SYSTEMS FROM A LINUX SERVER THROUGH LAN	157
<i>B.6.1 Configure DHCP Server Settings</i>	158
<i>B.6.2 Configure TFTP Settings</i>	159
<i>B.6.3 Configure One Key Recovery Server Settings</i>	160
<i>B.6.4 Start the DHCP, TFTP and HTTP</i>	161
<i>B.6.5 Create Shared Directory</i>	161
<i>B.6.6 Setup a Client System for Auto Recovery</i>	162
B.7 OTHER INFORMATION	165
<i>B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller</i>	165
<i>B.7.2 System Memory Requirement</i>	167
C BIOS MENU OPTIONS	168
C.1 BIOS CONFIGURATION OPTIONS.....	169
D WATCHDOG TIMER	172

List of Figures

Figure 1-1: ECW-281B/281B2-R30/N270 Series Embedded System.....	2
Figure 1-2: Power Adapter	7
Figure 2-1: ECW-281B/281B2-R30/N270 Dimensions (mm).....	10
Figure 2-2: WAFER SBC Dimensions (mm)	11
Figure 2-3: Power Module Dimensions (mm)	11
Figure 2-4: ECW-281B/281B2-R30/N270 Front Panel	12
Figure 2-5: ECW-281B-R30/N270 Rear Panel.....	13
Figure 2-6: ECW-281B2-R30/N270 Rear Panel.....	14
Figure 2-7: Bottom Surface	15
Figure 2-8: Internal Overview	16
Figure 3-1: WAFER-945GSE Jumper and Connector Locations	18
Figure 3-2: ATX Power Connector Location	21
Figure 3-3: ATX Power Supply Enable Connector Location	22
Figure 3-4: Audio Connector Pinouts (10-pin).....	22
Figure 3-5: CF Card Socket Location	23
Figure 3-6: LED Connector Locations	25
Figure 3-7: PCIe Mini Card Slot Location	26
Figure 3-8: Power Button Connector Location.....	27
Figure 3-9: Reset Button Connector Locations.....	28
Figure 3-10: SATA Drive Connector Locations	29
Figure 3-11: COM3 to COM6 Connector Pinout Locations.....	30
Figure 3-12: RS-232/422/485 Serial Port Connector Location.....	32
Figure 3-13: USB Connector Pinout Locations	33
Figure 3-14: ECW-281B/281B2-R30/N270 External Peripheral Interface Connector.....	34
Figure 3-15: RJ-45 Ethernet Connector.....	34
Figure 3-16: COM1 Pinout Locations.....	35
Figure 3-17: VGA Connector	36
Figure 3-18: Jumpers	37
Figure 3-19: CF Card Setup Jumper Location	38
Figure 3-20: Clear CMOS Jumper	39
Figure 3-21: COM 2 Function Select Jumper Location.....	40

ECW-281B/281B2-R30/N270 Embedded System

Figure 4-1: Bottom Surface Retention Screws	46
Figure 4-2: Hard Drive Bracket.....	47
Figure 4-3:HDD Bracket Retention Screws	47
Figure 4-4: HDD Retention Screws	48
Figure 4-5: HDD Thermal Pad.....	49
Figure 4-6: Mounting Bracket Retention Screws	50
Figure 4-7: Wall-mounting Bracket	51
Figure 4-8: Mount the Embedded System.....	52
Figure 4-9: DIN Rail Mounting Bracket.....	53
Figure 4-10: Screw Locations.....	53
Figure 4-11: Mounting the DIN RAIL	54
Figure 4-12: Secure the Assembly to the DIN Rail	54
Figure 4-13: Wireless Antenna Installation	55
Figure 4-14: Terminal Block Pinouts	56
Figure 4-15: Power Button	57
Figure 6-1: Drivers	100
Figure 6-2: Chipset Driver Screen.....	101
Figure 6-3: Chipset Driver Welcome Screen.....	101
Figure 6-4: Chipset Driver License Agreement	102
Figure 6-5: Chipset Driver Read Me File	103
Figure 6-6: Chipset Driver Setup Operations	103
Figure 6-7: Chipset Driver Installation Finish Screen.....	104
Figure 6-8: VGA Driver Read Me File	105
Figure 6-9: VGA Driver Setup Files Extracted	105
Figure 6-10: VGA Driver Welcome Screen	106
Figure 6-11: VGA Driver License Agreement.....	107
Figure 6-12: VGA Driver Read Me File.....	107
Figure 6-13: VGA Driver Setup Operations	108
Figure 6-14: VGA Driver Installation Finish Screen	108
Figure 6-15: LAN Driver Welcome Screen	109
Figure 6-16: LAN Driver Welcome Screen	110
Figure 6-17: LAN Driver Installation	110
Figure 6-18: LAN Driver Installation Complete.....	111
Figure 6-19: The InstallShield Wizard Starts	111
Figure 6-20: Preparing Setup Screen	112

Figure 6-21: InstallShield Wizard Welcome Screen	112
Figure 6-22: Audio Driver Software Configuration.....	113
Figure 6-23: Installation Wizard Updates the System.....	113
Figure 6-24: Restart the Computer	114
Figure 7-1: SO-DIMM Cover Plate	119
Figure 7-2: SO-DIMM Installation	120
Figure B-1: IEI One Key Recovery Tool Menu	127
Figure B-2: Launching the Recovery Tool	132
Figure B-3: Recovery Tool Setup Menu	132
Figure B-4: Command Prompt	133
Figure B-5: Partition Creation Commands.....	134
Figure B-6: Launching the Recovery Tool	136
Figure B-7: Manual Recovery Environment for Windows	136
Figure B-8: Building the Recovery Partition.....	137
Figure B-9: Press Any Key to Continue	137
Figure B-10: Press F3 to Boot into Recovery Mode.....	138
Figure B-11: Recovery Tool Menu	138
Figure B-12: About Symantec Ghost Window.....	139
Figure B-13: Symantec Ghost Path	139
Figure B-14: Select a Local Source Drive	140
Figure B-15: Select a Source Partition from Basic Drive	140
Figure B-16: File Name to Copy Image to	141
Figure B-17: Compress Image.....	141
Figure B-18: Image Creation Confirmation	142
Figure B-19: Image Creation Complete	142
Figure B-20: Image Creation Complete	142
Figure B-21: Press Any Key to Continue	143
Figure B-22: Auto Recovery Utility	144
Figure B-23: Disable Automatically Restart.....	144
Figure B-24: Launching the Recovery Tool	145
Figure B-25: Auto Recovery Environment for Windows	145
Figure B-26: Building the Auto Recovery Partition.....	146
Figure B-27: Factory Default Image Confirmation	146
Figure B-28: Image Creation Complete	147
Figure B-29: Press any key to continue	147

ECW-281B/281B2-R30/N270 Embedded System

Figure B-30: Partitions for Linux.....	149
Figure B-31: Manual Recovery Environment for Linux	150
Figure B-32: Access menu.lst in Linux (Text Mode).....	150
Figure B-33: Recovery Tool Menu	151
Figure B-34: Recovery Tool Main Menu	152
Figure B-35: Restore Factory Default.....	153
Figure B-36: Recovery Complete Window	153
Figure B-37: Backup System.....	154
Figure B-38: System Backup Complete Window	154
Figure B-39: Restore Backup	155
Figure B-40: Restore System Backup Complete Window	155
Figure B-41: Symantec Ghost Window	156
Figure B-42: Disable Automatically Restart.....	163

List of Tables

Table 1-1: Model Variations	3
Table 1-2: Technical Specifications.....	5
Table 1-3: ECW-281B/281B2-R30/N270 Power Module Options	5
Table 1-4: DC-to-DC Power Module Specifications.....	6
Table 1-5: Power Adapter Specifications	7
Table 3-1: Peripheral Interface Connectors	20
Table 3-2: ATX Power Connector Pinouts	21
Table 3-3: ATX Power Supply Enable Connector Pinouts	22
Table 3-4: Audio Connector Pinouts (10-pin)	23
Table 3-5: CF Card Socket Pinouts.....	24
Table 3-6: LED Connector Pinouts	25
Table 3-7: PCIe Mini Card Slot Pinouts	27
Table 3-8: Power Button Connector Pinouts	27
Table 3-9: Reset Button Connector Pinouts	28
Table 3-10: SATA Drive Connector Pinouts.....	29
Table 3-11: COM3 to COM6 Connector Pinouts	31
Table 3-12: RS-232/RS-485 Serial Port Connector Pinouts.....	32
Table 3-13: USB Port Connector Pinouts.....	33
Table 3-14: LAN Pinouts	34
Table 3-15: RJ-45 Ethernet Connector LEDs	35
Table 3-16: RS-232 Serial Port (COM 1) Pinouts	35
Table 3-17: USB Port Pinouts.....	36
Table 3-18: VGA Connector Pinouts.....	37
Table 3-19: Jumpers.....	38
Table 3-20: CF Card Setup Jumper Settings	38
Table 3-21: Clear CMOS Jumper Settings.....	39
Table 3-22: COM 2 Function Select Jumper Settings	40
Table 3-23: Motherboard Power Connector Mapping	41
Table 3-24: Motherboard Power Connector Mapping	41
Table 4-1: Package List Contents	45
Table 5-1: BIOS Navigation Keys	60

List of BIOS Menus

BIOS Menu 1: Main	61
BIOS Menu 2: Advanced	62
BIOS Menu 3: CPU Configuration	63
BIOS Menu 4: IDE Configuration	64
BIOS Menu 5: IDE Master and IDE Slave Configuration	65
BIOS Menu 6: Super IO Configuration	70
BIOS Menu 7: Hardware Health Configuration	73
BIOS Menu 8: Power Configuration	77
BIOS Menu 9: ACPI Configuration	78
BIOS Menu 10: Advanced Power Management Configuration	79
BIOS Menu 11: Remote Access Configuration	81
BIOS Menu 12: USB Configuration	84
BIOS Menu 13: PCI/PnP Configuration	86
BIOS Menu 14: Boot	88
BIOS Menu 15: Boot Settings Configuration	88
BIOS Menu 16: Boot Device Priority Settings	91
BIOS Menu 17: Security	91
BIOS Menu 18: Chipset	92
BIOS Menu 19: North Bridge Chipset Configuration	93
BIOS Menu 20: South Bridge Chipset Configuration	95
BIOS Menu 21: Exit	96
BIOS Menu 22: IEI Feature	148

Chapter

1

Introduction

1.1 Overview



Figure 1-1: ECW-281B/281B2-R30/N270 Series Embedded System

There are four WAFER-945GSE Intel® Atom™ based embedded solutions in the ECW-281B/281B2-R30/N270 series. All fanless motherboards have been optimized for multimedia applications that require minimum installation space. The WAFER-945GSE motherboard supports a full range of functions for an AT/ATX-compatible industrial computer. ECW-281B/281B2-R30/N270 embedded subsystems are all capable of supporting one 2.5" SATA hard disk drive. The W models also have a built-in 802.11b/g/n wireless module.

1.1.1 Benefits

The ECW-281B/281B2-R30/N270 embedded system has the following benefits:

- Easy installation saves installation time
- Complete integration saves solution development time and cost
- Secure storage with one SATA hard drive supported
- Compact size saves space
- Powerful preinstalled Intel® Atom™ N270 CPU and motherboard ensures rigorous processing needs can be met

1.1.2 Features

The ECW-281B/281B2-R30/N270 has the following features

- RoHS compliant design
- Fanless system
- Built-in DC-to-DC power converter

ECW-281B/281B2-R30/N270 Embedded System

- 1.6 GHz Intel® Atom™ N270 CPU supported
- Dual GbE LAN for high speed network applications
- One SATA hard drive supported
- Wall mount and DIN mount supported.

1.2 Model Variations

There are six models in the ECW-281B/281B2-R30/N270 embedded system series. The six models are all preinstalled with an Intel® Atom™ N270 processor and 1 GB DDR2 memory. The model variations are listed in **Table 1-1** below.

ECW-281B Series	Power	Wireless	VGA	COM Ports
ECW-281B-R30/N270/1GB	12V DC input (60 W adaptor)	No	1 x VGA	5 x RS-232 1 x RS-232 or optional RS-422/485
ECW-281B-WT-R30/N270/1GB*	12V DC input (60 W adaptor)	No		
ECW-281B-W-R30/N270/1GB	12V DC input (60 W adaptor)	Yes		
ECW-281B-WD-R30/N270/1GB	9V~36V DC input	No		
ECW-281B-WD-W-R30/N270/1GB	9V~36V DC input	Yes		
ECW-281B2 Series	Power	Wireless		
ECW-281B2-R30/N270/1GB	12V DC input (60 W adaptor)	No	2 x VGA	5 x RS-232
ECW-281B2-W-R30/N270/1GB	12V DC input (60 W adaptor)	Yes		
ECW-281B2-WD-R30/N270/1GB	9V~36V DC input	No		
ECW-281B2-WD-W-R30/N270/1GB	9V~36V DC input	Yes		

*Wide Operating Temperature: -20°C~70°C with CF/SSD

Table 1-1: Model Variations

1.3 Technical Specifications

The specifications for the Intel based embedded systems are listed below.

	ECW-281B-R30/N270	ECW-281B2-R30/N270
CPU	Preinstalled 1.6 GHz Intel® Atom™ Processor N270 with a 533 MHz FSB	
System Chipset	Intel® 945GSE + ICH7-M	
System Memory	Preinstalled 1.0 GB DDR2 SDRAM SO-DIMM (system max. 2 GB)	
Ethernet	Dual Realtek RTL8111E GbE controllers Built-in 802.11 b/g/n wireless module for the wireless models	
Display	One VGA port	Two VGA port
Serial Port	Five RS-232 One RS-232 or RS-422/485 (optional)	Five RS-232
USB	Four USB 2.0 ports	
Audio	One speaker out (5.1 channel Realtek ALC662 HD Audio codec)	
Storage	One 2.5" SATA hard drive supported One internal CF card slot	
Chassis Construction	Aluminum Alloy	
Power Supply	Internal DC-to-DC power converter, input voltage: 12V DC or 9V – 36V (WD series models) External power adapter, input voltage: 90V AC ~ 264V AC @ 47Hz ~ 63Hz, 60 W	
Power Consumption	19 W	
Operating Shock	Half-sine wave shock 3G; 11ms; 3 shocks per axis	
Operating Vibration	MIL-STD-810F 514.5C-1 (HDD) MIL-STD-810F 514.5C-2 (CF)	

ECW-281B/281B2-R30/N270 Embedded System

Operating temperature	-10°C ~ 50°C with HDD -10°C ~ 60°C with CF card/SSD (ECW-281B-WT-R30/N270: -20°C ~ 70°C with CF card/SSD)
Color	Black
Mounting	DIN mount VESA MIS-D 100 wall mount
Weight (Net/Gross)	2.1 kg/3.9 kg
Dimensions (D x W x H)	132 mm x 229 mm x 64 mm
EMC	FCC Class A, CE

Table 1-2: Technical Specifications

1.4 Power Module Specifications

1.4.1 Power Module Options

The ECW-281B/281B2-R30/N270 embedded system supports either a 12V DC input or a 9V~36V DC input. The input support depends on the power module installed in the system. The two power modules are listed in **Table 1-3**:

Embedded System	Power Module	DC Input
ECW-281B-R30/N270 Series ECW-281B2-R30/N270 Series	IDD-12250A	12V DC input
ECW-281BWD-R30/N270 Series ECW-281B2WD-R30/N270 Series	IDD-936260A	9V~36V DC input

Table 1-3: ECW-281B/281B2-R30/N270 Power Module Options

1.4.2 Power Module Specifications

The specifications for the IDD-12250A and IDD-936260A are shown in **Table 1-4**.

Model Name:	IDD-12250A	IDD-936260A
Input	12VDC	9VDC~36VDC
Output:		
12V	5A (pass thru.)	3A (Max.)
5V	10A (Max.)	10A (Max.)
5VSB	0.5A (Max.)	0.5A (Max.)
Max. Total Output:	50W+60W (12V pass thru.)	60W
Performance Characteristics:		
Noise & Ripple:	< 240mV	< 240mV
Line Regulation:	< 20mV	< 20mV
Load Regulation	<60mV	<60mV
Efficiency:	Up to 90%	Up to 90%
Dimensions:	40mm x 100mm	40mm x 100mm
Weight:	46g	58g
Operating Temperature:	-40°C~85°C	-40°C~85°C

Table 1-4: DC-to-DC Power Module Specifications

1.5 Power Adapter

The ECW-281B/281B2-R30/N270 series models are shipped with a 60W power adapter.



Figure 1-2: Power Adapter

The specifications for the adapter are listed in **Table 1-5**:

Input Voltage	90 V ~ 264 V AC
Input Frequency	47 Hz ~ 63 Hz
Output Voltage	12 V
Output Current	5 A
Efficiency	87%
Operating Temperature	0 °C ~ 40 °C
Storage Temperature	-20 °C ~ 65 °C

Table 1-5: Power Adapter Specifications



Chapter

2

Mechanical Description

2.1 Mechanical Overview

The ECW-281B/281B2-R30/N270 RoHS compliant, Intel® Atom™ fanless embedded system features industrial grade components that offer longer operating life, high shock/vibration resistance and endurance over a wide temperature range. The ECW-281B/281B2-R30/N270 combines these features in an aluminum enclosure designed for space critical applications that require low power consumption. Featuring two LAN, four USB, six serial communication ports, as well as audio, and VGA, the ECW-281B/281B2-R30/N270 offers system integrators and developers the best selection of robust and high performance computing system platforms. An internal bracket supports one 2.5" SATA hard drives.

2.2 Physical Dimensions

The physical dimensions of the ECW-281B/281B2-R30/N270 embedded systems are listed below.

2.2.1 System Dimensions

The dimensions of the ECW-281B/281B2-R30/N270 are listed below and shown in **Figure 2-1**.

- **Height:** 64.00 mm
- **Width:** 229.00 mm
- **Length:** 132.00 mm

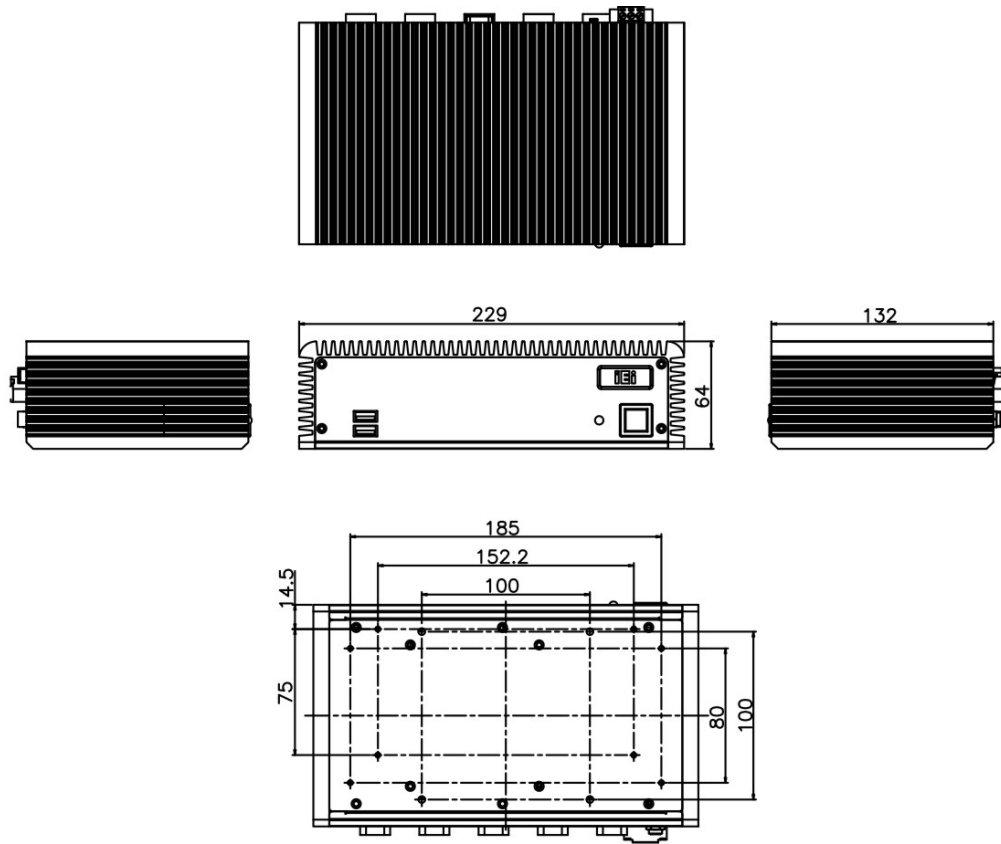


Figure 2-1: ECW-281B/281B2-R30/N270 Dimensions (mm)

2.2.2 Motherboard Dimensions

The WAFER series dimension are listed below and shown in **Figure 2-2**.

- **Length:** 145.00 mm
- **Width:** 102.00 mm

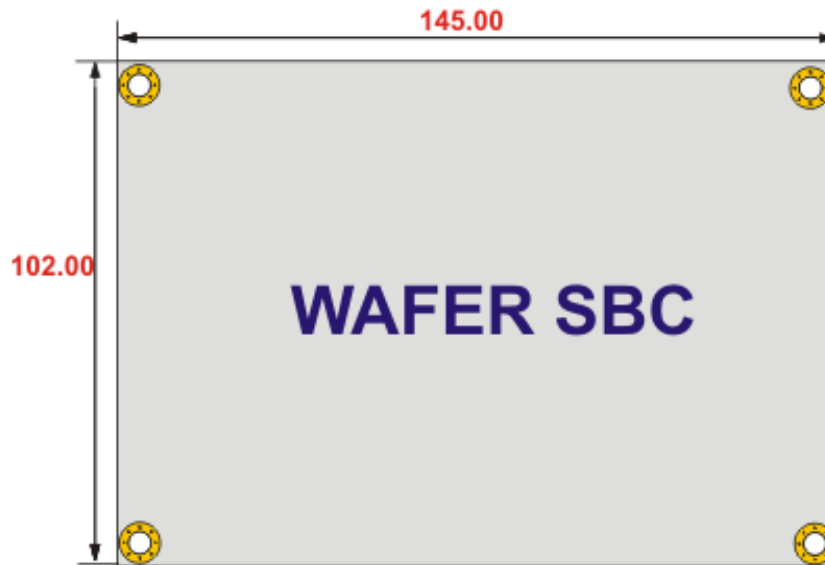


Figure 2-2: WAFER SBC Dimensions (mm)

2.2.3 Power Module Dimensions

The power module dimensions are listed below and shown in **Figure 2-3**.

- **Length:** 100.00 mm
- **Width:** 40.00 mm



Figure 2-3: Power Module Dimensions (mm)

2.3 External Overview

2.3.1 Front Panel

The ECW-281B/281B2-R30/N270 front panel contains:

- 2 x USB port connectors
- 1 x HDD LED indicator
- 1 x Power button

An overview of the front panel is shown in **Figure 2-4** below.



Figure 2-4: ECW-281B/281B2-R30/N270 Front Panel

2.3.2 Rear Panel

2.3.2.1 ECW-281B-R30/N270 Rear Panel

The rear panel of the ECW-281B-R30/N270 provides access to the following external I/O connectors.

- 2 x USB port connectors
- 2 x RJ-45 Ethernet connector
- 1 x VGA connector
- 1 x RS-232/422/485 serial port (Default: RS-232)
- 5 x RS-232 serial ports
- 1 x Speaker out
- 1 x 3-pin power terminal block
- 1 x 12V DC power jack

ECW-281B/281B2-R30/N270 Embedded System

- 1 x Wireless antenna connector (for wireless models only)

An overview of the rear panel is shown in **Figure 2-5**.

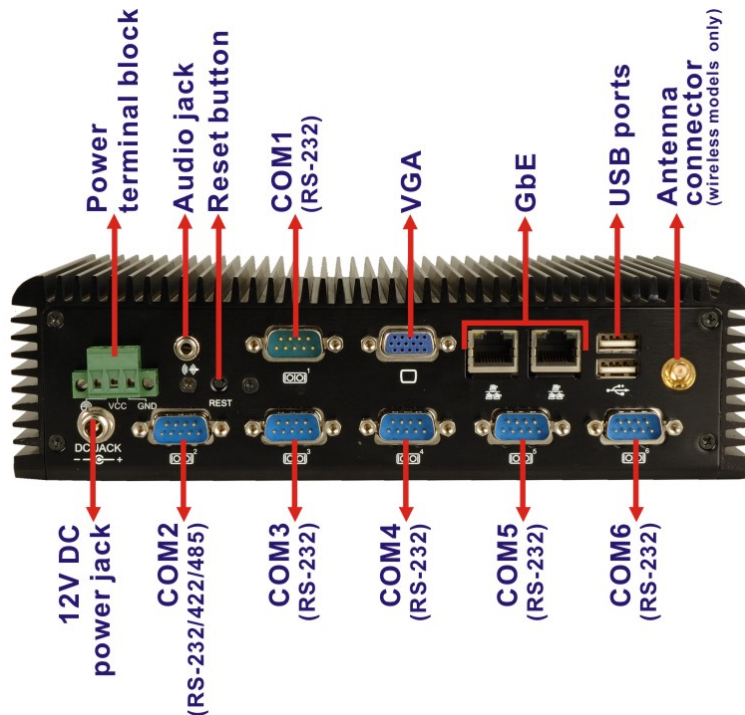


Figure 2-5: ECW-281B-R30/N270 Rear Panel

2.3.2.2 ECW-281B2-R30/N270 Rear Panel

The rear panel of the ECW-281B2-R30/N270 provides access to the following external I/O connectors.

- 2 x USB port connectors
- 2 x RJ-45 Ethernet connector
- 2 x VGA connectors
- 5 x RS-232 serial ports
- 1 x Speaker out
- 1 x 3-pin power terminal block
- 1 x 12V DC power jack
- 1 x Wireless antenna connector (for wireless models only)

An overview of the rear panel is shown in **Figure 2-6**.

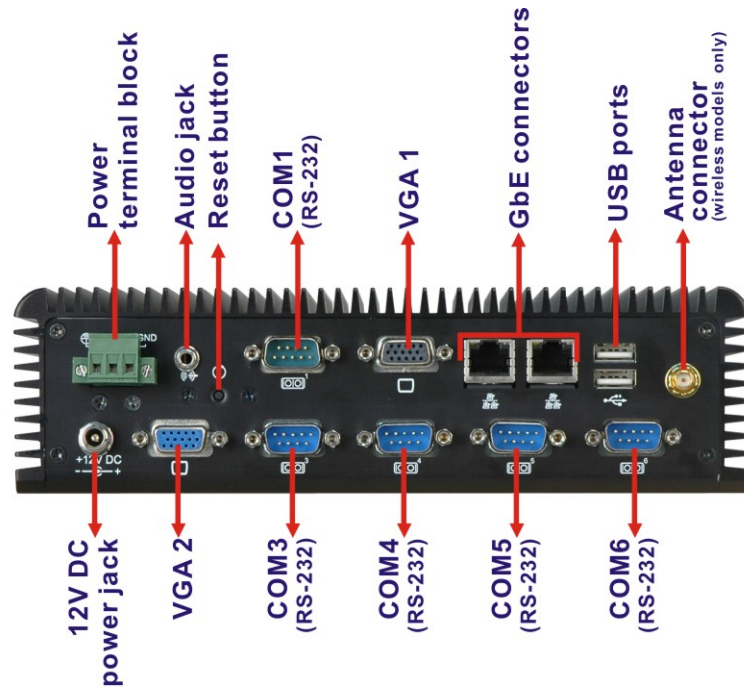


Figure 2-6: ECW-281B2-R30/N270 Rear Panel

2.3.3 Bottom Surface



WARNING:

Never remove the bottom access panel from the chassis while power is still being fed into the system. Before removing the bottom access panel, make sure the system has been turned off and all power connectors unplugged.

The bottom surface of the ECW-281B/281B2-R30/N270 contains the retention screw holes for the VESA MIS-D 100 wall-mount kit, two-side mounting brackets and DIN mount bracket.

ECW-281B/281B2-R30/N270 Embedded System

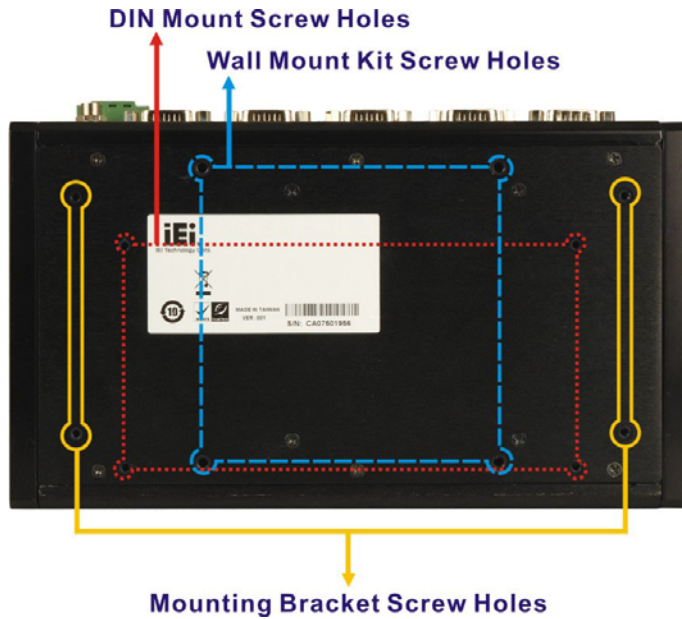


Figure 2-7: Bottom Surface

2.4 Internal Overview

The ECW-281B/281B2-R30/N270 internal components are listed below:

- 1 x IEI WAFER motherboard (preinstalled)
- 1 x IEI power module (preinstalled)
- 1 x SO-DIMM module (preinstalled)
- 1 x Hard drive bracket and SATA cable support one SATA hard disk

All the components are accessed by removing the bottom surface.

