

MODEL:  
**KINO-KBN-i2**

PICO-ITX SBC with AMD® G-Series SoC Processor,  
DDR3, VGA/HDMI, GbE, USB 3.0, Dual Mini PCIe,  
SATA 6Gb/s, Audio and RoHS

## User Manual

# Revision

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Date	Version	Changes
12 March, 2014	1.01	Add Chassis intrusion connector(CHASSIS1) Add IPMI LED connector(ID_BT_FP1)
20 November, 2013	1.00	Initial release

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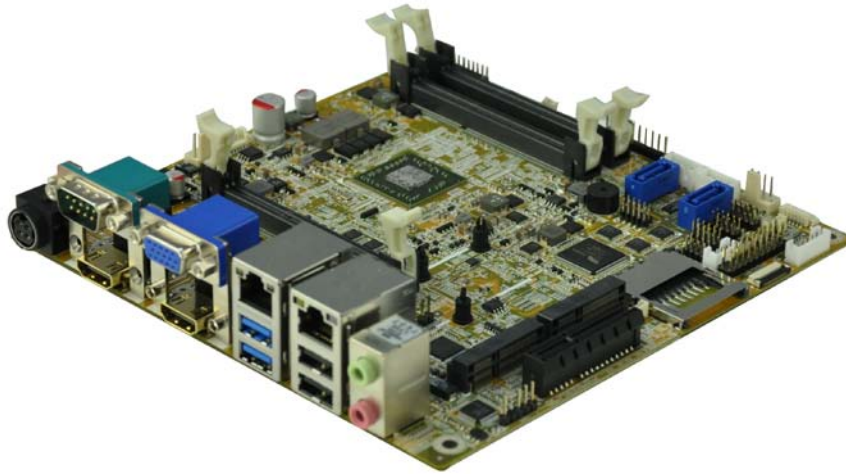
Chapter

1

# Introduction

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## 1.1 Introduction



**Figure 1-1: KINO-KBN-i2**

The KINO-KBN-i2 PICO-ITX motherboard is an AMD® G-Series SoC processor platform. It supports two 1600/1333 MHz DDR3 SO-DIMM modules up to 8.0 GB.

The KINO-KBN-i2 includes a VGA connector and two HDMI connectors. Expansion and I/O include two USB 3.0 connectors on the rear panel, two USB 2.0 connectors on the rear panel, two USB 2.0 connectors by pin header and two SATA 6Gb/s connectors. Serial device connectivity is provided by three internal RS-232 connectors, one external RS-232 connector and one internal RS-422/485 connector. Two RJ-45 Ethernet connectors provide the system with smooth connections to an external LAN.

## 1.2 Model Variations

The model variations of the KINO-KBN-i2 Series are listed below.

Model No.	SoC
KINO-KBN-i2-4151-R10	AMD® G-Series GX-415GA, 15W, 1.5GHz
KINO-KBN-i2-2101-R10	AMD® G-Series GX-210HA, 9W, 1.0GHz
KINO-KBN-i2-4201-R10	AMD® G-Series GX-420CA, 25W, 2.0GHz
KINO-KBN-i2-2171-R10	AMD® G-Series GX-217GA, 15W, 1.65GHz

**Table 1-1: KINO-KBN-i2 Model Variations**

## KINO-KBN-i2

### 1.3 Features

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

- PICO-ITX form factor with AMD® G-Series SoC processor supports DDR3 1600/1333 MHz memory
- 12V only single voltage design for AT/ATX power
- Dual independent display by VGA and dual HDMI,
- Supporting Dual PCIe Mini card slot with mSATA, wireless card and DOM capabilities
- IPMI 2.0 support by IPMI-01-R101 module card
- IEI One Key Recovery solution allows you to create rapid OS backup and recovery

### 1.4 Connectors

The connectors on the KINO-KBN-i2 are shown in the figure below.

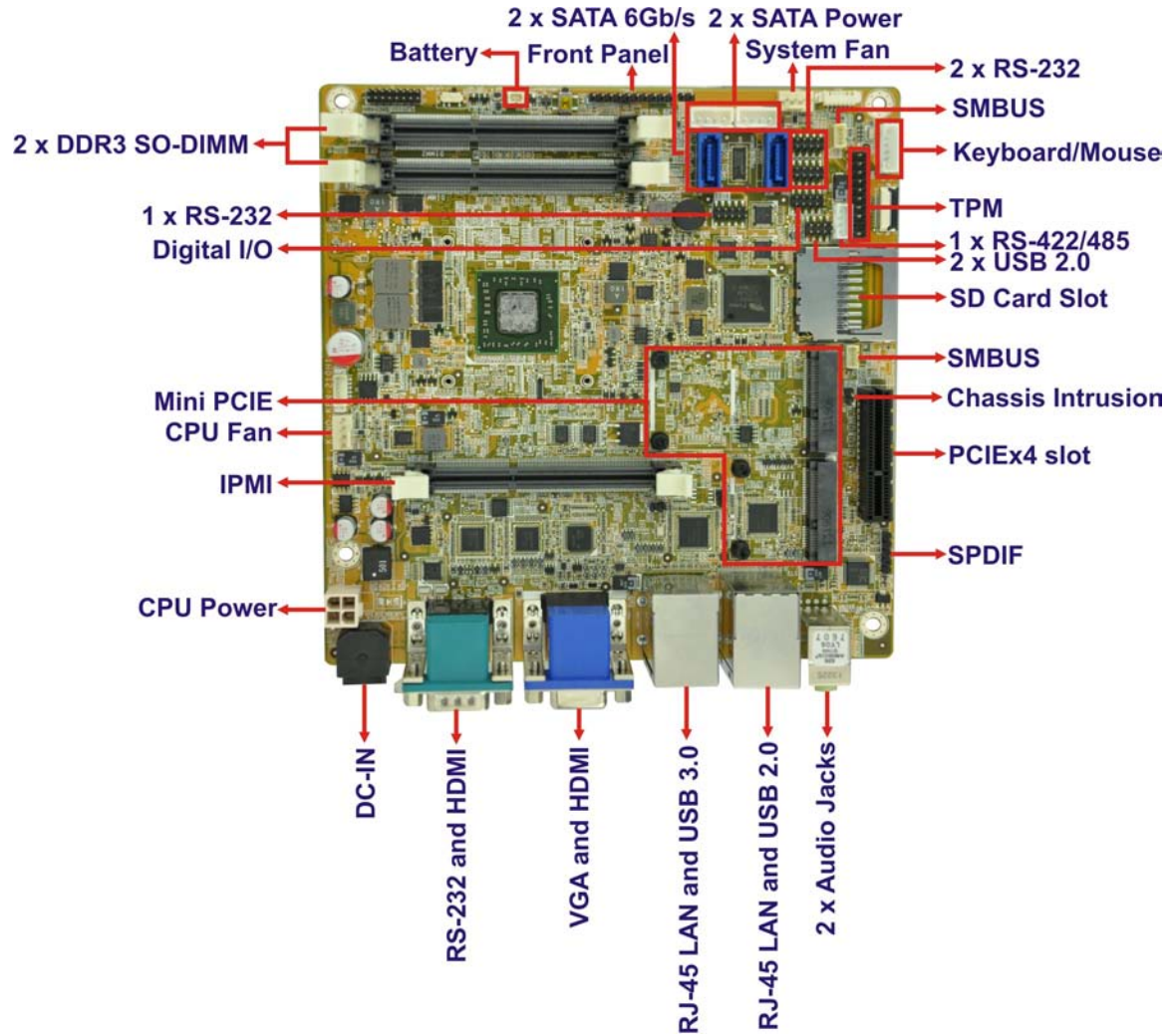


Figure 1-2: Connectors



KINO-KBN-i2

1.5 Dimensions

The dimensions of the board are listed below:

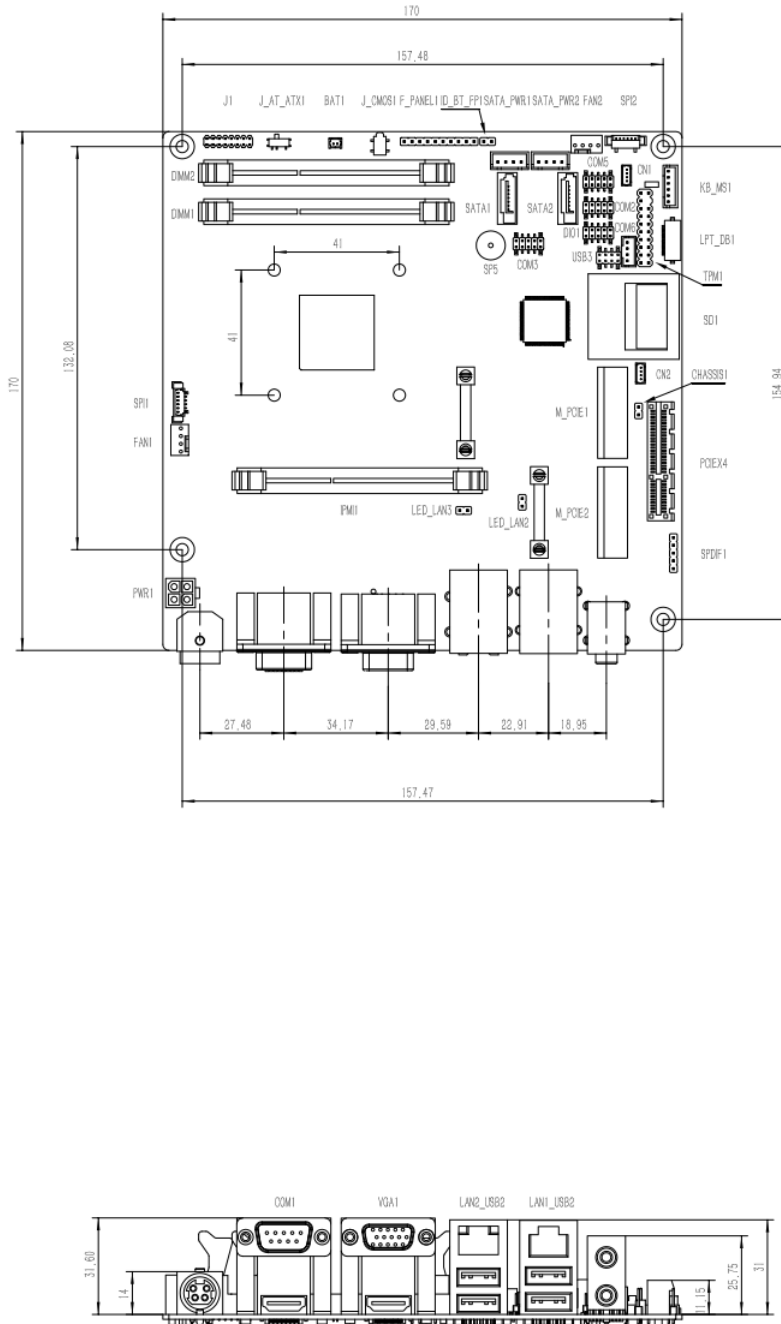


Figure 1-3: Dimensions (mm)



### 1.6 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

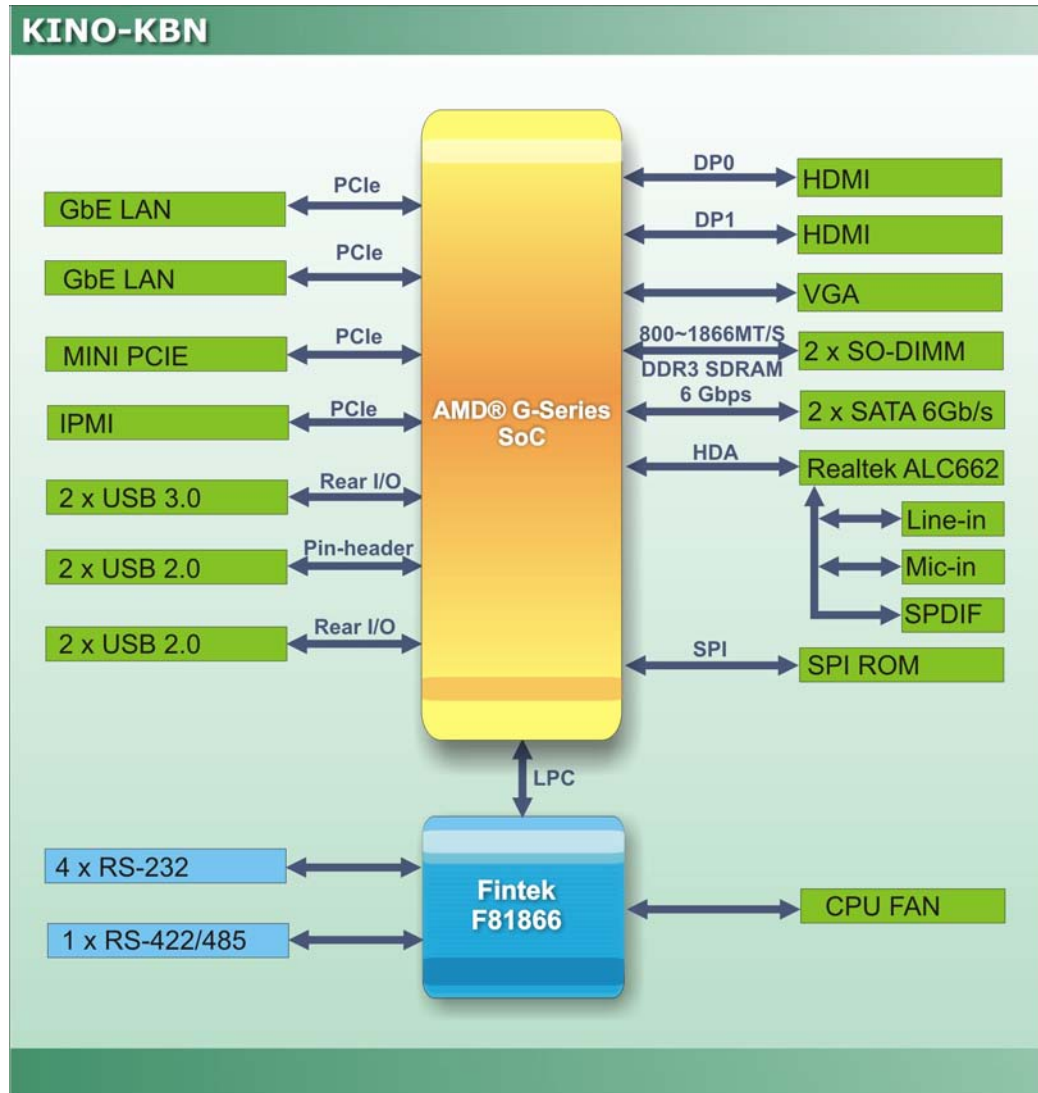


Figure 1-4: Data Flow Diagram

## KINO-KBN-i2

### 1.7 Technical Specifications

KINO-KBN-i2 technical specifications are listed below.

Specification	KINO-KBN-i2
SoC	AMD® G-Series SoC processor
Memory	Two 204-pin 1600/1333 MHz single-channel DDR3 SO-DIMM supported (system max. 8GB)
BIOS	UEFI BIOS
Ethernet	LAN1 (LAN1_USB2): Intel® I210-AT PCIe controller LAN2 (LAN2_USB2): Intel® I211-AT PCIe controller
Graphics	GPU frequency 300MHz (Radeon™ HD 8310E), DirectX® 11.1, UVD4.2, HDMI™ 1.4a, DisplayPort 1.2
Display Output	2 x HDMI (2560x1600) 1 x VGA (2560x1600)
Super IO	Fintek F81866
Audio	Realtek ALC892 HD Audio codec
Watchdog Timer	Software programmable supports 1~255 sec. system reset
<b>I/O Interface Connectors</b>	
Audio Connector	1 x SPDIF for digital audio 1x Line-out / Mic-In audio jack on rear IO
Ethernet	Two RJ-45 ports
Fan	1 x 4-pin CPU fan connector 1 x 4-pin system fan connector
Serial Ports	1 x RS-232 on rear I/O 3 x RS-232 by 8-pin (2x4) header 1 x RS-422/485 by 4-pin (1x4) wafer
USB Ports	2 x USB 3.0 on rear I/O 2 x USB 2.0 on rear I/O 2 x USB 2.0 by 8-pin (2x4) header

Specification	KINO-KBN-i2
Keyboard/Mouse	1 x 6-pin wafer for PS/2 KB/MS
SD Card	1 x SD card
Front Panel	1 x Front Panel (Power LED, HDD LED, Speaker, Power Button, Reset Button)
LAN LED	2 x 2-pin (1x2) header
SMBus	1 x 4-pin (1x4) wafer
Digital I/O	8-bit digital I/O (4-bit input / 4-bit output)
IPMI	1 x IPMI slot
<b>Storage</b>	
Serial ATA	2 x SATA 6Gb/s with 5V/12V SATA power connector
<b>Expansion</b>	
Mini PCIe	1 x full-size PCIe mini card slot only for mSATA (SATA1 and mSATA shares SATA signal) 1 x half-size PCIe mini card slot
PCIe Slot	1 x PCIe x4 slot
<b>Environmental and Power Specifications</b>	
Power Supply	12V DC input only (AT/ ATX support) 1 x 4-pin (2x2) internal power jack
Power Consumption	TBD
Operating Temperature	-10°C ~ 60°C
Storage Temperature	-20°C ~ 85°C
Humidity	5% ~ 95% (non-condensing)
<b>Physical Specifications</b>	
Dimensions	170mm x 170mm
Weight GW/NW	600 g / 250 g

**Table 1-2: Technical Specifications**

Chapter

2

# Unpacking

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## 2.1 Anti-static Precautions

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### 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.

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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-KBN-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-KBN-i2






### 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-KBN-i2 was purchased from or contact an IEI sales representative directly by sending an email to [sales@iei.com.tw](mailto:sales@iei.com.tw).

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

Quantity	Item and Part Number	Image
1	KINO-KBN-i2 motherboard	
2	SATA with power output cable kit (P/N:32801-000100-300-RS)	
1	Utility CD	
1	One Key Recovery CD	
1	Quick Installation Guide	

## 2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
Dual-port USB cable with bracket (P/N:19800-003100-200-RS)	 A white dual-port USB cable with a metal bracket at one end and two USB-A connectors at the other.
RS-422/485 cable, 200mm (P/N:32200-074800-RS)	 A short, flat, beige ribbon-style cable with a black connector at one end.
RS-232 cable (P/N: 19800-000300-200-RS)	 A flat, grey ribbon-style cable with a blue RS-232 connector at one end and a black connector at the other.

Chapter

3

# Connectors

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### 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

#### 3.1.1 KINO-KBN-i2 Layout

The figures below show all the connectors and jumpers.

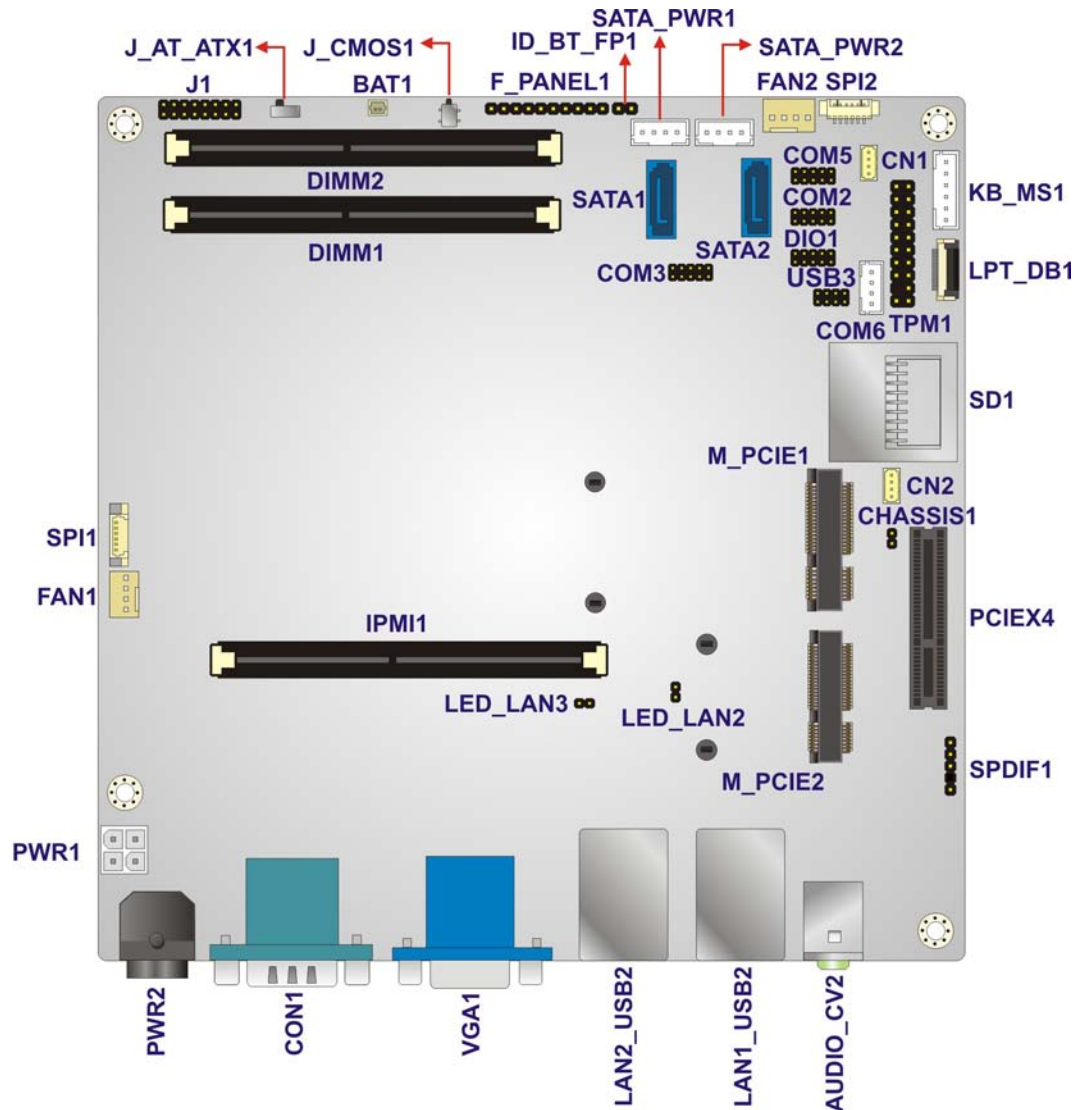


Figure 3-1: Connector and Jumper Locations

#### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

## KINO-KBN-i2

Connector	Type	Label
AT/ATX mode select switch	switch	J_ATX_AT1
Battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
Clear CMOS button	button	J_CMOS1
CPU fan connector	4-pin wafer	FAN1
CPU power connector	4-pin Molex	PWR1
DDR3 SO-DIMM slots	DDR3 SO-DIMM slot	DIMM1, DIMM2
Digital I/O connector	10-pin header	DIO1
EC debug connector	20-pin FPC connector	LPT_DB1
Front panel connector	10-pin wafer	F_PANEL1
IPMI LED connector	2-pin header	ID_BT_FP1
IPMI slot	204-pin slot	IPMI1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LAN LED connectors	2-pin header	LED_LAN2, LED_LAN3
PCIe x4 slot	PCIe x4 slot	PCIEX4
PCIe Mini Card Slots	PCIe mini card slot	M_PCIE1, M_PCIE2
RS-232 serial port connector	10-pin header	COM2, COM3, COM5
RS-422/485 serial port connector	4-pin wafer	COM6
SATA 6Gb/s drive connectors	7-pin SATA connector	SATA1, SATA2
SATA power connectors	2-pin wafer	SATA_PWR1, SATA_PWR2
SD card slot	SD card slot	SD1



SMBus connectors	4-pin wafer	CN1, CN2
SPDIF connector	5-pin header	SPDIF1
SPI Flash connectors	6-pin wafer	SPI1, SPI2
System fan connector	4-pin wafer	FAN2
TPM connector	20-pin connector	TPM1
USB connector	8-pin header	USB3

**Table 3-1: Peripheral Interface Connectors**

### 3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Audio jacks	Audio jack	AUDIO_CV2
Ethernet and USB 2.0 ports	RJ-45, USB 2.0	LAN1_USB2
Ethernet and USB 3.0 ports	RJ-45, USB 3.0	LAN2_USB2
Power connector	DC power jack	PWR2
Serial port and HDMI connectors	DB-9, HDMI	COM1,HDMI1
VGA and HDMI connectors	15-pin female, HDMI	VGA1,HDMI2

**Table 3-2: Rear Panel Connectors**

## 3.2 Internal Peripheral Connectors

The section describes all of the connectors on the KINO-KBN-i2.

