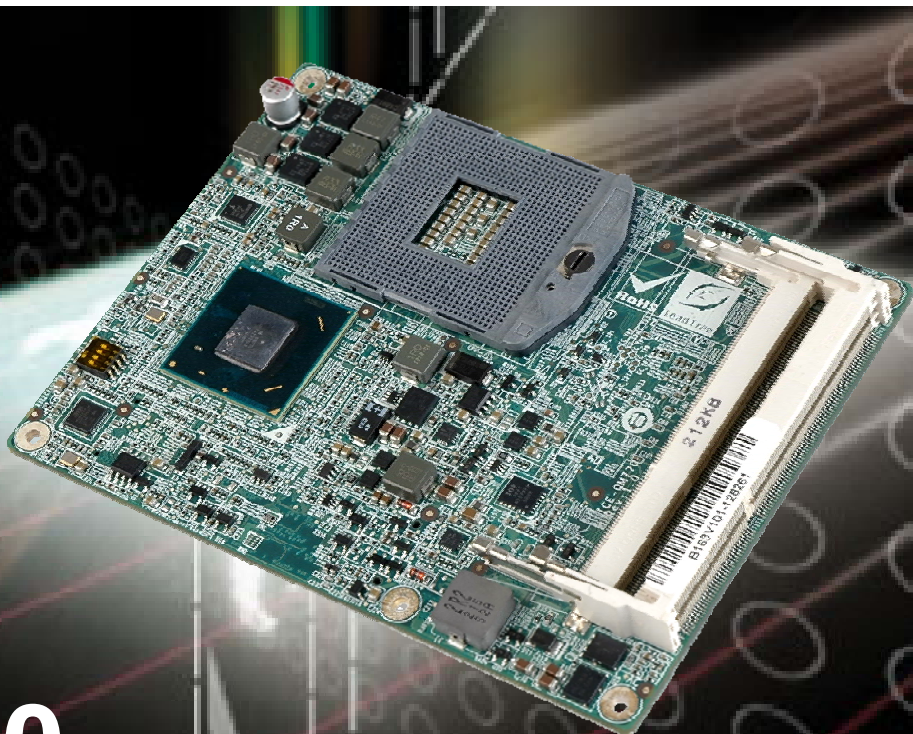




IEI Technology Corp.



**MODEL:
ICE-QM770**

**COM Express R2.0 Module (Type 6),
Socket G2 Supports 2nd and 3rd Generation Intel® Core™
i7/i5/i3, Pentium® and Celeron® Processors, DDR3 and RoHS**

User Manual

Rev. 1.01 – 17 April, 2013



Revision

Date	Version	Changes
17 April, 2013	1.01	Updated Section 4.6: Mounting the ICE-QM770 to an Optional Baseboard
11 January, 2013	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction



Figure 1-1: ICE-QM770

The ICE-QM770 COM Express module provides the main processing chips and is connected to a compatible COM Express baseboard. The ICE-QM770 is equipped with the Intel® QM77 Express Chipset and Socket G2 that supports 2nd and 3rd generation Intel® Core™ i7/i5/i3, Pentium® and Celeron® processors. The COM Express standard allows the COM Express baseboard to be designed, while leaving the choice of processor till the later stages of design. The ICE-QM770 provides a low power option with the full range of modern I/O options. The ICE-QM770 embedded module is designed for flexible integration by system developers into customized platform devices.

1.2 Features

Some of the ICE-QM770 COM Express module features are listed below:

- Complies with COM Express form factor
- Socket G2 supports 2nd and 3rd generation Intel® Core™ i7/i5/i3, Pentium® and Celeron® processors
- Intel® QM77 Express Chipset
- Supports DDR3/DDR3L (1.35V) SO-DIMM
- Supports 18-/24-bit dual-channel LVDS, analog CRT (VGA) and HDTV
- Supports USB 3.0, SATA 6Gb/s and GbE
- RoHS compliant

ICE-QM770 COM Express Module

1.3 Connectors

The connectors on the ICE-QM770 are shown in the figures below.

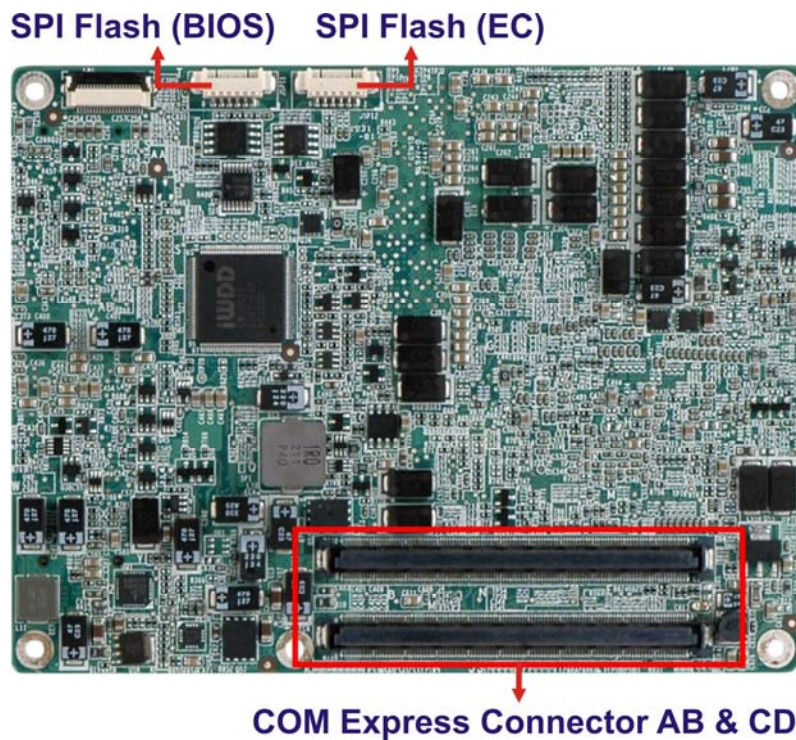
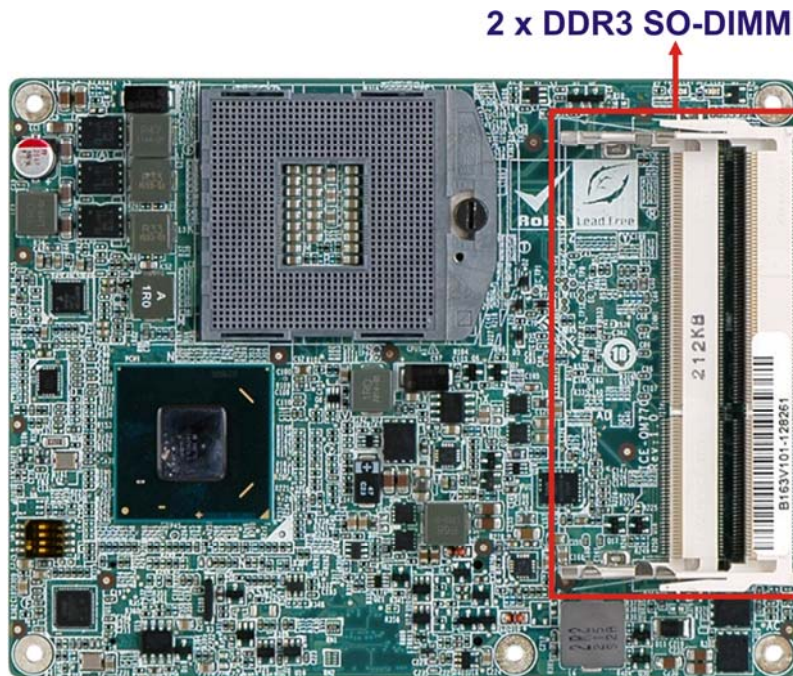


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the ICE-QM770 are shown in the diagram below.

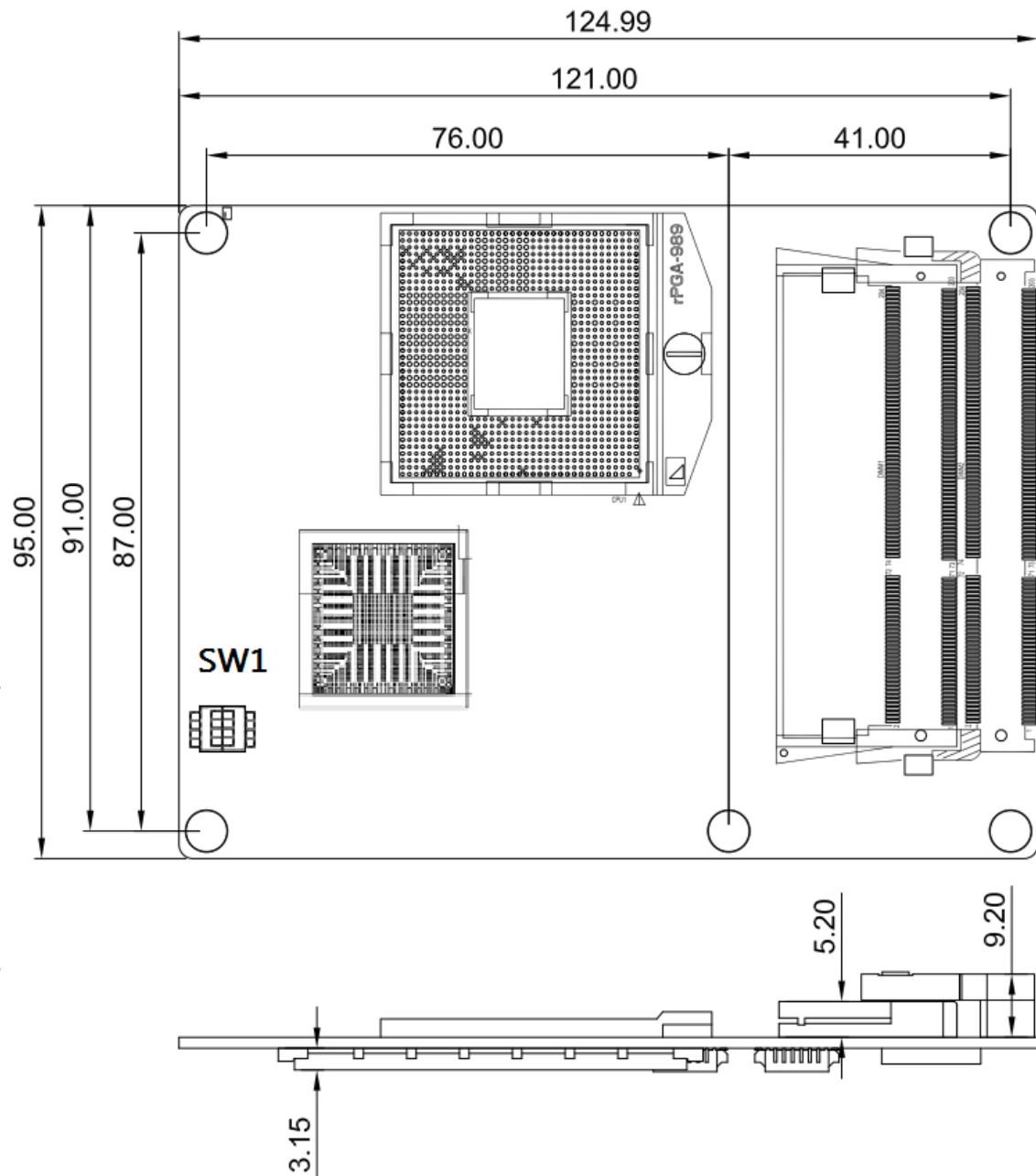


Figure 1-3: ICE-QM770 Dimensions (mm)

ICE-QM770 COM Express Module

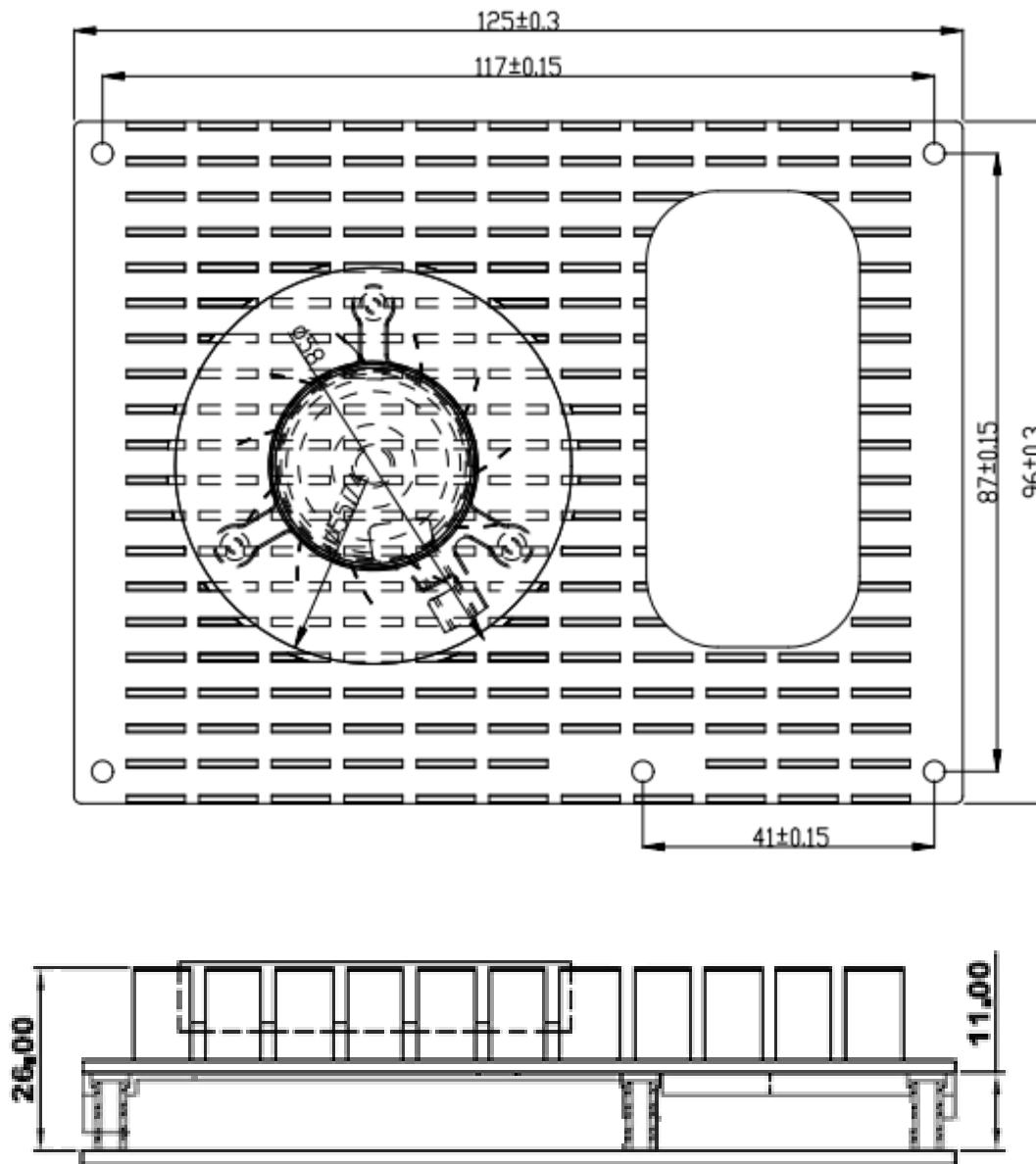


Figure 1-4: ICE-QM770 with Heatspreader Plate and Cooler Kit Dimensions (mm)

1.5 Data Flow

Figure 1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

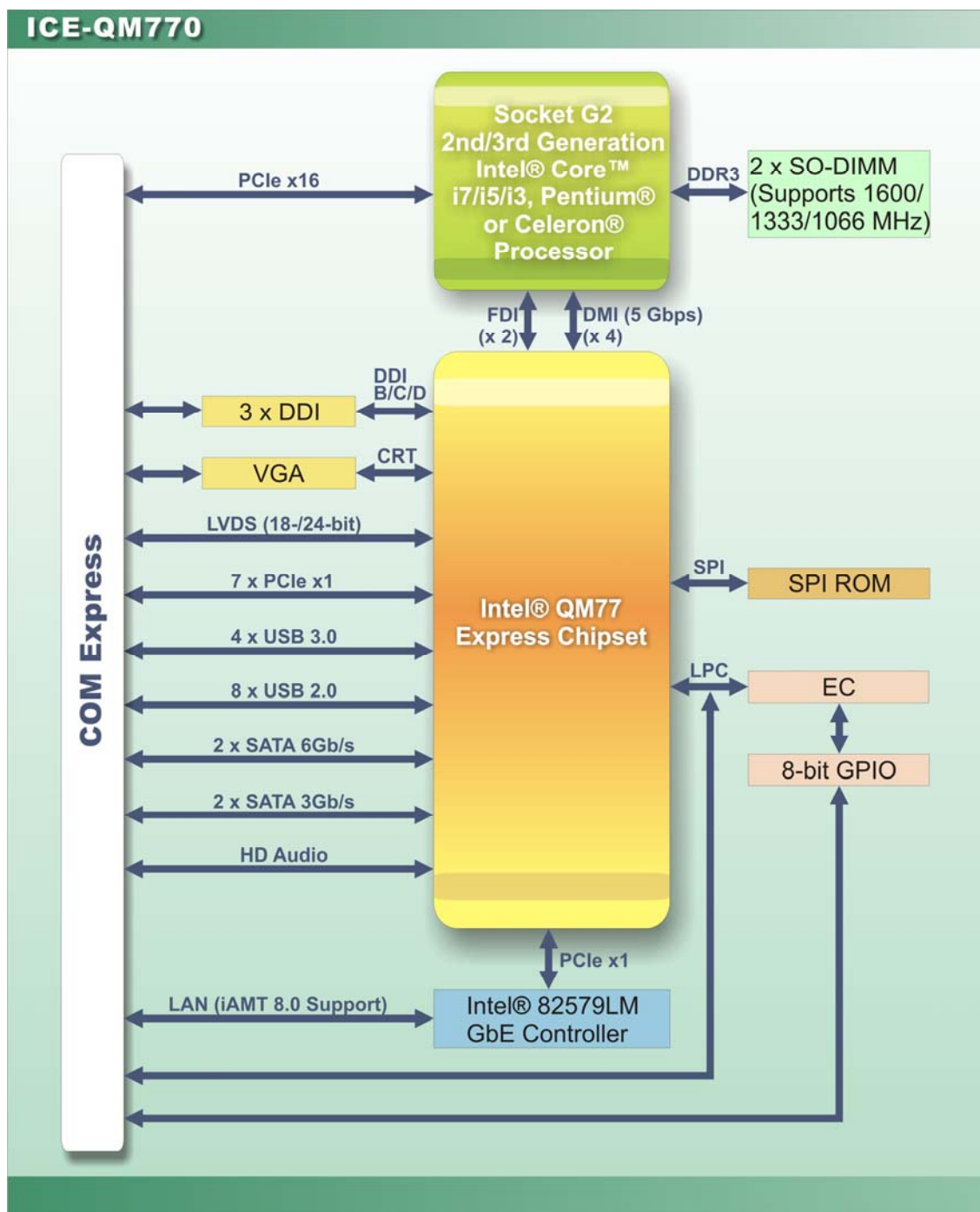


Figure 1-5: Data Flow Diagram

ICE-QM770 COM Express Module

1.6 Technical Specifications

The ICE-QM770 technical specifications are listed below.

Specifications/Model	ICE-QM770
Form Factor	PICMG COM Express R2.0 Type 6 for basic size (95 mm x 125 mm)
CPU Socket	Socket G2
CPU Supported	2nd and 3rd generation Intel® Core™ i7/i5/i3, Pentium® and Celeron® processors
Express Chipset	Intel® QM77
Memory	Two 204-pin 1600/1333/1066 MHz dual-channel DDR3/DDR3L (1.35V) SO-DIMMs supported (system max. 16 GB)
Graphics Engine	Intel® HD Graphics 2000/3000 Supports DirectX 11 OCL 1.1 and OpenGL 3.0 Full MPEG2, VC-1 and AVC decoding
Ethernet	Intel® 82579LM Supports Intel® AMT 8.0
BIOS	UEFI BIOS
Embedded Controller	iWDD
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Display (Signal to Baseboard)	One VGA (up to 2048 x 1536 @ 75Hz) is integrated in the Intel® QM77 One 18-/24-bit dual-channel LVDS (up to 1920 x 1200 @ 60Hz) Three DDI (up to 2560 x 1600 @ 60Hz)
Expansions (Signal to Baseboard)	One PCIe x16 Seven PCIe x1

Specifications/Model	ICE-QM770
I/O Interfaces (Signal to Baseboard)	Four USB 3.0 Eight USB 2.0 Two SATA 6Gb/s Two SATA 3Gb/s Two RS-232 HD Audio 8-bit GPIO SMBus I2C LPC TPM SPI
Power Consumption	+12V @ 1.75 A , Vcore_12V @ 3.33A (2.30 GHz Intel® Core™ i7-3610QE CPU with two 8 GB 1600 MHz DDR3 SO-DIMMs)
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 70°C
Humidity (Operating)	5% ~ 95% (non-condensing)
Dimensions	125 mm x 95 mm
Weight (GW/NW)	700 g/250 g

Table 1-1: ICE-QM770 Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband:*** Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding:*** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad:*** When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB:*** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the ICE-QM770 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

ICE-QM770 COM Express Module



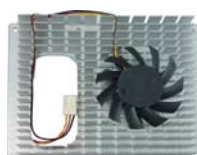

2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the ICE-QM770 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The ICE-QM770 is shipped with the following components:

Quantity	Item and Part Number	Image
1	ICE-QM770	
1	Heatspreader plate (P/N: 34000-000490-RS)	
1	Cooling kit (P/N: 19100-000168-00-RS)	
1	One Key Recovery CD	



Quantity	Item and Part Number	Image
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:


Item and Part Number	Image
Baseboard for COM Express Type 6 modules (P/N: ICE-DB-T6-R10)	

Table 2-2: Optional Items

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the connectors.

3.1.1 ICE-QM770 Layout

The figure below shows all the connectors.

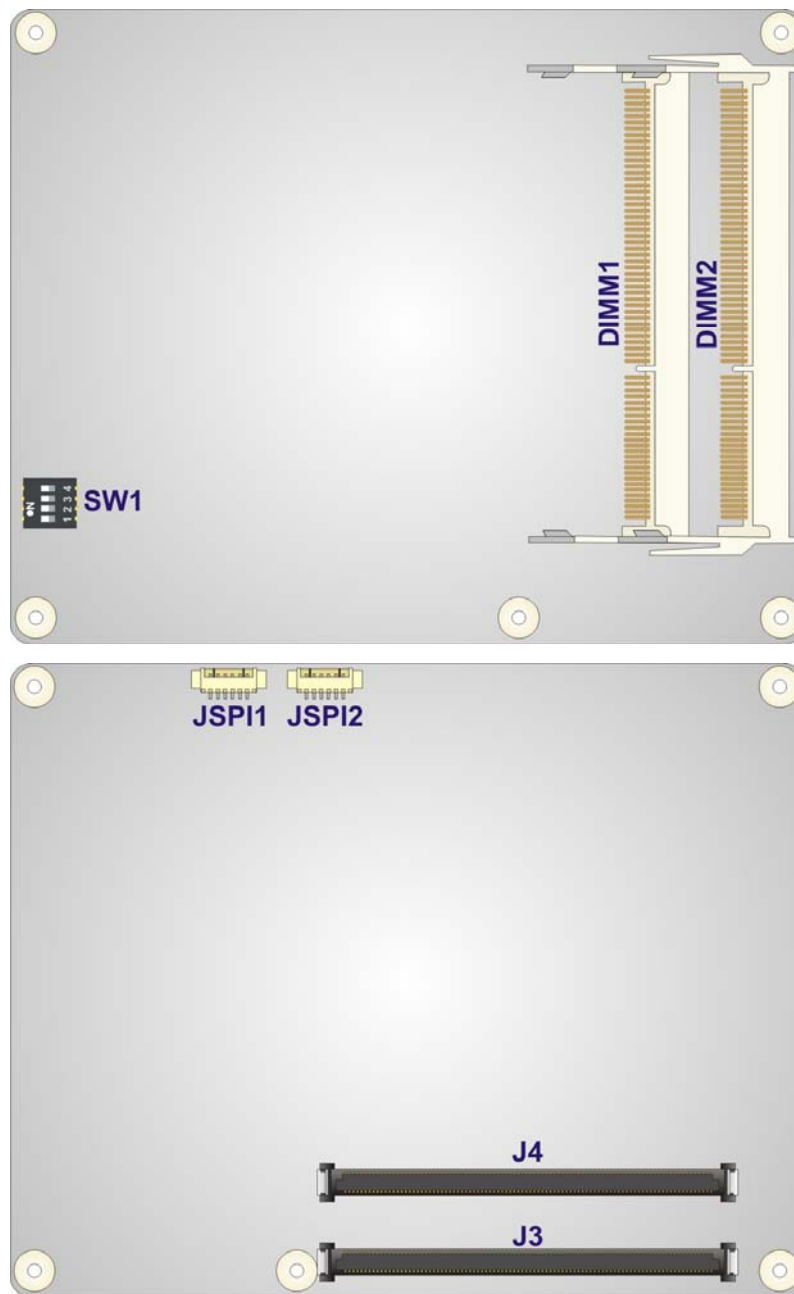


Figure 3-1: Connectors

ICE-QM770 COM Express Module

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the ICE-QM770.

Connector	Type	Label
COM Express connector AB	COM Express connector	J3
COM Express connector CD	COM Express connector	J4
SO-DIMM connectors	SO-DIMM connector	DIMM1, DIMM2
SPI Flash (BIOS)	6-pin connector	JSPI1
SPI Flash (EC)	6-pin connector	JSPI2

Table 3-1: Peripheral Interface Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the ICE-QM770.

3.2.1 COM Express Connector AB

- CN Label:** J3
- CN Type:** 220-pin COM Express connector
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-2**

The standard COM Express connector AB location and pinouts are shown below.

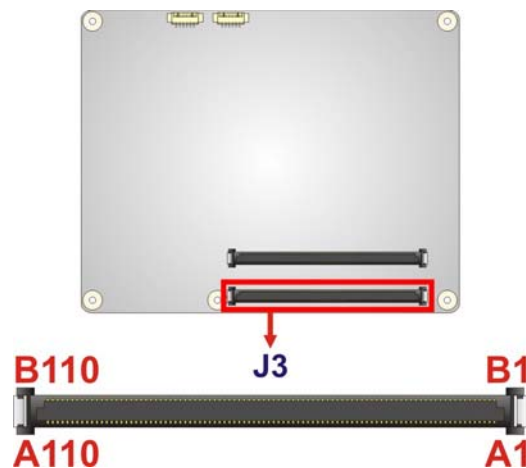


Figure 3-2: COM Express Connector AB Location

Pin No.	Description	Pin No.	Description
A1	GND0	B1	GND15
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	LPC_DRQ0#
A9	GBE0_MDI1-	B9	LPC_DRQ1#
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND1	B11	GND16
A12	GBE0_MDIO-	B12	PWRBTN#
A13	GBE0_MDIO+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND2	B21	GND17
A22	SATA2_TX+	B22	SATA3_TX+
A23	SATA2_TX-	B23	SATA3_TX-
A24	SUS_S5#	B24	PWR_OK
A25	SATA2_RX+	B25	SATA3_RX+
A26	SATA2_RX-	B26	SATA3_RX-
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	AC/HD_SDIN2
A29	AC/HD_SYNC	B29	AC/HD_SDIN1
A30	AC/HD_RST#	B30	AC/HD_SDINO
A31	GND3	B31	GND18
A32	AC/HD_BITCLK	B32	SPKR

ICE-QM770 COM Express Module

Pin No.	Description	Pin No.	Description
A33	AC/HD_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND4	B41	GND19
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	EXCD1_PERST#
A48	EXCD0_PERST#	B48	EXCD1_CPPE#
A49	EXCD0_CPPE#	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND5	B51	GND20
A52	PCIE_TX5+	B52	PCIE_RX5+
A53	PCIE_TX5-	B53	PCIE_RX5-
A54	GPIO	B54	GPO1
A55	PCIE_TX4+	B55	PCIE_RX4+
A56	PCIE_TX4-	B56	PCIE_RX4-
A57	GND6	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND7	B60	GND21
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+

Pin No.	Description	Pin No.	Description
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND8	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND9	B70	GND22
A71	LVDS_A0+	B71	LVDS_B0+
A72	LVDS_A0-	B72	LVDS_B0-
A73	LVDS_A1+	B73	LVDS_B1+
A74	LVDS_A1-	B74	LVDS_B1-
A75	LVDS_A2+	B75	LVDS_B2+
A76	LVDS_A2-	B76	LVDS_B2-
A77	LVDS_VDD_EN	B77	LVDS_B3+
A78	LVDS_A3+	B78	LVDS_B3-
A79	LVDS_A3-	B79	LVDS_BKLT_EN
A80	GND10	B80	GND23
A81	LVDS_A_CK+	B81	LVDS_B_CK+
A82	LVDS_A_CK-	B82	LVDS_B_CK-
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	VCC5SBY1
A85	GPI3	B85	VCC5SBY2
A86	RSVD	B86	VCC5SBY3
A87	RSVD	B87	VCC5SBY4
A88	PCIE0_CK_REF+	B88	BIOS_DIS1#
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND11	B90	GND24
A91	SPI_VCC	B91	VGA_GRN
A92	SPI_MISO	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	SPI_CLK	B94	VGA_VSYNC
A95	SPI_MOSI	B95	VGA_I2C_CK
A96	PP_TPM	B96	VGA_I2C_DAT

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Pin No.	Description	Pin No.	Description
A97	RSVD	B97	SPI_CS#
A98	RS1_TX	B98	RSVD
A99	RS1_RX	B99	RSVD
A100	GND13	B100	GND25
A101	RS2_TX	B101	FAN_PWMOUT
A102	RS2_RX	B102	FAN_TACHIN
A103	LID#	B103	SLEEP#
A104	VCC_12V7	B104	VCC_12V16
A105	VCC_12V8	B105	VCC_12V17
A106	VCC_12V9	B106	VCC_12V18
A107	VCC_12V10	B107	VCC_12V19
A108	VCC_12V11	B108	VCC_12V20
A109	VCC_12V12	B109	VCC_12V21
A110	GND14	B110	GND26

Table 3-2: COM Express Connector AB Pin Definitions

3.2.2 COM Express Connector CD

- CN Label:** J4
- CN Type:** 220-pin COM Express connector
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-3**

The standard COM Express connector CD location and pinouts are shown below.