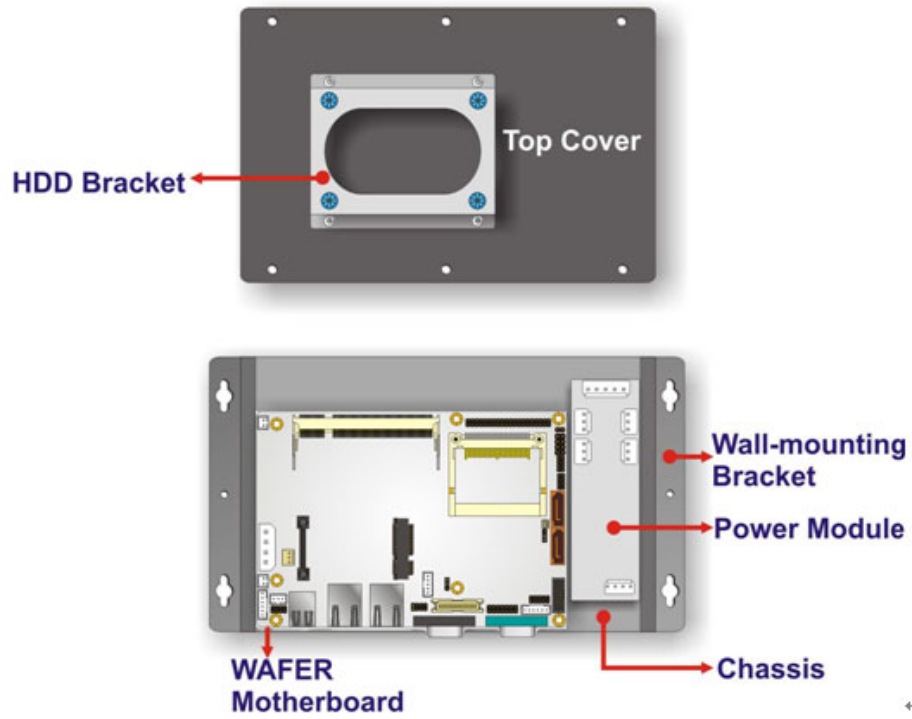


Figure 2-8: Internal Overview

Chapter

3

System Components

3.1 Embedded System Motherboard



NOTE:

The jumpers and connectors shown in the section below are those jumpers and connectors that are relevant to the configuration and installation of the embedded system. For a complete list of jumpers and connectors on the WAFER-945GSE motherboard, please refer to the WAFER-945GSE user manual.

The ECW-281B/281B2-R30/N270 models have a WAFER-945GSE motherboard installed in the system. The following sections describe the relevant connectors and jumpers on the motherboard.

3.1.1 WAFER-945GSE Motherboard Overview

The locations of the WAFER-945GSE jumpers and connectors used on the ECW-281B/281B2-R30/N270 are shown in **Figure 3-1** below.

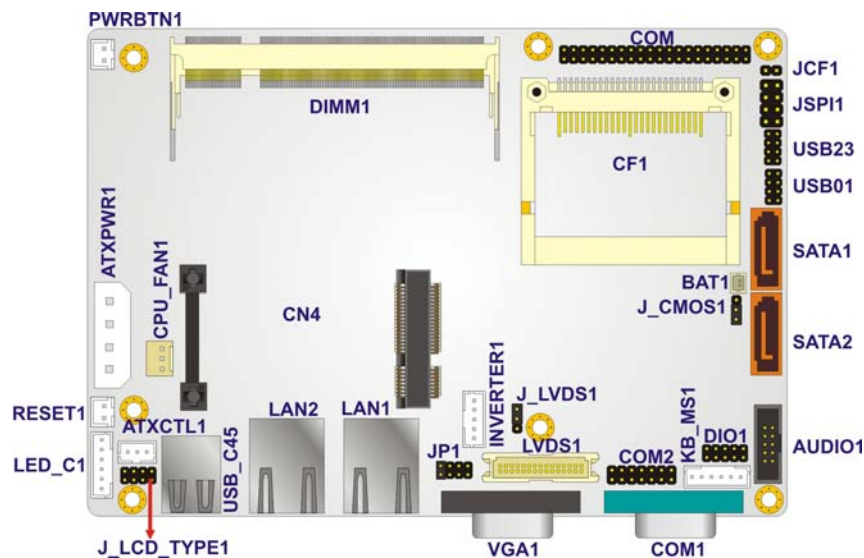


Figure 3-1: WAFER-945GSE Jumper and Connector Locations

3.1.2 CPU Support



NOTE:

The ECW-281B/281B2-R30/N270 series has a preinstalled Intel® Atom™ 1.6 GHz CPU on-board. If the CPU fails, the motherboard has to be replaced. Please contact the IEI reseller or vendor you purchased the ECW-281B/281B2-R30/N270 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The ECW-281B/281B2-R30/N270 comes with an embedded 45 nm 1.60 GHz Intel® Atom™ processor N270. The processor supports a 533 MHz FSB and has a 1.6 GHz 512 KB L2 cache. The low power processor has a maximum power of 2.5 W.

3.2 Peripheral Interface Connectors

Section 3.2.1 lists all the peripheral interface connectors seen in Section 3.1.1.

3.2.1 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the WAFER-945GSE that are used for the ECW-281B/281B2-R30/N270. Detailed descriptions of these connectors can be found in Section 3.3.

Connector	Type	Label
Audio connector	10-pin header	AUDIO1
ATX enable connector	3-pin wafer	ATXCTL1
ATX power connector	4-pin ATX	ATXPWR1
CompactFlash® socket	50-pin CF socket	CF1
LED connector	6-pin header	LED_C1

PCIe Mini Card slot	PCIe Mini Slot	CN4
Power Button	2-pin wafer	PWRBTN1
Reset button connector	2-pin header	RESET1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1
RS-232 serial port connector (COM3 – COM6)	40-pin header	COM
RS-232/422/485 serial port connector	14-pin header	COM2
USB 2.0 connector	8-pin header	USB01

Table 3-1: Peripheral Interface Connectors

3.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of the internal, peripheral connectors on the WAFER-945GSE that are used for the ECW-281B/281B2-R30/N270.

3.3.1 ATX Power Connector

- CN Label:** **ATXPWR1**
- CN Type:** 4-pin AT power connector (1x4)
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-2**

The 4-pin ATX power connector is connected to a DC-DC power module.

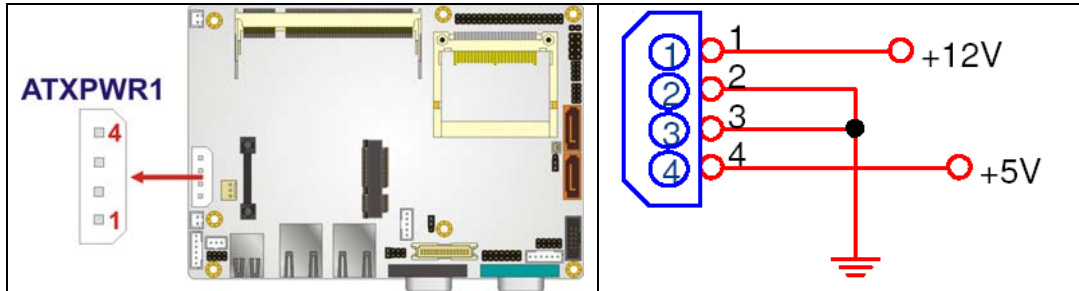


Figure 3-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

Table 3-2: ATX Power Connector Pinouts

3.3.2 ATX Power Supply Enable Connector

- CN Label:** ATXCTL1
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-3**

The ATX power supply enable connector is connected to the ATX mode connector on the power module to enable the ECW-281B/281B2-R30/N270 to be connected to an ATX power supply.

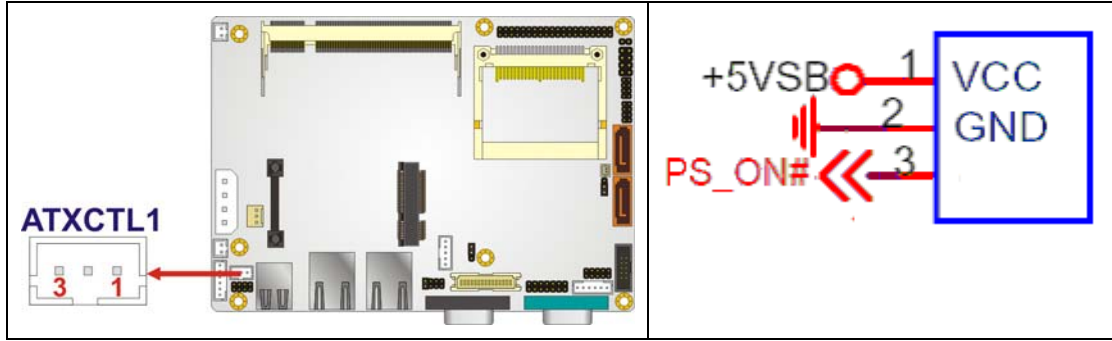


Figure 3-3: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	+5V Standby
2	GND
3	PS-ON

Table 3-3: ATX Power Supply Enable Connector Pinouts

3.3.3 Audio Connector (10-pin)

- CN Label:** AUDIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-4**
- CN Pinouts:** See **Table 3-4**

The 10-pin audio connector is interfaced to an audio line-out connector and provides output of audio signals from the system.

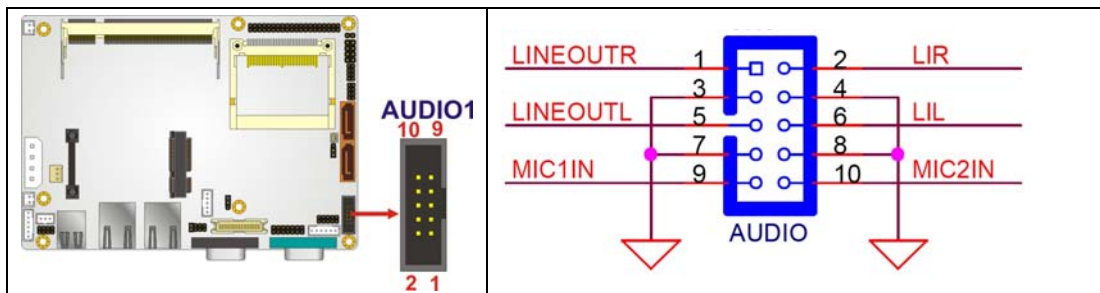


Figure 3-4: Audio Connector Pinouts (10-pin)

ECW-281B/281B2-R30/N270 Embedded System

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line out R	2	Line in R
3	GND	4	GND
5	Line out L	6	Line in L
7	GND	8	GND
9	MIC in	10	Mic in

Table 3-4: Audio Connector Pinouts (10-pin)

3.3.4 CompactFlash® Socket

- CN Label:** CF1
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 3-5
- CN Pinouts:** See Table 3-5

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the ECW-281B/281B2-R30/N270.

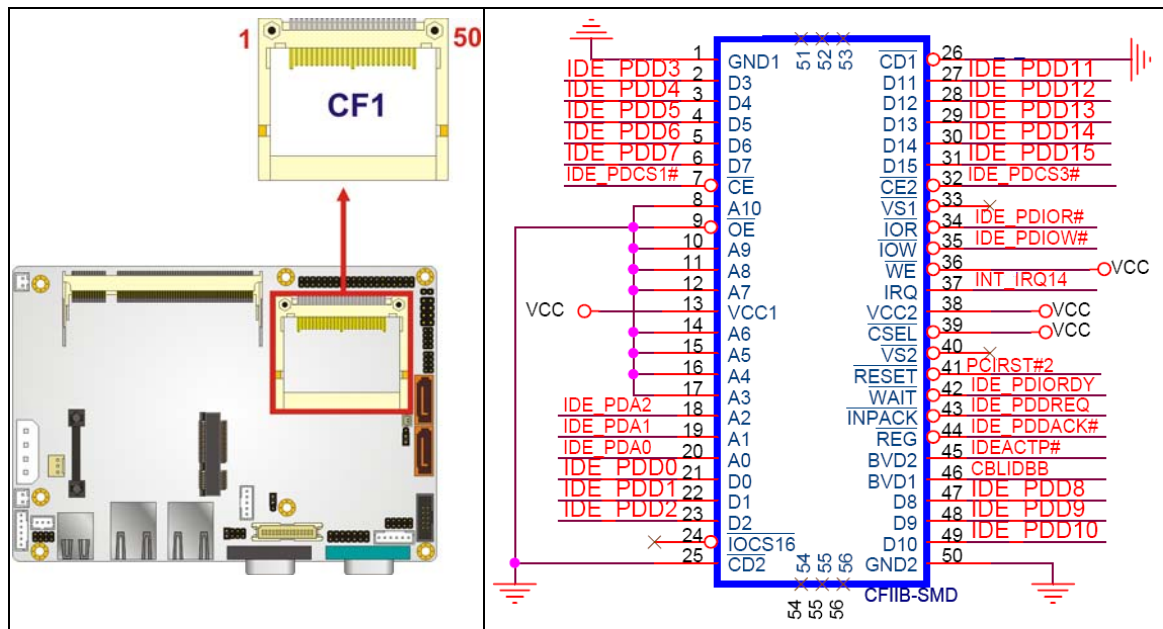


Figure 3-5: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	GROUND	33	N/C
9	GROUND	34	IOR#
10	GROUND	35	IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	IRQ14
13	VCC_COM	38	VCC_COM
14	GROUND	39	CSEL
15	GROUND	40	N/C
16	GROUND	41	HDD_RESET
17	GROUND	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-5: CF Card Socket Pinouts

3.3.5 LED Connector

CN Label: LED_C1

CN Type: 6-pin wafer (1x6)

ECW-281B/281B2-R30/N270 Embedded System

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-6**

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.

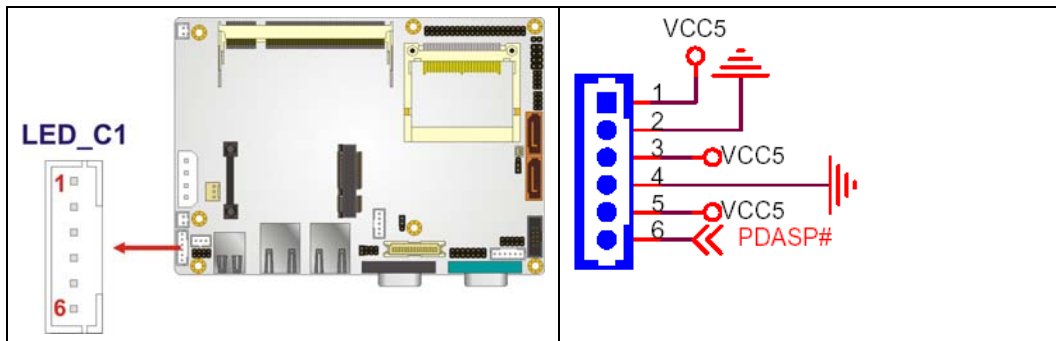


Figure 3-6: LED Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	GND
3	Power LED+
4	Power LED-
5	HDD LED +
6	HDD LED-

Table 3-6: LED Connector Pinouts

3.3.6 PCIe Mini Card Slot

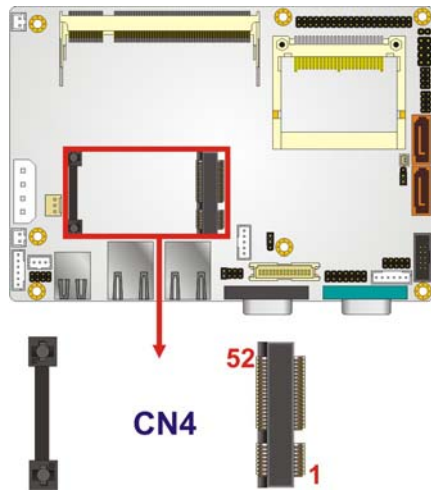
CN Label: **CN4**

CN Type: 52-pin Mini PCIe Card Slot

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

CN Pinouts: See **Table 3-7**

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards.


Figure 3-7: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
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

ECW-281B/281B2-R30/N270 Embedded System

41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-7: PCIe Mini Card Slot Pinouts

3.3.7 Power Button Connector

CN Label:	PWRBTN1
CN Type:	2-pin wafer (1x2)
CN Location:	See Figure 3-8
CN Pinouts:	See Table 3-8

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

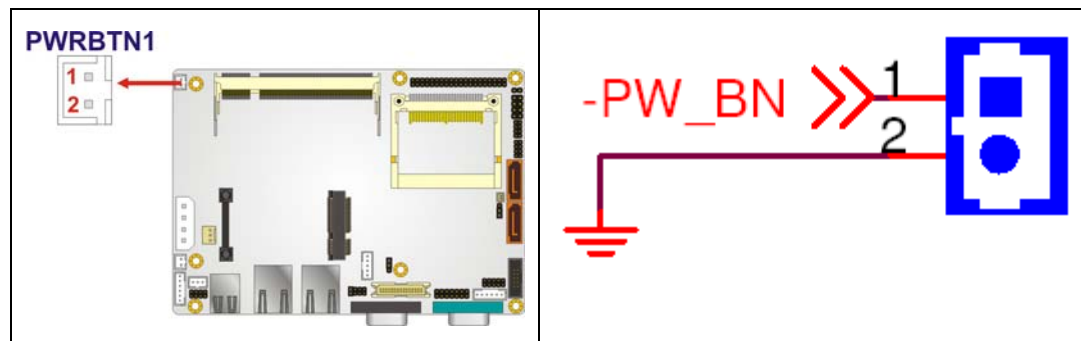


Figure 3-8: Power Button Connector Location

PIN NO.	DESCRIPTION
1	Power Switch
2	GND

Table 3-8: Power Button Connector Pinouts

3.3.8 Reset Button Connector

- CN Label:** **RESET1**
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

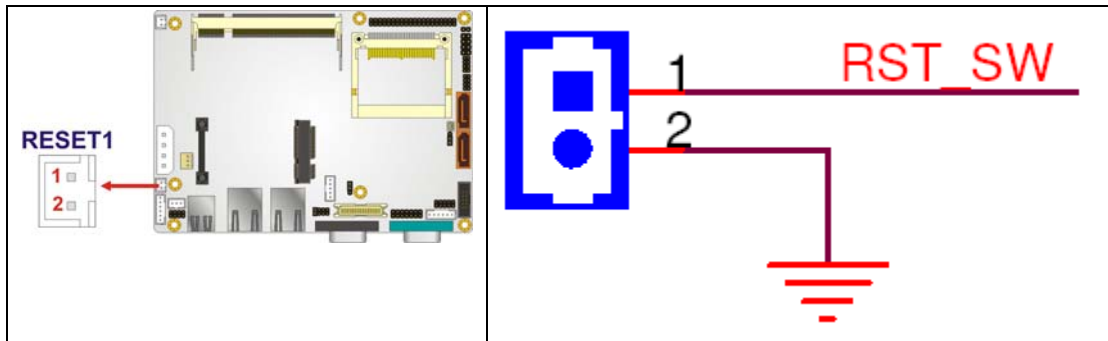


Figure 3-9: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

Table 3-9: Reset Button Connector Pinouts

3.3.9 SATA Drive Connectors

- CN Label:** **SATA1, SATA2**
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-10**

ECW-281B/281B2-R30/N270 Embedded System

The SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

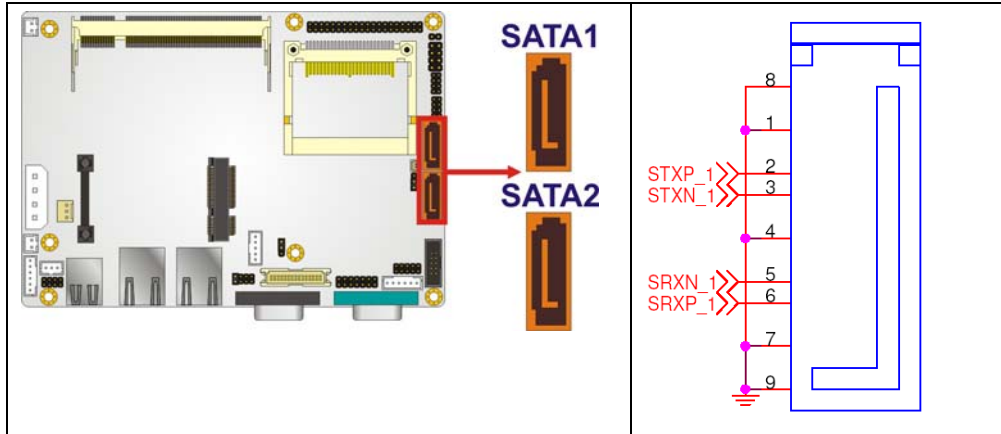


Figure 3-10: SATA Drive Connector Locations

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

Table 3-10: SATA Drive Connector Pinouts

3.3.10 Serial Port Connector (COM3, COM4, COM5 and COM6)

CN Label:	COM
CN Type:	40-pin header (2x20)
CN Location:	See Figure 3-11
CN Pinouts:	See Table 3-11

The 40-pin serial port connector contains the following four serial ports: COM3, COM4, COM5 and COM6. All these serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- COM3 is located on pin 1 to pin 10
- COM4 is located on pin 11 to pin 20
- COM5 is located on pin 21 to pin 30
- COM6 is located on pin 31 to pin 40

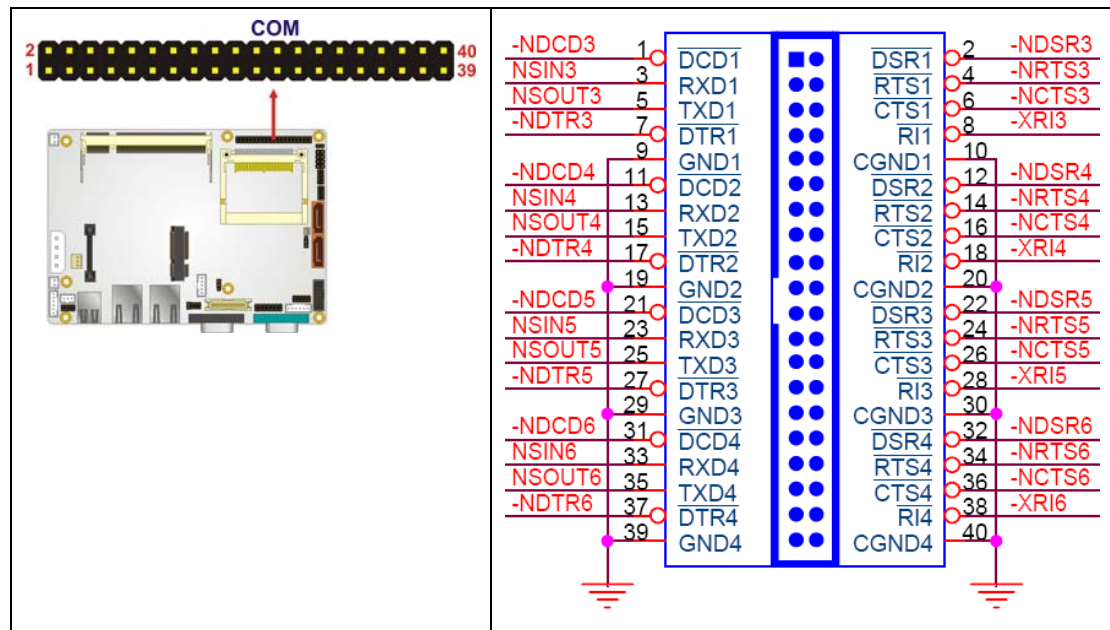


Figure 3-11: COM3 to COM6 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD3)	2	DATA SET READY (DSR3)
3	RECEIVE DATA (RXD3)	4	REQUEST TO SEND (RTS3)
5	TRANSMIT DATA (TXD3)	6	CLEAR TO SEND (CTS3)
7	DATA TERMINAL READY (DTR3)	8	RING INDICATOR (RI3)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD4)	12	DATA SET READY (DSR4)
13	RECEIVE DATA (RXD4)	14	REQUEST TO SEND (RTS4)
15	TRANSMIT DATA (TXD4)	16	CLEAR TO SEND (CTS4)
17	DATA TERMINAL READY (DTR4)	18	RING INDICATOR (RI4)
19	GND	20	GND

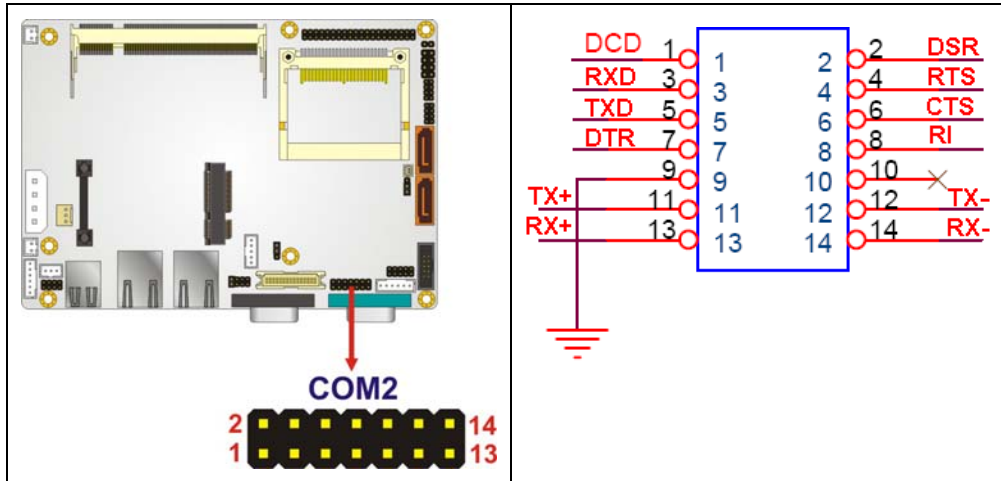
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
21	DATA CARRIER DETECT (DCD5)	22	DATA SET READY (DSR5)
23	RECEIVE DATA (RXD5)	24	REQUEST TO SEND (RTS5)
25	TRANSMIT DATA (TXD5)	26	CLEAR TO SEND (CTS5)
27	DATA TERMINAL READY (DTR5)	28	RING INDICATOR (RI5)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD6)	32	DATA SET READY (DSR6)
33	RECEIVE DATA (RXD6)	34	REQUEST TO SEND (RTS6)
35	TRANSMIT DATA (TXD6)	36	CLEAR TO SEND (CTS6)
37	DATA TERMINAL READY (DTR6)	38	RING INDICATOR (RI6)
39	GND	40	GND

Table 3-11: COM3 to COM6 Connector Pinouts

3.3.11 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

- CN Label:** COM2
- CN Type:** 14-pin header (2x7)
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multi function channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.


Figure 3-12: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	2	NDSR2
3	NRX	4	NRTS2
5	NTX	6	NCTS2
7	NDTR	8	NRI2
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 3-12: RS-232/RS-485 Serial Port Connector Pinouts

3.3.12 USB Connectors (Internal)

CN Label: USB01 and USB23

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-13**

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

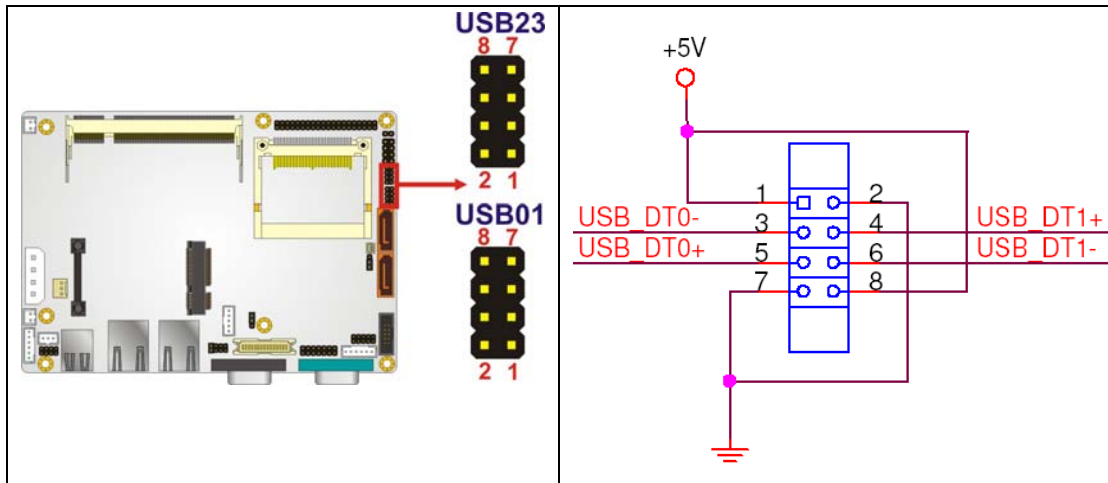


Figure 3-13: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-13: USB Port Connector Pinouts

3.4 External Peripheral Interface Connector Panel

Figure 3-14 shows the ECW-281B/281B2-R30/N270 external peripheral interface connector (EPIC) panel. The ECW-281B/281B2-R30/N270 EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 1 x Serial port connectors
- 2 x USB connectors
- 1 x VGA connector

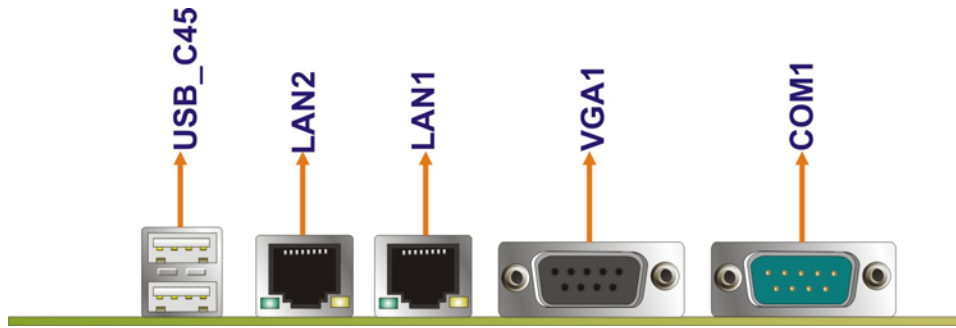


Figure 3-14: ECW-281B/281B2-R30/N270 External Peripheral Interface Connector

3.4.1 LAN Connectors

- CN Label:** LAN1 and LAN2
- CN Type:** RJ-45
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-14**

The ECW-281B/281B2-R30/N270 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+
3	MDIA2-	7	MDIA0-
4	MDIA1-	8	MDIA0+

Table 3-14: LAN Pinouts

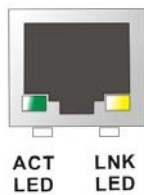


Figure 3-15: RJ-45 Ethernet Connector

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 3-15**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-15: RJ-45 Ethernet Connector LEDs

3.4.2 Serial Port Connector (COM1)

- CN Label:** COM1
- CN Type:** DB-9 connectors
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-16** and **Figure 3-16**

The 9-pin DB-9 serial port connectors are connected to RS-232 serial communications devices.