### 3.2.1 AT/ATX Mode Select Switch

CN Label: **J\_ATX\_AT1**

CN Type: switch

**KINO-KBN-i2**

CN Location: See **Figure 3-2**

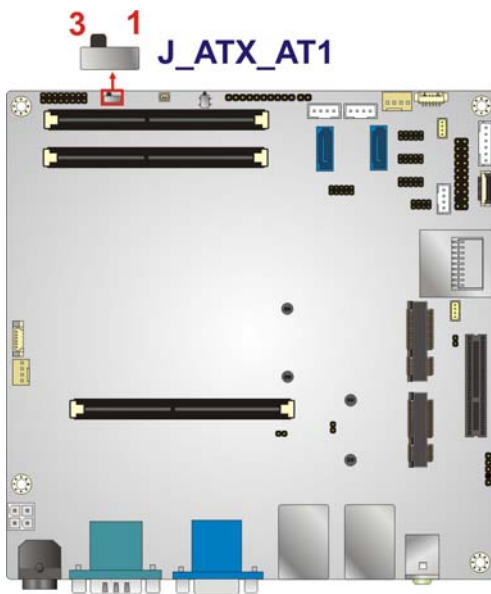
CN Settings: See **Table 3-3**

The AT/ATX mode select switch specifies the systems power mode as AT or ATX. AT/ATX mode select switch settings are shown in **Table 3-3**.

Setting	Description	
Short 1-2	AT Mode	
Short 2-3	ATX Mode	Default

**Table 3-3: AT/ATX Mode Select Switch Settings**

The location of the AT/ATX mode select switch is shown in **Figure 3-2** below.



**Figure 3-2: AT/ATX Mode Select Switch Location**

**3.2.2 Battery Connector**

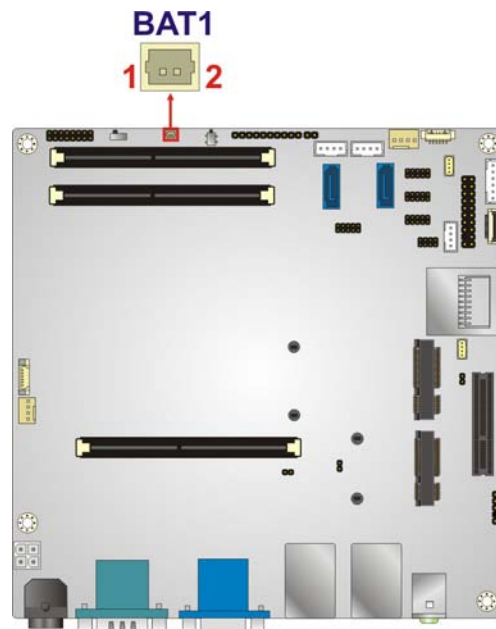
CN Label: **BAT1**

CN Type: 2-pin wafer

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

CN Pinouts: See **Table 3-4**

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



**Figure 3-3: Battery Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+VBAT	2	GND

**Table 3-4: Battery Connector Pinouts**

### 3.2.3 Chassis Intrusion Connector

CN Label: CHASSIS 1  
 CN Type: 2-pin header  
 CN Location: See **Figure 3-4**  
 CN Pinouts: See **Table 3-5**

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

KINO-KBN-i2

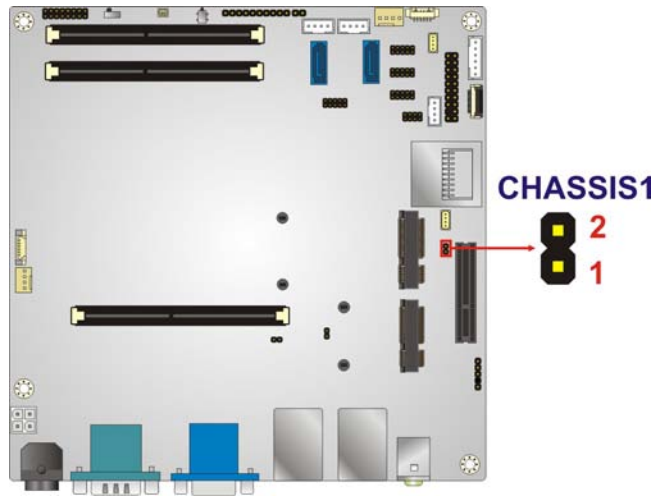


Figure 3-4: Chassis Intrusion Connector Location

Pin	Description
1	+V3.3A_EC_PLL
2	CHASSIE_EC

Table 3-5: Chassis Intrusion Connector Pinouts

3.2.4 Clear CMOS Button

- CN Label: J\_CMOS1
- CN Type: button
- CN Location: See **Figure 3-5**
- CN Settings: See **Table 3-6**

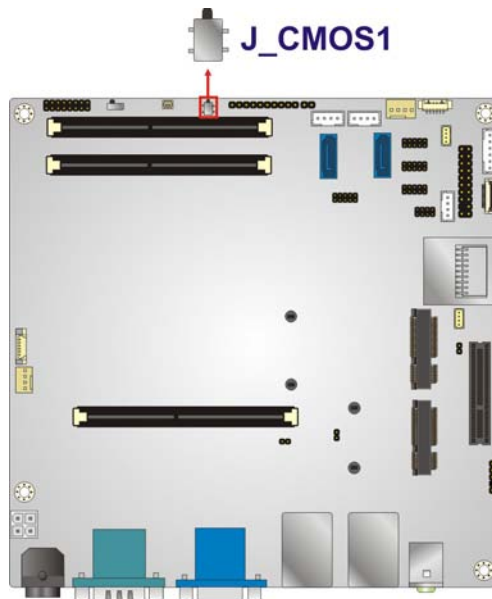
If the KINO-KBN-i2 fails to boot due to improper BIOS settings, use the button to clear the CMOS data and reset the system BIOS information.

The clear CMOS button settings are shown in **Table 3-6**.

Setting	Description	
Open	Normal Operation	Default
Push	Clear CMOS Setup	

Table 3-6: Clear CMOS Button Settings

The location of the clear CMOS button is shown in **Figure 3-5**.



**Figure 3-5: Clear CMOS Button Location**

### 3.2.5 CPU Fan Connector

CN Label:	FAN1
CN Type:	4-pin wafer
CN Location:	See <b>Figure 3-6</b>
CN Pinouts:	See <b>Table 3-7</b>

The fan connector attaches to a CPU cooling fan.



KINO-KBN-i2

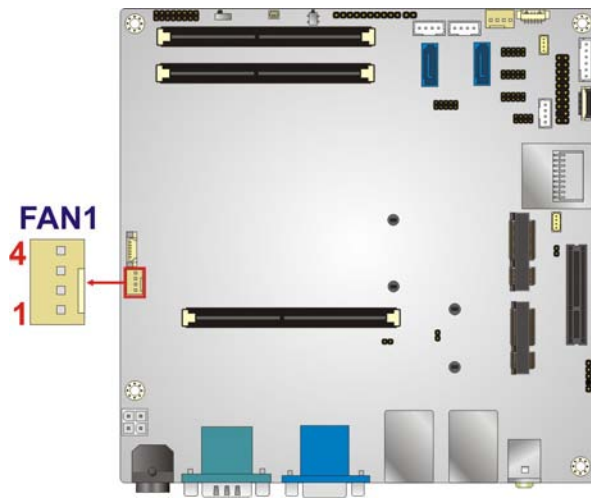


Figure 3-6: CPU Fan Connector Locations

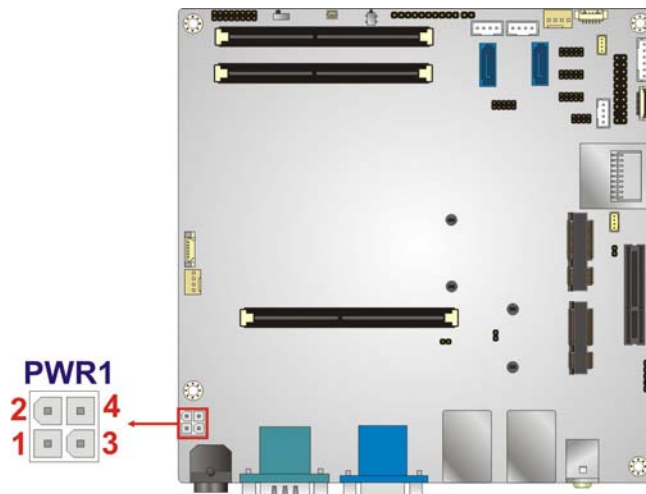
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FAN1IN	4	FAN1OUT

Table 3-7: CPU Fan Connector Pinouts

3.2.6 CPU Power Connector

- CN Label: PWR1
- CN Type: 4-pin Molex
- CN Location: See **Figure 3-7**
- CN Pinouts: See **Table 3-8**

The CPU power connector provides power to the CPU.



**Figure 3-7: CPU Power Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND_VIN	2	GND_VIN
3	12VIN_1	4	12VIN_1

**Table 3-8: CPU Power Connector Pinouts**

### 3.2.7 DDR3 SO-DIMM Slots

- CN Label: DIMM1, DIMM2
- CN Type: DDR3 SO-DIMM slot
- CN Location: See **Figure 3-8**

The DDR3 SO-DIMM slot is for DDR3 SO-DIMM memory module. DIMM2 slot must be installed memory module.

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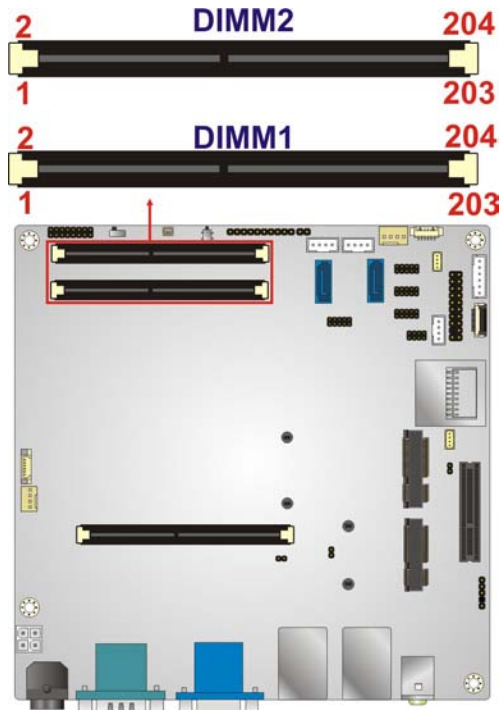
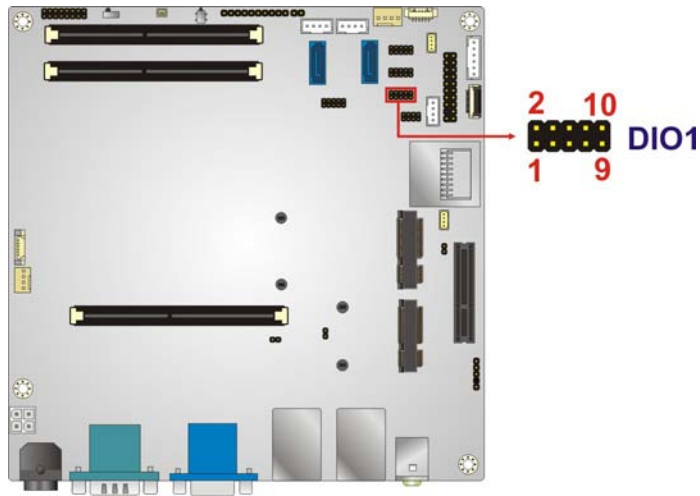


Figure 3-8: DDR3 SO-DIMM Slot Location

### 3.2.8 Digital I/O Connector

CN Label:	<b>DIO1</b>
CN Type:	10-pin header
CN Location:	See <b>Figure 3-9</b>
CN Pinouts:	See <b>Table 3-9</b>

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.



**Figure 3-9: Digital I/O Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

**Table 3-9: Digital I/O Connector Pinouts**

### 3.2.9 EC Debug Connector

- CN Label: LPT\_DB1
- CN Type: 20-pin FPC connector
- CN Location: See **Figure 3-10**
- CN Pinouts: See **Table 3-10**

The EC debug connector connects to a debug card for Embedded Controller (EC) debug.

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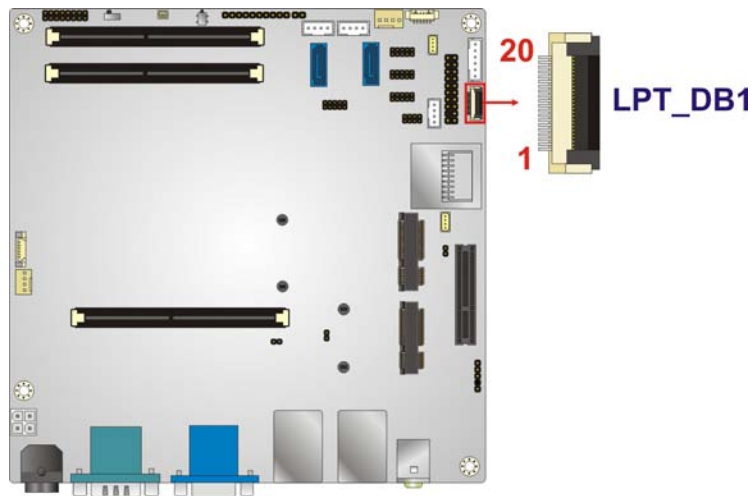


Figure 3-10: EC Debug Connector Location

Pin	Description	Pin	Description
1	KSI0	11	KSO9
2	KSO0	12	KSO10
3	KSO1	13	KSO12
4	KSO2	14	KSI1
5	KSO3	15	KSO11
6	KSO4	16	KSI2
7	KSO5	17	KSI3
8	KSO6	18	GND
9	KSO7	19	GND
10	KSO8	20	GND

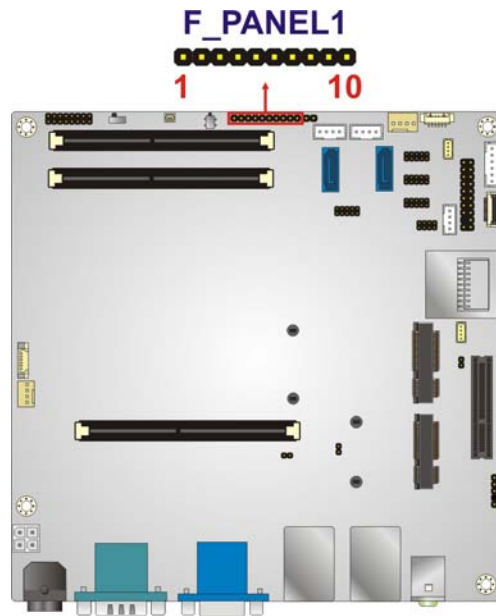
Table 3-10: EC Debug Connector Pinouts

### 3.2.10 Front Panel Connector

- CN Label: F\_PANEL1
- CN Type: 10-pin header
- CN Location: See **Figure 3-11**
- CN Pinouts: See **Table 3-11**

The front panel connector connects to the indicator LEDs on the system front panel.





**Figure 3-11: Front Panel Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	2	PWRBTN+
3	GND	4	HDD LED+
5	HDD LED-	6	PWR LED+
7	PWR LED+	8	PWR LED-
9	RST BTN+	10	GND

**Table 3-11: Front Panel Connector Pinouts**

### 3.2.11 IPMI LED Connector

- CN Label: ID\_BT\_FP1
- CN Type: 2-pin header
- CN Location: See **Figure 3-12**
- CN Pinouts: See **Table 3-12**

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

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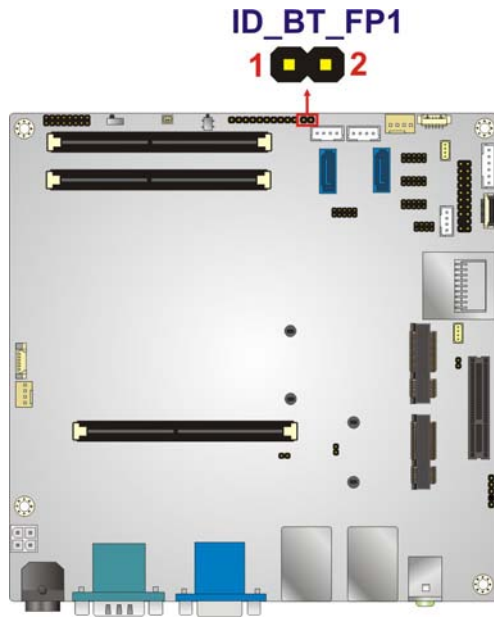


Figure 3-12: IPMI LED Connector Location

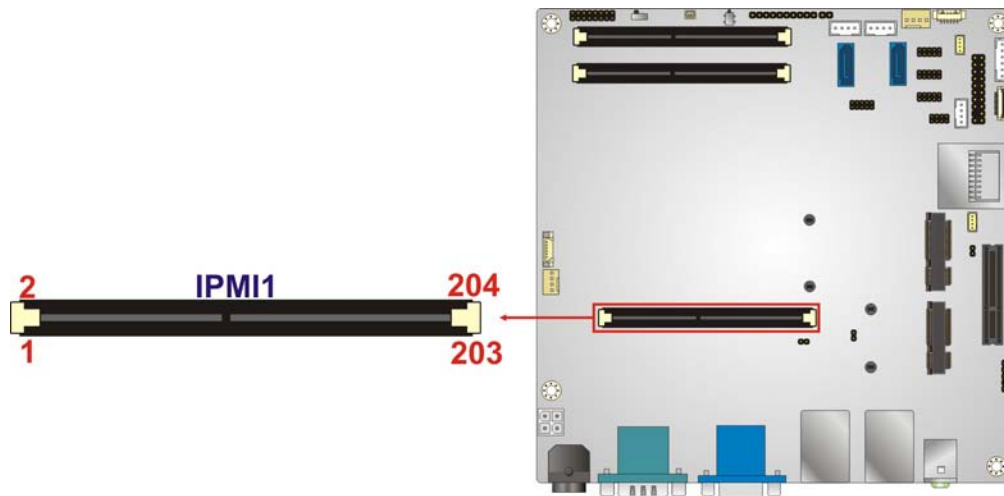
Pin	Description
1	+V3.3A_EC_PLL
2	ID_BT_FP#

Table 3-12: IPMI LED Connector Pinouts

3.2.12 IPMI Slot

- CN Label: IPMI1
- CN Type: IPMI slot
- CN Location: See **Figure 3-13**
- CN Pinouts: See **Table 3-13**

The IPMI slot is for IPMI module card.