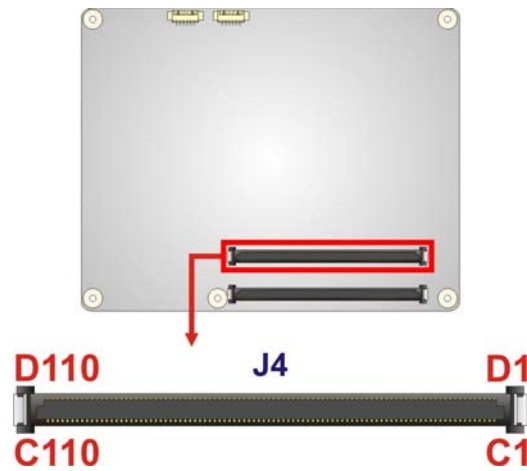


Figure 3-3: COM Express Connector CD Location

Pin No.	Description	Pin No.	Description
C1	GND0	D1	GND15
C2	GND	D2	GND
C3	USB_SSRX0-	D3	USB_SSTX0-
C4	USB_SSRX0+	D4	USB_SSTX0+
C5	GND	D5	GND
C6	USB_SSRX1-	D6	USB_SSTX1-
C7	USB_SSRX1+	D7	USB_SSTX1+
C8	GND	D8	GND
C9	USB_SSRX2-	D9	USB_SSTX2-
C10	USB_SSRX2+	D10	USB_SSTX2+
C11	GND1	D11	GND16
C12	USB_SSRX3-	D12	USB_SSTX3-
C13	USB_SSRX3+	D13	USB_SSTX3+
C14	GND	D14	GND
C15	DDI1_PARI6+	D15	DDI1_AUX+
C16	DDI1_PARI6-	D16	DDI1_AUX-
C17	RSVD	D17	RSVD
C18	RSVD	D18	RSVD
C19	PCIE_RX6+	D19	PCIE_TX6+
C20	PCIE_RX6-	D20	PCIE_TX6-
C21	GND2	D21	GND17

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Pin No.	Description	Pin No.	Description
C22	RSVD	D22	RSVD
C23	RSVD	D23	RSVD
C24	DDI1_HPD	D24	RSVD
C25	DDI1_PAIR4+	D25	RSVD
C26	DDI1_PAIR4-	D26	DDI1_PAIR0+
C27	RSVD	D27	DDI1_PAIR0-
C28	RSVD	D28	RSVD
C29	DDI1_PAIR5+	D29	DDI1_PAIR1+
C30	DDI1_PAIR5-	D30	DDI1_PAIR1-
C31	GND3	D31	GND18
C32	DDI2_AUX+	D32	DDI1_PAIR2+
C33	DDI2_AUX-	D33	DDI1_PAIR2-
C34	DDI2_CTRLCLK	D34	DDI2_CTRLDATA
C35	RSVD	D35	RSVD
C36	DDI3_AUX+	D36	DDI1_PAIR3+
C37	DDI3_AUX-	D37	DDI1_PAIR3-
C38	DDI3_CTRLCLK	D38	DDI3_CTRLDATA
C39	DDI3_PAIR0+	D39	DDI2_PAIR0+
C40	DDI3_PAIR0-	D40	DDI2_PAIR0-
C41	GND4	D41	GND19
C42	DDI3_PAIR1+	D42	DDI2_PAIR1+
C43	DDI3_PAIR1-	D43	DDI2_PAIR1-
C44	DDI3_HPD	D44	DDI2_HPD
C45	RSVD	D45	RSVD
C46	DDI3_PAIR2+	D46	DDI2_PAIR2+
C47	DDI3_PAIR2-	D47	DDI2_PAIR2-
C48	RSVD	D48	RSVD
C49	DDI3_PAIR3+	D49	DDI2_PAIR3+
C50	DDI3_PAIR3-	D50	DDI2_PAIR3-
C51	GND5	D51	GND20
C52	PEG_RX0+	D52	PEG_TX0+
C53	PEG_RX0-	D53	PEG_TX0-

Pin No.	Description	Pin No.	Description
C54	RSVD	D54	PEG_LANE_RV#
C55	PEG_RX1+	D55	PEG_TX1+
C56	PEG_RX1-	D56	PEG_TX1-
C57	RSVD	D57	TYPE2#
C58	PEG_RX2+	D58	PEG_TX2+
C59	PEG_RX2-	D59	PEG_TX2-
C60	GND7	D60	GND21
C61	PEG_RX3+	D61	PEG_TX3+
C62	PEG_RX3-	D62	PEG_TX3-
C63	RSVD1	D63	RSVD10
C64	RSVD2	D64	RSVD9
C65	PEG_RX4+	D65	PEG_TX4+
C66	PEG_RX4-	D66	PEG_TX4-
C67	RSVD3	D67	GND28
C68	PEG_RX5+	D68	PEG_TX5+
C69	PEG_RX5-	D69	PEG_TX5-
C70	GND9	D70	GND22
C71	PEG_RX6+	D71	PEG_TX6+
C72	PEG_RX6-	D72	PEG_TX6-
C73	DDI1_CTRLDATA	D73	DDI1_CTRLCLK
C74	PEG_RX7+	D74	PEG_TX7+
C75	PEG_RX7-	D75	PEG_TX7-
C76	GND8	D76	GND29
C77	RSVD4	D77	RSVD
C78	PEG_RX8+	D78	PEG_TX8+
C79	PEG_RX8-	D79	PEG_TX8-
C80	GND10	D80	GND23
C81	PEG_RX9+	D81	PEG_TX9+
C82	PEG_RX9-	D82	PEG_TX9-
C83	RSVD5	D83	RSVD8
C84	GND6	D84	GND30
C85	PEG_RX10+	D85	PEG_TX10+

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Pin No.	Description	Pin No.	Description
C86	PEG_RX10-	D86	PEG_TX10-
C87	GND35	D87	GND31
C88	PEG_RX11+	D88	PEG_TX11+
C89	PEG_RX11-	D89	PEG_TX11-
C90	GND27	D90	GND24
C91	PEG_RX12+	D91	PEG_TX12+
C92	PEG_RX12-	D92	PEG_TX12-
C93	GND11	D93	GND32
C94	PEG_RX13+	D94	PEG_TX13+
C95	PEG_RX13-	D95	PEG_TX13-
C96	GND12	D96	GND33
C97	RSVD6	D97	PEG_ENABLE#
C98	PEG_RX14+	D98	PEG_TX14+
C99	PEG_RX14-	D99	PEG_TX14-
C100	GND13	D100	GND25
C101	PEG_RX15+	D101	PEG_TX15+
C102	PEG_RX15-	D102	PEG_TX15-
C103	GND	D103	GND34
C104	VCC_12V1	D104	VCC_12V7
C105	VCC_12V2	D105	VCC_12V8
C106	VCC_12V3	D106	VCC_12V9
C107	VCC_12V4	D107	VCC_12V10
C108	VCC_12V5	D108	VCC_12V11
C109	VCC_12V6	D109	VCC_12V12
C110	GND14	D110	GND26

Table 3-3: COM Express Connector CD Pin Definitions

3.2.3 SO-DIMM Connectors

CN Label:	DIMM1, DIMM2
CN Type:	204-pin DDR3 SO-DIMM connector
CN Location:	See Figure 3-4

The SO-DIMM connectors are for installing memory on the system.

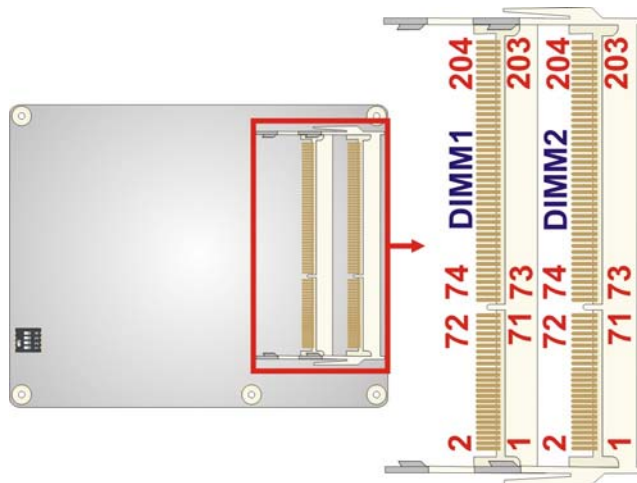


Figure 3-4: SO-DIMM Connector Locations

3.2.4 SPI Flash Connector (BIOS)

CN Label:	JSPI1
CN Type:	6-pin connector
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-5

The SPI Flash connector is for flashing new BIOS onto the SPI BIOS chip.

ICE-QM770 COM Express Module

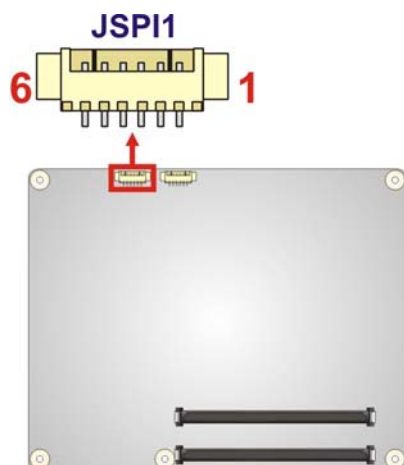


Figure 3-5: SPI Flash Connector (BIOS) Location

Pin	Description
1	+V3.3M_SPI_CON
2	SPI_CS
3	SPI_SO_SW
4	SPI_CLK_SW
5	SPI_SI_SW
6	GND

Table 3-4: SPI Flash Connector (BIOS) Pinouts

3.2.5 SPI Flash Connector (EC)

CN Label:	JSPI2
CN Type:	6-pin connector
CN Location:	See Figure 3-6
CN Pinouts:	See Table 3-5

The SPI Flash connector is for flashing new BIOS onto the embedded controller.

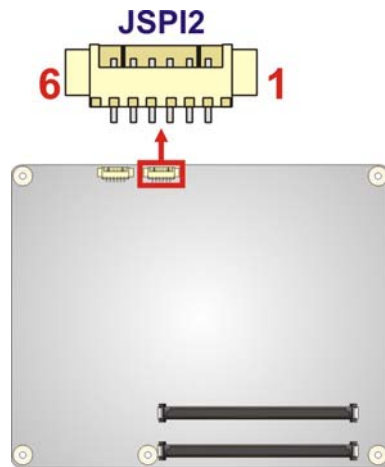


Figure 3-6: SPI Flash Connector (EC) Location

Pin	Description
1	+V3.3M_SPI_CON_EC
2	SPI_CS#0_CN_EC
3	SPI_SO_SW_EC
4	SPI_CLK_SW_EC
5	SPI_SI_SW_EC
6	GND

Table 3-5: SPI Flash Connector (EC) Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the ICE-QM770 may result in permanent damage to the ICE-QM770 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ICE-QM770. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ICE-QM770 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the ICE-QM770, place it on an anti-static pad. This reduces the possibility of ESD damaging the ICE-QM770.
- ***Only handle the edges of the PCB:-*** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

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WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the ICE-QM770 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the ICE-QM770 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the ICE-QM770 off:
 - When working with the ICE-QM770, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the ICE-QM770 **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Socket G2 CPU Installation

**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU, please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket G2 CPU onto the ICE-QM770, follow the steps below:

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: Unlock the CPU retention screw. When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 4-1**.

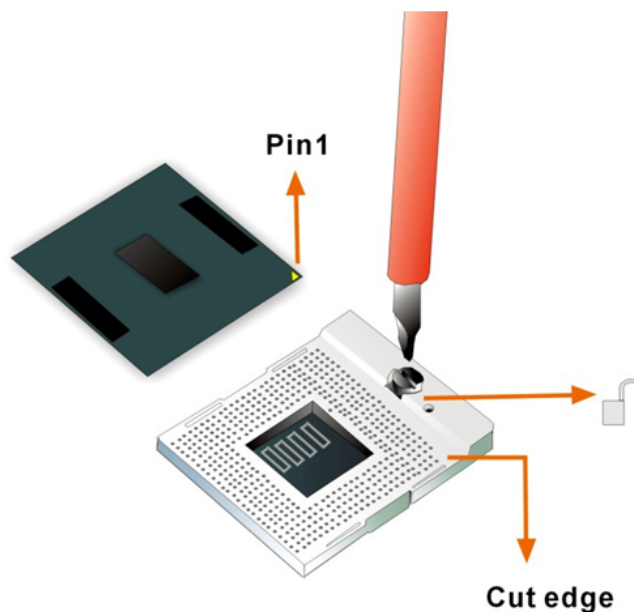


Figure 4-1: Unlock CPU socket retention screw

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- Step 2: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 3: Correctly Orientate the CPU.** Make sure the IHS (integrated heat sink) side is facing upwards.
- Step 4: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 4-1**.
- Step 5: Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.
- Step 6: Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.
- Step 7: Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 4-2**.

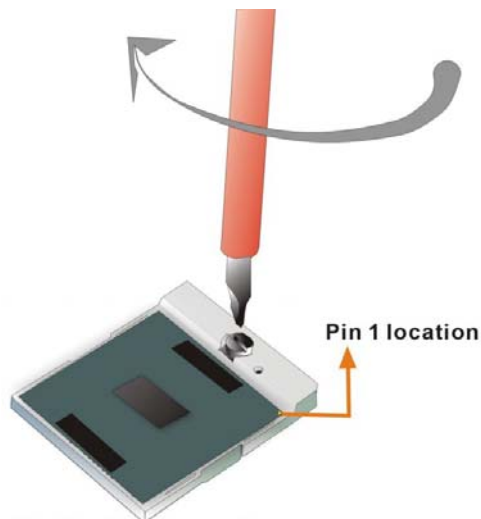


Figure 4-2: Lock the CPU Socket Retention Screw

4.4 SO-DIMM Installation



WARNING:

Using incorrectly specified SO-DIMM may cause permanent damage to the ICE-QM770. Please make sure the purchased SO-DIMM complies with the memory specifications of the ICE-QM770. SO-DIMM specifications compliant with the ICE-QM770 are listed in Chapter 1.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 4-3**.

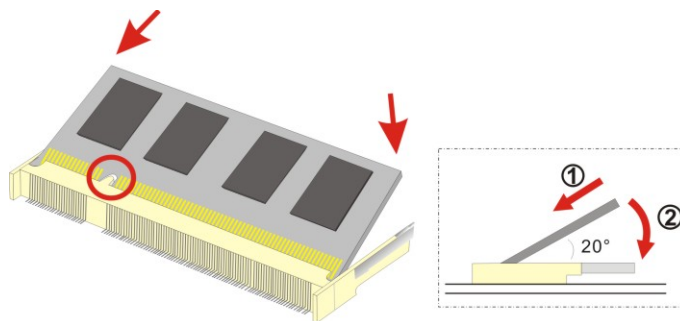


Figure 4-3: SO-DIMM Installation

- Step 1:** **Locate the SO-DIMM socket.** Place the ICE-QM770 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the 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.
- Step 3:** **Insert the SO-DIMM.** Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-3**)
- Step 4:** **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 4-3**)
- Step 5:** **Secure the SO-DIMM.** Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

4.5 Jumper Settings

4.5.1 LVDS Panel Type Selection

Jumper Label: SW1
Jumper Type: DIP switch
Jumper Settings: See **Table 4-1**
Jumper Location: See **Figure 4-4**

This switch sets the resolution of the panel attached to the LVDS output.

The pin order listed in the first column of **Table 4-1** is: 4 → 3 → 2 → 1. (ON=0, OFF=1)

SW1	EDID Resolution	Color Depth	Channel
1111	640X480	18-bit	Single
1110	800X480	18-bit	Single
1101	800X600	18-bit	Single
1100	1024X768	18-bit	Single
1011	1024X768	24-bit	Single
1010	1280X1024	24-bit	Dual
1001	1600X1200	24-bit	Dual
1000	1280X768	18-bit	Single
0111	1280X800	18-bit	Single
0110	1366X768	24-bit	Single
0101	1440X900	24-bit	Dual
0100	1600X900	24-bit	Dual
0011	1680X1050	24-bit	Dual
0010	1920X1080	24-bit	Dual
0001	1920X1200	24-bit	Dual
0000	LVDS disable		

Table 4-1: LVDS Panel Type Selection

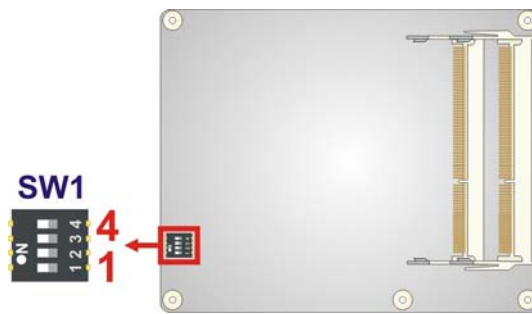


Figure 4-4: LVDS Panel Type Selection Switch Location

4.6 Mounting the ICE-QM770 to an Optional Baseboard



NOTE:

Baseboard can be designed by the end user, customized by IEI, or purchased from IEI. For more information visit the IEI website (www.ieiworld.com) or contact an IEI sales representative.



WARNING:

Never run the COM Express module without the cooling kit. The heatspreader plate shipped with the ICE-QM770 acts as a thermal interface between the module and the cooling kit. The cooling kit must be installed on the heatspreader plate to maintain proper operating temperatures. Make sure to maintain the heatspreader plate temperature under 60°C in operation.

Follow the steps below to install the ICE-QM770 to the optional baseboard.

- Step 1:** Align the two COM Express connectors on the reverse side of ICE-QM770 with the corresponding connectors on the baseboard. Gently push the COM Express module down to ensure the connectors are properly connected (**Figure 4-5**).

ICE-QM770 COM Express Module

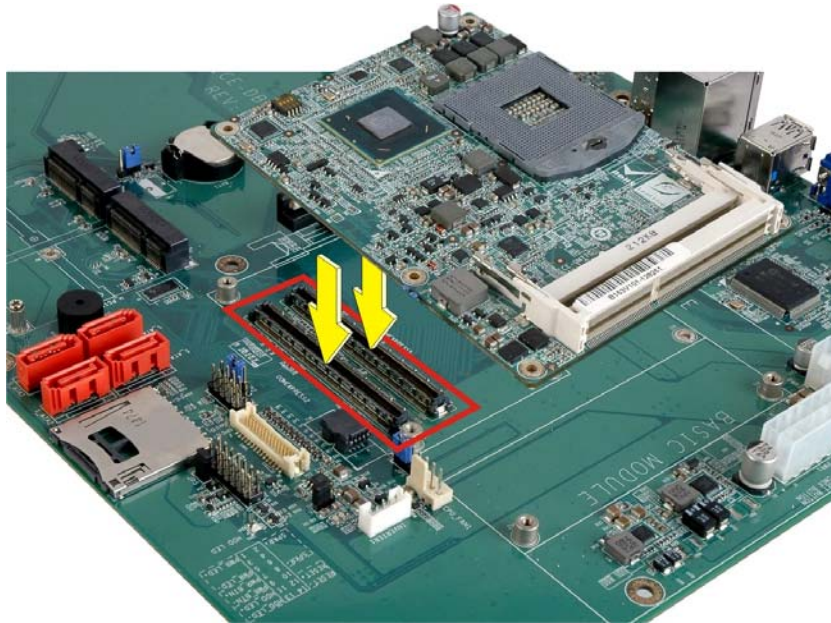


Figure 4-5: Connect the COM Express Connectors

Step 2: Place the supplied cooling kit on the heatspreader plate, aligning the retention screw holes (**Figure 4-6**). Ensure to apply thermal paste to the heat sink or heatspreader plate for optimum heat dissipation.

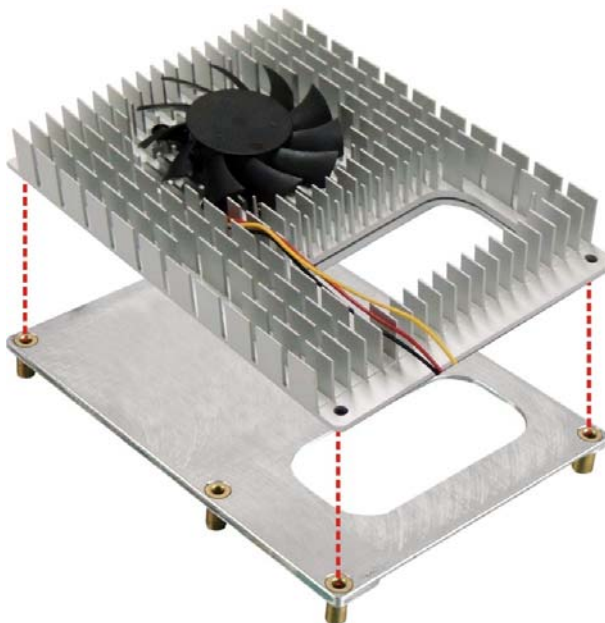


Figure 4-6: Attach the Cooling Kit to the Heatspreader Plate

- Step 3:** Place the heatspreader plate with the cooling kit on the ICE-QM770, aligning the retention screw holes (**Figure 4-7**).
- Step 4:** Secure the heatspreader plate with the cooling kit onto the baseboard with the supplied retention screws (**Figure 4-7**).

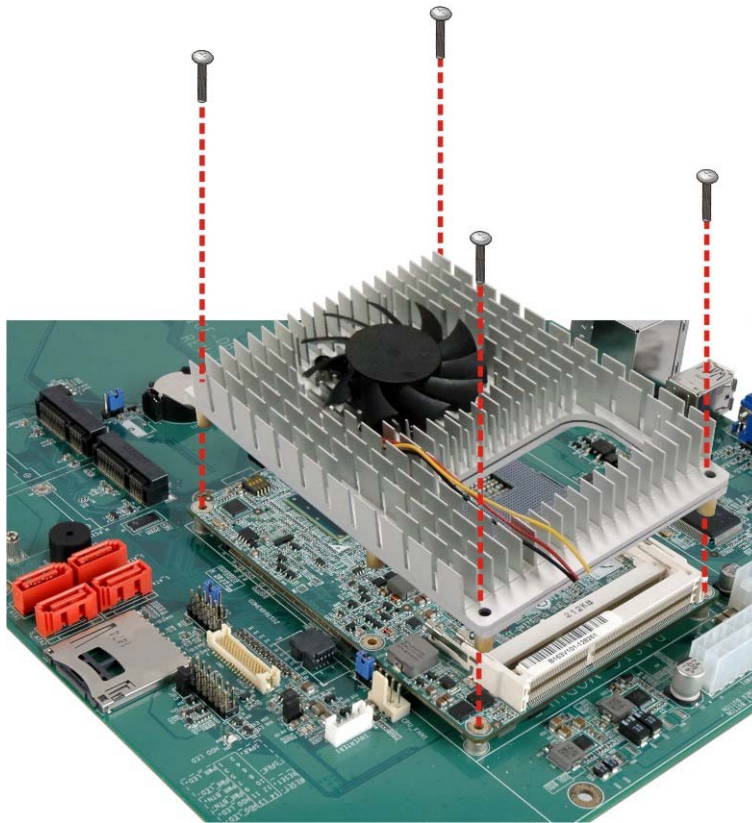


Figure 4-7: Secure the Heatspreader Plate with the Cooling Kit to the Baseboard

- Step 5:** Connect the cooling kit fan cable to the CPU fan connector on the baseboard (**Figure 4-8**).

ICE-QM770 COM Express Module

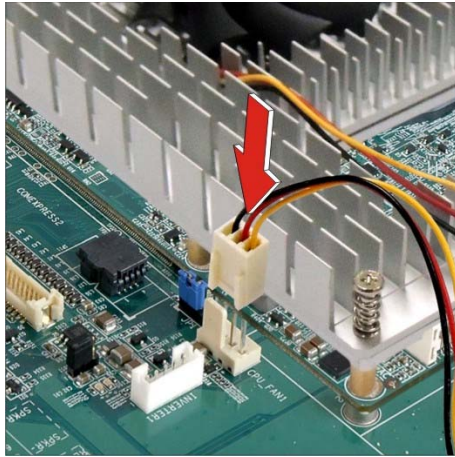


Figure 4-8: Connect to the CPU Fan Connector on the Baseboard

Chapter

5

BIOS

5.1 Introduction

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

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

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

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

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

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the jumper described in **Chapter 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.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings.

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

5.2 Main

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

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

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information			Set the Date. Use Tab to switch between Date elements.		
BIOS Vendor			American Megatrends		
Core Version			4.6.5.3.0.18		
Compliance			UEFI 2.3; PI 1.2		
Project Version			B163AR10.ROM		
Build Date and Time			11/20/2012 11:53:40		
iWDD Vendor			ICP		
iWDD Version			B163ER10.bin		
Processor Information					
Name			IvyBridge		
Brand String			Intel(R) Core(TM) i5-		
Frequency			2700 MHz		
Processor ID			306a9		
Stepping			E1		
Number of Processors			2Core(s) / 4Thread(s)		
Microcode Revision			15		
GT Info			GT2 (950 MHz)		
IGFX VBIOS Version			2137		
Memory RC Version			1.7.0.0		
Total Memory			4096 MB (DDR3)		
Memory Frequency			1600 MHz		
PCH Information					
Name			PantherPoint		
Stepping			04/C1		
TXT Capability of Platform/PCH			Supported		
LAN PHY Revision			C0		
ME FW Version			8.0.13.1502		
ME Firmware SKU			5MB		
SPI Clock Frequency					
DOFR Support			Supported		
Read Status Clock Frequency			33 MHz		
Write Status Clock Frequency			33 MHz		
Fast Read Status Clock Frequency			33 MHz		
System Date			[Tue 12/25/2012]		
System Time			[15:10:27]		
Access Level			Administrator		

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

BIOS Menu 1: Main

→ System Overview

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

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

The System Overview field also has two user configurable fields:

→ System Date [xx/xx/xx]

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

→ System Time [xx:xx:xx]

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

5.3 Advanced

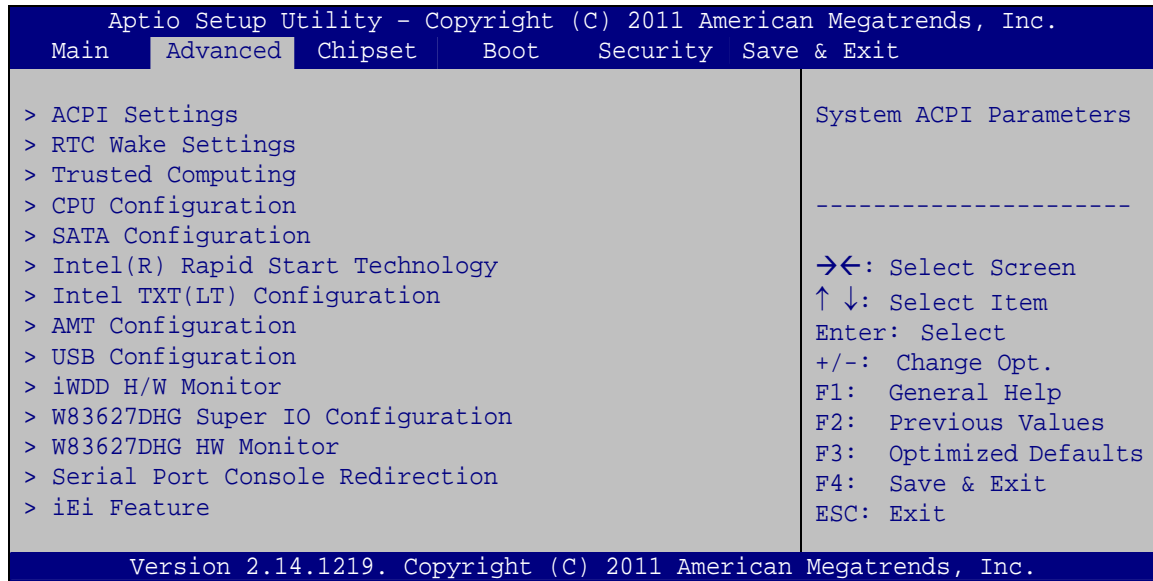
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:



WARNING:

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

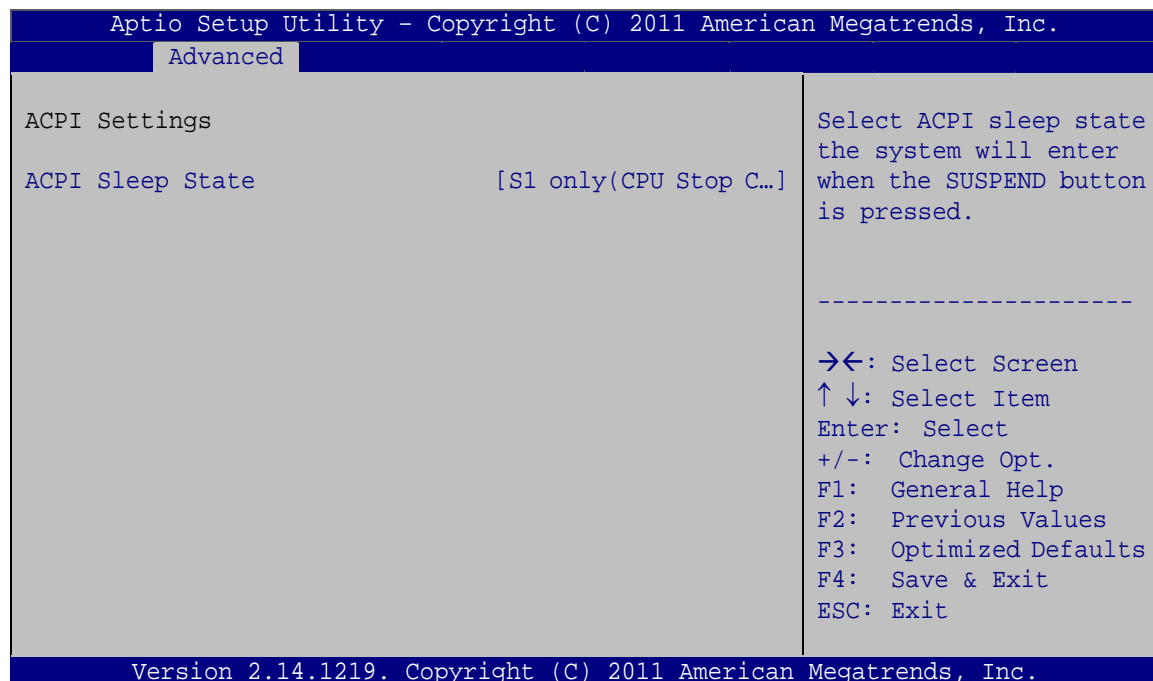
ICE-QM770 COM Express Module



BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Settings

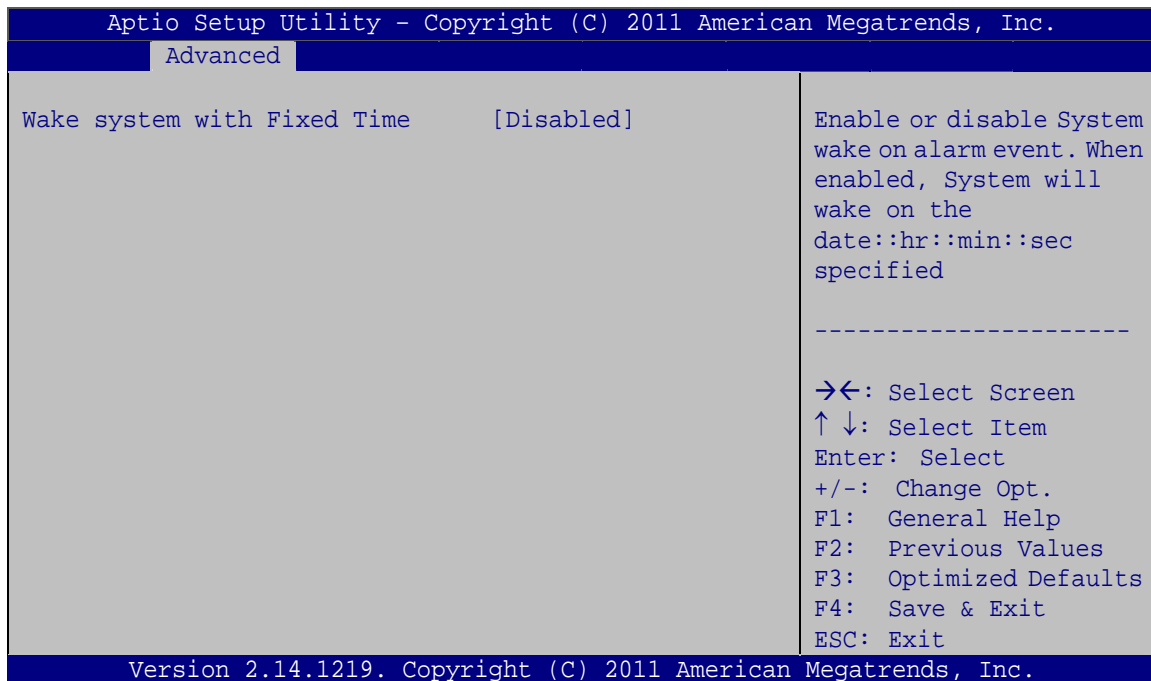
→ ACPI Sleep State [S1 only (CPU Stop Clock)]

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

- | | |
|--|--|
| <p>→ S1 only (CPU Stop Clock) DEFAULT</p> | <p>The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.</p> |
| <p>→ S3 only (Suspend to RAM)</p> | <p>The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.</p> |

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.



BIOS Menu 4: RTC Wake Settings

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→ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

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

→ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up date

Wake up hour

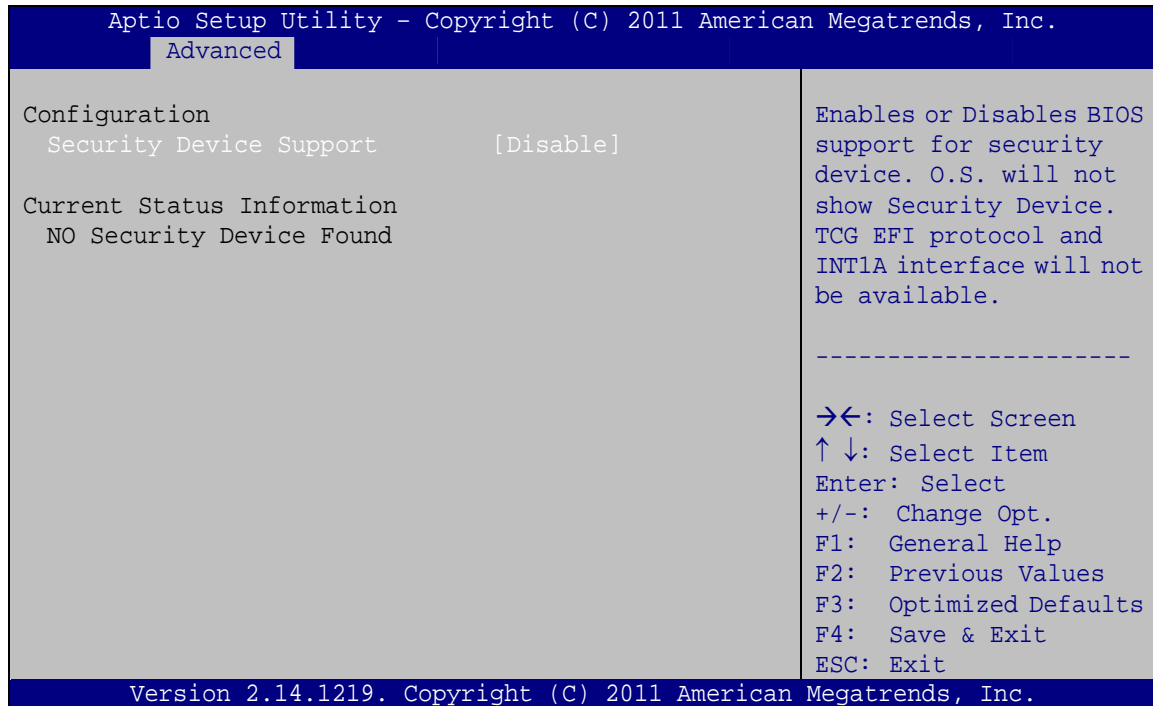
Wake up minute

Wake up second

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

5.3.3 Trusted Computing

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



BIOS Menu 5: Trusted Computing

→ Security Device Support [Disable]

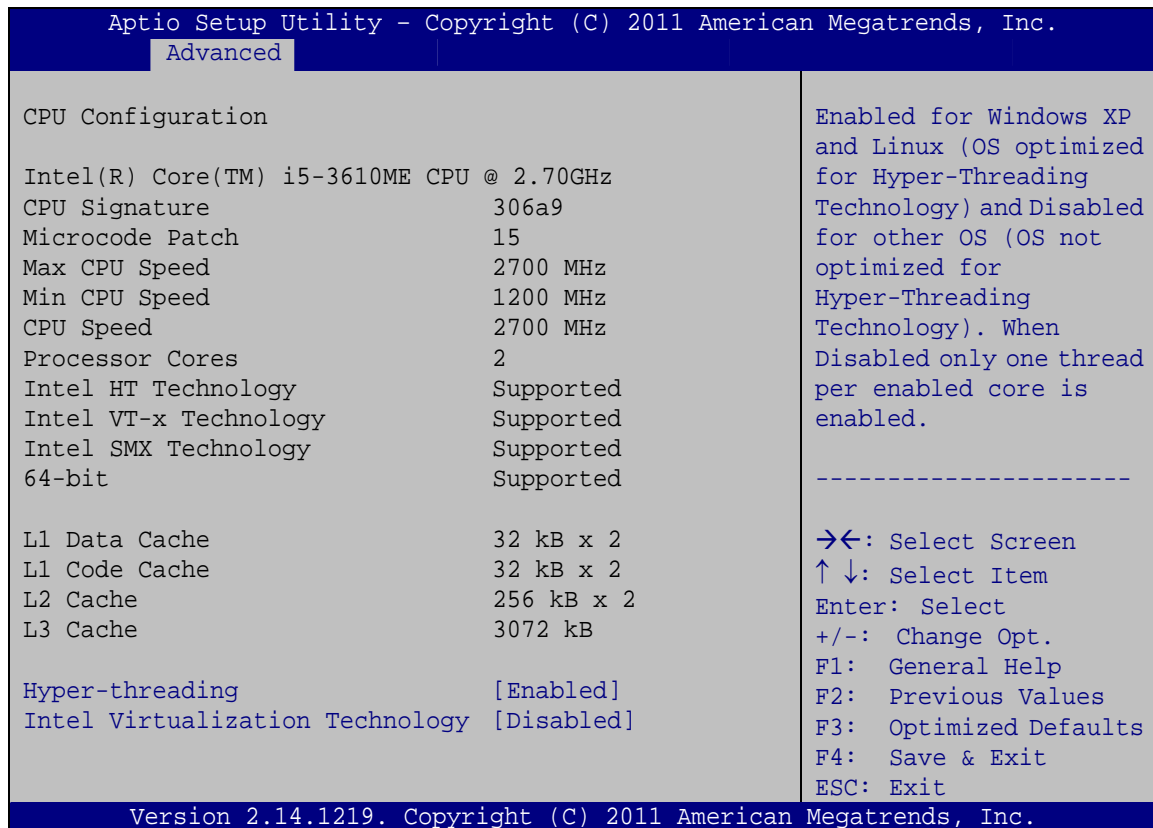
Use the **Security Device Support** option to configure support for the TPM.

- **Disable** **DEFAULT** TPM support is disabled.
- **Enable** TPM support is enabled.

ICE-QM770 COM Express Module

5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 6: CPU Configuration

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- CPU Speed: Lists the CPU processing speed
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.

- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- 64-bit: Indicates if 64-bit is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ **Hyper-threading [Enabled]**

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

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

➔ **Intel Virtualization Technology [Disabled]**

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

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

➔ **Hyper-Threading [Enabled]**

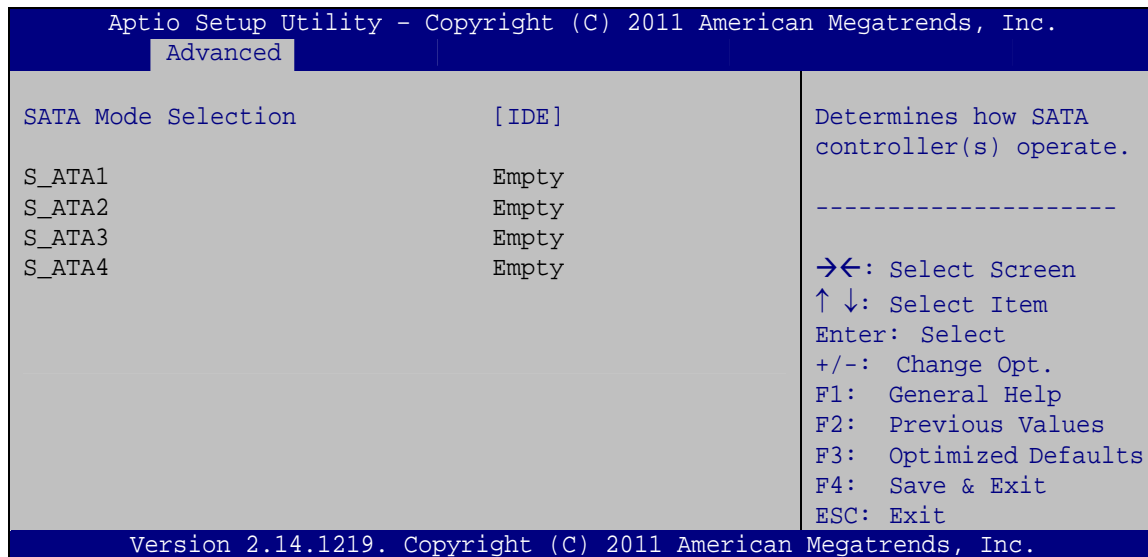
Use the **Hyper-Threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

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

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5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 7: SATA Configuration

→ SATA Mode Selection [IDE]

Use the **SATA Mode Selection** option to configure SATA devices.

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

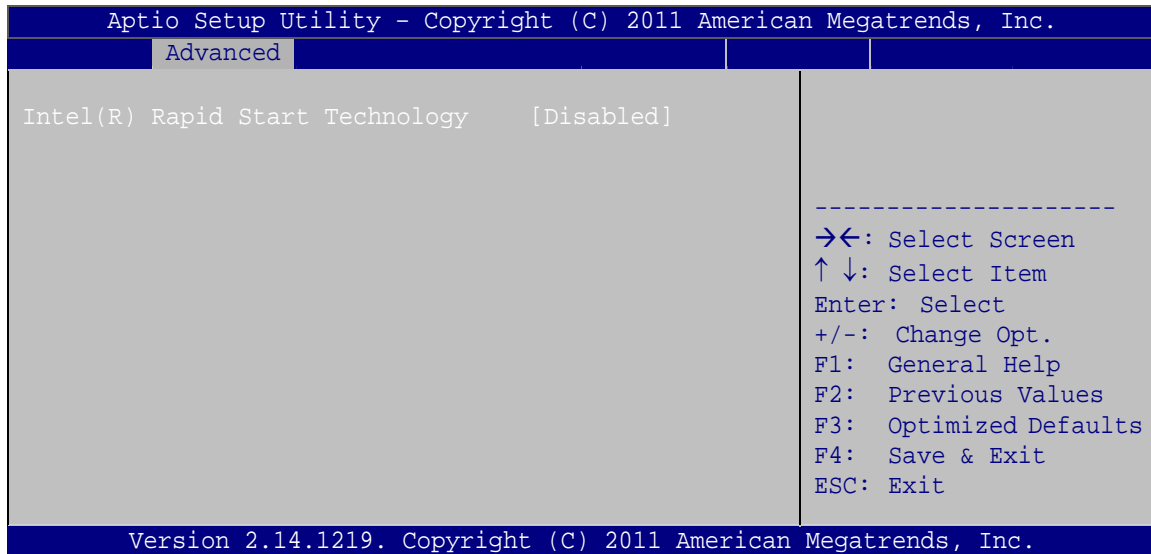


NOTE:

Before accessing the RAID configuration utility, ensure to set the **Option ROM Messages** BIOS option in the **Boot** menu to **Force BIOS**. This is to allow the "Press <CTRL+I> to enter Configuration Utility....." message to appear during POST. Press Ctrl+I when prompted to enter the RAID configuration utility.

5.3.6 Intel(R) Rapid Start Technology

Use the **Intel(R) Rapid Start Technology (BIOS Menu 8)** menu to configure Intel® Rapid Start Technology support.



BIOS Menu 8: Intel(R) Rapid Start Technology

→ Intel(R) Rapid Start Technology [Disabled]

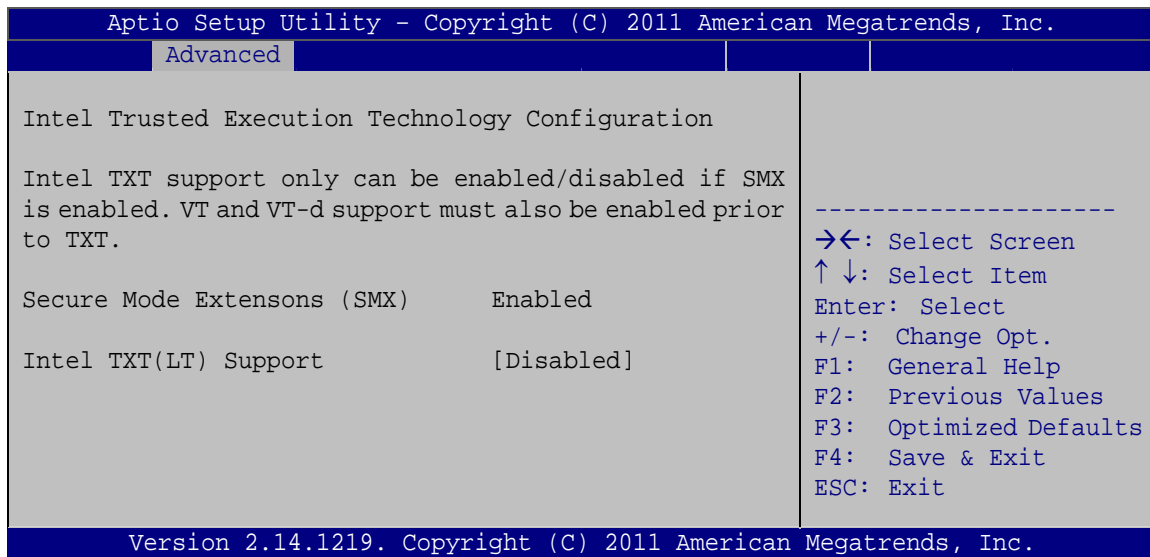
Use **Intel(R) Rapid Start Technology** option to enable or disable the Intel® Rapid Start Technology function.

- **Disabled** **DEFAULT** Intel® Rapid Start Technology is disabled
- **Enabled** Intel® Rapid Start Technology is enabled

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5.3.7 Intel TXT(LT) Configuration

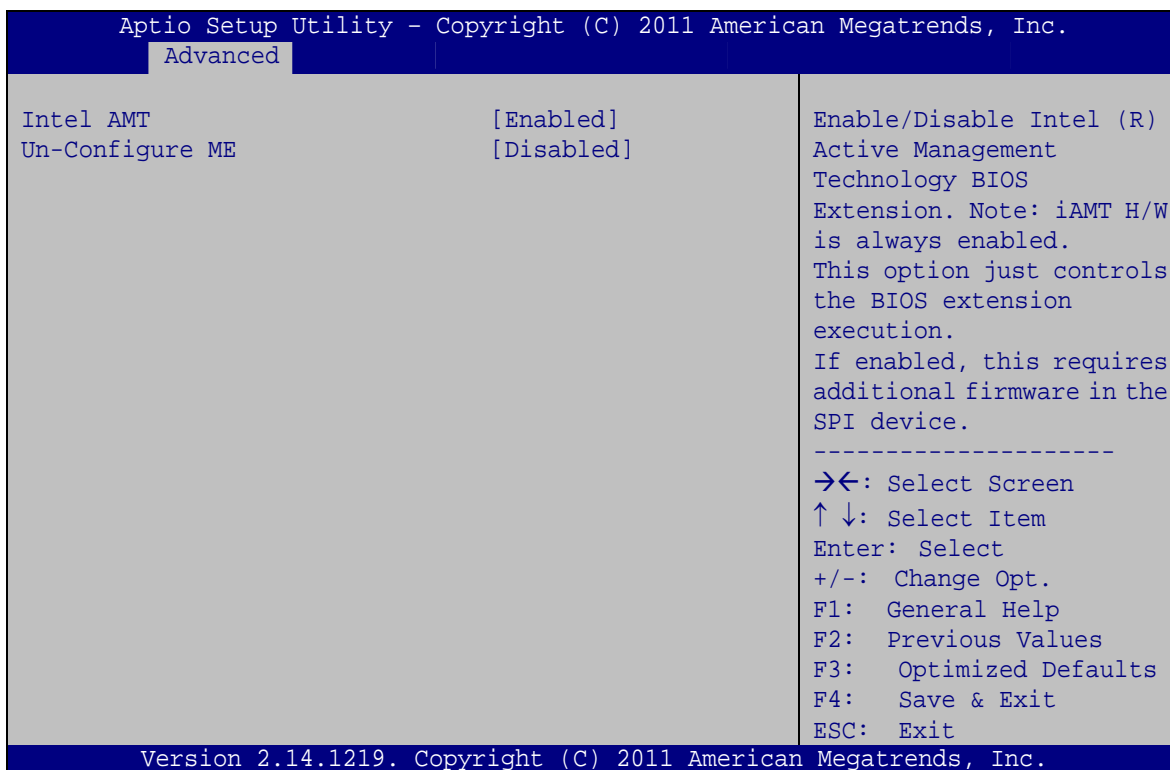
Use the **Intel TXT(LT) Configuration (BIOS Menu 9)** menu to configure Intel Trusted Execution Technology support.



BIOS Menu 9: Intel TXT(LT) Configuration

5.3.8 AMT Configuration

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



BIOS Menu 10: AMT Configuration

→ Intel AMT [Enabled]

Use **Intel AMT** option to enable or disable the Intel® AMT function.

- **Disabled** Intel® AMT is disabled
- **Enabled** **DEFAULT** Intel® AMT is enabled

→ Un-Configure ME [Disabled]

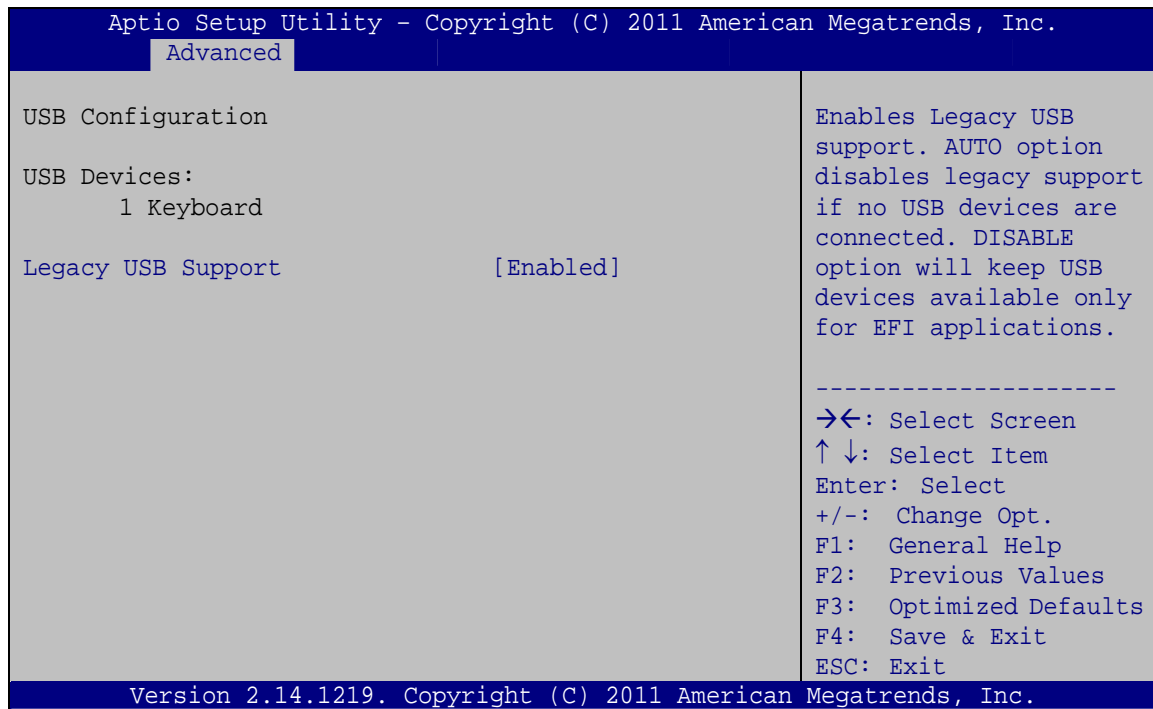
Use the **Un-Configure ME** option to perform ME unconfigure without password operation.

- **Disabled** **DEFAULT** Not perform ME unconfigure
- **Enabled** To perform ME unconfigure

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5.3.9 USB Configuration

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



BIOS Menu 11: USB Configuration

→ USB Devices

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

→ Legacy USB Support [Enabled]

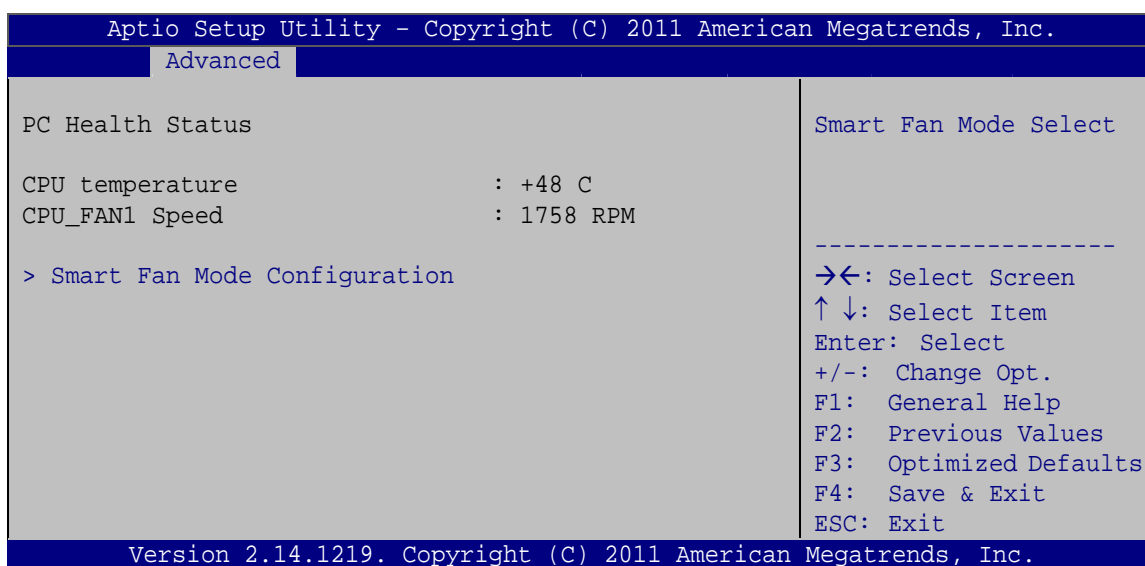
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

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

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

5.3.10 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 12**) displays the CPU temperature and CPU fan speed, and contains the fan configuration submenu.



BIOS Menu 12: iWDD H/W Monitor

➔ PC Health Status

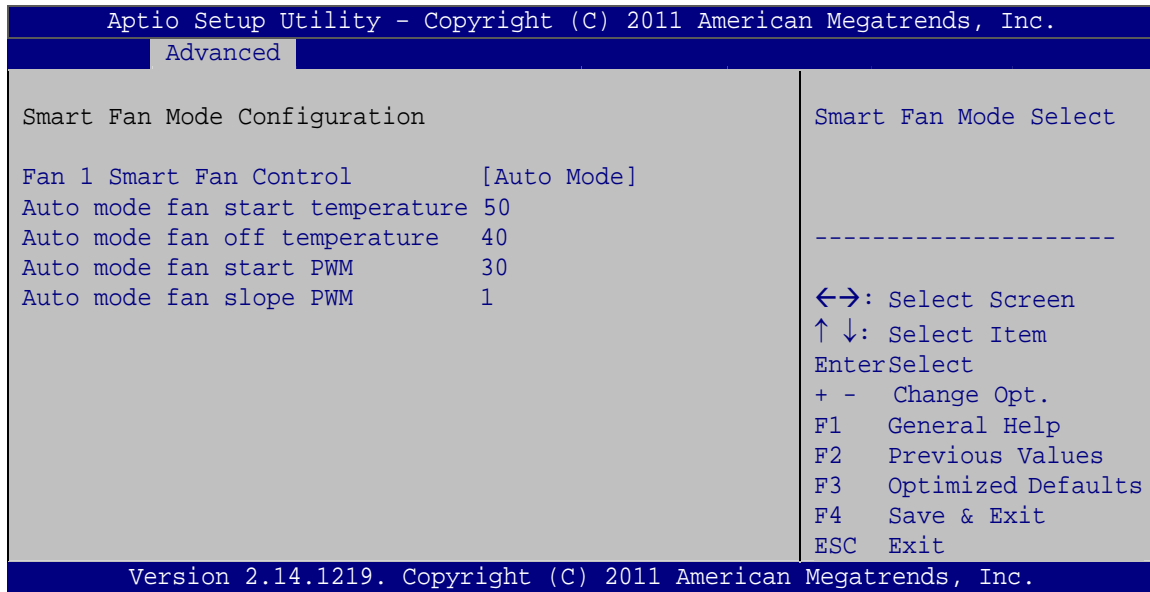
The following system parameters and values are shown. The system parameters that are monitored are:

- CPU Temperature
- CPU Fan Speed

5.3.10.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 13**) to configure the smart fan temperature and speed settings.

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BIOS Menu 13: Smart Fan Mode Configuration

➔ Fan 1 Smart Fan Control [Auto Mode]

Use the **Fan 1 Smart Fan Control** option to configure the CPU Smart Fan.