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

Table 3-16: RS-232 Serial Port (COM 1) Pinouts

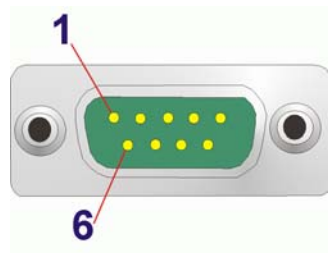


Figure 3-16: COM1 Pinout Locations

3.4.3 USB Connectors

- CN Label:** USB
- CN Type:** Dual USB port
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-17**

The ECW-281B/281B2-R30/N270 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GND	8	GND

Table 3-17: USB Port Pinouts

3.4.4 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Figure 3-17** and **Table 3-18**

The single 15-pin female connector for connectivity to standard display devices.

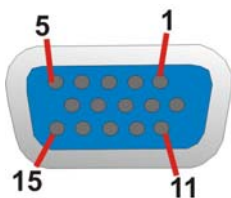


Figure 3-17: VGA Connector

ECW-281B/281B2-R30/N270 Embedded System

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

Table 3-18: VGA Connector Pinouts

3.5 WAFER-945GSE Motherboard On-board Jumpers



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.

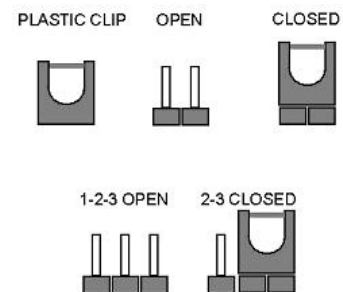


Figure 3-18: Jumpers

The WAFER-945GSE motherboard has several onboard jumpers (**Table 3-19**).

Description	Label	Type
CF Card Setting	JCF1	2-pin header
Clear CMOS	J_CMOS1	3-pin header

COM2 Mode Setting	JP1	6-pin header
-------------------	-----	--------------

Table 3-19: Jumpers

3.5.1 CF Card Setup

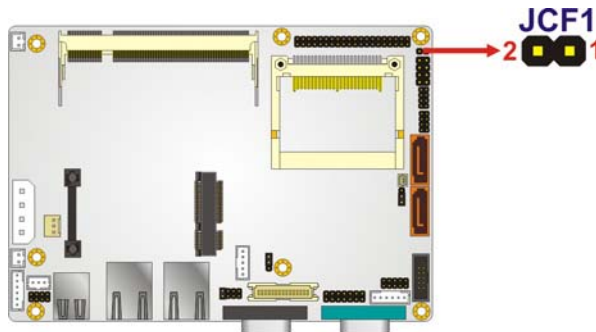
Jumper Label:	JCF1
Jumper Type:	2-pin header
Jumper Settings:	See Table 3-20
Jumper Location:	See Figure 3-19

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in Table 3-20.

CF Card Setup	Description	
OFF	Slave	Default
Short 1-2	Master	

Table 3-20: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 3-19.


Figure 3-19: CF Card Setup Jumper Location

3.5.2 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header

ECW-281B/281B2-R30/N270 Embedded System

Jumper Settings: See **Table 3-21**

Jumper Location: See **Figure 3-20**

If the ECW-281B/281B2-R30/N270 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

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

The clear CMOS jumper settings are shown in **Table 3-21**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 3-21: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 3-20** below.

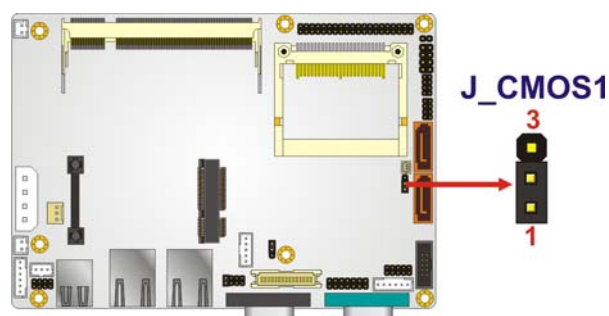


Figure 3-20: Clear CMOS Jumper

3.5.3 COM 2 Function Select Jumper (ECW-281B Series Only)

Jumper Label:	JP1
Jumper Type:	8-pin header
Jumper Settings:	See Table 3-22
Jumper Location:	See Figure 3-21

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 3-22**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	
Short 5-6 Short 7-8	RS-485 with RTS control	

Table 3-22: COM 2 Function Select Jumper Settings

The COM 2 Function Select jumper location is shown in **Figure 3-21**.

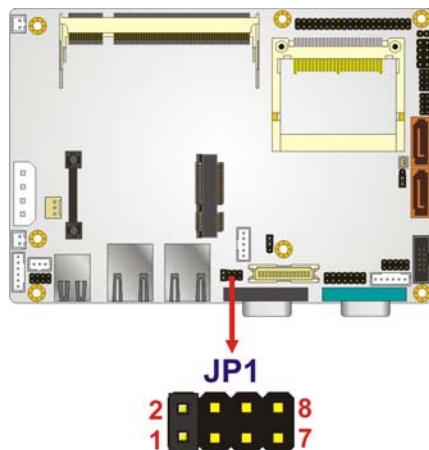


Figure 3-21: COM 2 Function Select Jumper Location

3.6 Connector Mappings

This section describes how the connectors on the motherboard and power module are connected to different components within the system. When performing maintenance operations on the system it is imperative that the correct connections are made.

3.6.1 Power Connector

The connector mapping for the power module output power connector and the motherboard input power connector are shown in **Table 3-23**.

WAFER-945GSE	Power Module
ATXPWR1: Power	CN4: Output Power
Pin 1	Pin 4
Pin 2	Pin 3
Pin 3	Pin 2
Pin 4	Pin 1

Table 3-23: Motherboard Power Connector Mapping

3.6.2 ATX Mode Connector

The connector mapping for the ATX mode connector on the motherboard and power module are shown in **Table 3-24**.

WAFER-945GSE	Power Module
ATXCTL1: PS-ON	CN7: ATX Mode
Pin 1	Pin 1
Pin 2	Pin 2
Pin 3	Pin 3

Table 3-24: Motherboard Power Connector Mapping

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

If the following anti-static precautions are not followed, a user may be injured and the system irreparably damaged.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER series motherboard and the power module. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the ECW-281B/281B2-R30/N270 is opened and any electrical component 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.

4.2 Installation Procedure

4.2.1 Installation Procedure Overview

To properly install the ECW-281B/281B2-R30/N270, the following steps must be followed. Detailed descriptions of these instructions are listed in the sections that follow.

Step 1: Unpacking

Step 2: Configure the jumper settings

Step 3: Install the SATA hard disk drive (HDD)

Step 4: Mount the ECW-281B/281B2-R30/N270

Step 5: Connect the front panel peripheral connectors

Step 6: Power the system up

4.2.2 Unpacking

After the ECW-281B/281B2-R30/N270 is received make sure the following components are included in the package. If any of these components are missing, please contact the ECW-281B/281B2-R30/N270 reseller or vendor where it was purchased or contact an IEI sales representative immediately.

Quantity	Item	Image
1	ECW-281B/281B2-R30/N270 embedded system	
1	Power cord (optional for WD models)	
1	Power adapter with ERP and PSE certificates (P/N: 63000-FSP025DGAA1702-RS)	
2	Mounting brackets	
1	Screw set	
1	Thermal pad for HDD	
1	Quick installation guide	




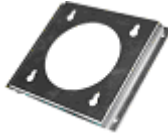

1	Driver and manual CD	
1	One Key Recovery CD	
1	Wireless antenna (wireless model only)	
1	VESA MIS-D 100 wall mount kit (optional)	
1	DIN mount kit (optional)	

Table 4-1: Package List Contents

4.2.3 Bottom Surface Removal



WARNING:

Over-tightening bottom cover screws will cause damage to the bottom surface. Maximum torque for cover screws is 5 kg-cm (0.36 lb-ft/0.49 Nm).

Before the jumper settings can be configured and the hard disk drive can be installed, the bottom surface must be removed. To remove the bottom surface, please follow the steps below:

- Step 1:** Remove the bottom surface retention screws. The bottom surface is secured to the chassis with six retention screws (**Figure 4-1**). All six screws must be removed.



Figure 4-1: Bottom Surface Retention Screws

Step 2: Gently remove the bottom surface from the ECW-281B/281B2-R30/N270.

4.2.4 Configure the Jumper Settings

To configure the jumper settings, please follow the steps below.

Step 1: Remove the bottom surface. See **Section 4.2.3**.

Step 2: Locate the jumper settings on the embedded motherboard. See **Chapter 3**.

Step 3: Make the jumper settings in accordance with the settings described and defined in **Chapter 3**.

4.2.5 Hard Drive Installation

One 2.5" SATA hard drive supported. The SATA drive is installed into a hard drive bracket attached on the inside of the bottom panel (**Figure 4-2**).

ECW-281B/281B2-R30/N270 Embedded System



Figure 4-2: Hard Drive Bracket

To install the hard drive into the system, please follow the steps below.

- Step 1:** Remove the bottom surface See Section 4.2.3.
- Step 2:** Remove the hard drive bracket from the bottom surface by removing the four retention screws that secure the bracket to the bottom surface. **(Figure 4-3)**



Figure 4-3:HDD Bracket Retention Screws

- Step 3:** Place the HDD into the bracket.
- Step 4:** Align the retention screw holes in the HDD with those in the bottom of the bracket.

Step 5: Secure the HDD with the bracket by inserting four retention screws into the bottom of the bracket (**Figure 4-4**).



Figure 4-4: HDD Retention Screws

Step 6: Locate the breather hole of the HDD. Cut off the corresponding area of the breather hole from the thermal pad.

Step 7: Adhere the thermal pad to the HDD. Make sure there is no obstacle covering the breather hole (**Figure 4-5**).



CAUTION:

Make sure the breather hole of the HDD is not covered. Covering the breather hole may cause damage to the HDD.

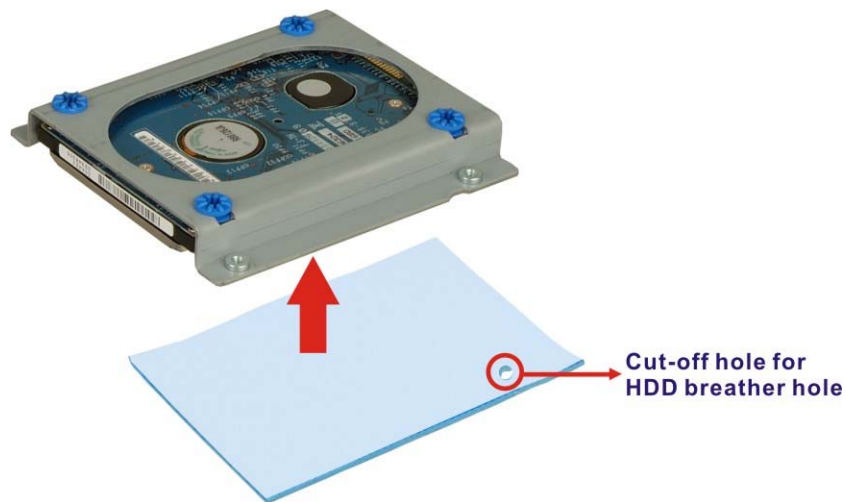


Figure 4-5: HDD Thermal Pad

- Step 8:** Replace the HDD bracket onto the bottom surface by aligning the four retention screw holes in the HDD bracket with those in the back of the bottom surface.
- Step 9:** Reinsert the four previously removed retention screws.
- Step 10:** Connect the SATA cable connector in the ECW-281B/281B2-R30/N270 to the HDD.
- Step 11:** Replace the bottom surface to the bottom panel by reinserting the six previously removed retention screws.



WARNING:

Over-tightening bottom cover screws will cause damage to the bottom surface. Maximum torque for cover screws is 5 kg-cm (0.36 lb-ft/0.49 Nm).

4.2.6 Mounting the System with Mounting Brackets

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

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



Figure 4-6: Mounting Bracket Retention Screws

- Step 4:** Drill holes in the intended installation surface.
- Step 5:** Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.
- Step 6:** Insert four retention screws, two in each bracket, to secure the system to the wall.

ECW-281B/281B2-R30/N270 Embedded System

4.2.7 Mounting the System with Wall Mount Kit

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

- Step 1:** Select the location on the wall for the wall-mounting bracket.
- Step 2:** Carefully mark the locations of the four bracket screw holes on the wall.
- Step 3:** Drill four pilot holes at the marked locations on the wall for the bracket retention screws.
- Step 4:** Align the wall-mounting bracket screw holes with the pilot holes.
- Step 5:** Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 4-7**).

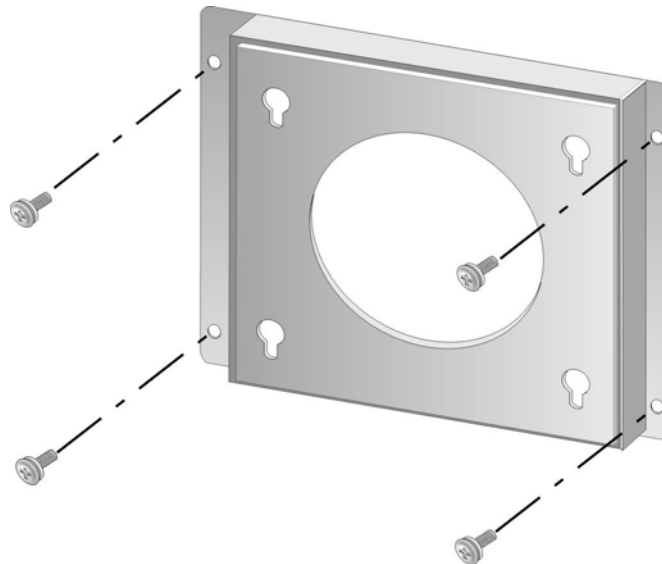


Figure 4-7: Wall-mounting Bracket

- Step 6:** Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the bottom panel of the system and tighten until the screw shank is secured against the bottom panel (**Figure 4-8**).

- Step 7:** Align the mounting screws on the ECW-281B/281B2-R30/N270 bottom panel with the mounting holes on the bracket.
- Step 8:** Carefully insert the screws through the holes and gently pull the monitor downwards until the ECW-281B/281B2-R30/N270 rests securely in the slotted holes (**Figure 4-8**). Ensure that all four of the mounting screws fit snugly into their respective slotted holes.

**NOTE:**

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

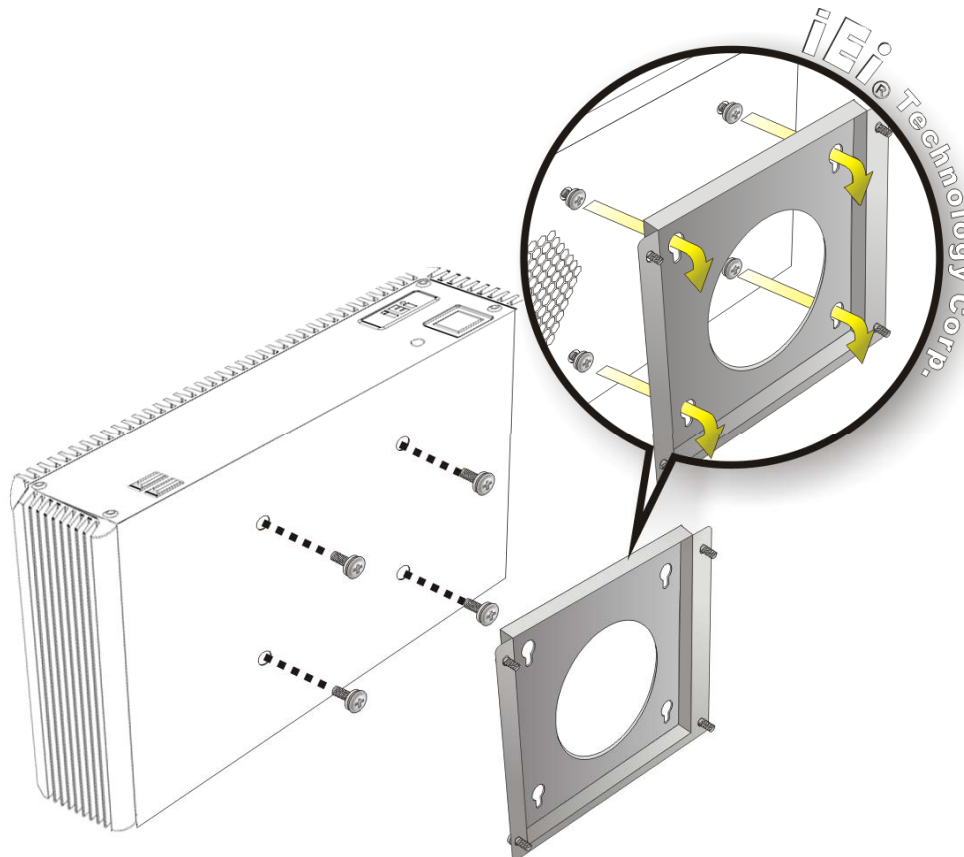


Figure 4-8: Mount the Embedded System

ECW-281B/281B2-R30/N270 Embedded System

4.2.8 DIN Mounting

To mount the ECW-281B/281B2-R30/N270 embedded system onto a DIN rail, please follow the steps below.

Step 1: Attach the DIN rail mounting bracket to the bottom panel of the embedded system. Secure the bracket to the embedded system with the supplied retention screws (**Figure 4-9**).

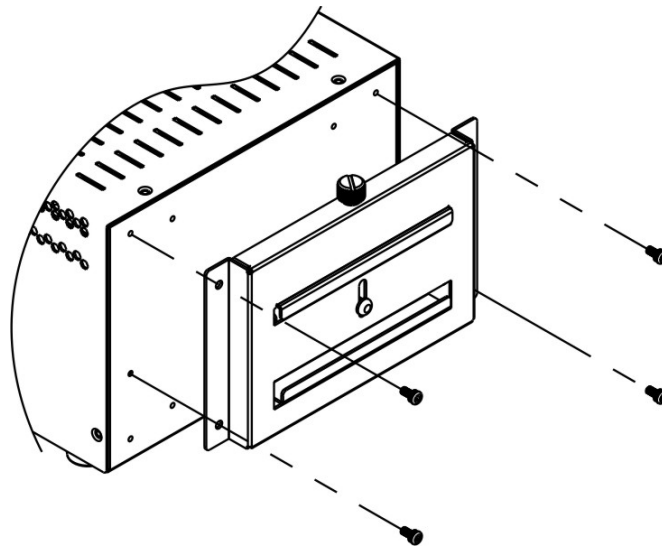


Figure 4-9: DIN Rail Mounting Bracket

Step 2: Make sure the inserted screw in the center of the bracket is at the lowest position of the elongated hole (**Figure 4-10**).

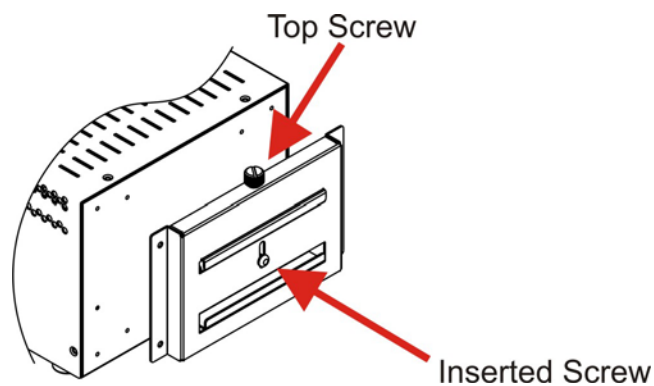


Figure 4-10: Screw Locations

Step 3: Place the DIN rail flush against the back of the mounting bracket making sure the edges of the rail are between the upper and lower clamps (**Figure 4-11**).

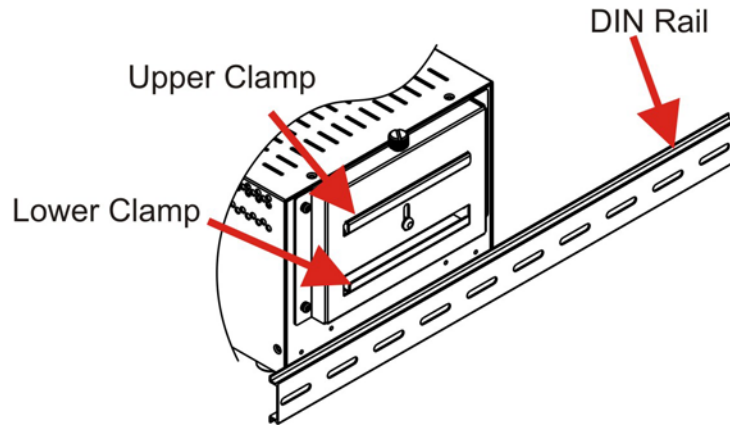


Figure 4-11: Mounting the DIN RAIL

Step 4: Secure the DIN rail to the mounting bracket by turning the top screw clockwise. This draws the lower clamp up and secures the embedded system to the DIN rail (**Figure 4-12**).

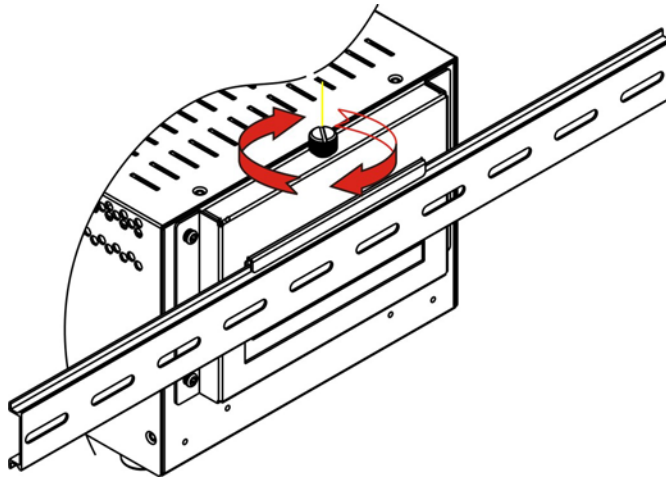


Figure 4-12: Secure the Assembly to the DIN Rail

ECW-281B/281B2-R30/N270 Embedded System

4.2.9 Wireless Antenna Installation (Wireless Models Only)

To install an antenna to the wireless ECW-281B/281B2-R30/N270 series for efficient wireless network transmission, follow the steps below.

Step 1: Locate the antenna connector on the rear panel of the embedded system (refer to **Figure 2-5**).

Step 2: Install the antenna to the antenna connector (**Figure 4-13**).



Figure 4-13: Wireless Antenna Installation

4.2.10 Cable Connections

Once the system has been mounted on the wall, the following connectors can be connected to the system.

- VGA cable connector
- Serial port connectors
- RJ-45 connectors
- USB devices can be connected to the system.

The cable connection locations are shown in **Figure 2-5**.

4.3 Power-On Procedure

4.3.1 Installation Checklist



WARNING:

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

To power on the embedded system please make sure of the following:

- The bottom surface panel is installed
- All peripheral devices (VGA monitor, serial communications devices etc.) are connected
- The power cables are plugged in
- The system is securely mounted

4.3.2 Terminal Block Pinouts

The terminal block pinouts are shown in **Figure 4-14**.

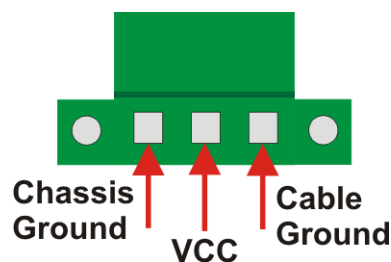


Figure 4-14: Terminal Block Pinouts

The chassis ground is connected to the ECW chassis internally. The cable ground is connected to the ground pin on the input power connector of the power module.

ECW-281B/281B2-R30/N270 Embedded System

4.3.3 Power-on Procedure

To power-on the ECW-281B/281B2-R30/N270 please follow the steps below:

Step 1: Push the power button.

Step 2: Once turned on, the power button should turn to blue. See **Figure 4-15**.



Figure 4-15: Power Button



Chapter

5

BIOS Screens

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

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

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

5.1.2 Using Setup

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

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

Key	Function
F2/F3 key	Change color from total 3 colors. F2 to select color forward
F10	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter 4.

