

MODEL:
KINO-AA750-i2

Mini-ITX SBC Supports Socket FS1r2 AMD R-Series APU, AMD A75 Chipset, DDR3, HDMI, DVI-D, VGA, iDP, Dual PCIe GbE, SATA 6Gb/s, USB 3.0, PCIe Mini, iRIS-2400, HD Audio and RoHS

User Manual

Revision

Date	Version	Changes
23 April, 2014	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

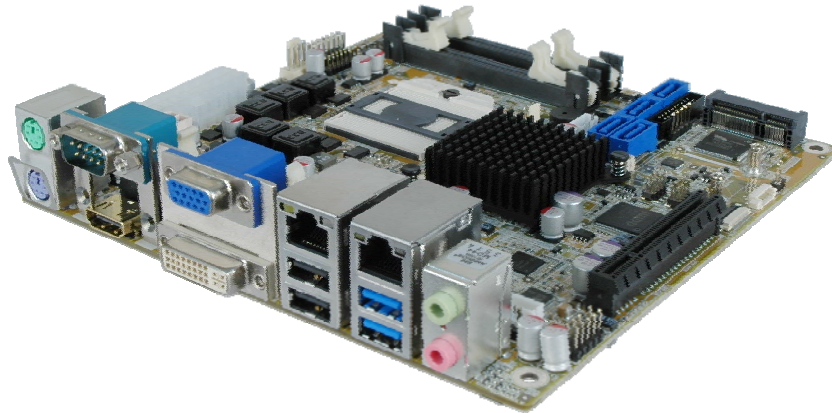


Figure 1-1: KINO-AA750-i2

The KINO-AA750-i2 is a Mini-ITX SBC. It accepts a Socket FS1r2 AMD R-Series APU and supports two 204-pin 1600/1333/1066 MHz dual-channel 1.5V/1.35V/1.25V DDR3 SO-DIMMs up to 16 GB.

The KINO-AA750-i2 provides two GbE interfaces through the Intel® I211-AT and the Intel® I210-AT GbE controllers. The integrated AMD A75 chipset supports four SATA 6Gb/s drives. In addition, the KINO-AA750-i2 includes HDMI, DVI-D, VGA and iDP interfaces for triple independent display.

Two USB 3.0 and two USB 2.0 on the rear panel, four USB 2.0 by pin headers, two RS-232, one RS-422/485, one SD card slot, one PCIe Mini card slot and one PCIe x8 slot provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the KINO-AA750-i2.

KINO-AA750-i2 Mini-ITX SBC

1.2 Features

Some of the KINO-AA750-i2 motherboard features are listed below:

- Mini-ITX form factor
- Socket FS1r2 supports AMD Embedded R-Series APU
- AMD A75 chipset
- Two 204-pin 1600/1333/1066 MHz dual-channel 1.5V/1.35V/1.25V DDR3 SO-DIMMs support up to 16 GB
- Triple independent display via HDMI, DVI-D, VGA and iDP interfaces
- 3D micro-architecture enhancements support DirectX 11, OpenCL 1.1 and OpenGL 4.2
- Rich media acceleration for hardware decode and encode acceleration
- High-speed I/O interfaces, including USB 3.0 and SATA 6Gb/s
- Supports IPMI 2.0 via iRIS-2400 module
- IEL jumper-less function
- One PCIe Mini card slot
- One SIM card slot
- One SD card slot
- RoHS compliant

1.3 Connectors

The connectors on the KINO-AA750-i2 are shown in the figures below.

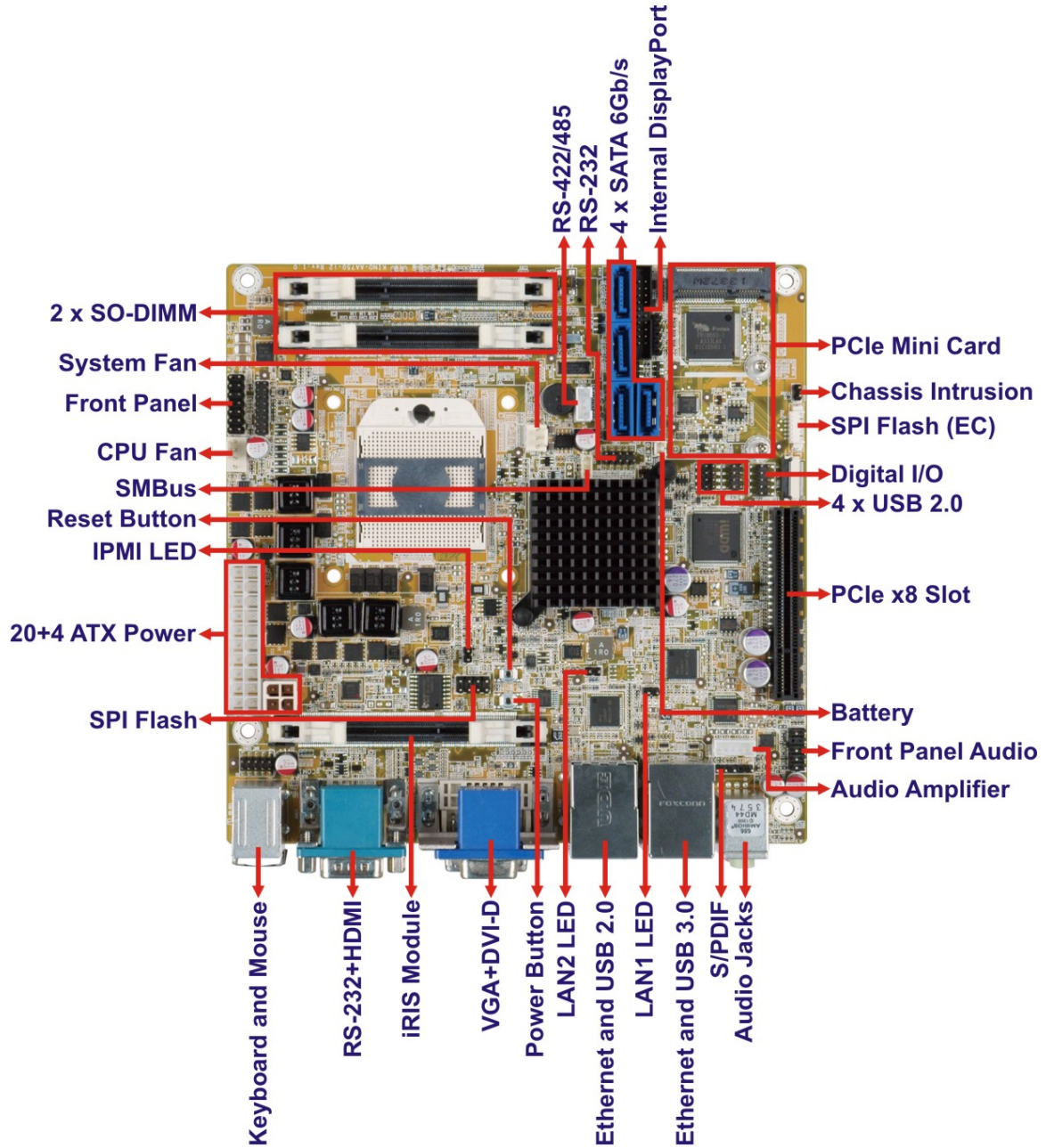


Figure 1-2: Connectors (Front Side)

KINO-AA750-i2 Mini-ITX SBC



Figure 1-3: Connectors (Solder Side)

1.4 Dimensions

The main dimensions of the KINO-AA750-i2 are shown in the diagram below.

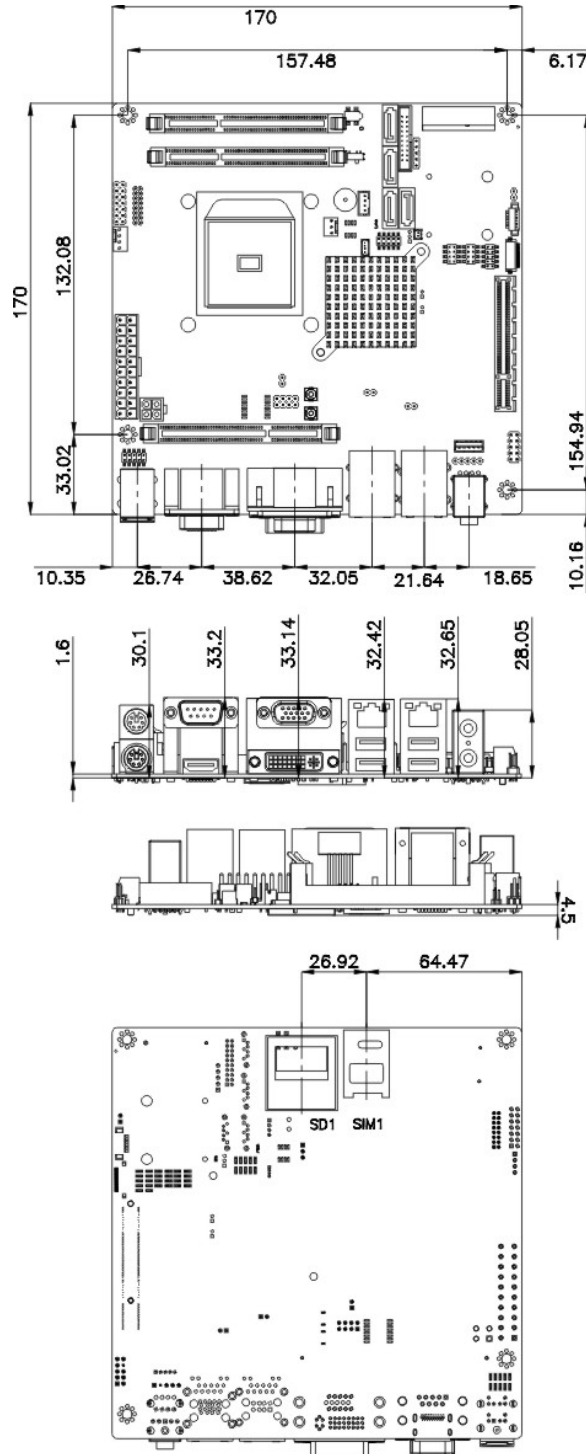


Figure 1-4: KINO-AA750-i2 Dimensions (mm)

KINO-AA750-i2 Mini-ITX SBC

1.5 Data Flow

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

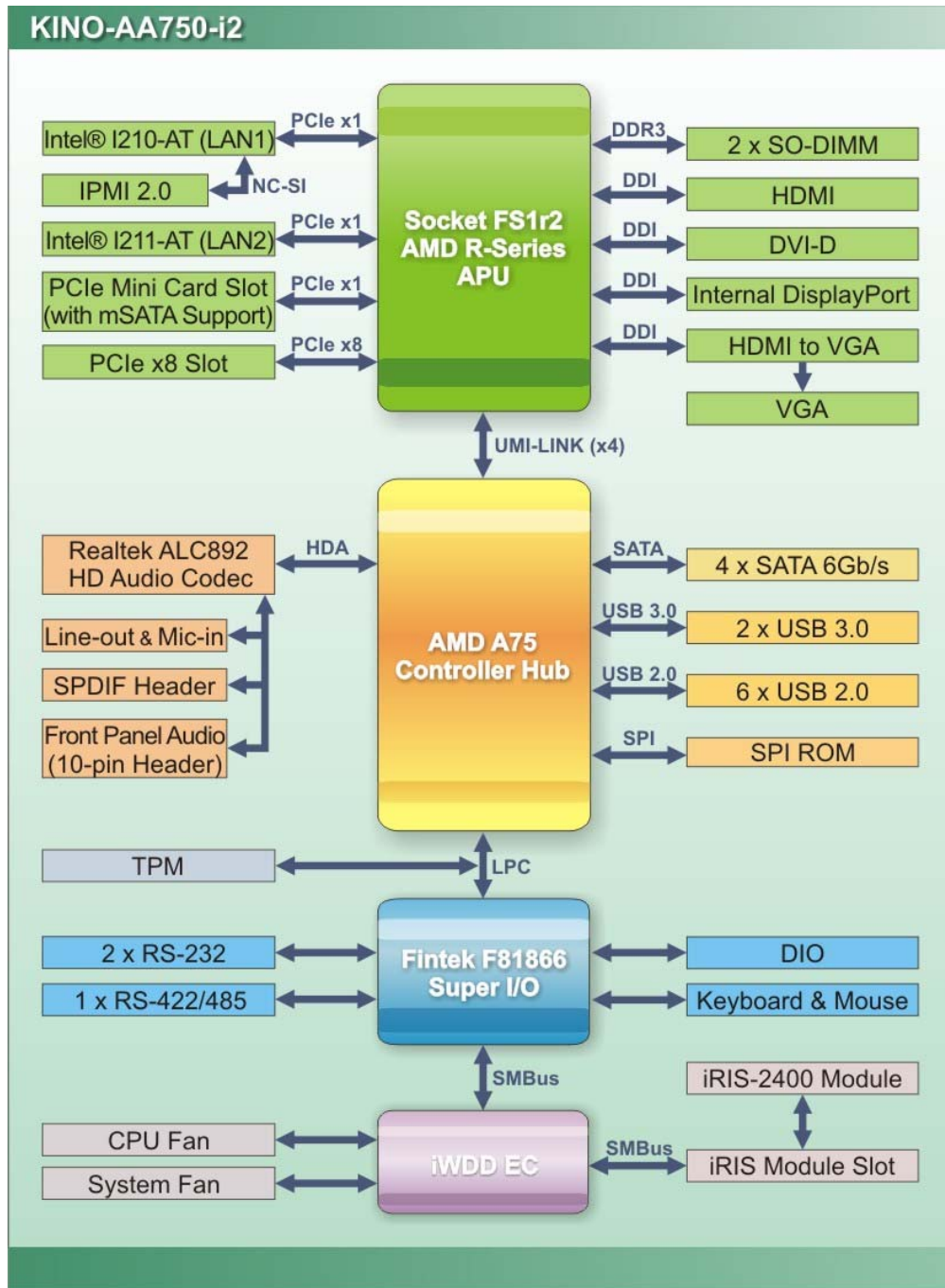


Figure 1-5: Data Flow Diagram

1.6 Technical Specifications

The KINO-AA750-i2 technical specifications are listed in **Table 1-1**.

Specification/Model	KINO-AA750-i2
Form Factor	Mini-ITX
APU	Socket FS1r2 AMD Embedded R-Series APU supported
System Chipset	AMD A75
Memory	Two 204-pin 1600/1333/1066 MHz dual-channel unbuffered DDR3/DDR3L SO-DIMMs supported (system max. 16 GB) Supports 1.5V/1.35V/1.25V DDR3
Graphics Engine	AMD Radeon™ GPU (Radeon™ HD 7000 series), supports DirectX 11, OpenCL 1.1, OpenGL 4.2 and UVD 3 H.264, VC1, MPEG2 and DivX decode
Display Output	One HDMI (up to 1920 x 1080, 60 Hz) One DVI-D (up to 1920 x 1080, 60 Hz) One VGA (up to 1920 x 1200, 60 Hz) One iDP interface for HDMI, LVDS, VGA, DVI and DisplayPort (up to 2560 x 1600, 60 Hz)
BIOS	UEFI BIOS
Ethernet Controllers	LAN1 (LAN_USB1): Intel® I210-AT PCIe GbE controller with NC-SI support LAN2 (LAN_USB2): Intel® I211-AT PCIe GbE controller
Audio	Realtek ALC892 HD Audio codec
Super I/O Controller	Fintek F81866
Embedded Controller	iWDD
Watchdog Timer	Software programmable, supports 1~255 sec. system reset

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Expansions	<p>1 x Full-size/half-size PCIe Mini card slot with mSATA support (co-lay PCIe and SATA)</p> <p>1 x PCIe x8 slot</p> <p>1 x SD card slot</p> <p>1 x SIM card slot</p>
I/O Interface Connectors	
Audio Connectors	<p>Line-out and mic-in audio jacks on rear panel</p> <p>One SPDIF connector (5-pin header)</p> <p>One front panel audio connector (10-pin header)</p> <p>One audio amplifier connector (5-pin wafer) (2 x 3 W)</p>
Chassis Intrusion	One 2-pin header
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet	Two RJ-45 GbE ports
Fan Connectors	<p>One 4-pin wafer connector (CPU fan)</p> <p>One 3-pin wafer connector (system fan)</p>
Front Panel	One 14-pin header (power LED, HDD LED, speaker, power button, reset button)
IPMI 2.0	One iRIS module slot
IPMI LED	One 2-pin header for IPMI LED
Keyboard and Mouse	One PS/2 keyboard and mouse connector
LAN LEDs	Two 2-pin headers for LAN1 LED and LAN2 LED (link signal)
Serial ATA	Four SATA 6Gb/s connectors with RAID support
Serial Ports	<p>Two RS-232 COM connectors (one by pin header, one on rear panel)</p> <p>One RS-422/485 COM connector (4-pin wafer)</p>
SMBus	One 4-pin wafer connector
USB Ports	<p>Two USB 3.0 ports on rear panel</p> <p>Six USB 2.0 ports (two on rear panel, four by pin headers)</p>

Environmental and Power Specifications	
Power Supply	20+4 ATX power Supports AT/ATX power mode
Power Consumption	+12V@2.45A , +5V@3.25A, 3.3V@0.76A (AMD R-460H APU with two 8 GB 1600 MHz DDR3 memory)
Operating Temperature	0°C ~ 60°C
Storage Temperature	-10°C ~ 70°C
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight (GW/NW)	900 g/450 g

Table 1-1: Technical 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 KINO-AA750-i2 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.

KINO-AA750-i2 Mini-ITX SBC






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 KINO-AA750-i2 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The KINO-AA750-i2 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-AA750-i2 SBC	
1	SATA cable (P/N: 32801-000703-400-RS)	
1	I/O shielding (P/N: 45014-0050C0-00-RS)	
1	Utility CD	
1	One Key Recovery CD	








Quantity	Item and Part Number	Image
1	Quick installation guide	

Table 2-1: Packing List

2.4 Optional Items

These optional items are available.

Item and Part Number	Image
iRIS-2400 module, IPMI 2.0 adapter card with AST2400 BMC chip for DDR3 SO-DIMM socket interface (P/N: iRIS-2400-R10)	
Dual-port USB 2.0 cable (w bracket) (P/N: 19800-003100-300-RS)	
RS-422/485 cable (200 mm) (P/N: 32205-003800-300-RS)	
RS-232 cable with bracket (230 mm) (P/N: 19800-000300-100-RS)	
SATA cable (P/N: 32801-000703-400-RS)	
SATA power cable (P/N: 32102-000100-200-RS)	

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Item and Part Number	Image
CPU cooler for 50 W processor, aluminum (P/N: CF-989B-RS-R11)	
DisplayPort to 24-bit dual-channel LVDS converter board for IEI iDP connector (P/N: DP-LVDS-R10)	
DisplayPort to HDMI converter board for IEI iDP connector (P/N: DP-HDMI-R10)	
DisplayPort to VGA converter board for IEI iDP connector (P/N: DP-VGA-R10)	
DisplayPort to DVI-D converter board for IEI iDP connector (P/N: DP-DVI-R10)	
DisplayPort to DisplayPort converter board for IEI iDP connector (P/N: DP-DP-R10)	

Table 2-2: Optional Items

Chapter

3

Connectors

KINO-AA750-i2 Mini-ITX SBC

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 Layout

The figures below show all the peripheral interface connectors.

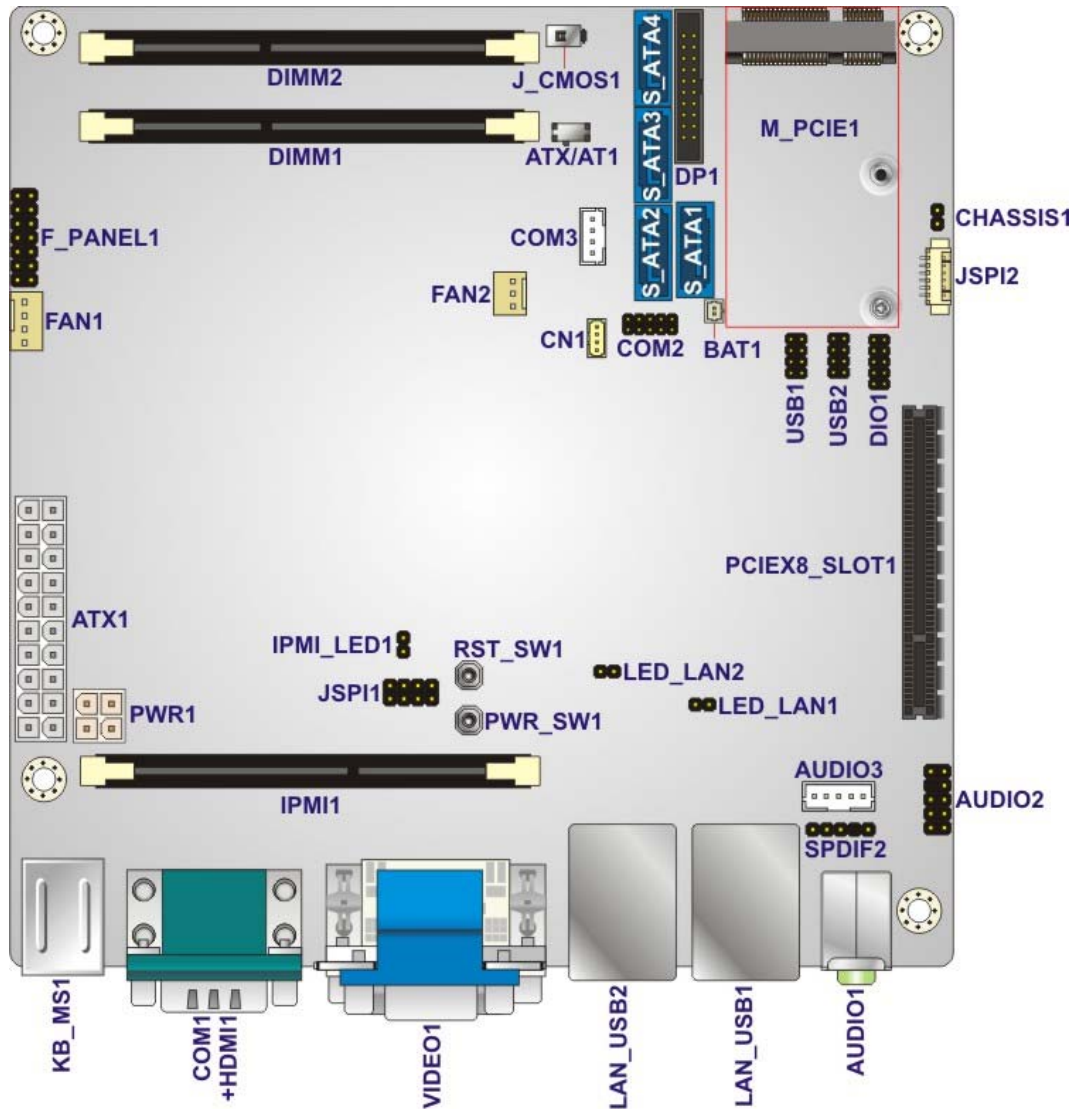


Figure 3-1: Peripheral Interface Connectors (Front Side)

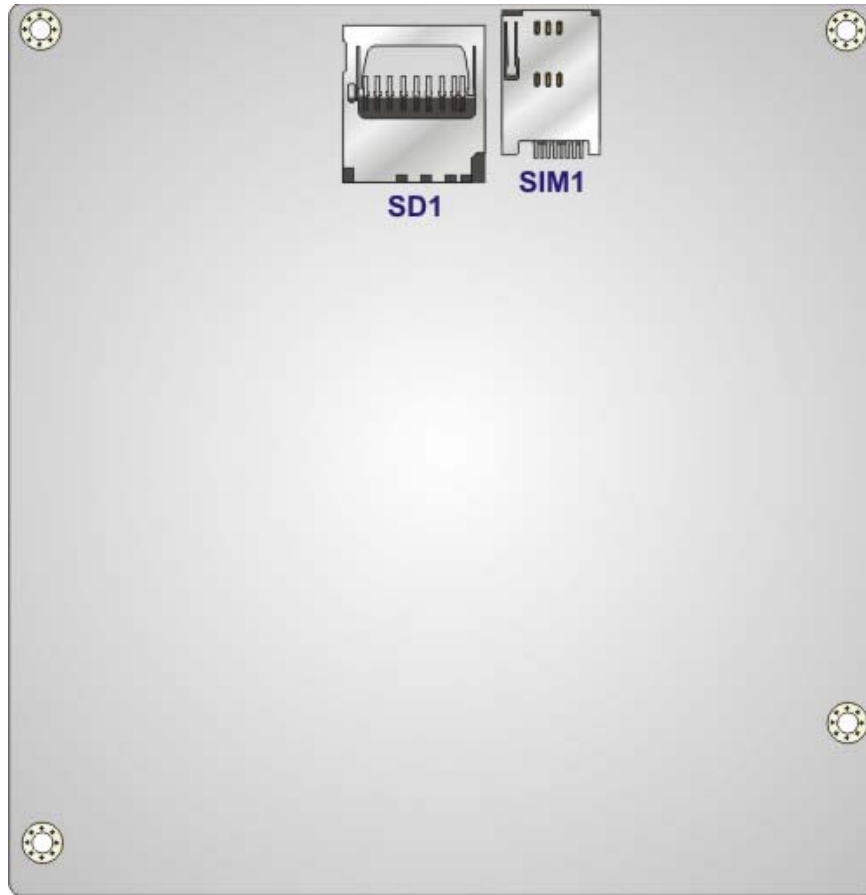


Figure 3-2: Peripheral Interface Connectors (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the KINO-AA750-i2. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
+12V ATX power connector	4-pin Molex power connector	PWR1
ATX power connector	20-pin connector	ATX1
Audio connector	10-pin header	AUDIO2
Audio amplifier connector	5-pin wafer	AUDIO3
Battery connector	2-pin wafer	BAT1

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Connector	Type	Label
Chassis intrusion connector	2-pin header	CHASSIS1
Digital I/O connector	10-pin header	DIO1
Fan connector (CPU)	4-pin wafer	FAN1
Fan connector (system)	3-pin wafer	FAN2
Front panel connector	14-pin header	F_PANEL1
Internal DisplayPort connector	20-pin box header	DP1
IPMI LED connector	2-pin header	IPMI_LED1
iRIS module slot	iRIS module slot	IPMI1
LAN1 LED connector	2-pin header	LED_LAN1
LAN2 LED connector	2-pin header	LED_LAN2
PCIe Mini card slot	PCIe Mini card slot	M_PCIE1
Power button (on-board)	Push button	PWR_SW1
Reset button (on-board)	Push button	RST_SW1
SATA 6Gb/s connectors	7-pin SATA connector	S_ATA1, S_ATA2, S_ATA3, S_ATA4
SD card slot	SD card slot	SD1
Serial port, RS-232	10-pin header	COM2
Serial port, RS-422/485	4-pin wafer	COM3
SIM card slot	SIM card slot	SIM1
SMBus connector	4-pin wafer	CN1
SO-DIMM connectors	204-pin DDR3 SO-DIMM connector	DIMM1, DIMM2
S/PDIF connector	5-pin header	SPDIF2
SPI flash connector	8-pin header	JSPI1
SPI Flash connector (EC)	6-pin wafer	JSPI2
USB 2.0 connectors	8-pin header	USB1, USB2

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the KINO-AA750-i2. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
Audio jacks (mic-in, line-out)	Audio jack	AUDIO1
Ethernet and USB 2.0 connectors	RJ-45 and USB 2.0	LAN_USB2
Ethernet and USB 3.0 connectors	RJ-45 and USB 3.0	LAN_USB1
HDMI connector	HDMI	HDMI1
Keyboard and mouse connectors	Dual PS/2	KB_MS1
RS-232 serial port	DB-9	COM1
VGA and DVI-D connectors	15-pin female, 24-pin DVI-D	VIDEO1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the KINO-AA750-i2.

3.2.1 +12V ATX Power Connector

- CN Label:** PWR1
- CN Type:** 4-pin Molex power connector
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-3**

This connector provides power to the CPU.

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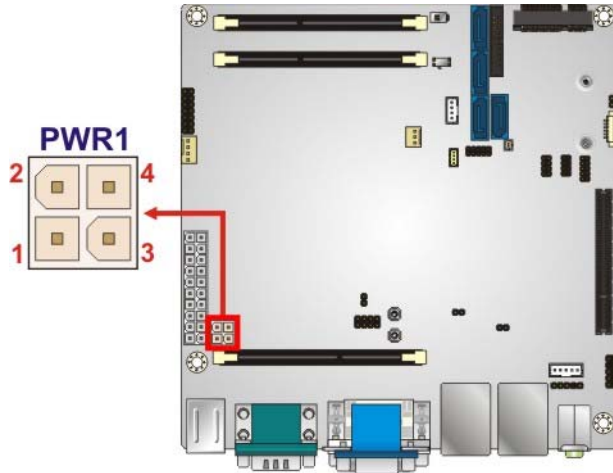


Figure 3-3: +12V ATX Power Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	+12V	4	+12V

Table 3-3: +12V ATX Power Connector Pinouts

3.2.2 ATX Power Connector

- CN Label:** ATX1
- CN Type:** 20-pin connector
- CN Location:** See **Figure 3-4**
- CN Pinouts:** See **Table 3-4**

The ATX power connector connects to an ATX power supply.