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

➔ Auto mode fan start/off temperature

Use the + or – key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

➔ Auto mode fan start PWM

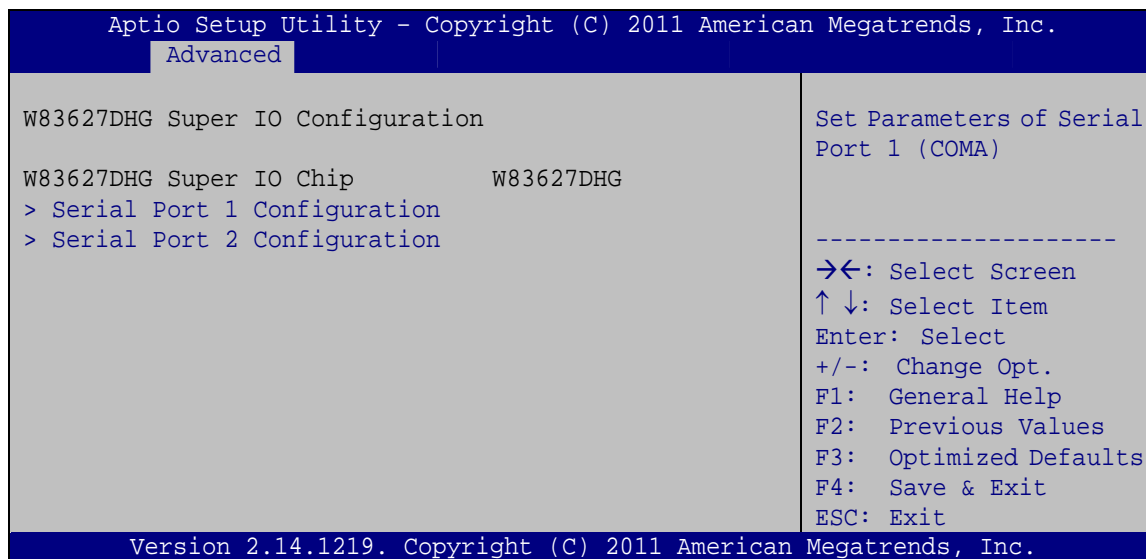
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 128.

➔ Auto mode fan slope PWM

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 64.

5.3.11 W83627DHG Super IO Configuration

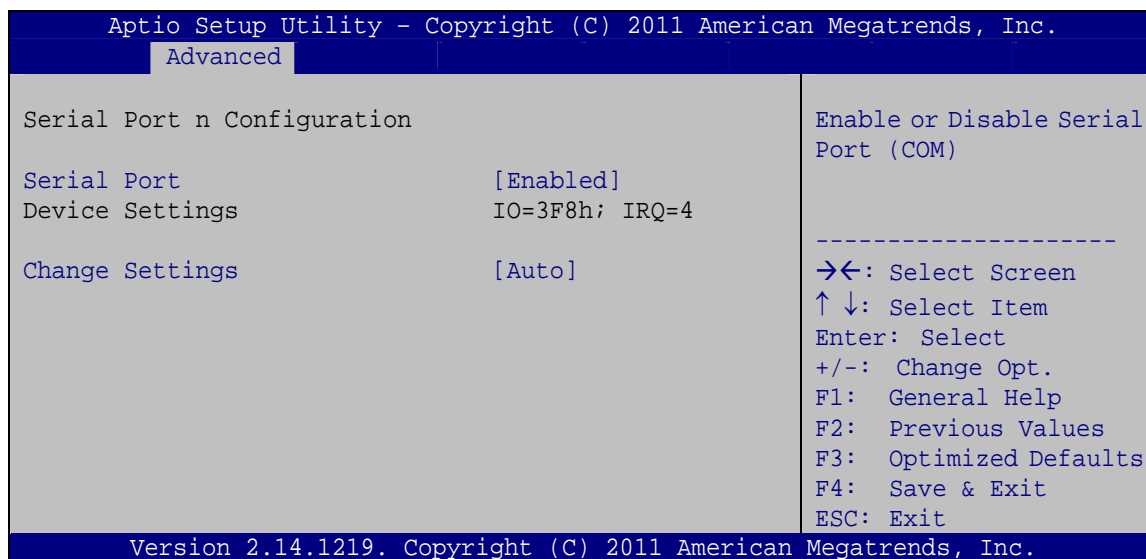
Use the **W83627DHG Super IO Configuration** menu (**BIOS Menu 14**) to set or change the configurations for the serial ports.



BIOS Menu 14: W83627DHG Super IO Configuration

5.3.11.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 15**) to configure the serial port n.



BIOS Menu 15: Serial Port n Configuration Menu

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5.3.11.1.1 Serial Port 1 Configuration

→ Serial Port [Enabled]

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

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

→ Change Settings [Auto]

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

- **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- **IO=3F8h;**
IRQ=4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
- **IO=3F8h;**
IRQ=3, 4 Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- **IO=2F8h;**
IRQ=3, 4 Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- **IO=3E8h;**
IRQ=3, 4 Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4
- **IO=2E8h;**
IRQ=3, 4 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.11.1.2 Serial Port 2 Configuration

→ Serial Port [Enabled]

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

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

→ Change Settings [Auto]

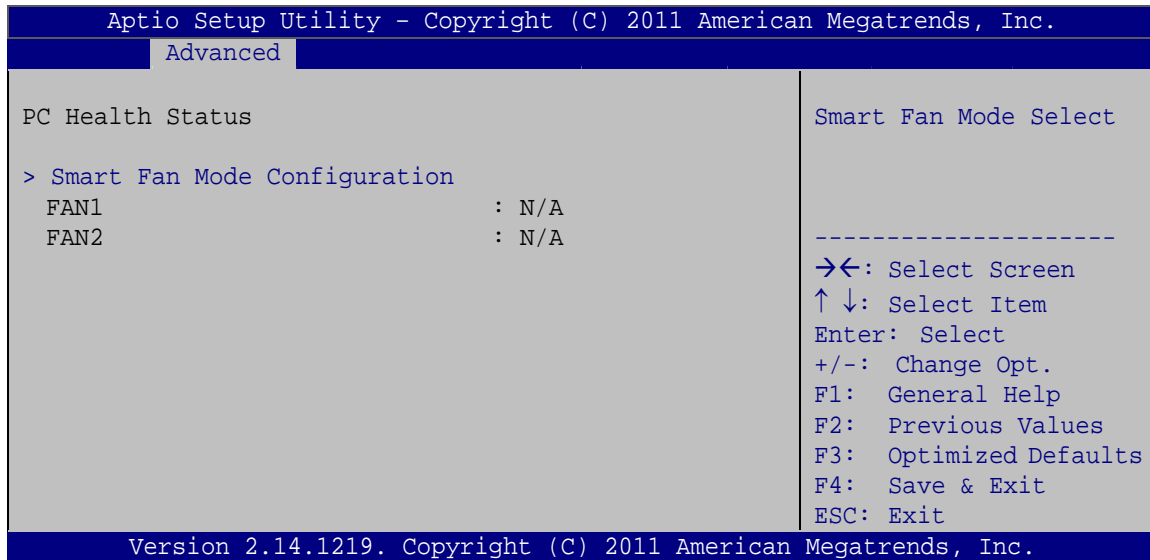
Use the **Change Settings** option to change the serial port IO port address and interrupt address.

→	Auto	DEFAULT	The serial port IO port address and interrupt address are automatically detected.
→	IO=2F8h; IRQ=3		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
→	IO=3F8h; IRQ=3, 4		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
→	IO=2F8h; IRQ=3, 4		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
→	IO=3E8h; IRQ=3, 4		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4
→	IO=2E8h; IRQ=3, 4		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.12 W83627DHG H/W Monitor

The **W83627DHG H/W Monitor** menu (**BIOS Menu 16**) contains the fan configuration submenu and displays the system fan speeds.

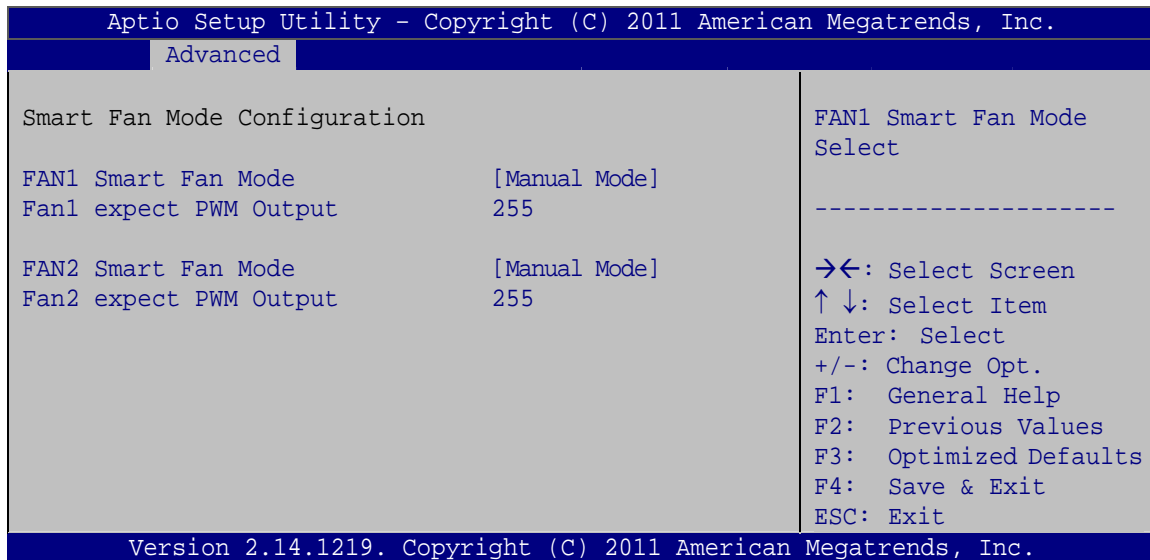
ICE-QM770 COM Express Module



BIOS Menu 16: W83627DHG H/W Monitor

5.3.12.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 17**) to configure fan temperature and speed settings.



BIOS Menu 17: Smart Fan Mode Configuration

→ FAN1/FAN2 Smart Fan Mode [Manual Mode]

Use the **FAN1/FAN2 Smart Fan Mode** option to configure the system smart fans.

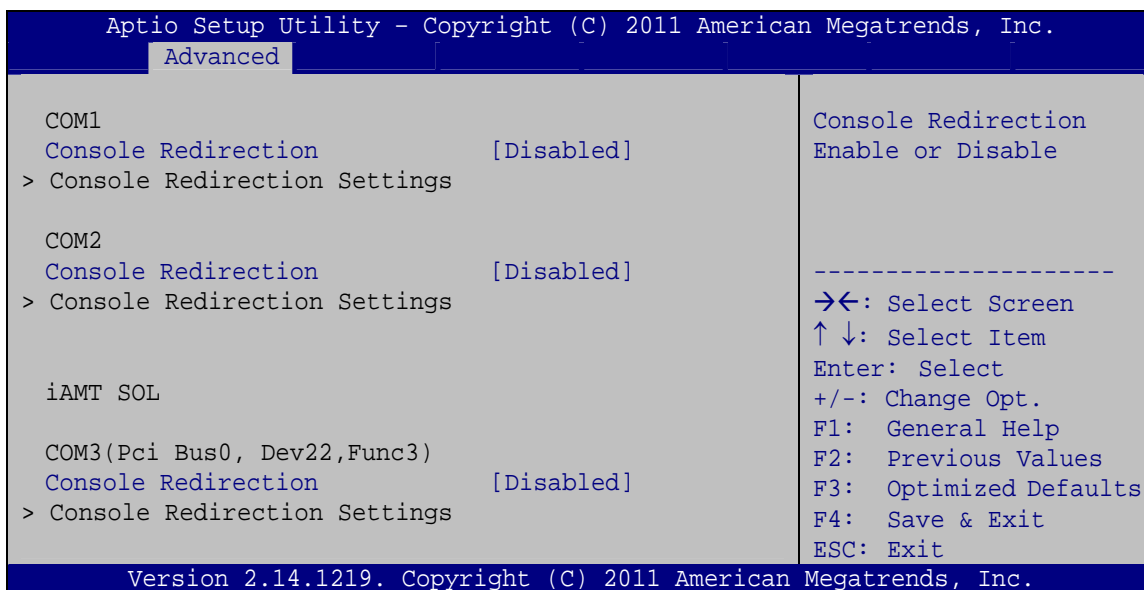
- ➔ **Manual Mode** **DEFAULT** The fan spins at the speed set in Fan1/Fan2 expect PWM Output settings.

➔ **Fan1/ Fan2 expect PWM Output**

Use the + or – key to change the value. Enter a decimal number between 0 and 255.

5.3.13 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 18**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 18: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

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

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

➔ **Terminal Type [ANSI]**

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

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

➔ **Bits per second [115200]**

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

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

➔ **Data Bits [8]**

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

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

➔ **Parity [None]**

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

- ➔ **None** **DEFAULT** No parity bit is sent with the data bits.
- ➔ **Even** The parity bit is 0 if the number of ones in the data bits is even.
- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.

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

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

➔ **Stop Bits [1]**

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

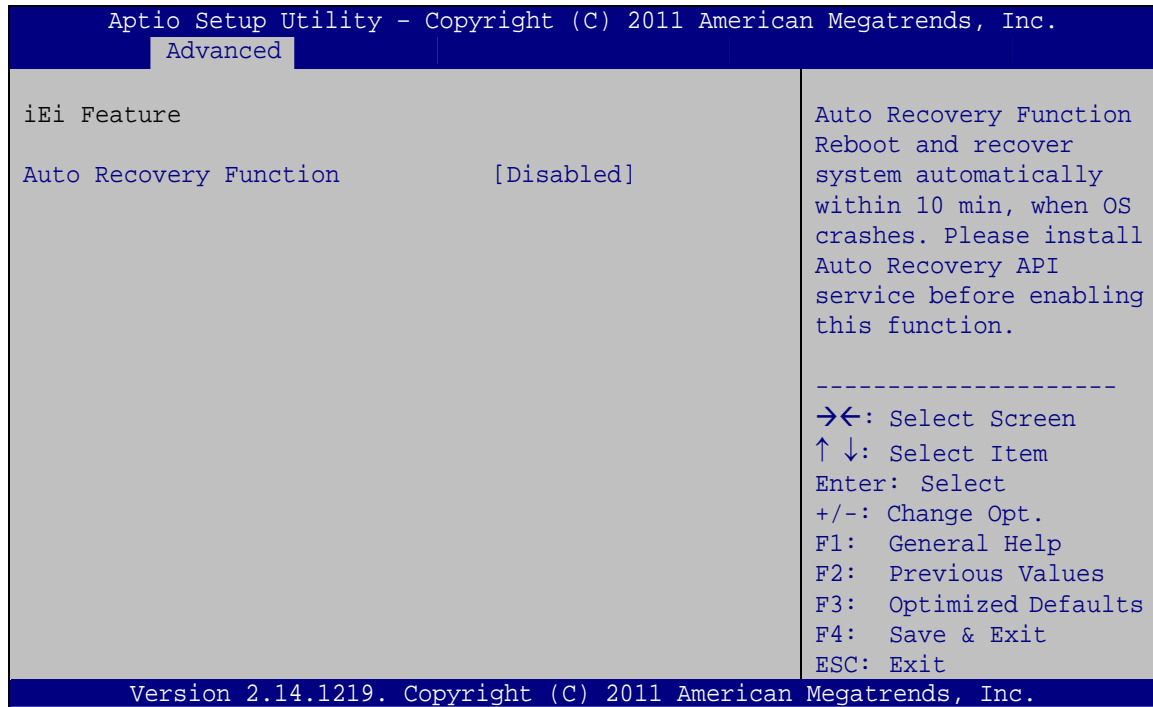
➔ **1** **DEFAULT** Sets the number of stop bits at 1.

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

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5.3.14 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 19**) to configure One Key Recovery function.



BIOS Menu 19: iEi Feature

➔ Auto Recovery Function [Disabled]

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

- ➔ **Disabled** **DEFAULT** Auto recovery function disabled
- ➔ **Enabled** Auto recovery function enabled

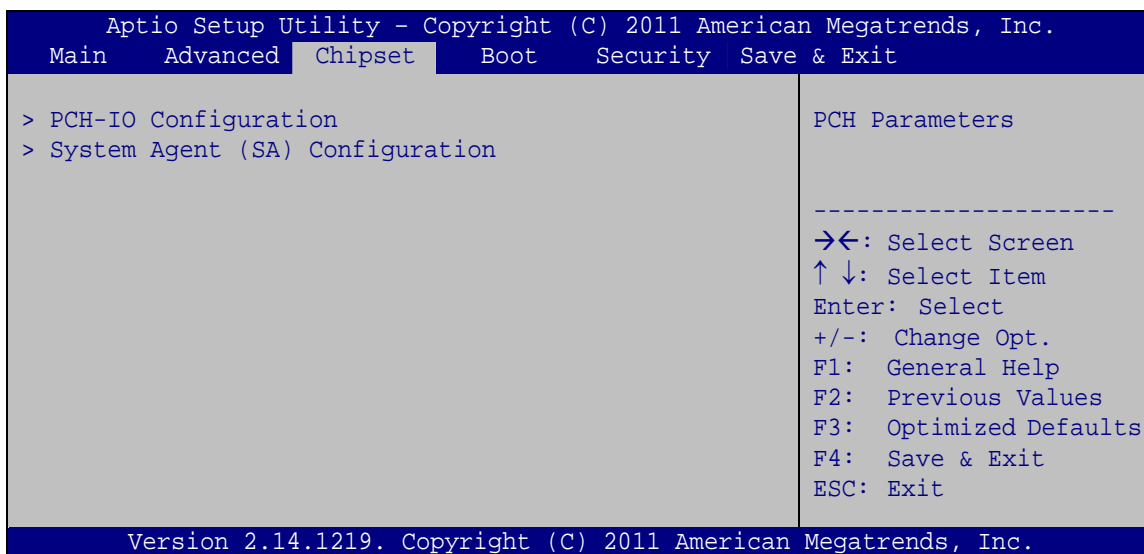
5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 20**) to access the PCH IO and System Agent (SA) configuration menus.



WARNING!

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

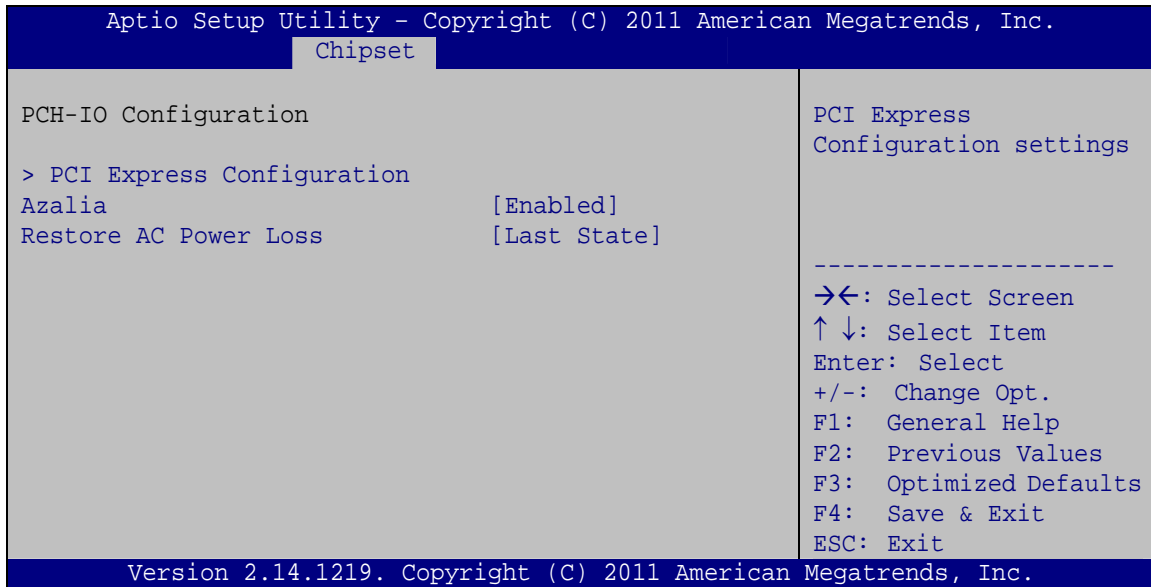


BIOS Menu 20: Chipset

5.4.1 PCH-IO Configuration

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

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BIOS Menu 21: PCH-IO Configuration

→ Azalia [Enabled]

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

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

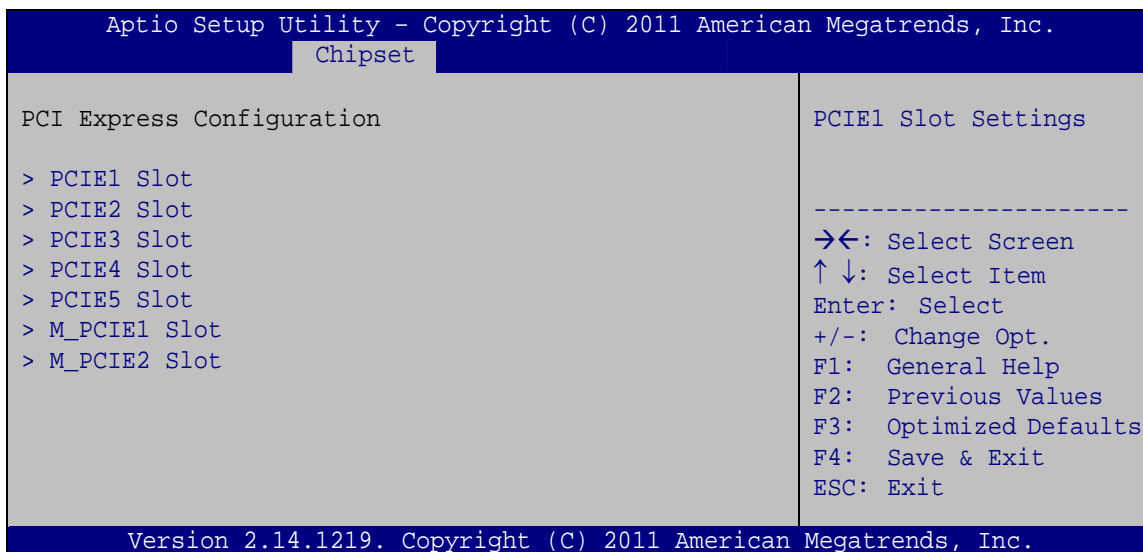
→ Restore AC Power Loss [Last State]

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

- **Always OFF** The system remains turned off
- **Always ON** The system turns on
- **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

5.4.1.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 22**) to select the support type of the PCI Express or PCIe Mini slots.



BIOS Menu 22: PCI Express Configuration

➔ PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/M_PCIE1/M_PCIE2 Slot

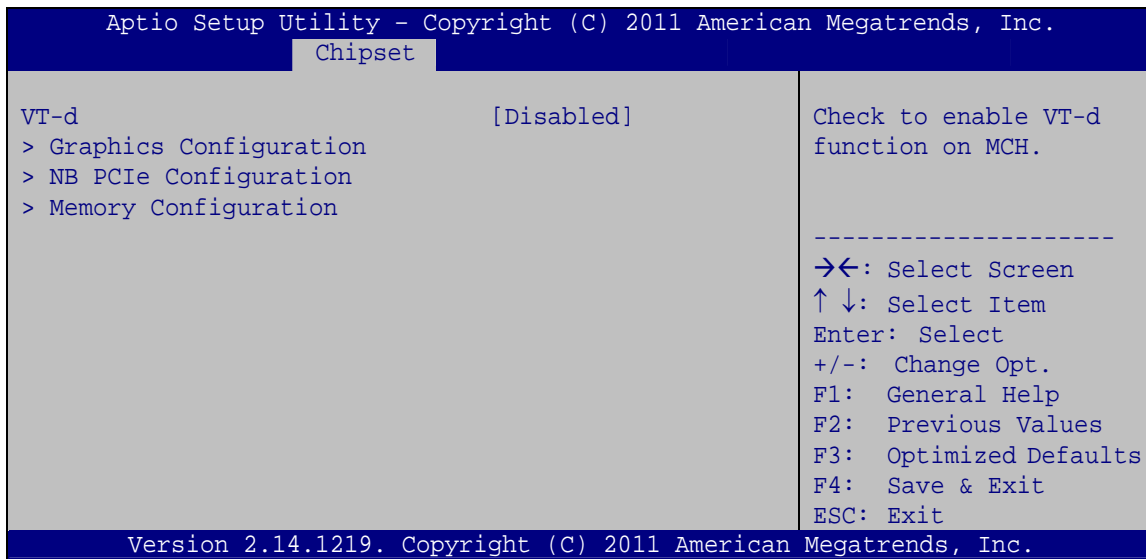
Use this option to select the support type of the PCI Express or PCIe Mini slots. The following options are available:

- Auto **Default**
- Gen1
- Gen2

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5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 23**) to configure the System Agent (SA) parameters.



BIOS Menu 23: System Agent (SA) Configuration

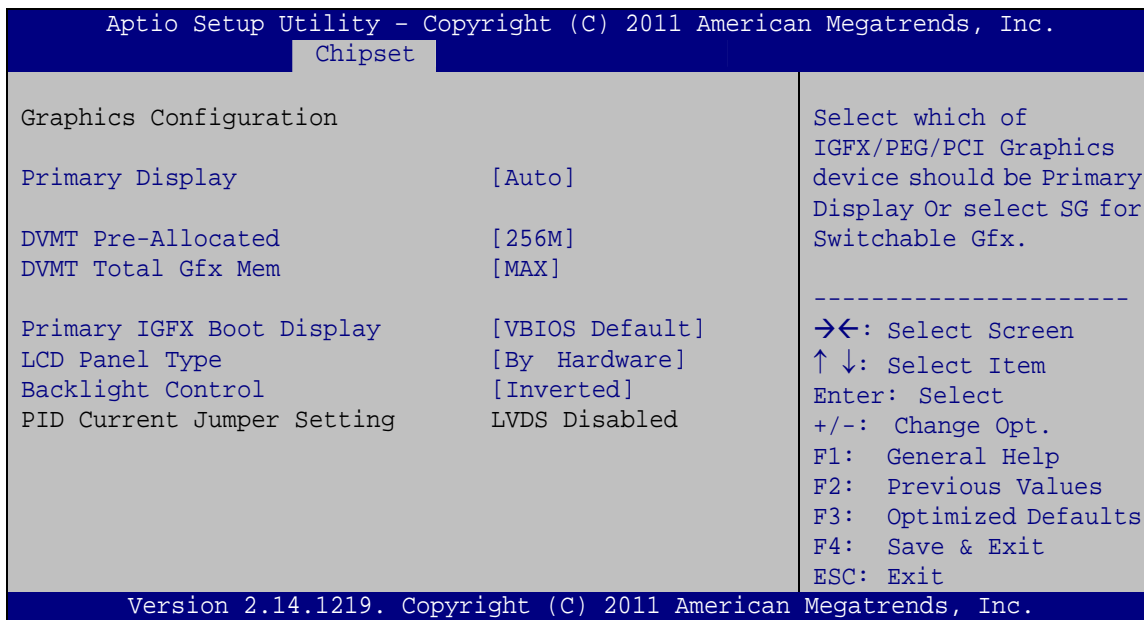
→ VT-d [Disabled]

Use the **VT-d** option to enable or disable VT-d support.

- **Disabled** **DEFAULT** Disables VT-d support.
- **Enabled** Enables VT-d support.

5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 24**) menu to configure the video device connected to the system.



BIOS Menu 24: Graphics Configuration

→ Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses.

The following options are available:

- Auto **Default**
- IGFX
- PEG

→ DVMT Pre-Allocated [256M]

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

- 32M
- 64M
- 128M
- 256M **Default**
- 512M
- 1024M

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→ DVMT Total Gfx Mem [MAX]

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

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

→ Primary IGFX Boot Display [VBIOS Default]

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

- VBIOS Default **DEFAULT**
- CRT
- LVDS
- Display Port 1
- Display Port 2
- Display Port 3

→ LCD Panel Type [By Hardware]

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- By Hardware **DEFAULT**
- 640x480 18BIT
- 800x480 18BIT
- 800x600 18BIT
- 1024x768 18BIT
- 1024x768 24BIT
- 1280x1024 48BIT
- 1600x1200 48BIT
- 1280x768 18BIT
- 1280x800 18BIT
- 1366x768 24BIT
- 1440x900 48BIT
- 1600x900 48BIT

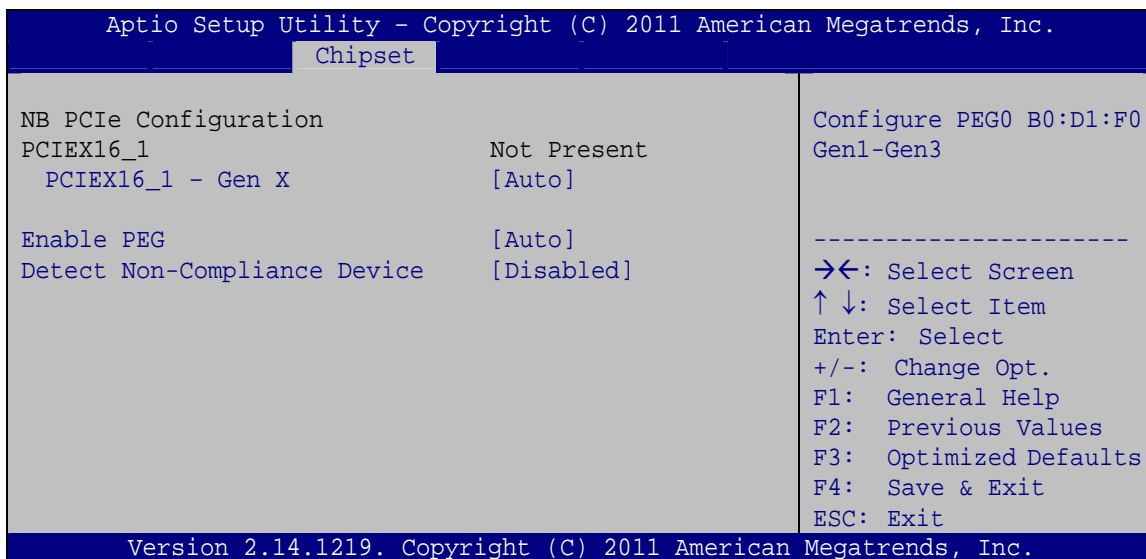
- 1680x1050 48BIT
- 1920x1080 48BIT
- 1920x1200 48BIT

➔ **Backlight Control [Inverted]**

Use the **Backlight Control** option to select the backlight control mode.