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

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

5.2 Main

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

```

BIOS SETUP UTILITY
Main  Advanced  PCIPnP  Boot  Security  Chipset  Exit

System Overview
-----
AMIBIOS
Version      :08.00.15
Build Date   :07/07/11
ID:          :Z200MR10

Processor
Genuine Intel(R) CPU N270 @ 1.60GHz
Speed        :1600MHz
Count        :1

System Memory
Size         :1016MB

System Time           [14:20:27]
System Date           [Tue 08/30/2011]

Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system time.

<=> Select Screen
↑↓ Select Item
+ - Change Field
Tab Select Field
F1  General Help
F10 Save and Exit
ESC Exit

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```

BIOS Menu 1: Main

→ System Overview

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

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

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

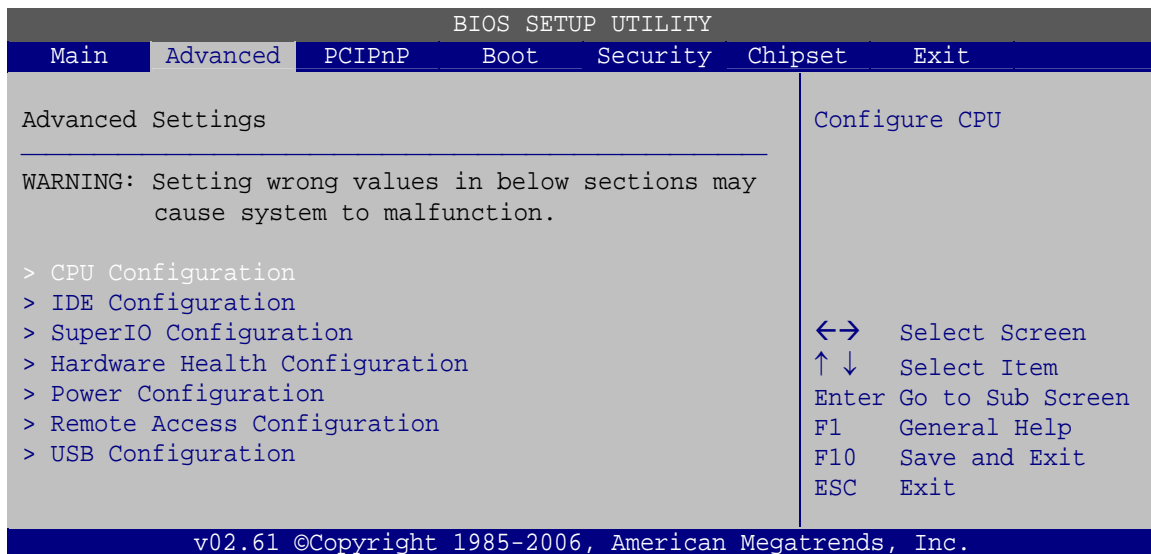
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

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

5.3 Advanced

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



BIOS Menu 2: Advanced



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.

ECW-281B/281B2-R30/N270 Embedded System

5.3.1 CPU Configuration

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

```

BIOS SETUP UTILITY
-----
Advanced
-----
Configure advanced CPU Settings
Module Version:3F.10
-----
Manufacturer   :Intel
Genuine Intel(R) CPU N270 @ 1.60GHz
Frequency      :1.60GHz
FSB Speed      :532Hz