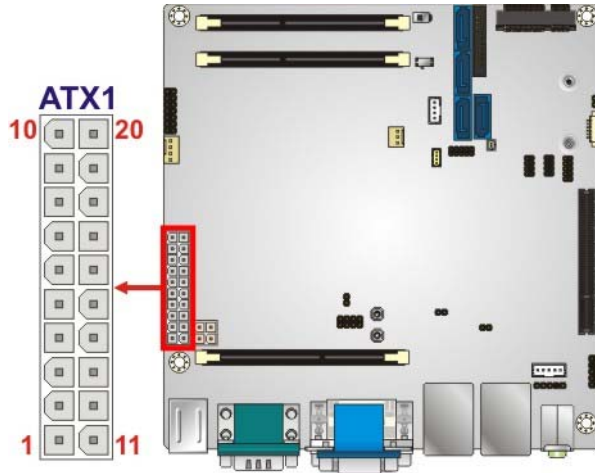


Figure 3-4: ATX Power Connector Location

Pin	Description	Pin	Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power good	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

Table 3-4: ATX Power Connector Pinouts

3.2.3 Audio Amplifier Connector

- CN Label:** AUDIO3
- CN Type:** 5-pin wafer
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-5**

This connector provides audio amplifier function to the speakers.

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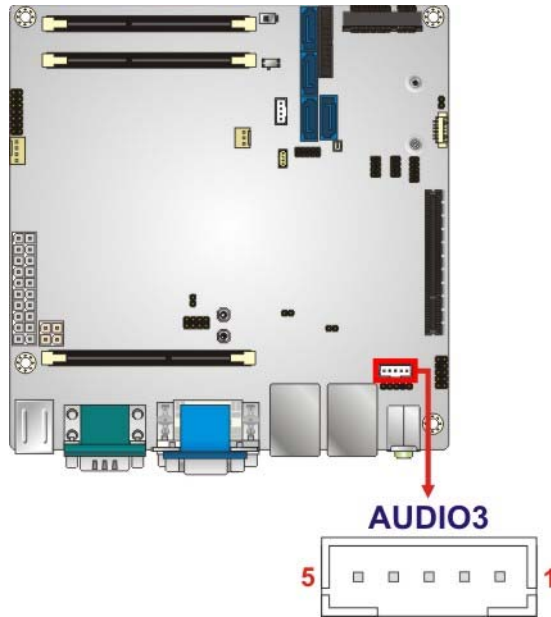


Figure 3-5: Audio Amplifier Connector Location

Pin	Description
1	SPEAKER_R+
2	SPEAKER_R-
3	GND
4	SPEAKER_L-
5	SPEAKER_L+

Table 3-5: Audio Amplifier Connector Pinouts

3.2.4 Audio Connector

- CN Label:** AUDIO2
- CN Type:** 10-pin header
- CN Location:** See Figure 3-6
- CN Pinouts:** See Table 3-6

This connector connects to speakers, a microphone and an audio input.

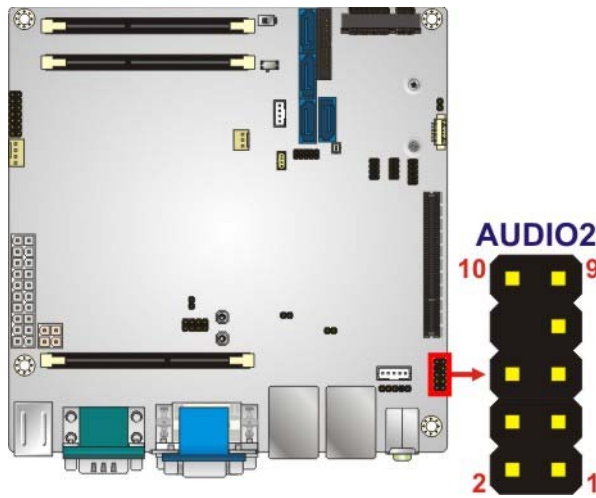


Figure 3-6: Audio Connector Location

Pin	Description	Pin	Description
1	LMIC2-L	2	ANALOG GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LLINE2-L	10	LINE2-JD

Table 3-6: Audio Connector Pinouts

3.2.5 Battery Connector



CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

CN Label: **BAT1**
CN Type: 2-pin wafer

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

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

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

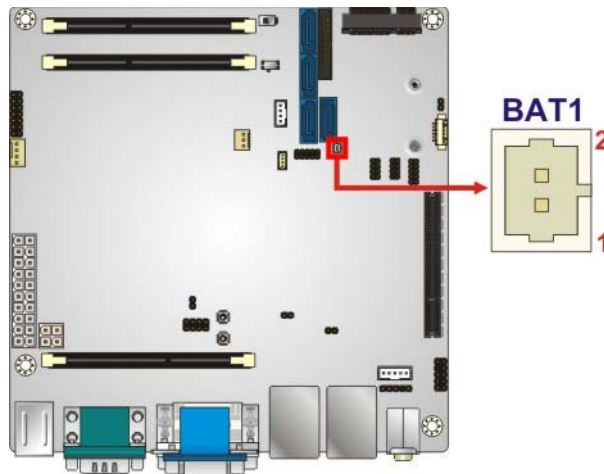


Figure 3-7: Battery Connector Location

Pin	Description
1	VBATT
2	GND

Table 3-7: Battery Connector Pinouts

3.2.6 Chassis Intrusion Connector

CN Label: **CHASSIS1**

CN Type: 2-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-8**

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.

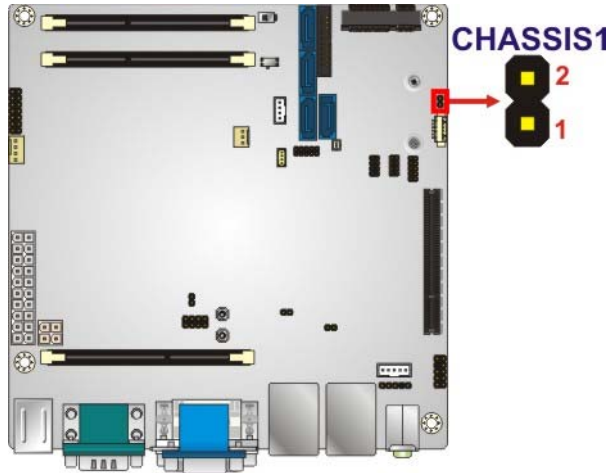


Figure 3-8: Chassis Intrusion Connector Location

Pin	Description
1	+3.3EC
2	CHASSIS OPEN#

Table 3-8: Chassis Intrusion Connector Pinouts

3.2.7 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-9**

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.

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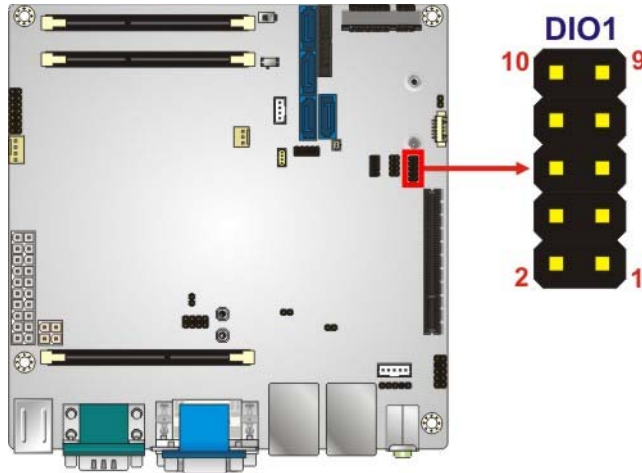


Figure 3-9: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	+V5S
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-9: Digital I/O Connector Pinouts

3.2.8 Fan Connector (CPU)

- CN Label:** FAN1
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-10**

The fan connector attaches to a CPU cooling fan.

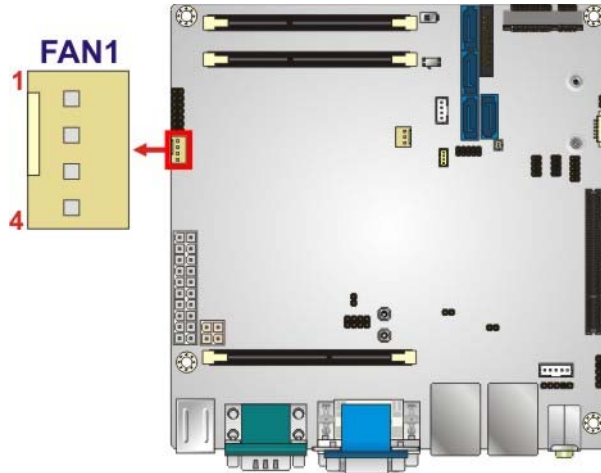


Figure 3-10: CPU Fan Connector Location

Pin	Description
1	GND
2	+V12S
3	Rotation Signal
4	PWM Control Signal

Table 3-10: CPU Fan Connector Pinouts

3.2.9 Fan Connector (System)

- CN Label:** FAN2
- CN Type:** 3-pin wafer
- CN Location:** See **Figure 3-11**
- CN Pinouts:** See **Table 3-11**

The fan connector attaches to a system cooling fan.

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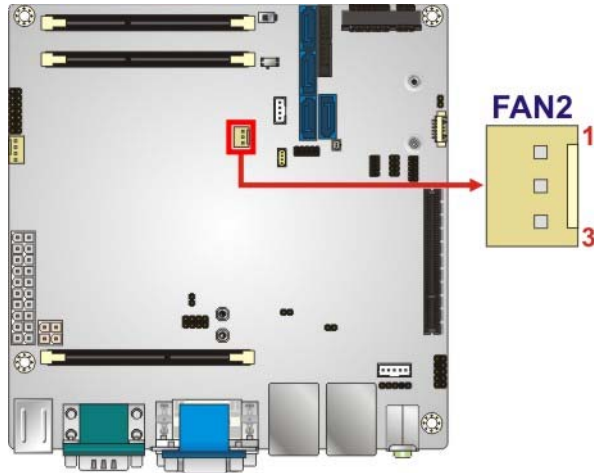


Figure 3-11: System Fan Connector Location

Pin	Description
1	Rotation Signal
2	+12V
3	GND

Table 3-11: System Fan Connector Pinouts

3.2.10 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 14-pin header
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-12**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

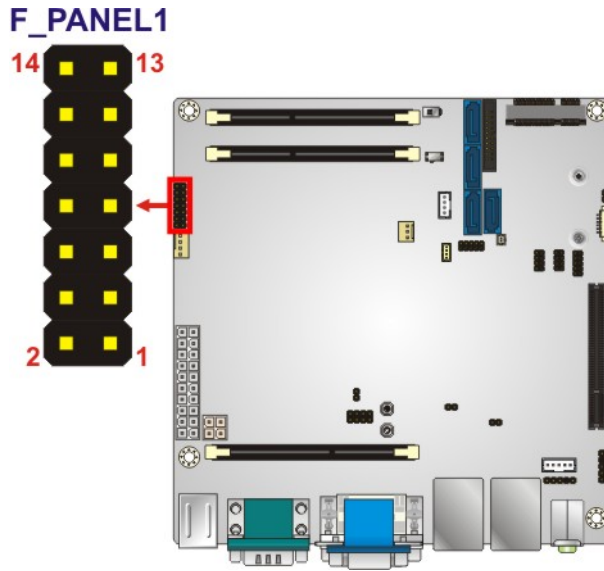


Figure 3-12: Front Panel Connector Location

Function	Pin	Description	Function	Pin	Description
Power LED	1	LED_PWR	Buzzer	2	BEEP_PWR
	3	NC		4	NC
	5	GND		6	NC
Power Button	7	PWR_BTN		8	PC_BEEP#
	9	GND	10	NC	
HDD LED	11	HDD_LED+	Reset	12	RESET
	13	HDD_LED-		14	GND

Table 3-12: Front Panel Connector Pinouts

3.2.11 Internal DisplayPort Connector

- CN Label:** DP1
- CN Type:** 20-pin box header
- CN Location:** See **Figure 3-13**
- CN Pinouts:** See **Table 3-13**

The DisplayPort connector supports HDMI, LVDS, VGA, DVI and DisplayPort graphics interfaces with up to 2560x1600 resolution.

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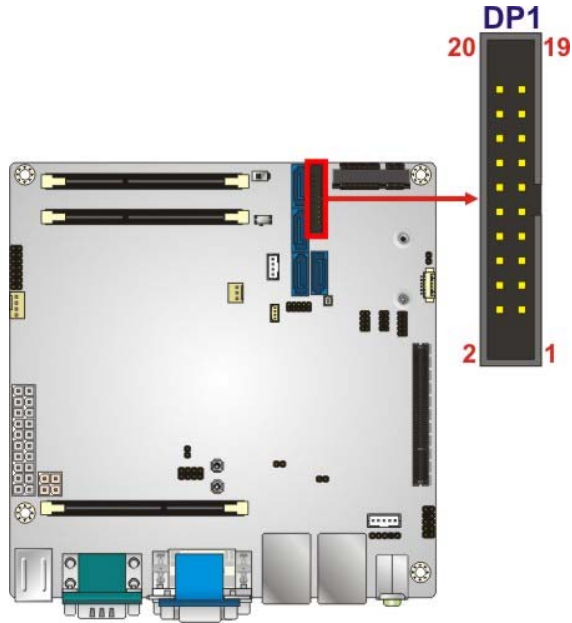


Figure 3-13: Internal DisplayPort Connector Location

Pin	Description	Pin	Description
1	HPD	2	AUX+
3	GND	4	AUX-
5	CAD	6	GND
7	GND	8	Lane2+
9	Lane3+	10	Lane2-
11	Lane3-	12	GND
13	GND	14	Lane0+
15	Lane1+	16	Lane0-
17	Lane1-	18	VCC3
19	VCC5	20	N/C

Table 3-13: Internal DisplayPort Connector Pinouts

3.2.12 IPMI LED Connector

CN Label: IPMI_LED1

CN Type: 2-pin header

CN Location: See Figure 3-14

CN Pinouts: See Table 3-14

The IPMI LED connector is used to connect to the IPMI LED indicator on the chassis.

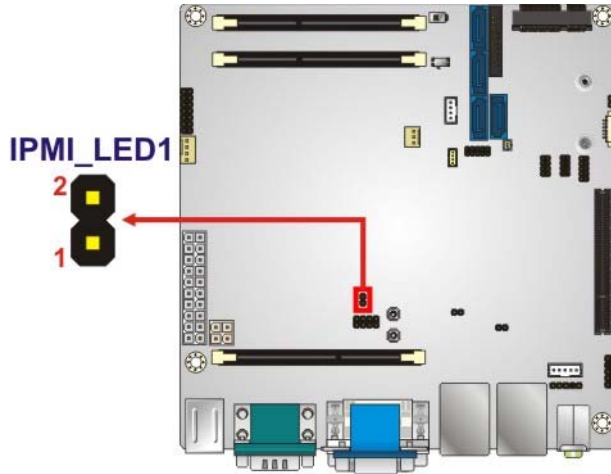


Figure 3-14: IPMI LED Connector Location

Pin	Description
1	+V3.3EC
2	IPMI LED#

Table 3-14: IPMI LED Connector Pinouts

3.2.13 iRIS Module Slot

- CN Label:** IPMI1
- CN Type:** iRIS module slot
- CN Location:** See **Figure 3-15**

The iRIS module slot allows installation of the iRIS-2400 module.

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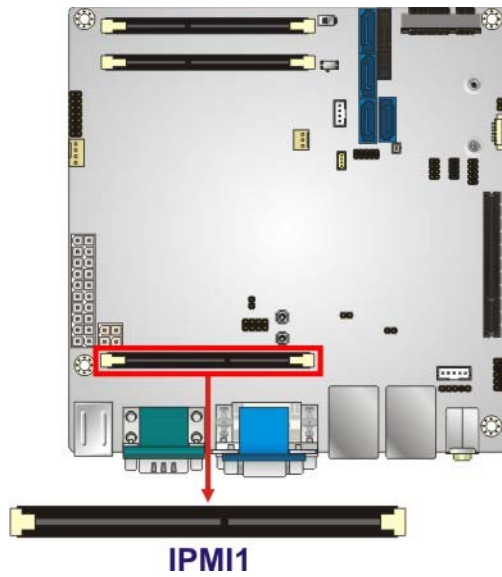


Figure 3-15: iRIS Module Slot Location



WARNING:

The iRIS module slot is designed to install the iRIS-2400 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-AA750-i2.

3.2.14 LAN LED Connectors

CN Label:	LED_LAN1, LED_LAN2
CN Type:	2-pin header
CN Location:	See Figure 3-16
CN Pinouts:	See Table 3-15

The LAN LED connectors are used to connect to the LAN LED indicators on the chassis to indicate users the link activities of the two LAN ports.

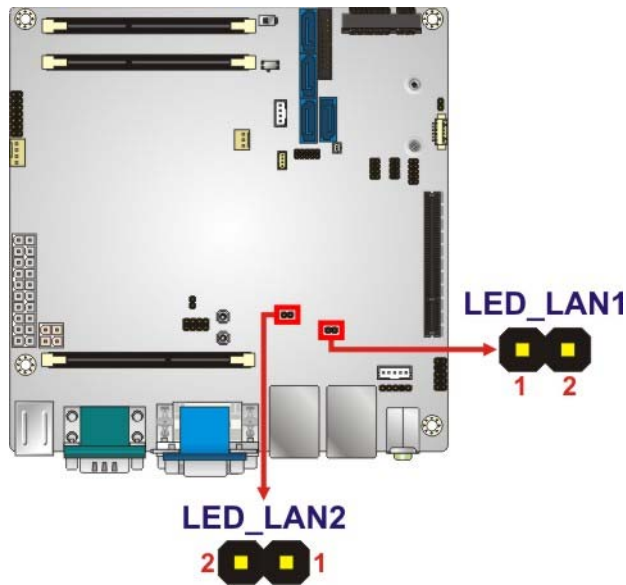


Figure 3-16: LAN LED Connector Locations

Pin	Description
1	+V3.3LAN
2	LED LINK_ACT-

Table 3-15: LAN LED Connector Pinouts

3.2.15 PCIe Mini Card Slot

- CN Label:** M_PCIE1
- CN Type:** PCIe Mini card slot
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-16**

The PCIe Mini card slot enables a full-size/half-size PCIe Mini card expansion module to be connected to the board.

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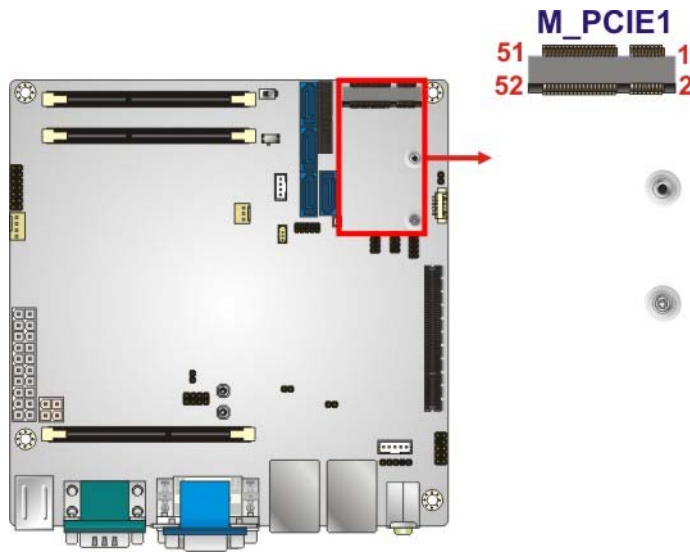


Figure 3-17: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-

Pin	Description	Pin	Description
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-16: PCIe Mini Card Slot Pinouts

3.2.16 Power Button (On-board)

- CN Label:** PWR_SW1
- CN Type:** Push button
- CN Location:** See **Figure 3-18**

Push the on-board power button to power on the KINO-AA750-i2.

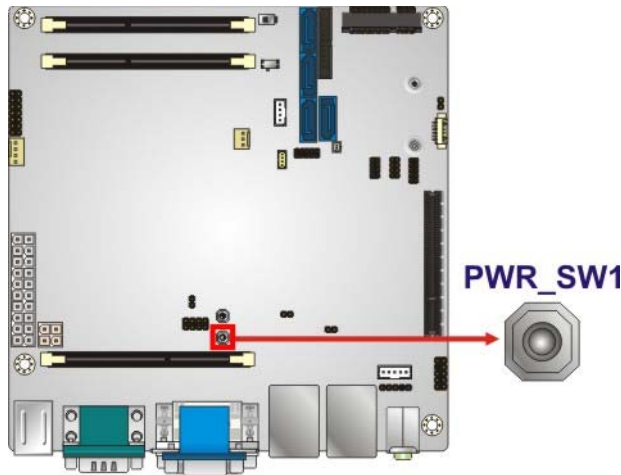


Figure 3-18: On-board Power Button Location

KINO-AA750-i2 Mini-ITX SBC

3.2.17 Reset Button (On-board)

CN Label:	RST_SW1
CN Type:	Push button
CN Location:	See Figure 3-19

Push the on-board reset button to reset the KINO-AA750-i2.

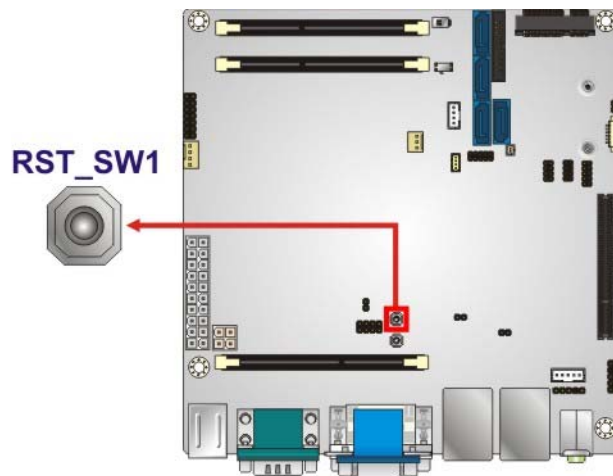


Figure 3-19: On-board Reset Button Location

3.2.18 SATA 6Gb/s Drive Connectors

CN Label:	S_ATA1, S_ATA2, S_ATA3, S_ATA4
CN Type:	7-pin SATA drive connector
CN Location:	See Figure 3-20
CN Pinouts:	See Table 3-17

The SATA drive connectors can be connected to SATA drives and support up to 6Gb/s data transfer rate.

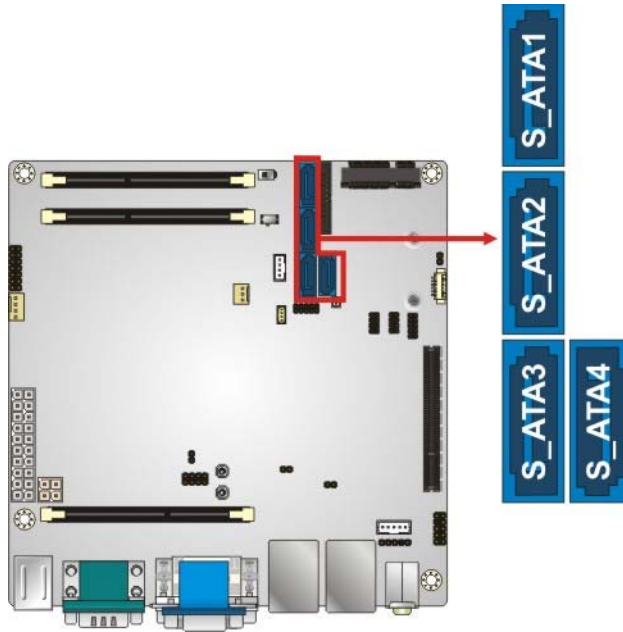


Figure 3-20: SATA 6Gb/s Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-17: SATA 6Gb/s Drive Connector Pinouts

3.2.19 SD Card Slot

- CN Label:** SD1
- CN Type:** SD card slot
- CN Location:** See **Figure 3-21**

The SD card slot is for installing an SD card to the system.

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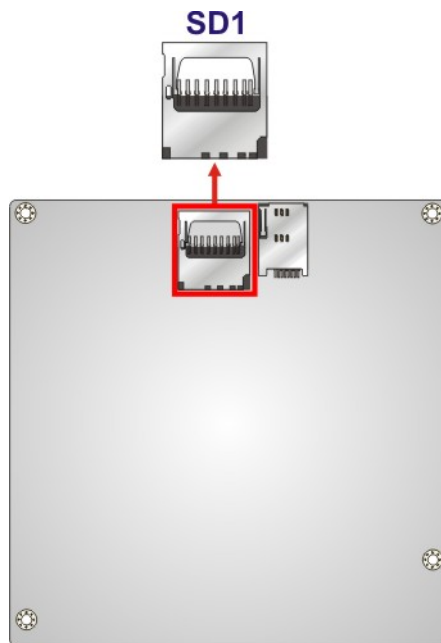


Figure 3-21: SD Card Slot Location

3.2.20 Serial Port Connector, RS-232

CN Label:	COM2
CN Type:	10-pin header
CN Location:	See Figure 3-22
CN Pinouts:	See Table 3-18

The 10-pin serial port connector provides one RS-232 serial communications channel. The COM serial port connector can be connected to an external RS-232 serial port device.

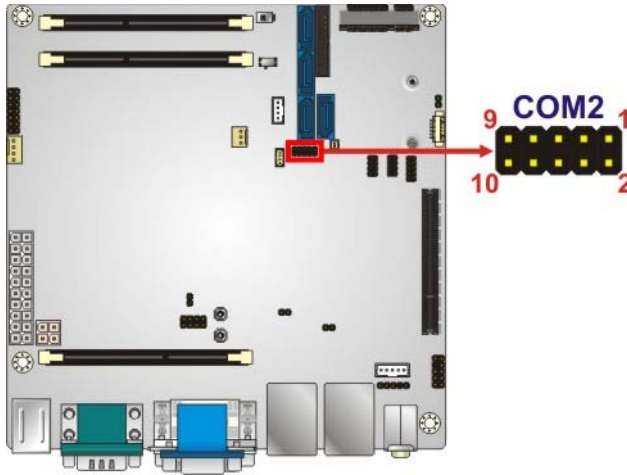


Figure 3-22: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	-NDCD2	2	-NDSRs
3	NSIN2	4	-NRTS2
5	NSOUT2	6	-NCTS2
7	-NDTR2	8	-XRI2
9	GND	10	GND

Table 3-18: RS-232 Serial Port Connector Pinouts

3.2.21 Serial Port Connector, RS-422/485

- CN Label:** COM3
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-19**

This connector provides RS-422 or RS-485 communications.

KINO-AA750-i2 Mini-ITX SBC

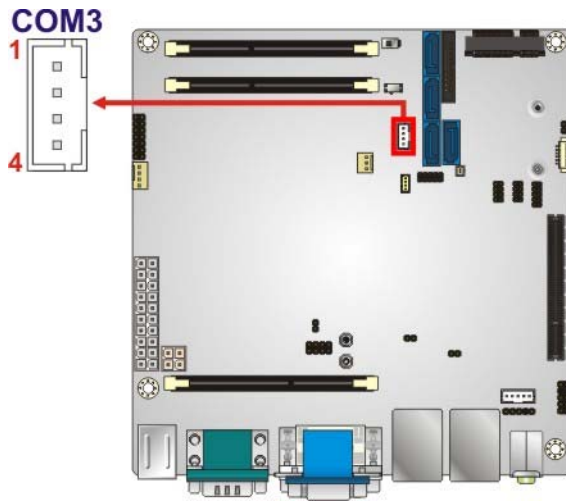


Figure 3-23: RS-422/485 Serial Port Connector Location

Pin	Description
1	RXD422-
2	RXD422+
3	TXD422+/TXD485+
4	TXD422-/TXD485-

Table 3-19: RS-422/485 Serial Port Connector Pinouts

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

RS-422 Pinouts	RS-485 Pinouts

Table 3-20: DB-9 RS-422/485 Pinouts

3.2.22 SIM Card Slot

CN Label:	SIM1
CN Type:	SIM card slot
CN Location:	See Figure 3-24

The SIM card slot is for installing a SIM card to the system.

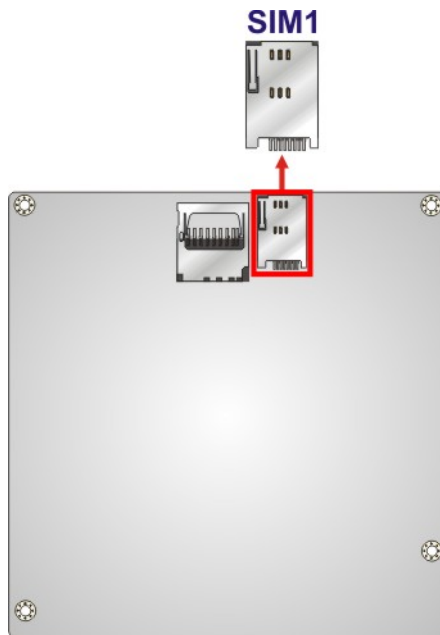


Figure 3-24: SIM Card Slot Location

3.2.23 SMBus Connector

CN Label:	CN1
CN Type:	4-pin wafer
CN Location:	See Figure 3-25
CN Pinouts:	See Table 3-21

The SMBus (System Management Bus) connector provides low-speed system management communications.