- ➔ **Inverted** **DEFAULT** The LVDS backlight is brighter at high voltage level.
- ➔ **Normal** The LVDS backlight is brighter at low voltage level.

5.4.2.2 NB PCIe Configuration



BIOS Menu 25: NB PCIe Configuration

➔ **PCIEX16_1 – Gen X [Auto]**

Use the **PCIEX16_1 – Gen X** option to select the support type of the PCI Express x16 slot.

The following options are available:

- Auto **Default**
- Gen1
- Gen2
- Gen3

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→ Enable PEG [Auto]

Use the **Enable PEG** option to enable or disable the PCI Express controller. The following options are available:

- Disabled
- Enabled
- Auto **Default**

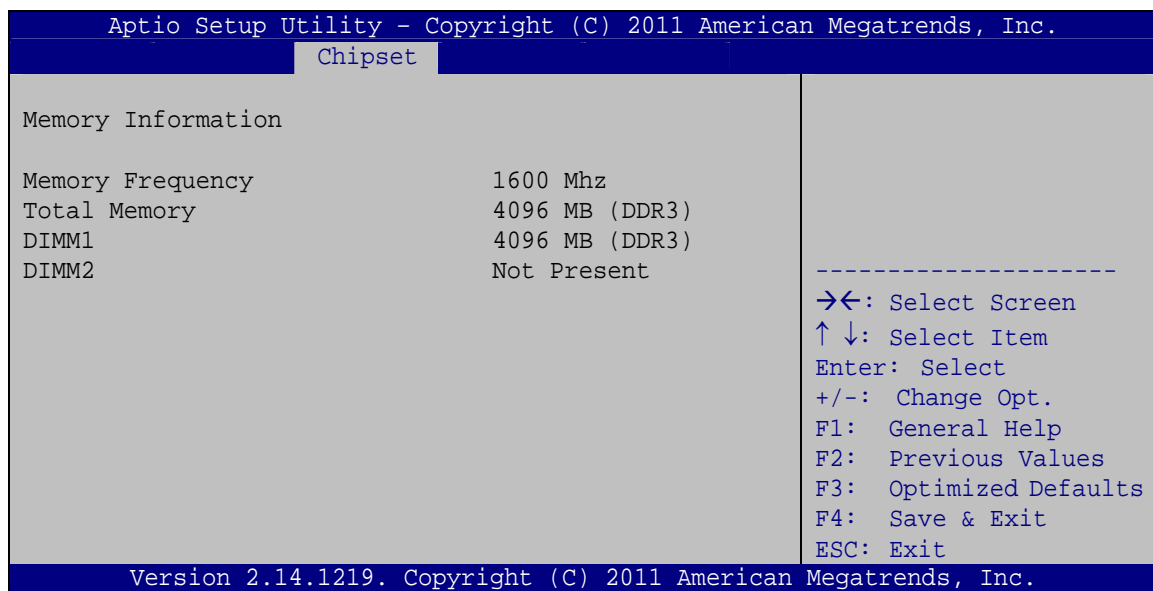
→ Detect Non-Compliance Device [Disabled]

Use the **Detect Non-Compliance Device** option to enable or disable detecting a non-compliance PCI Express device in the PEG. The following options are available:

- Disabled **Default**
- Enabled

5.4.2.3 Memory Configuration

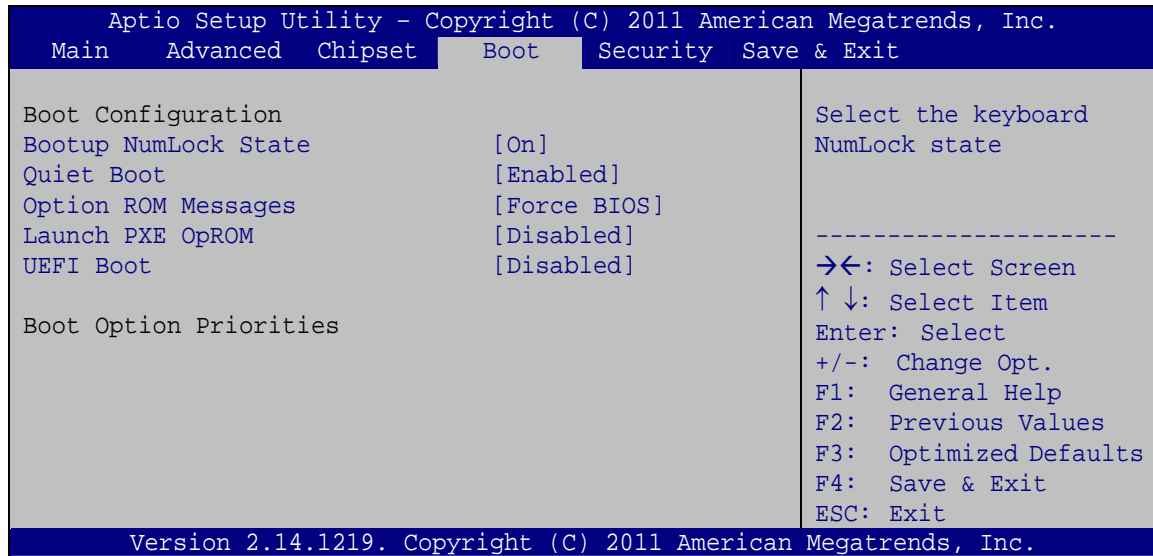
Use the **Memory Configuration** submenu (**BIOS Menu 26**) to view memory information.



BIOS Menu 26: Memory Configuration

5.5 Boot

Use the **Boot menu (BIOS Menu 27)** to configure system boot options.



BIOS Menu 27: Boot

→ Bootup NumLock State [On]

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

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

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

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→ 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

→ Option ROM Messages [Force BIOS]

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

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

→ Launch PXE OpROM [Disabled]

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

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

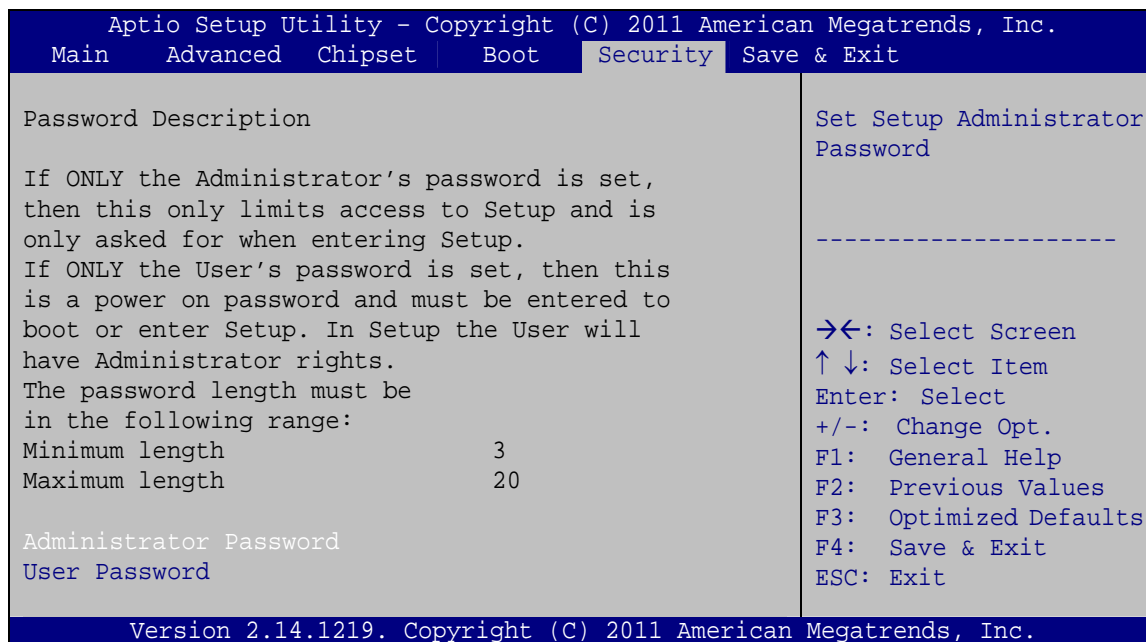
→ UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- **Disabled** **DEFAULT** Disables to boot from the UEFI devices.
- **Enabled** Enables to boot from the UEFI devices.

5.6 Security

Use the **Security** menu (**BIOS Menu 28**) to set system and user passwords.



BIOS Menu 28: Security

→ Administrator Password

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

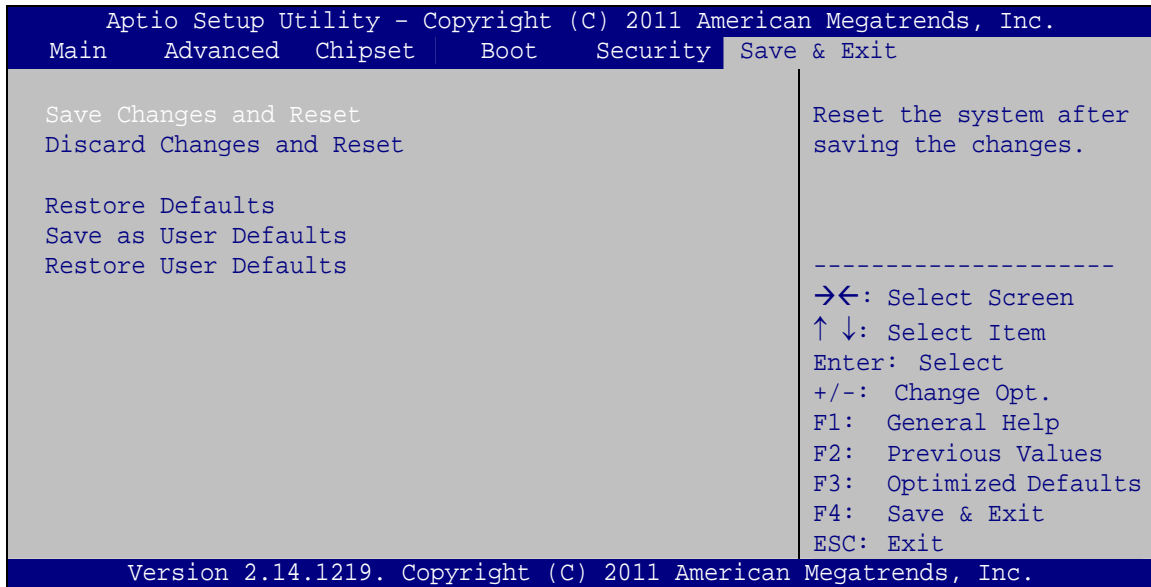
→ User Password

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

5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 29**) to load default BIOS values, optimal failsafe values and to save configuration changes.

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BIOS Menu 29: Save & Exit

→ Save Changes and Reset

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

→ Discard Changes and Reset

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

→ Restore Defaults

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

→ Save as User Defaults

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

→ Restore User Defaults

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

Chapter

6

Software Drivers

ICE-QM770 COM Express Module

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
- Graphics
- LAN
- Audio
- SATA (Intel® Rapid Storage Technology)
- USB 3.0
- Intel® AMT

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 that came with the system into a CD drive connected to the system.



NOTE:

If the installation program doesn't start automatically:
Click "Start->Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 6-1**).

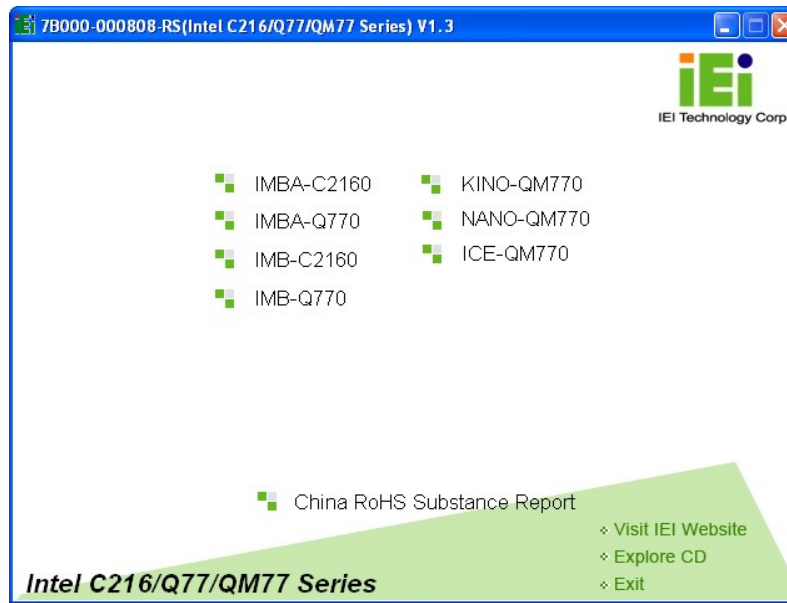


Figure 6-1: Start Up Screen

Step 3: Click ICE-QM770.

Step 4: The list of drivers in **Figure 6-2** appears.

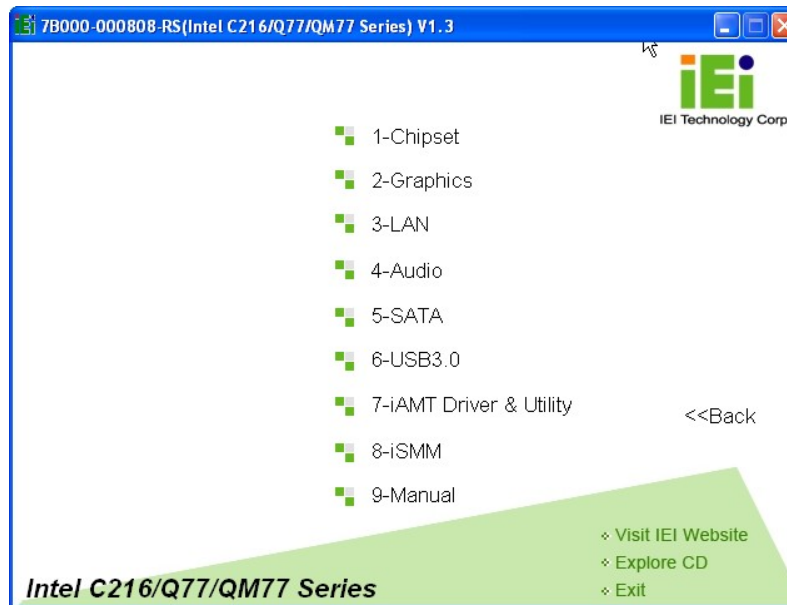


Figure 6-2: Drivers

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6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “1-Chipset”.

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-3** appears. Click **Next** to continue.



Figure 6-3: Chipset Driver Welcome Screen

Step 5: The license agreement in **Figure 6-4** appears.

Step 6: Read the **License Agreement**.

Step 7: Click **Yes** to continue.



Figure 6-4: Chipset Driver License Agreement

Step 8: The **Read Me** file in **Figure 6-5** appears.

Step 9: Click **Next** to continue.

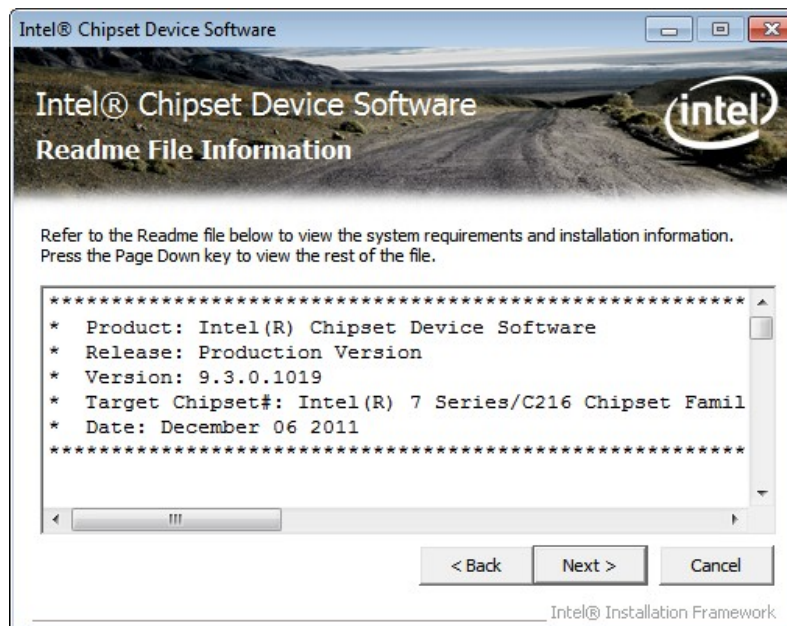


Figure 6-5: Chipset Driver Read Me File

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Step 10: Setup Operations are performed as shown in Figure 6-6.

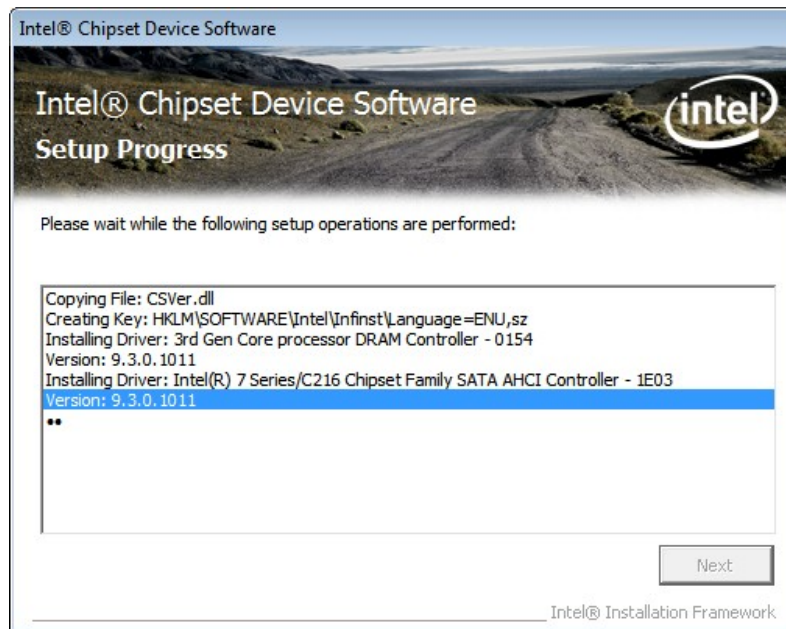


Figure 6-6: Chipset Driver Setup Operations

Step 11: Once the Setup Operations are complete, click **Next** to continue.

Step 12: The **Finish** screen in Figure 6-7 appears.

Step 13: Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See Figure 6-7.

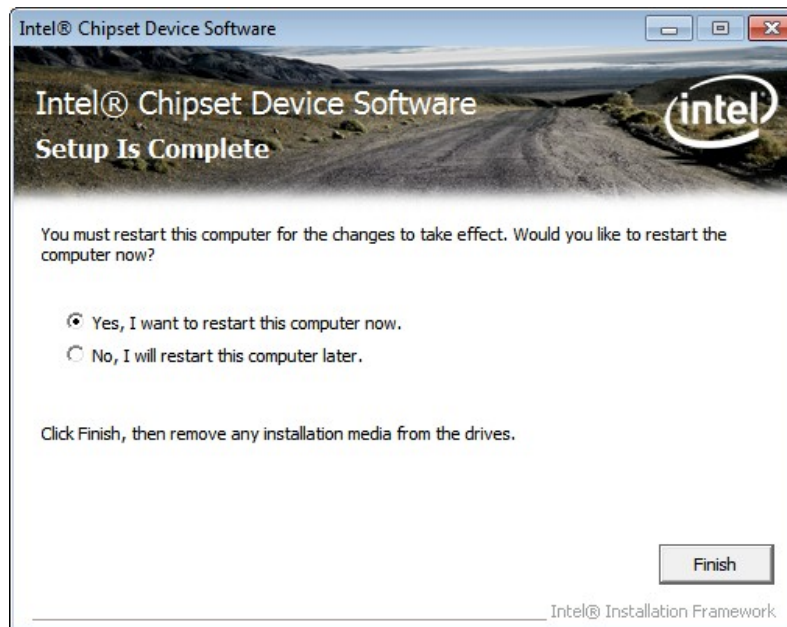


Figure 6-7: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the graphics driver, please do the following.

- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click "**2-Graphics**" and select the folder which corresponds to the operating system.
- Step 3:** Double click the setup file.
- Step 4:** The **Welcome Screen** in **Figure 6-8** appears. Click **Next** to continue.

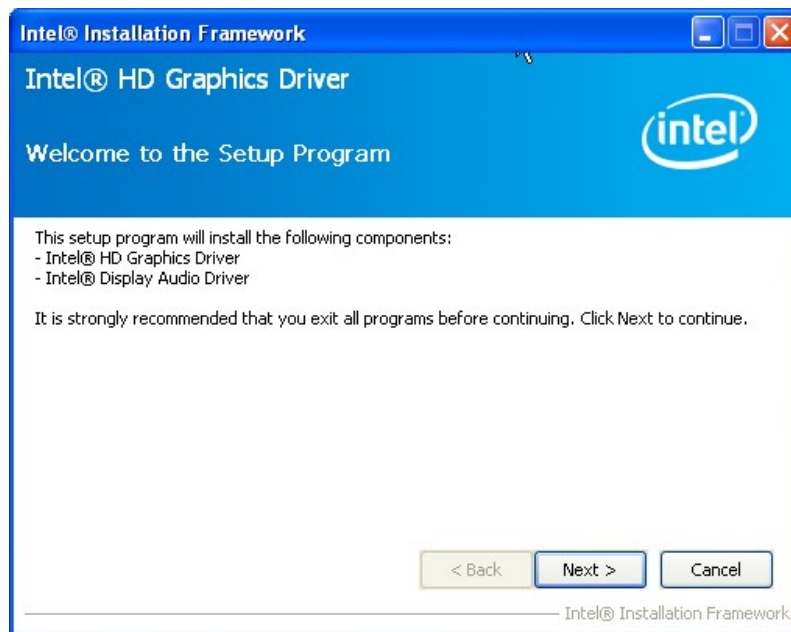


Figure 6-8: Graphics Driver Welcome Screen

Step 5: The license agreement in **Figure 6-9** appears. Read the **License Agreement**.

Step 6: Click **Yes** to continue.

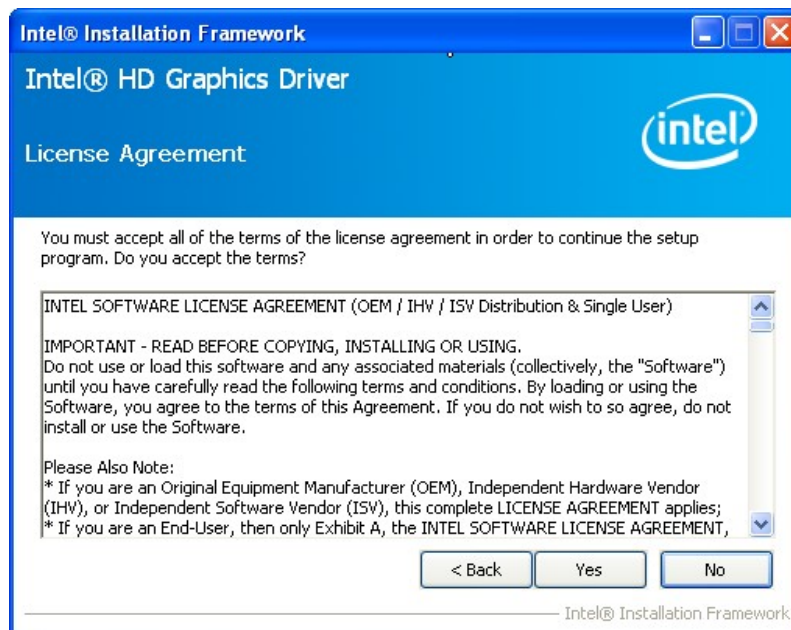


Figure 6-9: Graphics Driver License Agreement

Step 7: The Read Me file in **Figure 6-10** appears.

Step 8: Click **Next** to continue.

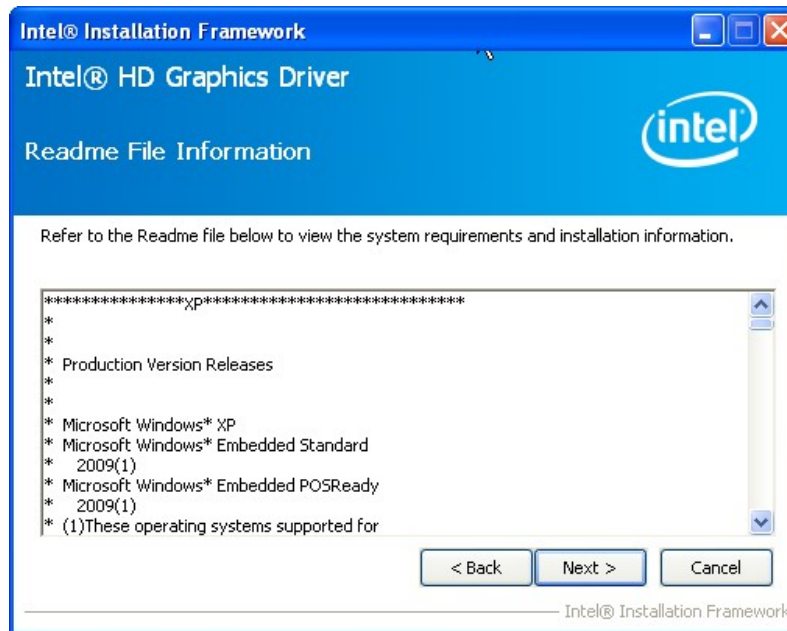


Figure 6-10: Graphics Driver Read Me File

Step 9: **Setup Operations** are performed as shown in **Figure 6-11**.

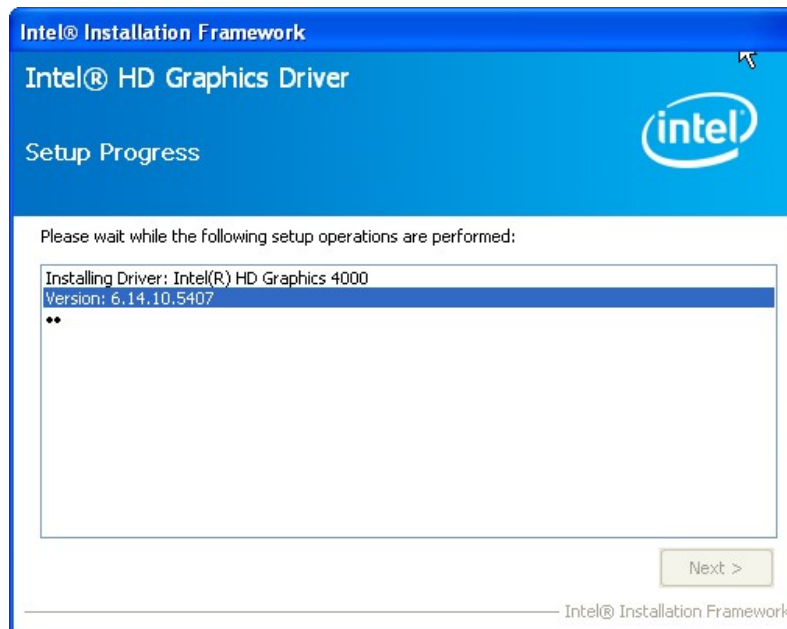


Figure 6-11: Graphics Driver Setup Operations

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Step 10: Once the **Setup Operations** are complete, click the **Next** icon to continue.

Step 11: The **Finish** screen appears.

Step 12: Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See **Figure 6-12**.



Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

Step 1: Right-click the Computer button from the start menu and select **Properties** (Figure 6-13).

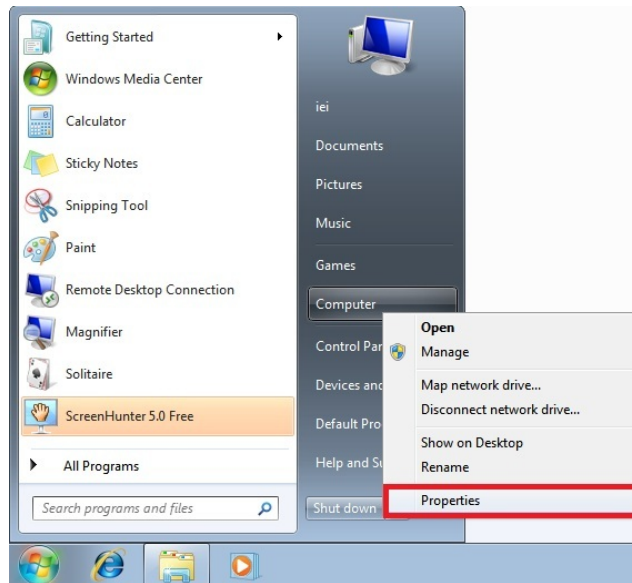


Figure 6-13: Windows Control Panel

Step 2: The system control panel window in **Figure 6-14** appears.