Cache L1       :24 KB
Cache L2       :512 KB

Ratio Actual Value:12

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

v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
  
```

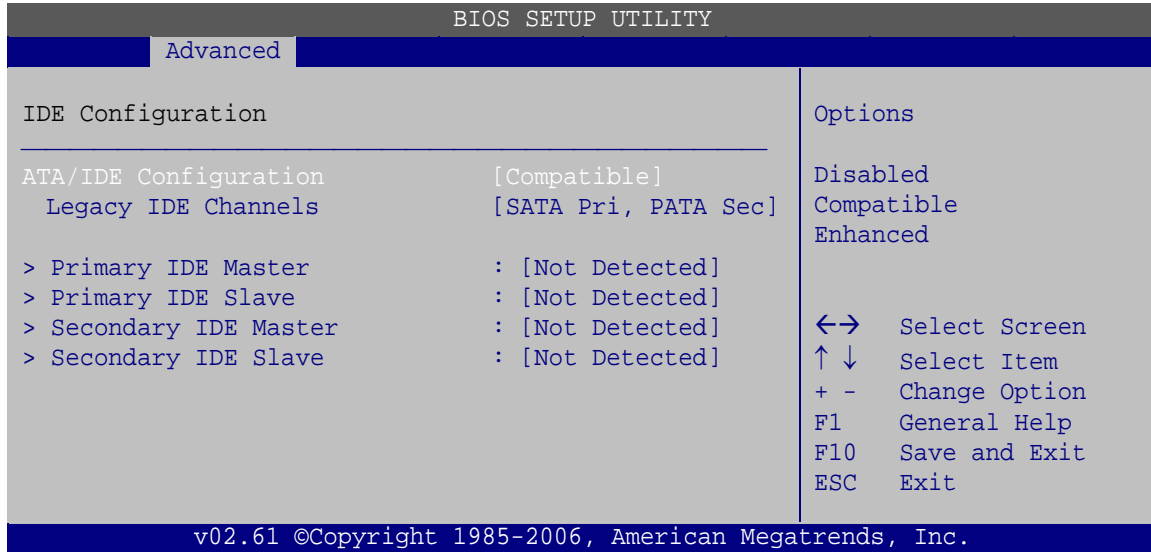
BIOS Menu 3: CPU Configuration

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

- **Manufacturer:** Lists the name of the CPU manufacturer
- **Brand String:** Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed:** Lists the FSB speed
- **Cache L1:** Lists the CPU L1 cache size
- **Cache L2:** Lists the CPU L2 cache size
- **Ratio Actual Value:** Lists the ratio of the frequency to the clock speed

5.3.2 IDE Configuration

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



BIOS Menu 4: IDE Configuration

→ ATA/IDE Configuration [Compatible]

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

- **Disabled** Disables the on-board ATA/IDE controller.
- **Compatible** **DEFAULT** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.
- **Enhanced** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

→ Legacy IDE Channels [SATA Pri, PATA Sec]

- **SATA Only** Only the SATA drives are enabled.
- **SATA Pri, PATA Sec** **DEFAULT** The SATA drives are enabled on the Primary IDE channel. The IDE drives are enabled on the Secondary IDE channel.

ECW-281B/281B2-R30/N270 Embedded System

→ PATA Only

The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

→ IDE Master and IDE Slave

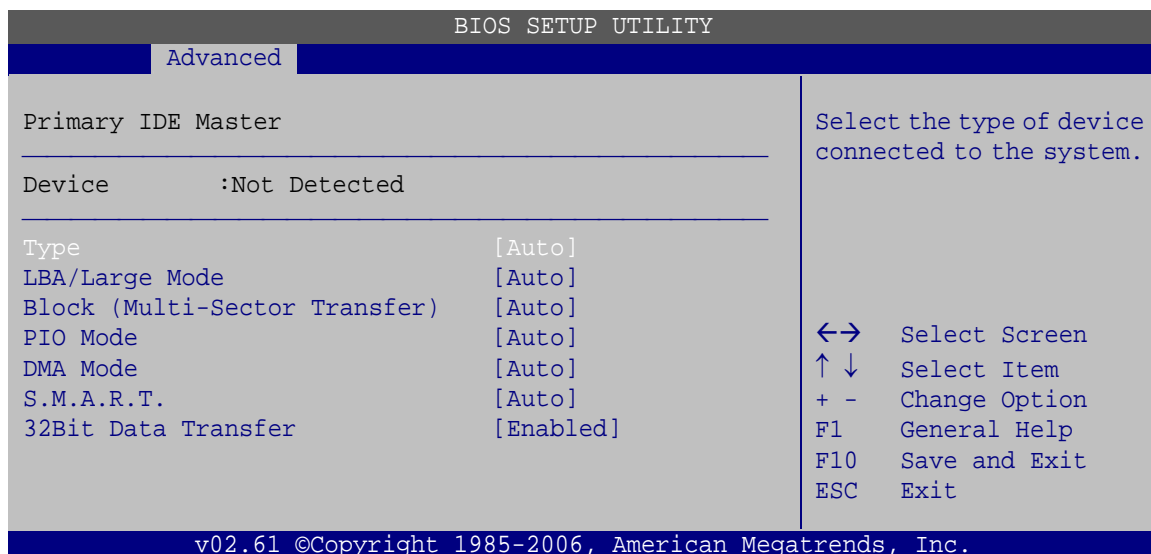
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

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

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options is selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

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



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

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

- **Device:** Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type:** Indicates the type of devices a user can manually select
- **Vendor:** Lists the device manufacturer
- **Size:** List the storage capacity of the device.
- **LBA Mode:** Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode:** Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode:** Indicates the PIO mode of the installed device.
- **Async DMA:** Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA:** Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.:** Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer:** Enables 32-bit data transfer.

➔ **Type [Auto]**

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

- | | | | |
|---|----------------------|----------------|--|
| ➔ | Not Installed | | BIOS is prevented from searching for an IDE disk drive on the specified channel. |
| ➔ | Auto | DEFAULT | The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel. |
| ➔ | CD/DVD | | The CD/DVD option specifies that an IDE CD-ROM |

drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

→ **ARMD**

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

ZIP

LS-120

→ **LBA/Large Mode [Auto]**

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

→ **Disabled**

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

→ **Auto** **DEFAULT**

BIOS auto detects the LBA mode control on the specified channel.

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

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

→ **Disabled**

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

→ **Auto** **DEFAULT**

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

→ **PIO Mode [Auto]**

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

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

→ **DMA Mode [Auto]**

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

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data

ECW-281B/281B2-R30/N270 Embedded System

transfer rate of 13.3MBps

- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

→ **S.M.A.R.T [Auto]**

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

- **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- **Disabled** Prevents BIOS from using the HDD SMART feature.
- **Enabled** Allows BIOS to use the HDD SMART feature

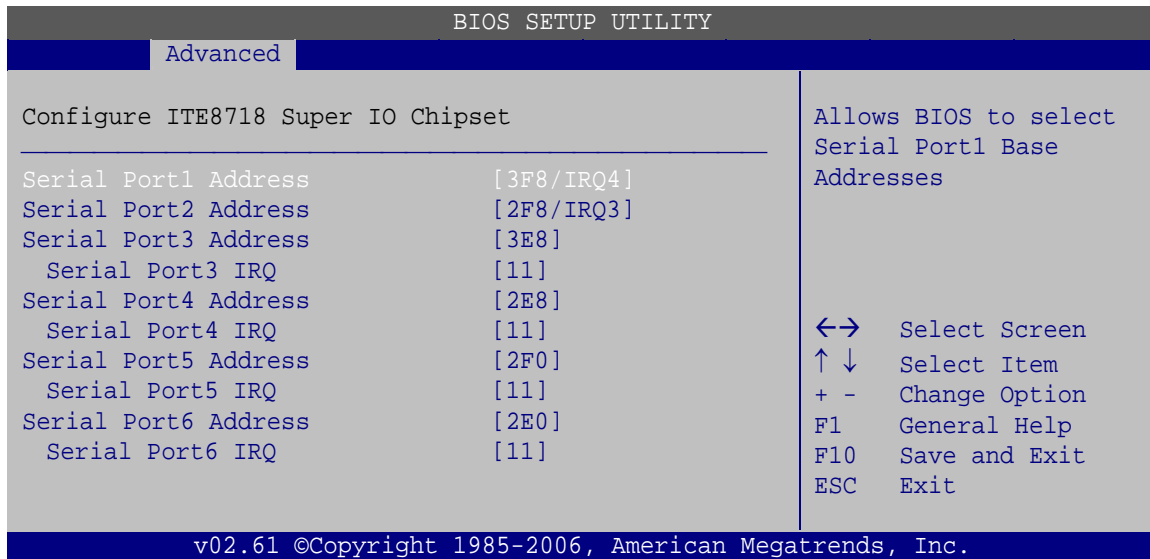
→ **32Bit Data Transfer [Enabled]**

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

- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super IO Configuration

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



BIOS Menu 6: Super IO Configuration

➔ Serial Port1 Address [3F8/IRQ4]

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

- ➔ **Disabled** No base address is assigned to Serial Port 1
- ➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
- ➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

ECW-281B/281B2-R30/N270 Embedded System

→ Serial Port2 Address [2F8/IRQ3]

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

- **Disabled** No base address is assigned to Serial Port 2
- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

→ Serial Port3 Address [3E8]

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

- **Disabled** No base address is assigned to serial port 3
- **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- **2E8** Serial port 3 I/O port address is 2E8
- **2F0** Serial port 3 I/O port address is 2F0
- **2E0** Serial port 3 I/O port address is 2E0

→ Serial Port3 IRQ [11]

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

- **10** Serial port 3 IRQ address is 10
- **11** **DEFAULT** Serial port 3 IRQ address is 11

→ Serial Port4 Address [2E8]

Use the **Serial Port4 Address** option to select the base address for serial port 4.

- **Disabled** No base address is assigned to serial port 3

- 3E8 Serial port 4 I/O port address is 3E8
- 2E8 DEFAULT Serial port 4 I/O port address is 2E8
- 2F0 Serial port 4 I/O port address is 2F0
- 2E0 Serial port 4 I/O port address is 2E0

→ **Serial Port4 IRQ [11]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- 10 Serial port 4 IRQ address is 10
- 11 DEFAULT Serial port 4 IRQ address is 11

→ **Serial Port5 Address [2F0]**

Use the **Serial Port5 Address** option to select the base address for serial port 5

- Disabled No base address is assigned to serial port 5
- 3E8 Serial port 5 I/O port address is 3F8
- 2E8 Serial port 5 I/O port address is 2E8
- 2F0 DEFAULT Serial port 5 I/O port address is 2F0
- 2E0 Serial port 5 I/O port address is 2E0

→ **Serial Port5 IRQ [11]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- 10 Serial port 5 IRQ address is 10
- 11 DEFAULT Serial port 5 IRQ address is 11

→ **Serial Port6 Address [2E0]**

Use the **Serial Port6 IRQ** option to select the base address for serial port 6.

ECW-281B/281B2-R30/N270 Embedded System

- ➔ **Disabled** No base address is assigned to serial port 6
- ➔ **3E8** Serial port 6 I/O port address is 3E8
- ➔ **2E8** Serial port 6 I/O port address is 2E8
- ➔ **2F0** Serial port 6 I/O port address is 2F0
- ➔ **2E0** **DEFAULT** Serial port 6 I/O port address is 2E0

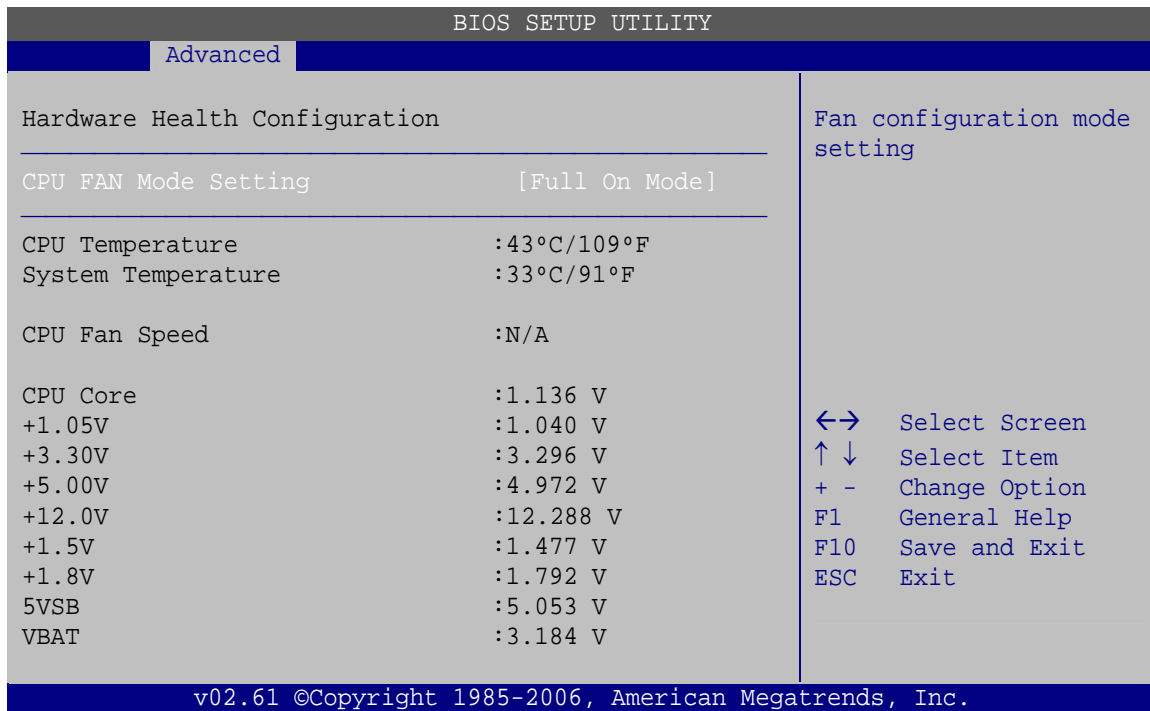
➔ **Serial Port6 IRQ [11]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- ➔ **10** Serial port 6 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 6 IRQ address is 11

5.3.4 Hardware Health Configuration

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



The screenshot shows the BIOS Setup Utility interface. At the top, it says "BIOS SETUP UTILITY" and "Advanced" is selected. The main menu is "Hardware Health Configuration". Below it, "CPU FAN Mode Setting" is set to "[Full On Mode]". The screen displays various system metrics:

CPU Temperature	: 43°C/109°F
System Temperature	: 33°C/91°F
CPU Fan Speed	: N/A
CPU Core	: 1.136 V
+1.05V	: 1.040 V
+3.30V	: 3.296 V
+5.00V	: 4.972 V
+12.0V	: 12.288 V
+1.5V	: 1.477 V
+1.8V	: 1.792 V
5VSB	: 5.053 V
VBAT	: 3.184 V

On the right side, there is a "Fan configuration mode setting" section with navigation instructions:

- ↔ Select Screen
- ↑ ↓ Select Item
- + - Change Option
- F1 General Help
- F10 Save and Exit
- ESC Exit

At the bottom, the version and copyright information are displayed: "v02.61 ©Copyright 1985-2006, American Megatrends, Inc."

BIOS Menu 7: Hardware Health Configuration

→ **CPU FAN Mode Setting [Full On Mode]**

Use the **CPU FAN Mode Setting** option to configure the second fan.

- **Full On Mode** **DEFAULT** Fan is on all the time
- **Automatic mode** Fan is off when the temperature is low enough. Parameters must be set by the user.
- **PWM Manually mode** Pulse width modulation set manually

When the **CPU FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temperature Limit of Off
- CPU Temperature Limit of On
- CPU Fan Start PWM
- Slope PWM

When the **CPU FAN Mode Setting** option is in the **PWM Manually Mode**, the following parameters can be set.

- CPU Fan PWM control

→ **CPU Temperature Limit of Off [000]**



WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temperature Limit of Off** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temperature Limit of Off** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temperature Limit of Off** option and enter a decimal number between 000 and 127. The temperature range is specified below.

ECW-281B/281B2-R30/N270 Embedded System

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

→ CPU Temperature Limit of On [020]



WARNING:

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

The **CPU Temperature Limit of On** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temperature Limit of On** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **CPU Fan Start PWM** option below. To select a value, select the **CPU Temperature Limit of On** option and enter a decimal number between 000 and 127. The temperature range is specified below.

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

→ CPU Fan Start PWM [070]

The **CPU Fan Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Fan Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **CPU Temperature Limit of On** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **CPU Fan Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

→ Slope PWM [0.5 PWM]

The **Slope PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

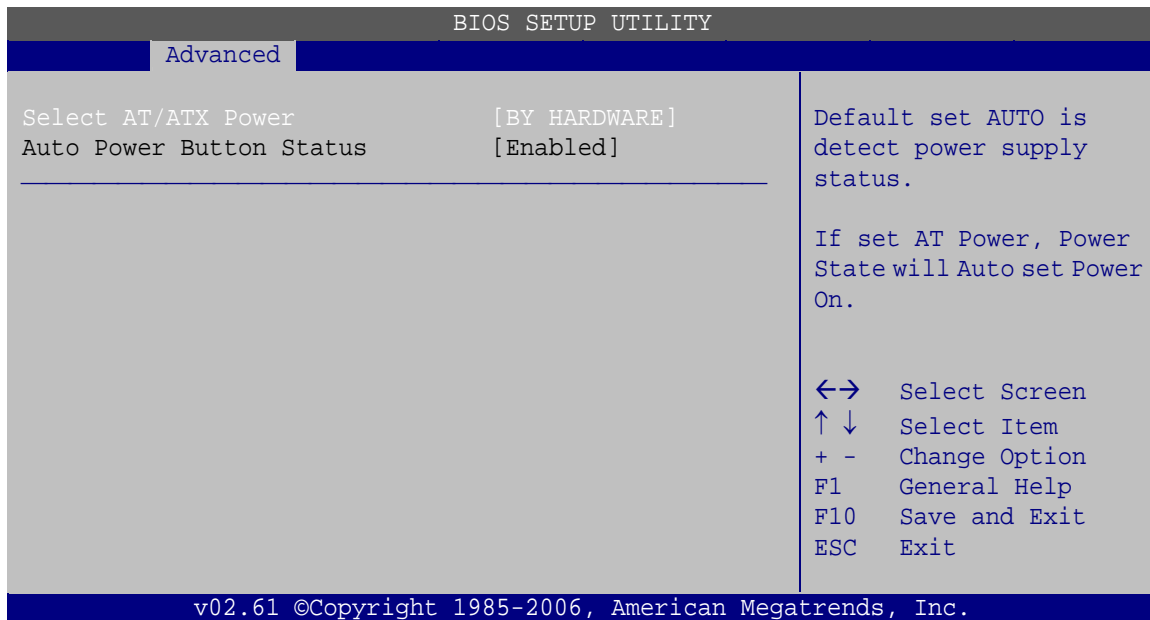
- 0.125 PWM
- 0.25 PWM
- 0.5 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 15 PWM

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

- **System Temperatures:** The following system temperatures are monitored
 - CPU Temperature
 - System Temperature
- **Fan Speeds:** The CPU cooling fan speed is monitored.
 - CPU Fan Speed
- **Voltages:** The following system voltages are monitored
 - CPU Core
 - +1.05V
 - +3.30V
 - +5.00V
 - +12.0 V
 - +1.5V
 - +1.8V
 - 5VSB
 - VBAT

5.3.5 Power Configuration

The **Power Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: Power Configuration

→ Select AT/ATX Power [By HARDWARE]

Sets the behavior of the power.

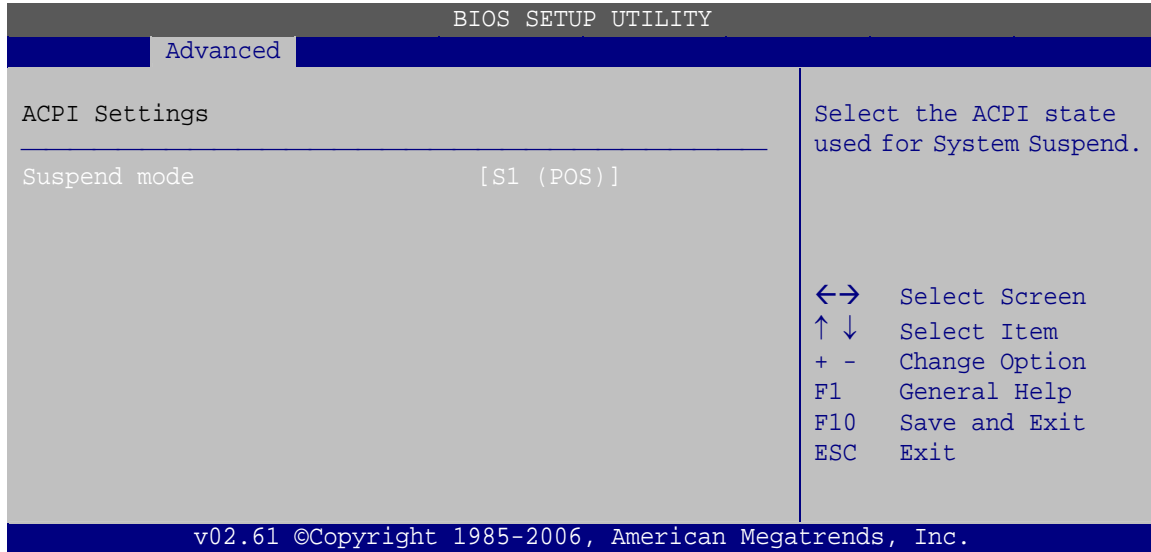
- AT Power
- ATX Power
- BY HARDWARE **DEFAULT**

When the **Select AT/ATX Power** option is set to **ATX Power**, the following sub-menus appear.

- ACPI Configuration
- APM Configuration

5.3.5.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI).



BIOS Menu 9: ACPI Configuration

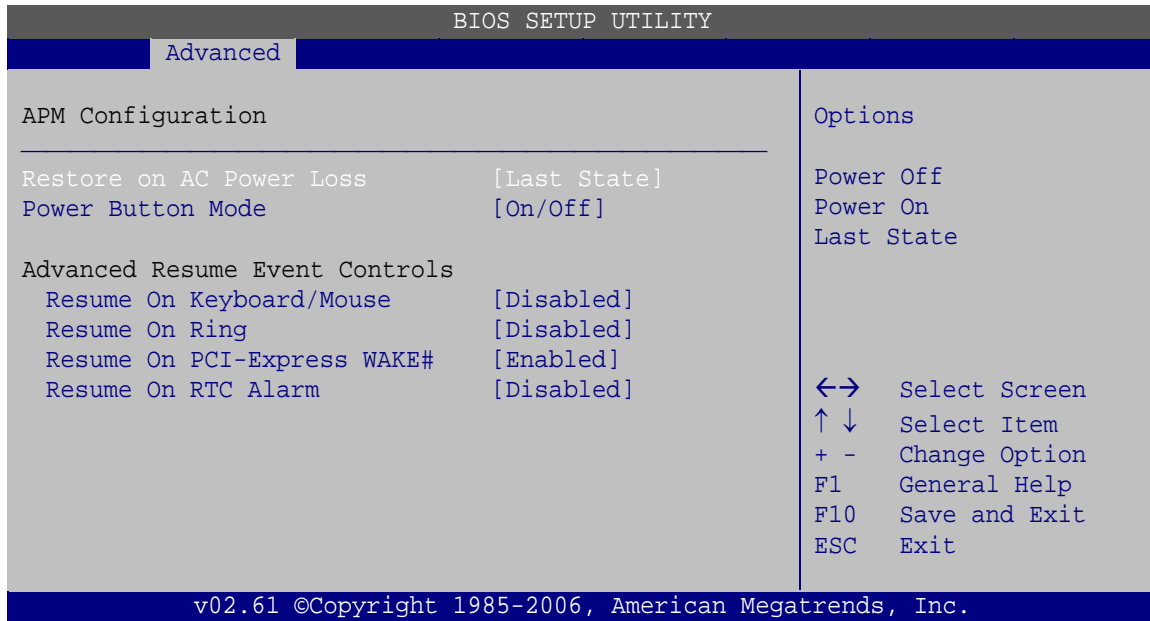
→ Suspend mode [S1 (POS)]

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

- **S1 (POS) DEFAULT** System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

5.3.5.2 APM Configuration

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



BIOS Menu 10: Advanced Power Management Configuration

→ Restore on AC Power Loss [Last State]

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

- **Power Off** The system remains turned off
- **Power On** The system turns on
- **Last State DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

→ Power Button Mode [On/Off]

Use the **Power Button Mode** BIOS to specify how the power button functions.

- **On/Off DEFAULT** When the power button is pressed the system is either turned on or off
- **Suspend** When the power button is pressed the system goes into suspend mode

→ **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

→ **Disabled** **DEFAULT** Wake event not generated by activity on the keyboard or mouse

→ **Enabled** Wake event generated by activity on the keyboard or mouse

→ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

→ **Disabled** **DEFAULT** Wake event not generated by an incoming call

→ **Enabled** Wake event generated by an incoming call

→ **Resume on PCI-Express WAKE# [Enabled]**

Use the **Resume PCI-Express WAKE#** BIOS option to enable activity on the PCI-Express WAKE# signal to rouse the system from a suspend or standby state.

→ **Disabled** Wake event not generated by PCI-Express WAKE# signal activity

→ **Enabled** **DEFAULT** Wake event generated by PCI-Express WAKE# signal activity

→ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

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

→ **Enabled**

event

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

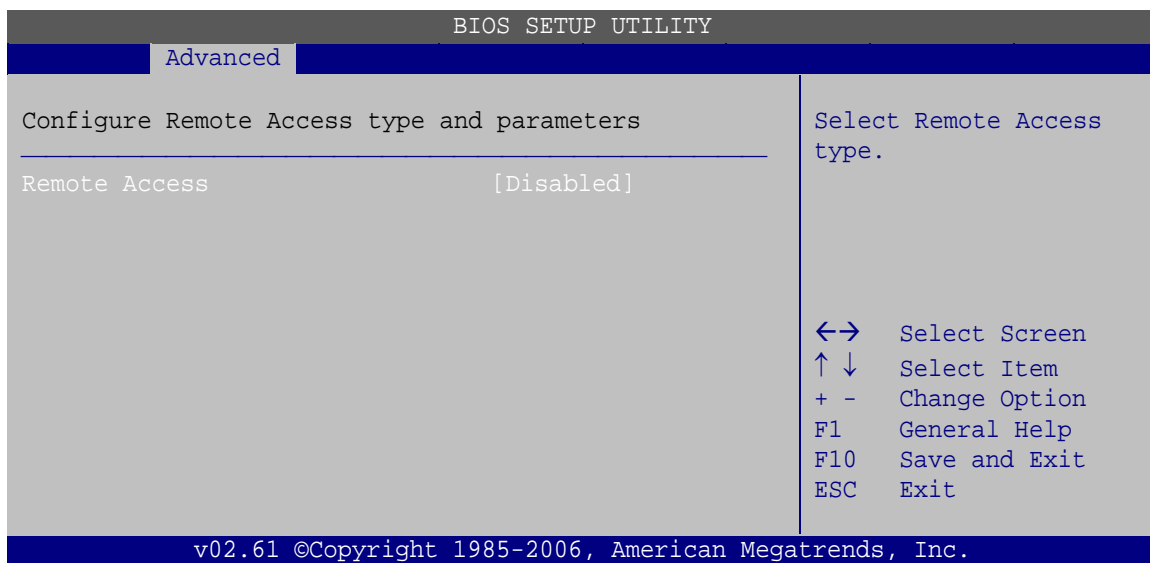
RTC Alarm Date (Days)

System Time

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

5.3.6 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 11: Remote Access Configuration

→ **Remote Access [Disabled]**

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

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

→ Enabled

Remote access configuration options shown below appear:

Serial port number

Serial Port Mode

Redirection after BIOS POST

Terminal Type

These configuration options are discussed below.

→ Serial Port Number [COM1]

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

→ COM1 DEFAULT System is remotely accessed through COM1

→ COM2 System is remotely accessed through COM2

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

→ Base Address, IRQ [3F8h,4]

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

→ Serial Port Mode [115200 8,n,1]

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

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



NOTE:

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

→ Redirection After BIOS POST [Always]

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

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

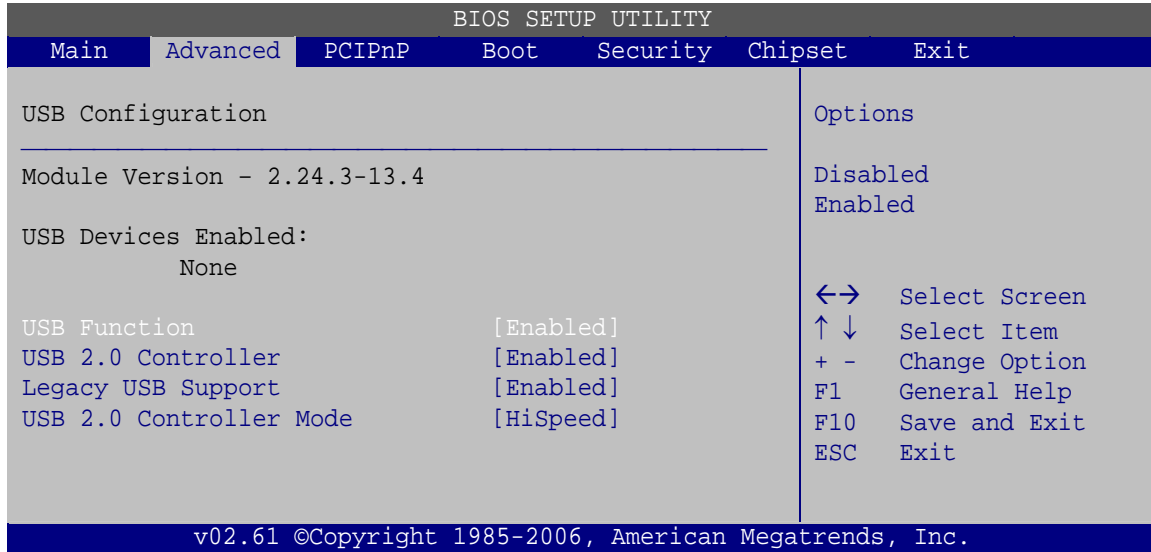
→ Terminal Type [ANSI]

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

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

5.3.7 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



BIOS Menu 12: USB Configuration

→ USB Function [Enabled]

Use the **USB Function** option to enable or disable the USB controllers.

- **Disabled** USB controllers are enabled
- **Enabled** **DEFAULT** USB controllers are disabled

→ USB 2.0 Controller [Enabled]

The **USB 2.0 Controller** BIOS option enables or disables the USB 2.0 controller

- **Disabled** USB function disabled
- **Enabled** **DEFAULT** USB function enabled

→ Legacy USB Support [Enabled]

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

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

ECW-281B/281B2-R30/N270 Embedded System

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

➔ **USB 2.0 Controller Mode [HiSpeed]**

The **USB2.0 Controller Mode** BIOS option sets the speed of the USB2.0 controller.

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

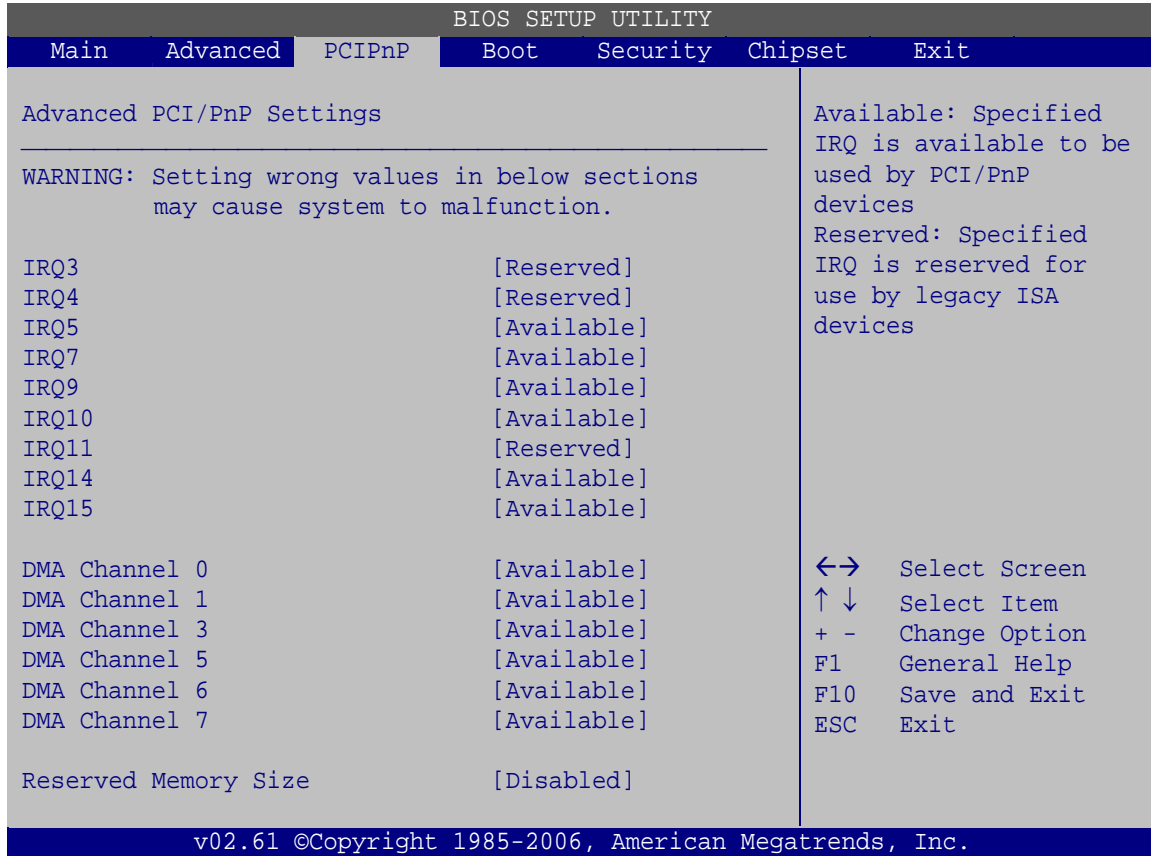
5.4 PCI/PnP

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



WARNING:

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



BIOS Menu 13: PCI/PnP Configuration

→ IRQ# [Available]

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

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

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7

ECW-281B/281B2-R30/N270 Embedded System

- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

→ DMA Channel# [Available]

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

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

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

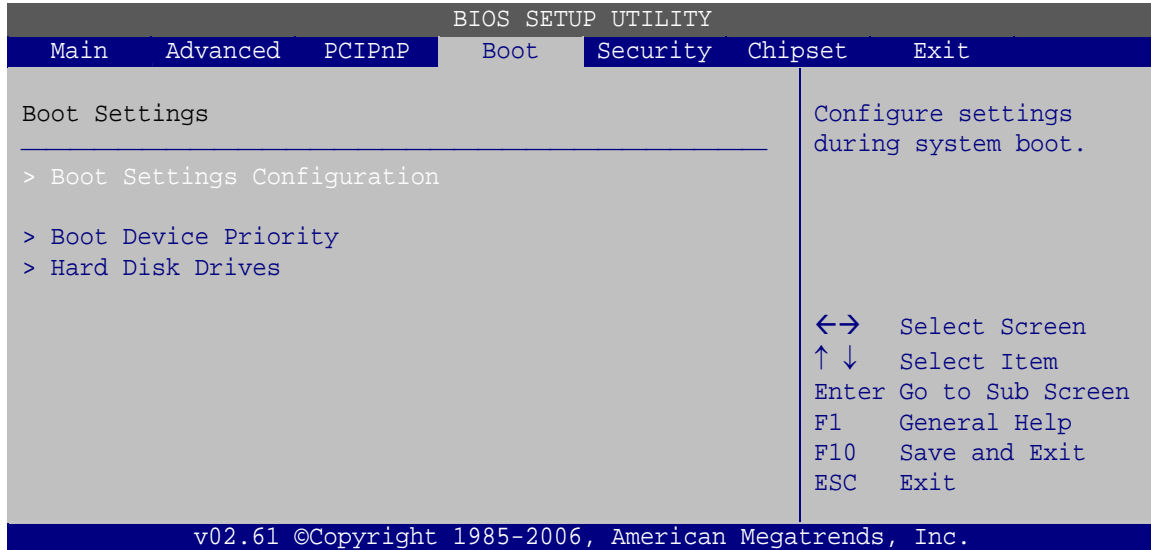
→ Reserved Memory Size [Disabled]

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

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

5.5 Boot

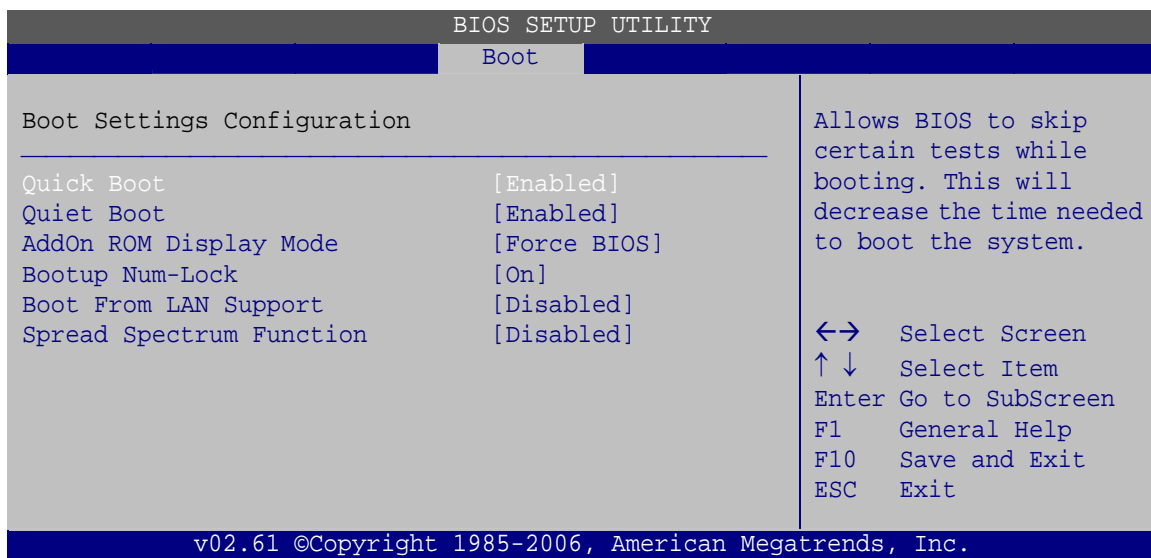
Use the **Boot menu (BIOS Menu 14)** to configure system boot options.



BIOS Menu 14: Boot

5.5.1 Boot Settings Configuration

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



BIOS Menu 15: Boot Settings Configuration

ECW-281B/281B2-R30/N270 Embedded System

→ Quick Boot [Enabled]

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

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

→ Quiet Boot [Enabled]

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

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

→ AddOn ROM Display Mode [Force BIOS]

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

- **Force BIOS** **DEFAULT** Allows the computer system to force a third party BIOS to display during system boot.
- **Keep Current** Allows the computer system to display the information during system boot.

→ Bootup Num-Lock [On]

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

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

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

→ **Boot From LAN Support [Disabled]**

The **Boot From LAN Support** option enables the system to be booted from a remote system.

- **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN.
- **Enabled** Can be booted from a remote system through the LAN.

→ **Spread Spectrum Function [Disabled]**

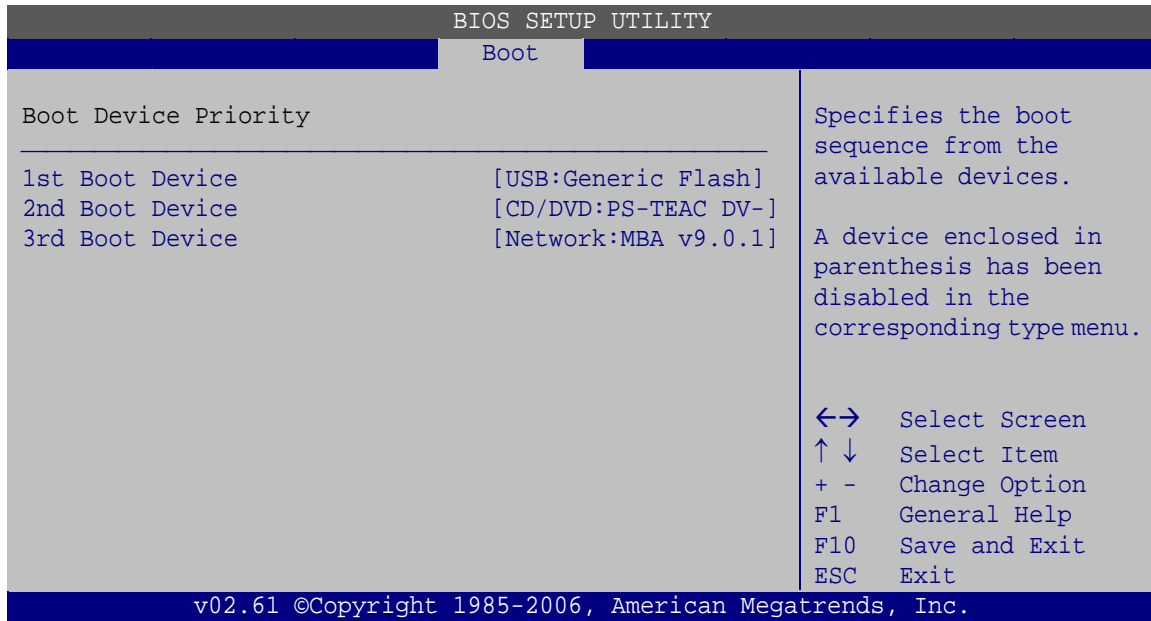
Use the **Spread Spectrum Function** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be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

- **Disabled** **DEFAULT** EMI not reduced
- **Enabled** EMI reduced

5.5.2 Boot Device Priority

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

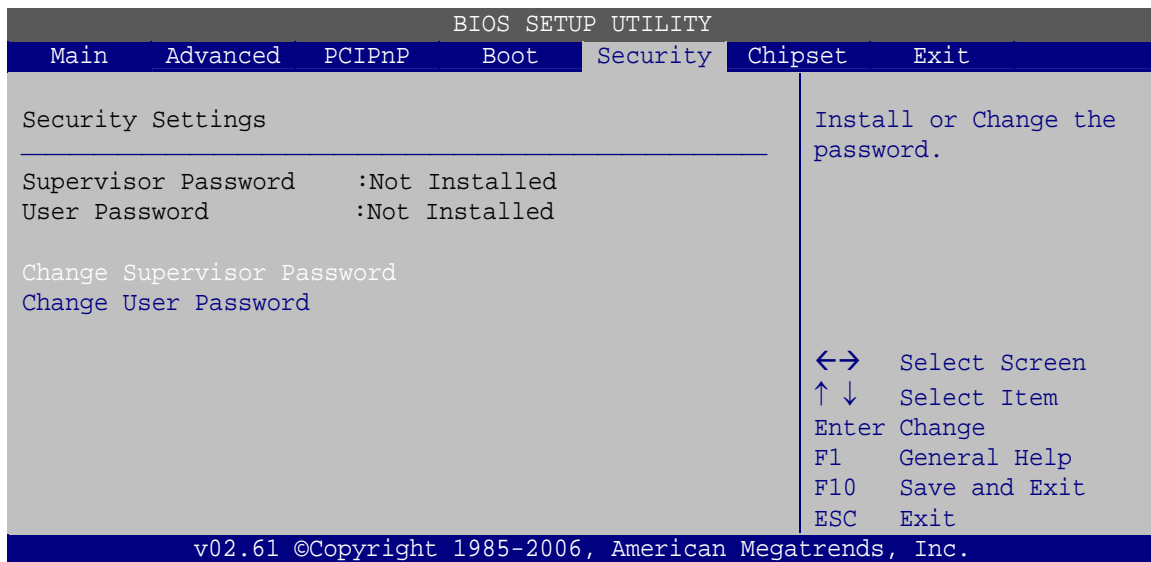
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BIOS Menu 16: Boot Device Priority Settings

5.6 Security

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



BIOS Menu 17: Security

→ **Change Supervisor Password**

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

➔ **Change User Password**

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

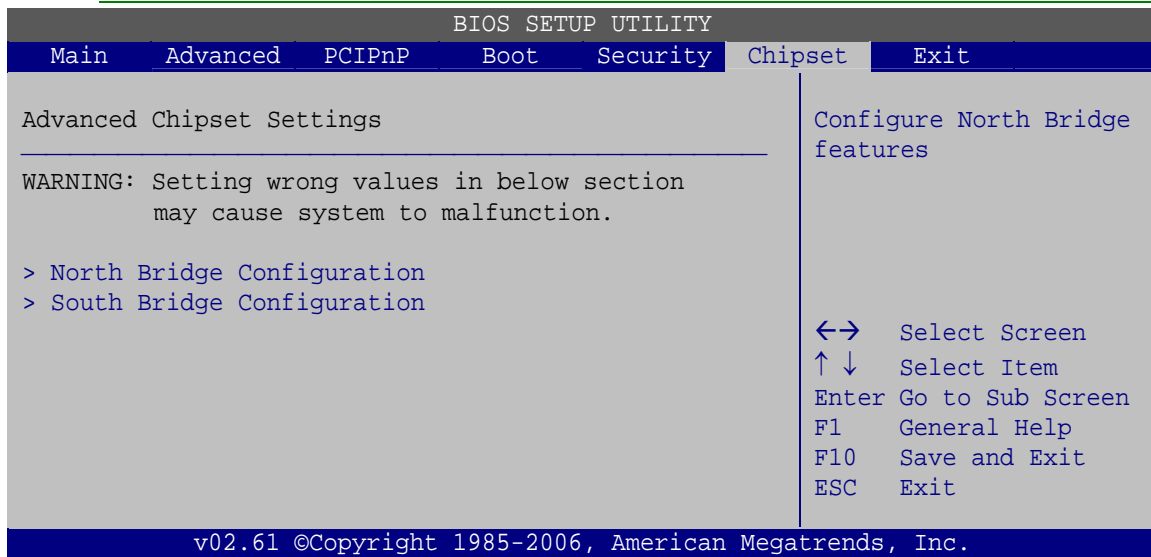
5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the NorthBridge and SouthBridge configuration menus.



WARNING!

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

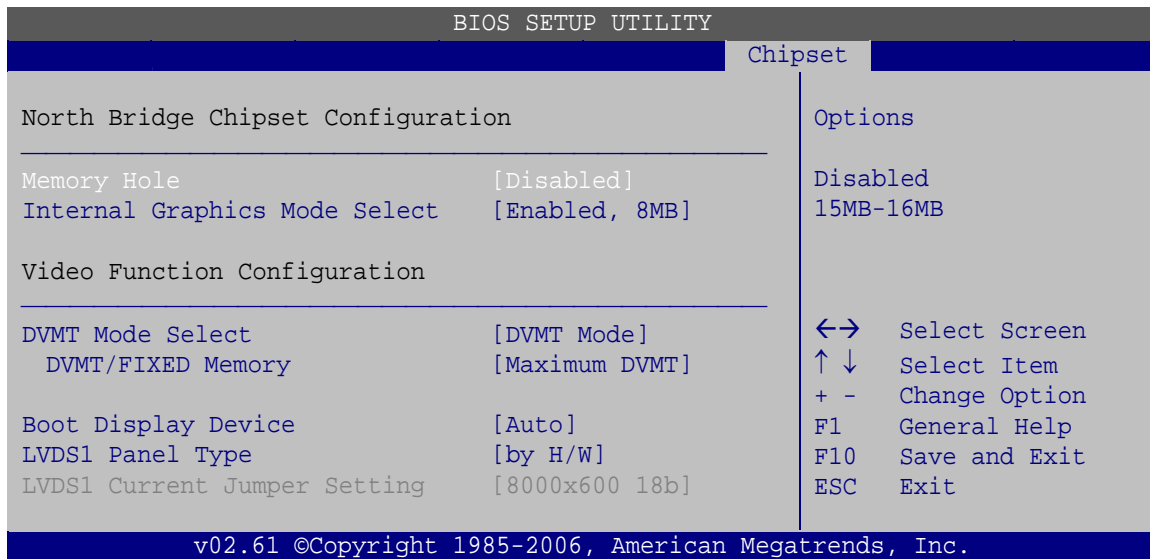


BIOS Menu 18: Chipset

ECW-281B/281B2-R30/N270 Embedded System

5.7.1 North Bridge Chipset Configuration

Use the **North Bridge Chipset Configuration** menu (**BIOS Menu 19**) to configure the Northbridge chipset settings.



BIOS Menu 19: North Bridge Chipset Configuration

→ **Memory Hole [Disabled]**

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

- **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards
- **15MB-16MB** Memory is reserved for ISA expansion cards

→ **Internal Graphics Mode Select [Enabled, 8MB]**

The **Internal Graphic Mode Select** option determines the amount of system memory that can be used by the internal graphics device.

- **Disabled**
- **Enabled, 1MB** 1MB of memory used by internal graphics device

→ Enabled, 8MB **DEFAULT** 8MB of memory used by internal graphics device

→ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

→ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.

→ **DVMT Mode** **DEFAULT** Graphics memory is dynamically allocated according to the system and graphics needs.

→ **Combo Mode** A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

→ **DVMT/FIXED Memory [Maximum DVMT]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Select** option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB
- Maximum DVMT **DEFAULT**

→ **Boot Display Device [Auto]**

The **Boot Display Device** BIOS option selects the display device the system uses when it boots. The available options are listed below:

- Auto **DEFAULT**
- CRT
- LFP

ECW-281B/281B2-R30/N270 Embedded System

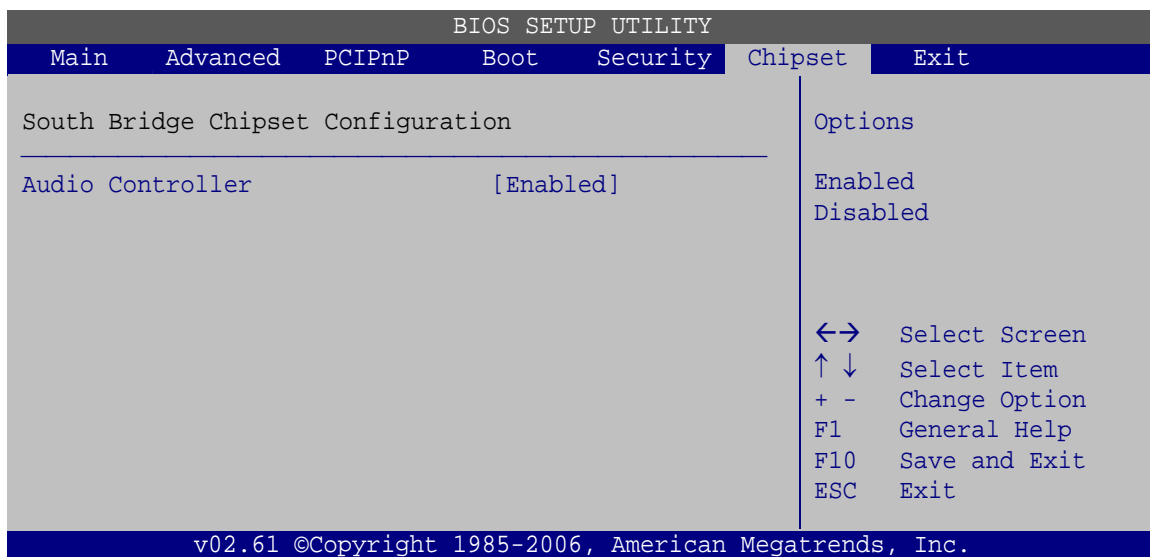
→ LVDS1 Panel Type [by H/W]

Use the **LVDS Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640x480 18b
- 800x480 18b
- 800x600 18b
- 1024x768 18b
- 1280x1024 36b
- 1400x1050 36b
- 1440x900 36b
- 1600x1200 36b
- 1280x720 18b
- by H/W **DEFAULT**

5.7.2 South Bridge Chipset Configuration

The **South Bridge Chipset Configuration** menu (**BIOS Menu 20**) allows the southbridge chipset to be configured.



BIOS Menu 20: South Bridge Chipset Configuration

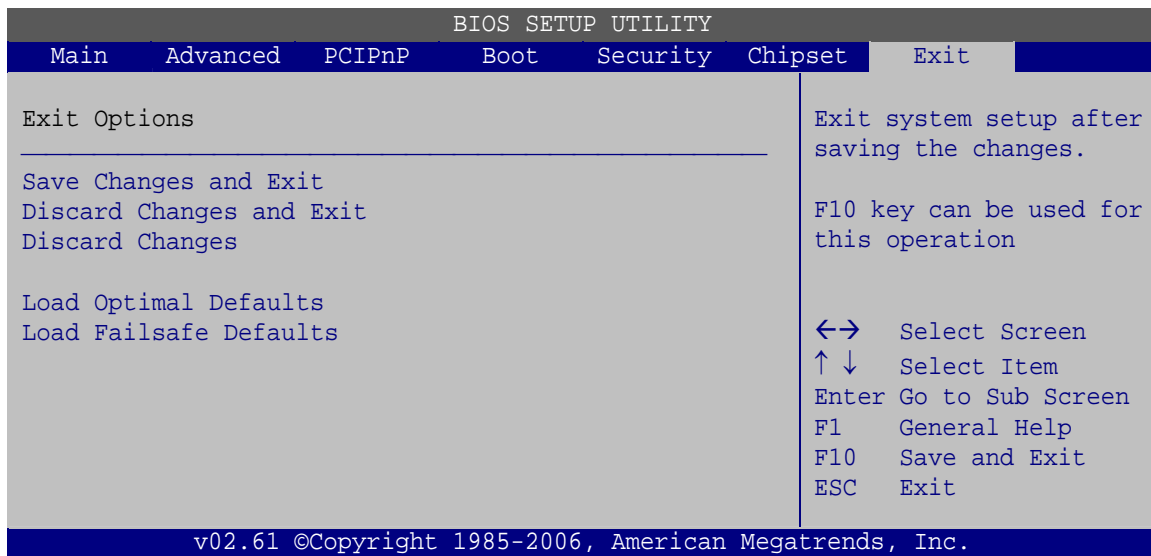
→ Audio Controller [Enabled]

The **Audio Controller** option enables or disables the audio controller.

- **Enabled** **DEFAULT** The on-board audio controller is enabled.
- **Disabled** The on-board audio controller is disabled.

5.8 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21: Exit

→ **Save Changes and Exit**

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

→ **Discard Changes and Exit**

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

→ **Discard Changes**

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

ECW-281B/281B2-R30/N270 Embedded System

→ Load Optimal Defaults

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

→ Load Failsafe Defaults

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

Chapter

6

Software Drivers

6.1 Available Software Drivers



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
- Audio

Installation instructions are given below.

6.2 Starting the Driver Program

To access the driver installation programs, please do the following.

Step 1: Insert the CD-ROM that came with the system into a CD-ROM drive attached to the system.

Step 2: The list of drivers in **Figure 6-1** appears.

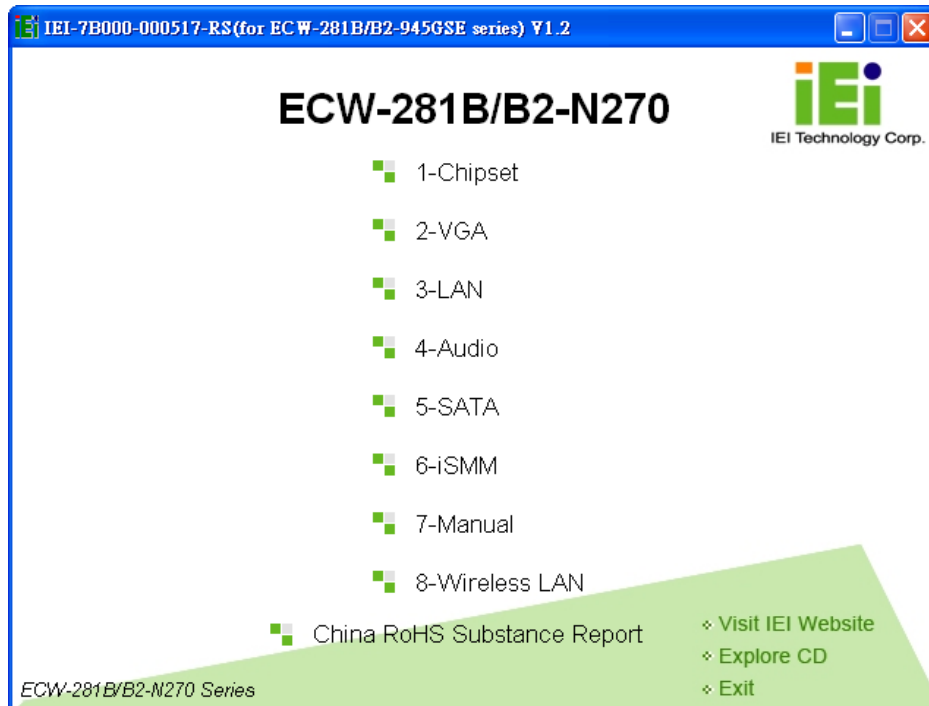


Figure 6-1: Drivers

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click “1-Chipset”

Step 3: The setup files are extracted as shown in **Figure 6-2**.



Figure 6-2: Chipset Driver Screen

Step 4: When the setup files are completely extracted the **Welcome Screen** in Figure 6-3 appears.



Figure 6-3: Chipset Driver Welcome Screen

Step 5: Click **Next** to continue.

Step 6: The license agreement in Figure 6-4 appears.

Step 7: Read the License Agreement.

Step 8: Click the **Yes** icon to continue.



Figure 6-4: Chipset Driver License Agreement

Step 9: The Read Me file in Figure 6-5 appears.

Step 10: Click **Next** to continue.



Figure 6-5: Chipset Driver Read Me File

Step 11: Setup Operations are performed as shown in Figure 6-6.



Figure 6-6: Chipset Driver Setup Operations

Step 12: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 13: The **Finish** screen appears.

Step 14: Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See Figure 6-7.



Figure 6-7: Chipset Driver Installation Finish Screen

6.4 VGA Driver Installation

To install the VGA driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click “**2-VGA**”

Step 3: The VGA Read Me file in Figure 6-8 appears.

Step 4: Click **Next** to continue.

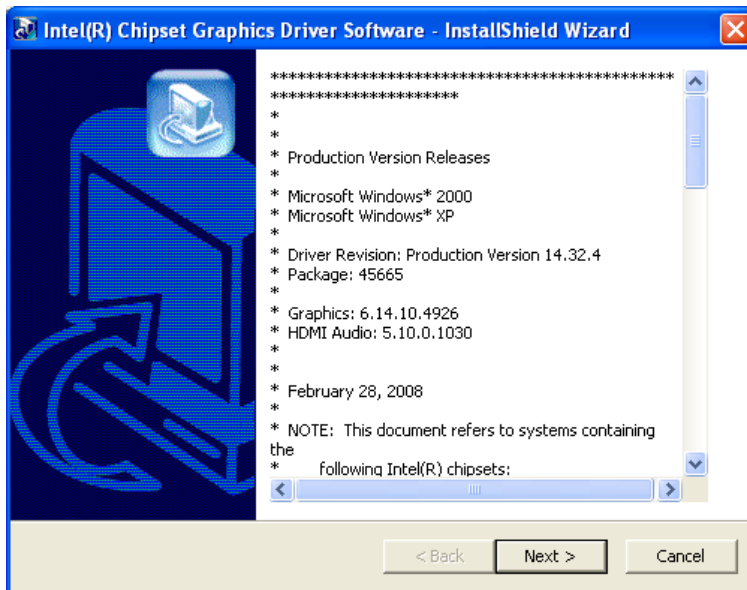


Figure 6-8: VGA Driver Read Me File

Step 5: The installation files are extracted. See Figure 6-9.

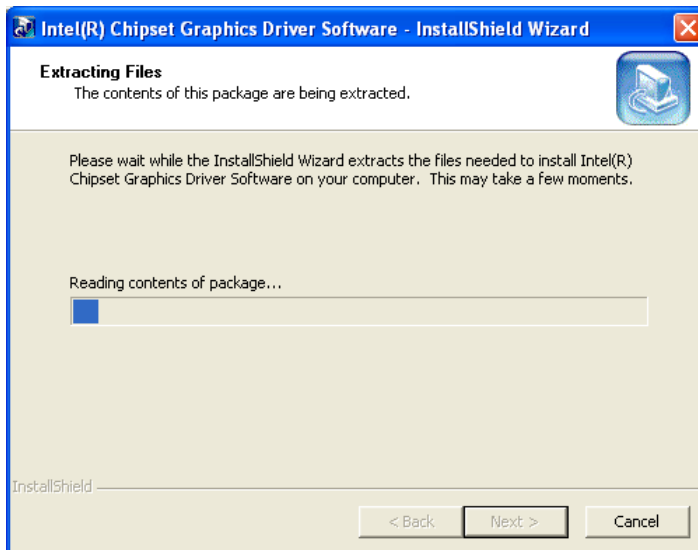


Figure 6-9: VGA Driver Setup Files Extracted

Step 6: The Welcome Screen in Figure 6-10 appears.



Figure 6-10: VGA Driver Welcome Screen

- Step 7:** Click **Next** to continue.
- Step 8:** The license agreement in Figure 6-11 appears.
- Step 9:** Read the **License Agreement**.
- Step 10:** Click the **Yes** icon to continue.

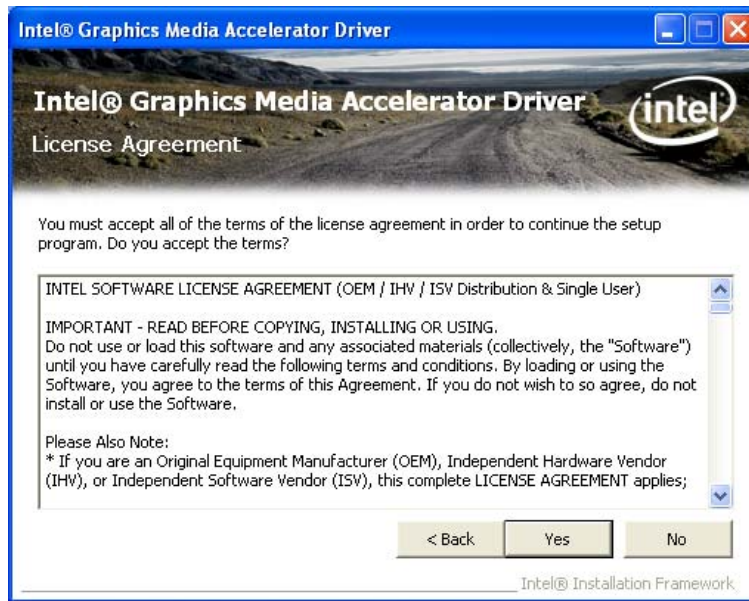


Figure 6-11: VGA Driver License Agreement

Step 11: The Read Me file in Figure 6-12 appears.

Step 12: Click **Next** to continue.

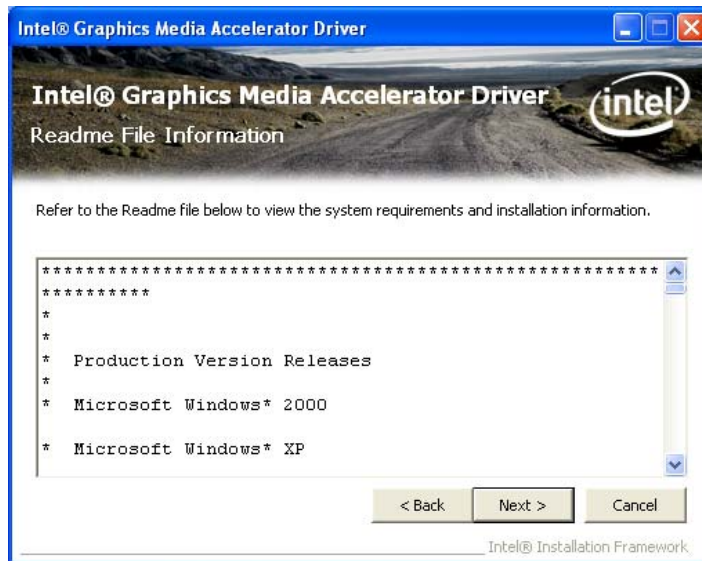


Figure 6-12: VGA Driver Read Me File

Step 13: Setup Operations are performed as shown in Figure 6-13.

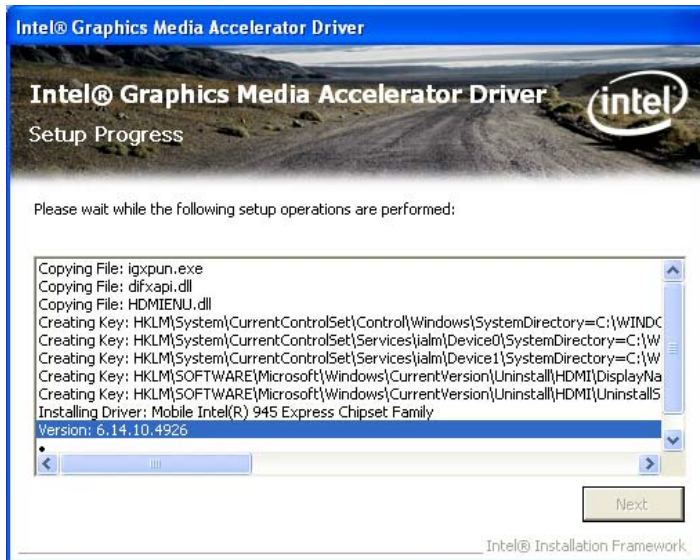


Figure 6-13: VGA Driver Setup Operations

Step 14: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 15: The **Finish** screen appears.

Step 16: Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See Figure 6-14.



Figure 6-14: VGA Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list shown in Figure 6-1. (See **Section 6.2**)

Step 2: Click “**3-LAN**”. Locate the **Realtek\RTL8111E** folder and double-click the appropriate OS folder.

Step 3: Double-click the **setup.exe** program icon.

Step 4: The **Welcome** screen in Figure 6-15 appears.

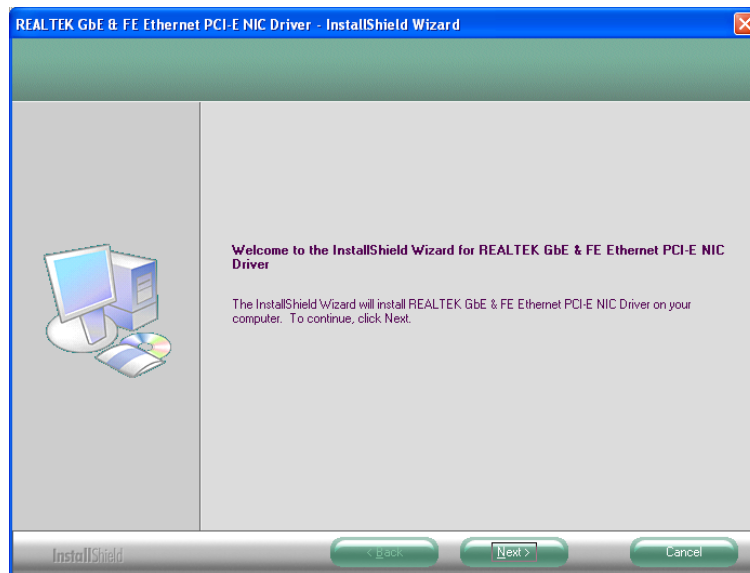


Figure 6-15: LAN Driver Welcome Screen

Step 5: Click **Next** to continue.

Step 6: The **Ready to Install** screen in Figure 6-16 appears.

Step 7: Click **Next** to proceed with the installation.

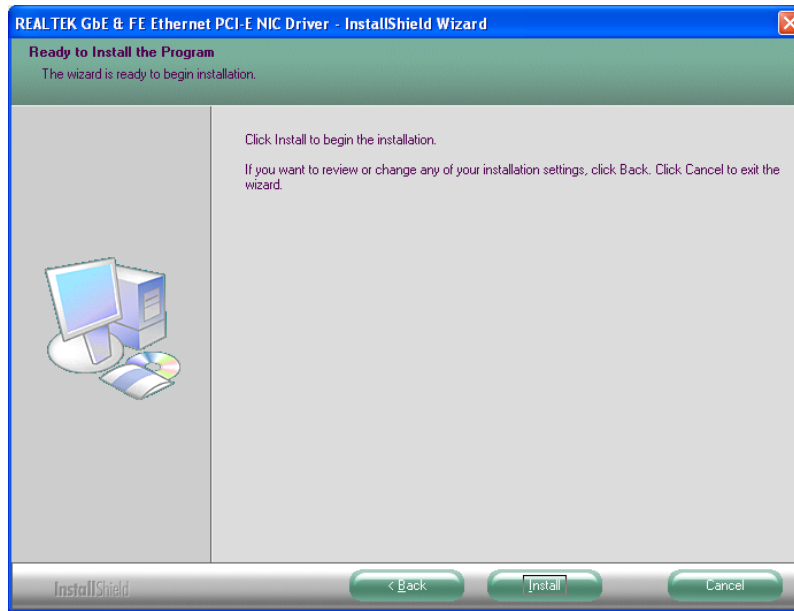


Figure 6-16: LAN Driver Welcome Screen

Step 8: The program begins to install.

Step 9: The installation progress can be monitored in the progress bar shown in Figure 6-17.

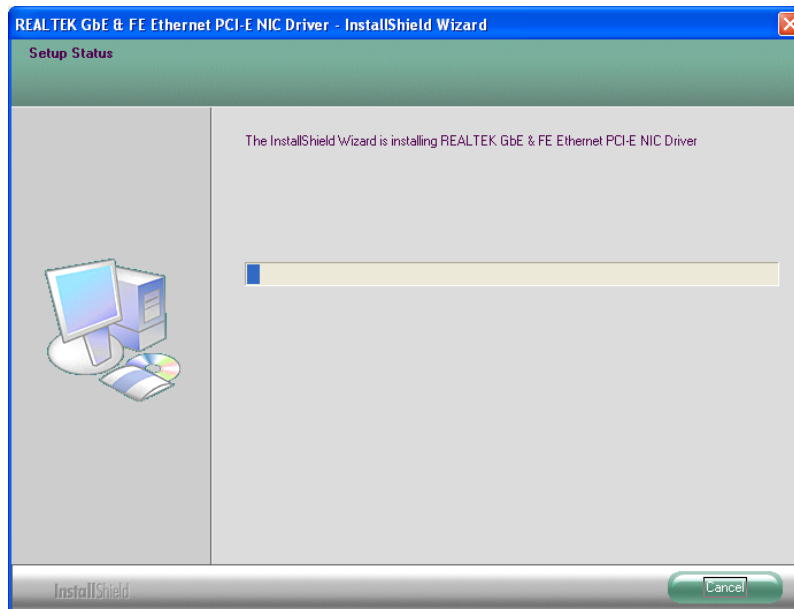


Figure 6-17: LAN Driver Installation

Step 10: When the driver installation is complete, the screen in Figure 6-18 appears.

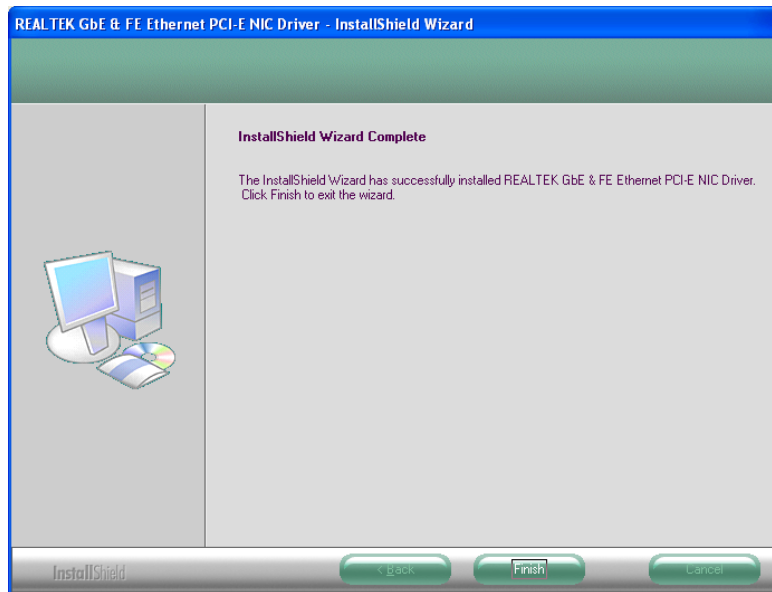


Figure 6-18: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the chipset driver, please do the following.

- Step 1:** Access the driver list shown in Figure 6-1. (See **Section 6.2**)
- Step 2:** Click **“4-Audio”** and select the **“High Definition Audio Codecs”** folder.
- Step 3:** Browse through the folders and locate the installation file. Double click the installation file.
- Step 4:** The **InstallShield Wizard** starts (**Figure 6-19**).

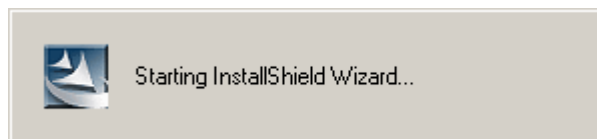


Figure 6-19: The InstallShield Wizard Starts

- Step 5:** The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 6-20**).

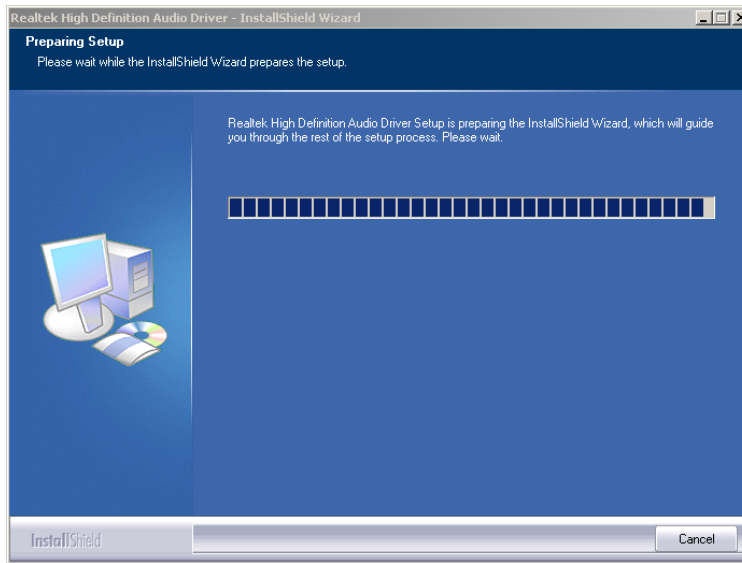


Figure 6-20: Preparing Setup Screen

Step 6: Once initialized, the **InstallShield Wizard** welcome screen appears (Figure 6-21).

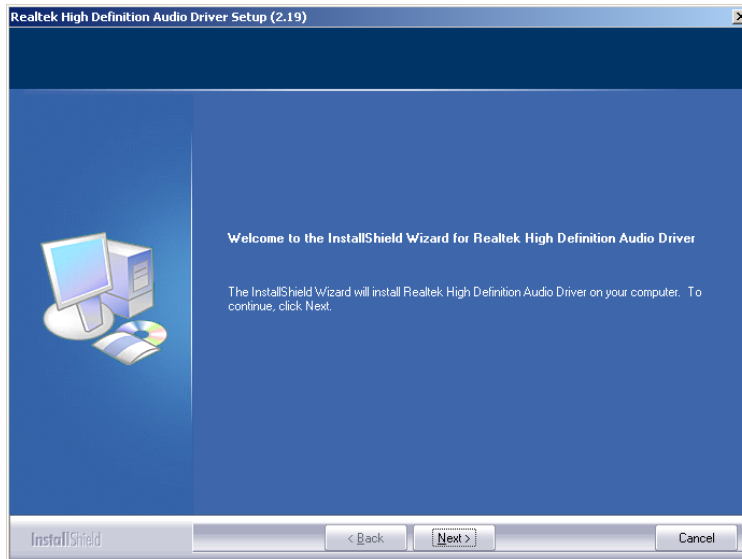


Figure 6-21: InstallShield Wizard Welcome Screen

Step 7: Click **NEXT** to continue the installation.

Step 8: InstallShield starts to install the new software as shown in Figure 6-22.

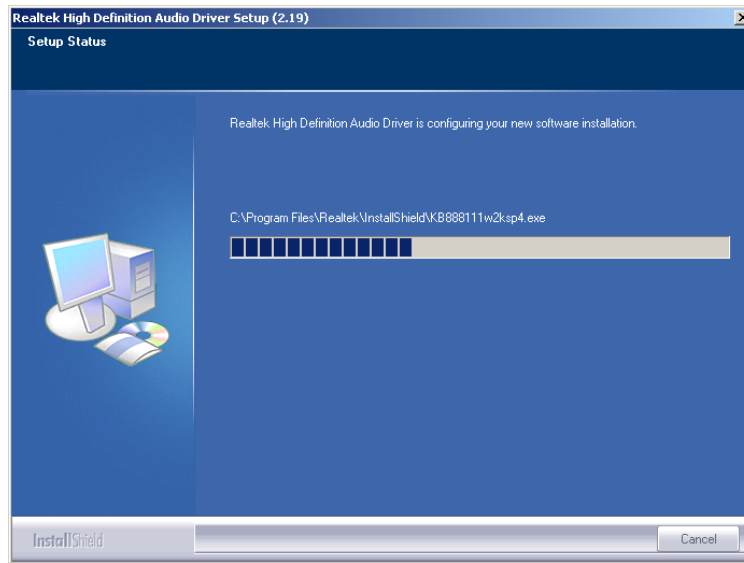


Figure 6-22: Audio Driver Software Configuration

Step 9: The Installation Wizard updates the system as shown in Figure 6-23.

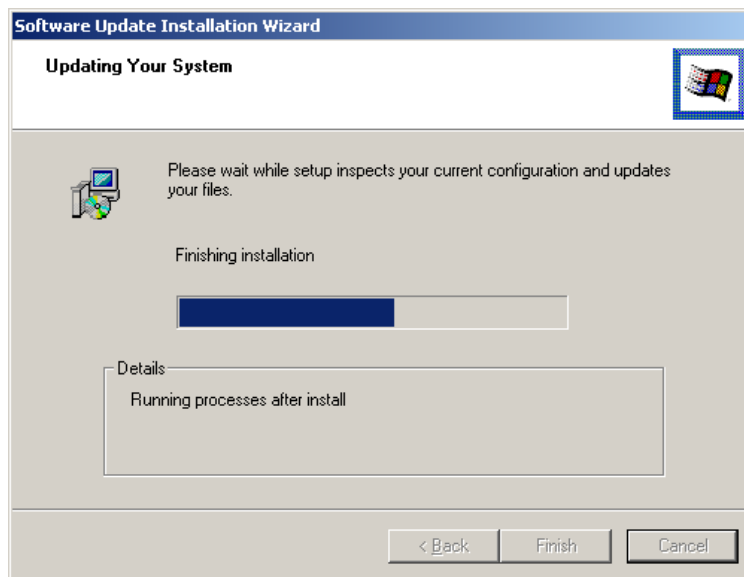


Figure 6-23: Installation Wizard Updates the System

Step 10: After the driver installation process is complete, a confirmation screen appears (Figure 6-24).

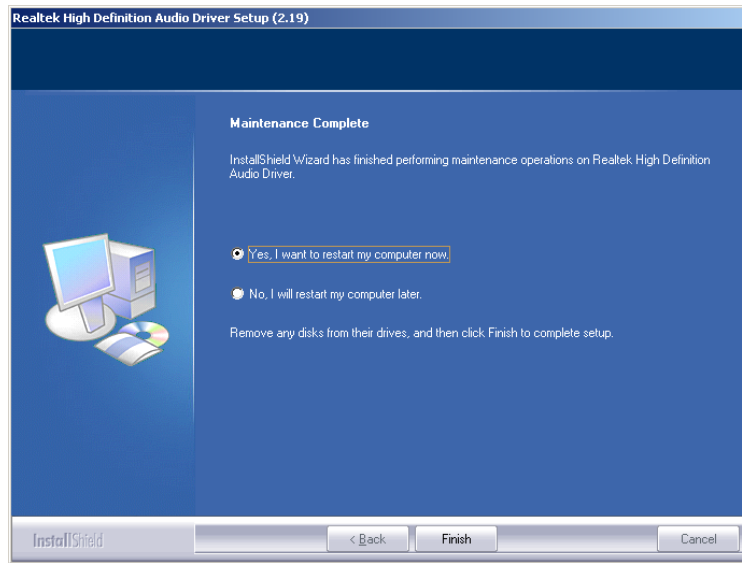


Figure 6-24: Restart the Computer

Step 11: The confirmation screen offers the option of restarting the computer now or later.

For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Chapter

7

Troubleshooting and Maintenance

**WARNING:**

Take Anti-Static precautions whenever maintenance is being carried out on the system components. Failure to take anti-static precautions can cause permanent system damage. For more details on anti-static precautions, please refer to **Section 4.1**.

7.1 ECW-281B/281B2-R30/N270 System Maintenance Overview

**NOTE:**

When doing maintenance operations on the system, please follow the instructions in this chapter. Failure to follow these instructions may lead to personal injury and system damage.

To preserve the working integrity of the ECW-281B/281B2-R30/N270 embedded system, the system must be properly maintained. If embedded system components need replacement, the proper maintenance procedures must be followed to ensure the system can continue to operate normally.

7.2 System Troubleshooting

This section provides some simple troubleshooting suggestions.

7.2.1 The System Doesn't Turn On

If after turning the system on, there is no power (indicated by the power button on the front panel not turning on) please do the following:

- Step 1:** Check that the power cable connector is properly connected to the terminal block or power socket on the system front panel.
- Step 2:** Check that the power cable connector is properly plugged into the power source.
- Step 3:** Make sure the power button is turned on.

ECW-281B/281B2-R30/N270 Embedded System

Step 4: Plug the system into a monitor and check to see if anything appears on the screen. If the boot-up screen appears it means the power LED has become disconnected. To fix this problem, open the top cover and reconnect the power LED to the motherboard.

If the above steps have been completed and the system still doesn't turn on, please do the following.

Step 1: Open the bottom surface (**Section 4.2.3**)

Step 2: Check the terminal block/power socket power cable connector is properly connected to the power module.

Step 3: Check that the power button cable connector is properly connected to the motherboard.

Step 4: Make sure the cable connecting to the terminal block/power socket are properly attached and have not become separated.

Step 5: Make sure the cable connecting the power button to the motherboard is still properly attached to the power button and has not been separated.

7.2.2 The System Doesn't Boot Up

If the system doesn't boot up please do the following:

Step 1: Check the power is turned on. See **Section 7.2.1** above.

Step 2: Make sure the SO-DIMM module is properly installed.

Step 3: Reset the system using the reset CMOS jumper.

7.2.3 More Troubleshooting

- **Nothing appears on the monitor after booting up the system:** Make sure the monitor is properly connected to the system and the monitor is connected to a power supply and turned on.



WARNING!

If all troubleshooting measures have been taken and the system still fails to start, contact the IEI reseller or vendor you purchased the ECW-281B/281B2-R30/N270 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

7.3 Component Replacement Procedure



WARNING!

Users are not advised to attempt to repair or replace any internal or external components of the ECW-281B/281B2-R30/N270 embedded system other than those listed below. If any other components fail or need replacement, contact the IEI reseller or vendor you purchased the ECW-281B/281B2-R30/N270 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The embedded system components listed below can all be replaced if they fail:

- SO-DIMM module
- Internal hard disk drive (see **Section 4.2.5**)

7.3.1 SO-DIMM Replacement



WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the ECW-281B/281B2-R30/N270. Please make sure the purchased SO-DIMM complies with the memory specifications of the ECW-281B/281B2-R30/N270.

To replace a SO-DIMM memory module into a SO-DIMM socket, please follow the steps below.

Step 1: Remove the bottom surface panel. Place the ECW-281B/281B2-R30/N270 on an anti-static pad with the bottom panel facing up and the bottom surface removed. (see **Section 4.2.3**).

Step 2: Locate the SO-DIMM (Figure 7-1).



Figure 7-1: SO-DIMM Cover Plate

Step 3: Remove the SO-DIMM by releasing the arms on the SO-DIMM socket.

Step 4: Align the new SO-DIMM with the socket. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (Figure 7-2).

Step 5: Insert the SO-DIMM. Push the SO-DIMM chip into the socket at an angle (Figure 7-2).

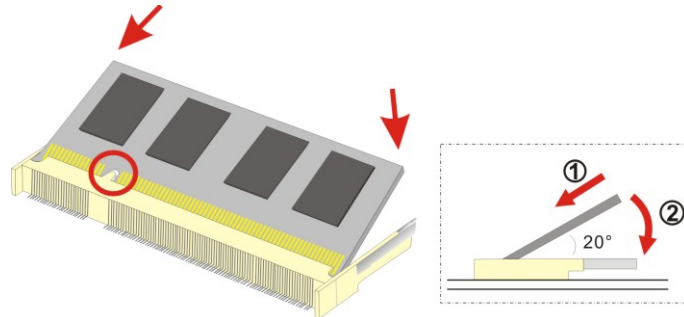


Figure 7-2: SO-DIMM Installation

Step 6: Open the SO-DIMM socket arms. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 7-2**)

Step 7: Secure the SO-DIMM. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Appendix

A

Safety Precautions

**WARNING:**

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the ECW-281B/281B2-R30/N270.

A.1 Safety Precautions

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

A.1.1 General Safety Precautions

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

- **Follow the electrostatic precautions** outlined below whenever the ECW-281B/281B2-R30/N270 is opened.
- **Make sure the power is turned off and the power cord is disconnected** whenever the ECW-281B/281B2-R30/N270 is being installed, moved or modified.
- **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 the ECW-281B/281B2-R30/N270 chassis is opened when the ECW-281B/281B2-R30/N270 is running.
- **Do not drop or insert any objects** into the ventilation openings of the ECW-281B/281B2-R30/N270.
- **If considerable amounts of dust, water, or fluids enter the ECW-281B/281B2-R30/N270**, turn off the power supply immediately, unplug the power cord, and contact the ECW-281B/281B2-R30/N270 vendor.
- **DO NOT:**
 - Drop the ECW-281B/281B2-R30/N270 against a hard surface.
 - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the ECW-281B/281B2-R30/N270 may result in permanent damage to the ECW-281B/281B2-R30/N270 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ECW-281B/281B2-R30/N270. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ECW-281B/281B2-R30/N270 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.

A.1.3 Product Disposal

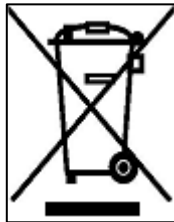


CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords.

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

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

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the ECW-281B/281B2-R30/N270, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the ECW-281B/281B2-R30/N270, please read the details below.

ECW-281B/281B2-R30/N270 Embedded System

- The interior of the ECW-281B/281B2-R30/N270 does not require cleaning. Keep fluids away from the ECW-281B/281B2-R30/N270 interior.
- Be cautious of all small removable components when vacuuming the ECW-281B/281B2-R30/N270.
- Turn the ECW-281B/281B2-R30/N270 off before cleaning the ECW-281B/281B2-R30/N270.
- Never drop any objects or liquids through the openings of the ECW-281B/281B2-R30/N270.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the ECW-281B/281B2-R30/N270.
- Avoid eating, drinking and smoking within vicinity of the ECW-281B/281B2-R30/N270.

A.2.2 Cleaning Tools

Some components in the ECW-281B/281B2-R30/N270 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 ECW-281B/281B2-R30/N270.

- **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the ECW-281B/281B2-R30/N270.
- **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol can be used to clean the ECW-281B/281B2-R30/N270.
- **Using solvents** – The use of solvents is not recommended when cleaning the ECW-281B/281B2-R30/N270 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 ECW-281B/281B2-R30/N270. Dust and dirt can restrict the airflow in the ECW-281B/281B2-R30/N270 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

B

One Key Recovery

B.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 B.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

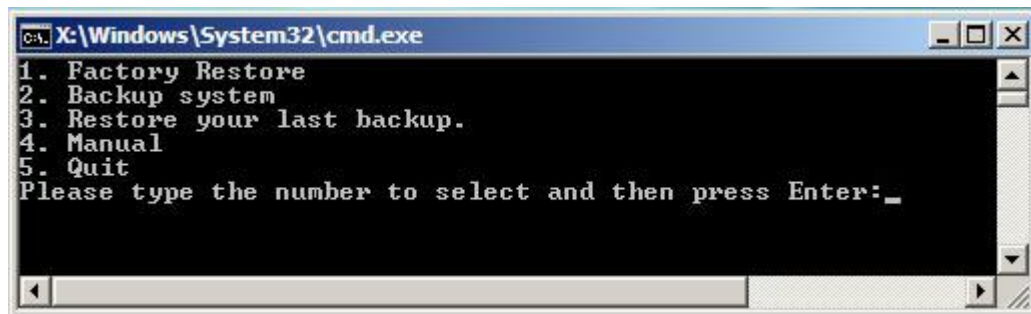


Figure B-1: IEI One Key Recovery Tool Menu

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

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

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

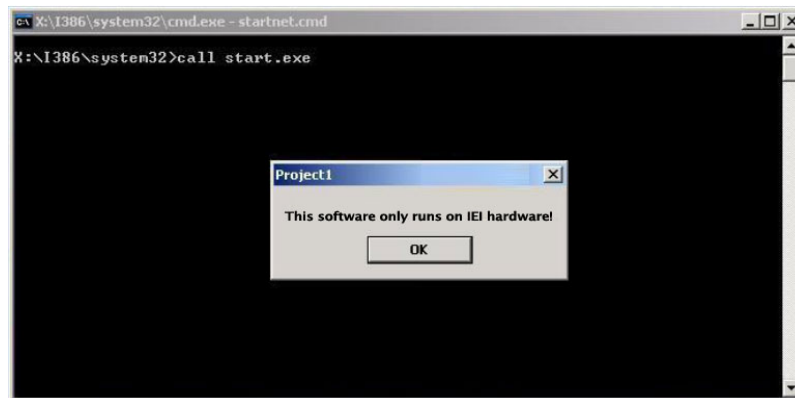
**NOTE:**

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

B.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

ECW-281B/281B2-R30/N270 Embedded System

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.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating systems (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 B.3) and the restore through LAN function (described in Section B.6) are not supported in the Windows CE 5.0/6.0 operating system environment.

- 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.

B.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 B.2.1**)

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

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

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

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

ECW-281B/281B2-R30/N270 Embedded System

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 B.3**.

B.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.

B.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!

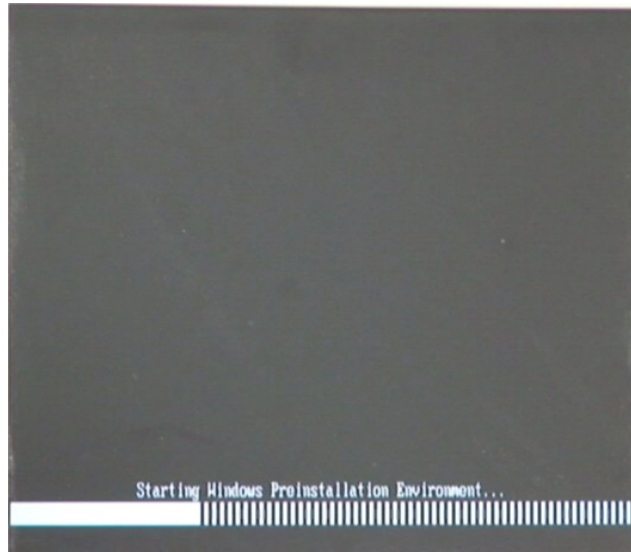


Figure B-2: Launching the Recovery Tool

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

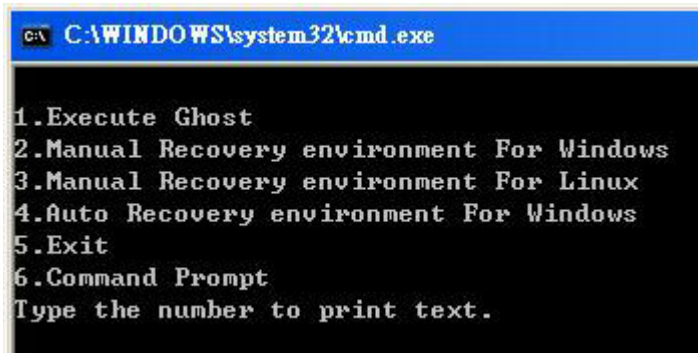
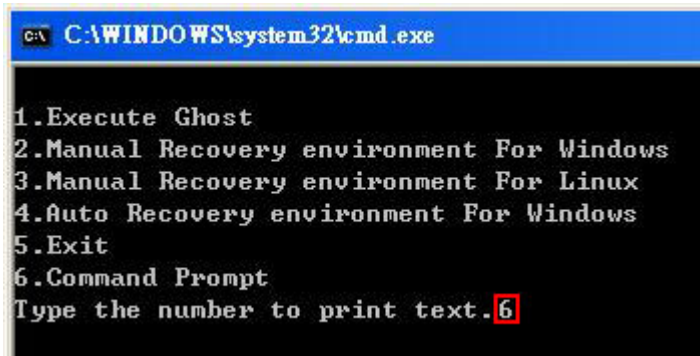


Figure B-3: Recovery Tool Setup Menu

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 B-4: Command Prompt

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
```



```

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

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

DISKPART> list vol → Show partition information

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

DISKPART> sel disk 0 → Select a disk

Disk 0 is now the selected disk.

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

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

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

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

DISKPART> exit → Exit diskpart

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

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

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

Figure B-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 the Recovery Partition.

B.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.

B.2.4 Building the Recovery Partition

- Step 1:** Put the recover CD in the optical drive.
- Step 2:** Start the system.
- Step 3:** **Boot the system from the recovery CD.** When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

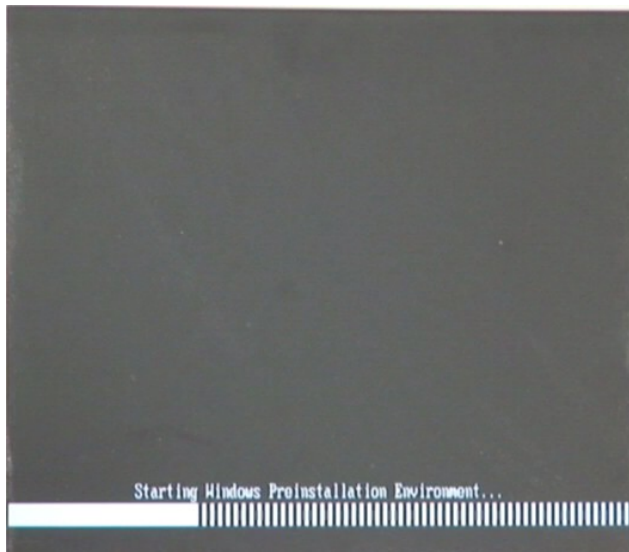


Figure B-6: Launching the Recovery Tool

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

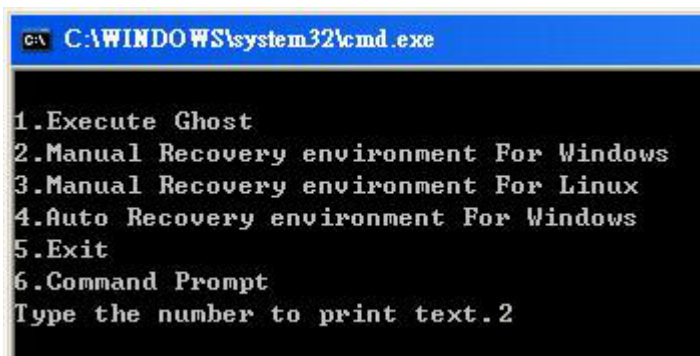


Figure B-7: Manual Recovery Environment for Windows

ECW-281B/281B2-R30/N270 Embedded System

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

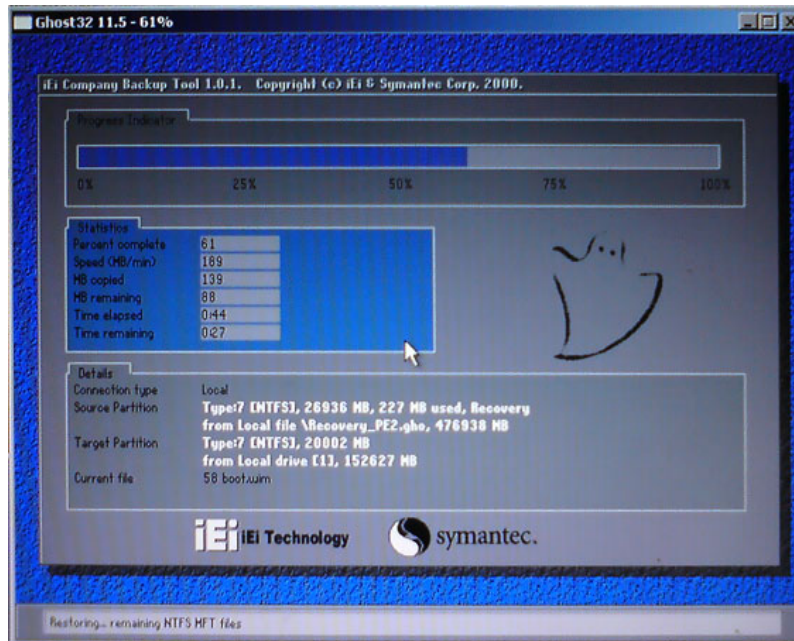


Figure B-8: Building the Recovery Partition

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

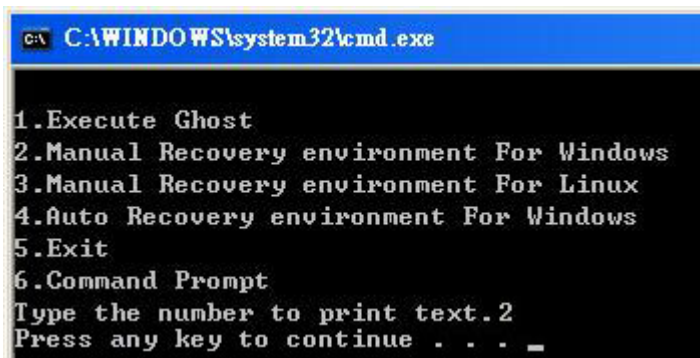


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

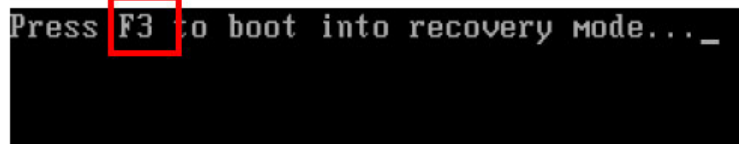


NOTE:

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 B-10**), press the <F3> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.