KINO-AA750-i2 Mini-ITX SBC

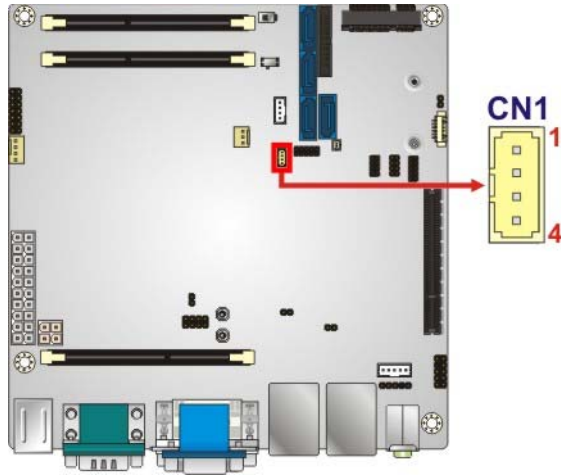


Figure 3-25: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

Table 3-21: SMBus Connector Pinouts

3.2.24 SO-DIMM Connectors

CN Label: DIMM1, DIMM2

CN Type: 204-pin DDR3 SO-DIMM connector

CN Location: See **Figure 3-26**

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

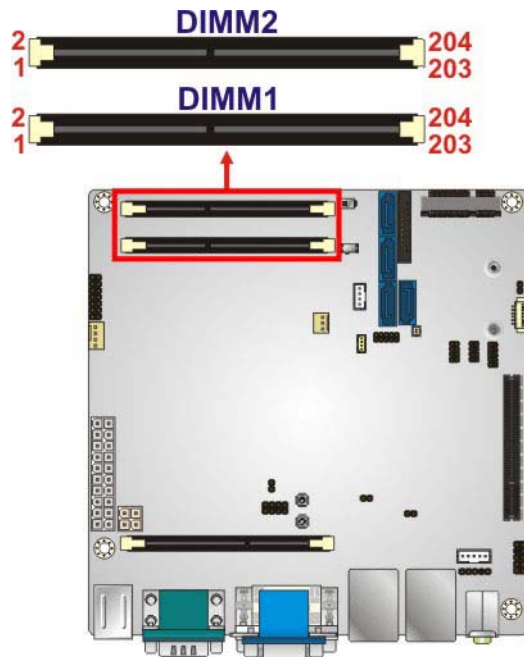


Figure 3-26: SO-DIMM Connector Locations

3.2.25 S/PDIF Connector

- CN Label:** SPDIF2
- CN Type:** 5-pin header
- CN Location:** See **Figure 3-27**
- CN Pinouts:** See **Table 3-22**

Use the S/PDIF connector to connect digital audio devices to the system.

KINO-AA750-i2 Mini-ITX SBC

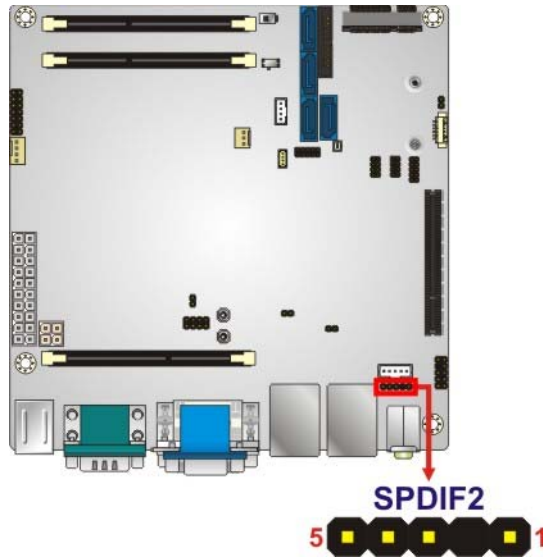


Figure 3-27: SPDIF Connector Location

Pin	Description
1	+V5S
2	NC
3	SPDIFOUT
4	GND
5	SPDIFIN

Table 3-22: SPDIF Connector Pinouts

3.2.26 SPI Flash Connector

- CN Label:** JSPI1
- CN Type:** 8-pin header
- CN Location:** See Figure 3-28
- CN Pinouts:** See Table 3-23

The SPI flash connector is used to flash the SPI ROM.

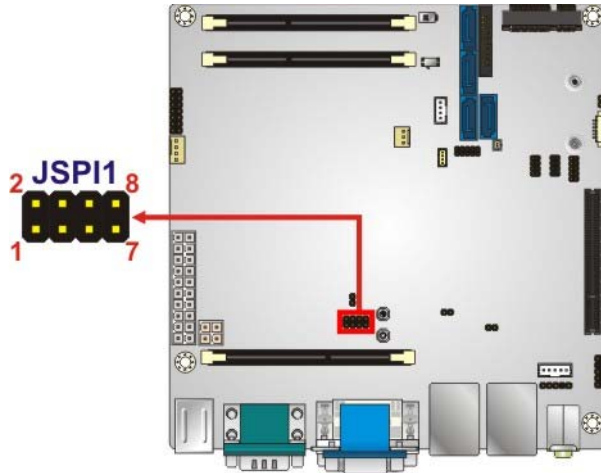


Figure 3-28: SPI Flash Connector Location

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

Table 3-23: SPI Flash Connector Pinouts

3.2.27 SPI Flash Connector (EC)

- CN Label:** JSPI2
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-29**
- CN Pinouts:** See **Table 3-24**

The SPI flash connector is used to flash the EC ROM.

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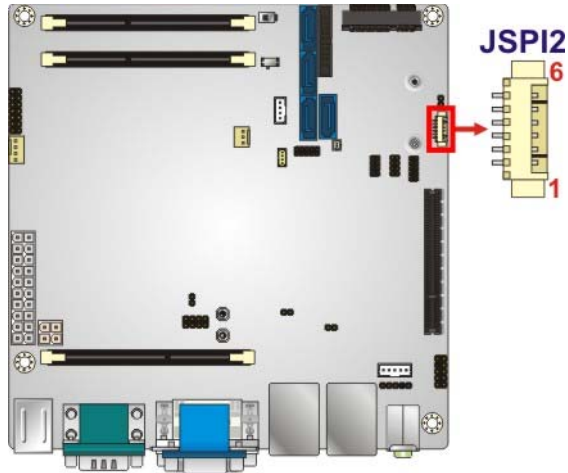


Figure 3-29: EC SPI Flash Connector Location

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 3-24: EC SPI Flash Connector Pinouts

3.2.28 USB 2.0 Connectors

- CN Label:** USB1, USB2
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-30**
- CN Pinouts:** See **Table 3-25**

Each USB header can connect to two USB 2.0 devices.

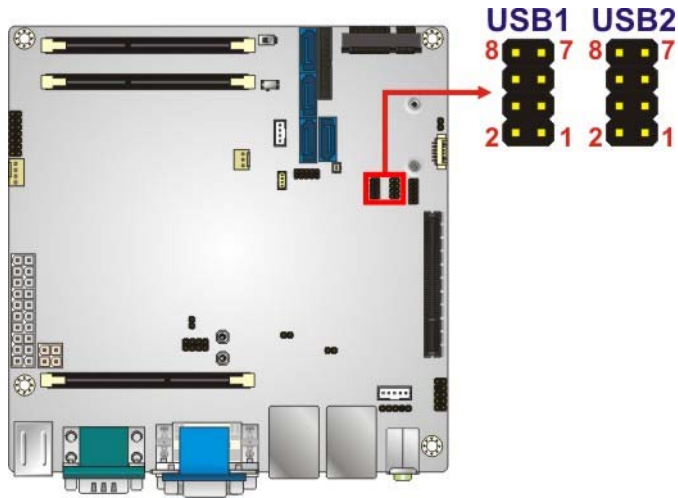


Figure 3-30: USB Connector Locations

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

Table 3-25: USB 2.0 Port Connector Pinouts

3.3 External Interface Connectors

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

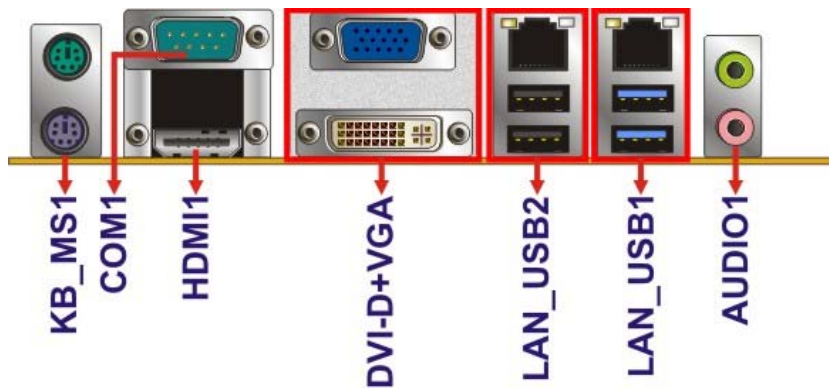


Figure 3-31: External Interface Connectors

KINO-AA750-i2 Mini-ITX SBC

3.3.1 Audio Jacks

CN Label: AUDIO1
CN Type: Audio jack
CN Location: See **Figure 3-31**

The audio jacks connect to external audio devices.

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



Figure 3-32: Audio Jacks

3.3.2 Ethernet and USB 2.0 Connectors

CN Label: LAN_USB2
CN Type: RJ-45 and USB 2.0 combo connector
CN Location: See **Figure 3-31**
CN Pinouts: See **Table 3-26** and **Table 3-27**

The LAN connector connects to a local network.

Pin	Description	Pin	Description
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND

Pin	Description	Pin	Description
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-
15	GND		

Table 3-26: LAN2 Pinouts

The KINO-AA750-i2 has two external USB 2.0 ports.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND

Table 3-27: External USB 2.0 Port Pinouts

3.3.3 Ethernet and USB 3.0 Connectors

CN Label: LAN_USB1

CN Type: RJ-45 and USB 3.0 combo connector

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-28** and **Table 3-29**

The LAN connector connects to a local network.

Pin	Description	Pin	Description
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-
15	GND		

Table 3-28: LAN1 Pinouts

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NOTE:

When using the IPMI function, ensure to connect the Ethernet cable to the LAN connector labeled **LAN_USB1**. Please refer to **Section 4.12.8** for IPMI setup procedures.

The KINO-AA750-i2 has two external USB 3.0 ports.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND1
5	STDA_SSRX1_N
6	STDA_SSRX1_P
7	GND_DRAIN
8	STDA_SSTX1_N
9	STDA_SSTX1_P

Table 3-29: External USB 3.0 Port Pinouts

3.3.4 HDMI Connector

- CN Label:** HDMI1
- CN Type:** HDMI connector
- CN Location:** See **Figure 3-31**
- CN Pinouts:** See **Table 3-30**

The HDMI connector connects to a display device with HDMI interface.

Pin	Description	Pin	Description
1	D2+	2	NC
3	D2-	4	D1+

Pin	Description	Pin	Description
5	GND	6	D1-
7	DO+	8	GND
9	DO-	10	CLK+
11	GND	12	CLK-
13	NC	14	NC
15	DDC CLK	16	DDC DATA
17	GND	18	VCC5
19	HP DETECT	20	GND

Table 3-30: HDMI Connector Pinouts

3.3.5 Keyboard and Mouse Connector

- CN Label:** KB_MS1
- CN Type:** Dual PS/2
- CN Location:** See **Figure 3-31**
- CN Pinouts:** See **Table 3-31**

The PS/2 ports are for connecting a PS/2 mouse and a PS/2 keyboard.

Pin	Description	Pin	Description
1	Keyboard Data	7	Mouse Data
2	NC	8	NC
3	GND	9	GND
4	VCC	10	VCC
5	Keyboard Clock	11	Mouse Clock
6	NC	12	NC

Table 3-31: PS/2 Connector Pinouts

3.3.6 Serial Port Connector (COM1)

- CN Label:** COM1
- CN Type:** DB-9

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CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-32**

The serial port connects to a RS-232 serial communications device.

Pin	Description	Pin	Description
1	DATA CARRIER DETECT (DCD1)	6	DATA SET READY (DSR1)
2	RECEIVE DATA (RXD1)	7	REQUEST TO SEND (RTS1)
3	TRANSMIT DATA (TXD1)	8	CLEAR TO SEND (CTS1)
4	DATA TERMINAL READY (DTR1)	9	RING INDICATOR (RI1)
5	GND		

Table 3-32: Serial Port Pinouts

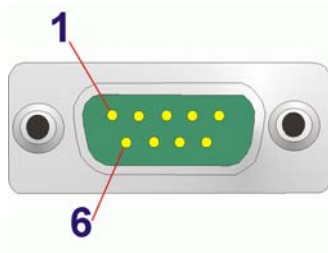


Figure 3-33: Serial Port Pinouts

3.3.7 VGA and DVI-D Connectors

CN Label: VIDEO1

CN Type: 15-pin female, 24-pin DVI-D

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-33** and **Table 3-34**

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

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND

Pin	Description	Pin	Description
9	VGAVCC	10	GND
11	NC	12	DCCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-33: VGA Connector Pinouts

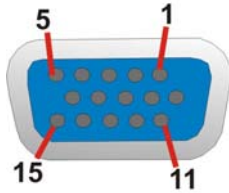


Figure 3-34: VGA Connector

The DVI-D connector connects to a monitor that supports DVI video input.

Pin	Description	Pin	Description
1	DVI_DATA2#_C	2	DVI_DATA2_C
3	GND	4	NC
5	NC	6	DVI_SCL
7	DVI_SDA	8	NC
9	DVI_DATA1#_C	10	DVI_DATA1_C
11	GND	12	NC
13	NC	14	+5V
15	GND	16	DVI_HPD
17	DVI_DATA0#_C	18	DVI_DATA0_C
19	GND	20	NC
21	NC	22	GND
23	DVI_CLK_C	24	DVI_CLK#_C

Table 3-34: DVI-D Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-AA750-i2. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the KINO-AA750-i2, or any other electrical component, is handled.

- **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 KINO-AA750-i2, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-AA750-i2.
- **Only handle the edges of the PCB:-:** When handling the PCB, hold it by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-AA750-i2 is installed. All installation notices pertaining to the installation of KINO-AA750-i2 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-AA750-i2 and injury to the person installing the motherboard.

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WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-AA750-i2, KINO-AA750-i2 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 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 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 off:**
 - Make sure the product is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-AA750-i2, **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 FS1r2 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.

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

To install the CPU, follow the steps below.

Step 1: **Unlock the CPU retention screw.** Make sure the retention lock is unlocked.

See **Figure 4-1**.

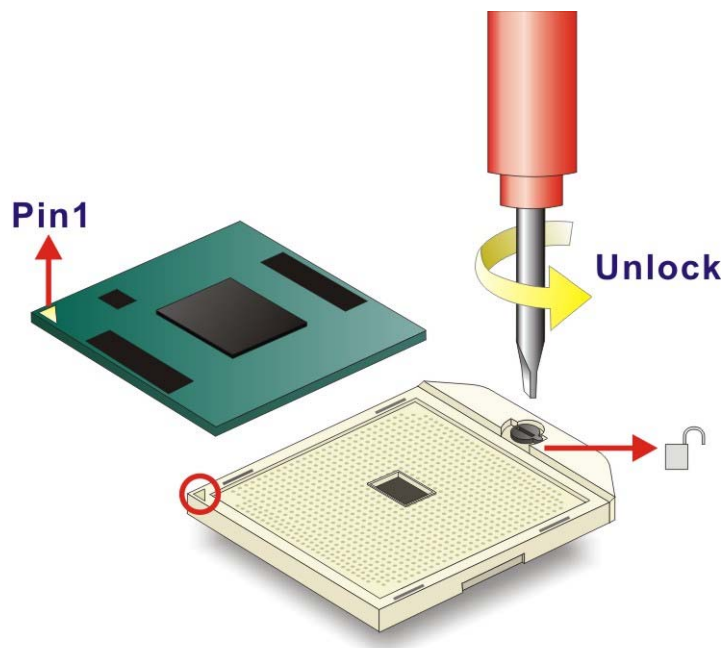


Figure 4-1: Unlocked Retention Screw

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins on the CPU.

Remove any debris from the CPU socket using compressed air.

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- Step 3:** Correctly Orientate the CPU. Make sure the pins are facing down.
- Step 4:** Correctly position the CPU. Match the Pin 1 mark on the CPU with the marked corner 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 lined up correctly, the CPU will gently drop into the correct position.
- Step 7:** Lock the retention screw. Rotate the retention screw into the locked position. See **Figure 4-2**.

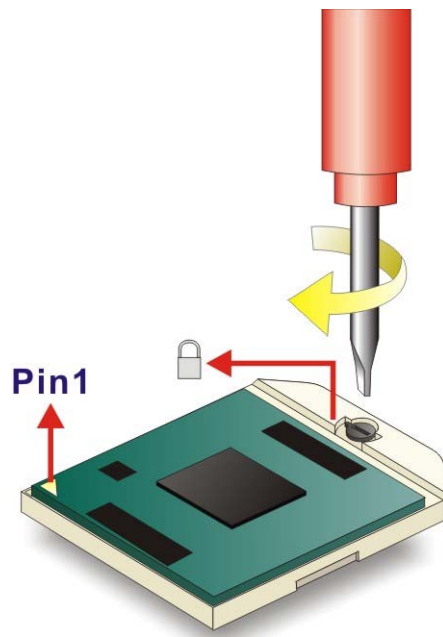


Figure 4-2: Lock the CPU Socket Retention Screw

4.4 Cooling Kit Installation

An IEI CPU cooling kit can be purchased separately (See **Chapter 2**). The cooling kit is comprised of a CPU heat sink and a cooling fan.



WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, please follow the steps below.

Step 1: Install the support bracket. Remove the tape from the support bracket. From the solder side of the board, align the support bracket to the holes on board and stick in place.

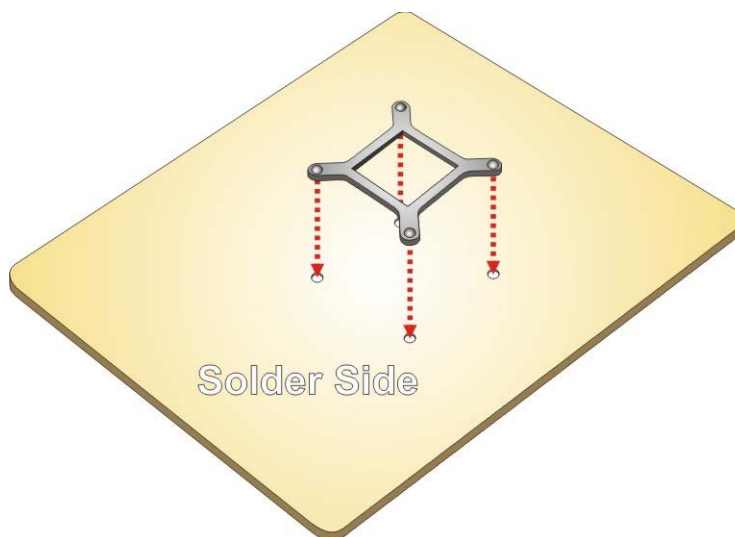


Figure 4-3: Install Support Bracket

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Step 2: Properly orient the cooling kit. The CPU fan cable must not interfere with the fan or other moving parts. Make sure the cable can be routed away from the moving parts.

Step 3: Properly align the cooling kit. Line up the four screws with the screw holes on the support bracket below the board (**Figure 4-4**).

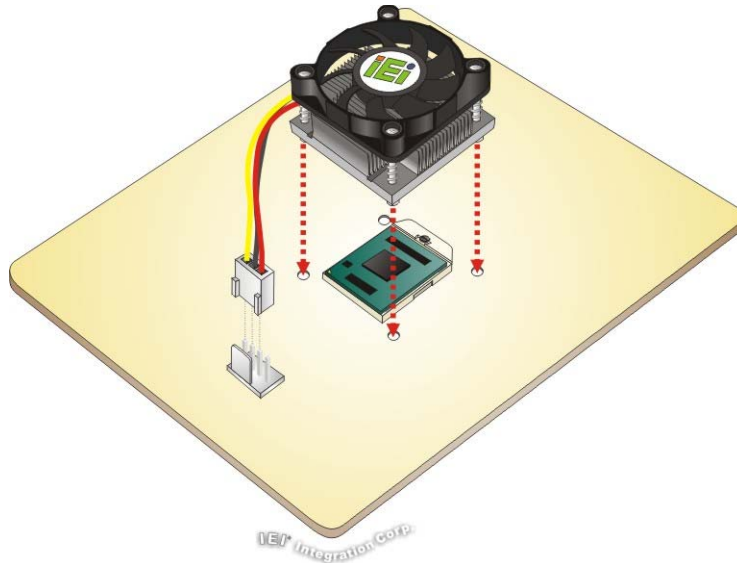


Figure 4-4: Align the Cooling Kit

Step 4: Place the cooling kit onto the CPU. Push down the fan with some pressure to secure the cooling kit with the support bracket. See **Figure 4-5**.

Step 5: Tighten the screws. Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws. See **Figure 4-5**.

Step 6: Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the board. Carefully route the cable away from heat generating chips and fan blades.

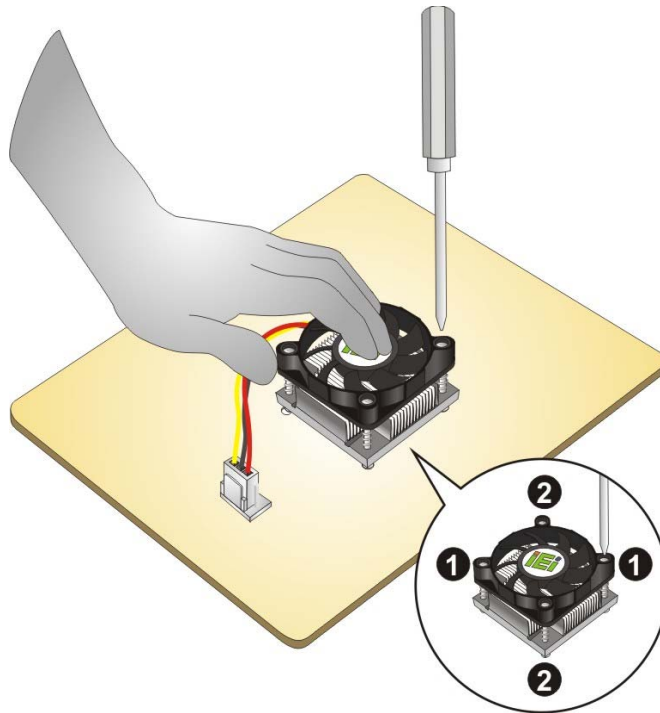


Figure 4-5: Secure the Cooling Kit

4.5 SO-DIMM Installation

To install a SO-DIMM, please follow the steps below and refer to **Figure 4-6**.

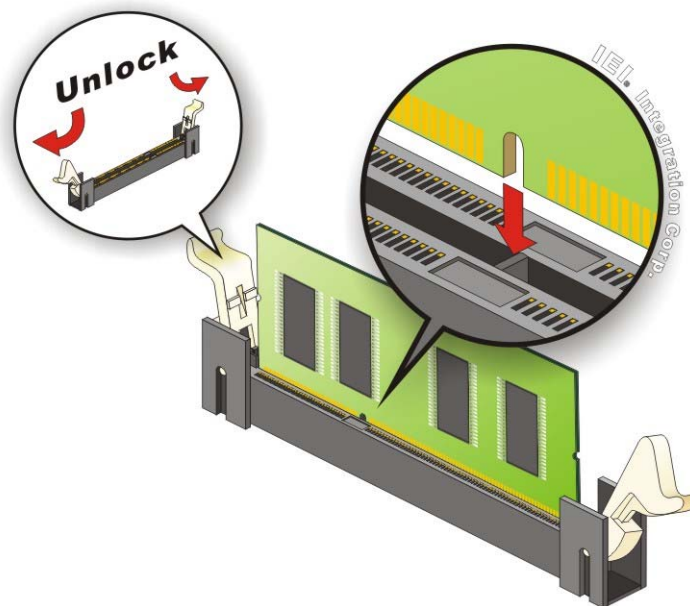


Figure 4-6: SO-DIMM Installation

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- Step 1: Open the SO-DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-6**.
- Step 2: Align the SO-DIMM with the socket.** Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-6**.
- Step 3: Insert the SO-DIMM.** Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See **Figure 4-6**.
- Step 4: Removing a SO-DIMM.** To remove a SO-DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.6 iRIS Module Installation



WARNING:

The iRIS module slot is designed to install the iRIS-2400 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-AA750-i2.

To install the iRIS-2400 module, please follow the steps below and refer to **Figure 4-7**.

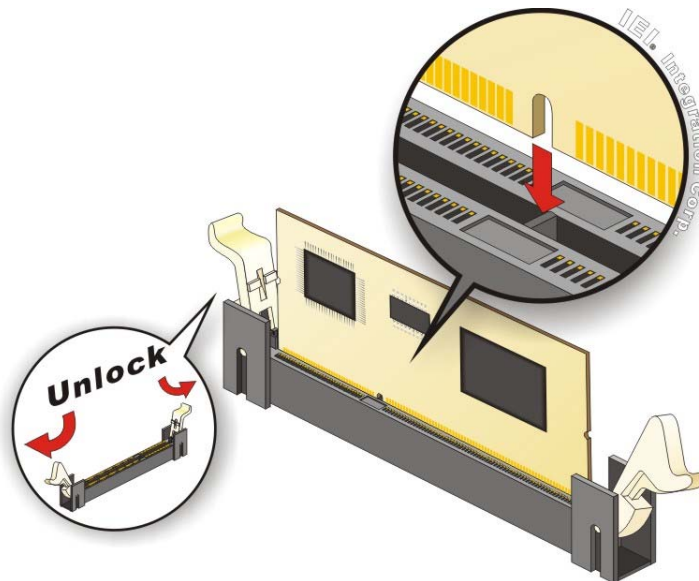


Figure 4-7: iRIS Module Installation

- Step 1:** Locate the iRIS module slot. See **Figure 3-15**.
- Step 2:** Open the socket handles. Open the two handles outwards as far as they can. See **Figure 4-7**.
- Step 3:** Align the iRIS-2400 module with the socket. Align the iRIS-2400 module so the notch on the module lines up with the notch on the socket. See **Figure 4-7**.
- Step 4:** Insert the iRIS-2400 module. Once aligned, press down until the iRIS-2400 module is properly seated. Clip the two handles into place. See **Figure 4-7**.
- Step 5:** Removing the iRIS-2400 module. To remove the iRIS-2400 module, push both handles outward. The module is ejected by a mechanism in the socket.

**NOTE:**

After installing the iRIS-2400 module, use **LAN_USB1** port to establish a network connection. Please refer to **Section 4.12.8** for IPMI setup procedures.

4.7 Full-size PCIe Mini Card Installation

The PCIe Mini card slot allows installation of either a full-size or half-size PCIe Mini card. To install a full-size PCIe Mini card, please follow the steps below.

- Step 1:** Locate the PCIe Mini card slot. See **Figure 3-17**.
- Step 2:** Remove the retention screw. Remove the retention screw as shown in **Figure 4-8**.

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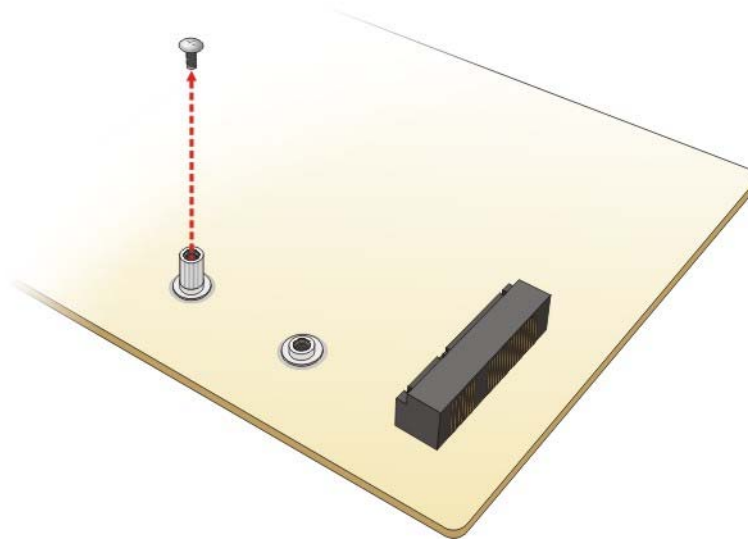


Figure 4-8: Removing the Retention Screw

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20° (Figure 4-9).

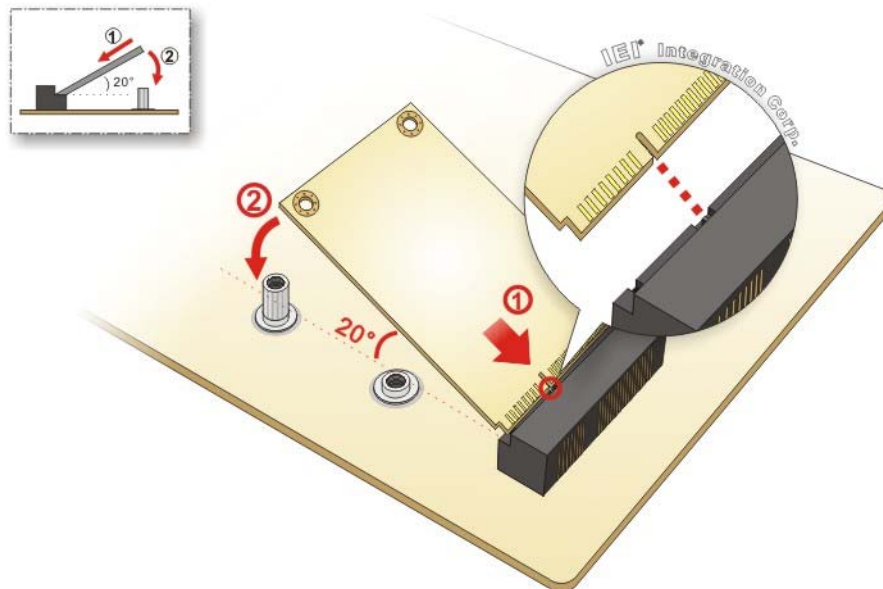


Figure 4-9: Inserting the Full-size PCIe Mini Card into the Slot at an Angle

Step 4: **Secure the full-size PCIe Mini card.** Secure the full-size PCIe Mini card with the retention screw previously removed (**Figure 4-10**).