Step 3: Click the Device Manager link (**Figure 6-14**).

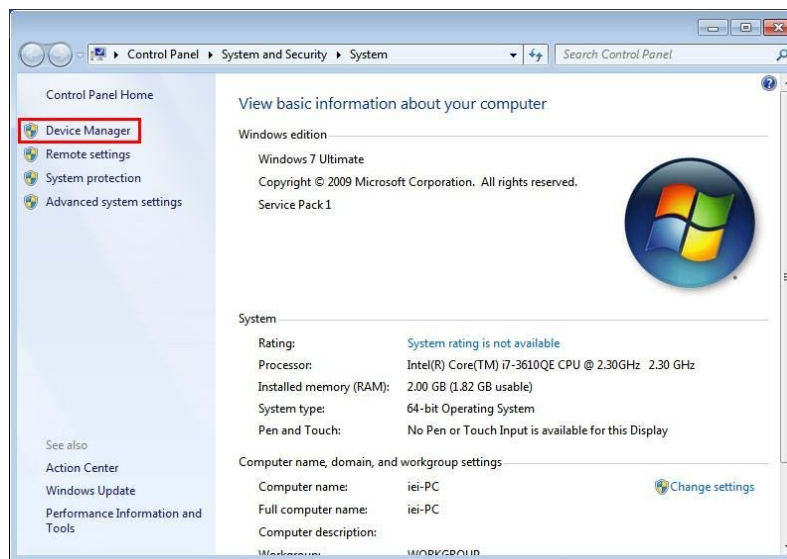


Figure 6-14: System Control Panel

Step 4: A list of system hardware devices appears (**Figure 6-15**).

Step 5: Right-click the Ethernet Controller that has question marks next to it (this means Windows does not recognize the device).

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Step 6: Select **Update Driver Software**.

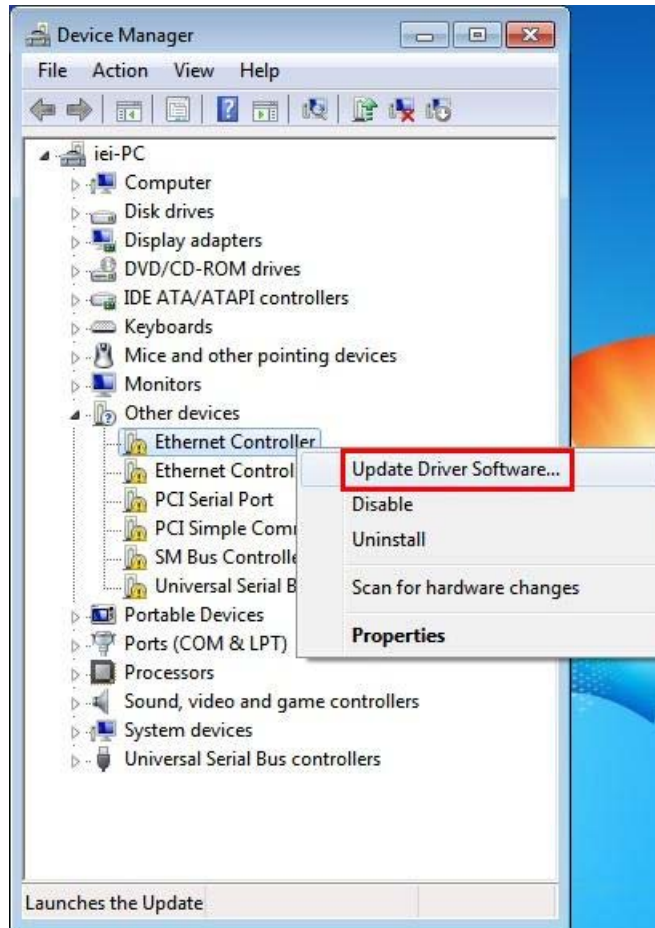


Figure 6-15: Device Manager List

Step 7: The Update Driver Software Window appears (**Figure 6-16**).

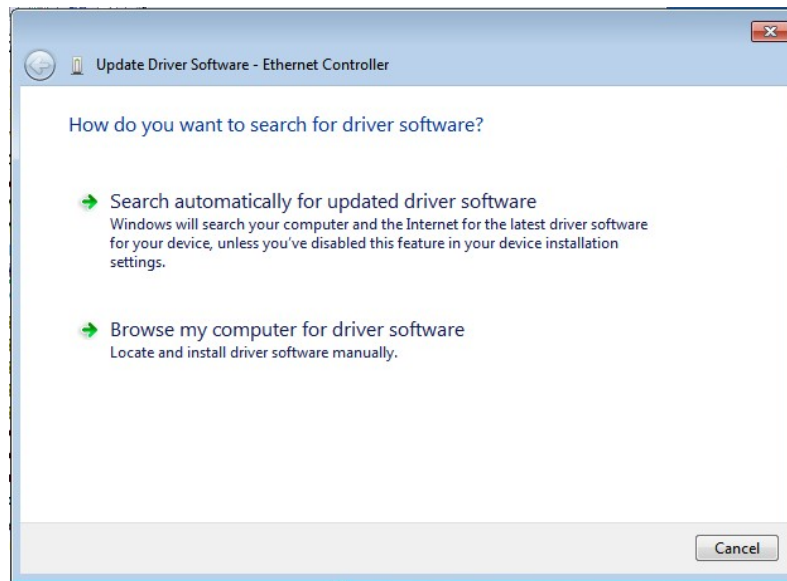


Figure 6-16: Update Driver Software Window

Step 8: Select "Browse my computer for driver software" and click **NEXT** to continue.

Step 9: Click Browse to select "**X:\3-LAN**" directory in the **Locate File** window, where "**X:**" is the system CD drive. (**Figure 6-17**).

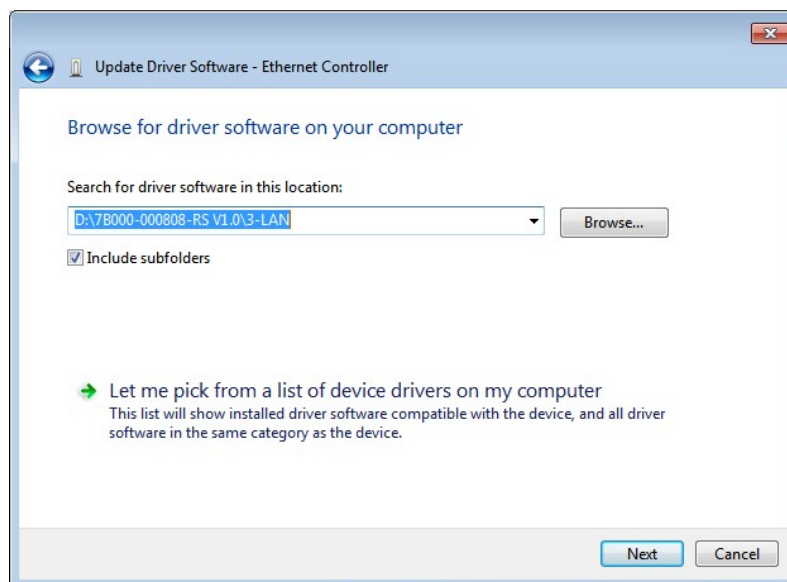


Figure 6-17: Locate Driver Files

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

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Step 11: Driver Installation is performed as shown in **Figure 6-18**.

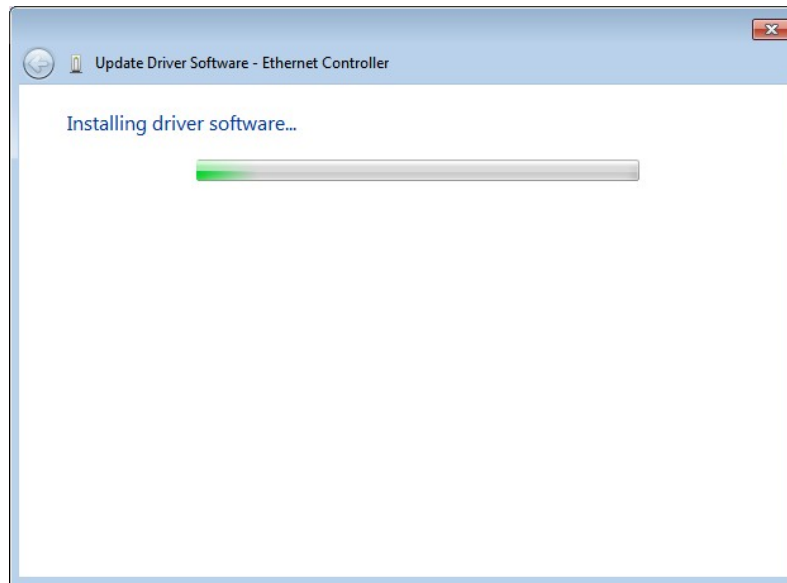


Figure 6-18: LAN Driver Installation

Step 12: The **Finish** screen in **Figure 6-19** appears. Click **Close** to exit.

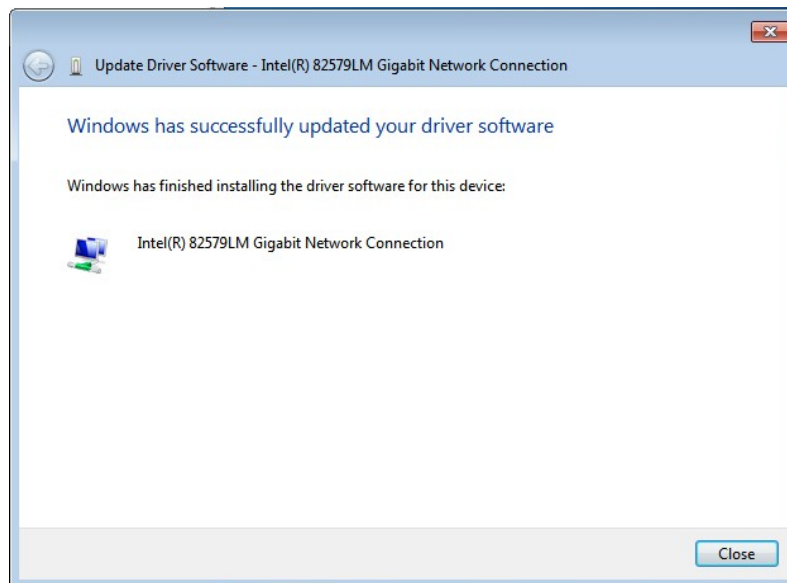


Figure 6-19: LAN Driver Installation Complete

6.6 Audio Driver Installation

To install the Audio driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**4-Audio**” and select the folder which corresponds to the operating system.

Step 3: Double click the setup file.

Step 4: The **InstallShield Wizard** is prepared to guide the user through the rest of the process.

Step 5: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 6-20**).

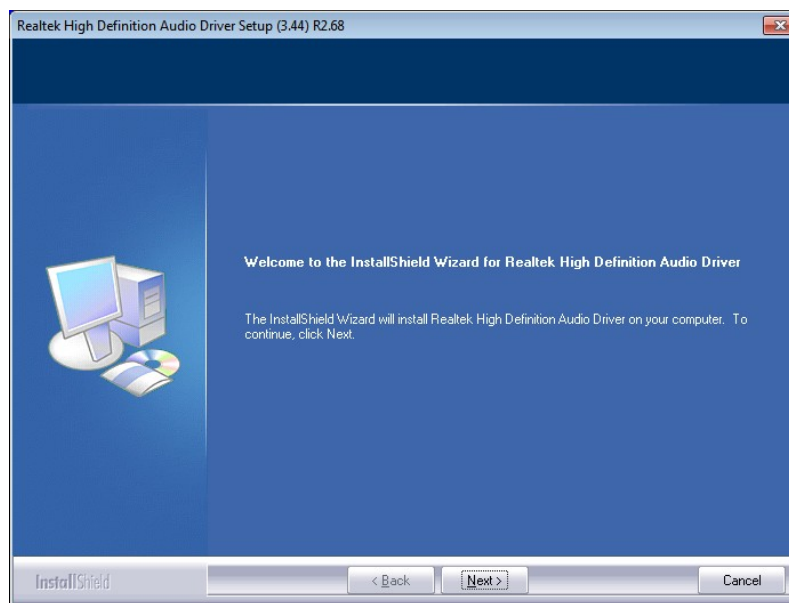
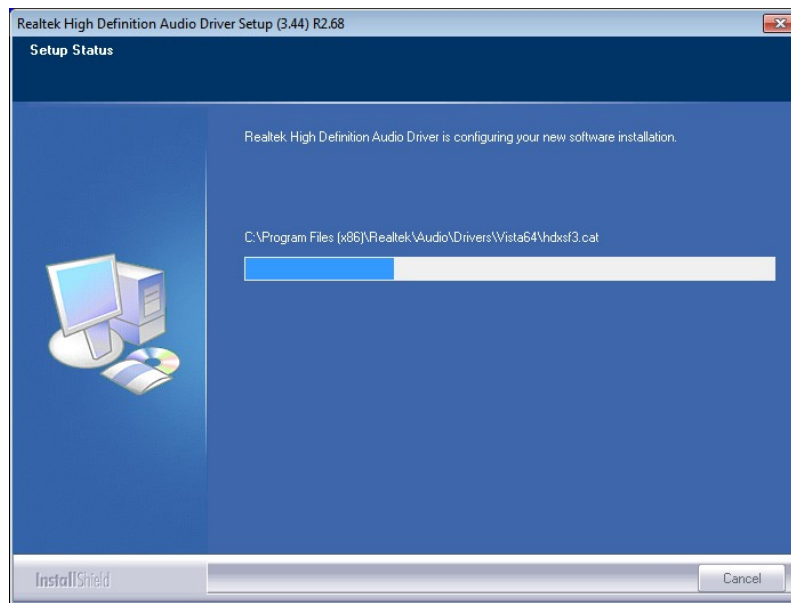


Figure 6-20: Audio Driver Welcome Screen

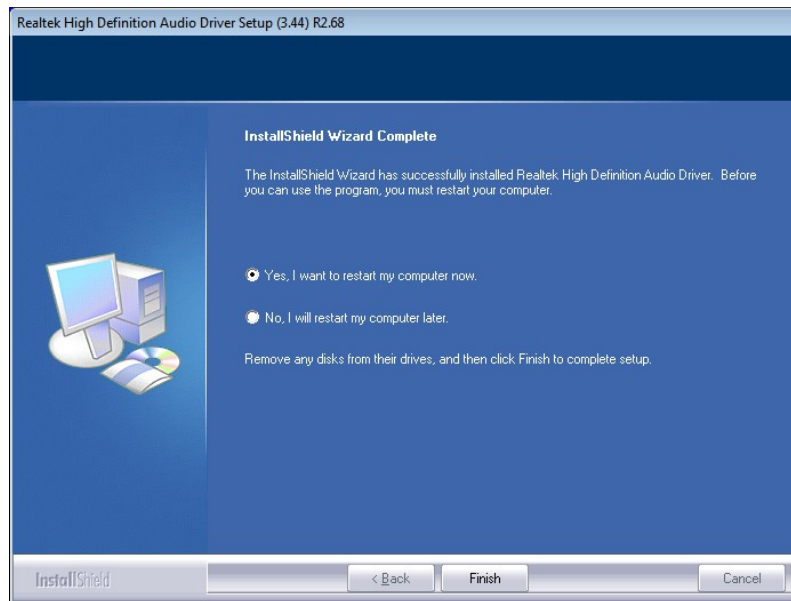
Step 6: Click **Next** to continue.

Step 7: The program begins to install. The installation progress can be monitored in the progress bar shown in **Figure 6-21**.

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**Figure 6-21: Audio Driver Installation**

Step 8: When the driver installation is complete, the screen in **Figure 6-22** appears.

**Figure 6-22: Audio Driver Installation Complete**

Step 9: Select “**Yes, I want to restart my computer now**” and click **Finish**.

Step 10: The system reboots.

6.7 Intel® Rapid Storage Technology Driver Installation

To install the Intel® Rapid Storage Technology driver, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**5-SATA**”.

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-23** appears.

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



Figure 6-23: SATA RAID Driver Welcome Screen

Step 6: The license agreement in **Figure 6-24** appears.

Step 7: Read the **License Agreement**.

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

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Figure 6-24: SATA RAID Driver License Agreement

Step 9: The **Read Me** file in Figure 6-25 appears.

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

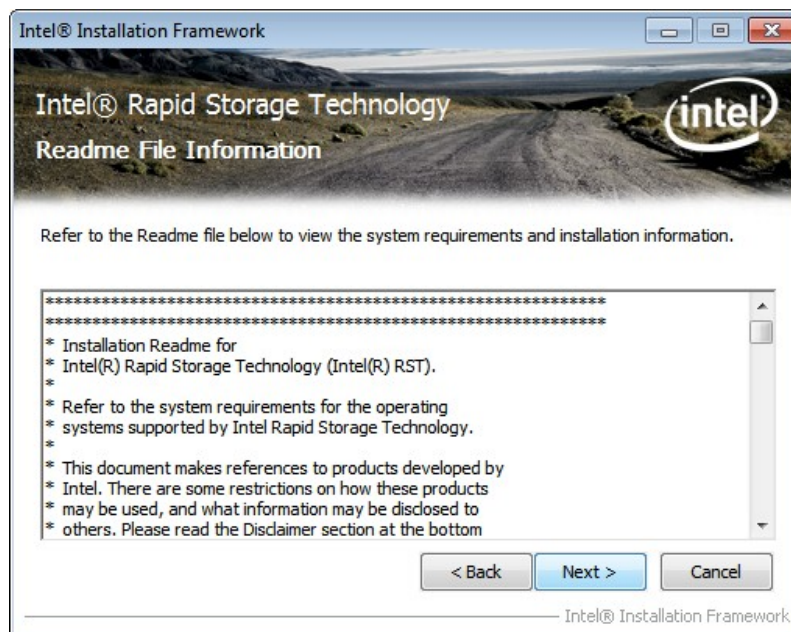


Figure 6-25: SATA RAID Driver Read Me File

Step 11: Setup Operations are performed as shown in **Figure 6-26**.

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

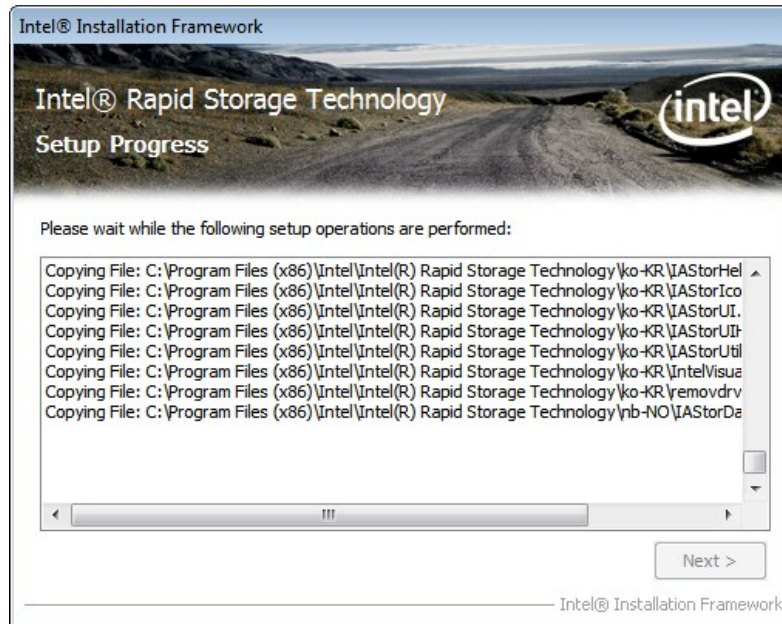


Figure 6-26: SATA RAID Driver Setup Operations

Step 13: The **Finish** screen in **Figure 6-27** appears.

Step 14: Select “**Yes, I want to restart this computer now**” and click **Finish**. **Step 0:**



Figure 6-27: SATA RAID Driver Installation Finish Screen

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6.8 USB 3.0 Driver Installation

**WARNING:**

Do not run this driver's installer (Setup.exe) from a USB storage device (ie. external USB hard drive or USB thumb drive). For proper installation, please copy driver files to a local hard drive folder and run from there.

To install the USB 3.0 driver, please follow the steps below.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click "**6-USB 3.0**".

Step 3: Locate the setup file and double click on it.

Step 4: The **Welcome Screen** in **Figure 6-28** appears.

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



Figure 6-28: USB 3.0 Driver Welcome Screen

Step 6: The license agreement in **Figure 6-29** appears.

Step 7: Read the **License Agreement**.

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



Figure 6-29: USB 3.0 Driver License Agreement

Step 9: The **Read Me** file in **Figure 6-30** appears.

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



Figure 6-30: USB 3.0 Driver Read Me File

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Step 11: Setup Operations are performed as shown in **Figure 6-31**.

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

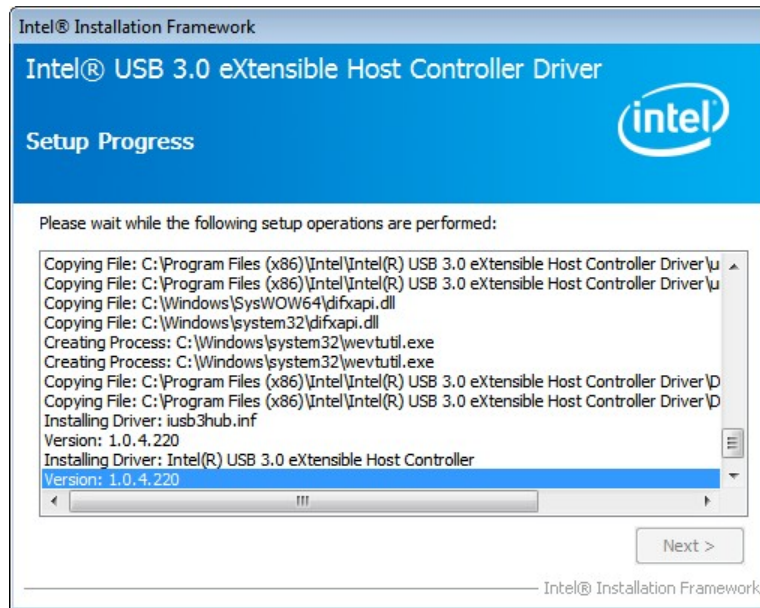


Figure 6-31: USB 3.0 Driver Setup Operations

Step 13: The **Finish** screen in **Figure 6-32** appears.

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



Figure 6-32: USB 3.0 Driver Installation Finish Screen

6.9 Intel® AMT Driver Installation

The package of the Intel® AMT components includes

- Intel® Management Engine Interface (Intel® ME Interface)
- Intel® Dynamic Application Loader
- Intel® Identity Protection Technology (Intel® IPT)
- Serial Over LAN (SOL)
- Intel® Manageability Engine Firmware Recovery Agent
- Intel® Management and Security Status
- Local Management Service (LMS)
- User Notification Service (UNS)

To install these Intel® AMT components, please do the following.

Step 1: Access the driver list. (See **Section 6.2**)

Step 2: Click “**7-iAMT Driver & Utility**”.

Step 3: Locate the setup file and double click it.

Step 4: When the setup files are completely extracted the **Welcome Screen** in **Figure 6-33** appears.

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

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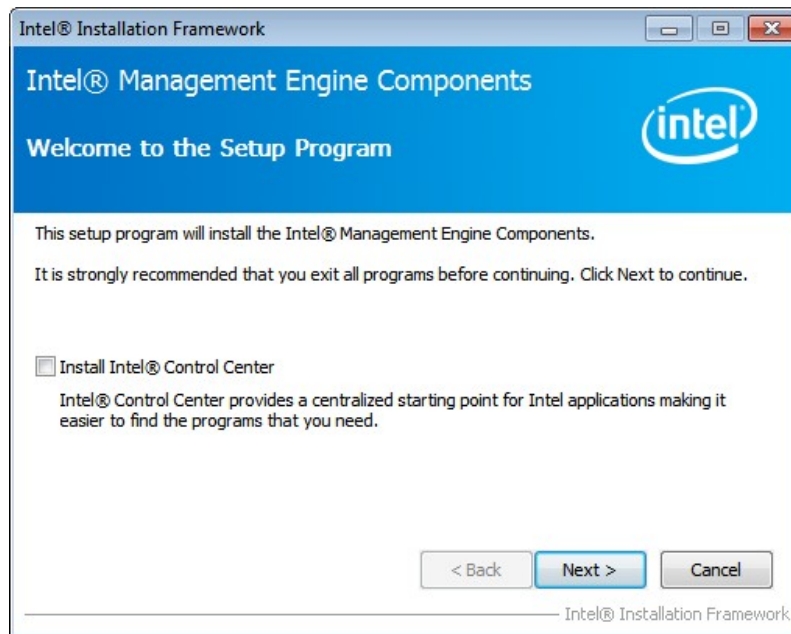


Figure 6-33: Intel® ME Driver Welcome Screen

Step 6: The license agreement in **Figure 6-34** appears.

Step 7: Read the **License Agreement**.

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

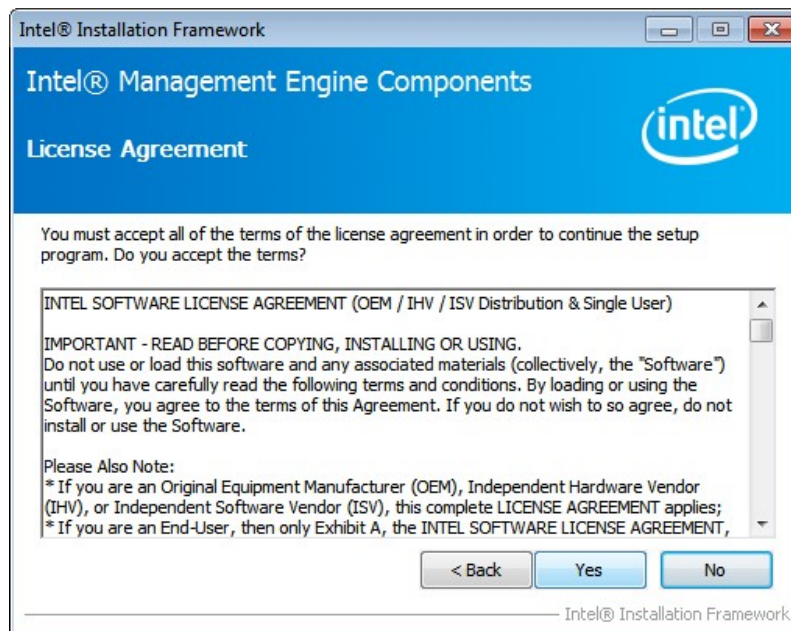


Figure 6-34: Intel® ME Driver License Agreement

Step 9: **Setup Operations** are performed as shown in **Figure 6-35**.

Step 10: Once the **Setup Operations** are complete, click **Next** to continue.

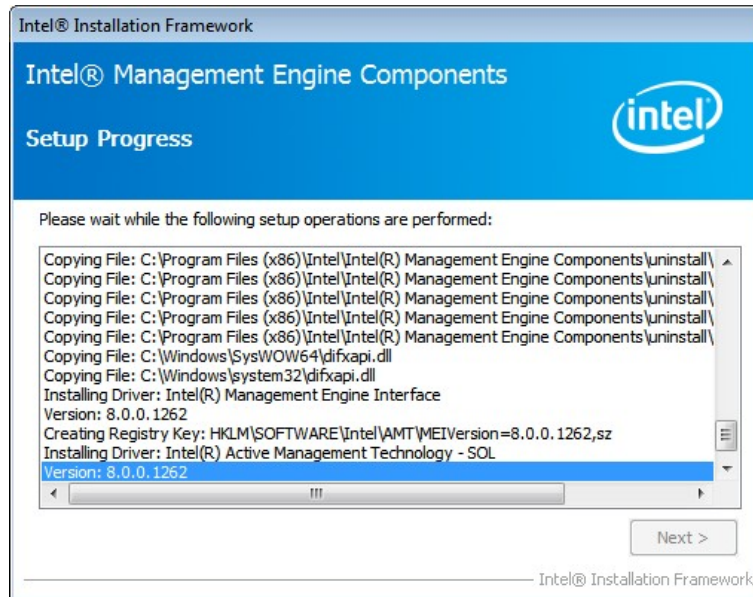


Figure 6-35: Intel® ME Driver Setup Operations

Step 11: The **Finish** screen in **Figure 6-36** appears.

Step 12: Select “**Yes, I want to restart this computer now**” and click **Finish**.