**Figure 3-13: IPMI Slot Location**

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	VGA_G2	52	NC	103	NC_SI_RXD1	154	PMBUS_ALERT#
2	NC	53	SDATA1_LAN1	104	NC_SI_TXD1	155	GND
3	VGA_R2	54	GND	105	+5V_DUAL	156	GND
4	NC	55	GND	106	+5V_DUAL	157	NC
5	VGA_B2	56	DATA5_P	107	NC	158	NC
6	NC	57	DATA4_P	108	NC_SI_CRSDV	159	NC
7	NC	58	DATA5_N	109	NC_SI_CLK_IN	160	NC
8	NC	59	DATA4_N	110	NC_SI_TX_EN	161	GND
9	VSYNC2	60	GND	111	+5V_DUAL	162	GND
10	NC	61	GND	112	+5V_DUAL	163	RTS#4
11	HSYNC2	62	APU_PROCHOT# _IPMI	113	APU_VDD_RUN	164	RXD4
12	NC	63	GND	114	NC	165	DTR#4
13	VI_DDCDAT	64	+3.3V	115	+0.95V_ALW	166	TXD4
14	NC	65	GND	116	APU_VDDIO_SUS	167	GND
15	VI_DDCCLK	66	GND	117	+5V	168	GND
16	NC	67	NC	118	+5V	169	-CASEOPEN
17	NC	68	NC	119	NC	170	GND
18	NC	69	NC	120	APU_VTT_SUS	171	SYS_RST#
19	GND	70	NC	121	NC	172	GND

## KINO-KBN-i2

20	GND	71	GND	122	SPI_SWITCH	173	GND
21	SMB_PCIE_3V3 _CLK	72	GND	123	+3.3V	174	BMC_TXD5
22	SMB_IPMB_3VS B_CLK	73	APU_VDD_RUN	124	+3.3V	175	DSR#4
23	SMB_PCIE_3V3 _DATA	74	NC	125	ID_BT_FP#	176	BMC_RXD5
24	SMB_IPMB_3VS B_DATA	75	+3.3V_DUAL	126	NC	177	CTS#4
25	GND	76	+3.3V_DUAL	127	GND	178	GND
26	GND	77	NC	128	IPMI_DET#	179	GND
27	BMC_SPKR	78	AMBER_LED-_B MC	129	SPI_BMC_BIOS_CS O_N	180	LAD2
28	GND	79	NC	130	SPI_PATBRG_R_CS O_N	181	LAD0
29	APU_VDD_PWR GD_IPMI	80	GREEN_LED-_B MC	131	SPI_BMC_BIOS_CL K	182	LAD3
30	NC	81	+3.3V_DUAL	132	SPI_PATBRG_R_CL K	183	LAD1
31	GND	82	+3.3V_DUAL	133	GND	184	GND
32	GND	83	NC	134	GND	185	GND
33	SMB_TEMP_3VS B_CLK	84	ID_LED#_BMC	135	SMI_ACTIVE#	186	PWRBTSW#
34	NC	85	PCIE_RST#	136	GND	187	GND
35	SMB_TEMP_3VS B_DATA	86	PCIE_WAKE_UP #	137	NMI_EVENT#	188	PWRBTSW_BMC
36	NC	87	+3.3V_DUAL	138	GND	189	GND
37	GND	88	+3.3V_DUAL	139	GND	190	GND
38	GND	89	NC	140	SPI_PATBRG_R_MO SI	191	NC
39	SCLK1_BMC	90	GPP_CLK3N	141	SPI_BMC_BIOS_MO SI	192	LFRAME#
40	ACLK_LAN2	91	NC	142	SPI_PATBRG_MISO	193	LPC_CLKO_IPMI

41	SDATA1_BMC	92	GPP_CLK3P	143	SPI_BMC_BIOS_MI SO	194	SERIRO
42	SDATA1_LAN2	93	+3.3V_DUAL	144	GND	195	GND
43	GND	94	+3.3V_DUAL	145	GND	196	GND
44	GND	95	IPMI_RXN	146	NC	197	PM_RSMRST#_ SIO
45	SYS_PWRGD_IP MI	96	IPMI_TXN	147	NC	198	PME#
46	GND	97	IPMI_RXP	148	NC	199	NC
47	SYS_PWRGD_IP MI	98	IPMI_TXP	149	NC	200	SLP_S3#
48	GND	99	+5V_DUAL	150	GND	201	SLP_S4#
49	GND	100	+5V_DUAL	151	GND	202	SLP_S5#
50	NC	101	NC_SI_RXD0	152	PBG_SYS_RESET_N _BMC	203	BMC_PSON
51	ACLK_LAN1	102	NC_SI_TXD0	153	GND	204	PS_ON#

**Table 3-13: IPMI Slot Pinouts**

### 3.2.13 Keyboard/Mouse Connector

CN Label: KB\_MS1

CN Type: 6-pin wafer

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-14**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.



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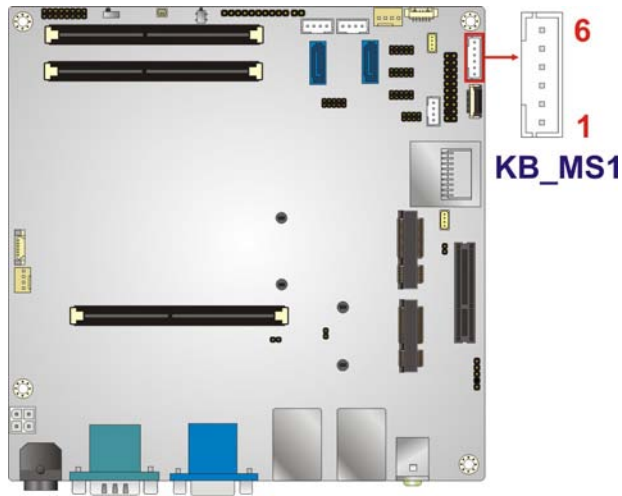


Figure 3-14: Keyboard/Mouse Connector Location

Pin	Description
1	VCC5_KBMS
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	KBMS_GND

Table 3-14: Keyboard/Mouse Connector Pinouts

3.2.14 LAN LED Connector

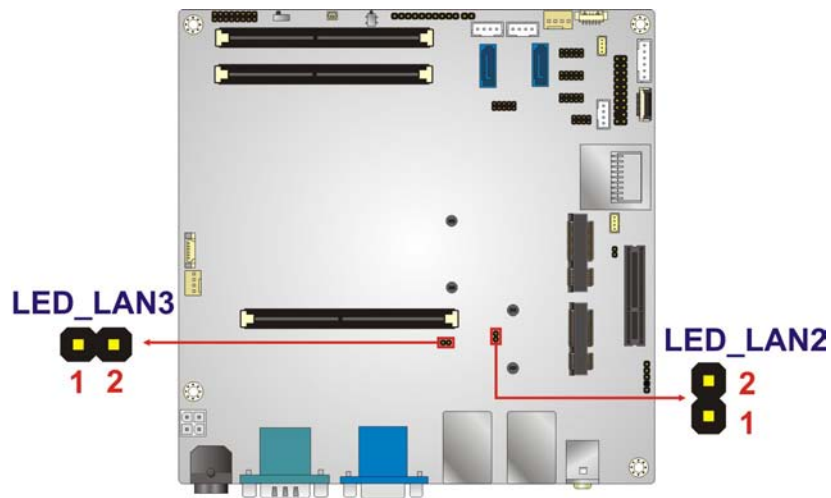
CN Label: LED\_LAN2, LED\_LAN3

CN Type: 2-pin header

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-15**

The LAN LED connectors connect to the LAN link LEDs on the system.



**Figure 3-15: LAN LED Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWR	2	L1/2_LINK_ACT-

**Table 3-15: LAN LED Connector Pinouts**

### 3.2.15 PCIe x4 Slot

- CN Label:       PCIEX4
- CN Type:        PCIe x4 slot
- CN Location:    See **Figure 3-16**
- CN Pinouts:     See **Table 3-16**

The PCIe x4 slot is for PCIe x4 expansion cards.

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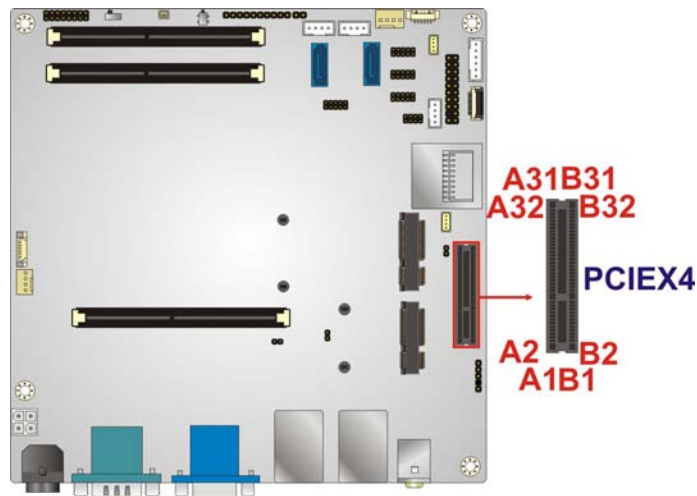


Figure 3-16: PCIe x4 Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	NC	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	NC	B5	SCLK1
A6	NC	B6	SDATA1
A7	NC	B7	GND
A8	NC	B8	+3.3V
A9	+3.3V	B9	NC
A10	+3.3V	B10	+3.3V_DUAL
A11	PCIE_RST#	B11	PCIE_WAKE_UP#
A12	GND	B12	NC
A13	GFX_CLKOP	B13	GND
A14	GFX_CLKON	B14	P_GFX_TXPO
A15	GND	B15	P_GFX_TXNO
A16	P_GFX_RXPO	B16	GND
A17	P_GFX_RXNO	B17	NC
A18	GND	B18	GND
A19	NC	B19	P_GFX_TXP1
A20	GND	B20	P_GFX_TXN1

A21	P_GFX_RXP1	B21	GND
A22	P_GFX_RXN1	B22	GND
A23	GND	B23	P_GFX_TXP2
A24	GND	B24	P_GFX_TXN2
A25	P_GFX_RXP2	B25	GND
A26	P_GFX_RXN2	B26	GND
A27	GND	B27	P_GFX_TXP3
A28	GND	B28	P_GFX_TXN3
A29	P_GFX_RXP3	B29	GND
A30	P_GFX_RXN3	B30	NC
A31	GND	B31	NC
A32	NC	B32	GND

**Table 3-16: PCIe x4 Slot Pinouts**

### 3.2.16 PCIe Mini Card Slot

CN Label: M\_PCIE1, M\_PCIE2

CN Type: full-size PCIe mini card slot, half-size PCIe mini card slot

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-17** and **Table 3-18**

The half-size PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. The full-size PCIe mini card slot is for installing mSATA cards.

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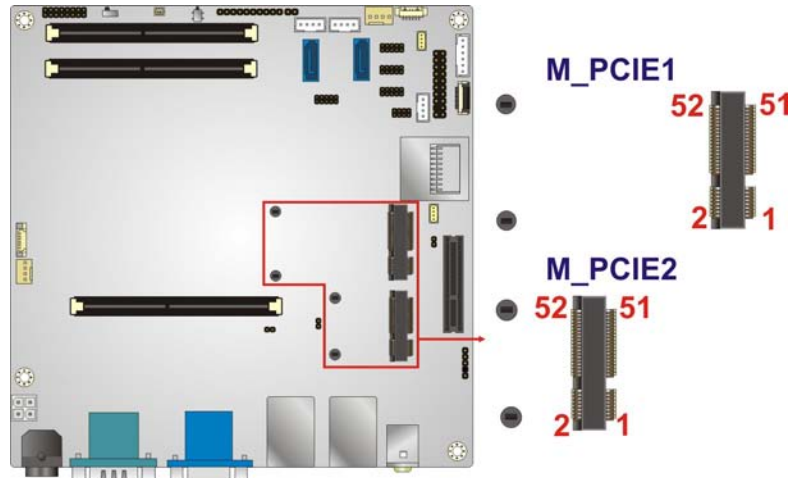


Figure 3-17: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	27	GND
2	VCC3_MINI_1	28	+V1.5_MINI_1
3	NC	29	GND
4	GND	30	SCLK1
5	NC	31	MPCIE_TXDN
6	+V1.5_MINI_1	32	SDATA1
7	NC	33	MPCIE_TXDP
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB6N
11	GPP_CLK2N	37	GND
12	NC	38	USB6P
13	GPP_CLK2P	39	VCC3_MINI_1
14	NC	40	GND
15	GND	41	VCC3_MINI_1
16	NC	42	NC
17	PCIE_RST#	43	NC
18	GND	44	NC
19	NC	45	NC
20	N48174558	46	NC



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
21	GND	47	NC
22	PCIE_RST#	48	+V1.5_MINI_1
23	MPCIE_RXDN	49	NC
24	+3.3V_DUAL	50	GND
25	MPCIE_RXDP	51	mSATA_DET#
26	GND	52	VCC3_MINI_1

**Table 3-17: PCIe Mini Card Slot Pinouts (M\_PCIE1)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	27	GND
2	VCC3_MINI_2	28	+V1.5_MINI_2
3	NC	29	GND
4	GND	30	SCLK1
5	NC	31	MINISLOT1_TXDN
6	+V1.5_MINI_2	32	SDATA1
7	MINI_PCIE_SLT1_CLKREQ#	33	MINISLOT1_TXDP
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB7N
11	NC	37	GND
12	NC	38	USB7P
13	NC	39	VCC3_MINI_2
14	NC	40	GND
15	GND	41	VCC3_MINI_2
16	NC	42	NC
17	PCIE_RST#	43	NC
18	GND	44	NC
19	NC	45	NC
20	WL_DISABLE1#	46	NC
21	GND	47	NC
22	PCIE_RST#	48	+V1.5_MINI_2

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
23	MINISLOT1_RXDN	49	NC
24	+3.3V_DUAL	50	GND
25	MINISLOT1_RXDP	51	NC
26	GND	52	VCC3_MINI_2

Table 3-18: PCIe Mini Card Slot Pinouts (M\_PCIE2)

3.2.17 RS-232 Serial Port Connector

CN Label: COM2, COM3, COM5

CN Type: 10-pin header

CN Location: See Figure 3-18

CN Pinouts: See Table 3-19

The serial connector provides RS-232 connection.

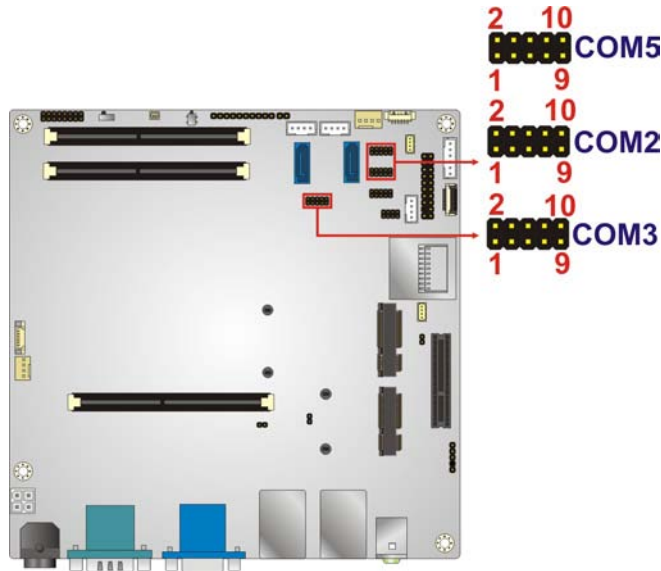


Figure 3-18: RS-232 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ND CD2/3/5	2	NDSR2/3/5
3	NRX2/3/5	4	NRTS2/3/5
5	NTX2/3/5	6	NCTS2/3/5

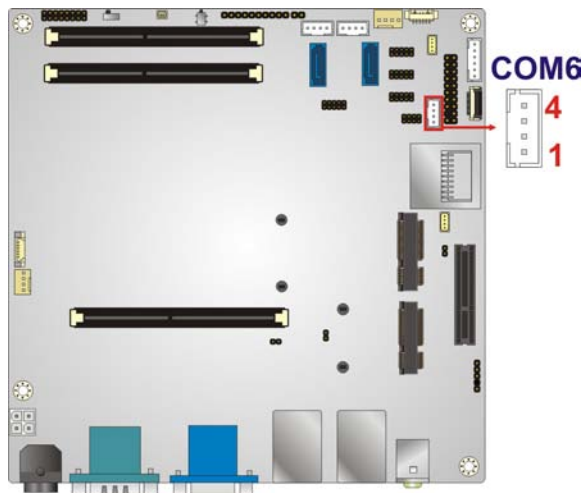
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
7	NDTR2/3/5	8	NR12/3/5
9	GND	10	GND

**Table 3-19: RS-232 Serial Port Connector Pinouts**

### 3.2.18 RS-422/485 Serial Port Connector

- CN Label: COM6
- CN Type: 4-pin wafer
- CN Location: See **Figure 3-19**
- CN Pinouts: See **Table 3-20**

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



**Figure 3-19: RS-422/485 Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

**Table 3-20: RS-422/485 Connector Pinouts**

### 3.2.19 SATA 6Gb/s Drive Connector

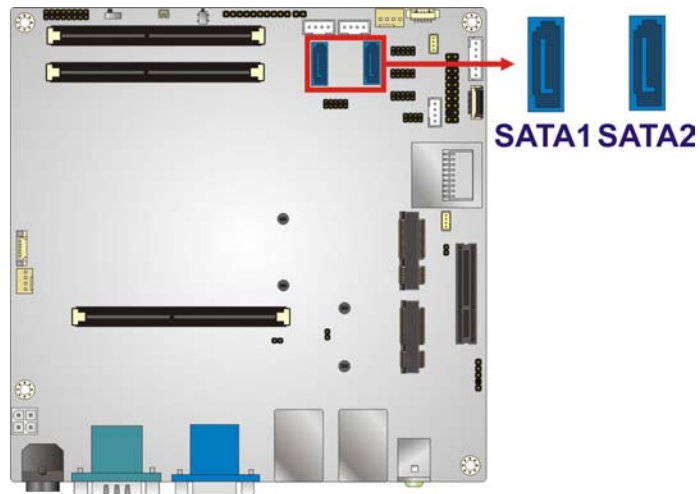
- CN Label: **SATA1, SATA2**

**KINO-KBN-i2**

CN Type: 7-pin SATA connector

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

The SATA 6Gb/s drive connector is connected to a SATA 6Gb/s drive. The SATA 6Gb/s drive transfers data at speeds as high as 6Gb/s.



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

### 3.2.20 SATA Power Connector

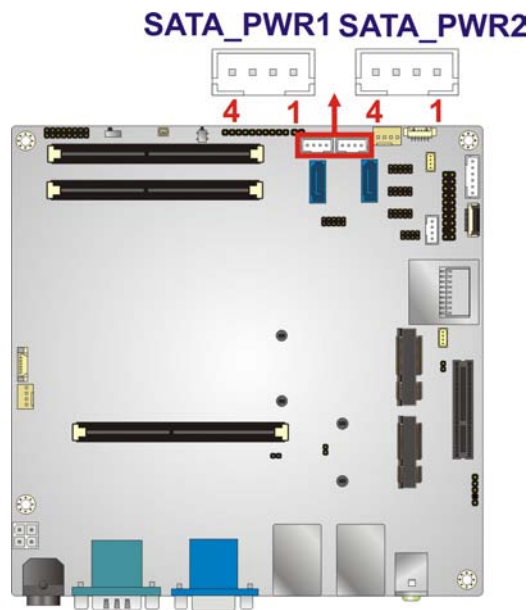
CN Label: **SATA\_PWR1, SATA\_PWR2**

CN Type: 4-pin wafer

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-21**

The SATA power connector provides +5V power output to the SATA connector.



**Figure 3-21: SATA Power Connector Location**

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

**Table 3-21: SATA Power Connector Pinouts**

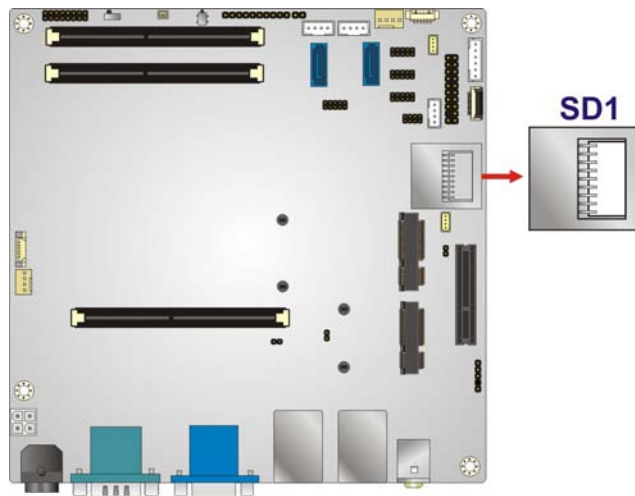
### 3.2.21 SD Card Slot

- CN Label: **SD1**
- CN Type: SD card slot
- CN Location: See **Figure 3-22**

An SD memory card can be inserted to the SD card slot on the KINO-KBN-i2.



## KINO-KBN-i2

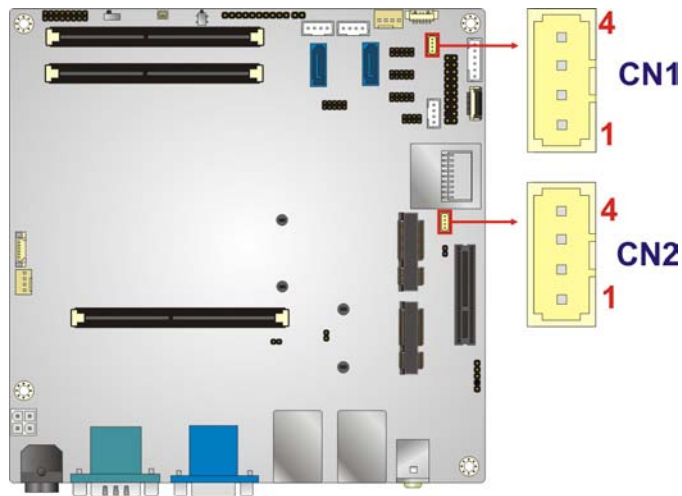


**Figure 3-22: SD Card Slot Location**

### 3.2.22 SMBUS Connector

CN Label:	CN1, CN2
CN Type:	4-pin wafer
CN Location:	See <b>Figure 3-23</b>
CN Pinouts:	See <b>Table 3-22</b>

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



**Figure 3-23: SMBus Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SDATA0/1
3	SCLK0/1	4	+5V

**Table 3-22: SMBus Connector Pinouts**

### 3.2.23 SPDIF Connector

- CN Label: SPDIF1
- CN Type: 5-pin header
- CN Location: See **Figure 3-24**
- CN Pinouts: See **Table 3-23**

Use the SPDIF connector to connect digital audio devices to the system.

KINO-KBN-i2

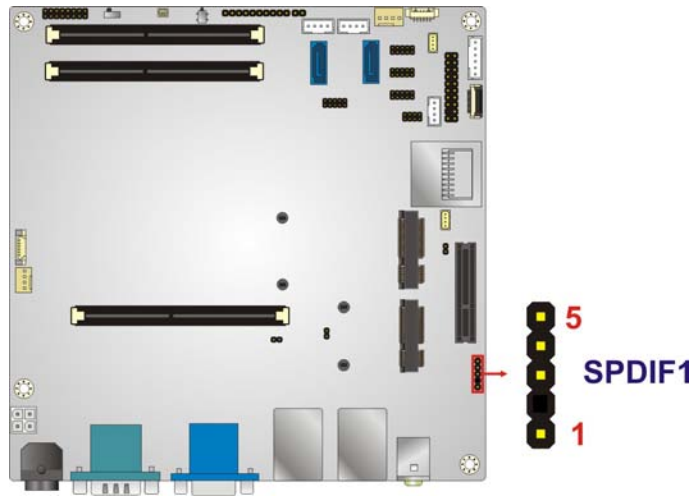


Figure 3-24: SPDIF Connector Location

Pin	Description
1	+5V
2	NC
3	SPDIF OUT
4	GND
5	SPDIF IN

Table 3-23: SPDIF Connector Pinouts

### 3.2.24 SPI Flash Connector

- CN Label: SPI1, SPI2
- CN Type: 6-pin wafer
- CN Location: See **Figure 3-25**
- CN Pinouts: See **Table 3-24** and **Table 3-25**

The SPI Flash connector is used to flash the BIOS.