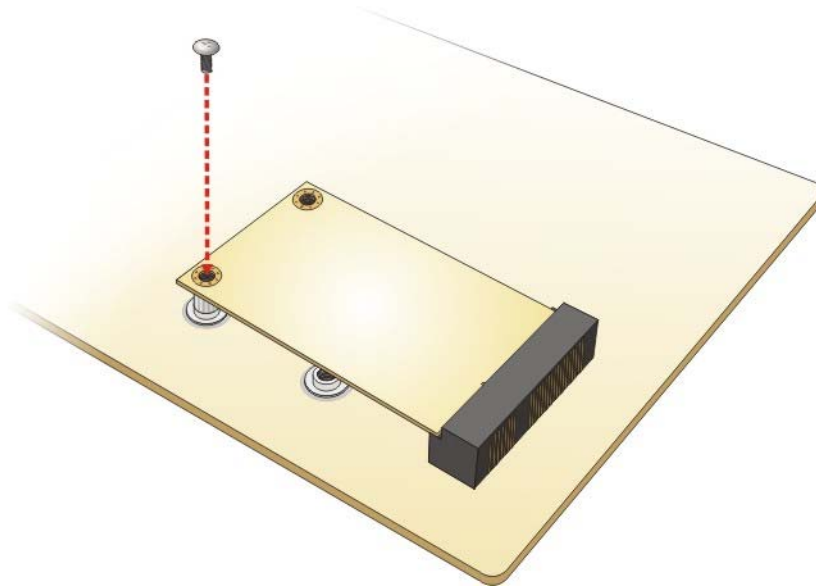


Figure 4-10: Securing the Full-size PCIe Mini Card

4.8 Half-size PCIe Mini Card Installation

The PCIe Mini card slot allows installation of either a full-size or half-size PCIe Mini card. To install a half-size PCIe Mini card, please follow the steps below.

Step 1: **Locate the PCIe Mini card slot.** See **Figure 3-17**.

Step 2: **Remove the retention screw.** Remove the retention screw as shown in **Figure 4-8**.

Step 3: **Remove the standoff.** Unscrew and remove the standoff secured on the motherboard as shown in **Figure 4-11**.

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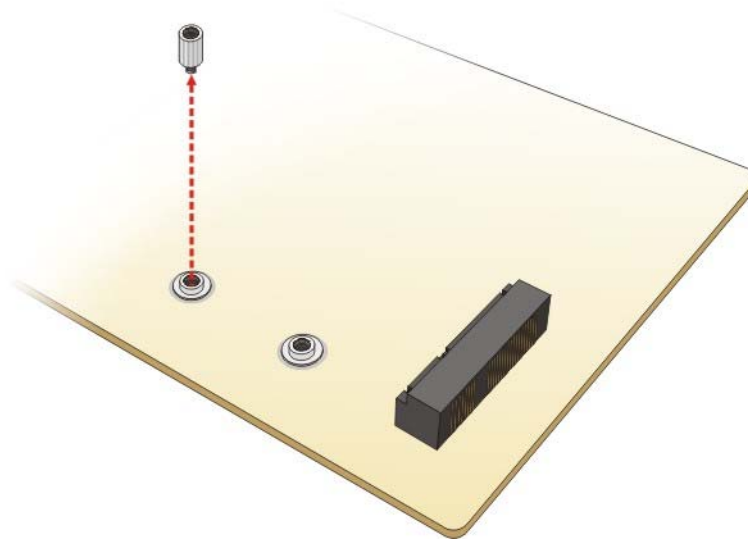


Figure 4-11: Removing the Standoff

Step 4: Install the standoff to the screw hole for the half-size PCIe Mini card. Install the previously removed standoff to the screw hole for the half-size PCIe Mini card (Figure 4-12).

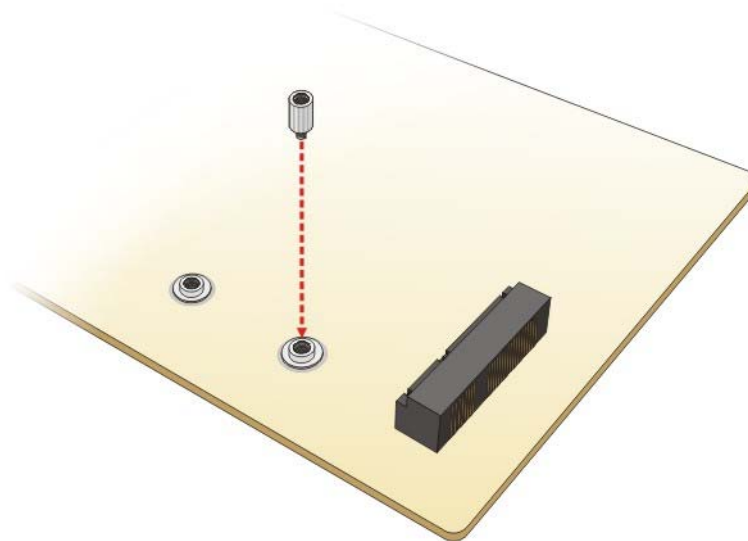


Figure 4-12: Installing the Standoff

Step 5: Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the slot at an angle of about 20° (Figure 4-13).

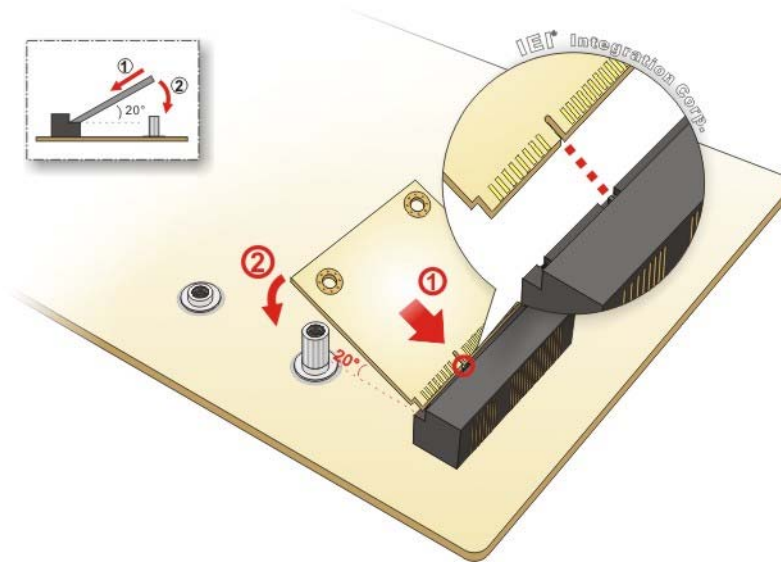


Figure 4-13: Inserting the Half-size PCIe Mini Card into the Slot at an Angle

Step 6: Secure the half-size PCIe Mini card. Secure the half-size PCIe Mini card with the retention screw previously removed (Figure 4-14).

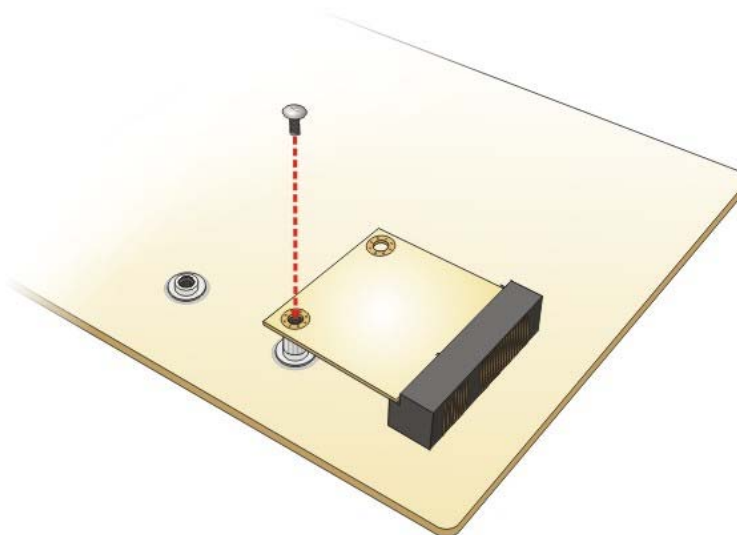


Figure 4-14: Securing the Half-size PCIe Mini Card

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4.9 System Configuration

The KINO-AA750-i2 is a jumper-less motherboard. The system configuration is controlled by buttons and switches. The system configuration should be performed before installation.

4.9.1 AT/ATX Power Mode Selection

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-15**.

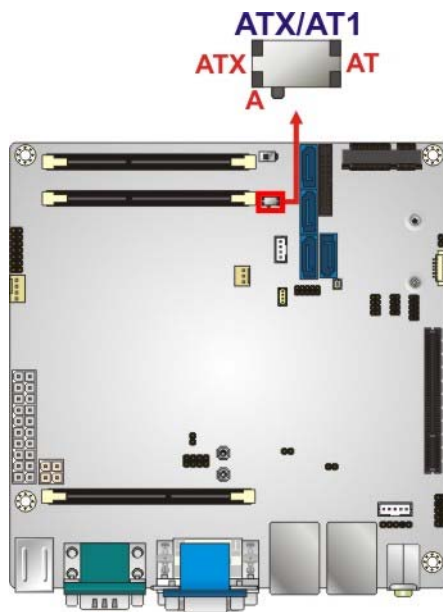


Figure 4-15: AT/ATX Power Mode Switch Location

Setting	Description
A-B	ATX power mode (default)
B-C	AT power mode

Table 4-1: AT/ATX Power Mode Switch Settings

4.9.2 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-16**.

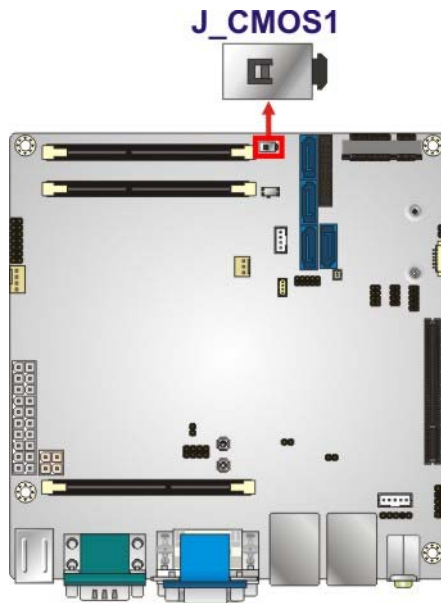


Figure 4-16: Clear CMOS Button Location

4.10 Chassis Installation

4.10.1 Airflow



WARNING:

Airflow is critical for keeping components within recommended operating temperatures. The chassis should have fans and vents as necessary to keep things cool.

The KINO-AA750-i2 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

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4.10.2 Motherboard Installation

To install the KINO-AA750-i2 motherboard into the chassis please refer to the reference material that came with the chassis.

4.11 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.11.1 SATA Drive Connection

The KINO-AA750-i2 is shipped with one SATA drive cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors.** The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector until it clips into place. See **Figure 4-17**.

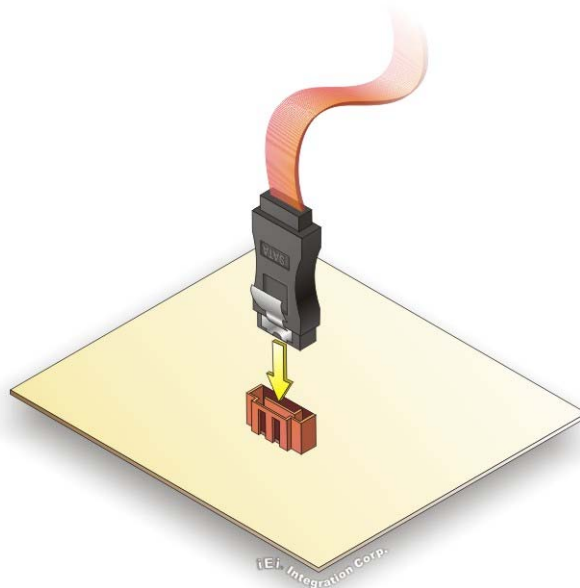


Figure 4-17: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-18**.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-18**.

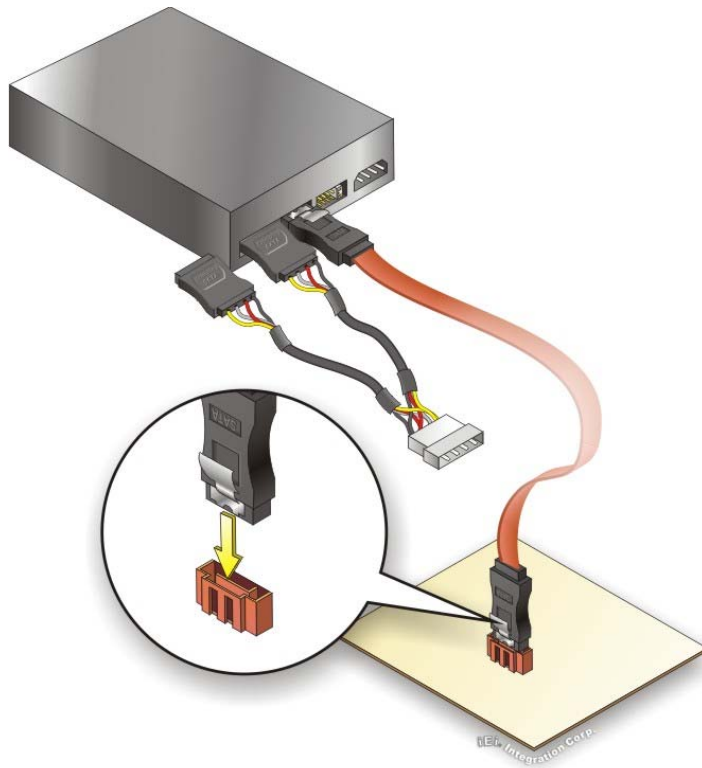


Figure 4-18: SATA Power Drive Connection

The SATA power cable can be bought from IEI. See **Optional Items** in Section 2.4.

4.12 External Peripheral Interface Connection

Devices can be connected to the external connectors. To install external devices, follow the directions in the subsections below.

4.12.1 Audio Connector

The audio jacks on the external audio connector enable the KINO-AA750-i2 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

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Step 1: Identify the audio plugs. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: Plug the audio plugs into the audio jacks. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

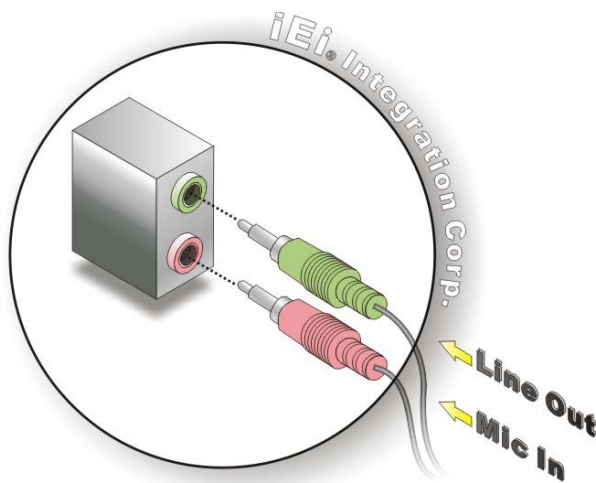


Figure 4-19: Audio Connector

Step 3: Check audio clarity. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

4.12.2 DVI Display Device Connection

The KINO-AA750-i2 has a single female DVI-D connector on the external peripheral interface panel. The DVI-D connector is connected to a digital display device. To connect a digital display device to the KINO-AA750-i2, please follow the instructions below.

Step 1: Locate the DVI-D connector. The location of the DVI-D connector is shown in Chapter 3.

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

Step 3: Insert the DVI-D connector Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the KINO-AA750-i2. See **Figure 4-20**.

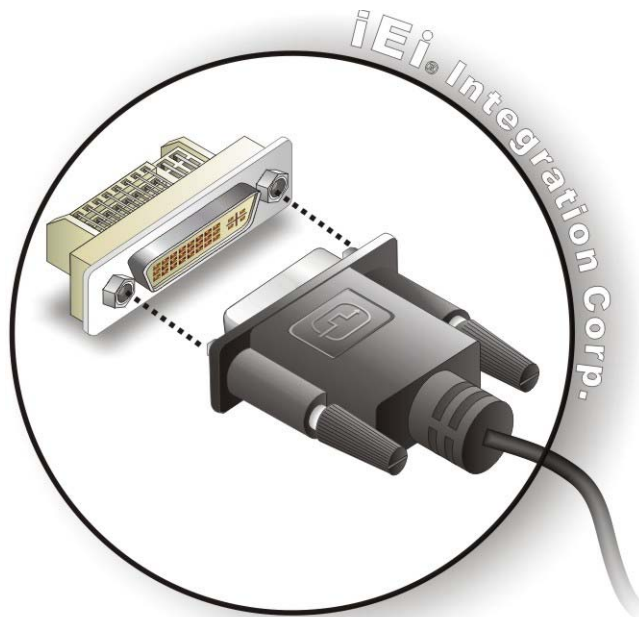


Figure 4-20: DVI-D Connector

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

4.12.3 HDMI Display Device Connection

The HDMI connector transmits a digital signal to compatible HDMI display devices such as a TV or computer screen. To connect the HDMI cable to the KINO-AA750-i2, follow the steps below.

Step 1: Locate the HDMI connector. The location is shown in **Chapter 3**.

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Step 2: Align the connector. Align the HDMI connector with the HDMI port. Make sure the orientation of the connector is correct.

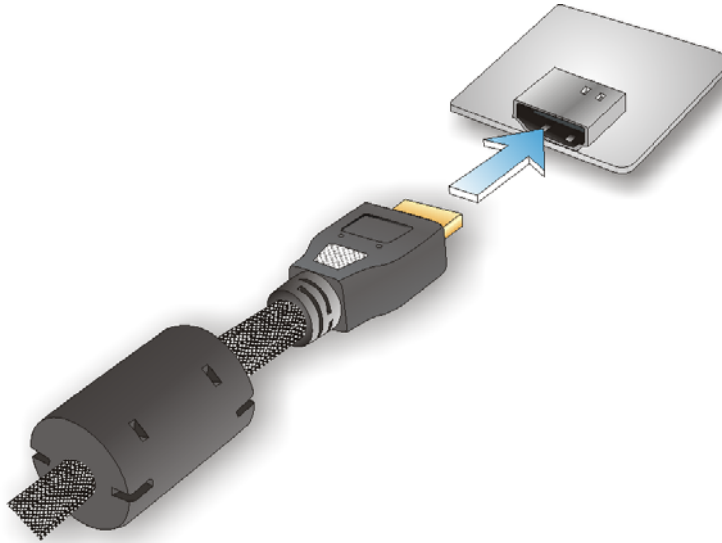


Figure 4-21: HDMI Connection

Step 3: Insert the HDMI connector. Gently insert the HDMI connector. The connector should engage with a gentle push. If the connector does not insert easily, check again that the connector is aligned correctly, and that the connector is being inserted with the right way up.

4.12.4 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connectors. The locations of the RJ-45 connectors are shown in **Chapter 3**.

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the KINO-AA750-i2. See **Figure 4-22**.

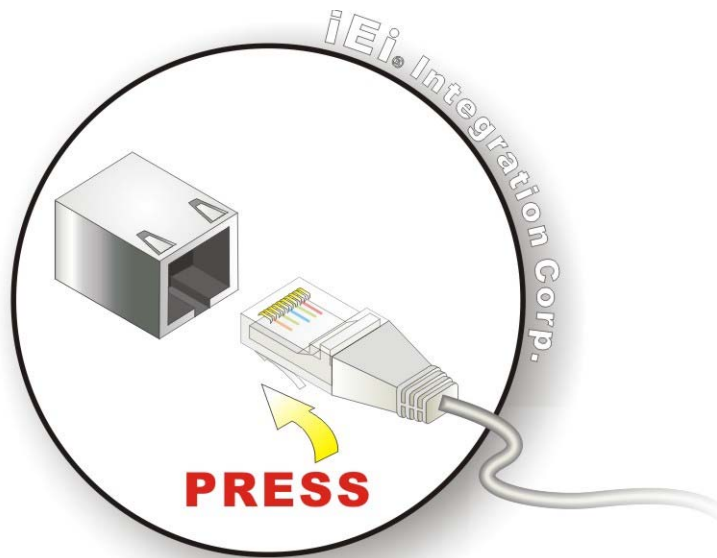


Figure 4-22: LAN Connection

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

4.12.5 PS/2 Keyboard and Mouse Connection

The KINO-AA750-i2 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the KINO-AA750-i2.

Step 1: Locate the dual PS/2 connector. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: Insert the keyboard/mouse connector. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 4-23**.

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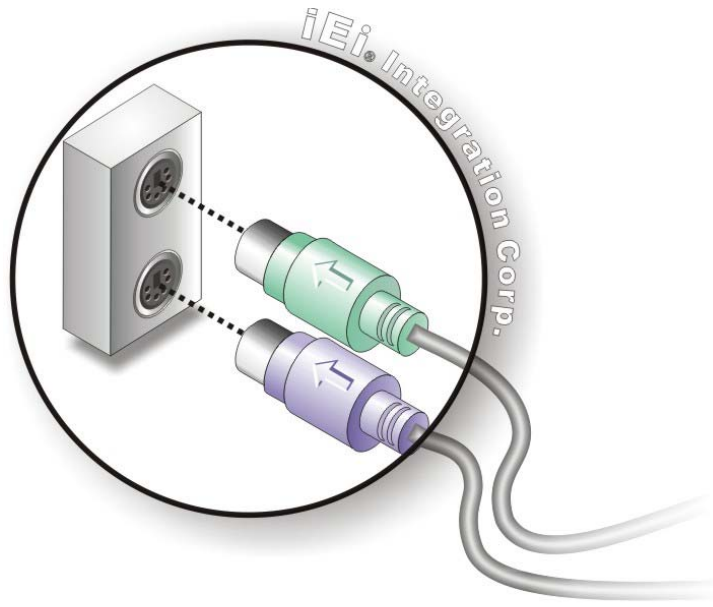


Figure 4-23: PS/2 Keyboard/Mouse Connector

4.12.6 Serial Device Connection

The KINO-AA750-i2 has a single male DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the KINO-AA750-i2.

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

Step 2: **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 4-24**.

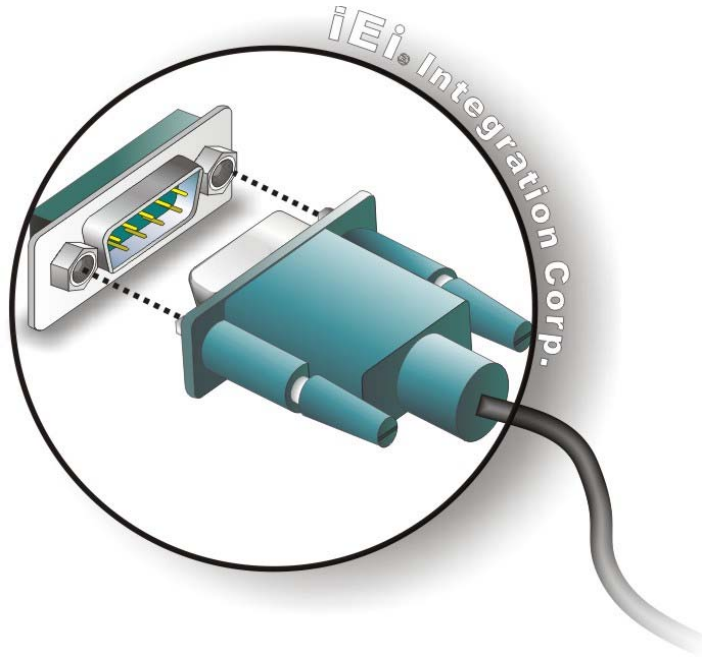


Figure 4-24: Serial Device Connector

Step 3: Secure the connector. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.12.7 USB Connection

The external USB 2.0/3.0 connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-AA750-i2.

Step 1: Locate the USB 2.0/3.0 connectors. The locations of the USB 2.0/3.0 connectors are shown in **Chapter 3**.

Step 2: Insert a USB 2.0/3.0 plug. Insert the USB 2.0/3.0 plug of a device into the USB 2.0/3.0 on the external peripheral interface. See **Figure 4-25**.

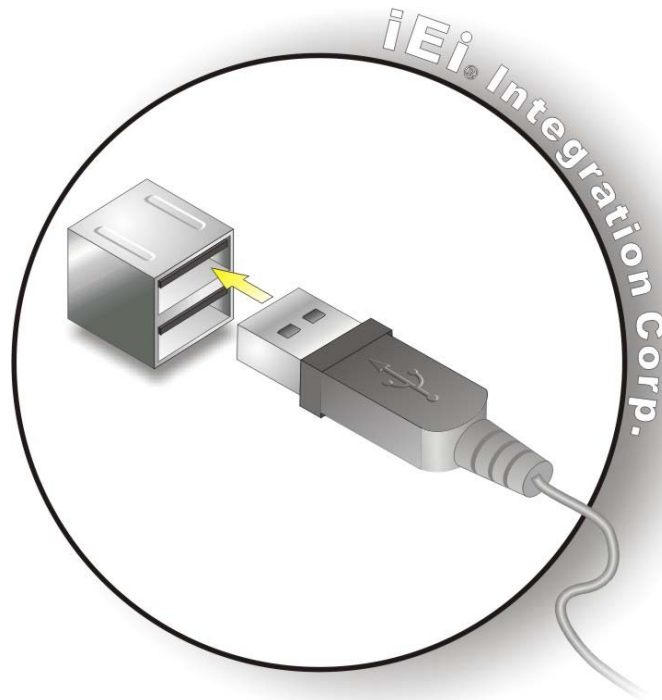


Figure 4-25: USB Connector

4.12.8 VGA Monitor Connection

The KINO-AA750-i2 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the KINO-AA750-i2, please follow the instructions below.

- Step 1:** **Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2:** **Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 3:** **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the KINO-AA750-i2. See **Figure 4-26**.

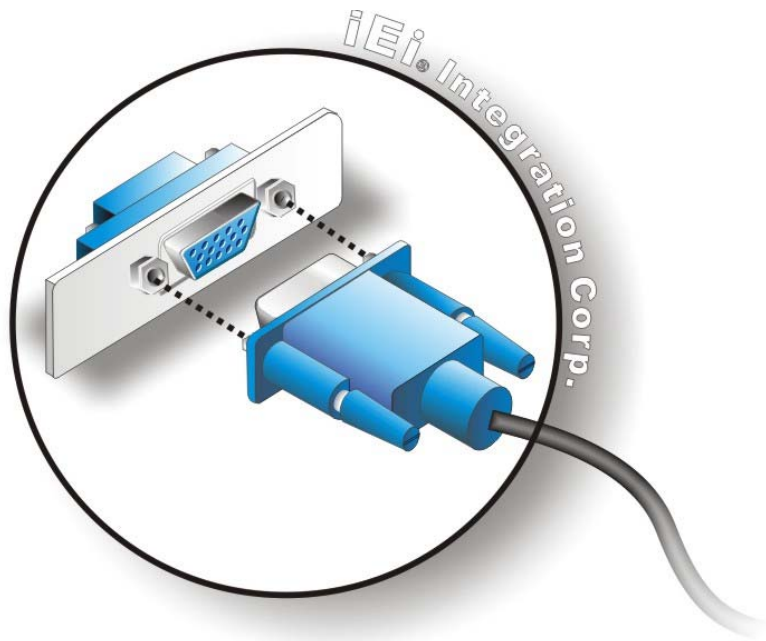


Figure 4-26: VGA Connector

Step 4: **Secure the connector.** Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.13 IPMI Setup Procedure

The KINO-AA750-i2 features Intelligent Platform Management Interface (IPMI) that helps lower the overall costs of server management by enabling users to maximize IT resources, save time and manage multiple systems. The KINO-AA750-i2 supports IPMI 2.0 through the optional iRIS-2400 module. Follow the steps below to setup IPMI.

4.13.1 Managed System Hardware Setup

The hardware configuration of the managed system (KINO-AA750-i2) is described below.

Step 1: Install an iRIS-2400 module to the iRIS module socket (refer to **Section 4.6**).

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Step 2: Make sure at least one DDR3 DIMM is installed in one of the DIMM sockets. If multiple DIMMs are installed, all of the DIMMs must be same size, same speed and same brand to get the best performance.

Step 3: Connect an Ethernet cable to the RJ-45 connector labeled **LAN_USB1** (Figure 3-31).

4.13.2 Using the IEI iMAN Web GUI

To manage a client system from a remote console using IEI iMAN Web GUI, follow the steps below.

Step 1: Obtain the IP address of the managed system. It is recommended to use the IPMI Tool on the managed system to obtain the IP address. To use IPMI Tool to obtain IP address, follow the steps below:

- a. Copy the **ipmitool.exe** file to a bootable USB flash drive.
- b. Insert the USB flash drive to the KINO-AA750-i2
- c. The KINO-AA750-i2 boots from the USB flash drive
- d. Enter the following command: **ipmitool 20 30 02 01 03 00 00**
(there is a space between each two-digit number)
- e. A serial of number shows. The last four two-digit hexadecimal numbers are the IP address. Convert the hexadecimal numbers to decimal numbers.