```
Press F3 to boot into recovery mode... _
```

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

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

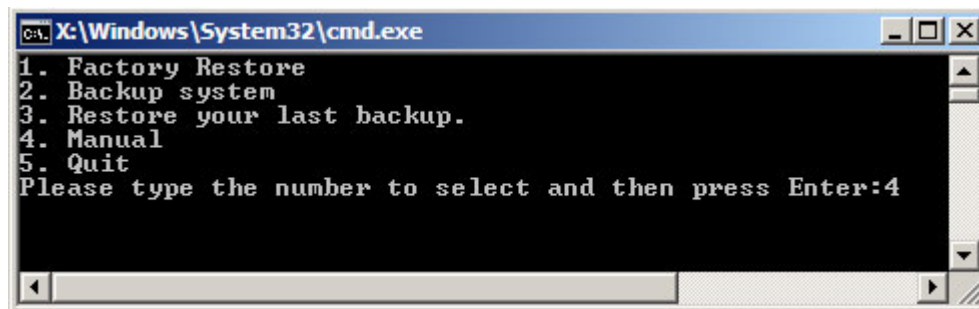


Figure B-11: Recovery Tool Menu

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

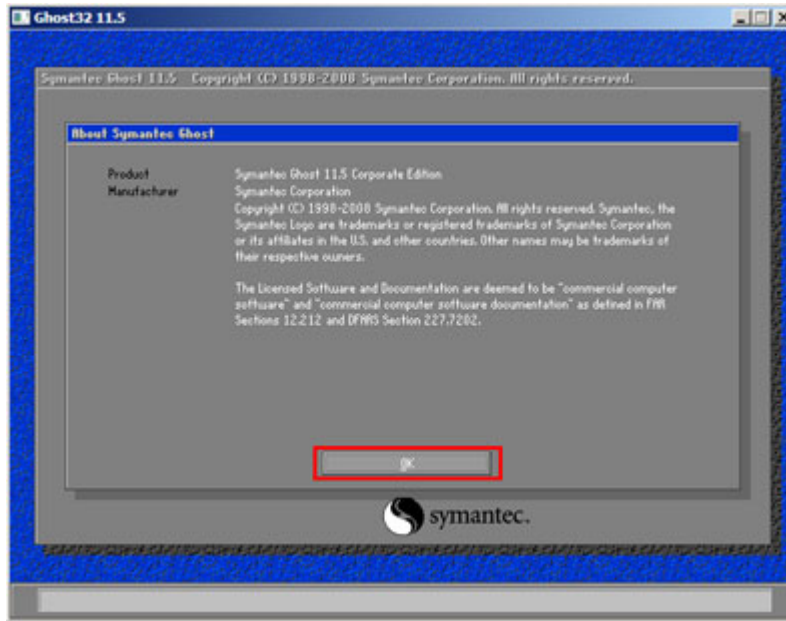


Figure B-12: About Symantec Ghost Window

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

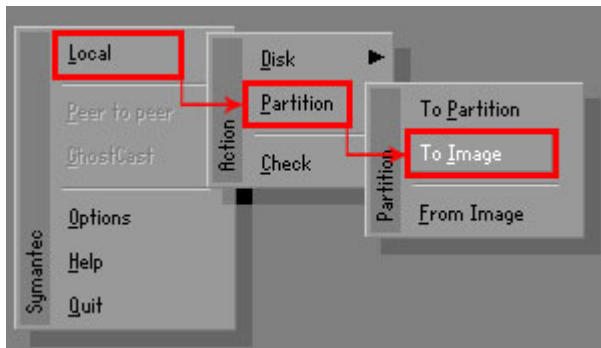


Figure B-13: Symantec Ghost Path

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

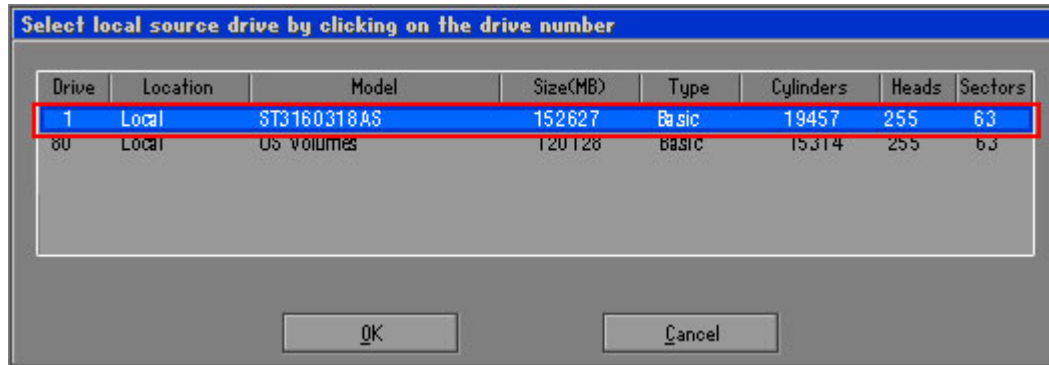


Figure B-14: Select a Local Source Drive

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

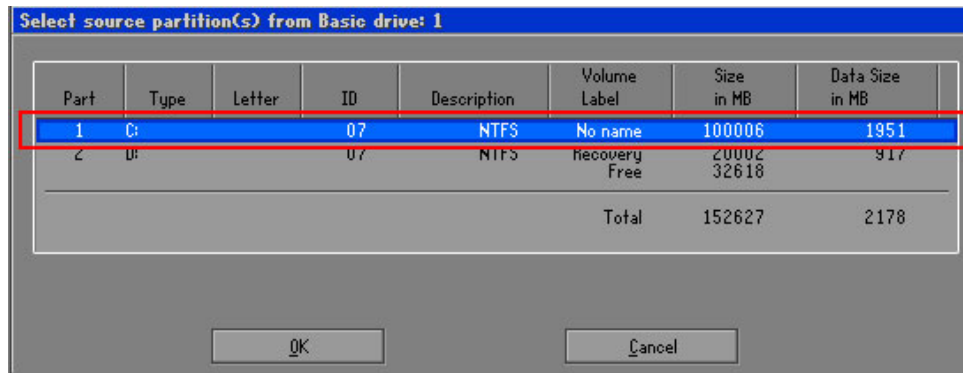


Figure B-15: Select a Source Partition from Basic Drive

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

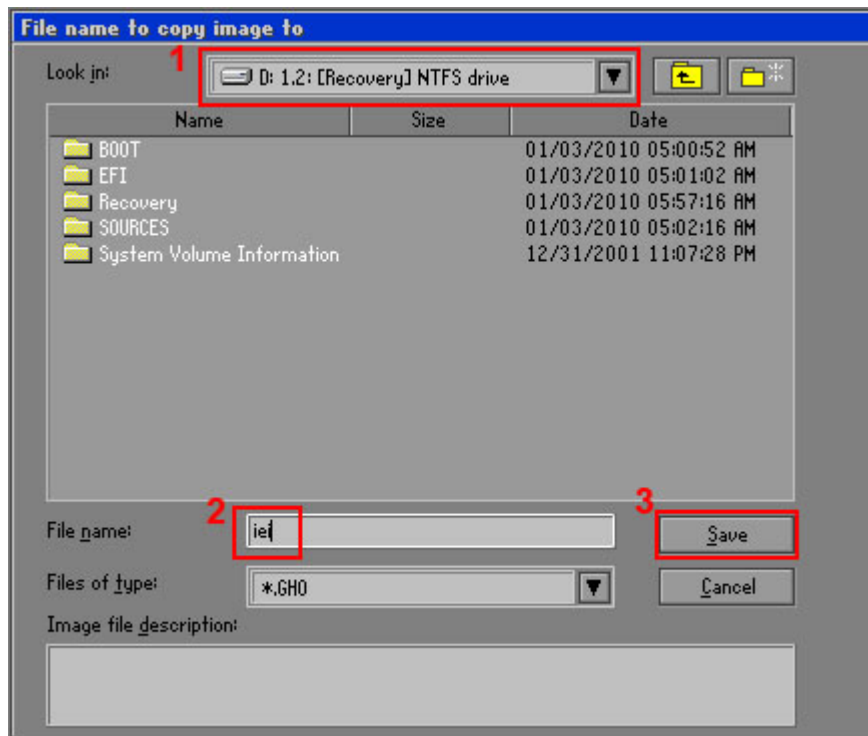


Figure B-16: File Name to Copy Image to

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

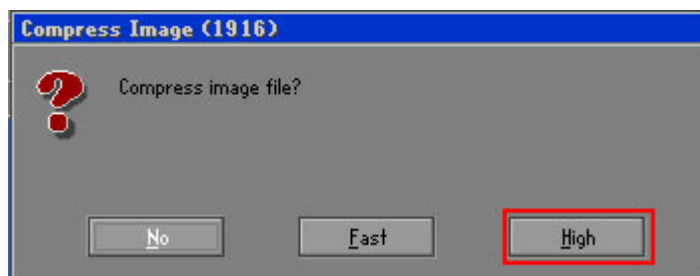


Figure B-17: Compress Image

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

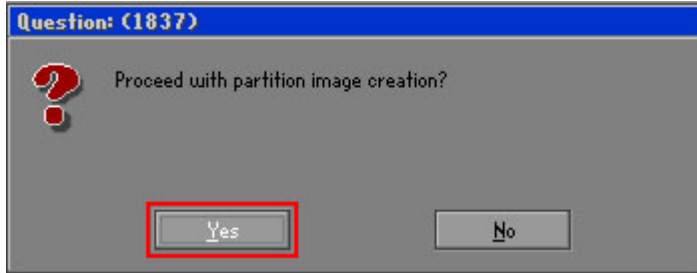


Figure B-18: Image Creation Confirmation

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

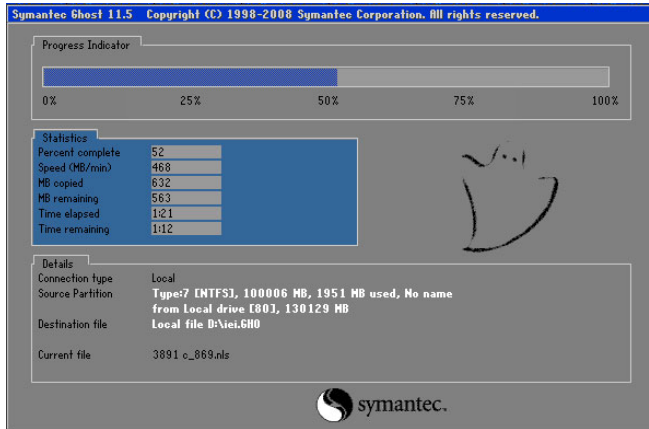


Figure B-19: Image Creation Complete

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**.

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

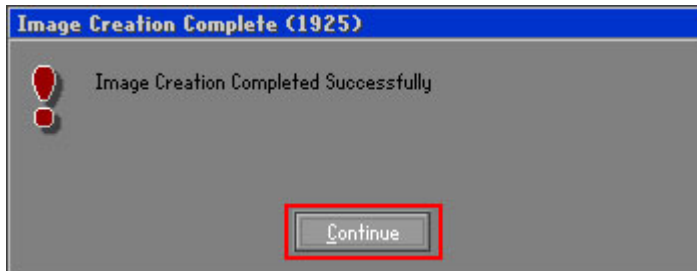
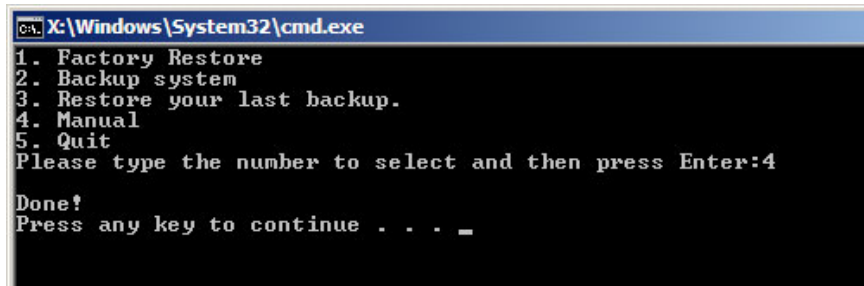


Figure B-20: Image Creation Complete

ECW-281B/281B2-R30/N270 Embedded System

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