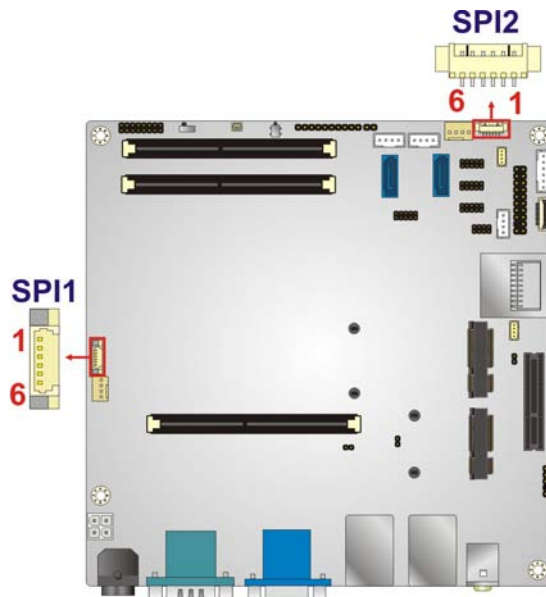


Figure 3-25: SPI Flash Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_POWER	2	SPI_CS#_CONN
3	SPI_DATAIN_CONN	4	SPI_CLK_CONN
5	SPI_DATAOUT_CONN	6	GND

Table 3-24: SPI Flash Connector Pinouts (SPI1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_SPI_VCC	2	FSCE#
3	FMISO	4	FSCK
5	FMOSI	6	GND

Table 3-25: SPI Flash Connector Pinouts (SPI2)

### 3.2.25 System Fan Connector

- CN Label: FAN2
- CN Type: 4-pin wafer
- CN Location: See **Figure 3-26**
- CN Pinouts: See **Table 3-26**

The fan connector attaches to a system cooling fan.

KINO-KBN-i2

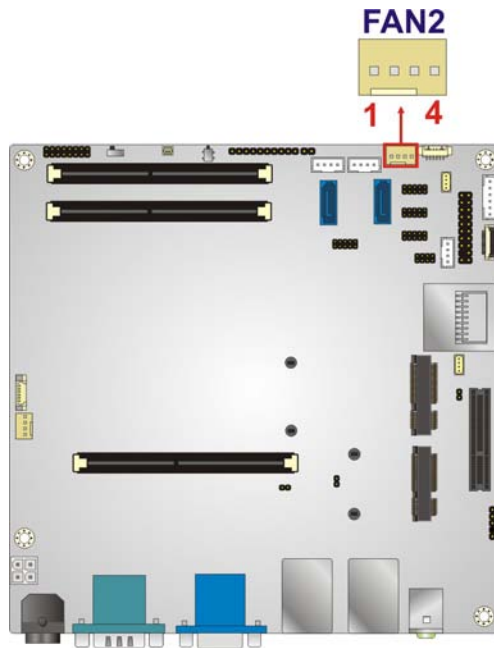


Figure 3-26: System Fan Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FAN2IN	4	FAN2OUT

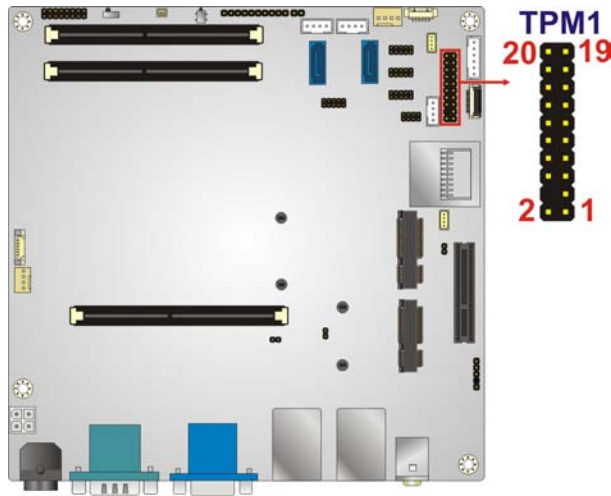
Table 3-26: System Fan Connector Pinouts

3.2.26 TPM Connector

- CN Label: TPM1
- CN Type: 20-pin connector
- CN Location: See **Figure 3-27**
- CN Pinouts: See **Table 3-27**

The Trusted Platform Module (TPM) connector secures the system on bootup.





**Figure 3-27: TPM Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LPC_CLK1	2	GND
3	LFRAME#	4	NC
5	LPC_RST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCLK0	14	SDATA0
15	+3.3V_DUAL	16	SERIRQ
17	GND	18	LPC_CLKRUN#
19	LPCPD#	20	LDRQ#0

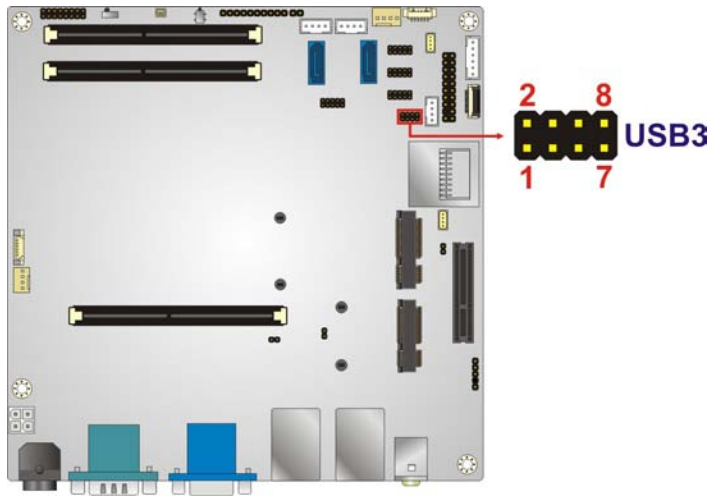
**Table 3-27: TPM Connector Pinouts**

### 3.2.27 USB Connector

- CN Label: **USB3**
- CN Type: 8-pin header
- CN Location: See **Figure 3-28**
- CN Pinouts: See **Table 3-28**

**KINO-KBN-i2**

The USB connector provides two USB 2.0 ports by dual-port USB cable.



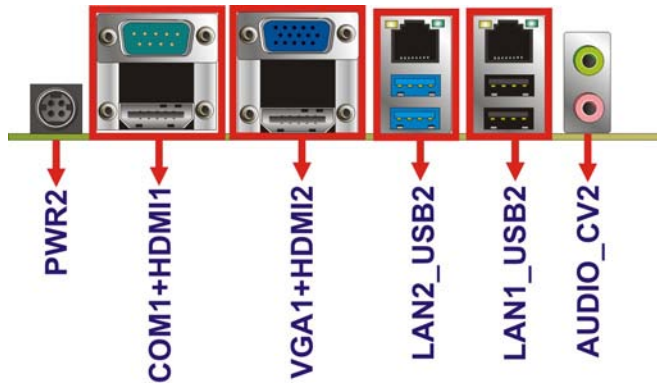
**Figure 3-28: USB Connector Locations**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV2L	2	GND
3	DATA2_N	4	DATA3_P
5	DATA2_P	6	DATA3_N
7	GND	8	USBV2L

**Table 3-28: USB Connector Pinouts**

### 3.3 External Peripheral Interface Connector Panel

**Figure 3-29** shows the KINO-KBN-i2 external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:



**Figure 3-29: External Peripheral Interface Connector**

#### 3.3.1 Audio Connector

CN Label: AUDIO\_CV2  
 CN Type: Audio jacks  
 CN Location: See **Figure 3-29**

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.



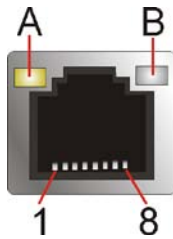
**Figure 3-30: Audio Connector**

## KINO-KBN-i2

### 3.3.2 Ethernet and USB Connectors

CN Label:	<b>LAN1_USB2, LAN2_USB2</b>
CN Type:	RJ-45 , USB 2.0 and USB 3.0 ports
CN Location:	See <b>Figure 3-29</b>
CN Pinouts:	See <b>Figure 3-31</b> , <b>Table 3-29</b> and <b>Table 3-30</b>

The LAN connector connects to a local network.



**Figure 3-31: LAN Connector**

The USB 2.0 ports are for attaching USB 2.0 peripheral devices to the system. The pinouts of LAN1 and USB 2.0 connectors are shown below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVOL	16	NC
2	DATA0_N	P1	1.5VLAN1
3	DATA0_P	P2	TRD1P0
4	GND	P3	TRD1N0
5	USBVOL	P4	TRD1P1
6	DATA1_N	P5	TRD1N1
7	DATA1_P	P6	TRD1P2
8	GND	P7	TRD1N2
9	NC	P8	TRD1P3
10	NC	P9	TRD1N3
11	NC	P10	GND
12	NC	P11	L1_100-
13	NC	P12	L1_1000-

14	NC	P13	L1_LINK_ACT-
15	NC	P14	+V3.3LAN1

**Table 3-29: LAN1\_USB2 Connector Pinouts**

The USB 3.0 ports are for attaching USB 3.0 peripheral devices to the system. To be able to use the USB 3.0 ports, please make sure the USB 3.0 driver is installed. The pinouts of LAN2 and USB 3.0 connectors are shown below.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
G1	IO_GND_1	R8	TRD2P3
G2	IO_GND_1	R9	TRD2N3
G3	IO_GND_1	U1	USB_3P0_VCC1
G4	IO_GND_1	U2	USB2P8_DM0_L
G5	IO_GND_1	U3	USB2P8_DP0_L
G6	IO_GND_1	U4	GND
G7	IO_GND_1	U5	USB3P0_RXDN0_C
G8	IO_GND_1	U6	USB3P0_RXDP0_C
L1	L2_100-	U7	GND
L2	L2_1000-	U8	USB3P0_TXDN0_C
L3	L2_LINK_ACT-	U9	USB3P0_TXDP0_C
L4	+V3.3LAN2	U10	USB_3P0_VCC2
R1	1.5VLAN2	U11	USB2P9_DM1_L
R10	GND	U12	USB2P9_DP1_L
R2	TRD2P0	U13	GND
R3	TRD2N0	U14	USB3P0_RXDN1_C
R4	TRD2P1	U15	USB3P0_RXDP1_C
R5	TRD2N1	U16	GND
R6	TRD2P2	U17	USB3P0_TXDN1_C
R7	TRD2N2	U18	USB3P0_TXDP1_C

**Table 3-30: LAN2\_USB2 Connector Pinouts**

### 3.3.3 HDMI Connector

CN Label: HDMI1, HDMI2



## KINO-KBN-i2

CN Type: HDMI connector

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-31**

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

Pin	Description	Pin	Description
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

**Table 3-31: HDMI Connector Pinouts**

### 3.3.4 Power Connector

CN Label: PWR2

CN Type: 4-pin DIN

CN Location: See **Figure 3-29**

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

The power connector supports 12V DC power input.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	12VIN_2	4	GND_VIN
2	GND_VIN	5	GND_VIN
3	12VIN_2		

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
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**Table 3-32: Power Connector Pinouts**

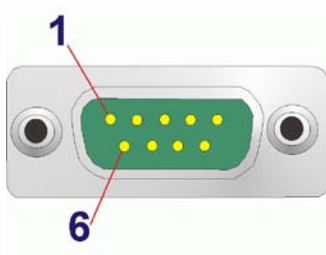
### 3.3.5 Serial Port Connector (COM1)

- CN Label: COM1
- CN Type: DB-9 Male connector
- CN Location: See **Figure 3-29**
- CN Pinouts: See **Table 3-33** and **Figure 3-32**

The RS-232 serial connector provides serial connection in the RS-232 mode.

Pin	Description	Pin	Description
1	NDCD1	6	NDSR1
2	NRX1	7	NRTS1
3	NTX1	8	NCTS1
4	NDTR1	9	NRI1
5	GND		

**Table 3-33: Serial Port Pinouts**



**Figure 3-32: Serial Port Pinout Locations**

### 3.3.6 VGA Connector

- CN Label: VGA1
- CN Type: D-sub 15-pin female connector
- CN Location: See **Figure 3-29**

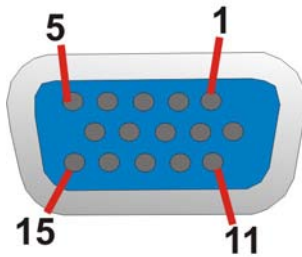
**KINO-KBN-i2**

CN Pinouts: See **Figure 3-33** an **Table 3-34**

The standard 15-pin female VGA connector connects to a CRT or LCD monitor.

Pin	Description	Pin	Description	Pin	Description
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	5VDDCDA
3	BLUE	8	GND	13	VGA_HSYNC
4	NC	9	CRT_VCC	14	VGA_VSYNC
5	GND	10	GND	15	5VDDCLK

**Table 3-34: VGA Connector Pinouts**



**Figure 3-33: VGA Connector**

Chapter

4

# Installation

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## KINO-KBN-i2

### 4.1 Anti-static Precautions

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#### **WARNING:**

Failure to take ESD precautions during the installation of the KINO-KBN-i2 may result in permanent damage to the KINO-KBN-i2 and severe injury to the user.

---

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

- ***Wear an anti-static wristband:*** Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the KINO-KBN-i2, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-KBN-i2.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

### 4.2 Installation Considerations

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#### **NOTE:**

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

---



**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-KBN-i2, KINO-KBN-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 KINO-KBN-i2 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the KINO-KBN-i2 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the KINO-KBN-i2 off:
  - When working with the KINO-KBN-i2, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

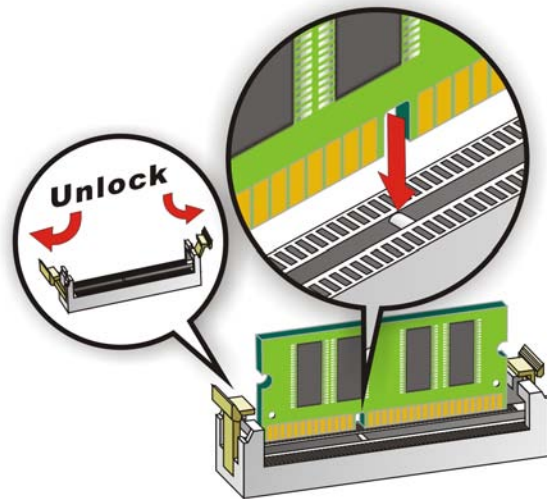
Before and during the installation of the KINO-KBN-i2 **DO NOT:**

- 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.

#### 4.2.1 SO-DIMM Installation

To install a SO-DIMM, please follow the steps below and refer to **Figure 4-1**.

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**Figure 4-1: SO-DIMM Installation**

- Step 1: Open the SO-DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-1**.
- Step 2: Align the SO-DIMM with the socket.** Align the DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-1**.
- 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 4-1**.
- 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.

## 4.3 Internal Peripheral Device Connections

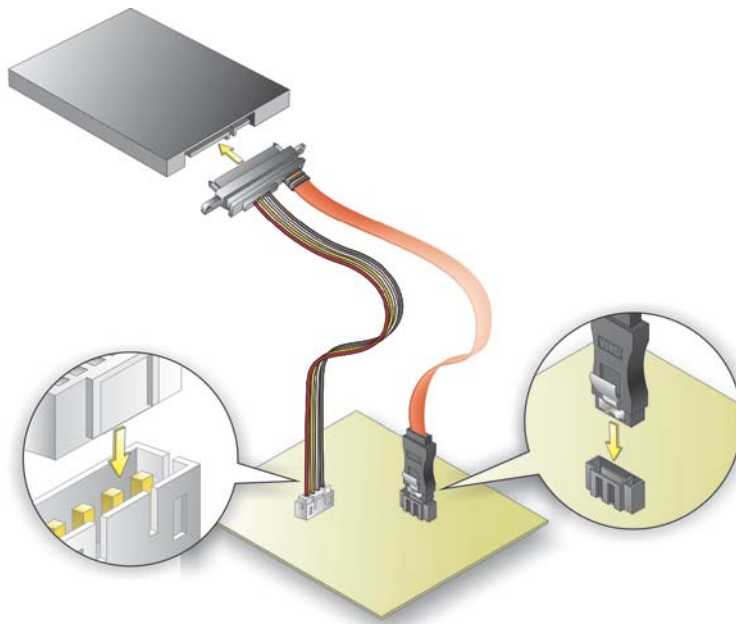
This section outlines the installation of peripheral devices to the on-board connectors

### 4.3.1 SATA Drive Connection

The KINO-KBN-i2 is shipped with two SATA drive cable. To connect the SATA drive to the connector, please follow the steps below.

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

**Step 2:** **Insert the cable connector.** Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-2**.



**Figure 4-2: 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 4-2.

**Step 4:** To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

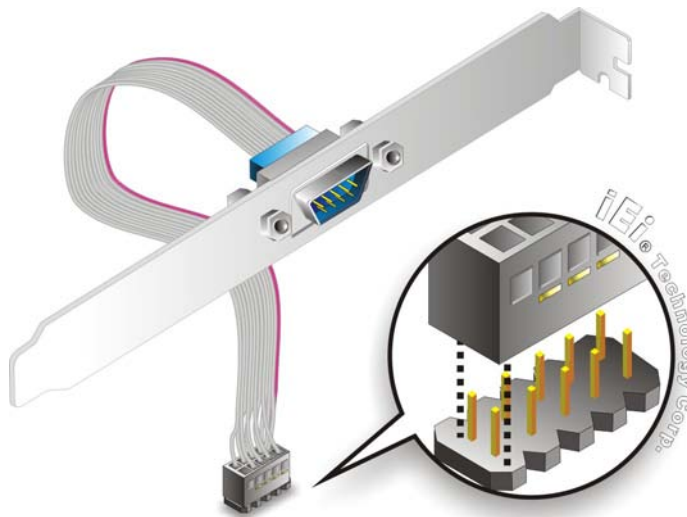
## KINO-KBN-i2

### 4.3.2 Single RS-232 Cable

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

**Step 1: Locate the connector.** The location of the RS-232 connector is shown in **Chapter 3**.

**Step 2: Insert the cable connector.** Insert the connector into the serial port box header. See **Figure 4-3**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.



**Figure 4-3: Single RS-232 Cable Installation**

**Step 3: Secure the bracket.** The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

**Step 4: Connect the serial device.** Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

## 4.4 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- HDMI devices
- RJ-45 Ethernet cable connector
- Serial port devices
- USB devices
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding KINO-KBN-i2 external peripheral interface connector making sure the pins are properly aligned.

### 4.4.1 Audio Connection

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

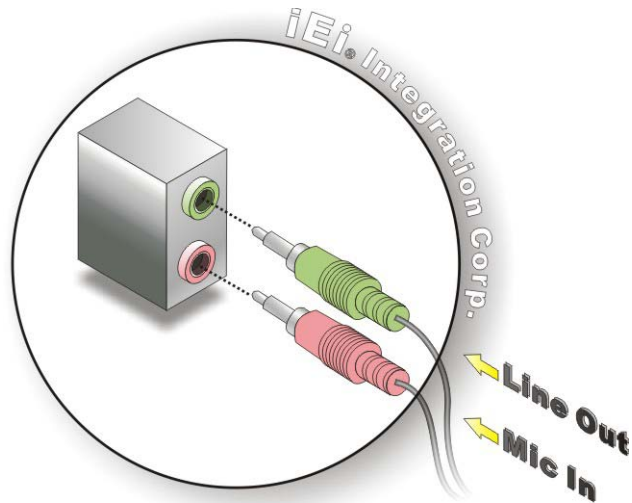
**Step 1: Identify the audio plugs.** The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

**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.



## KINO-KBN-i2



**Figure 4-4: Audio Connector**

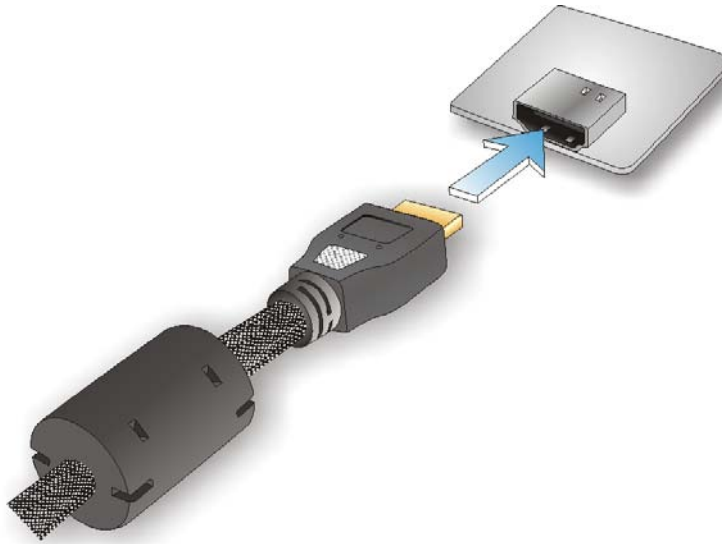
**Step 3: Check audio clarity.** Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

#### 4.4.2 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-KBN-i2, follow the steps below.

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

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



**Figure 4-5: 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.

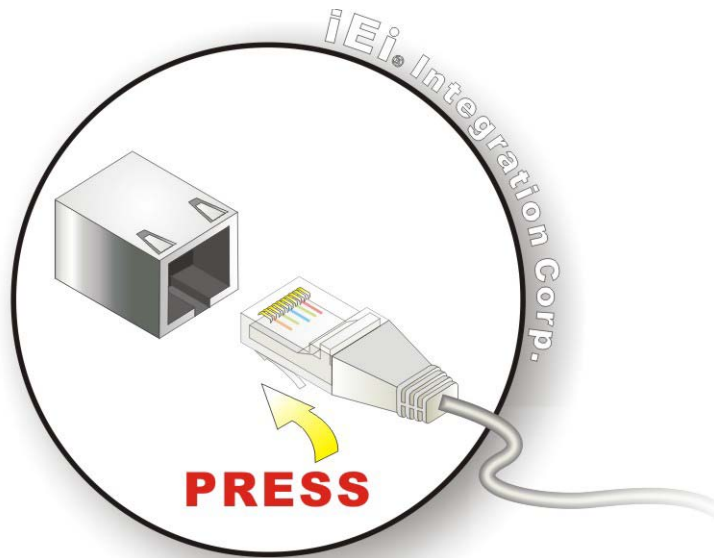
#### 4.4.3 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connector enables 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 LAN 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-KBN-i2. See **Figure 4-6**.