Step 2: On the remote management console, open a web browser. Enter the managed system IP address in the web browser (Figure 4-27).

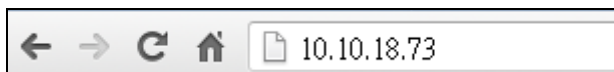


Figure 4-27: IEI iMAN Web Address

Step 3: The login page appears in the web browser.

Step 4: Enter the user name and password to login the system. The default login username and password are:

-Username: **admin**

-Password: **admin**

Step 5: Press the login button to login the system.

Step 6: The IEI iMAN Web Interface appears.

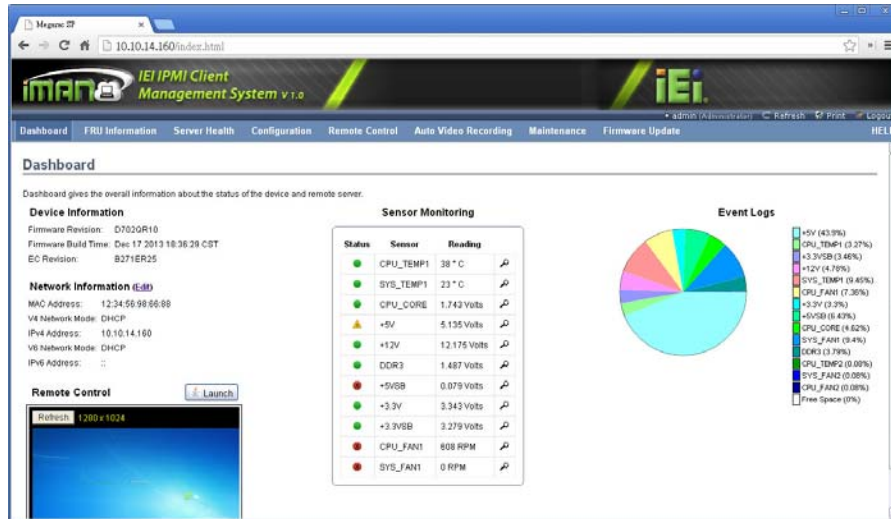


Figure 4-28: IEI iMAN Web GUI



NOTE:

To understand how to use the IEI iMAN Web GUI, please refer to the iRIS-2400 Web GUI user manual in the utility CD came with the KINO-AA750-i2. The user manual describes each function in detail.

Chapter

5

BIOS

5.1 Introduction

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



NOTE:

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

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

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Key	Function
-	Decrease the numeric value or make changes
Page Up key	Move to the next page
Page Dn key	Move to the previous page
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 clear CMOS button 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) 2012 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		
Compliance			UEFI 2.3.1; PI 1.2		
Project Version			E426AR03.ROM		
Build Date and Time			03/14/2014 11:43:32		-----
iWDD Vendor			iEi		→←: Select Screen
iWDD Version			E425ER12.bin		↑ ↓: Select Item
IPMI Module State			N/A		Enter: Select
System Date			[Tue 03/18/2014]		+/-: Change Opt.
System Time			[15:10:27]		F1: General Help
Access Level			Administrator		F2: Previous Values
					F3: Optimized Defaults
					F4: Save & Exit
					ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.					

BIOS Menu 1: Main

The Main menu has two user configurable fields:

➔ System Date [xx/xx/xx]

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

➔ System Time [xx:xx:xx]

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

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5.3 Advanced

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



WARNING:

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

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit
-----
> ACPI Settings                System ACPI Parameters
> Trusted Computing
> RTC Wake Settings
> CPU Configuration
> IDE Configuration
> USB Configuration
> iWDD H/W Monitor
> F81866 Super IO Configuration
> F81866 H/W Monitor
> Serial Port Console Redirection

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

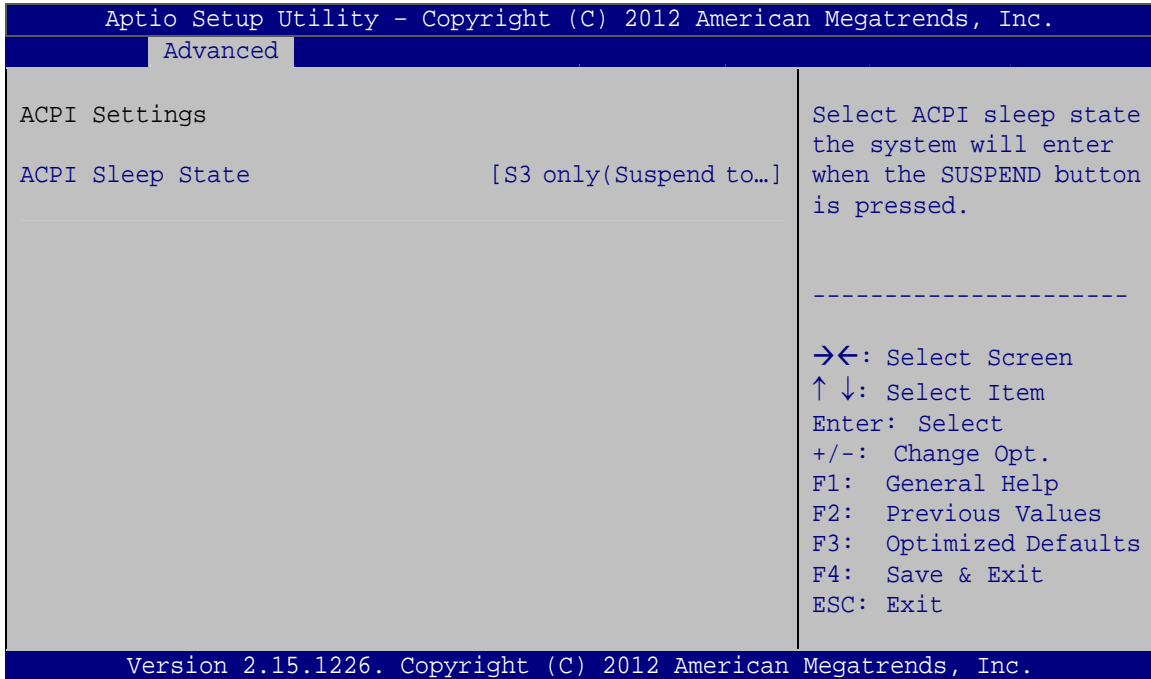
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

```

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Settings

➔ **ACPI Sleep State [S3 only (Suspend to RAM)]**

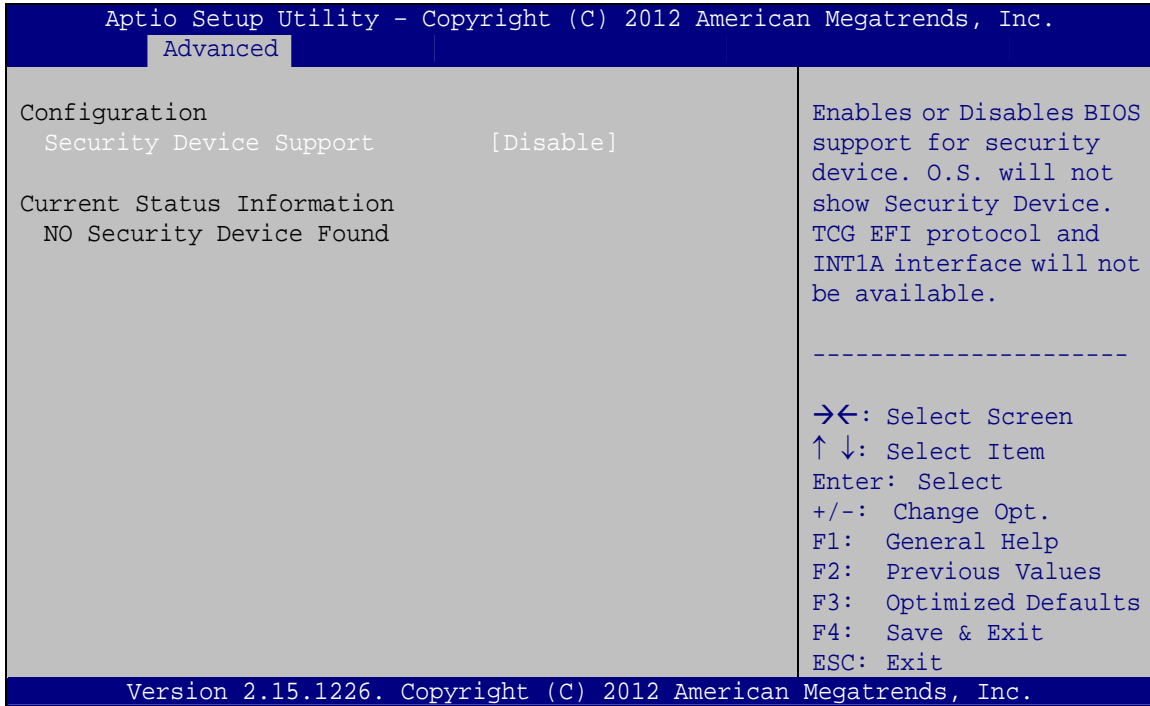
Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **S3 only (Suspend to RAM)** **DEFAULT** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

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BIOS Menu 4: Trusted Computing

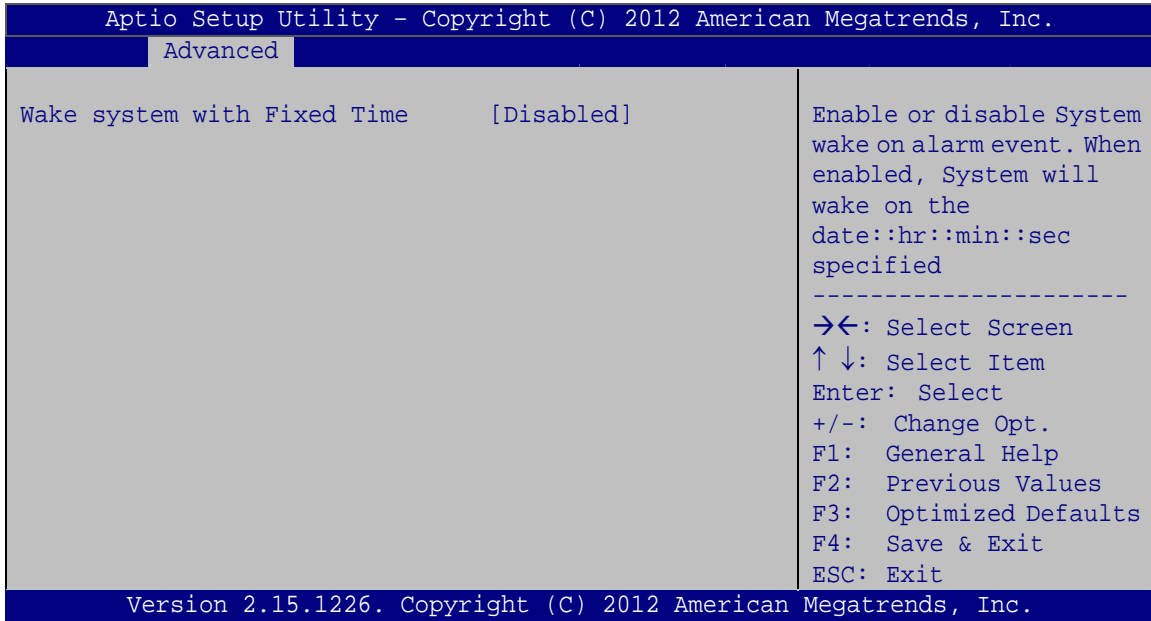
→ Security Device Support [Disable]

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

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

5.3.3 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 5**) enables the system to wake at the specified time.



BIOS Menu 5: RTC Wake Settings

➔ **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 every day
- Wake up date
- Wake up hour
- Wake up minute
- Wake up second

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

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5.3.4 CPU Configuration

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

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
CPU Configuration                                Enabled/disable CPU
                                                Virtualization
Module Version: 4.6.5.1 TrinityPI 016
AGESA Version : 1.0.0.6
-----
SVM Mode                                         [Enabled]
> Node 0 Information
                                                →←: Select Screen
                                                ↑ ↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
    
```

BIOS Menu 6: CPU Configuration

→ SVM Mode [Enabled]

Use the **SVM Mode** option to enable or disable CPU virtualization on the system.

- **Disabled** Disables CPU virtualization.
- **Enabled** **DEFAULT** Enables CPU virtualization.

5.3.4.1 Node 0 Information

The **Node 0 Information** submenu (**BIOS Menu 7**) lists detailed CPU specifications.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
Socekt0: AMD R-460H APU with Radeon(tm) HD Graphics
Dual Core Running @ 1934 MHz 550 mV
Max Speed:1900 MHz   Intended Speed:1900 MHz
Min Speed:900 MHz
Microcode Patch Level: 600110f

----- Cache per Core -----
L1 Instruction Cache: 64 KB/2-way
      L1 Data Cache: 16 KB/4-way
      L2 Cache: 2048 KB/16-way
No L3 Cache Present

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

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
    
```

BIOS Menu 7: Node 0 Information

5.3.5 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 8**) to view the SATA/mSATA devices installed in the system.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
IDE Configuration

SATA Port1           Not Present
SATA Port2           Not Present
SATA Port3           Not Present
SATA Port4           Not Present
SATA Port5           Not Present

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

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
    
```

BIOS Menu 8: IDE Configuration

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5.3.6 USB Configuration

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

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
-----
USB Configuration
USB Devices:
  1 Keyboard
Legacy USB Support          [Enabled]
-----
Enables Legacy USB
support. AUTO option
disables legacy support
if no USB devices are
connected. DISABLE
option will keep USB
devices available only
for EFI applications.

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

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 9: USB Configuration

➔ USB Devices

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

➔ Legacy USB Support [Enabled]

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

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

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

5.3.7 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 10**) contains the fan configuration submenu and displays the system fan speeds.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
-----
Advanced
-----
PC Health Status                                     Enable or Disable Smart Fan
FAN1 Speed                                           : 1658 RPM
FAN2 Speed                                           : N/A
+Vcore                                               : +2.231 V
+5V                                                  : +5.113 V
+12V                                                 : +11.803 V
+DDR3                                                : +1.366 V
+5VSB                                                : +5.144 V
+3.3V                                                : +3.389 V
Smart Fan Function [Enabled]
> Smart Fan Mode Configuration
-----
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
-----
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

```

BIOS Menu 10: iWDD H/W Monitor

➔ **Smart Fan Function [Enabled]**

Use the **Smart Fan Function** option to enable or disable the smart fan function.

- ➔ **Disabled** Disables the smart fan function
- ➔ **Enabled** **DEFAULT** Enables the smart fan function

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5.3.7.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 11**) to configure the smart fan temperature and speed settings. This submenu appears only when the **Smart Fan Function** option is enabled.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Advanced
Smart Fan Mode Configuration
Fan 1 Smart Fan Control      [Auto Mode]
Auto mode fan start temperature 40
Auto mode fan off temperature 30
Auto mode fan start PWM      30
Auto mode fan slope PWM      3

Fan 2 Smart Fan Control      [Auto Mode]
Auto mode fan start temperature 50
Auto mode fan off temperature 40
Auto mode fan start PWM      30
Auto mode fan slope PWM      1

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

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
    
```

BIOS Menu 11: Smart Fan Mode Configuration

➔ Fan 1 Smart Fan Control/Fan 2 Smart Fan Control [Auto Mode]

Use the **Fan 1 Smart Fan Control/Fan 2 Smart Fan Control** option to configure the CPU/System 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**

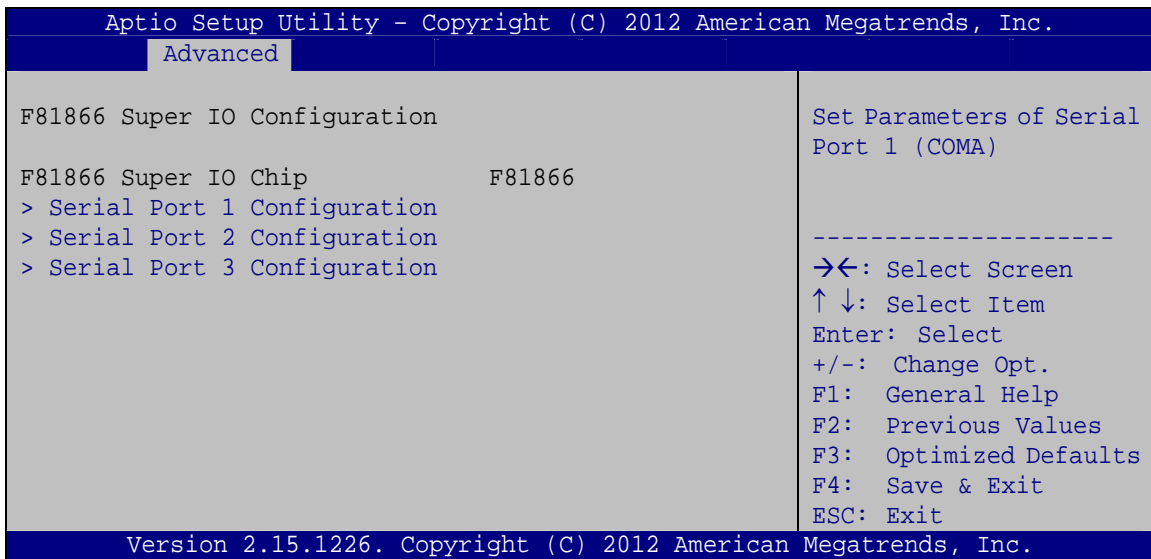
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ **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.

5.3.8 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 12**) to set or change the configurations for the serial ports.

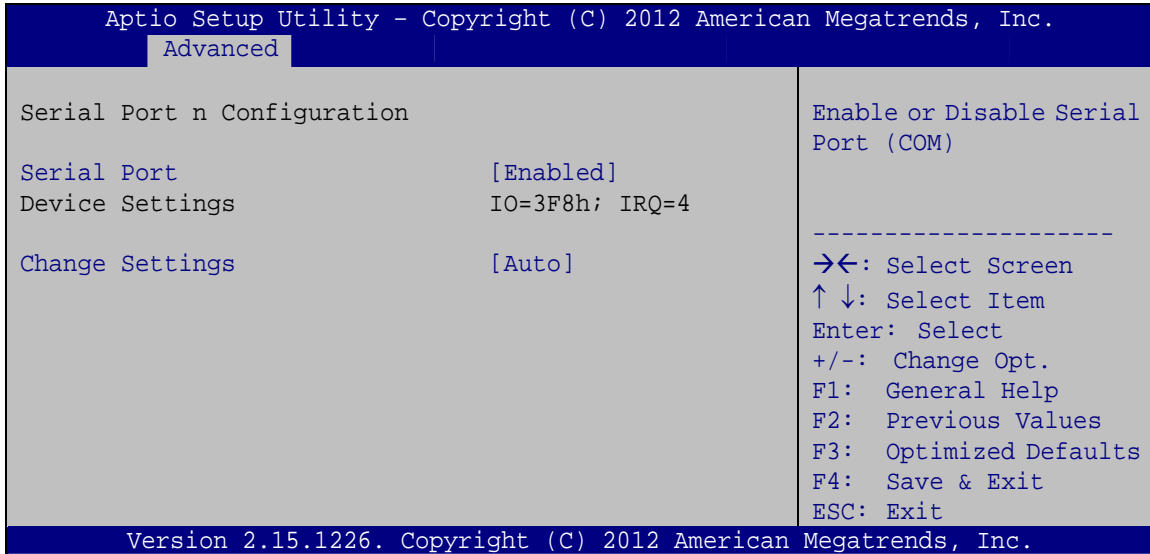


BIOS Menu 12: F81866 Super IO Configuration

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5.3.8.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 13**) to configure the serial port n.



BIOS Menu 13: Serial Port n Configuration Menu

5.3.8.1.1 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

5.3.8.1.2 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=2E8h;**
IRQ=3, 4 Serial Port I/O port address is 2E8h 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

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- ➔ **IO=2E8h;**
IRQ=3, 4 Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.8.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

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

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

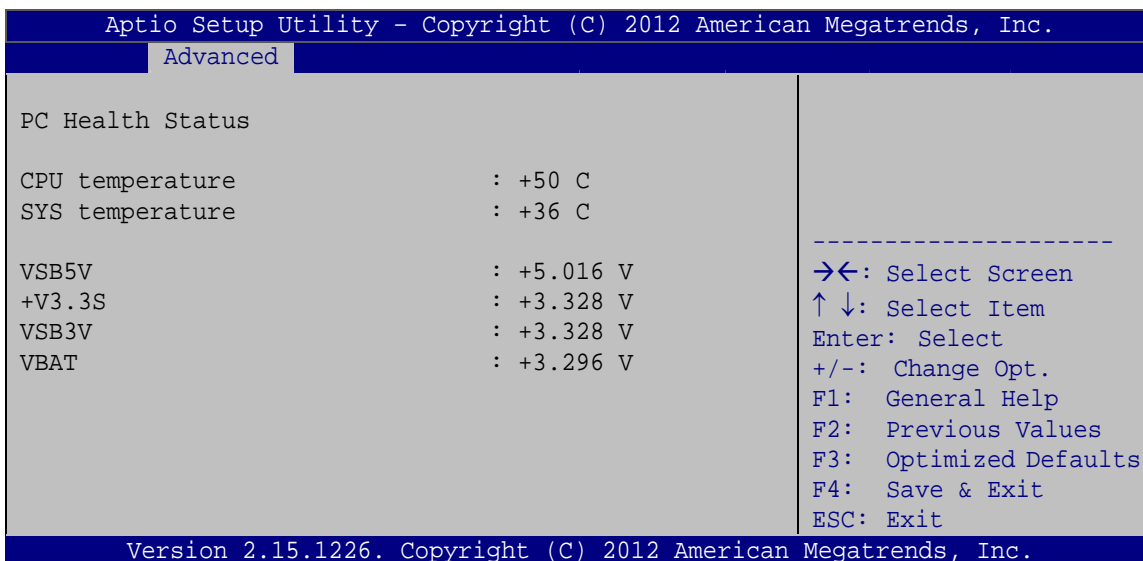
➔ Change Settings [Auto]

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

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=3E8h;**
IRQ=7 Serial Port I/O port address is 3E8h and the interrupt address is IRQ7
- ➔ **IO=3F8h;**
IRQ=5, 6,
7, 10, 11 Serial Port I/O port address is 3F8h and the interrupt address is IRQ5, 6, 7, 10, 11
- ➔ **IO=2F8h;**
IRQ=5, 6,
7, 10, 11 Serial Port I/O port address is 2F8h and the interrupt address is IRQ5, 6, 7, 10, 11
- ➔ **IO=3E8h;**
IRQ=5, 6,
7, 10, 11 Serial Port I/O port address is 3E8h and the interrupt address is IRQ5, 6, 7, 10, 11
- ➔ **IO=2E8h;**
IRQ=5, 6,
7, 10, 11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ5, 6, 7, 10, 11

5.3.9 F81866 H/W Monitor

The **F81866 H/W Monitor** menu (**BIOS Menu 14**) displays the system temperatures and voltages.

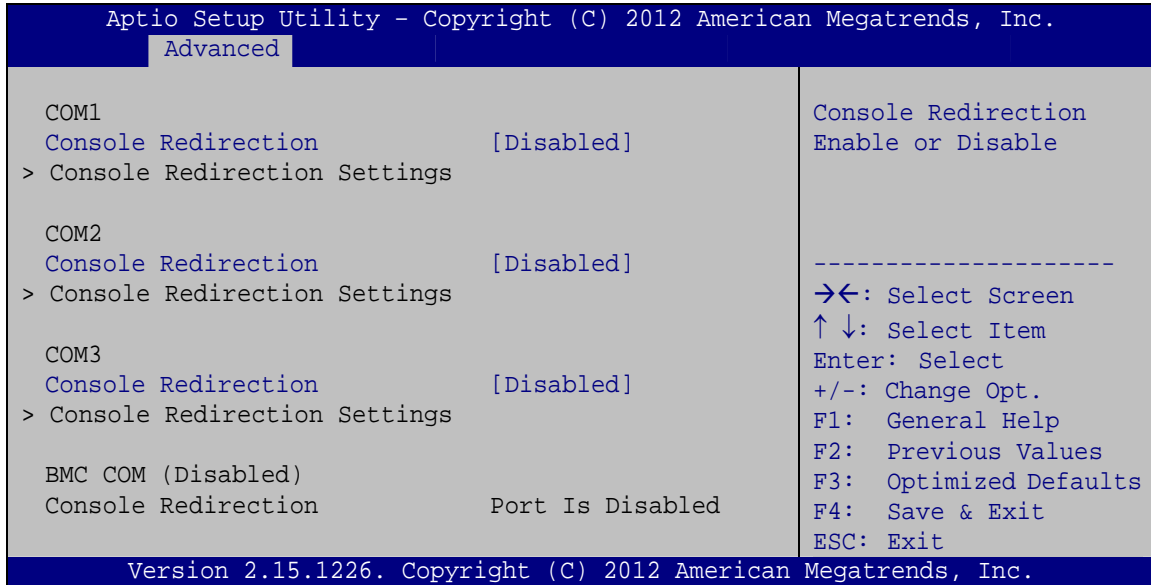


BIOS Menu 14: F81866 H/W Monitor

5.3.10 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 15**) 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.

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BIOS Menu 15: 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



NOTE:

The following options are available in the **Console Redirection Settings** submenu when the **Console Redirection** option is enabled.

→ Terminal Type [ANSI]

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

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

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

→ **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.
- **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.

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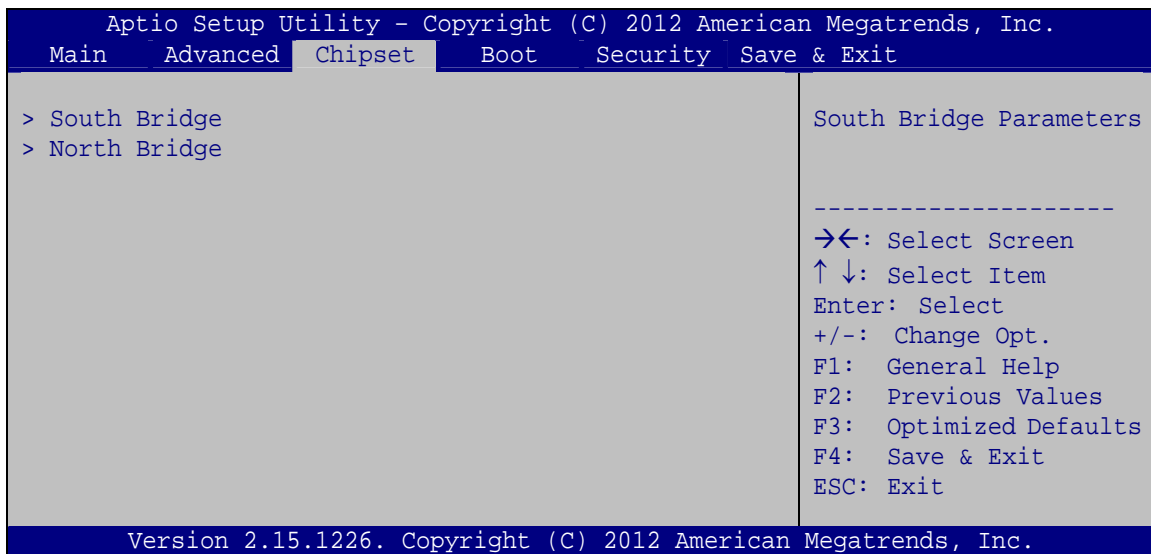
→ Stop Bits [1]

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

- 1 **DEFAULT** Sets the number of stop bits at 1.
- 2 Sets the number of stop bits at 2.

5.4 Chipset

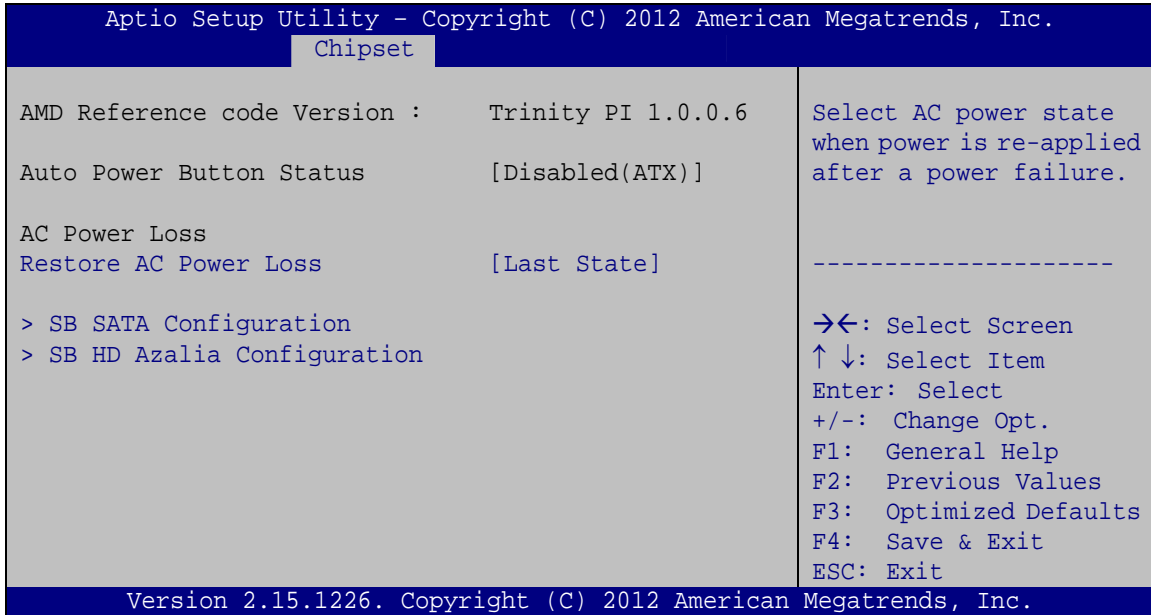
Use the **Chipset** menu (**BIOS Menu 16**) to access the Northbridge and Southbridge configuration menus.