```
C:\Windows\System32\cmd.exe
1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter:4
Done!
Press any key to continue . . . _
```

Figure B-21: Press Any Key to Continue

B.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 B.2.1 ~ Section B.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 B-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 B-23)

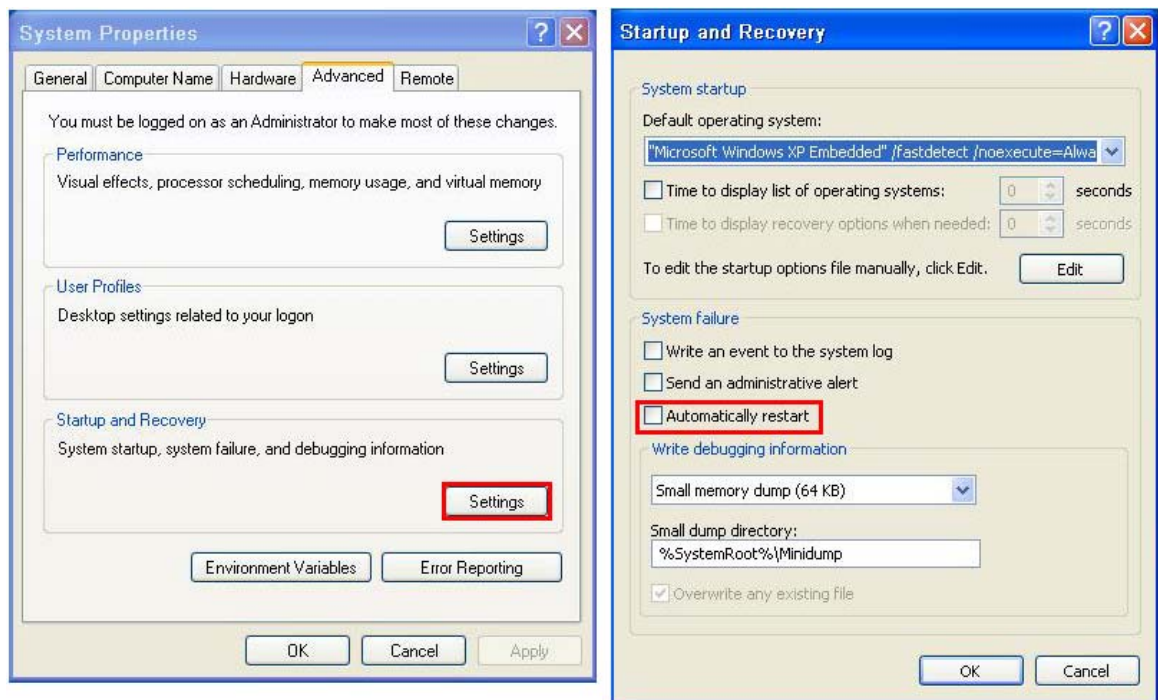


Figure B-23: Disable Automatically Restart

ECW-281B/281B2-R30/N270 Embedded System

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!

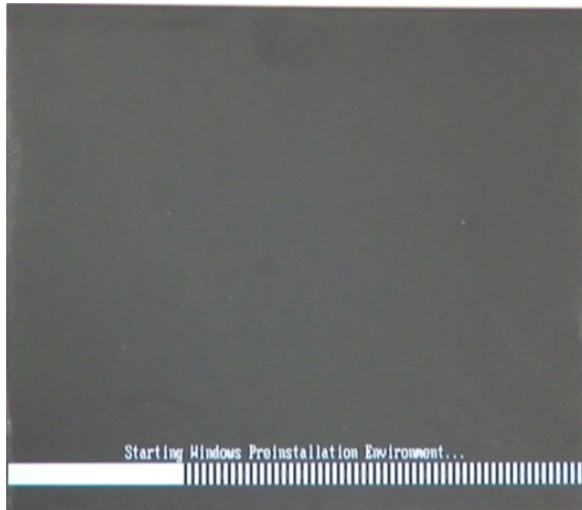


Figure B-24: Launching the Recovery Tool

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

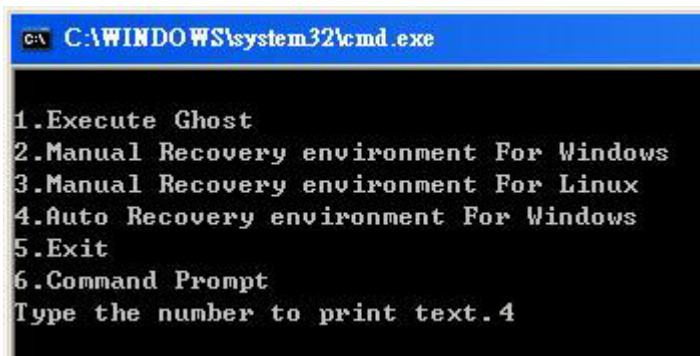


Figure B-25: Auto Recovery Environment for Windows

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

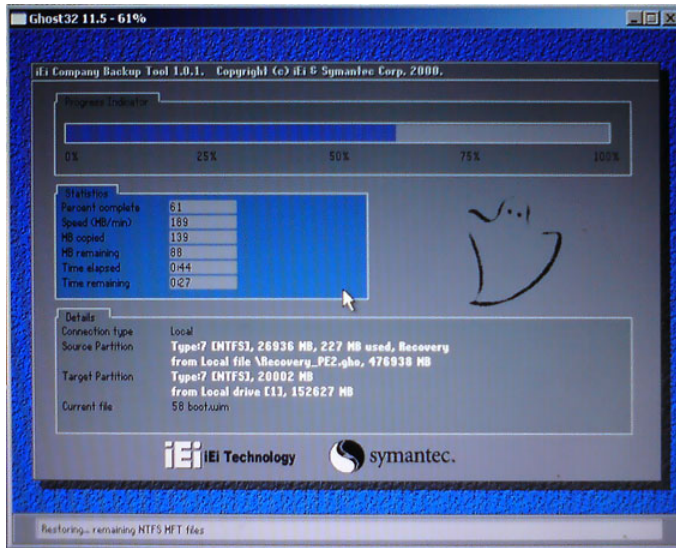


Figure B-26: Building the Auto Recovery Partition

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 B-27: Factory Default Image Confirmation

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

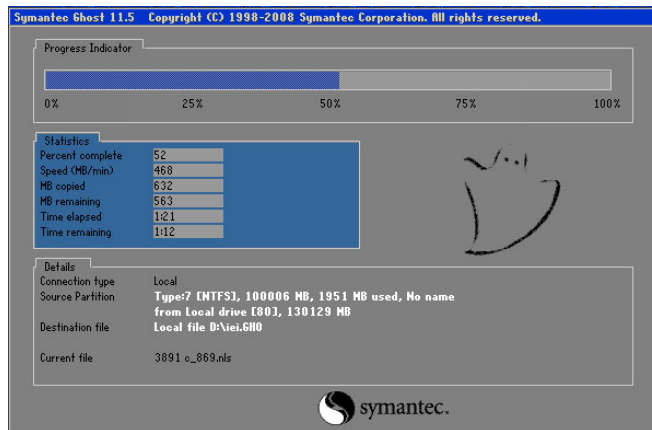


Figure B-28: Image Creation Complete

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

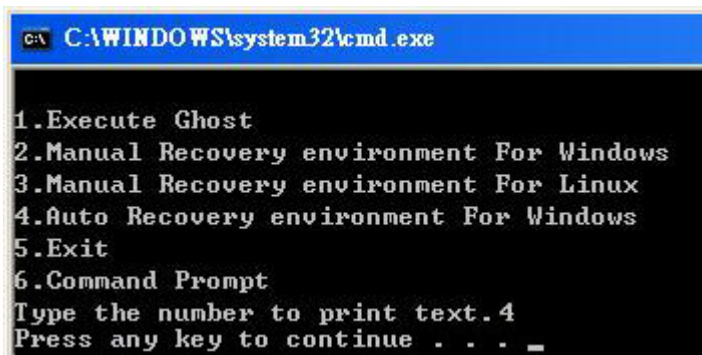


Figure B-29: Press any key to continue

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**).