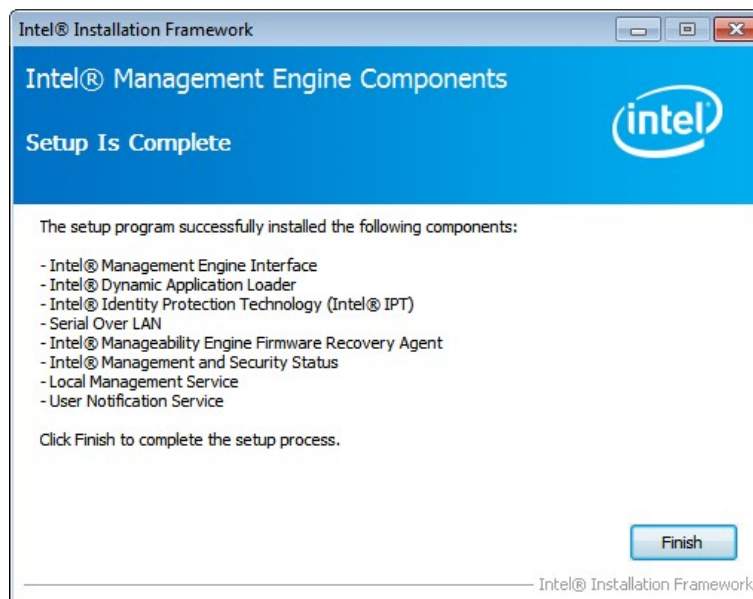


Figure 6-36: Intel® ME Driver Installation Finish Screen

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

System Overview	42
System Date [xx/xx/xx]	42
System Time [xx:xx:xx]	42
ACPI Sleep State [S1 only (CPU Stop Clock)]	44
Wake system with Fixed Time [Disabled]	45
Security Device Support [Disable]	46
Hyper-threading [Enabled]	48
Intel Virtualization Technology [Disabled]	48
Hyper-Threading [Enabled]	48
SATA Mode Selection [IDE]	49
Intel(R) Rapid Start Technology [Disabled]	50
Intel AMT [Enabled]	52
Un-Configure ME [Disabled]	52
USB Devices	53
Legacy USB Support [Enabled]	53
PC Health Status	54
Fan 1 Smart Fan Control [Auto Mode]	55
Auto mode fan start/off temperature	55
Auto mode fan start PWM	55
Auto mode fan slope PWM	55
Serial Port [Enabled]	57
Change Settings [Auto]	57
Serial Port [Enabled]	57
Change Settings [Auto]	58
FAN1/FAN2 Smart Fan Mode [Manual Mode]	59
Fan1/ Fan2 expect PWM Output	60
Console Redirection [Disabled]	60
Terminal Type [ANSI]	60
Bits per second [115200]	61
Data Bits [8]	61
Parity [None]	61
Stop Bits [1]	62
Auto Recovery Function [Disabled]	63

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Azalia [Enabled]	65
Restore AC Power Loss [Last State]	65
PCIE1/PCIE2/PCIE3/PCIE4/PCIE5/M_PCIE1/M_PCIE2 Slot	66
VT-d [Disabled]	67
Primary Display [Auto]	68
DVMT Pre-Allocated [256M]	68
DVMT Total Gfx Mem [MAX]	69
Primary IGFX Boot Display [VBIOS Default]	69
LCD Panel Type [By Hardware]	69
Backlight Control [Inverted]	70
PCIEX16_1 – Gen X [Auto]	70
Enable PEG [Auto]	71
Detect Non-Compliance Device [Disabled]	71
Bootup NumLock State [On]	72
Quiet Boot [Enabled]	73
Option ROM Messages [Force BIOS]	73
Launch PXE OpROM [Disabled]	73
UEFI Boot [Disabled]	73
Administrator Password	74
User Password	74
Save Changes and Reset	75
Discard Changes and Reset	75
Restore Defaults	75
Save as User Defaults	75
Restore User Defaults	75

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.

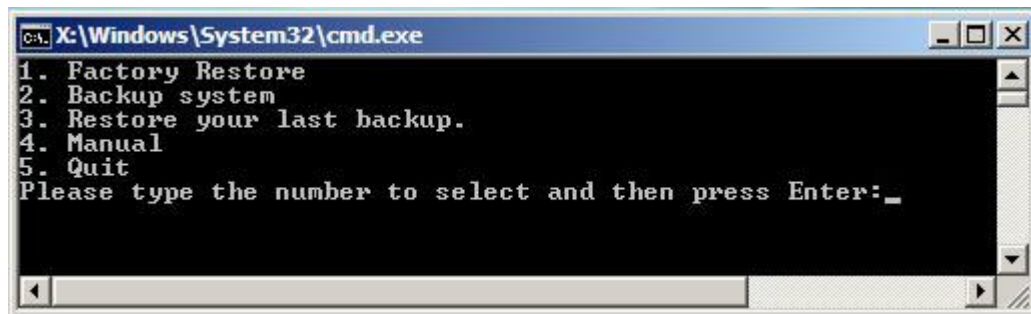


Figure B-1: IEI One Key Recovery Tool Menu

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-up 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**.

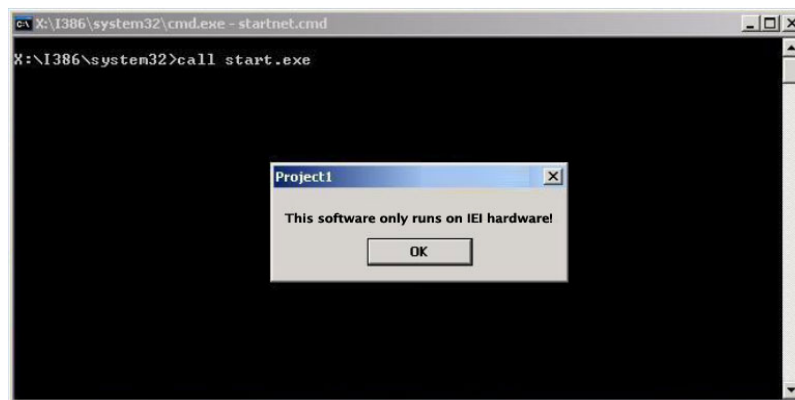

NOTE:

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

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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 system (OS). The supported OS versions are listed below.

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



NOTE:

The auto recovery function (described in **Section 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**)

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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!

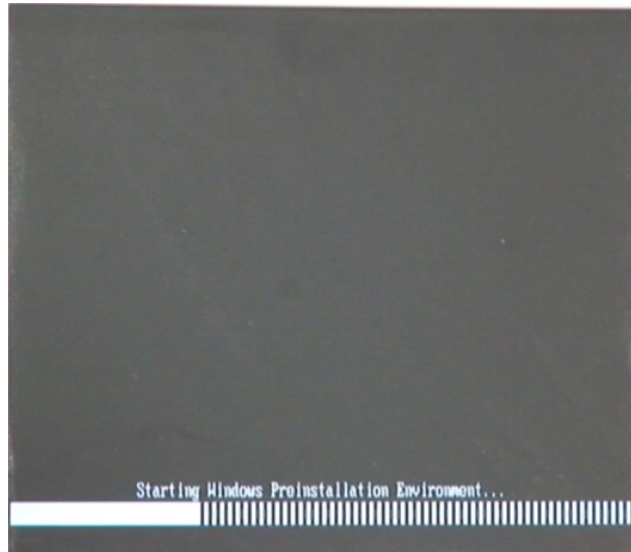


Figure B-2: Launching the Recovery Tool

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

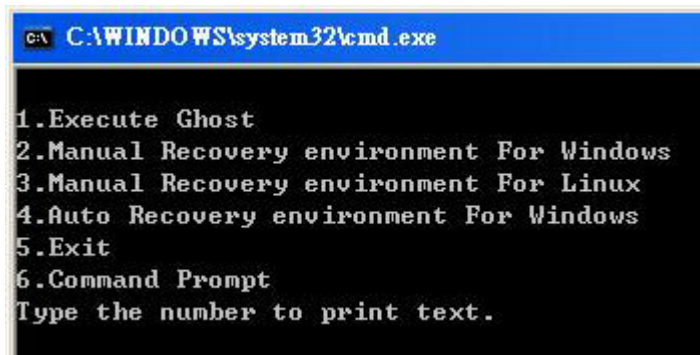


Figure B-3: Recovery Tool Setup Menu

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

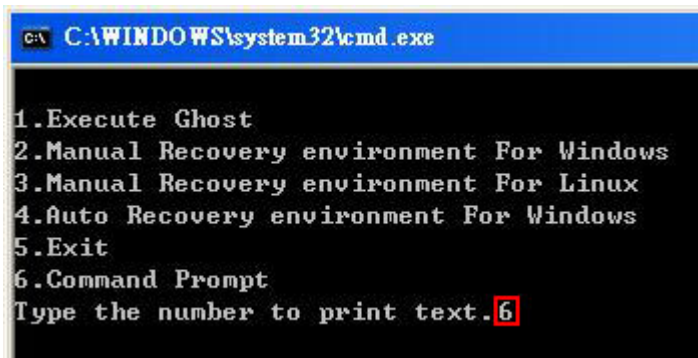


Figure B-4: Command Prompt

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

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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 Build-up Recovery Partition

- Step 1:** Put the recover CD in the optical drive.
- Step 2:** Start the system.
- Step 3:** **Boot the system from 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!

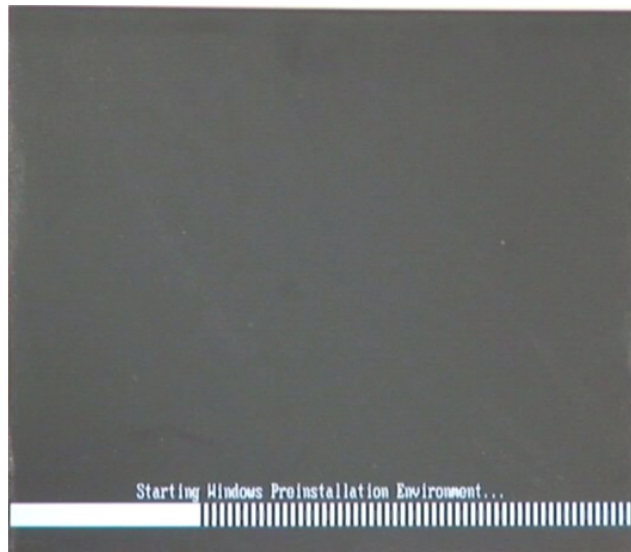


Figure B-6: Launching the Recovery Tool

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

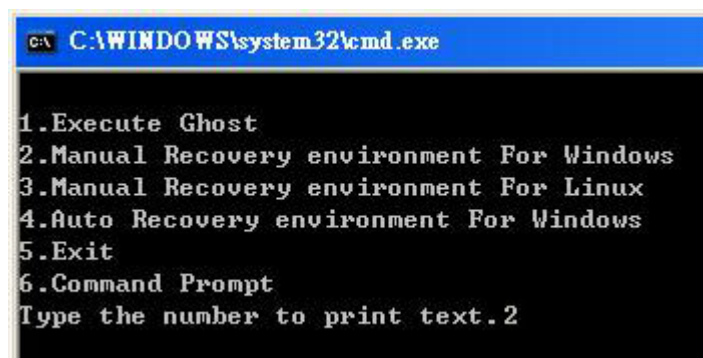


Figure B-7: Manual Recovery Environment for Windows

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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.

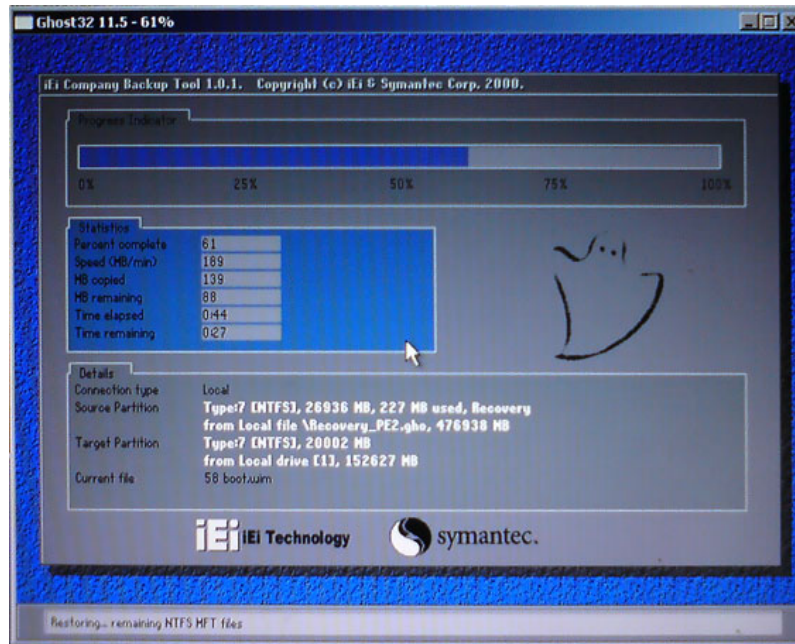


Figure B-8: Building the Recovery Partition

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

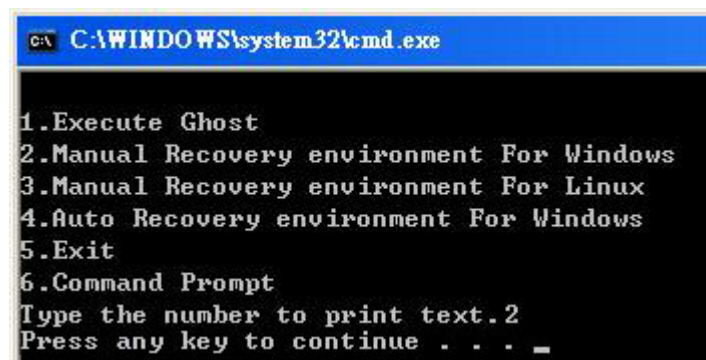


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

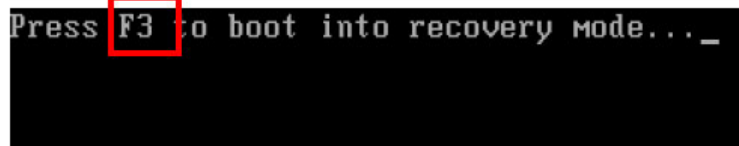


NOTE:

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**)

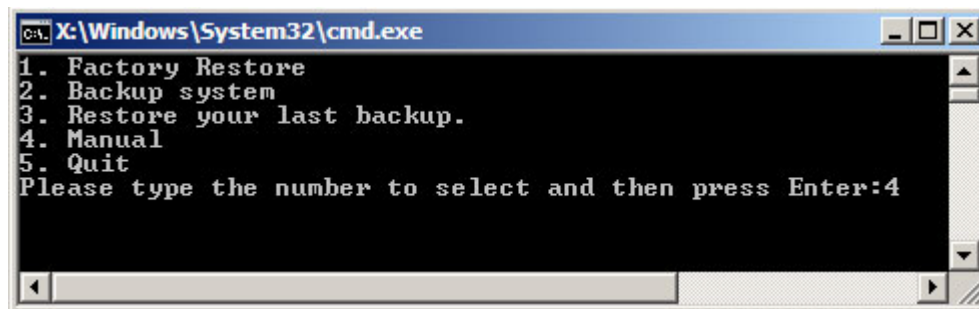


Figure B-11: Recovery Tool Menu

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

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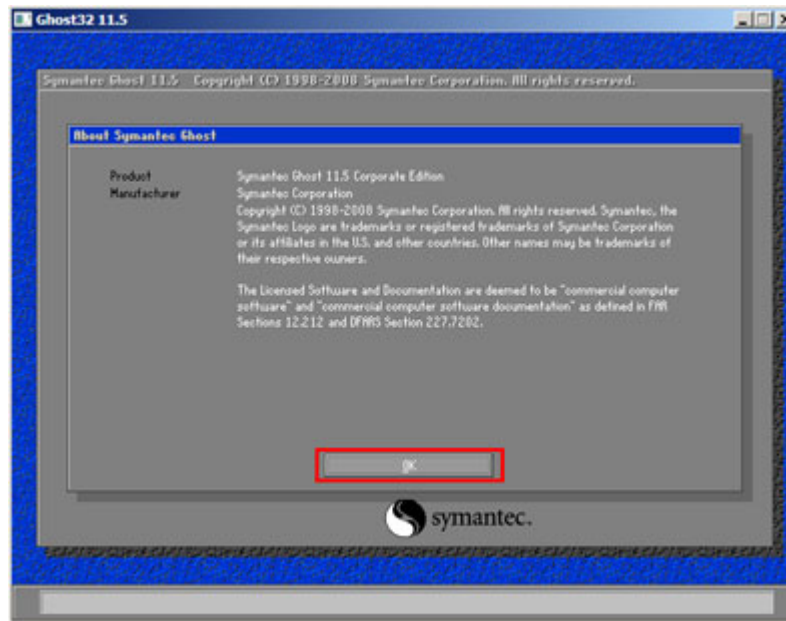


Figure B-12: About Symantec Ghost Window

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

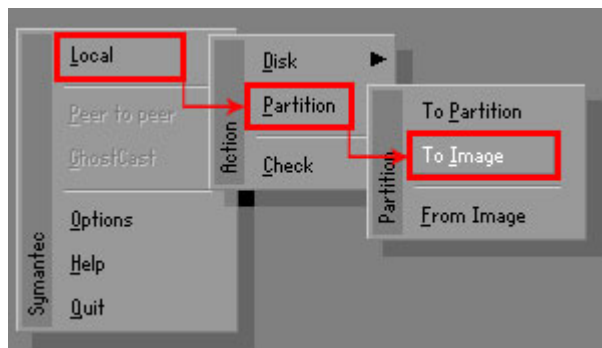


Figure B-13: Symantec Ghost Path

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

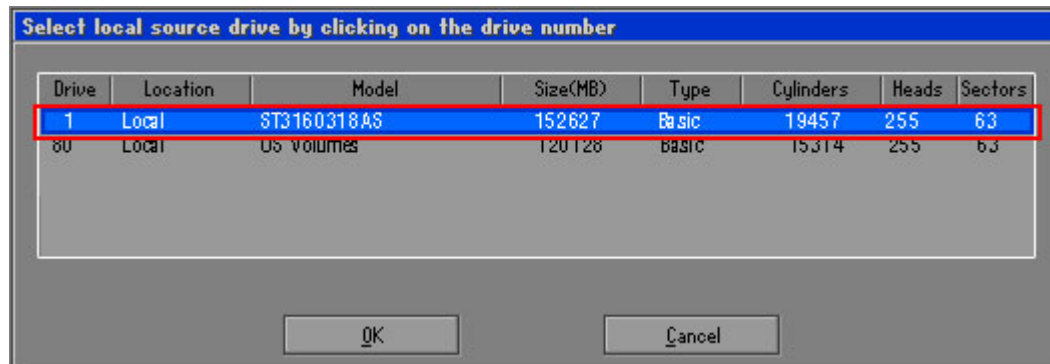


Figure B-14: Select a Local Source Drive

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

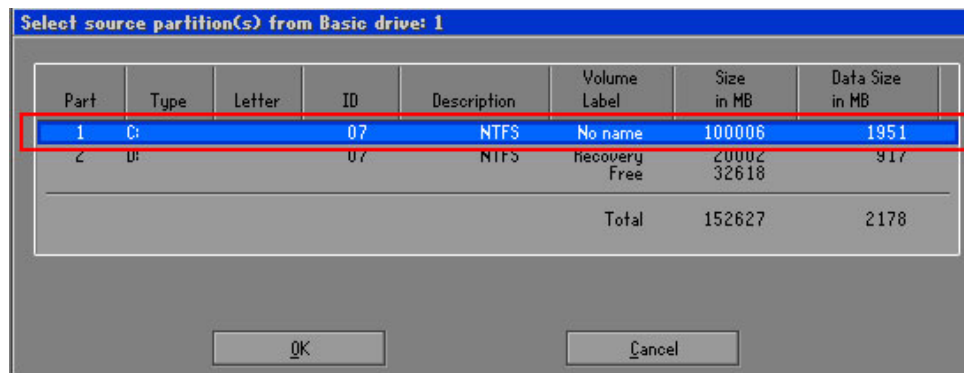


Figure B-15: Select a Source Partition from Basic Drive

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**.

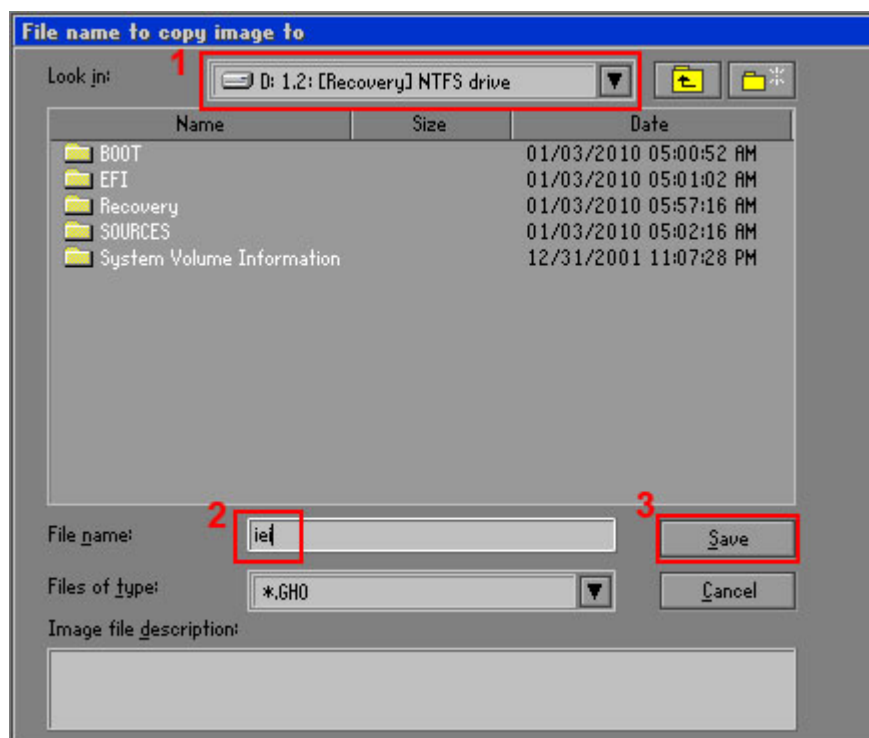


Figure B-16: File Name to Copy Image to

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

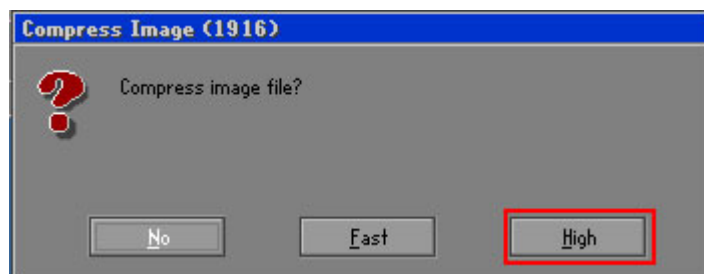


Figure B-17: Compress Image

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

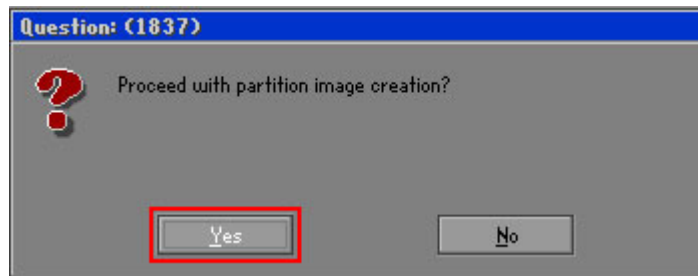


Figure B-18: Image Creation Confirmation

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

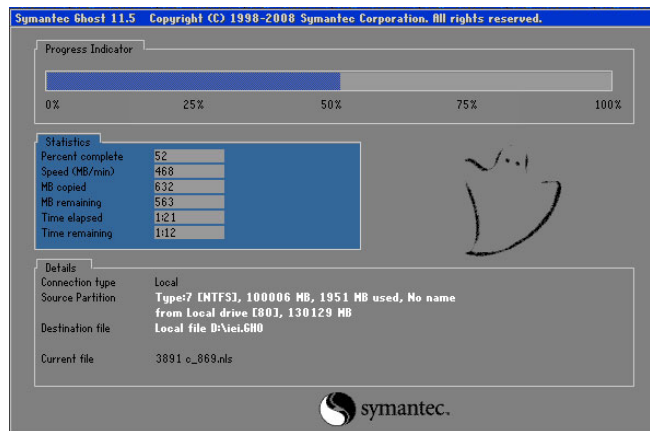


Figure B-19: Image Creation Complete

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.

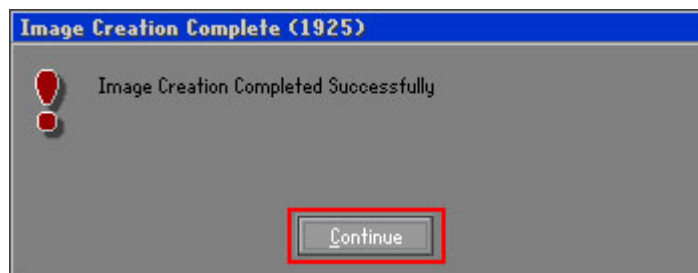


Figure B-20: Image Creation Complete

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

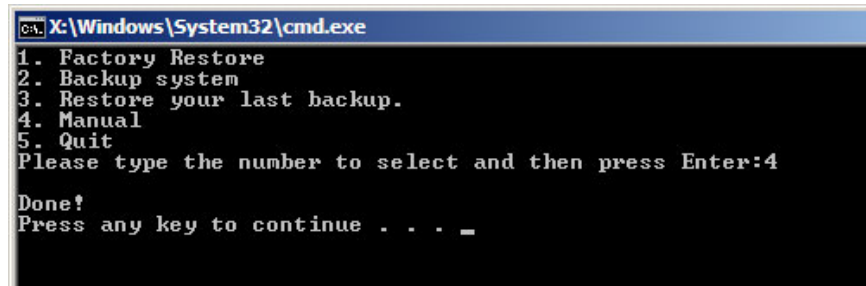


Figure B-21: Press Any Key to Continue

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**)

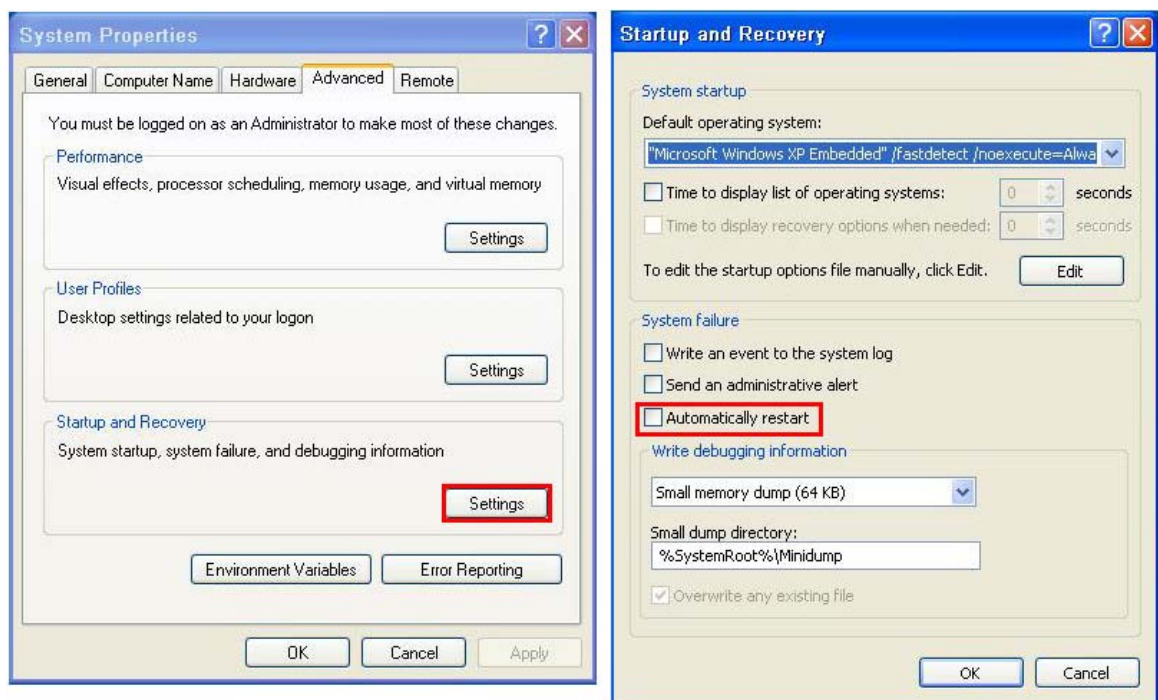


Figure B-23: Disable Automatically Restart

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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!

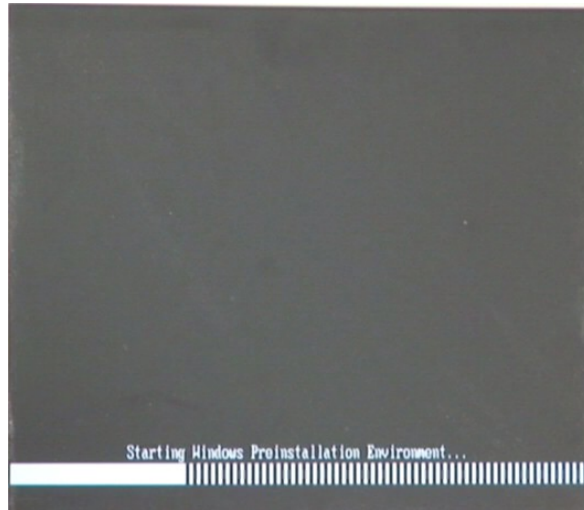


Figure B-24: Launching the Recovery Tool

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

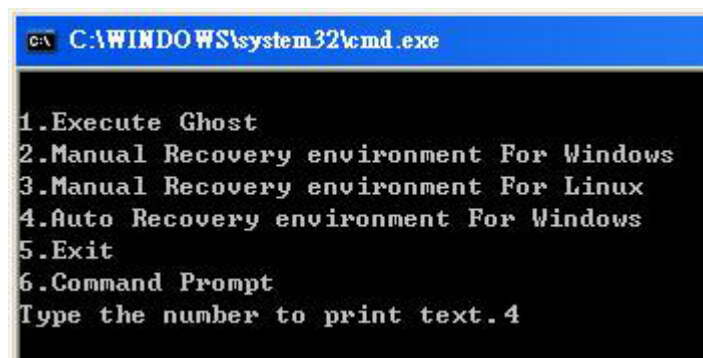


Figure B-25: Auto Recovery Environment for Windows

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.