BIOS Menu 16: Chipset

5.4.1 Southbridge Configuration

Use the **South Bridge** menu (**BIOS Menu 17**) to configure the Southbridge parameters.



BIOS Menu 17: Southbridge Configuration

➔ Restore AC Power Loss [Last State]

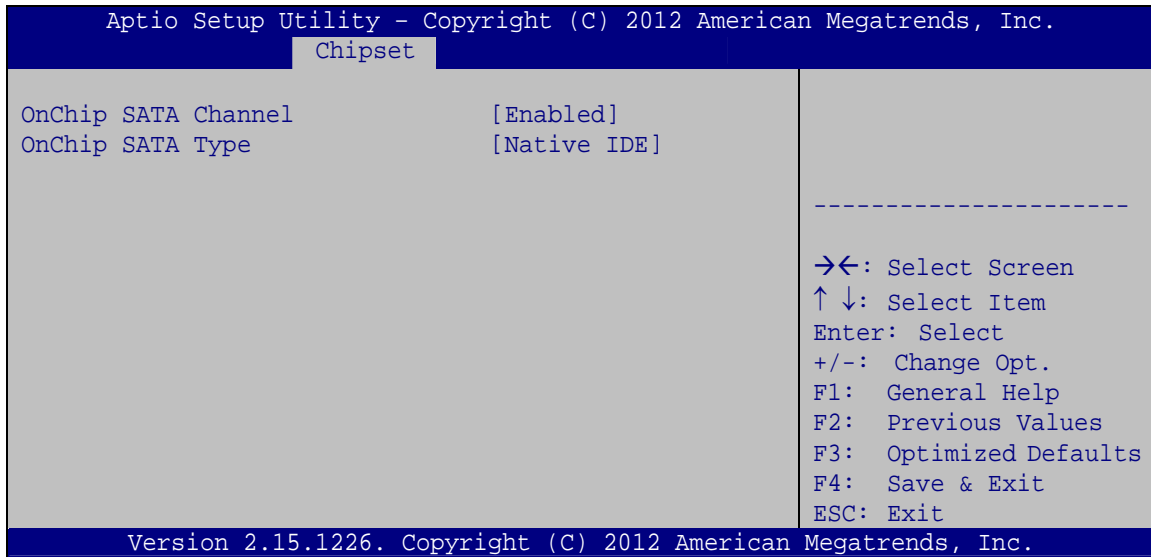
Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

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

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5.4.1.1 SB SATA Configuration

Use the **SB SATA Configuration** menu (**BIOS Menu 18**) to change and/or set the configuration of the SATA devices installed in the system.

**BIOS Menu 18: SB SATA Configuration**→ **OnChip SATA Channel [Enabled]**

Use the **OnChip SATA Channel** option to configure the serial ATA controller.

- **Enabled** **DEFAULT** Enables the on-board SATA controller.
- **Disabled** Disables the on-board SATA controller.

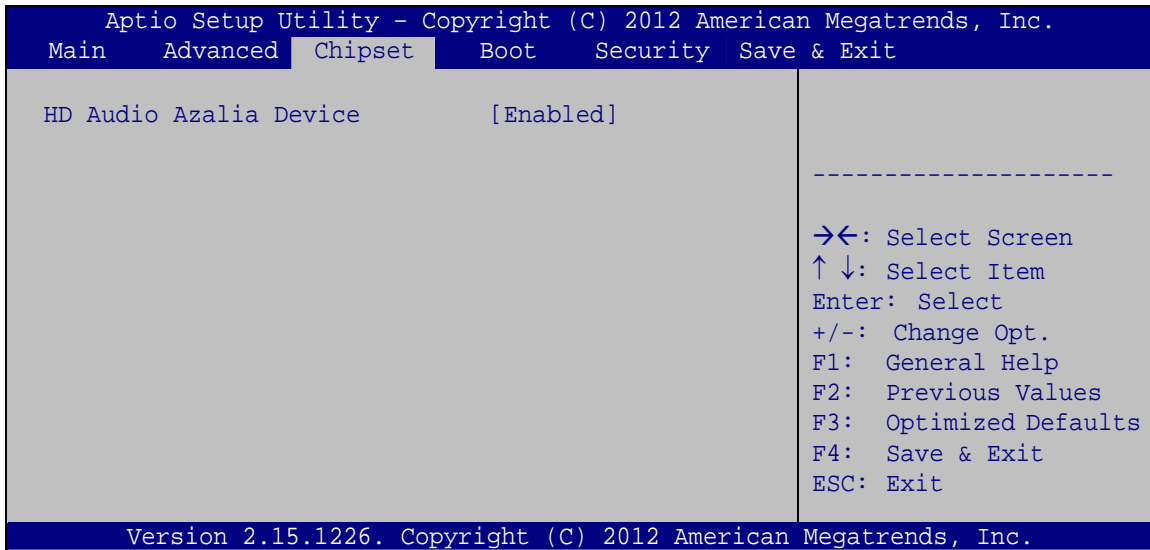
→ **OnChip SATA Type [Native IDE]**

Use the **OnChip SATA Type** option to configure SATA devices.

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

5.4.1.2 SB HD Azalia Configuration

Use the **SB HD Azalia Configuration** menu (**BIOS Menu 19**) to configure the HD Azalia settings.



BIOS Menu 19: SB HD Azalia Configuration Menu

→ HD Audio Azalia Device [Enabled]

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

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

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5.4.2 Northbridge Configuration

Use the **North Bridge** menu (**BIOS Menu 20**) to configure the Northbridge parameters.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
North Bridge Configuration
Memory Information
Total Memory: 4096 MB (DDR3)
> Socket 0 Information
View Information related
to Socket 0.
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 20: Northbridge Configuration

5.4.2.1 Socket 0 Information

Use the **Socket 0 Information** submenu (**BIOS Menu 21**) to view memory information.

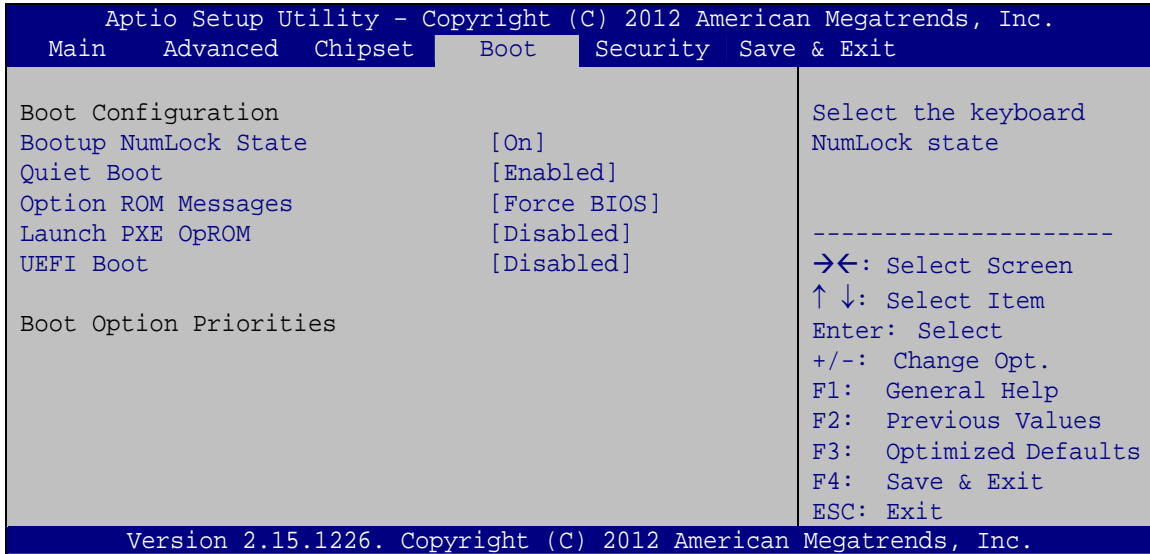
```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
Socket 0 Information
Dimm0: size=0 MB, speed=0 MHz
Dimm1: size=4096 MB, speed=1600 MHz
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.
  
```

BIOS Menu 21: Socket 0 Information

5.5 Boot

Use the **Boot menu (BIOS Menu 22)** to configure system boot options.



BIOS Menu 22: 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.

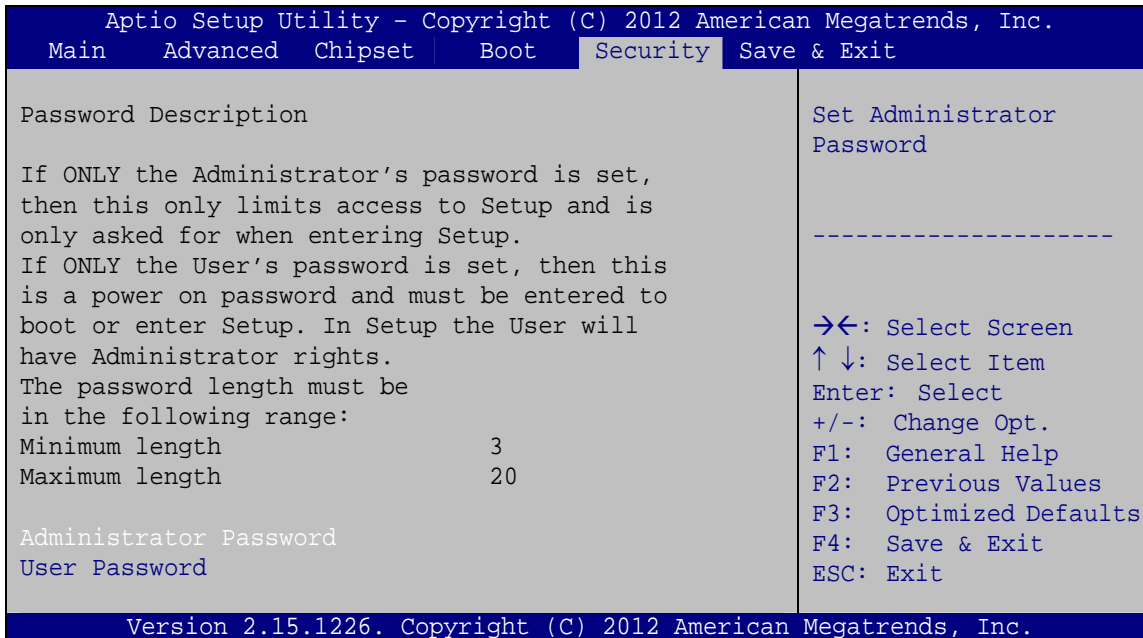
→ UEFI Boot [Disabled]

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 23**) to set system and user passwords.



BIOS Menu 23: 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 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.

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```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit

Save Changes and Reset
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Reset the system after
saving the changes.

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

Version 2.15.1226. Copyright (C) 2012 American Megatrends, Inc.

```

BIOS Menu 24: 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

KINO-AA750-i2 Mini-ITX SBC

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:

- Graphics
- LAN
- Audio

Installation instructions are given below.

6.2 Starting the Driver Program

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

Step 1: Insert the CD 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.

Step 3: Click KINO-AA750-i2.

Step 4: The list of drivers appears.

6.3 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 **Graphics** and select the folder which corresponds to the operating system.

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

Step 4: The **Welcome Screen** in **Figure 6-1** appears. Select the display language and click **Next** to continue.



Figure 6-1: Graphics Driver Welcome Screen

Step 5: Click **Install** (**Figure 6-2**).

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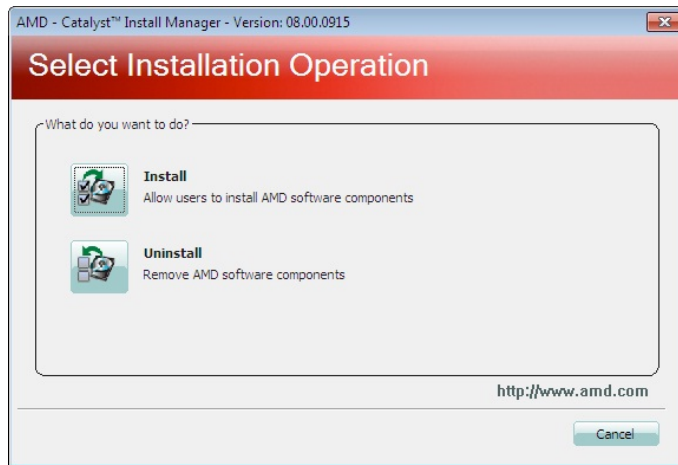


Figure 6-2: Select Installation Operation Screen

Step 6: The screen in Figure 6-3 appears.

Step 7: Select **Express** or **Custom** installation and click **Next** to continue.

When selecting **Custom** installation, a screen with component selection will appear, allowing the user to select the components to install.

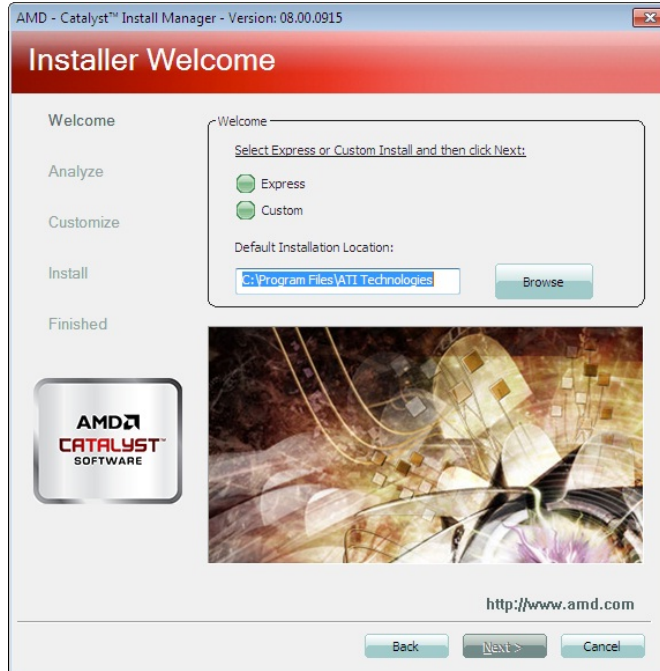


Figure 6-3: Select Express or Custom Install Screen

Step 8: The license agreement in **Figure 6-4** appears.

Step 9: Read the **License Agreement**, then click **Accept** to continue.

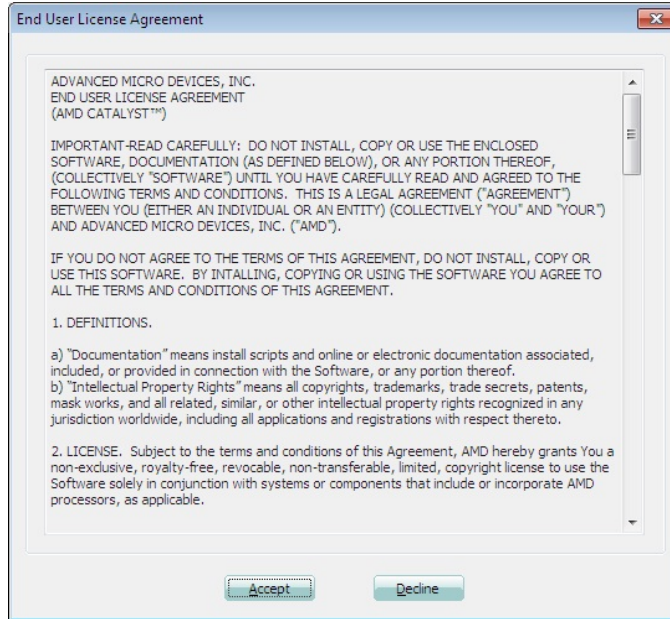


Figure 6-4: Graphics Driver License Agreement

Step 10: Setup operations are performed as shown in **Figure 6-5**.



Figure 6-5: Graphics Driver Setup Operations

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Step 11: The **Finished** screen in **Figure 6-6** appears. Click **Finish** to exit.

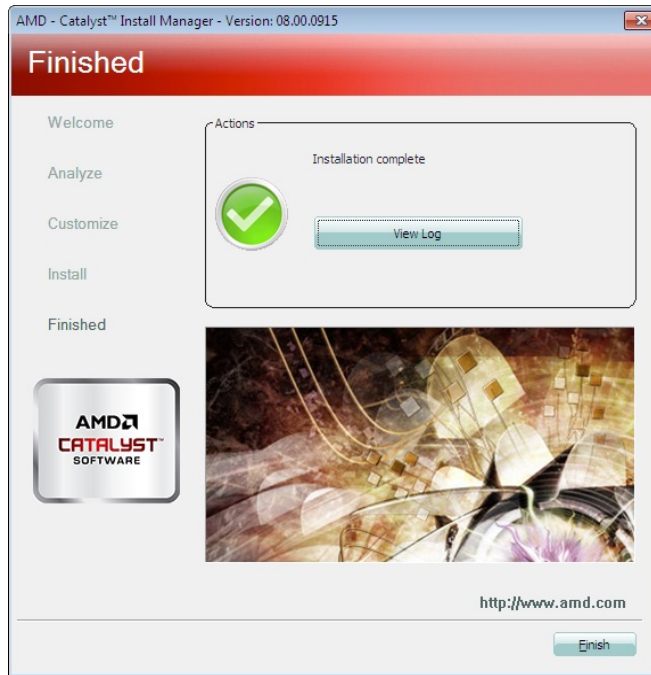


Figure 6-6: Graphics Driver Installation Finished Screen

Step 12: The message in **Figure 6-7** appears. Click **Yes** to restart the system.

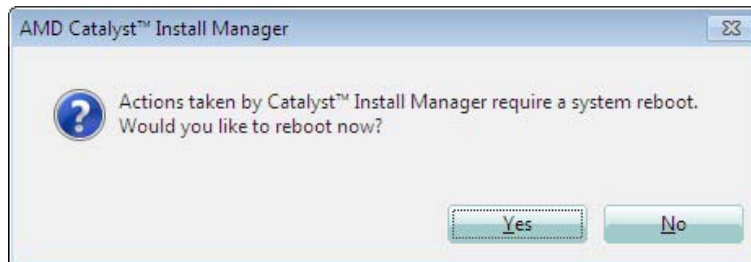


Figure 6-7: Reboot Screen

6.4 LAN Driver Installation

To install the LAN driver, please do the following.

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

Step 2: Click **LAN**.

Step 3: Select the folder with the driver of correspondent LAN controller.

Step 4: Locate the Autorun file and double click on it.

Step 5: The Intel® Network Connection menu in **Figure 6-8** appears.

Step 6: Click **Install Drivers and Software**.

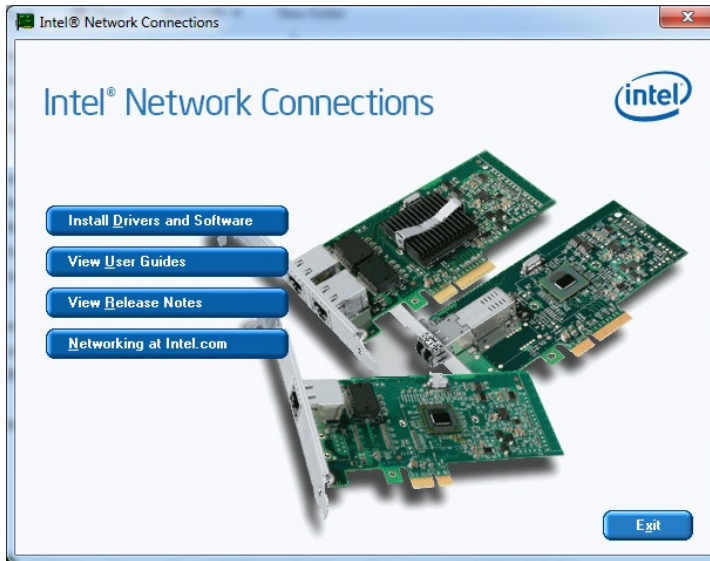


Figure 6-8: Intel® Network Connection Menu

Step 7: The **Welcome** screen in **Figure 6-9** appears.

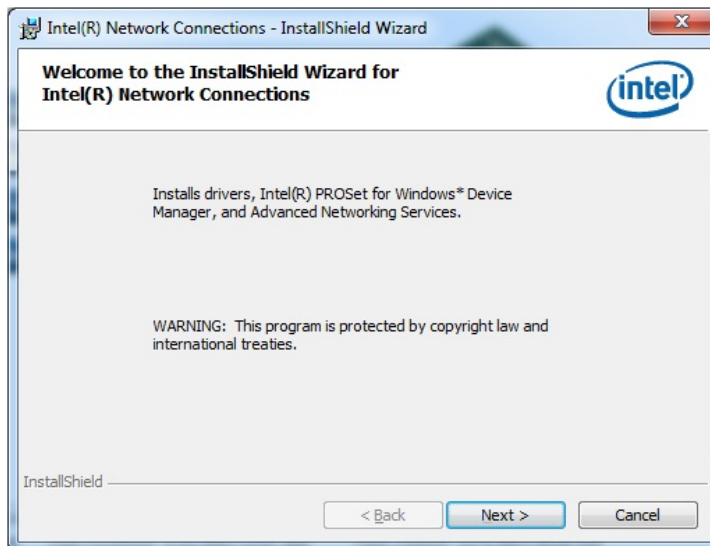


Figure 6-9: LAN Driver Welcome Screen

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

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Step 9: The **License Agreement** in **Figure 6-10** appears.

Step 10: Accept the agreement by selecting “**I accept the terms in the license agreement**”.

Step 11: Click **Next** to continue.



Figure 6-10: LAN Driver License Agreement

Step 12: The **Setup Options** screen in **Figure 6-11** appears.

Step 13: Select program features to install.

Step 14: Click **Next** to continue.

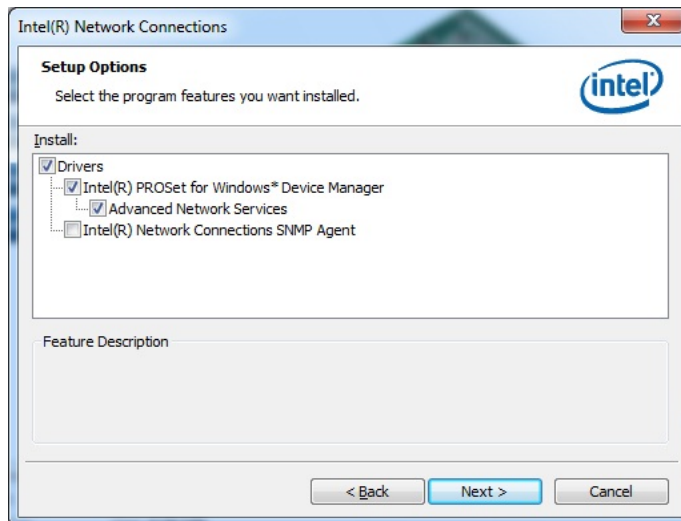


Figure 6-11: LAN Driver Setup Options

Step 15: The **Ready to Install the Program** screen in **Figure 6-12** appears.

Step 16: Click **Install** to proceed with the installation.

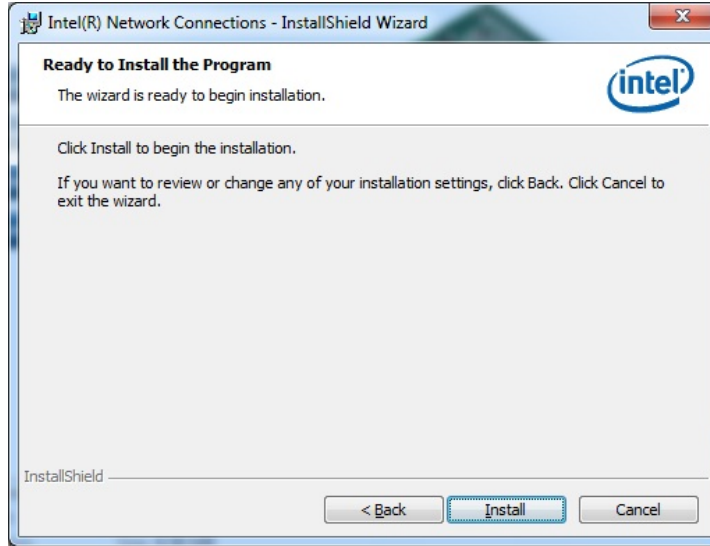


Figure 6-12: LAN Driver Installation

Step 17: The program begins to install.

Step 18: When the driver installation is complete, the screen in **Figure 6-13** appears.

Step 19: Click **Finish** to exit.

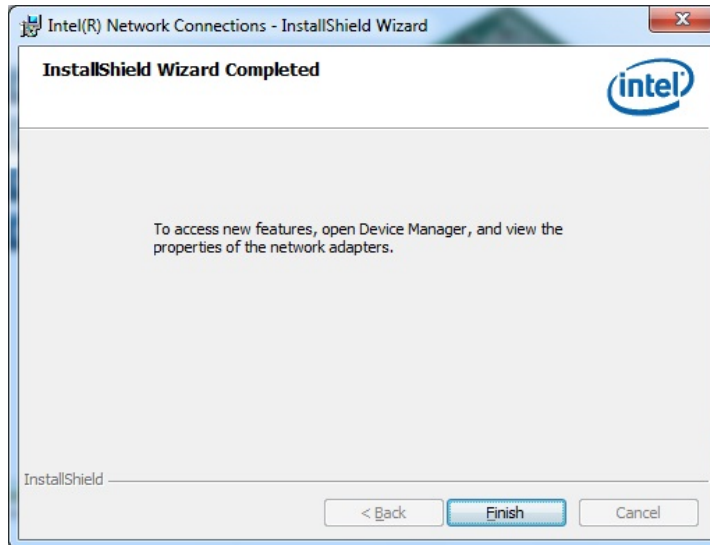


Figure 6-13: LAN Driver Installation Complete

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6.5 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 **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 6-14**).

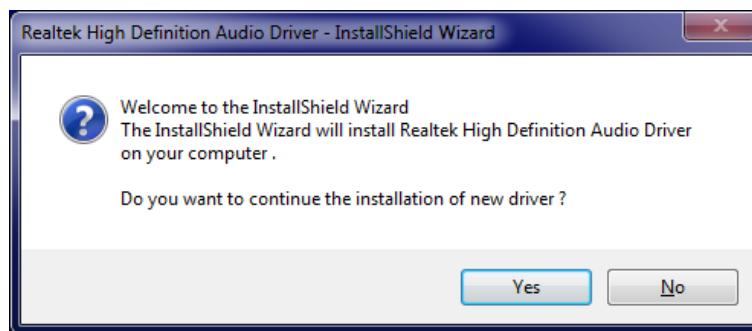


Figure 6-14: Audio Driver Welcome Screen

- Step 6:** Click **Yes** to continue.
- Step 7:** The program begins to install. See **Figure 6-15**.

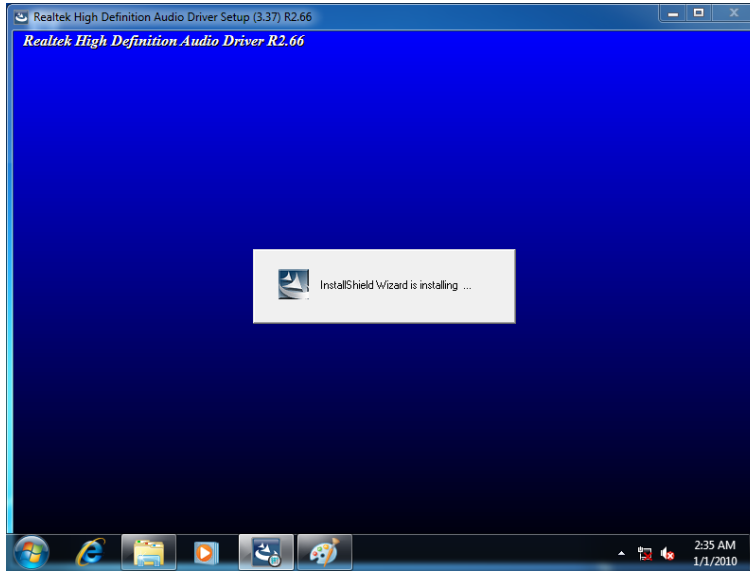


Figure 6-15: Audio Driver Installation

Step 8: When the driver installation is complete, the screen in **Figure 6-16** appears.

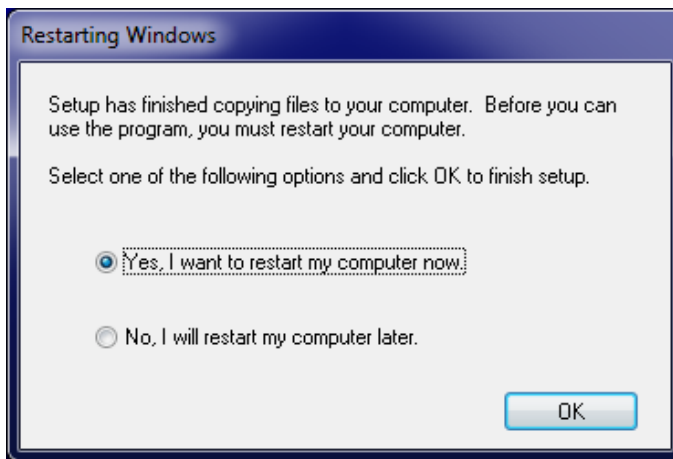


Figure 6-16: Audio Driver Installation Complete

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

Step 10: The system reboots.

Appendix

A

BIOS Options

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

System Date [xx/xx/xx]	86
System Time [xx:xx:xx]	86
ACPI Sleep State [S3 only (Suspend to RAM)]	88
Security Device Support [Disable]	89
Wake system with Fixed Time [Disabled]	90
SVM Mode [Enabled]	91
USB Devices	93
Legacy USB Support [Enabled]	93
Smart Fan Function [Enabled]	94
Fan 1 Smart Fan Control/Fan 2 Smart Fan Control [Auto Mode]	95
Auto mode fan start/off temperature	95
Auto mode fan start PWM	96
Auto mode fan slope PWM	96
Serial Port [Enabled]	97
Change Settings [Auto]	97
Serial Port [Enabled]	98
Change Settings [Auto]	98
Serial Port [Enabled]	99
Change Settings [Auto]	99
Console Redirection [Disabled]	101
Terminal Type [ANSI]	101
Bits per second [115200]	102
Data Bits [8]	102
Parity [None]	102
Stop Bits [1]	103
Restore AC Power Loss [Last State]	104
OnChip SATA Channel [Enabled]	105
OnChip SATA Type [Native IDE]	105
HD Audio Azalia Device [Enabled]	106
Bootup NumLock State [On]	108
Quiet Boot [Enabled]	109
Option ROM Messages [Force BIOS]	109
Launch PXE OpROM [Disabled]	109

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UEFI Boot [Disabled]	109
Administrator Password	110
User Password	110
Save Changes and Reset	111
Discard Changes and Reset	111
Restore Defaults	111
Save as User Defaults	111
Restore User Defaults	111

Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

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



NOTE:

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

The IEI One Key Recovery tool menu is shown below.

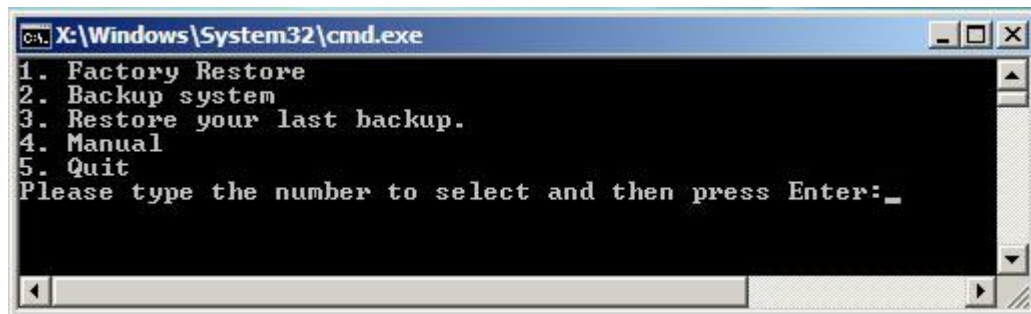


Figure B-1: IEI One Key Recovery Tool Menu

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

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

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

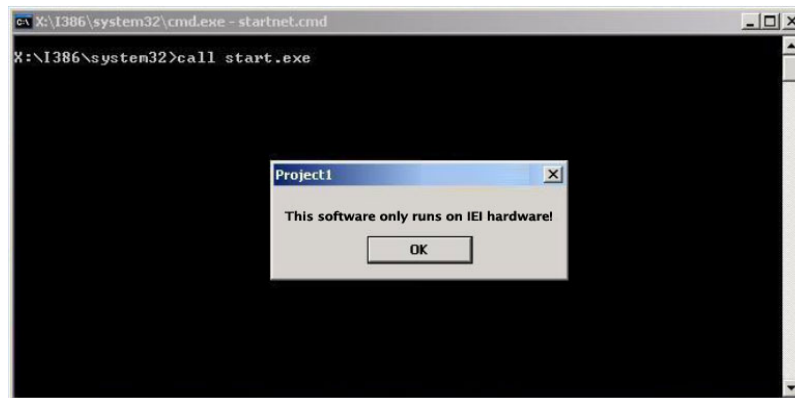
**NOTE:**

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

B.1.1 System Requirement

**NOTE:**

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



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

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

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

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



NOTE:

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

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

**NOTE:**

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

B.2 Setup Procedure for Windows

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

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

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

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

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

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

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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!

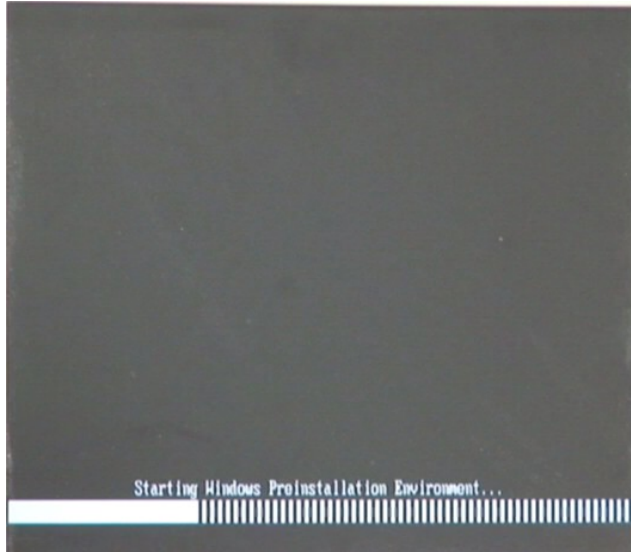


Figure B-2: Launching the Recovery Tool

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

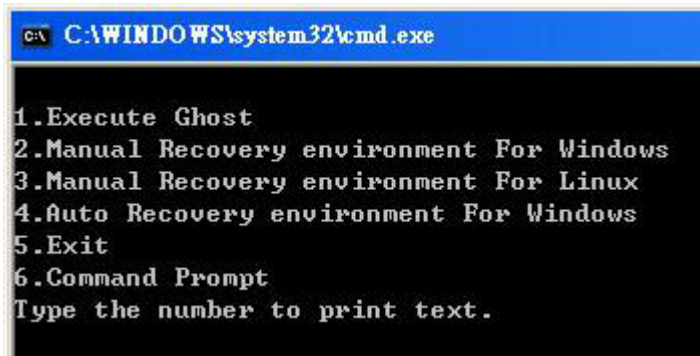
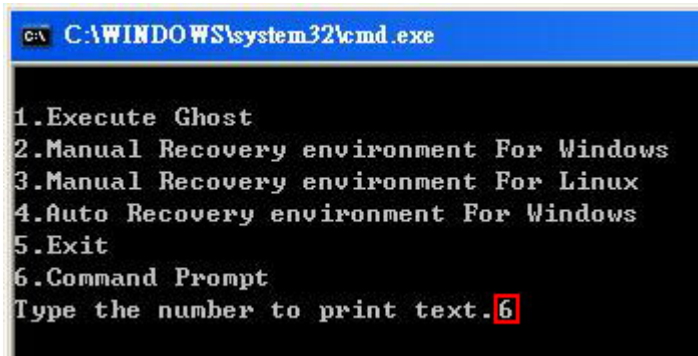


Figure B-3: Recovery Tool Setup Menu

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

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

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

Figure B-4: Command Prompt

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

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