## KINO-KBN-i2



**Figure 4-6: LAN Connection**

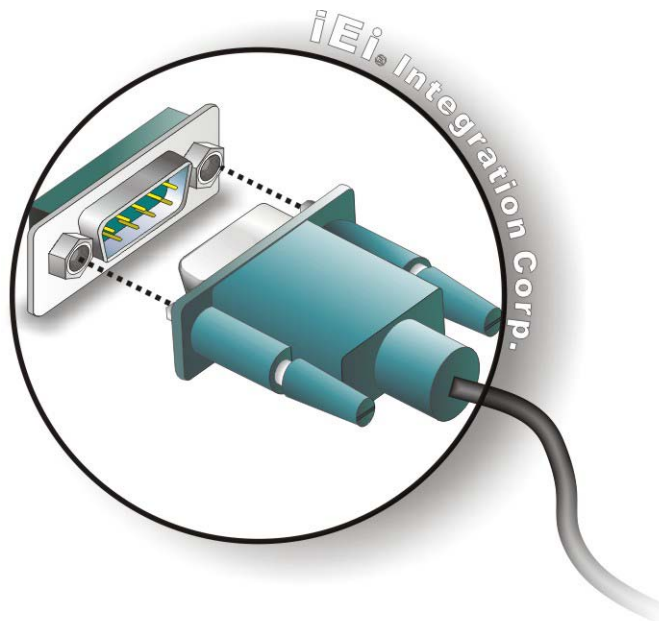
**Step 3:** Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

#### 4.4.4 Serial Device Connection

The KINO-KBN-i2 has two single female DB-9 connectors on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the KINO-KBN-i2.

**Step 1:** Locate the DB-9 connector. The locations of the DB-9 connectors are 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 4-7**.



**Figure 4-7: 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

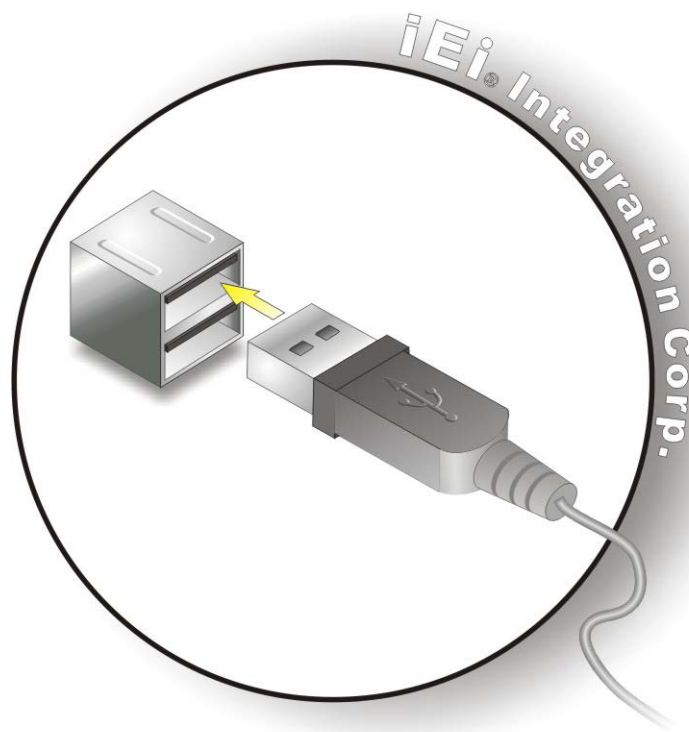
#### 4.4.5 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-KBN-i2.

**Step 1: Locate the USB Series "A" receptacle connectors.** The locations of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

**Step 2: Insert a USB Series "A" plug.** Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-8**.

## KINO-KBN-i2



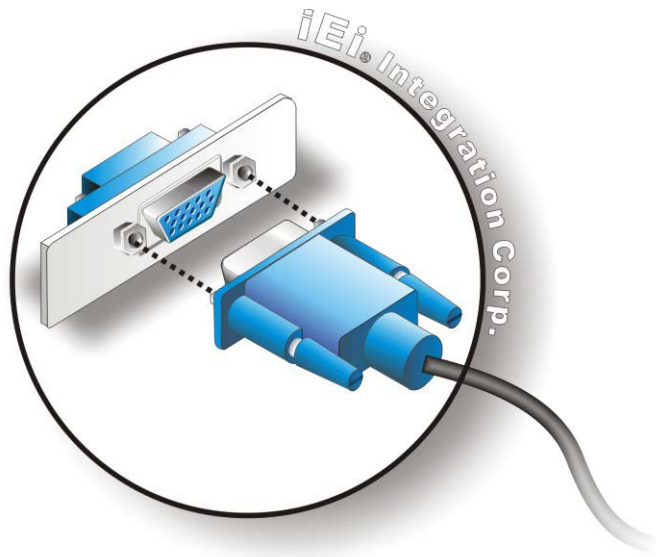
**Figure 4-8: USB Connector**

#### 4.4.6 VGA Monitor Connection

The KINO-KBN-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-KBN-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-KBN-i2. See **Figure 4-9**.





**Figure 4-9: 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.

Chapter

5

# BIOS

---

## 5.1 Introduction

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

### 5.1.1 Starting Setup

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

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

If the message disappears before the **DELETE** 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.

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

## KINO-KBN-i2

Key	Function
Esc	Main Menu – Quit and do 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
F9	Load optimized defaults
F10	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 is made, CMOS defaults. Use the jumper described in Chapter 3.

### 5.1.5 BIOS Menu Bar

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

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

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

## 5.2 Main

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

```

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

BIOS Information
BIOS Vendor                American Megatrends
Core Version                4.6.5.4
Compliancy                 UEFI 2.3.1; PI 1.2
Project Version            SA98AR06.rom
Build Date and Time        10/31/2013 16:26:18

System Date                 [Fri 11/08/2013]
System Time                 [19:43:27]

Access Level                Administrator

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

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

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
    
```

### BIOS Menu 1: Main

#### → BIOS Information

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

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

The System Overview field also has two user configurable fields:

#### → System Date [xx/xx/xx]

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



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→ System Time [xx:xx:xx]

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

### 5.3 Advanced

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



#### WARNING!

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

```

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

System ACPI Parameters.

-----
<=>: Select Screen
↑ ↓: Select Item
EnterSelect
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save
ESC Exit

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```

#### BIOS Menu 2: Advanced

##### 5.3.1 ACPI Settings

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



**BIOS Menu 3: ACPI Configuration**

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

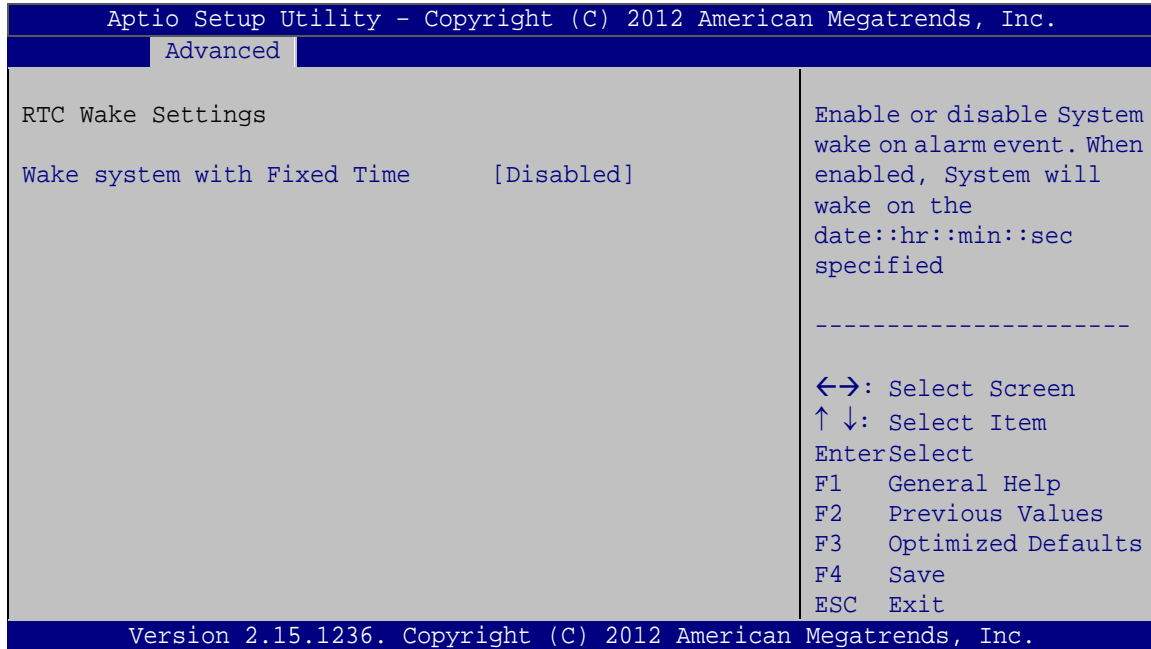
The fields in **ACPI Sleep State** option cannot be changed.

→ **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 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.

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### BIOS Menu 4: 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 date

Wake up hour

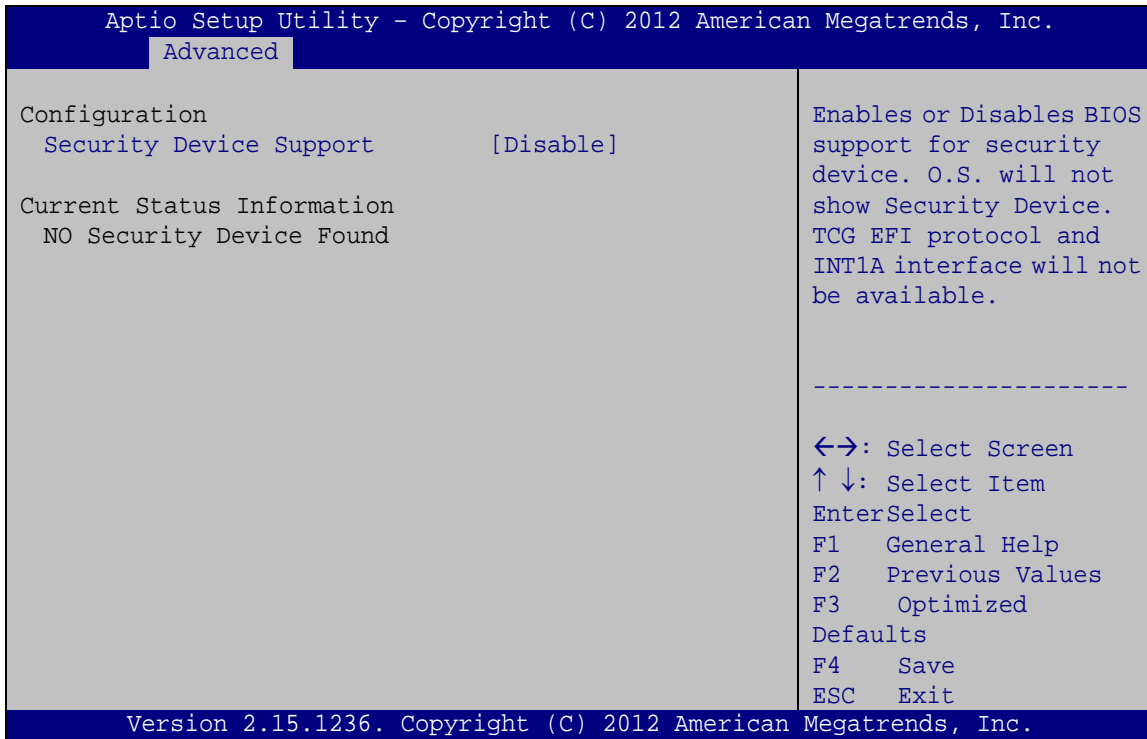
Wake up minute

Wake up second

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

### 5.3.3 Trusted Computing

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



#### BIOS Menu 5: Trusted Computing

➔ Security Device Support [Disable]

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

- ➔ **Disable** **DEFAULT** Security device support is disabled.
- ➔ **Enable** Security device support is enabled.

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### 5.3.4 CPU Configuration

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

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
CPU Configuration
Socket0: AMD GX-210HA SOC with Radeon(tm)HD Graphics
Dual Core Running @ 1017 MHZ 900 mV
Max Speed: 1000 MHZ  Intended Speed: 1000 MHZ
Min Speed: 800 MHZ
Microcode Patch Level: 7000106

-----Cache per Compute Unit-----
L1 Instruction Cache: 64 KB/2-way
  L1 Data Cache : 64 KB/8-way
  L2 Cache: 1024 KB/16-way
No L3 Cache Present

SVM Mode           [Enabled]
Core Leveling Mode [Automatic mode]

Enable/disable CPU
Virtualization

-----
<->: Select Screen
↑ ↓: Select Item
Enter>Select
F1  General Help
F2  Previous Values
F3  Optimized
Defaults
F4  Save
ESC Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  
```

#### BIOS Menu 6: CPU Configuration

→ SVM Mode [Enabled]

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

→ **Disabled** Disables the CPU virtualization function

→ **Enabled**      **DEFAULT**      Enables the CPU virtualization function

→ Core Leveling Mode [Automatic mode]

Use the **Core Leveling Mode** option to configure the number of the active processor cores.

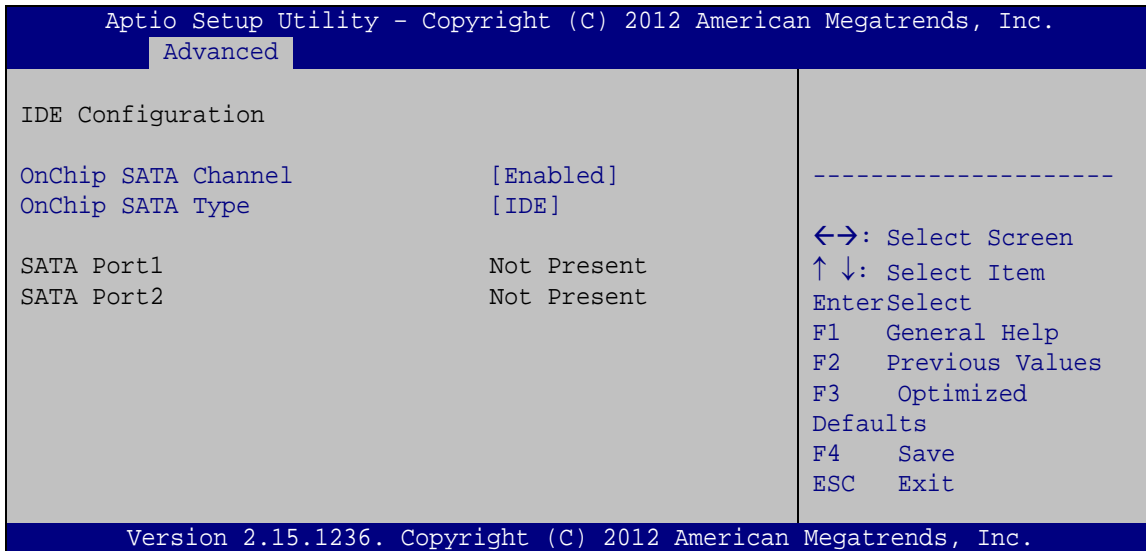
→ **Automatic mode**      **DEFAULT**      Active the processor cores by automatic mode



- ➔ **Three cores per processor**                      Active three of the processor cores
- ➔ **Two cores per processor**                      Active two of the processor cores
- ➔ **One core per processor**                      Active one of the processor cores

### 5.3.5 IDE Configuration

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



#### **BIOS Menu 7: IDE Configuration**

- ➔ OnChip SATA Channel [Enabled]

Use the **OnChip SATA Channel** option to configure Onchip SATA channel.

- ➔ **Disabled**                      Disables Onchip SATA channel.
- ➔ **Enabled**                      **DEFAULT**      Enables Onchip SATA channel.

- ➔ OnChip SATA Type [IDE]

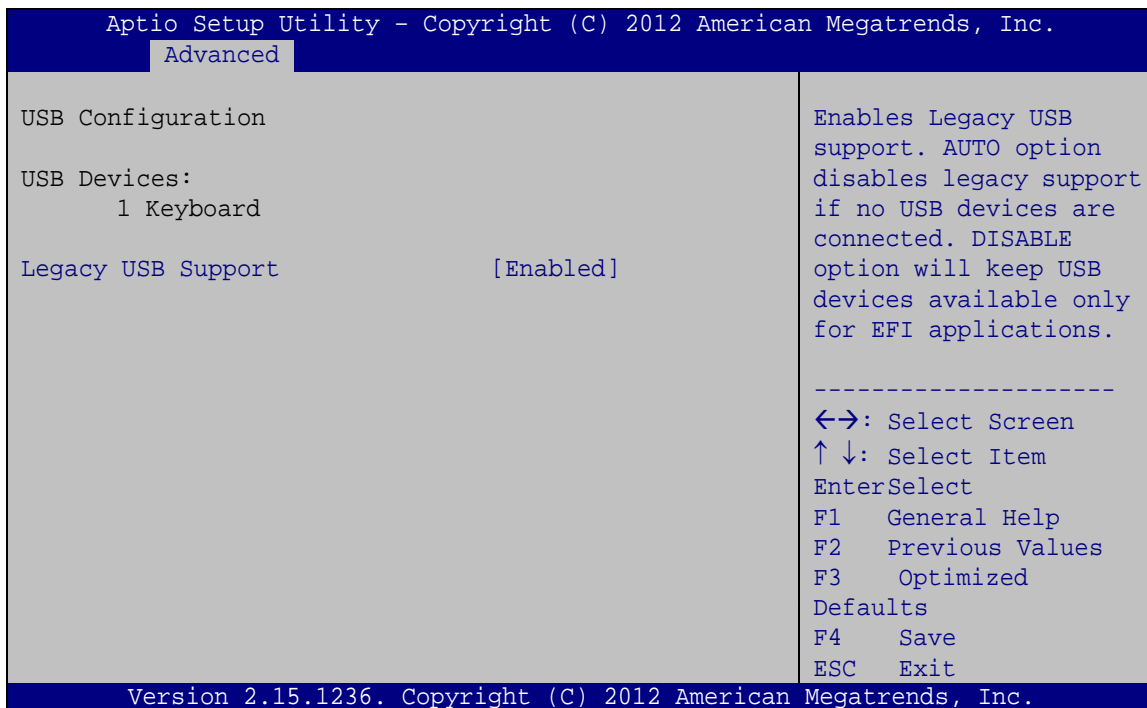
Use the **OnChip SATA Type** option to configure Onchip SATA type.

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

### 5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 10**) to read USB configuration information and configure the USB settings.



#### BIOS Menu 8: USB Configuration

- ➔ USB Devices

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

- ➔ Legacy USB Support [Enabled]

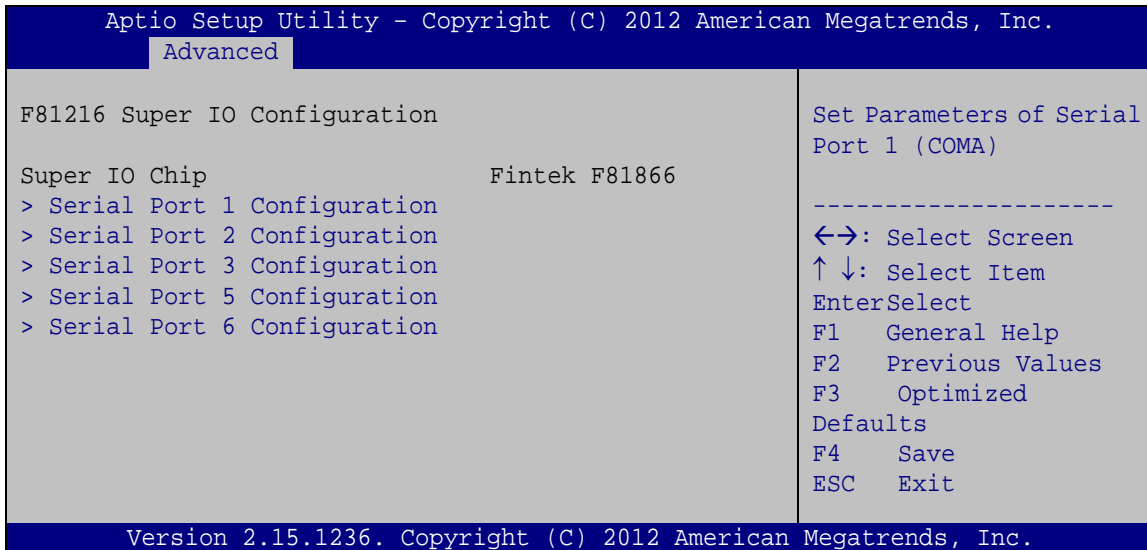
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, 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 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 9**) to set or change the configurations for the serial ports.

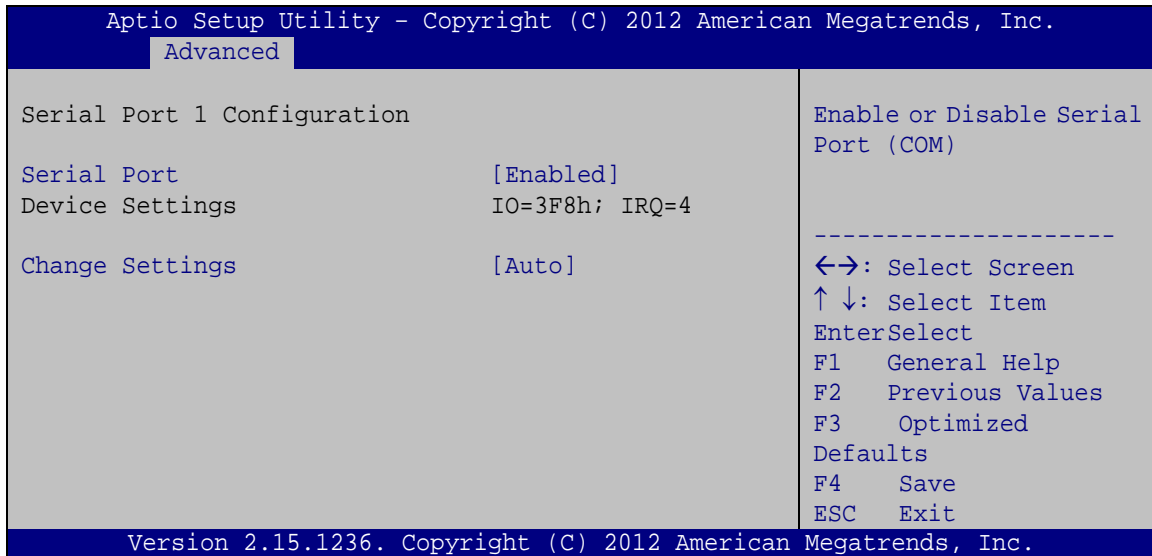


**BIOS Menu 9: Super IO Configuration**

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### 5.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 10**) to configure the serial port n.



#### BIOS Menu 10: Serial Port n Configuration Menu

##### 5.3.7.1.1 Serial Port 1 Configuration

###### → Serial Port [Enabled]

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

→ **Disabled** Disable the serial port

→ **Enabled** **DEFAULT** Enable the serial port

###### → Change Settings [Auto]

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

→ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.