```
BIOS SETUP UTILITY
Main  Advanced  PCIPNP  Boot  Security  Chipset  Exit
-----
iEi Feature
-----
Auto Recovery Function      [Enabled]
Recover from PXE           [Disabled]

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

v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```

BIOS Menu 22: 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.

B.4 Setup Procedure for Linux

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

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

ECW-281B/281B2-R30/N270 Embedded System

- Partition 1: /
- Partition 2: SWAP

**NOTE:**

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

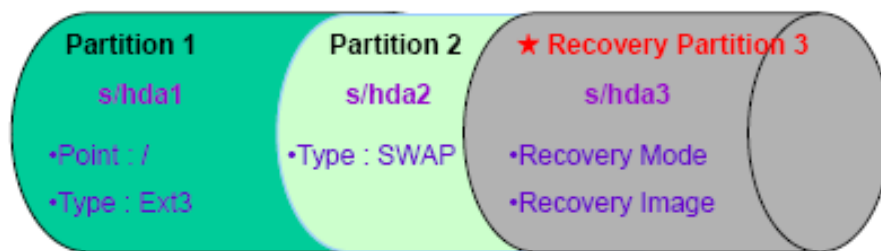


Figure B-30: Partitions for Linux

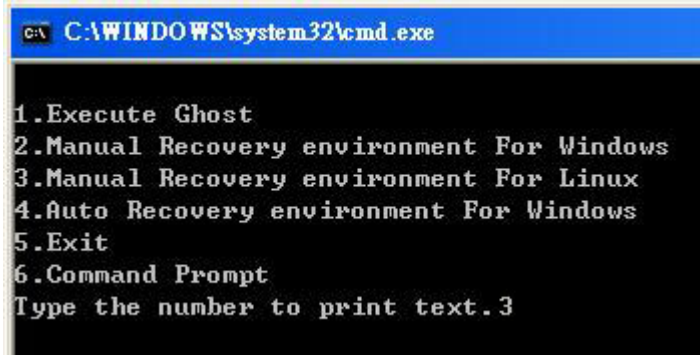
Step 3: Create a recovery partition. Insert the recovery CD into the optical disk drive.

Follow **Step 1 ~ Step 3** described in **Section B.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 the 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 B-31**). The Symantec Ghost window appears and starts configuring the system to build a

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



```

C:\WINDOWS\system32\cmd.exe

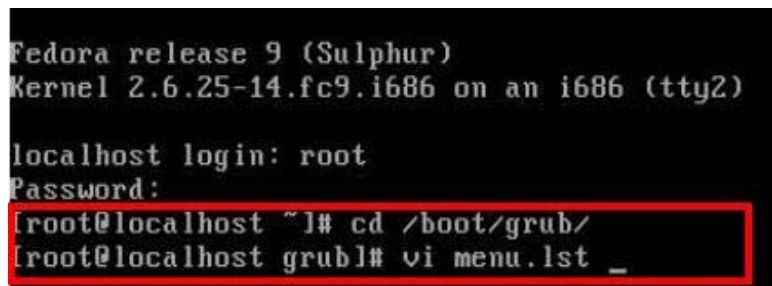
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
    
```

Figure B-31: Manual Recovery Environment for Linux

Step 5: Access the recovery tool main menu by modifying the “menu.lst”. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, 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 B-32: Access menu.lst in Linux (Text Mode)

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

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

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

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

Step 7: The recovery tool menu appears. (Figure B-33)

```
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 B-33: Recovery Tool Menu

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

B.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 B.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.

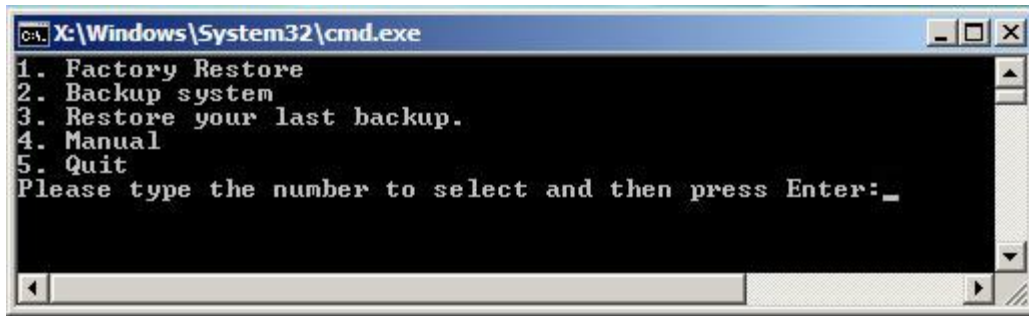


Figure B-34: Recovery Tool Main Menu

The recovery tool has several functions including:

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

B.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.

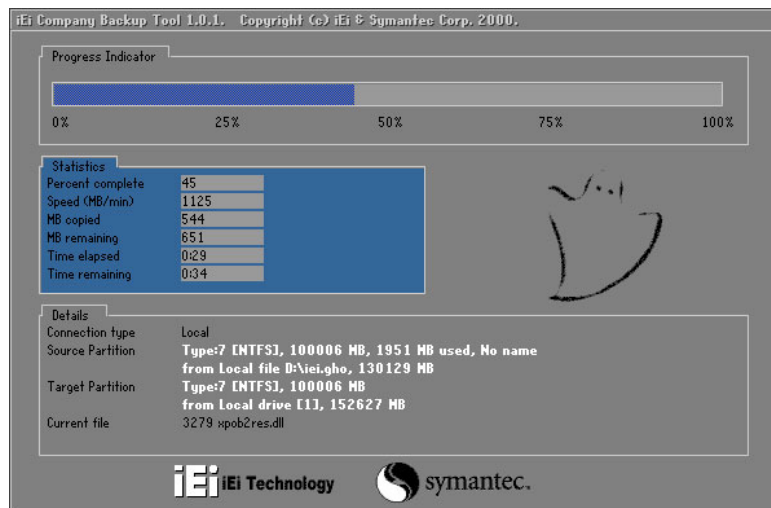


Figure B-35: Restore Factory Default

Step 3: The screen shown in **Figure B-36** appears when completed. Press any key to reboot the system.

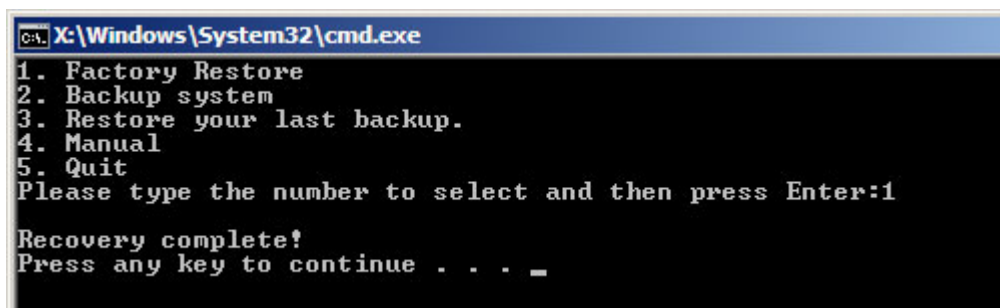


Figure B-36: Recovery Complete Window

B.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.

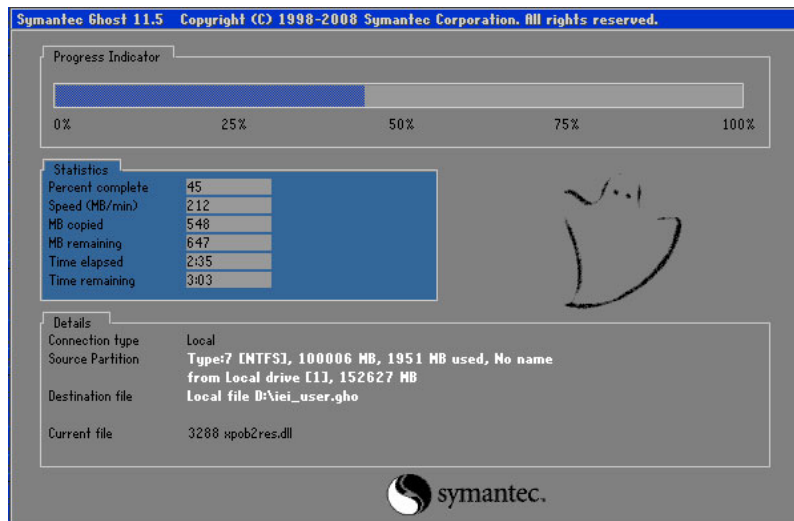


Figure B-37: Backup System

Step 3: The screen shown in **Figure B-38** appears when system backup is complete.

Press any key to reboot the system.

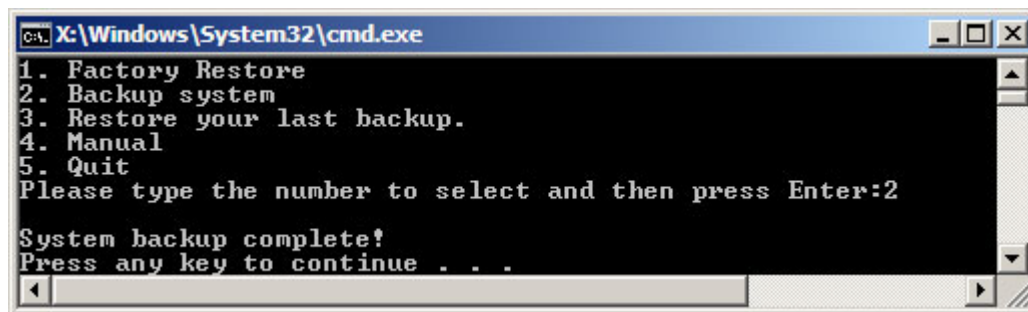


Figure B-38: System Backup Complete Window

B.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).

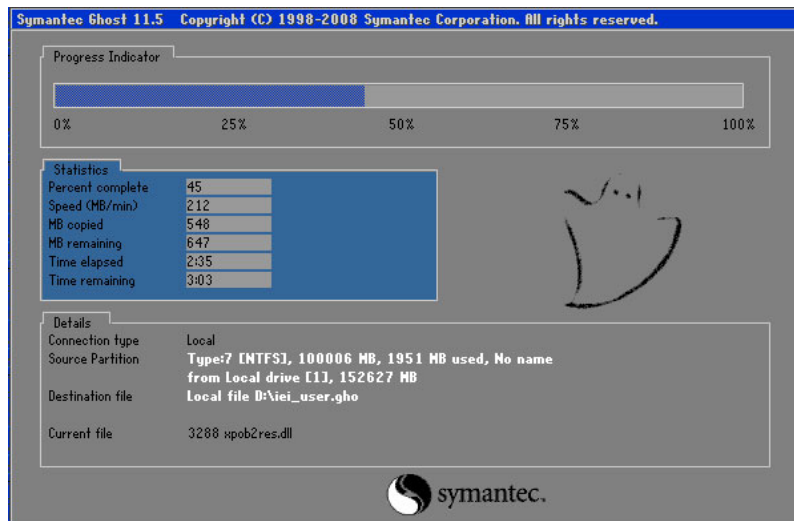


Figure B-39: Restore Backup

Step 3: The screen shown in **Figure B-40** appears when backup recovery is complete. Press any key to reboot the system.

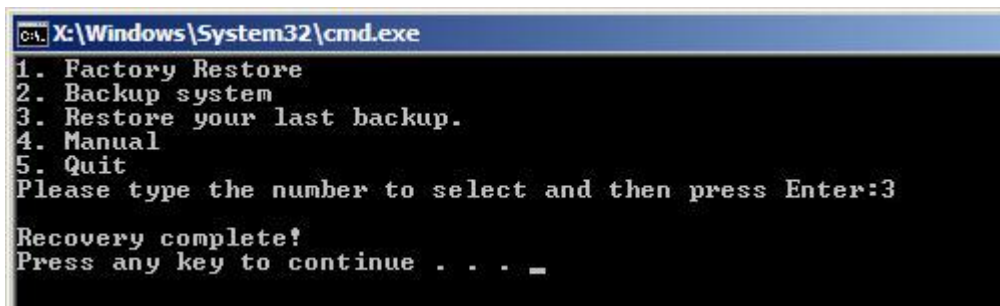


Figure B-40: Restore System Backup Complete Window

B.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.

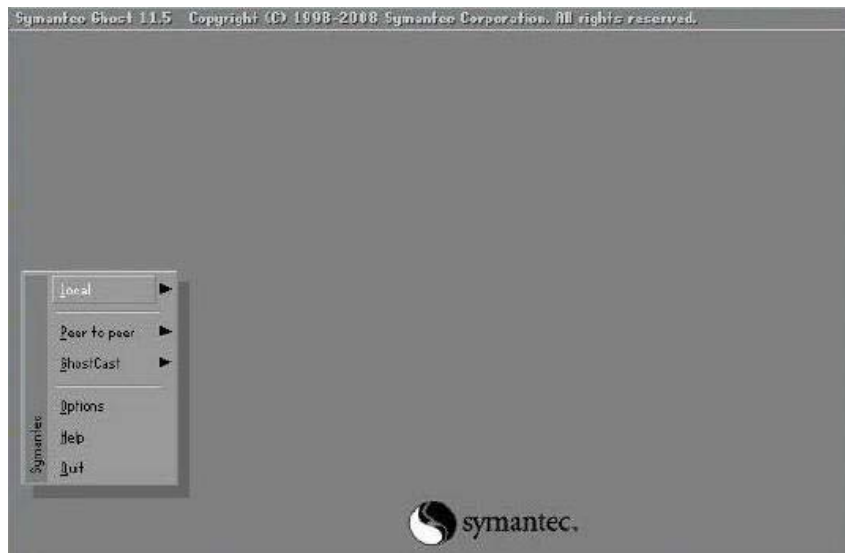
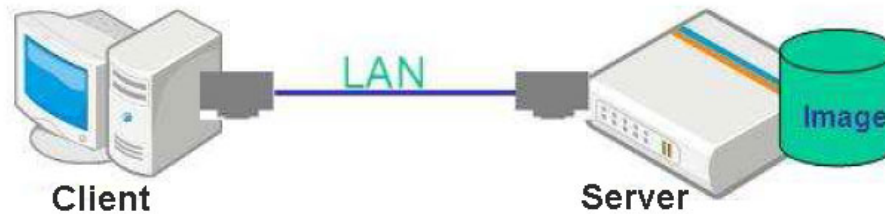


Figure B-41: Symantec Ghost Window

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

B.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.



CAUTION:

The supported client OS includes:

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

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).

B.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

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

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

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

CentOS

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

`#vi /etc/dhcpd.conf`

The DHCP server sample location is shown as below:

```
# 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;
}
```

B.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
```

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
```

B.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 -xvzf RecoveryR10.tar.bz2
```

Step 3: Copy “pxelinux.0” from “syslinux” and install to “/tftpboot”.

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

B.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
```

B.6.5 Create Shared Directory

Step 1: Install the samba.

```
#yum install samba
```

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

```
#mkdir /share
```

```
#cd /share
```

```
#mkdir /image
```

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



WARNING:

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

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

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

Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

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

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

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

Step 5: Modify the hostname

```
#vi /etc/hostname
```

Modify: RecoveryServer

```
RecoveryServer
```

B.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 B-23)

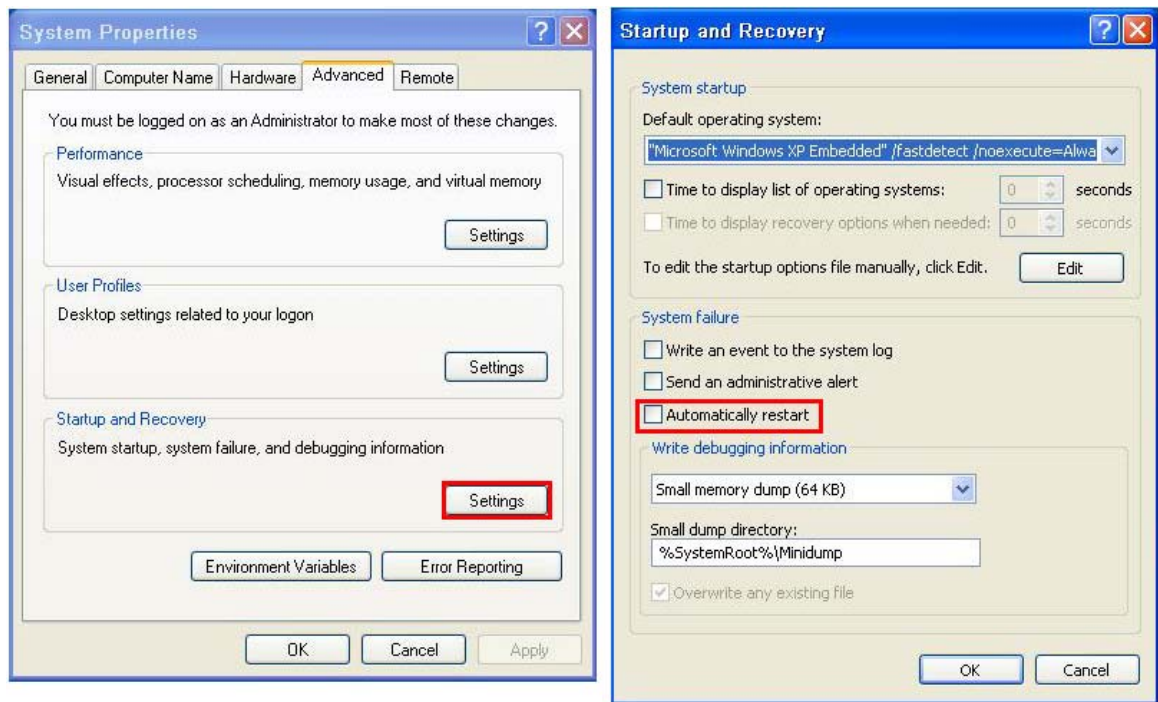


Figure B-42: Disable Automatically Restart

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.

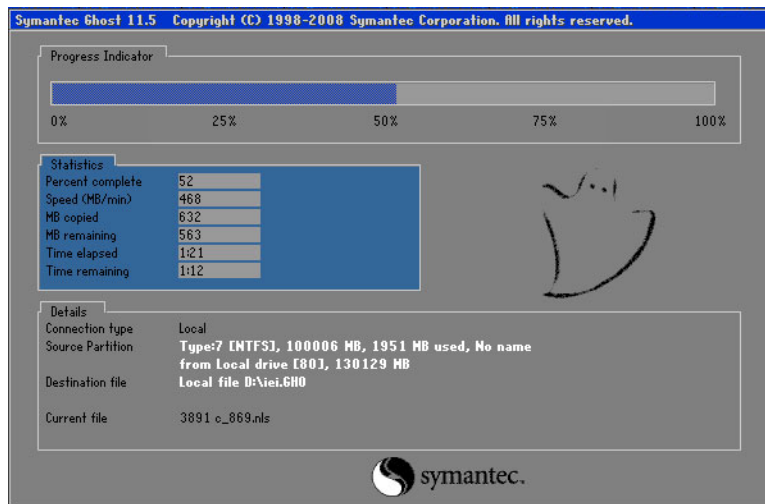


Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

```
Realtek PCIe GBE Family Controller Series v2.35 (06/14/10)
CLIENT MAC ADDR: 00 18 7D 13 E6 89  GUID: 00020003-0004-0005-0006-0007000000
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/00020003-0004-0005-0006-000700000009
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:

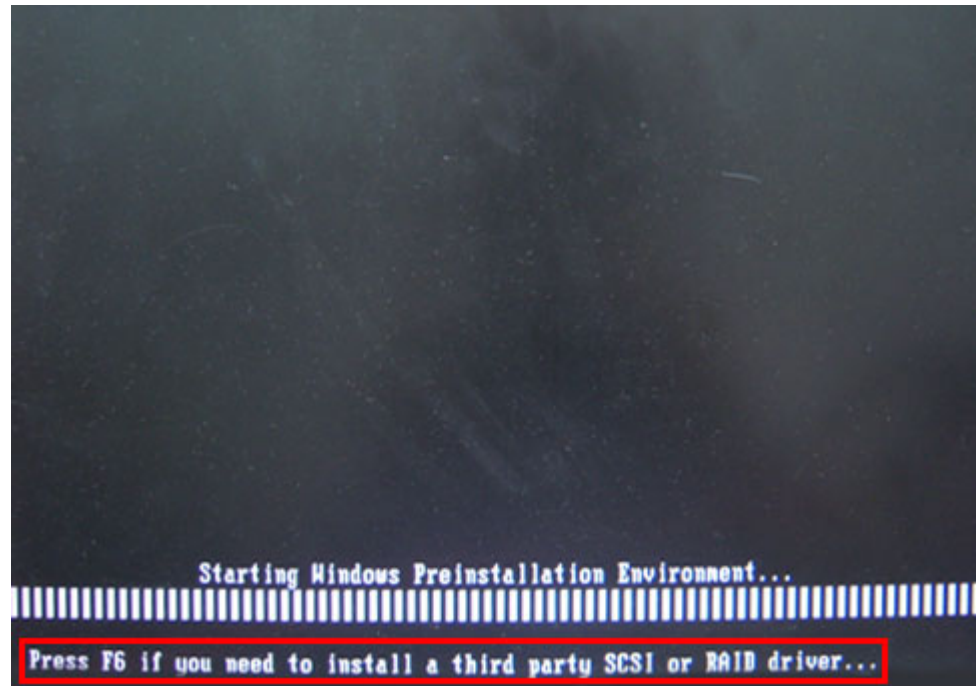
A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

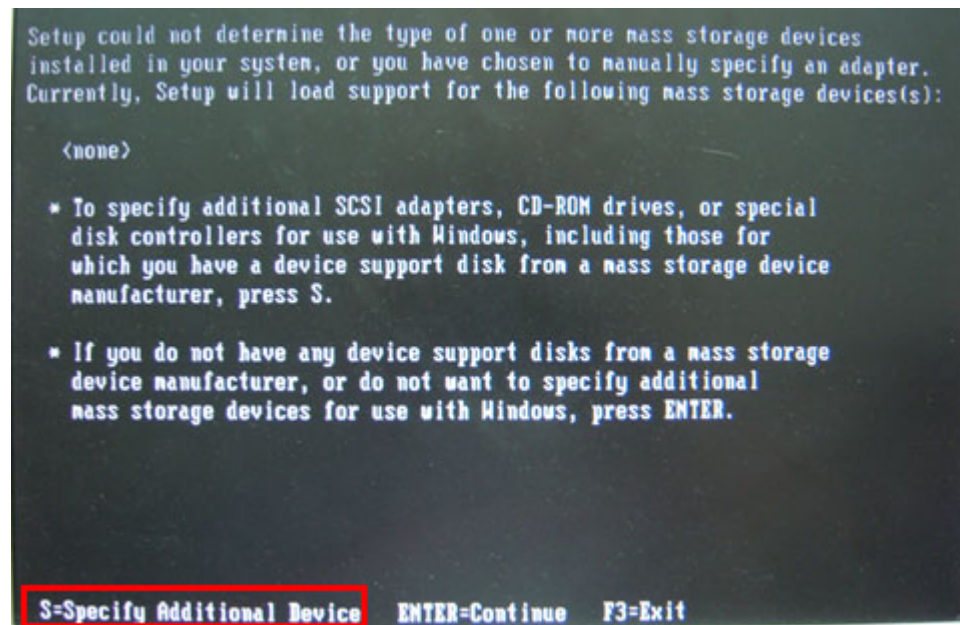
B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

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

- Step 1:** Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.
- Step 2:** Connect the USB floppy disk drive to the system.
- Step 3:** Insert the One Key Recovery CD into the system and boot the system from the CD.
- Step 4:** When launching the recovery tool, press <F6>.

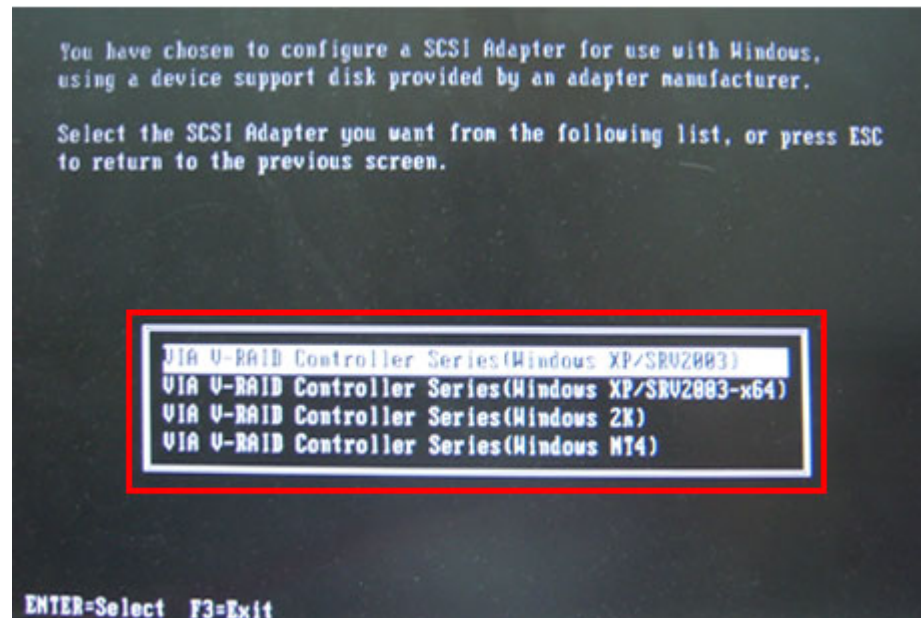


Step 5: When the following window appears, press <S> to select "Specify Additional Device".



ECW-281B/281B2-R30/N270 Embedded System

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

B.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

C

BIOS Menu Options

C.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

System Overview	61
System Time [xx:xx:xx]	62
System Date [xx/xx/xx]	62
ATA/IDE Configuration [Compatible]	64
Legacy IDE Channels [SATA Pri, PATA Sec]	64
IDE Master and IDE Slave	65
Auto-Detected Drive Parameters	66
Type [Auto]	66
LBA/Large Mode [Auto]	67
Block (Multi Sector Transfer) [Auto]	67
PIO Mode [Auto]	68
DMA Mode [Auto]	68
S.M.A.R.T [Auto]	69
32Bit Data Transfer [Enabled]	69
Serial Port1 Address [3F8/IRQ4]	70
Serial Port2 Address [2F8/IRQ3]	71
Serial Port3 Address [3E8]	71
Serial Port3 IRQ [11]	71
Serial Port4 Address [2E8]	71
Serial Port4 IRQ [11]	72
Serial Port5 Address [2F0]	72
Serial Port5 IRQ [11]	72
Serial Port6 Address [2E0]	72
Serial Port6 IRQ [11]	73
CPU FAN Mode Setting [Full On Mode]	74
CPU Temperature Limit of Off [000]	74
CPU Temperature Limit of On [020]	75
CPU Fan Start PWM [070]	75
Slope PWM [0.5 PWM]	75
Select AT/ATX Power [By HARDWARE]	77
Suspend mode [S1 (POS)]	78

Restore on AC Power Loss [Last State]	79
Power Button Mode [On/Off].....	79
Resume on Keyboard/Mouse [Disabled]	80
Resume on Ring [Disabled]	80
Resume on PCI-Express WAKE# [Enabled].....	80
Resume On RTC Alarm [Disabled].....	80
Remote Access [Disabled].....	81
Serial Port Number [COM1].....	82
Base Address, IRQ [3F8h,4].....	82
Serial Port Mode [115200 8,n,1].....	82
Redirection After BIOS POST [Always]	83
Terminal Type [ANSI].....	83
USB Function [Enabled].....	84
USB 2.0 Controller [Enabled].....	84
Legacy USB Support [Enabled].....	84
USB 2.0 Controller Mode [HiSpeed].....	85
IRQ# [Available].....	86
DMA Channel# [Available]	87
Reserved Memory Size [Disabled]	87
Quick Boot [Enabled]	89
Quiet Boot [Enabled]	89
AddOn ROM Display Mode [Force BIOS]	89
Bootup Num-Lock [On]	89
Boot From LAN Support [Disabled]	90
Spread Spectrum Function [Disabled]	90
Change Supervisor Password	91
Change User Password.....	92
Memory Hole [Disabled].....	93
Internal Graphics Mode Select [Enabled, 8MB]	93
DVMT Mode Select [DVMT Mode].....	94
DVMT/FIXED Memory [Maximum DVMT]	94
Boot Display Device [Auto].....	94
LVDS1 Panel Type [by H/W].....	95
Audio Controller [Enabled]	95
Save Changes and Exit	96

ECW-281B/281B2-R30/N270 Embedded System

Discard Changes and Exit.....	96
Discard Changes.....	96
Load Optimal Defaults.....	97
Load Failsafe Defaults.....	97

Appendix

D

Watchdog Timer



NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.



NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```

; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

    MOV     AX, 6F02H      ;setting the time-out value
    MOV     BL, 30        ;time-out value is 48 seconds
    INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

    CMP     EXIT_AP, 1    ;is the application over?
    JNE     W_LOOP       ;No, restart the application

    MOV     AX, 6F02H     ;disable Watchdog Timer
    MOV     BL, 0        ;
    INT     15H

;
; EXIT ;

```