```

X:\I386\SYSTEM32\CMD.EXE
X:\I386\SYSTEM32>diskpart → Starts the Microsoft disk partitioning tool.
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC

DISKPART> list vol → Show partition information

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

DISKPART> sel disk 0 → Select a disk
Disk 0 is now the selected disk.

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

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

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

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

DISKPART> exit → Exit diskpart

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

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

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

Figure B-5: Partition Creation Commands

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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 Building the Recovery Partition

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

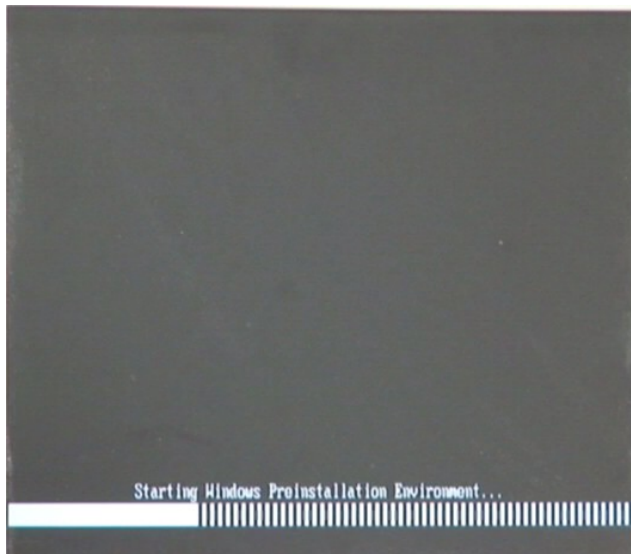


Figure B-6: Launching the Recovery Tool

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

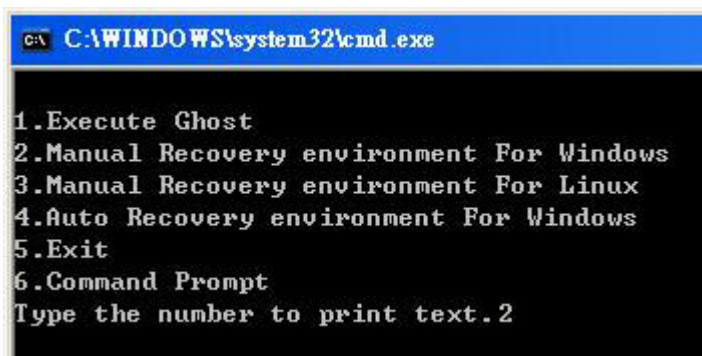


Figure B-7: Manual Recovery Environment for Windows

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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.

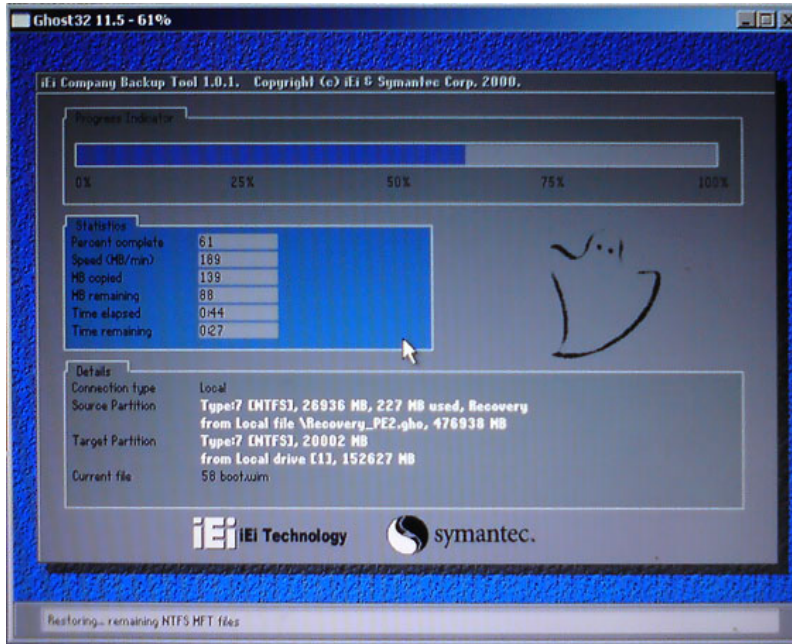


Figure B-8: Building the Recovery Partition

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

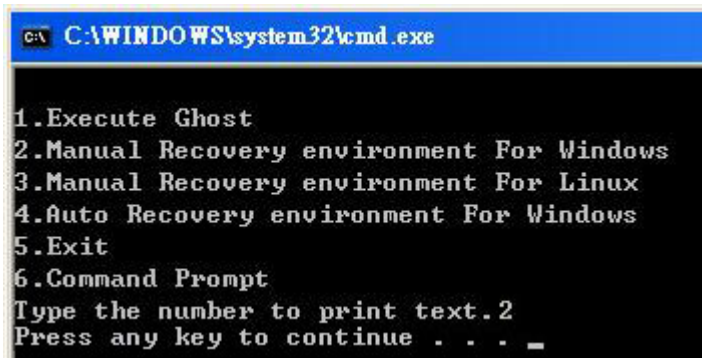


Figure B-9: Press Any Key to Continue

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.

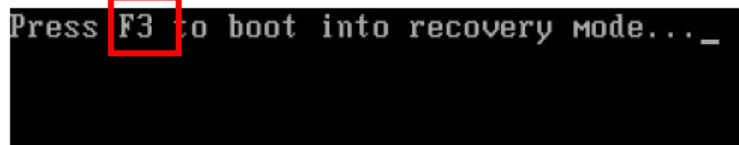


Figure B-10: Press F3 to Boot into Recovery Mode

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

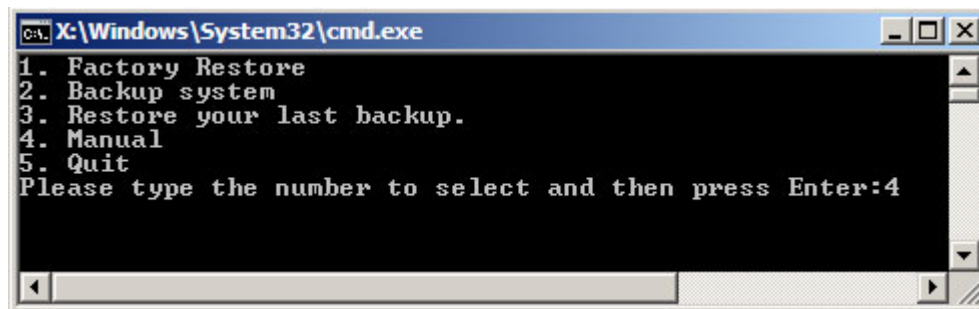


Figure B-11: Recovery Tool Menu

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

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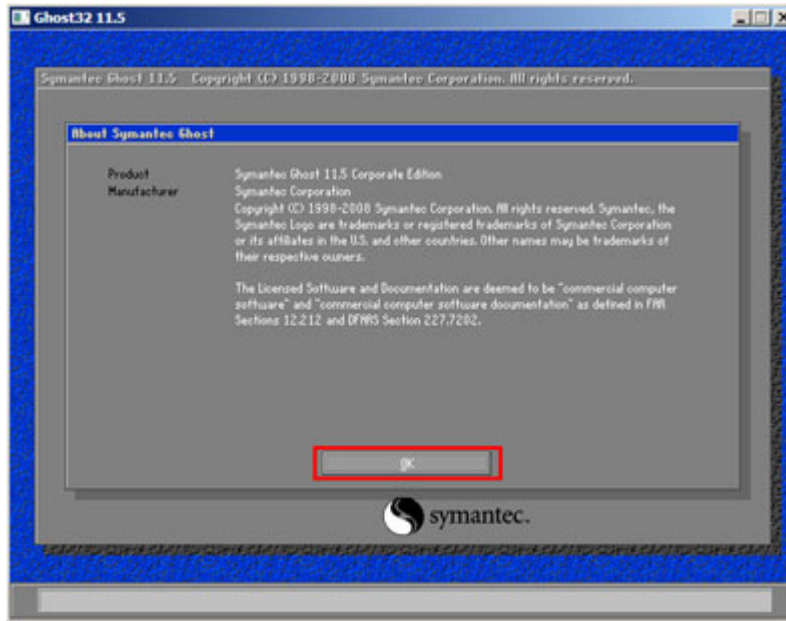


Figure B-12: About Symantec Ghost Window

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

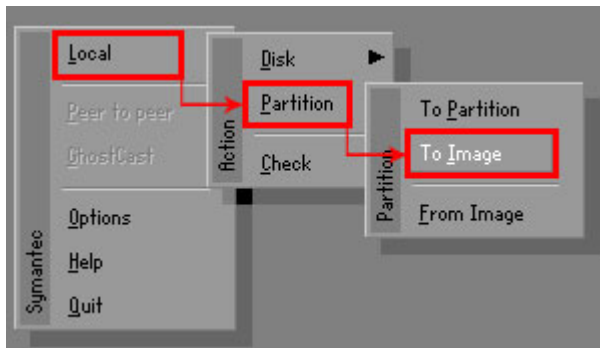


Figure B-13: Symantec Ghost Path

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

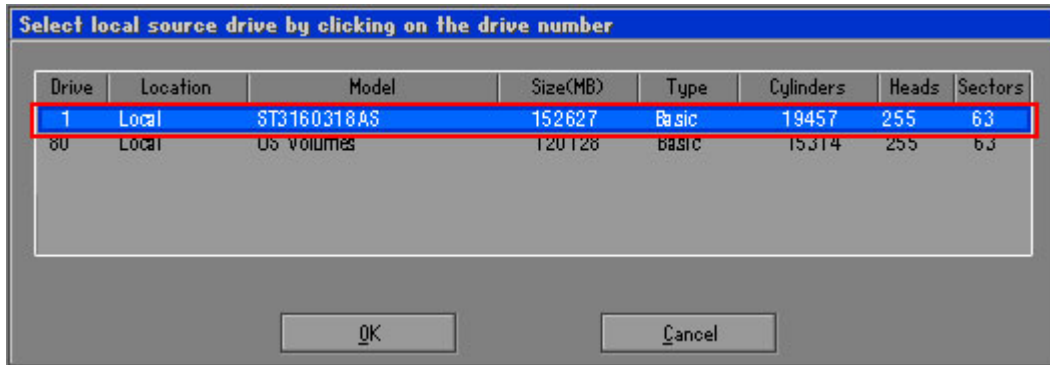


Figure B-14: Select a Local Source Drive

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

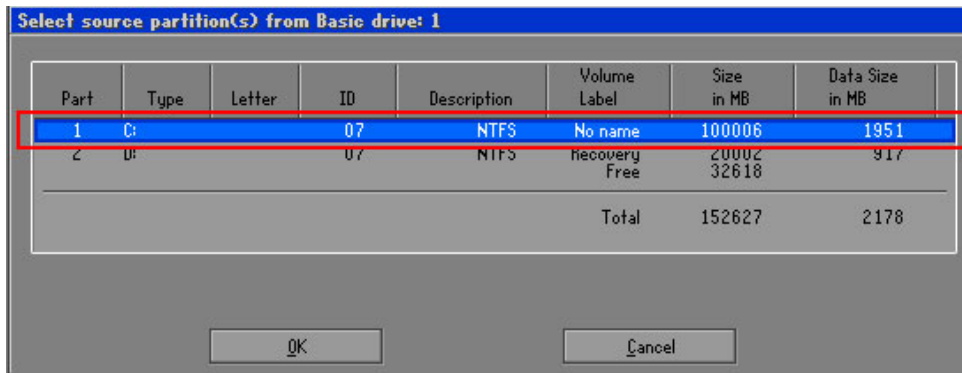


Figure B-15: Select a Source Partition from Basic Drive

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**.

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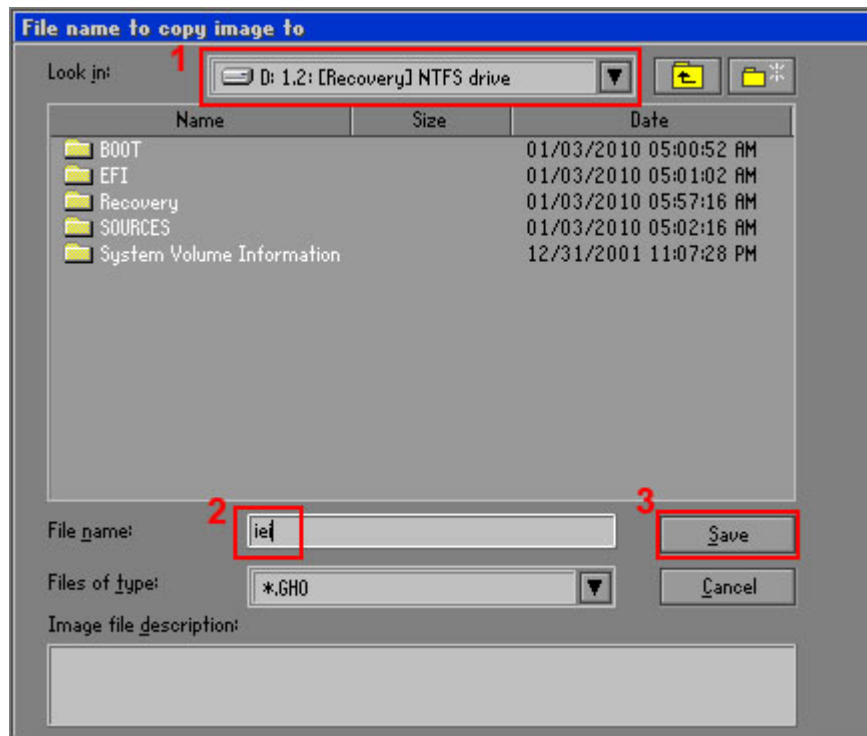


Figure B-16: File Name to Copy Image to

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

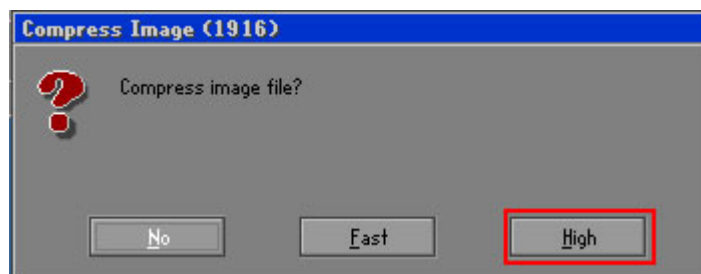


Figure B-17: Compress Image

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

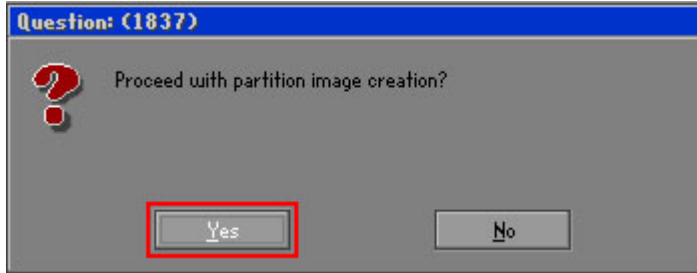


Figure B-18: Image Creation Confirmation

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

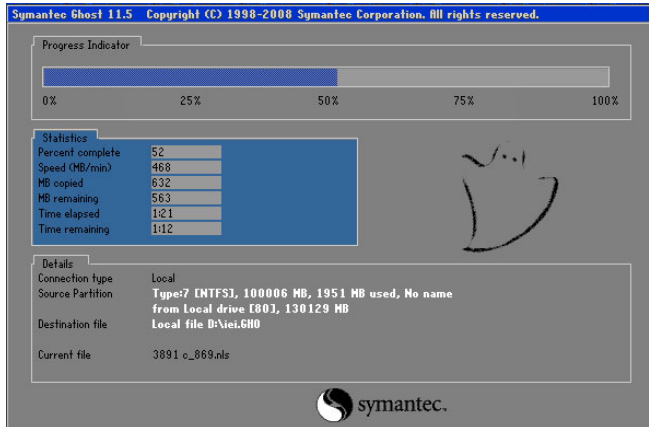


Figure B-19: Image Creation Complete

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.

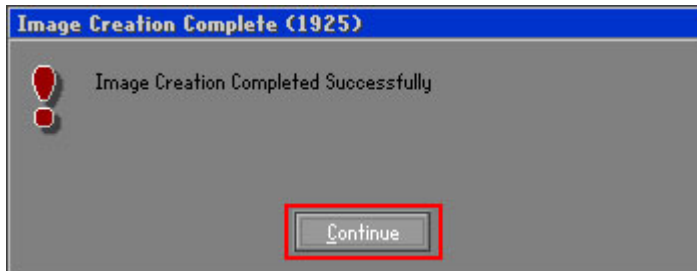
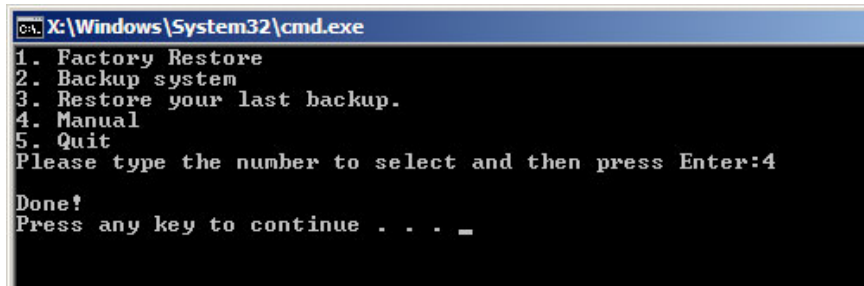


Figure B-20: Image Creation Complete

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



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

Figure B-21: Press Any Key to Continue

B.3 Auto Recovery Setup Procedure

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



CAUTION:

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

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



CAUTION:

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

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

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



Figure B-22: Auto Recovery Utility

Step 3: **Disable the automatically restart function before creating the factory default image.** Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect “Automatically restart”. Click OK to save the settings and exit. (See **Figure B-23**)

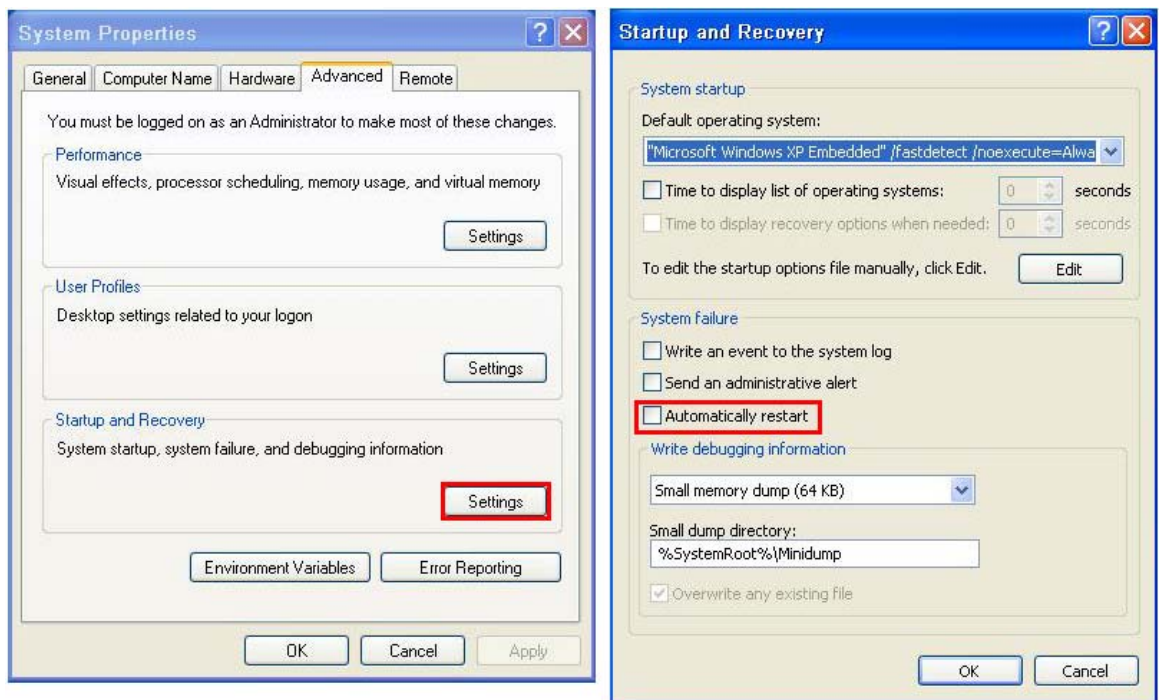


Figure B-23: Disable Automatically Restart

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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!

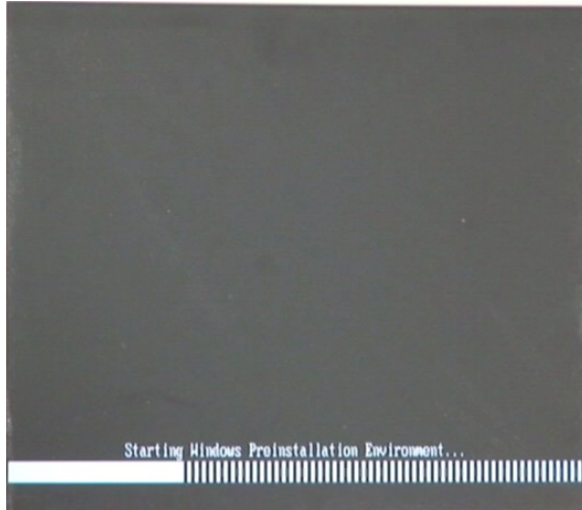


Figure B-24: Launching the Recovery Tool

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

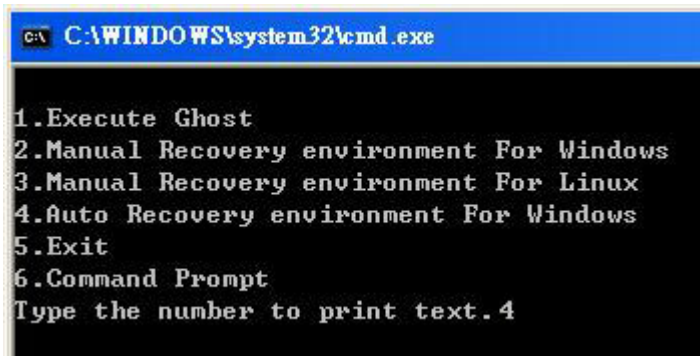


Figure B-25: Auto Recovery Environment for Windows

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.