→ **IO=3F8h; IRQ=4** Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

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

### 5.3.7.1.2 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, 4,5,6,7,10,11,12**      Serial Port I/O port address is 3F8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2F8h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 2F8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=3E8h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 3E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12



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

### 5.3.7.1.3 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=10**      Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- ➔ **IO=3E8h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 3E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2E8h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 2E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2D0h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 2D0h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2D8h; IRQ=3, 4,5,6,7,10,11,12**      Serial Port I/O port address is 2D8h and the interrupt address is IRQ3,4,5,6,7,10,11,12

\

#### 5.3.7.1.4 Serial Port 5 Configuration

##### → Serial Port [Enabled]

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

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

##### → Change Settings [Auto]

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

- **Auto**                      **DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- **IO=2D0h; IRQ=10**                      Serial Port I/O port address is 2D0h and the interrupt address is IRQ10
- **IO=3E8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 3E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- **IO=2E8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- **IO=2D0h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2D0h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- **IO=2D8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ3,4,5,6,7,10,11,12

#### 5.3.7.1.5 Serial Port 6 Configuration

##### → Serial Port [Enabled]

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

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- ➔ **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=2D8h; IRQ=10**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
- ➔ **IO=3E8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 3E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2E8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2E8h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2D0h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2D0h and the interrupt address is IRQ3,4,5,6,7,10,11,12
- ➔ **IO=2D8h; IRQ=3, 4,5,6,7,10,11,12**                      Serial Port I/O port address is 2D8h and the interrupt address is IRQ3,4,5,6,7,10,11,12

### 5.3.8 F81866 H/W Monitor

The **F8186 H/W Monitor** menu (**BIOS Menu 11**) shows the operating temperature, fan speeds and system voltages.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Advanced
PC Health Status
Smart Fan Function [Enabled]
> Smart Fan Mode Configuration
CPU Temperature      :-128 C
SYS Temperature     :+29 C
FAN1 Speed          :N/A V
FAN2 Speed          :N/A V
-----
<=>: Select Screen
↑↓: Select Item
EnterSelect
F1  General Help
F2  Previous Values
F3  Optimized
Defaults
F4  Save
ESC Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

```

#### BIOS Menu 11: Hardware Health Configuration

##### → PC Health Status

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

- System Temperatures:
  - CPU Temperature
  - SYS Temperature
- Fans Speeds:
  - FAN1 Speed
  - FAN2 Speed

##### → Smart Fan Function [Enabled]

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

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

### 5.3.8.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 12**) to configure the smart fan temperature and speed settings.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Advanced
Smart Fan Mode Configuration
FAN1 Smart Fan Control      [Auto Duty-Cycle Mode]
CPU Temperature 1          60
CPU Temperature 2          50
CPU Temperature 3          40
CPU Temperature 4          30
FAN2 Smart Fan Control      [Auto Duty-Cycle Mode]
SYS Temperature 1          60
SYS Temperature 2          50
SYS Temperature 3          40
SYS Temperature 4          30
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 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  
```

#### BIOS Menu 12: FAN 1 Configuration

- ➔ FAN1 Smart Fan Control [Auto Duty-Cycle Mode]

Use the **FAN1 Smart Fan Control** option to configure the CPU Smart Fan.

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



→ CPU Temperature n

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

→ FAN2 Smart Fan Control [Auto Duty-Cycle Mode]

Use the **FAN2 Smart Fan Control** option to configure the System Smart Fan.

- |   |                             |   |
|---|-----------------------------|---|
| → | <b>Manual Duty Mode</b>     | The fan spins at the speed set in Manual by Duty Cycle settings     |
| → | <b>Auto Duty-Cycle Mode</b> | DEFAULT The fan adjusts its speed using Auto by Duty-Cycle settings |

→ SYS Temperature n

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

### 5.3.9 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 13**) 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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```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Advanced
COM1
  Console Redirection          [Disabled]
> Console Redirection Settings
  Console Redirection          [Disabled]
> Console Redirection Settings
COM2
  Console Redirection          [Disabled]
> Console Redirection Settings
COM3
  Console Redirection          [Disabled]
> Console Redirection Settings
COM5
  Console Redirection          [Disabled]
> Console Redirection Settings
COM6
  Console Redirection          [Disabled]
> Console Redirection Settings
-----
<-->: Select Screen
↑ ↓: Select Item
Enter>Select
+ - Change Opt.
F1  General Help
F2  Previous Values
F3  Optimized Defaults
F4  Save
ESC Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  
```

### BIOS Menu 13: Serial Port Console Redirection

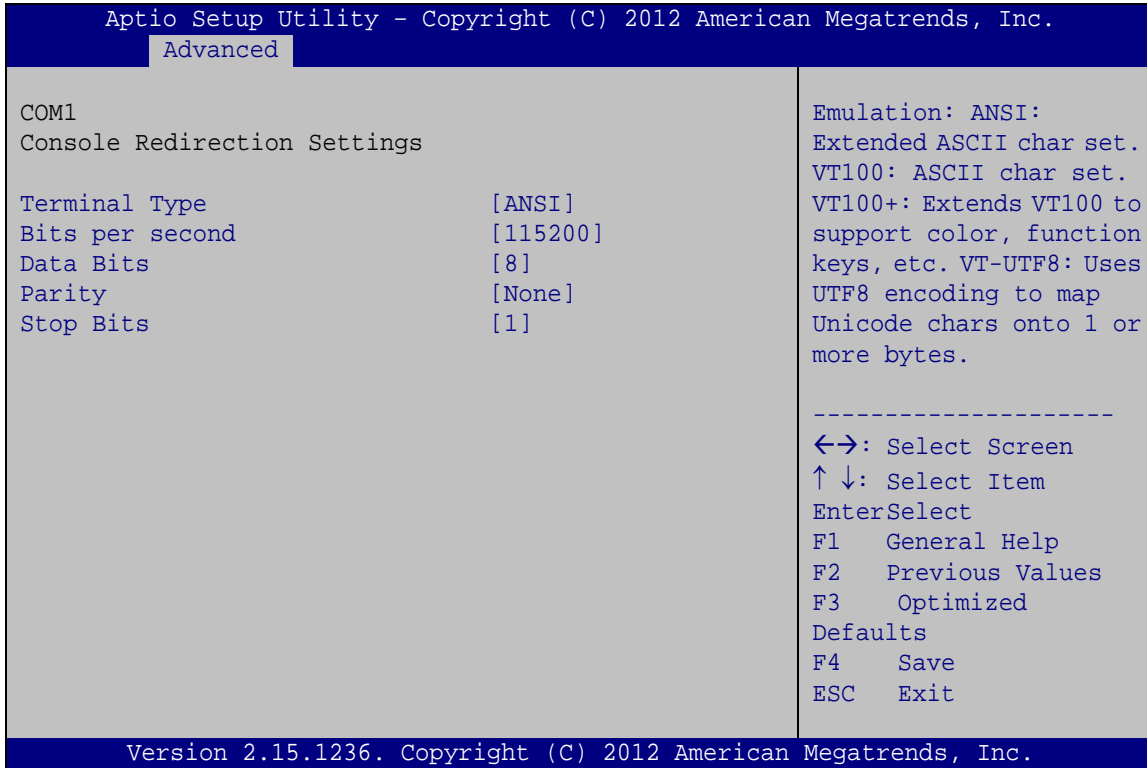
➔ Console Redirection [Disabled]

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

#### 5.3.9.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 14**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.



**BIOS Menu 14: Console Redirection Settings**

➔ 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.

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

→ **Data Bits [8]**

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

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

→ **Parity [None]**

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

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

→ **Stop Bits [1]**

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

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

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the PCH-IO and System Agent (SA) configuration menus.



### WARNING!

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

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
> GFX Configuration          GFX Configuration
> South Bridge
> North Bridge

-----
<->: Select Screen
↑ ↓: Select Item
Enter>Select
F1   General Help
F2   Previous Values
F3   Optimized
Defaults
F4   Save
ESC  Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
    
```

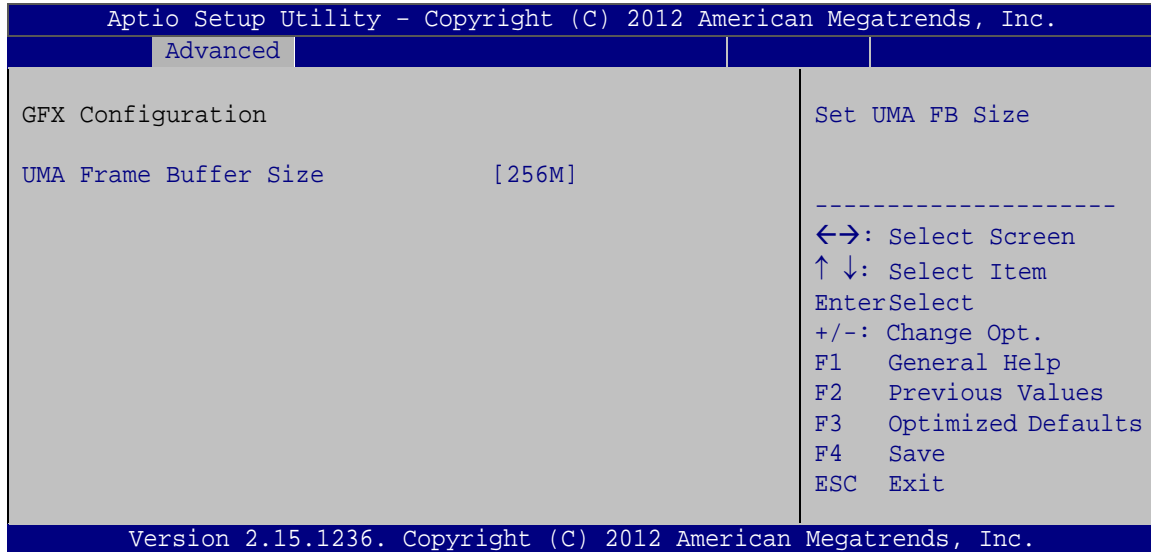
### BIOS Menu 15: Chipset

#### 5.4.1 GFX Configuration

Use the **GFX Configuration** menu (**BIOS Menu 16**) to configure the video device connected to the system.



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**BIOS Menu 16: GFX Configuration**

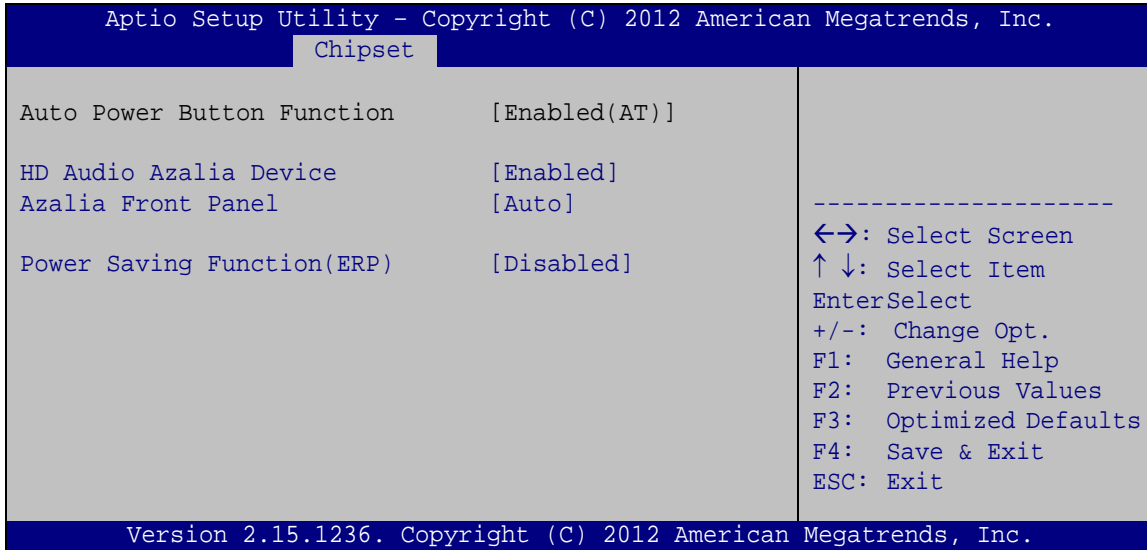
→ UMA Frame Buffer Size [256M]

Use the **UMA Frame Buffer** option to specify the amount of system memory that can be allocated as graphics memory. Configuration options are listed below.

- 32M
- 64M
- 128M
- 256M                      **DEFAULT**
- 512M

#### 5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 17**) to configure the South Bridge chipset.



**BIOS Menu 17: South Bridge Configuration**

→ 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 will be enabled if present, disabled otherwise.
- **Disabled** The onboard High Definition Audio controller is disabled
- **Enabled** **DEFAULT** The onboard High Definition Audio controller is detected automatically and enabled

→ Azalia Front Panel [Enabled]

Use the **Azalia Front Panel** option to enable or disable the front panel audio controller.

- **Auto** The front panel audio controller will be enabled if present, disabled otherwise.
- **Disabled** The front panel audio controller is disabled
- **Enabled** **DEFAULT** The front panel audio controller is detected automatically and enabled

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### ➔ Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function** BIOS option to enable or disable the power saving function.

- ➔ **Disabled**      **DEFAULT**      Power saving function is disabled.
- ➔ **Enabled**                      Power saving function is enabled. It will reduce power consumption when the system is off.

### 5.4.3 North Bridge Configuration

Use the **North Bridge** menu (**BIOS Menu 18**) to view the memory information.

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Chipset
North Bridge Configuration

Memory Information
Memory Clock:1333 MHZ
Total Memory:2048 MB (DDR3)
Dimm0: Not Present
Dimm1: size = 2048MB, speed = 1333MHZ

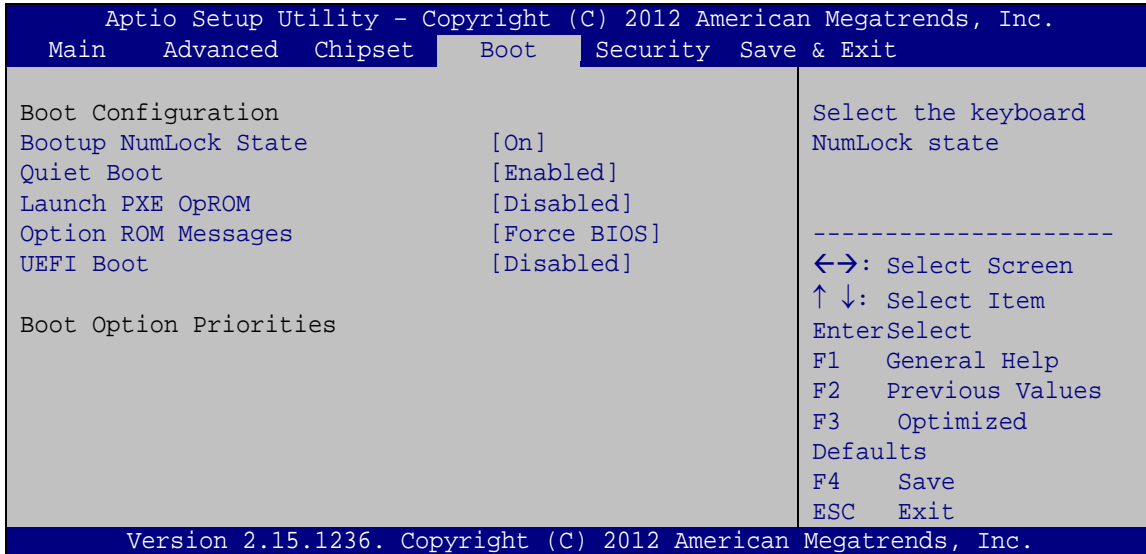
-----
<->: Select Screen
↑ ↓: Select Item
EnterSelect
+ - Change Opt.
F1 General Help
F2 Previous Values
F3 Optimized Defaults
F4 Save & Exit
ESC Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
  
```

**BIOS Menu 18: North Bridge Configuration**

## 5.5 Boot

Use the **Boot** menu (**BIOS Menu 19**) to configure system boot options.



### BIOS Menu 19: 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

## → 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.

## → 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.

## → UEFI Boot [Disabled]

Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

- **Auto** If the first boot HDD is GPT then enable UEFI boot options, otherwise disable,
- **Enabled** Boot from UEFI devices is enabled.
- **Disabled** **DEFAULT** Boot from UEFI devices is disabled.

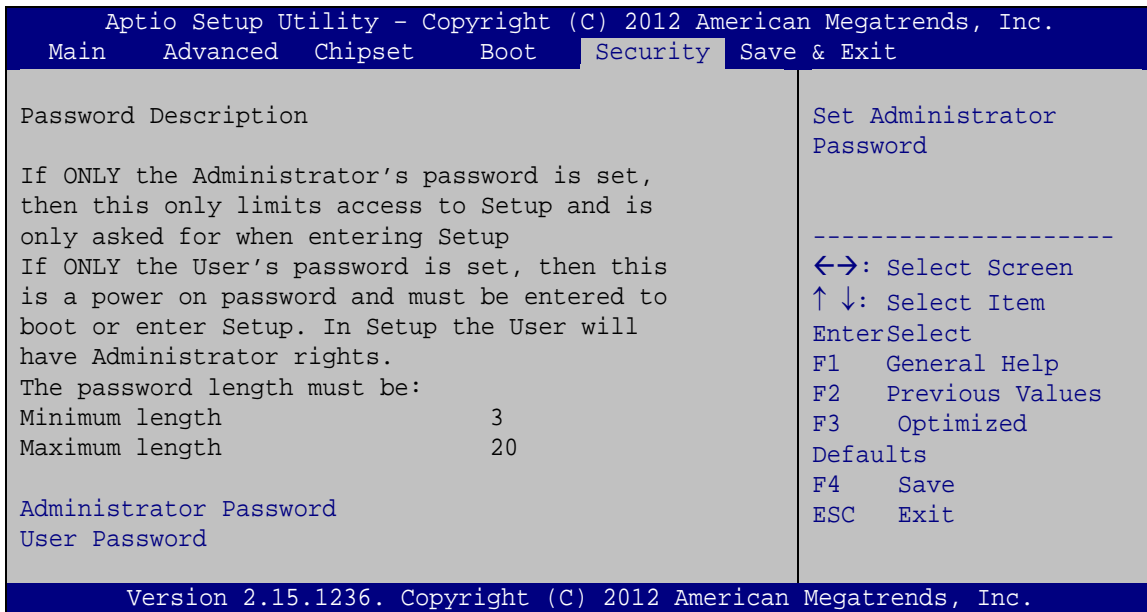


➔ **Boot Option Priority**

Use the **Boot Option Priority** function to set the system boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

## 5.6 Security

Use the **Security** menu (**BIOS Menu 18**) to set system and user passwords.



### **BIOS Menu 20: Security**

➔ **Administrator Password**

Use the **Administrator Password** to set or change a 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 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.

## KINO-KBN-i2

```

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
F1   General Help
F2   Previous Values
F3   Optimized
Defaults
F4   Save
ESC  Exit

Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

```

**BIOS Menu 21:Exit**

## → Save Changes and Reset

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

## → Discard Changes and Reset

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

## → Restore Defaults

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

## → 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.

Appendix

A

# BIOS Menu Options

---

## KINO-KBN-i2

➔ BIOS Information .....	70
➔ System Date [xx/xx/xx] .....	70
➔ System Time [xx:xx:xx] .....	71
➔ ACPI Sleep State [S3 only (Suspend to RAM)] .....	72
➔ Wake system with Fixed Time [Disabled].....	73
➔ Security Device Support [Disable] .....	74
➔ SVM Mode [Enabled] .....	75
➔ Core Leveling Mode [Automatic mode] .....	75
➔ OnChip SATA Channel [Enabled].....	76
➔ OnChip SATA Type [IDE] .....	76
➔ USB Devices .....	77
➔ Legacy USB Support [Enabled].....	77
➔ Serial Port [Enabled].....	79
➔ Change Settings [Auto] .....	79
➔ Serial Port [Enabled].....	80
➔ Change Settings [Auto] .....	80
➔ Serial Port [Enabled].....	81
➔ Change Settings [Auto] .....	81
➔ Serial Port [Enabled].....	82
➔ Change Settings [Auto] .....	82
➔ Serial Port [Enabled].....	82
➔ Change Settings [Auto] .....	83
➔ PC Health Status .....	84
➔ Smart Fan Function [Enabled].....	84
➔ FAN1 Smart Fan Control [Auto Duty-Cycle Mode] .....	85
➔ CPU Temperature n .....	86
➔ FAN2 Smart Fan Control [Auto Duty-Cycle Mode] .....	86
➔ SYS Temperature n .....	86
➔ Console Redirection [Disabled].....	87
➔ Terminal Type [ANSI].....	88
➔ Bits per second [115200].....	88
➔ Data Bits [8] .....	89
➔ Parity [None].....	89
➔ Stop Bits [1].....	89

→	UMA Frame Buffer Size [256M].....	91
→	HD Audio Azalia Device [Enabled] .....	92
→	Azalia Front Panel [Enabled] .....	92
→	Power Saving Function(ERP) [Disabled].....	93
→	Bootup NumLock State [On].....	94
→	Quiet Boot [Enabled] .....	95
→	Launch PXE OpROM [Disabled] .....	95
→	Option ROM Messages [Force BIOS].....	95
→	UEFI Boot [Disabled] .....	95
→	Boot Option Priority.....	96
→	Administrator Password .....	96
→	User Password .....	96
→	Save Changes and Reset .....	97
→	Discard Changes and Reset .....	97
→	Restore Defaults .....	97
→	Save as User Defaults .....	97
→	Restore User Defaults .....	97



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.

The IEI One Key Recovery tool menu is shown below.

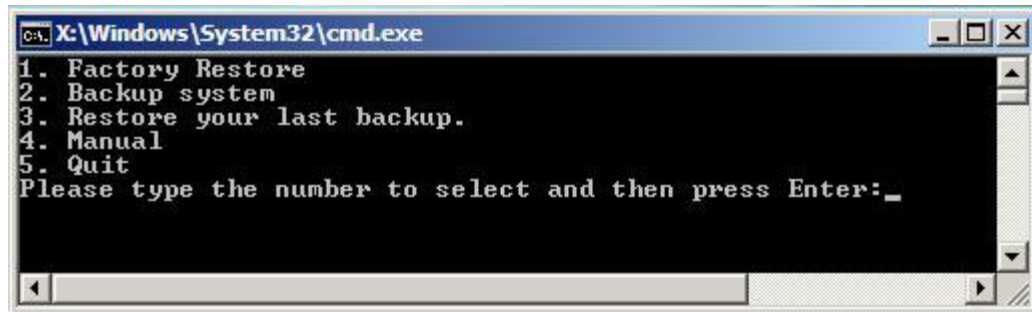


Figure B-1: IEI One Key Recovery Tool Menu

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.4**.



### NOTE:

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

---

**KINO-KBN-i2**

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

	OS	OS Image after Ghost	Compression Ratio
<b>Windows® 7</b>	7 GB	5 GB	70%
<b>Windows® XPE</b>	776 MB	560 MB	70%
<b>Windows® CE 6.0</b>	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 XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)
  - Ubuntu 8.10 (Intrepid)
  - Ubuntu 7.10 (Gutsy)
  - Ubuntu 6.10 (Edgy)
  - Debian 5.0 (Lenny)
  - Debian 4.0 (Etch)
  - SuSe 11.2
  - SuSe 10.3

## KINO-KBN-i2



### 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**)

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

The detailed descriptions are described in the following sections.



### NOTE:

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

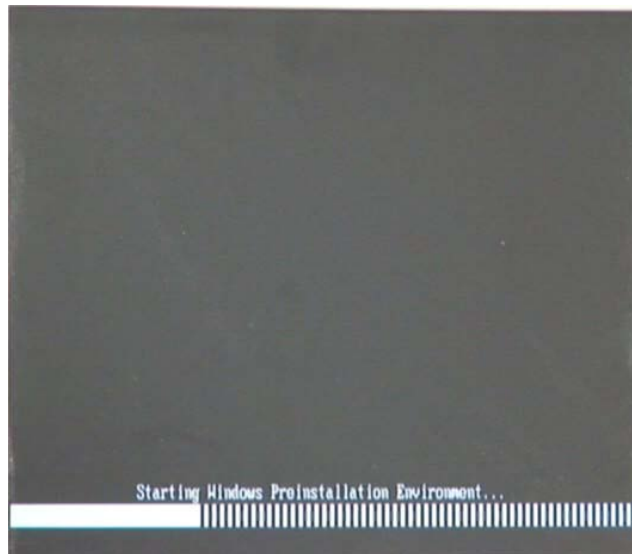


- Step 5:** Press the <DELETE> key as soon as the system is turned on to enter the BIOS.
- Step 6:** Select the connected optical disk drive as the 1<sup>st</sup> boot device. (**Boot → Boot Device Priority → 1<sup>st</sup> Boot Device**).
- Step 7:** Save changes and restart the computer. Continue to 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.

## KINO-KBN-i2

```
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.
```

Figure B-3: Recovery Tool Setup Menu

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

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

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

Figure B-4: Command Prompt

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

```
system32>diskpart
DISKPART>list vol
DISKPART>sel disk 0
DISKPART>create part pri size= ____
DISKPART>assign letter=N
DISKPART>create part pri size= ____
DISKPART>assign letter=F
DISKPART>exit
```

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

```

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

DISKPART> list vol → Show partition information

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

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

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

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

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

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

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

X:\I386\SYSTEM32>format f: /fs:ntfs /q /v:Recovery /y → Formate partition 2 (F) as NTFS formate and
name it as "Recovery".
The type of the file system is RAW.
The new file system is NTFS.
QuickFormatting 1804M
Creating file system structures.
Format complete.
 1847474 KB total disk space.
 1835860 KB are available.