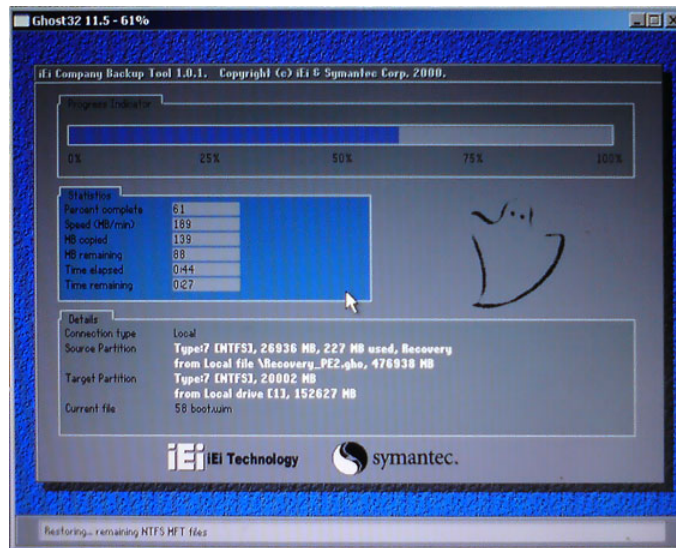


Figure B-26: Building the Auto Recovery Partition

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

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

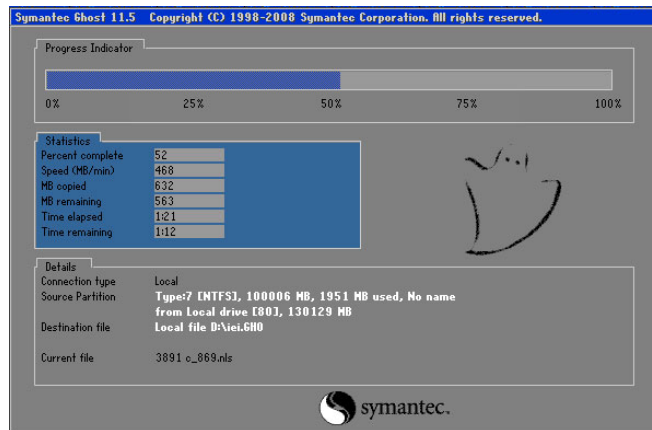


Figure B-28: Image Creation Complete

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

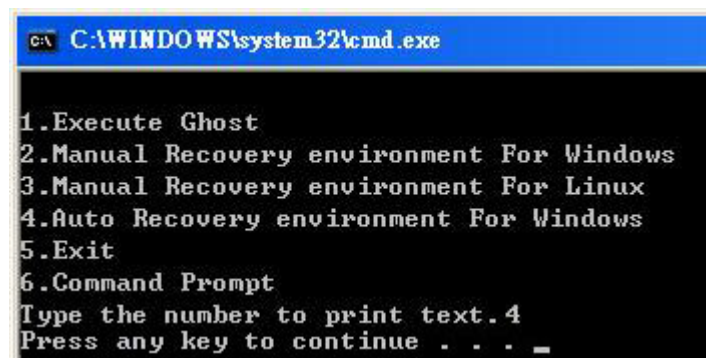


Figure B-29: Press any key to continue

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**).

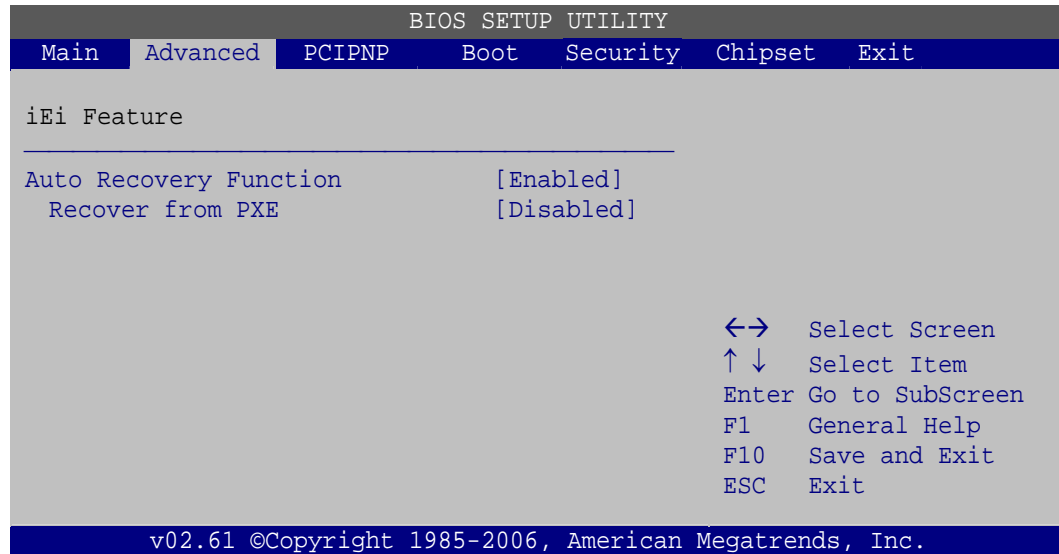


Figure B-30: IEI Feature

Step 13: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

B.4 Setup Procedure for Linux

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

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

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- Partition 1: /
- Partition 2: SWAP

**NOTE:**

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

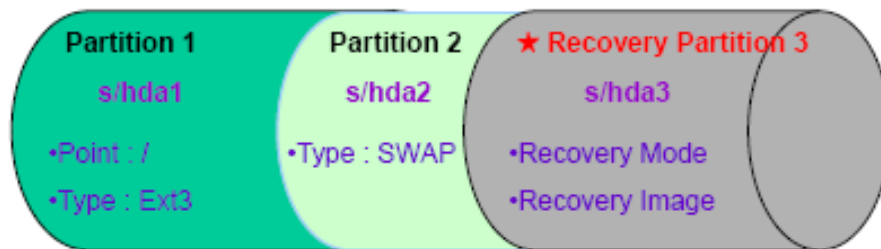


Figure B-31: Partitions for Linux

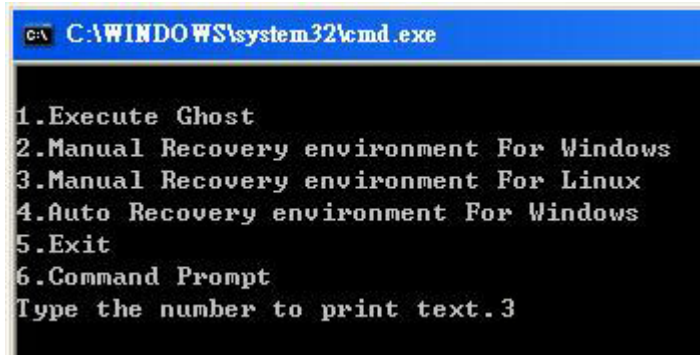
Step 3: Create a recovery partition. Insert the recovery CD into the optical disk drive.

Follow **Step 1 ~ Step 3** described in **Section 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-up recovery partition. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <3> and press <Enter> (**Figure B-32**). The Symantec Ghost window appears and starts configuring the system to build-up a

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



```
C:\WINDOWS\system32\cmd.exe

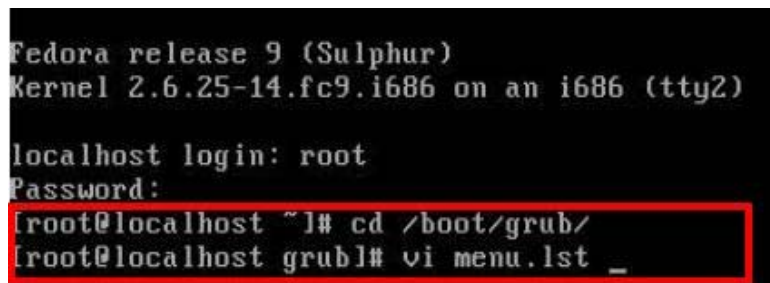
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
```

Figure B-32: System Configuration for Linux

Step 5: Access the recovery tool main menu by modifying the “menu.lst”. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, 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-33: Access menu.lst in Linux (Text Mode)

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

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

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

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

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

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

Figure B-34: 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.

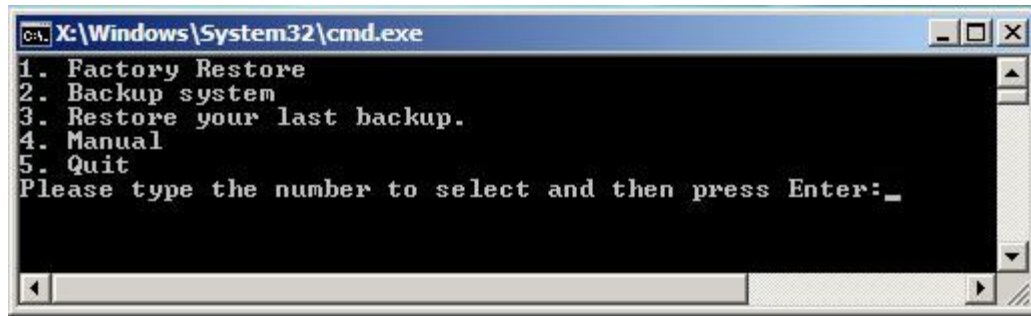


Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

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

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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.

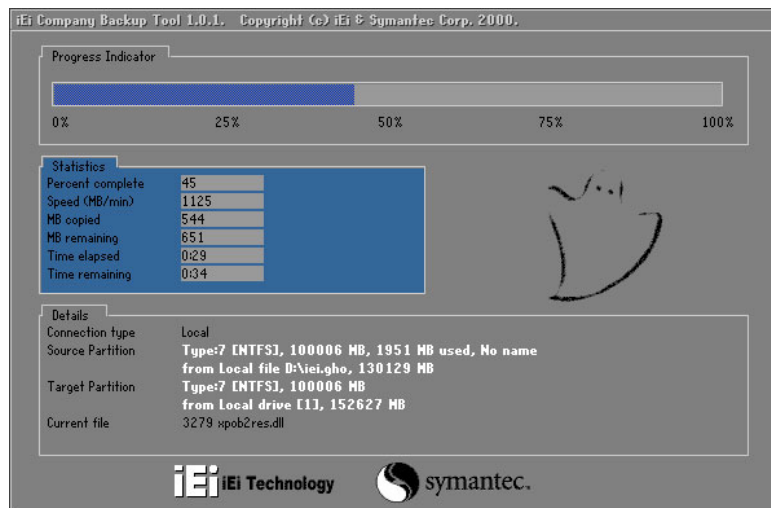


Figure B-36: Restore Factory Default

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

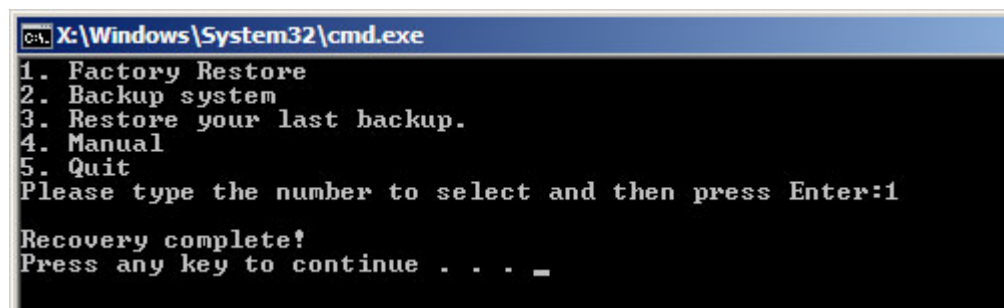


Figure B-37: Recovery Complete Window

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.

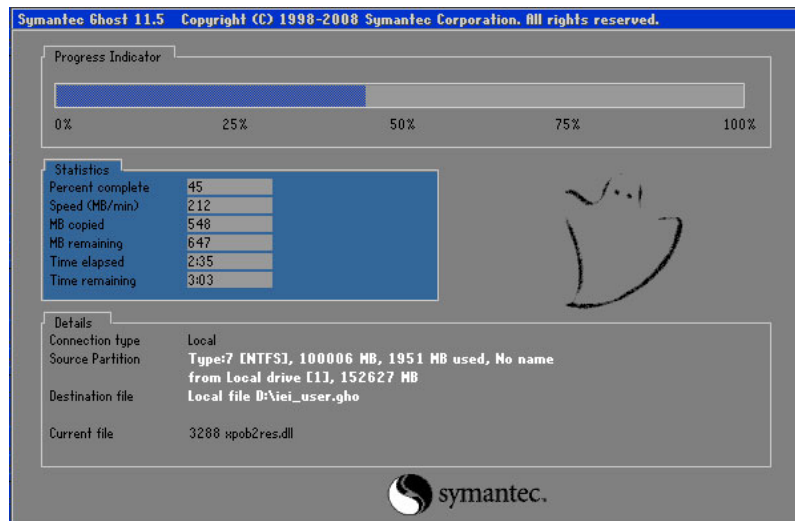


Figure B-38: Backup System

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

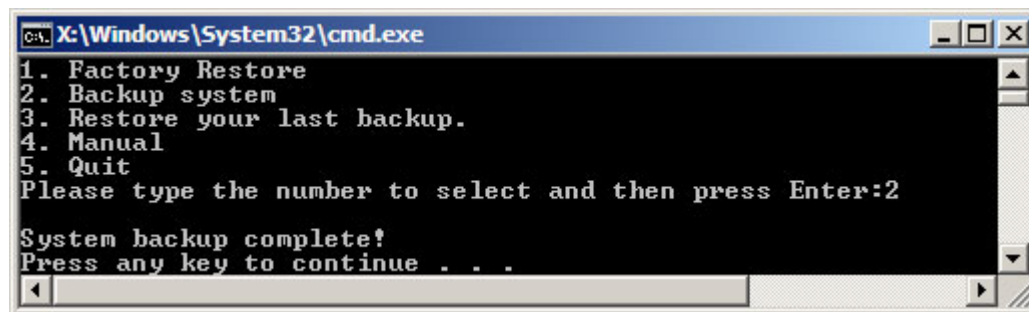


Figure B-39: System Backup Complete Window

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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).

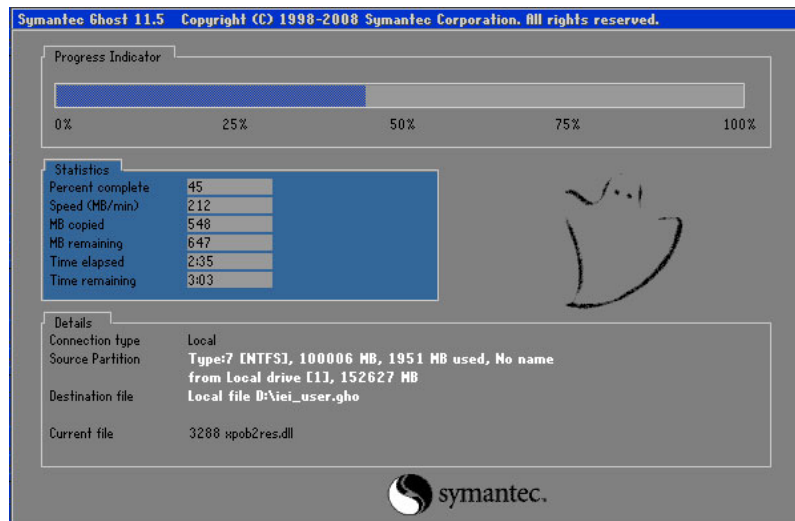


Figure B-40: Restore Backup

Step 3: The screen shown in **Figure B-41** appears when backup recovery is complete. Press any key to reboot the system.

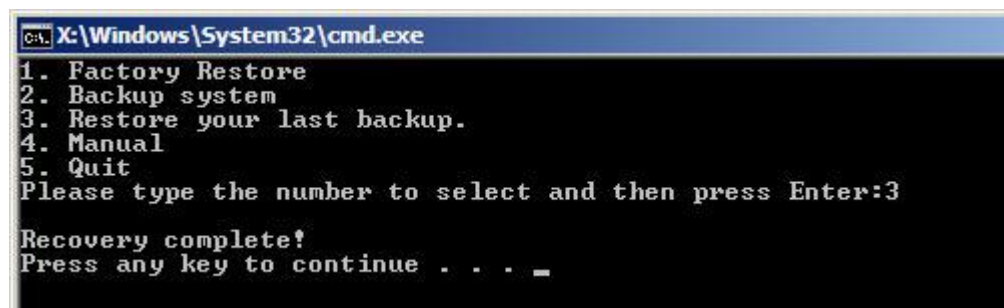


Figure B-41: Restore System Backup Complete Window

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.

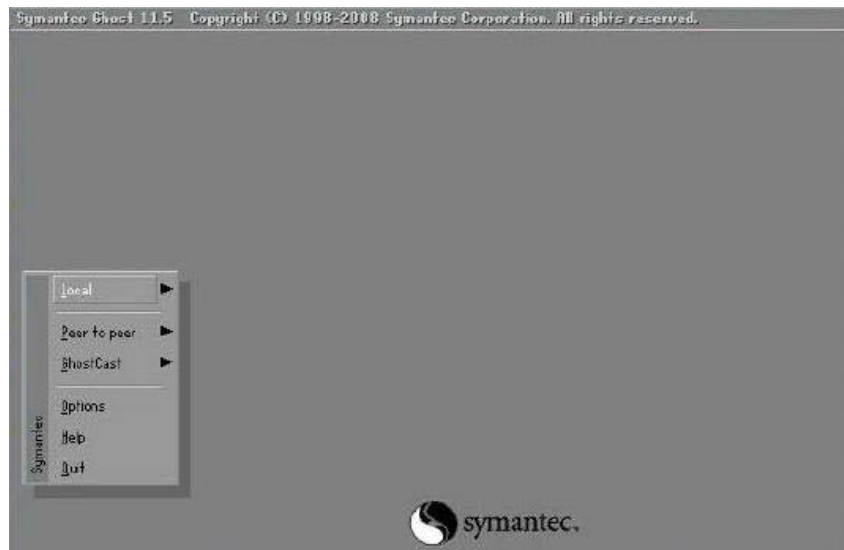
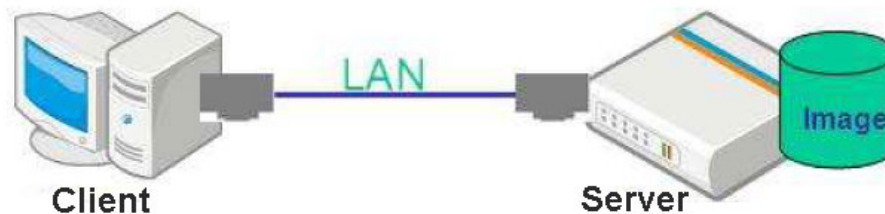


Figure B-42: Symantec Ghost Window

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 other-ntp-servers       192.168.1.1;
}
```

Debian

`#vi /etc/dhcpd.conf`

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

`next-server PXE server IP address;`

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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 -m /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 -xvjf RecoveryR10.tar.bz2
```

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

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


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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-43**)

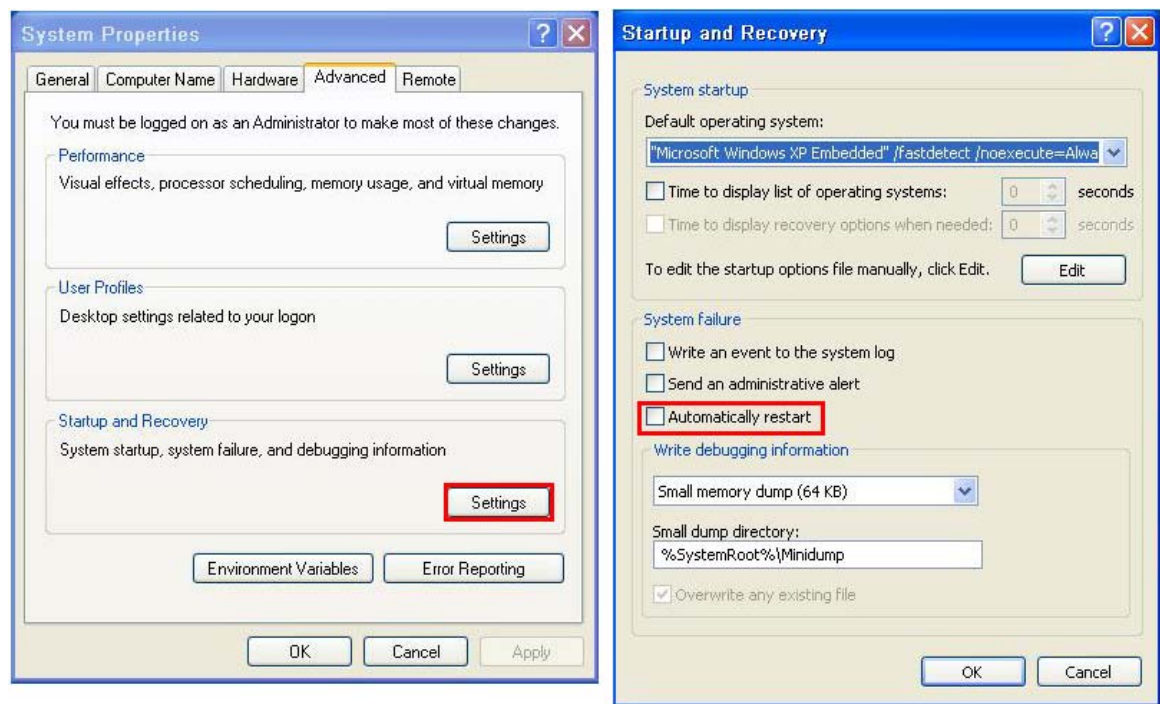


Figure B-43: Disable Automatically Restart

Step 2: Configure the following BIOS options of the client system.

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

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

Boot → Launch PXE OpROM → **Enabled**

Step 3: Continue to configure the **Boot Option Priorities** BIOS option of the client system:

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

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

Step 4: Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

Step 5: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility

MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



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)

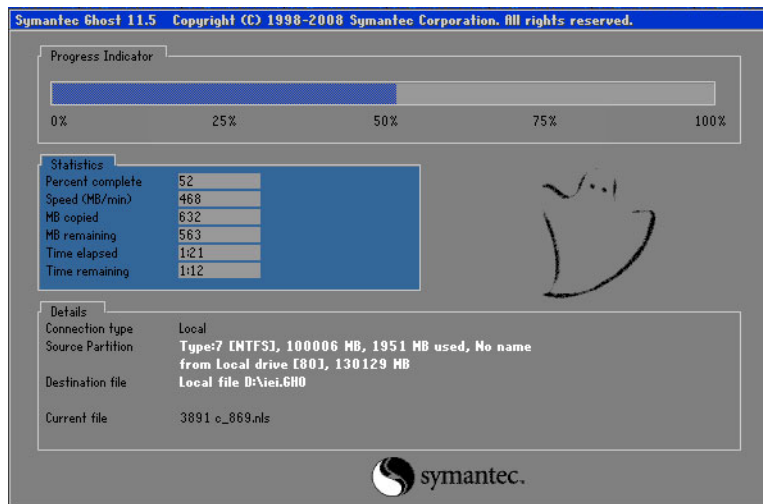
CLIENT MAC ADDR: 00 18 7D 13 E6 89  GUID: 00020003-0004-0005-0006-0007000000
DHCP.._
```

```
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
```


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**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

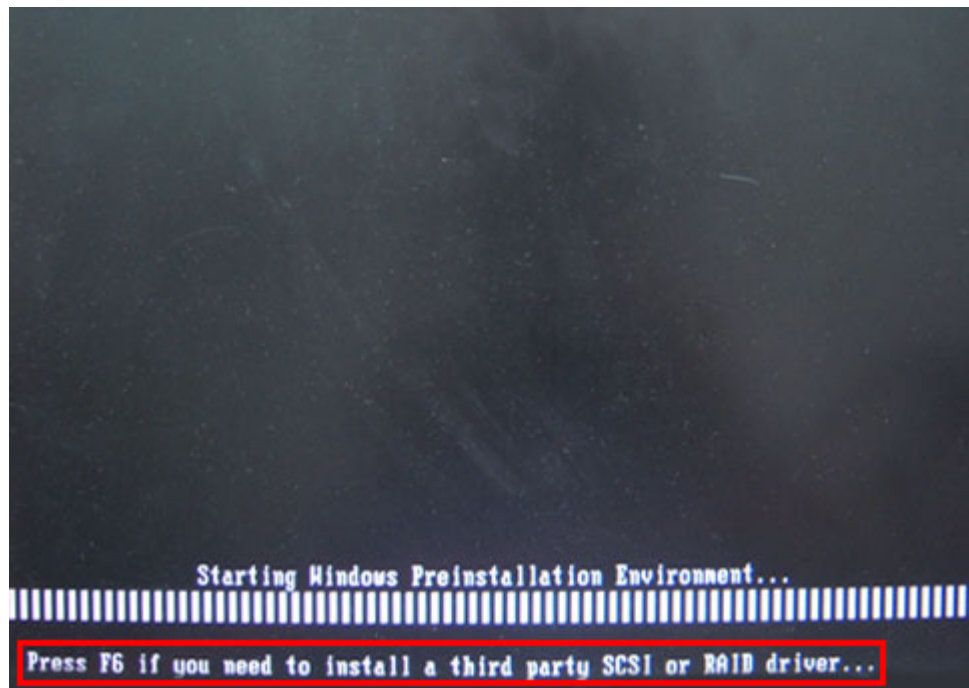
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

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.

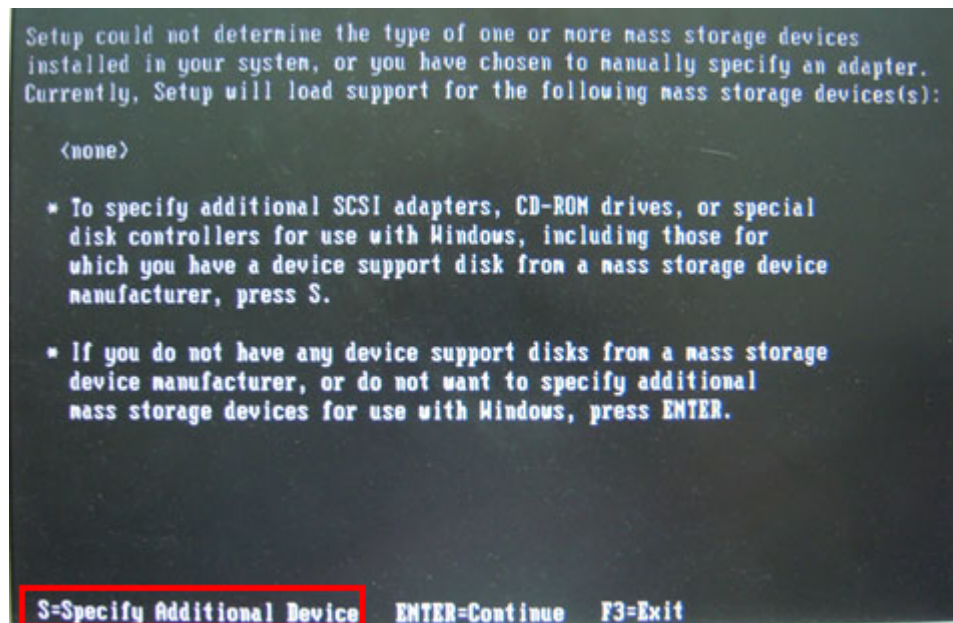
Step 2: Connect the USB floppy disk drive to the system.

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>.

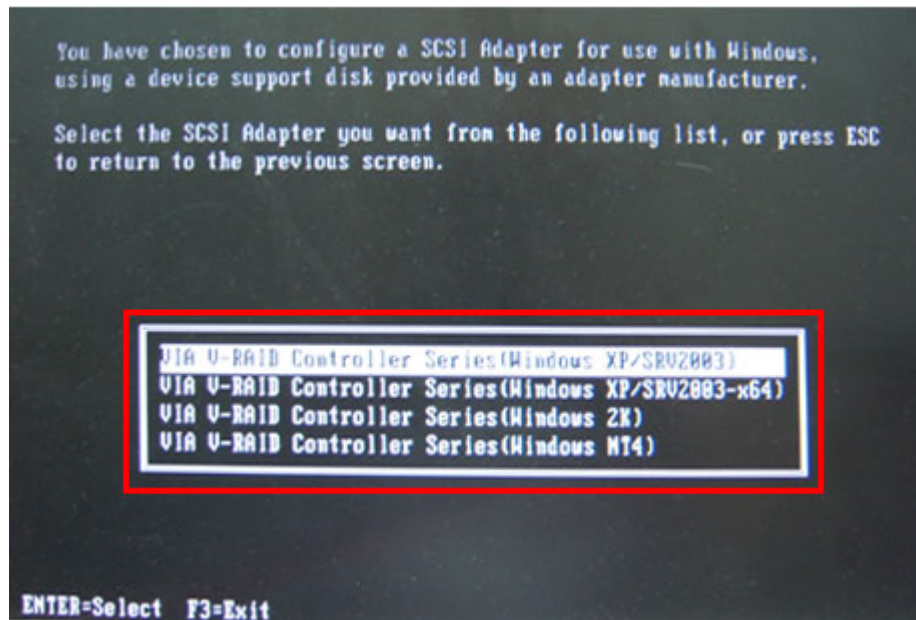


Step 5: When the following window appears, press <S> to select "Specify Additional Device".



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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

Terminology

ICE-QM770 COM Express Module

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel [®] in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.

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LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Watchdog Timer

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NOTE:

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

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 EMIs 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. When 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 ;

Appendix

E

Hazardous Materials Disclosure

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

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

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

Please refer to the table on the next page.

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Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006</p>						

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

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

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						