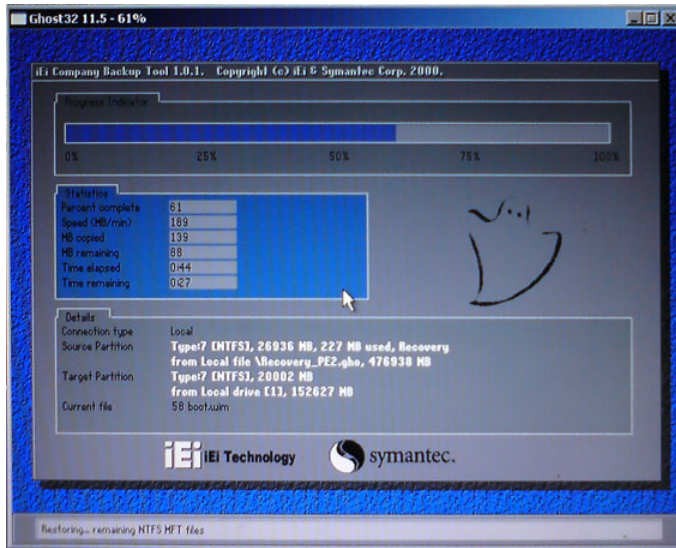


Figure B-26: Building the Auto Recovery Partition

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).

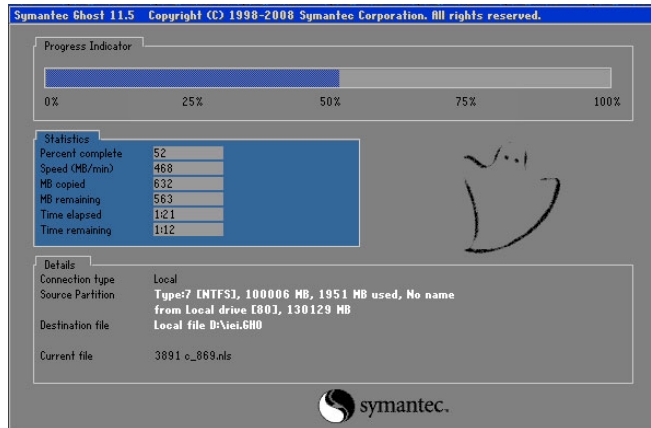


Figure B-28: Image Creation Complete

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

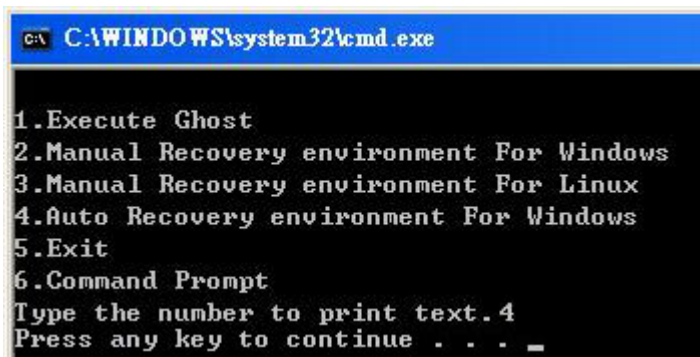


Figure B-29: Press any key to continue

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**).

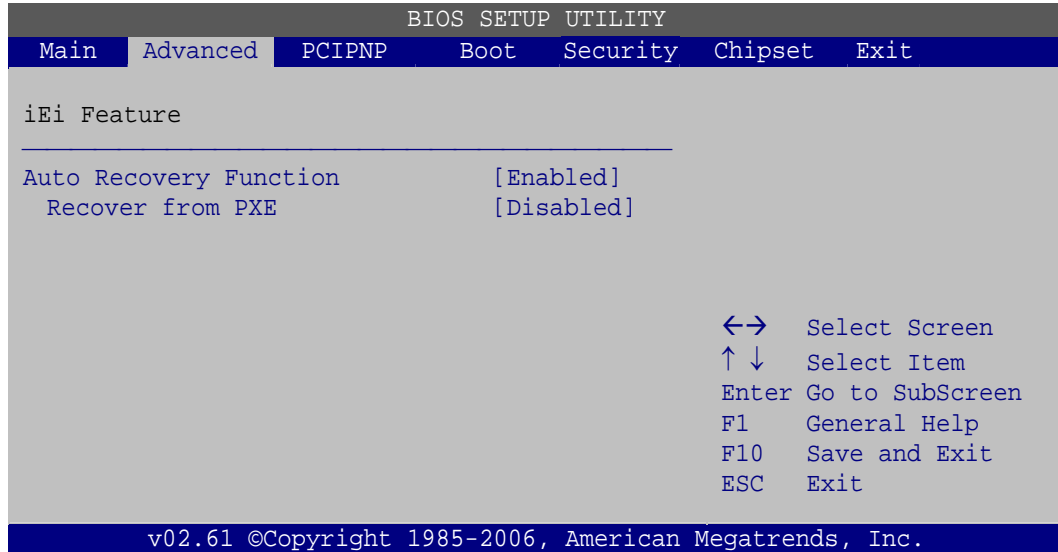


Figure B-30: IEI Feature

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

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

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



NOTE:

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

While installing Linux OS, please create two partitions:

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- Partition 1: /
- Partition 2: SWAP

**NOTE:**

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

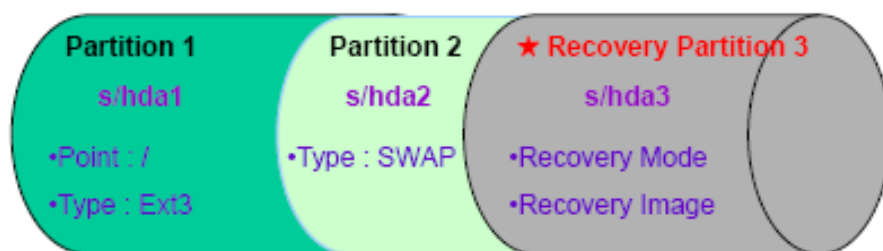


Figure B-31: Partitions for Linux

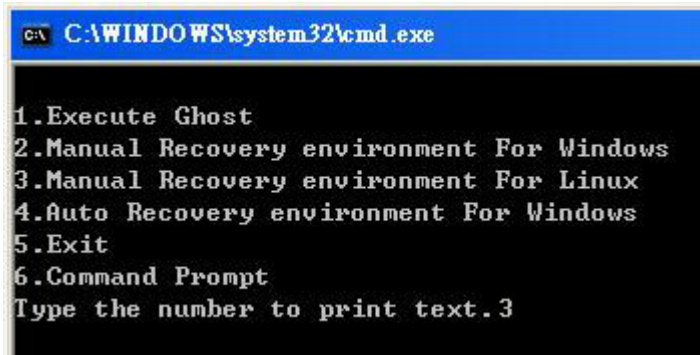
Step 3: Create a recovery partition. Insert the recovery CD into the optical disk drive.

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

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



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

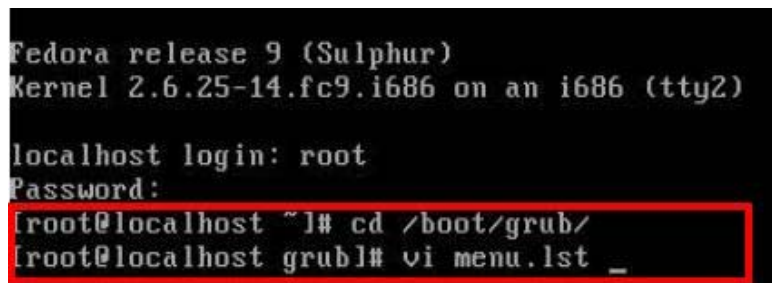
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
```

Figure B-32: Manual Recovery Environment for Linux

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

```
cd /boot/grub
```

```
vi menu.lst
```



```
Fedora release 9 (Sulphur)
Kernel 2.6.25-14.fc9.i686 on an i686 (tty2)

localhost login: root
Password:
[root@localhost ~]# cd /boot/grub/
[root@localhost grub]# vi menu.lst _
```

Figure B-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.

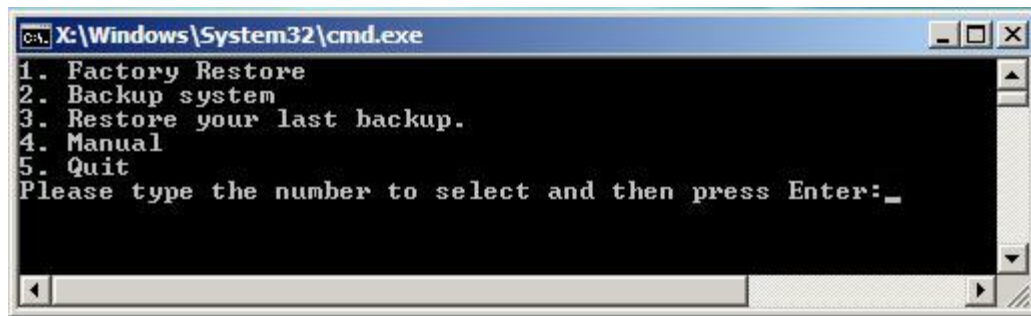


Figure B-35: Recovery Tool Main Menu

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.

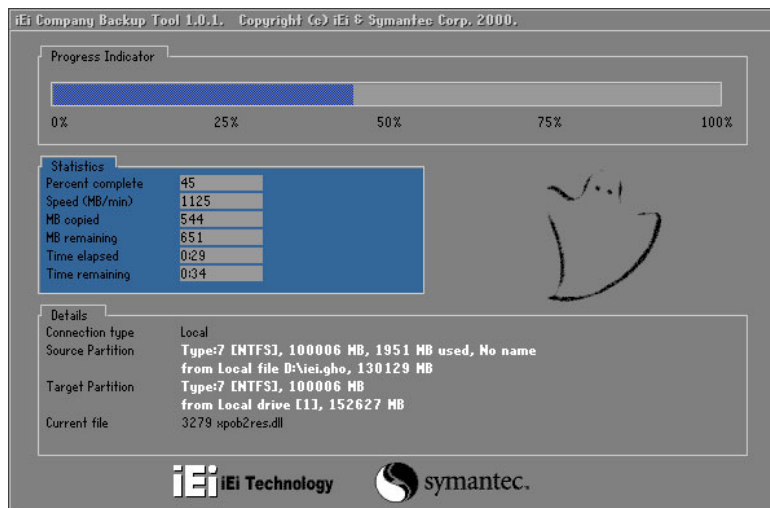


Figure B-36: Restore Factory Default

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

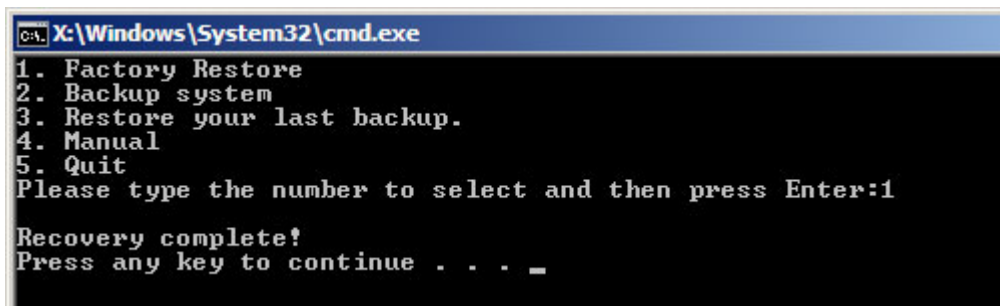


Figure B-37: Recovery Complete Window

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.

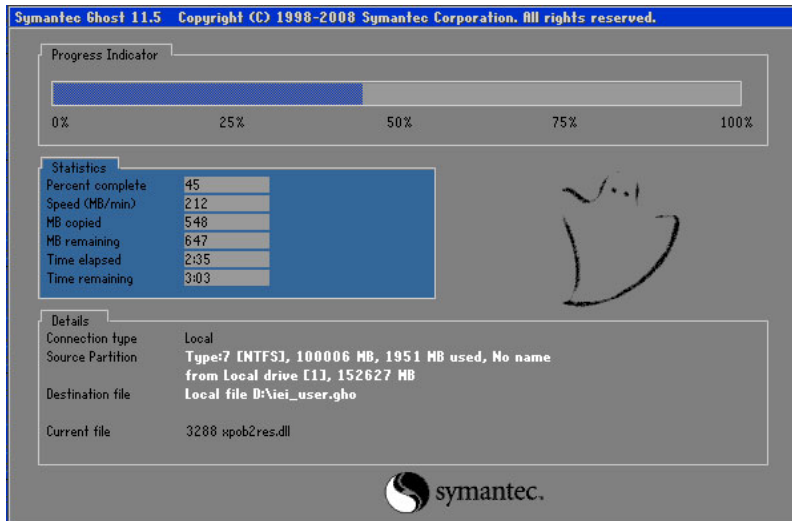


Figure B-38: Backup System

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

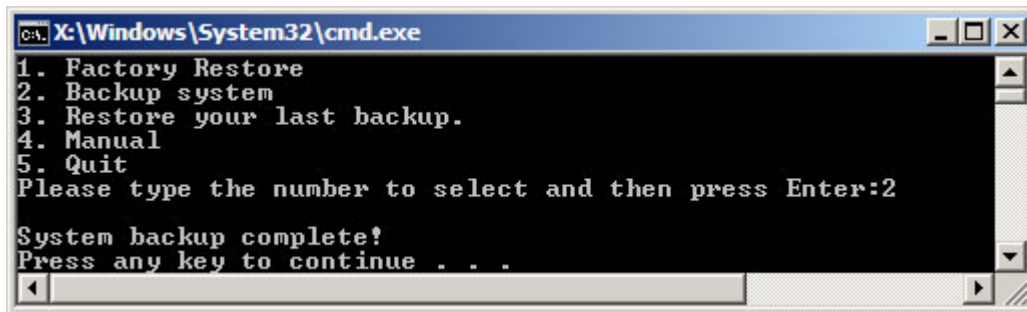


Figure B-39: System Backup Complete Window

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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).

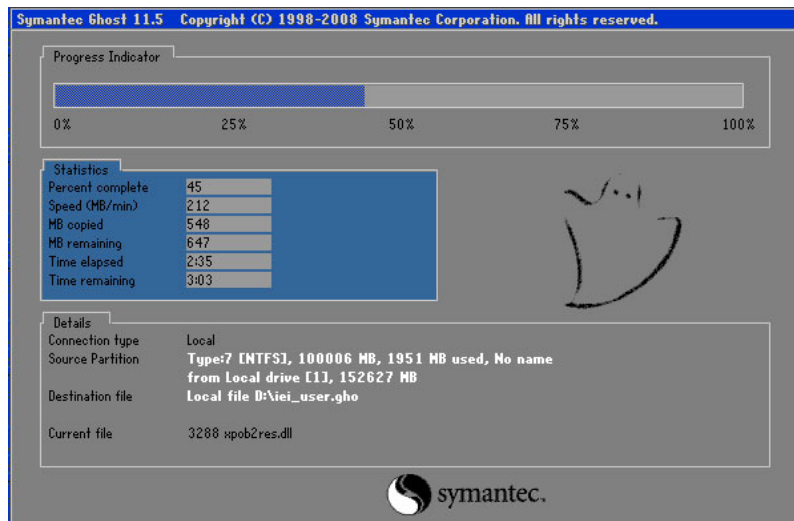


Figure B-40: Restore Backup

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

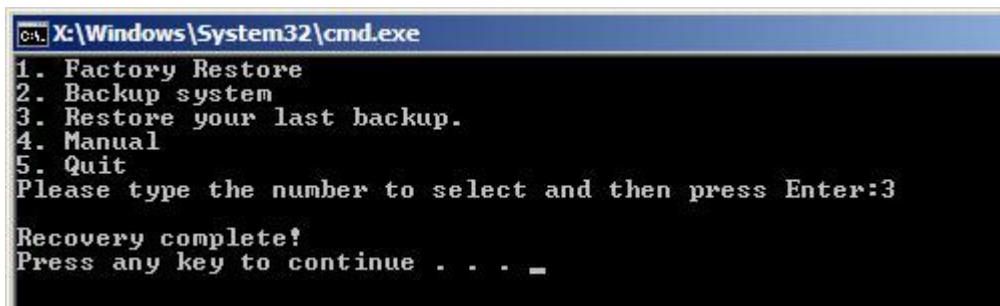


Figure B-41: Restore System Backup Complete Window

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.

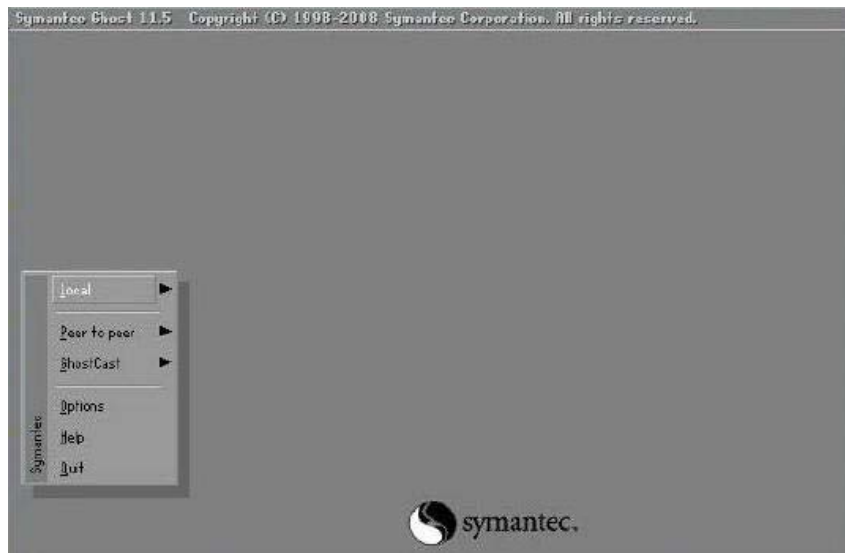
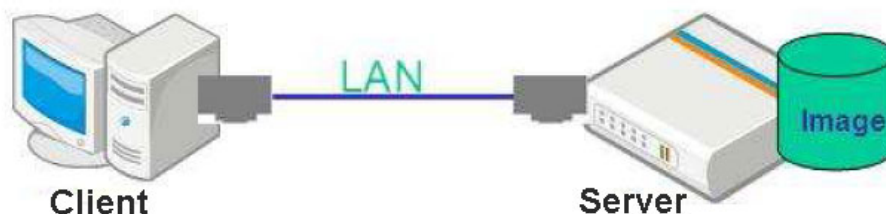


Figure B-42: Symantec Ghost Window

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;
}
```

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 -n /tftpboot/tftpd.remap -vvv
disable = no
per_source = 11
cps = 100 2
flags = IPv4
```

B.6.3 Configure One Key Recovery Server Settings

Step 1: Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).



Step 2: Extract the recovery package to /.

```
#cp RecoveryR10.tar.bz2 /
#cd /
#tar -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-23)

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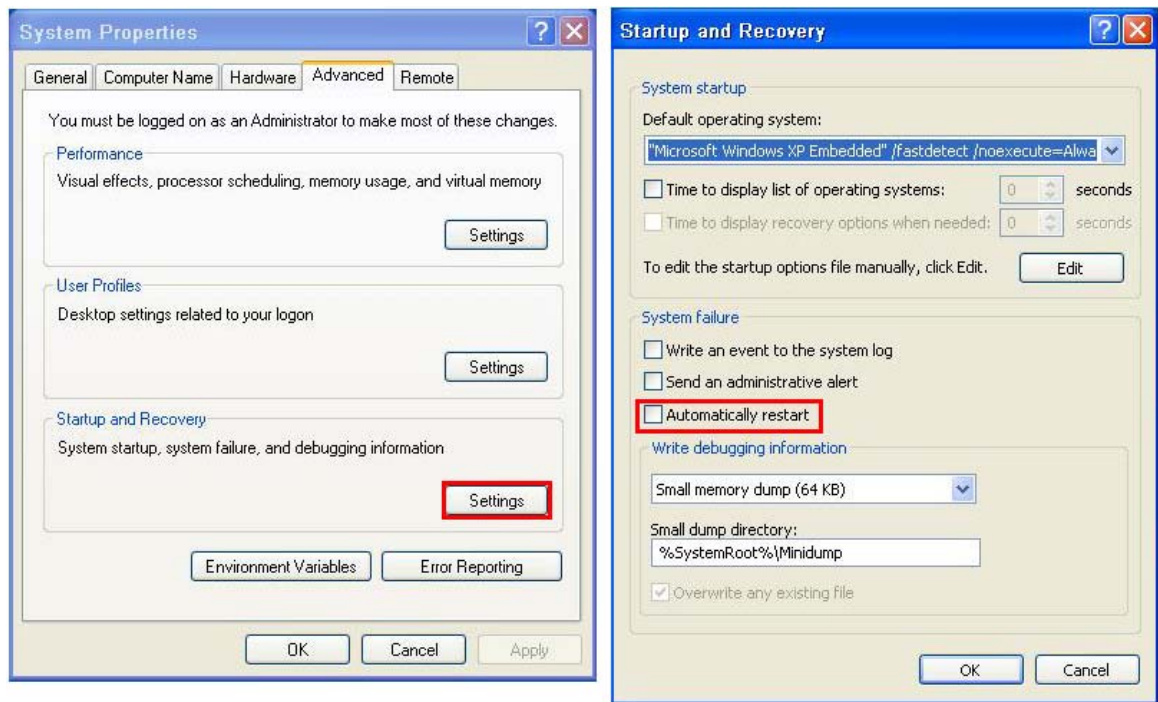


Figure B-43: Disable Automatically Restart

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.



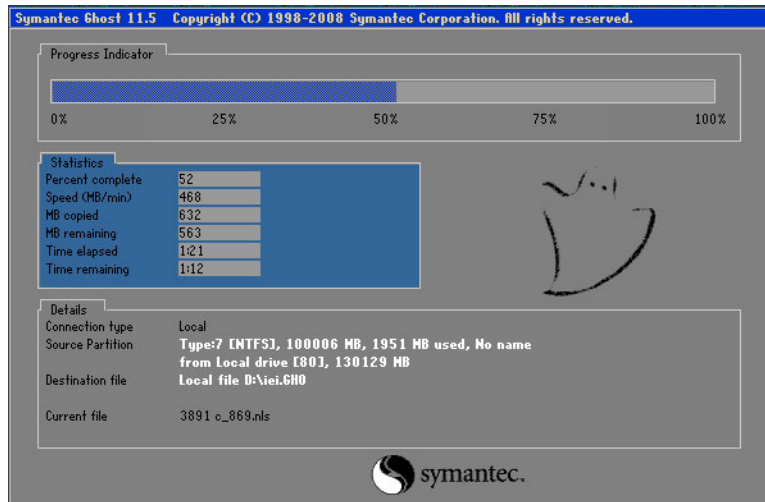
Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.

```
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:**

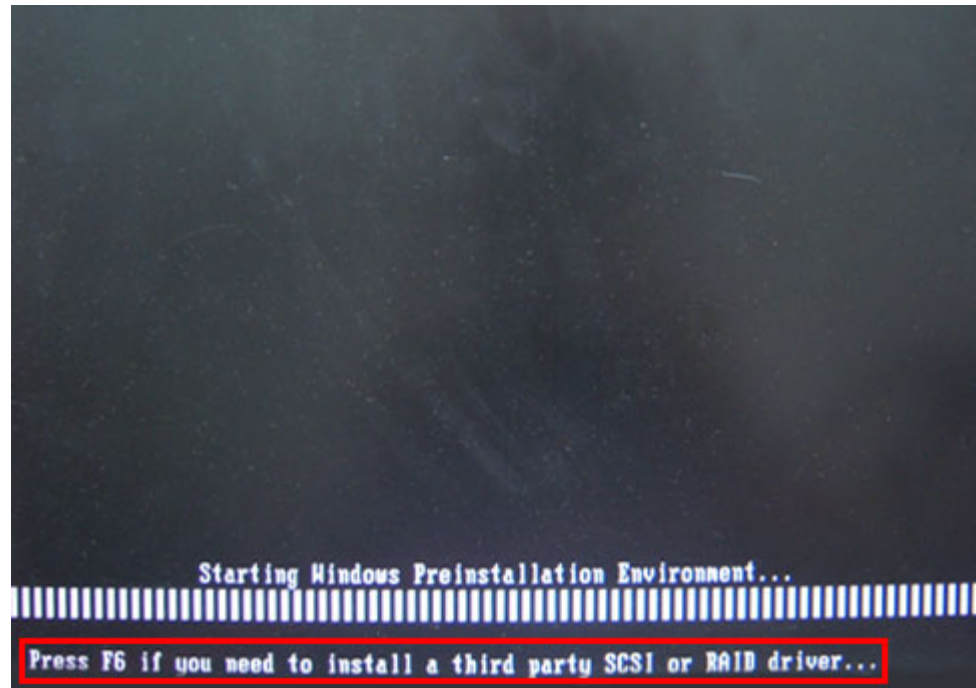
A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

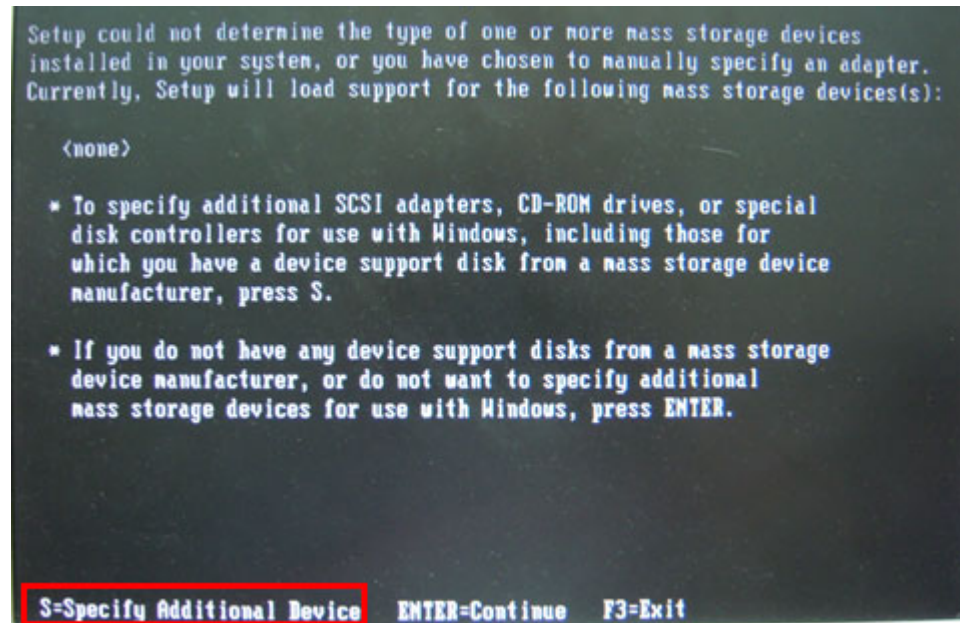
B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

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>.

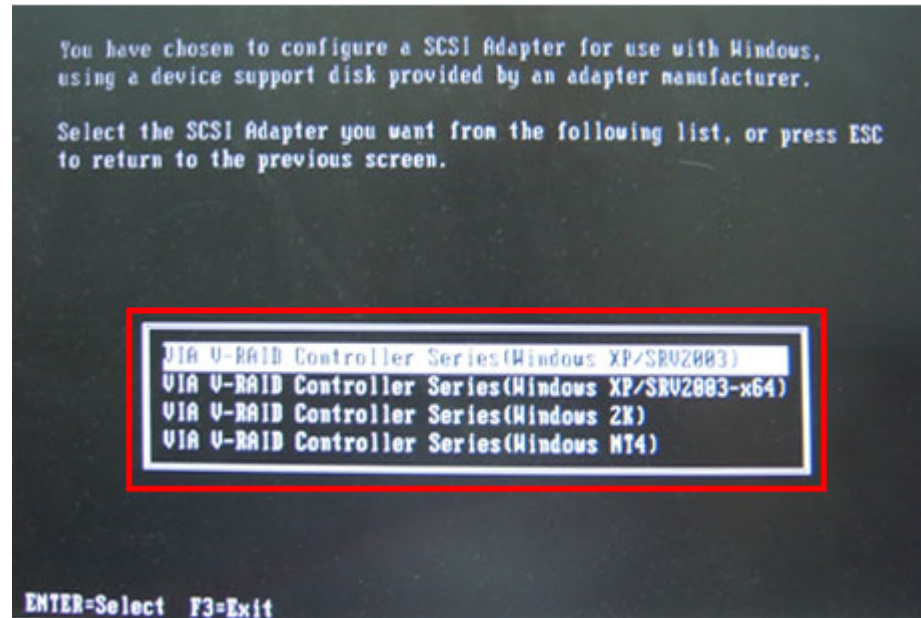


Step 5: When the following window appears, press <S> to select "Specify Additional Device".



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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

KINO-AA750-i2 Mini-ITX SBC

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.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
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.

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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.
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.
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

Digital I/O Interface

KINO-AA750-i2 Mini-ITX SBC

D.1 Introduction

The DIO connector on the KINO-AA750-i2 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

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

D.2 DIO Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 6-1: Digital I/O Connector Pinouts

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

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

```

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

```

D.3.2 Enable the DIO Output Function

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

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

Appendix

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.

KINO-AA750-i2 Mini-ITX SBC

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Printed Circuit Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Metal Fasteners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cable Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fan Assembly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power Supply Assemblies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

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

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

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

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

○: 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。