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

```

Figure B-5: Partition Creation Commands



**NOTE:**

Use the following commands to check if the partitions were created successfully.

```
X:\I386\SYSTEM32>diskpart
Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JUC
DISKPART> sel disk 0
Disk 0 is now the selected disk.
DISKPART> list part
  Partition ###  Type              Size      Offset
-----
  Partition 1    Primary           2000 MB   32 KB
  Partition 2    Primary           1804 MB  2000 MB
DISKPART> exit
```

**Step 6:** Press any key to exit the recovery tool and automatically reboot the system.

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

### B.2.3 Install Operating System, Drivers and Applications

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

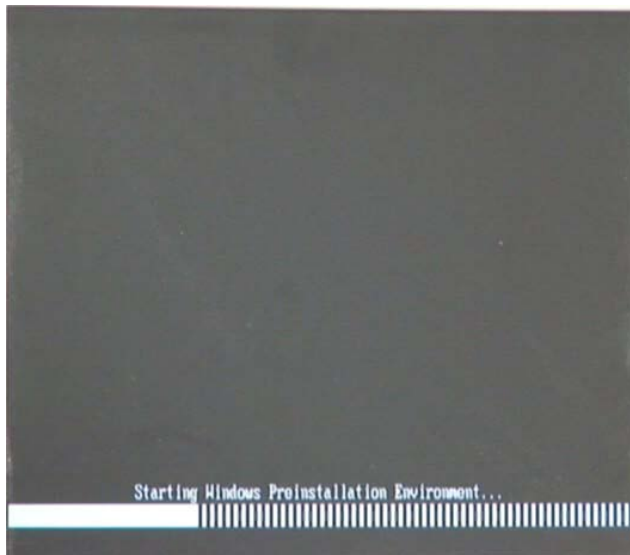
**NOTE:**

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

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

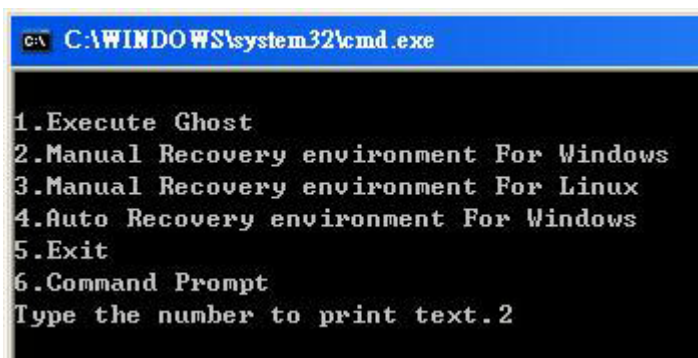
### B.2.4 Building the Recovery Partition

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



**Figure B-6: Launching the Recovery Tool**

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

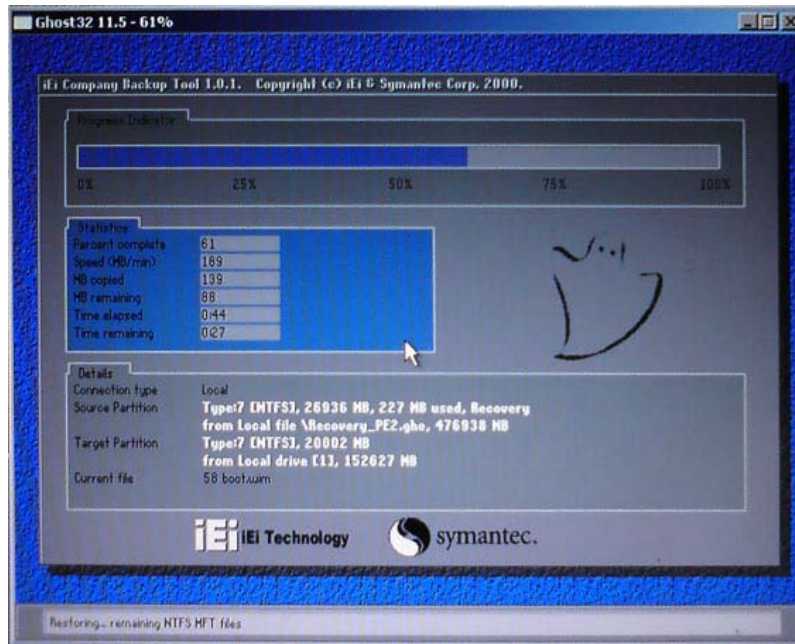


**Figure B-7: Manual Recovery Environment for Windows**



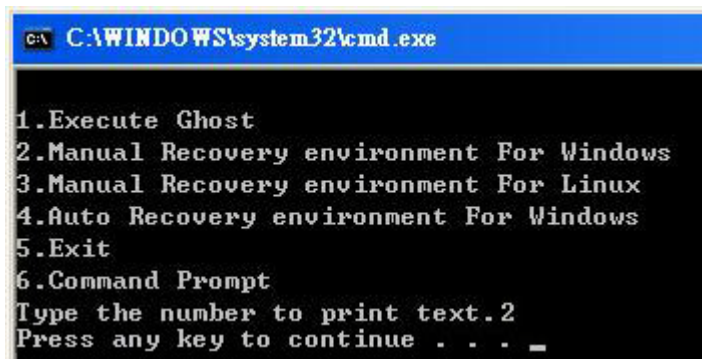
**KINO-KBN-i2**

**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

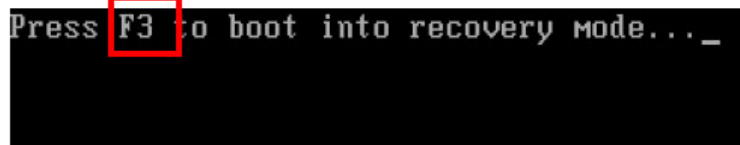


#### NOTE:

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

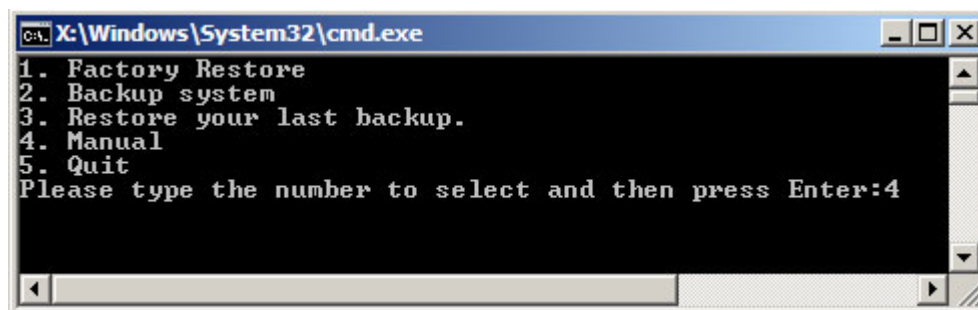
To create a factory default image, please follow the steps below.

**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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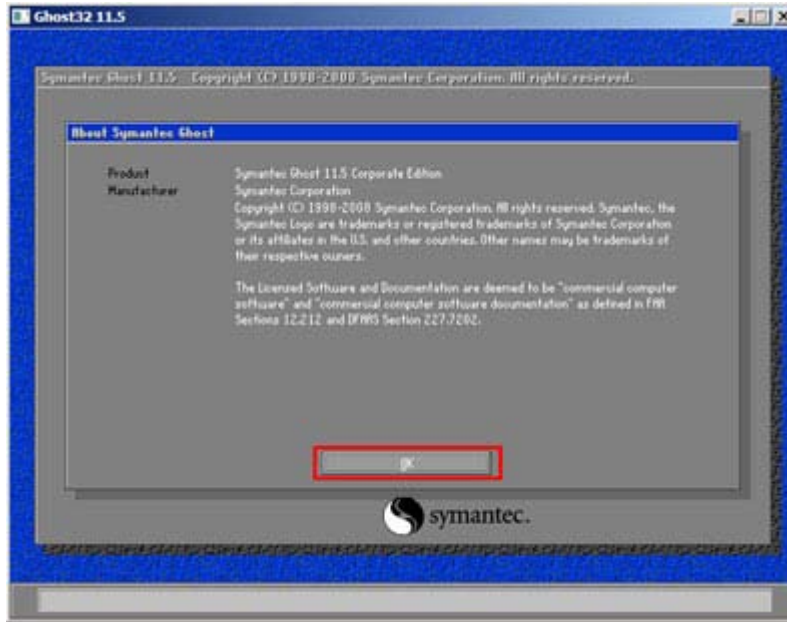


Figure B-12: About Symantec Ghost Window

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

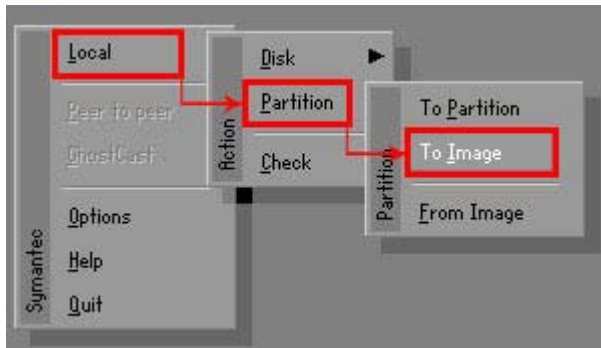
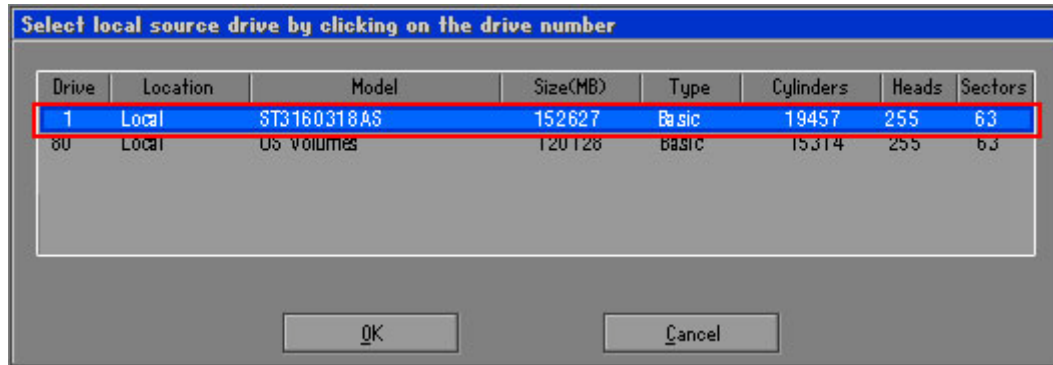


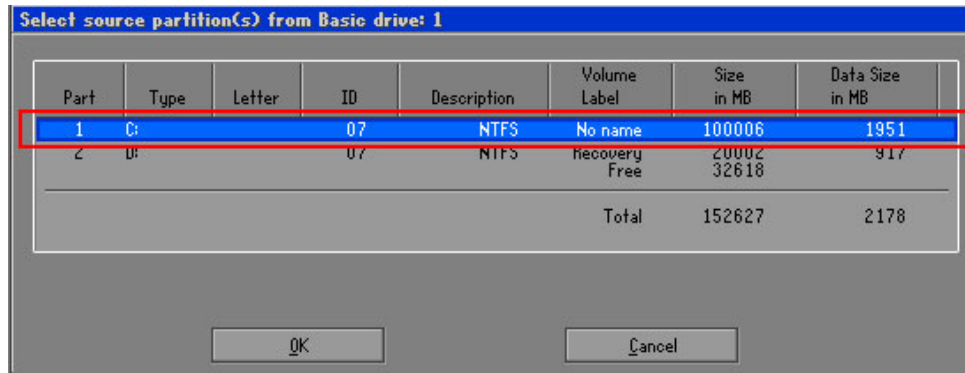
Figure B-13: Symantec Ghost Path

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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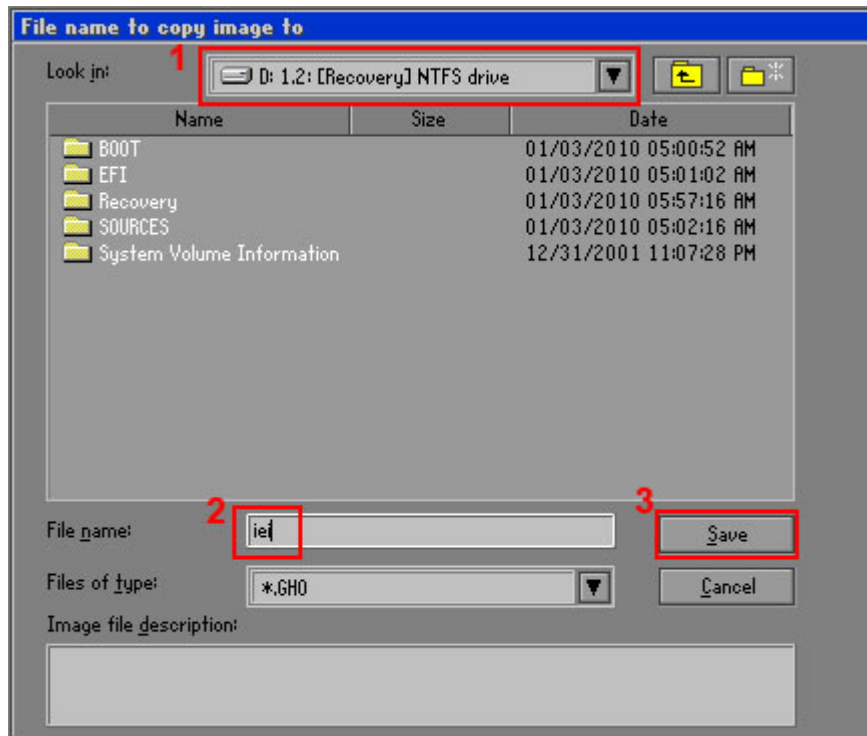


Figure B-16: File Name to Copy Image to

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

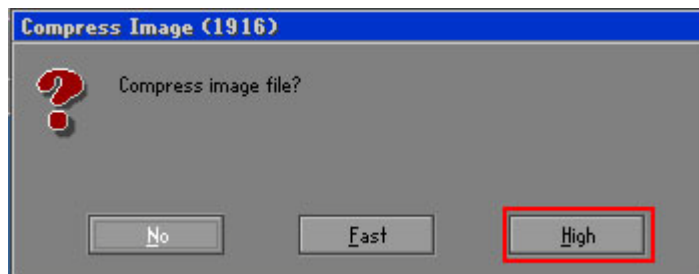
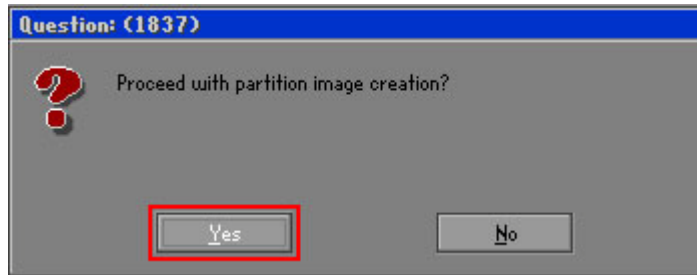


Figure B-17: Compress Image

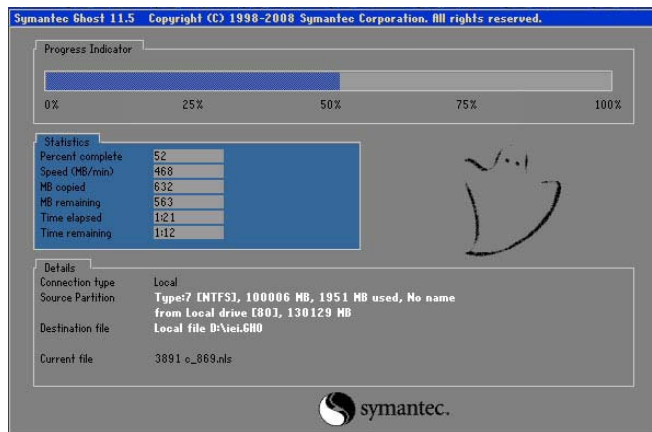


**Step 9:** The Proceed with partition image creation window appears, click **Yes** to continue.



**Figure B-18: Image Creation Confirmation**

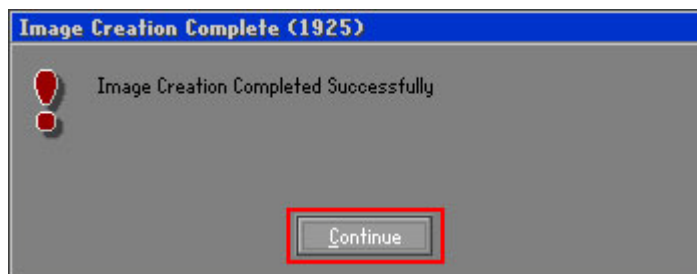
**Step 10:** The Symantec Ghost starts to create the factory default image (**Figure B-19**).



**Figure B-19: Image Creation Complete**

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

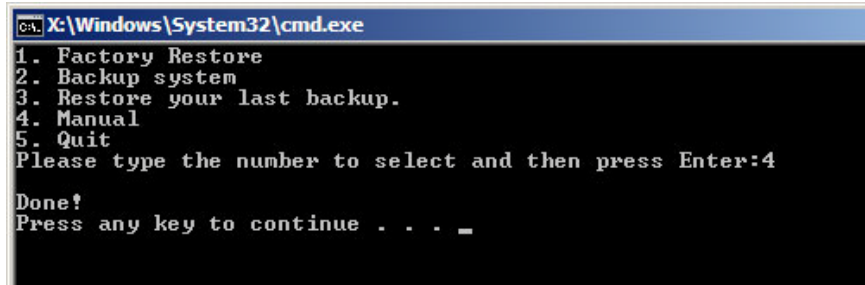
Click **Continue** and close the Ghost window to exit the program.



**Figure B-20: Image Creation Complete**

## KINO-KBN-i2

**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 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:

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

**NOTE:**

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

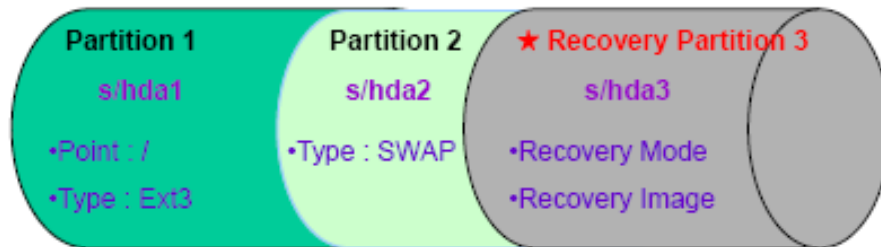


Figure B-22: Partitions for Linux

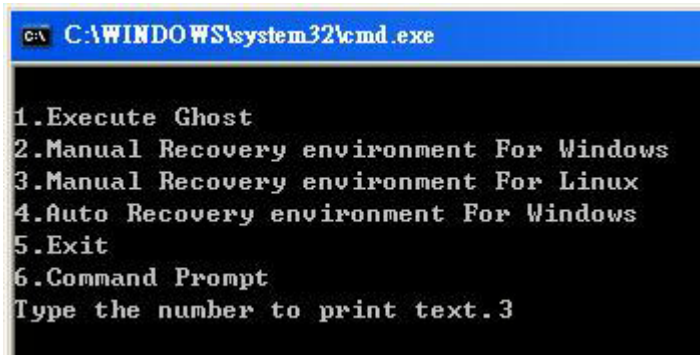
**Step 3:** Create a recovery partition. Insert the recovery CD into the optical disk drive.

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-23**). 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.

## KINO-KBN-i2



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

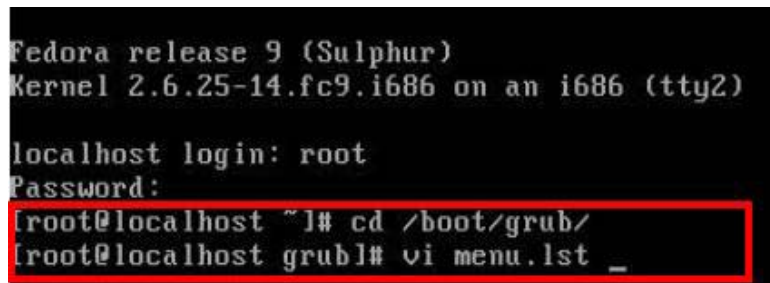
1.Execute Ghost
2.Manual Recovery environment For Windows
3.Manual Recovery environment For Linux
4.Auto Recovery environment For Windows
5.Exit
6.Command Prompt
Type the number to print text.3
```

Figure B-23: 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-24: Access menu.lst in Linux (Text Mode)

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



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

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

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

Step 7: The recovery tool menu appears. (Figure B-25)

```
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-25: 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.4 Recovery Tool Functions

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



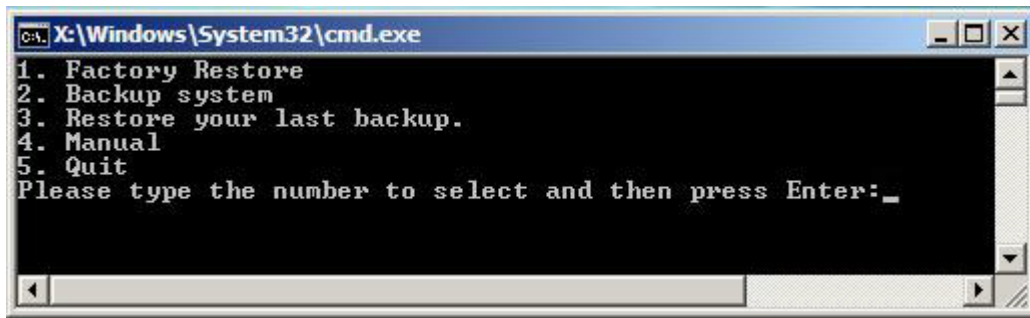


Figure B-26: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore:** Restore the factory default image (iei.GHO) created in Section B.2.5.
2. **Backup system:** Create a system backup image (iei\_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup:** Restore the last system backup image
4. **Manual:** Enter the Symantec Ghost window to configure manually.
5. **Quit:** Exit the recovery tool and restart the system.



**WARNING:**

Please do not turn off the system power during the process of system recovery or backup.



**WARNING:**

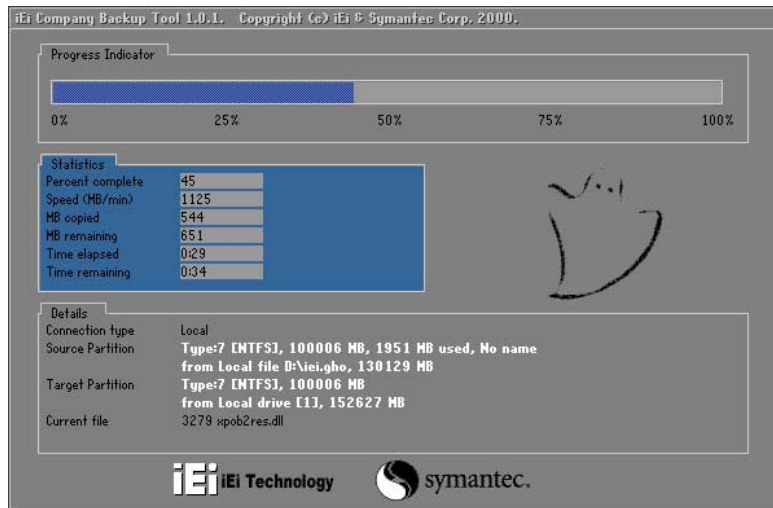
All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

### B.4.1 Factory Restore

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

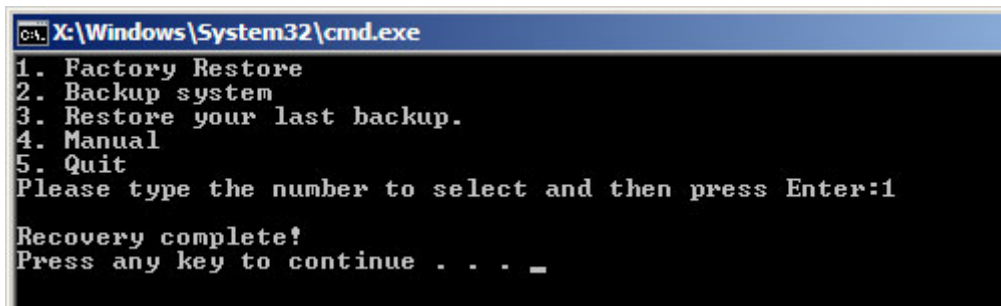
**Step 1:** Type <1> and press <Enter> in the main menu.

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



**Figure B-27: Restore Factory Default**

**Step 3:** The screen shown in **Figure B-28** appears when completed. Press any key to reboot the system.



**Figure B-28: Recovery Complete Window**

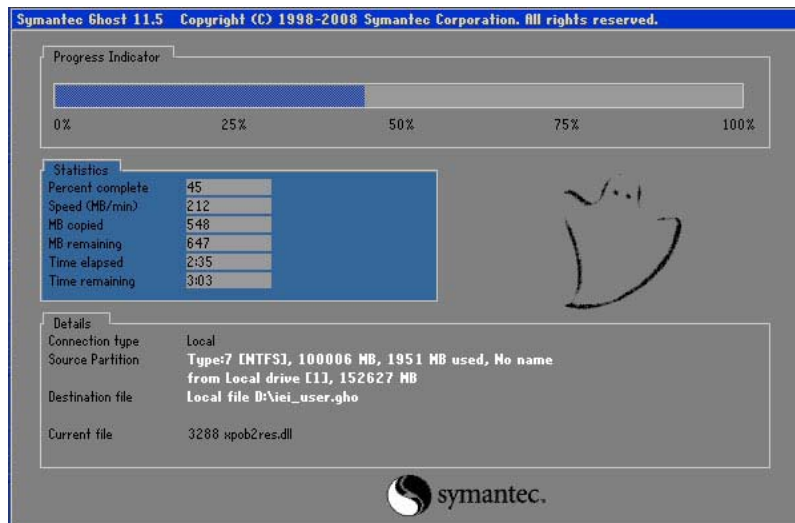
## KINO-KBN-i2

## B.4.2 Backup System

To backup the system, please follow the steps below.

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

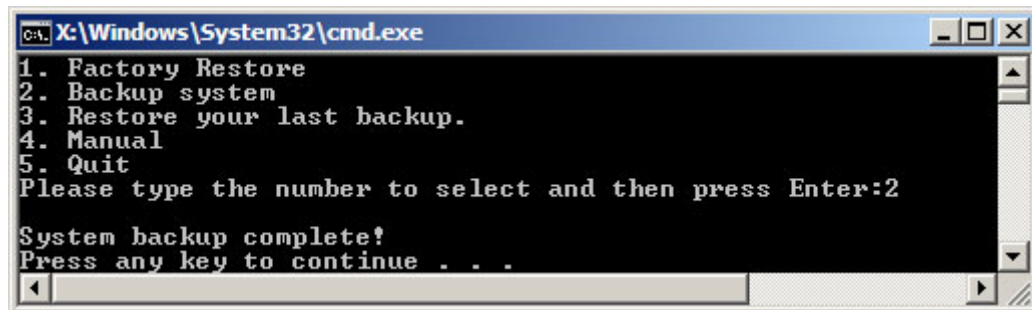
**Step 2:** The Symantec Ghost window appears and starts to backup the system. A backup image called `iei_user.GHO` is created in the hidden Recovery partition.



**Figure B-29: Backup System**

**Step 3:** The screen shown in **Figure B-30** appears when system backup is complete.

Press any key to reboot the system.



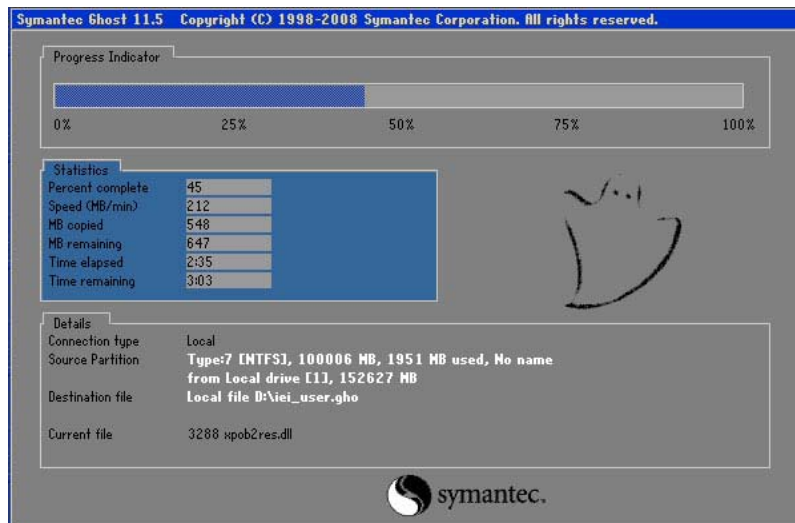
**Figure B-30: System Backup Complete Window**

### B.4.3 Restore Your Last Backup

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

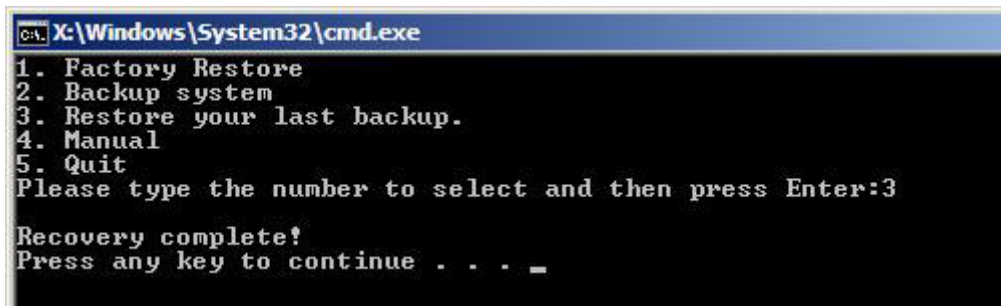
**Step 1:** Type <3> and press <Enter> in the main menu.

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



**Figure B-31: Restore Backup**

**Step 3:** The screen shown in **Figure B-32** appears when backup recovery is complete. Press any key to reboot the system.



**Figure B-32: Restore System Backup Complete Window**



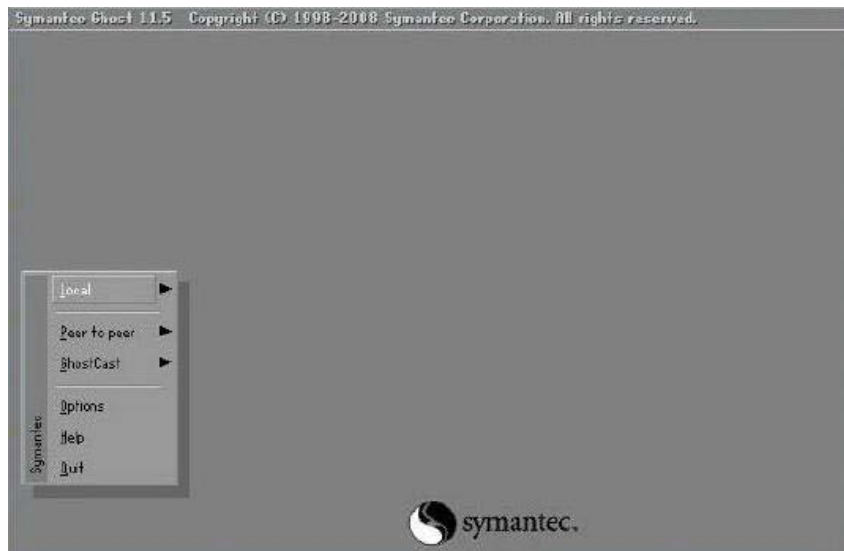
## KINO-KBN-i2

### B.4.4 Manual

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

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

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



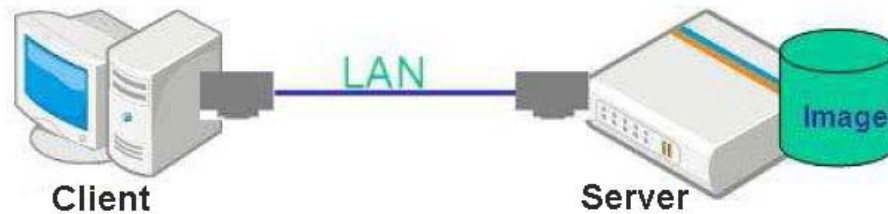
**Figure B-33: Symantec Ghost Window**

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



## B.5 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.



### NOTE:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows CE
- Windows XP Embedded

Prior to restoring client systems from a Linux server, a few setup procedures are required.

**Step 1:** Configure DHCP server settings

**Step 2:** Configure TFTP settings

**Step 3:** Configure One Key Recovery server settings

**Step 4:** Start DHCP, TFTP and HTTP

**Step 5:** Create a shared directory

**Step 6:** Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

## KINO-KBN-i2

## B.5.1 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;`

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.5.2 Configure TFTP Settings

**Step 1:** Install the tftp, httpd and syslinux.

```
#yum install tftp-server httpd syslinux (CentOS)
```

```
#apt-get install tftpd-hpa xinetd syslinux (Debian)
```

**Step 2:** Enable the TFTP server by editing the "/etc/xinetd.d/tftp" file and make it use the remap file. The "-vvv" is optional but it could definitely help on getting more information while running the remap file. For example:

#### CentOS

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

Modify:

```
disable = no
```

```
server_args = -s /tftpboot -m /tftpboot/tftpd.remap -vvv_
```

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

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**Debian**

Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

```
#vi /etc/inetd.conf
```

Modify: #tftp dgram udp wait root /usr/sbin..... (as shown below)

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

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

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

## B.5.3 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/
```



#### B.5.4 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.5.5 Create Shared Directory

**Step 1:** Install the samba.

```
#yum install samba
```

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

```
#mkdir /share
```

```
#cd /share
```

```
#mkdir /image
```

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



#### **WARNING:**

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

---

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

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



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Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

**Step 4:** Edit "/etc/samba/smb.conf" for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/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.5.6 Setup a Client System for Auto Recovery

**Step 1:** 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 2:** 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 3:** Save changes and exit BIOS menu.

Exit → **Save Changes and Exit**

**Step 4:** 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 5:** 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 . ./
```

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```

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

```

Windows is loading files...

IP: 192.168.0.8, File: \Boot\WinPE.wim
    
```

Symantec Ghost 11.5 Copyright (C) 1998-2008 Symantec Corporation. All rights reserved.

Progress Indicator: 50%

Statistics	
Percent complete	52
Speed (MB/min)	468
MB copied	632
MB remaining	563
Time elapsed	1:21
Time remaining	1:12

Details:

Connection type	Local
Source Partition	Type:7 [NTFS], 100006 MB, 1951 MB used, No name from Local drive [80], 130129 MB
Destination file	Local file D:\iei.GHO
Current file	3891 c_869.nls

symantec.



**NOTE:**

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

## B.6 Other Information

### B.6.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

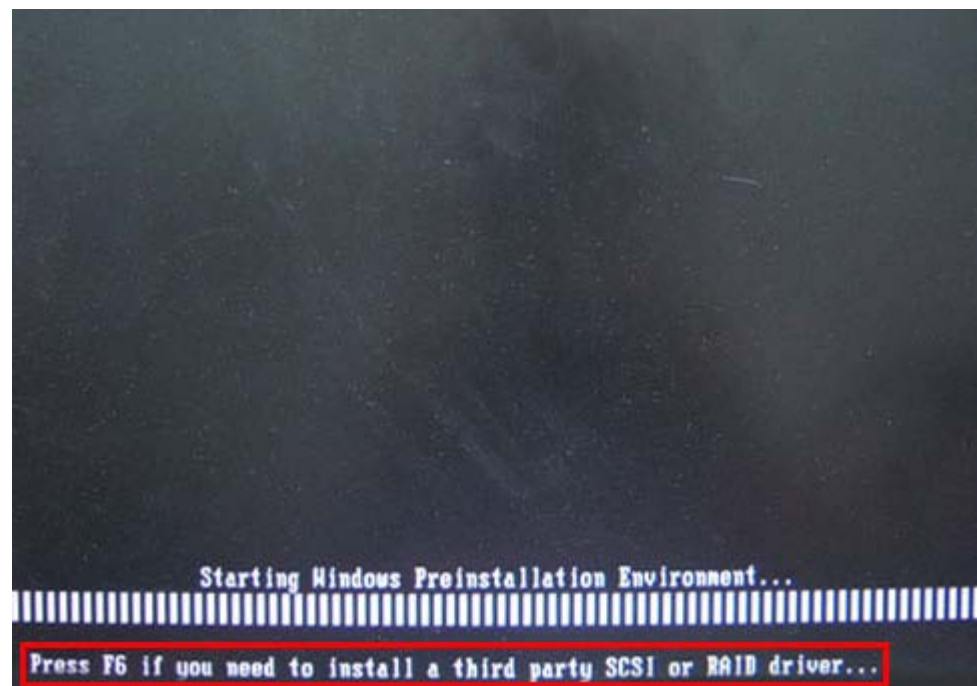
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

**Step 1:** Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

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

**Step 3:** Insert the One Key Recovery CD into the system and boot the system from the CD.

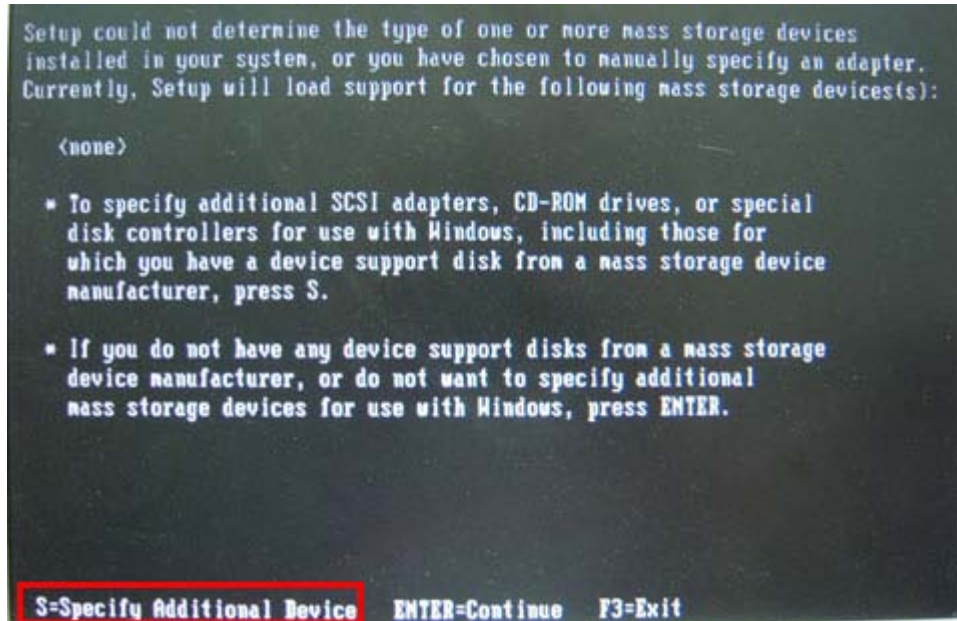
**Step 4:** When launching the recovery tool, press <F6>.



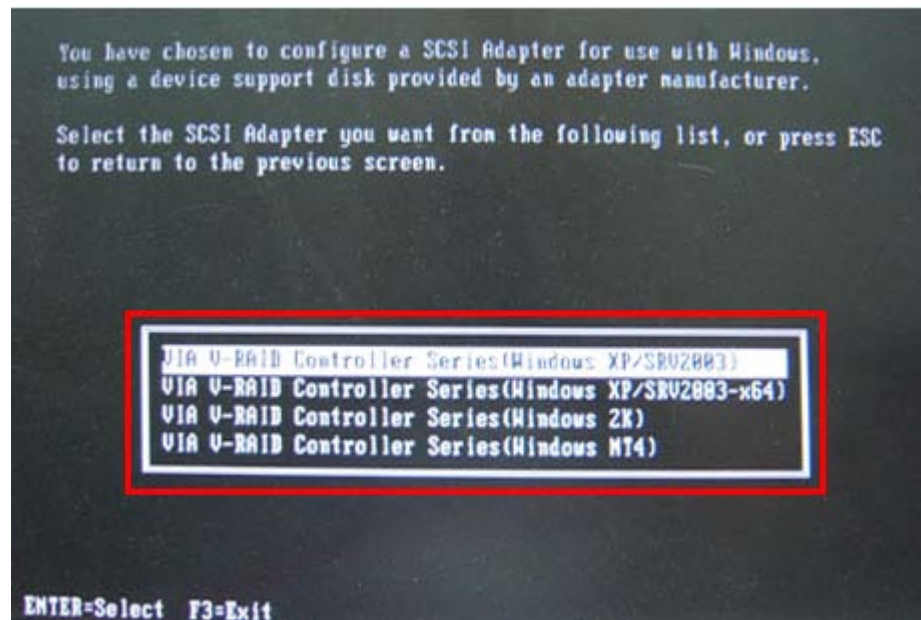


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**Step 5:** When the following window appears, press <S> to select “Specify Additional Device”.



**Step 6:** In the following window, select a SATA controller mode used in the system. Then press <Enter>. The user can now start using the SATA HDD.





**Step 7:** After pressing <Enter>, the system will get into the recovery tool setup menu.

Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

### B.6.2 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

---

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.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is a type of integrated circuit used in chips like static RAM and microprocessors.
COM	COM is used to refer to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal

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	computer is usually a male DE-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.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
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
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.
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.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.

PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAM	Random Access Memory (RAM) is a form of storage used in computer. RAM is volatile memory, so it loses its data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA 3Gb/s bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates, while



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USB 2.0 supports 480Mbps data transfer rates.

### VGA

The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

# Watchdog Timer

---

**NOTE:**

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

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

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

**INT 15H:**

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

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

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

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

**NOTE:**

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

**Example program:**

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

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

;
; ADD THE APPLICATION PROGRAM HERE
;

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

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

;
; EXIT ;
```

Appendix

E

# Hazardous Materials Disclosure

---



## E.1 Hazardous Material 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-KBN-i2**

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

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

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

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

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

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

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