IEI Integration Corp.

MODEL:

KINO-ABT-i2 Series

Mini-ITX SBC with 22nm Intel® Atom™ or Celeron® SoC, Dual GbE, DDR3, HDMI, VGA, DisplayPort, USB 3.0, COM, SATA 3Gb/s, IPMI 2.0 and RoHS

User Manual

Rev. 1.02 – June 29, 2017

RoHS Lead Free

Revision

Date	Version	Changes
June 29, 2017	1.02	Clarified BIOS specifications
February 16, 2016	1.01	Clarified memory specifications
August 28, 2014	1.00	Initial release

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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Chapter

1

Introduction

1.1 Introduction

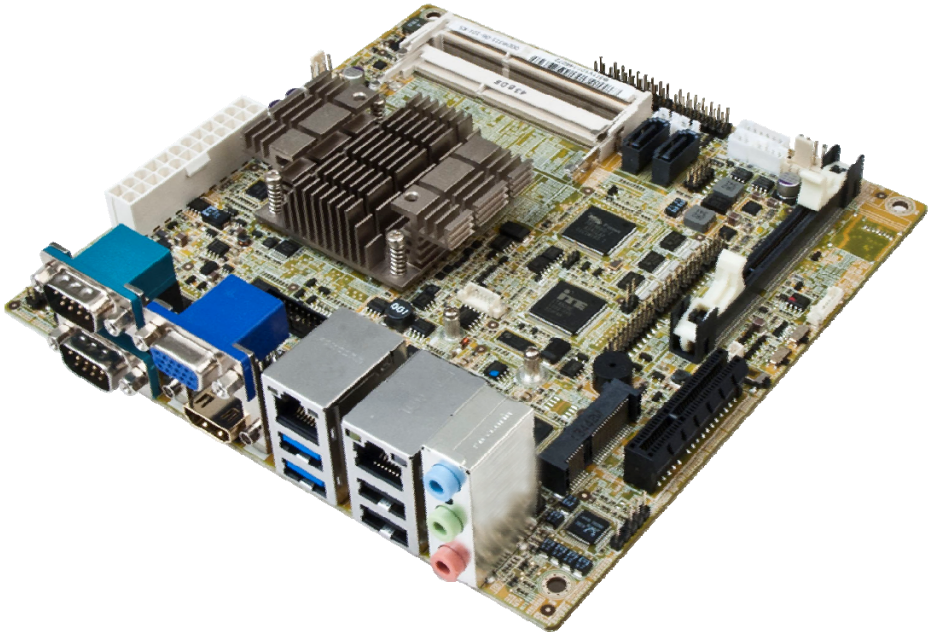


Figure 1-1: KINO-ABT-i2

The KINO-ABT-i2 is a Mini-ITX form factor single bard computer. It has an on-board 22nm Intel® Atom™ or Celeron® processor, and supports one/two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3 Low Voltage (DDR3L) SDRAM SO-DIMM with up to 4.0 GB / 8.0 GB of memory.

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

The KINO-ABT-i2 includes one VGA port and one HDMI port for dual independent display. It also has an internal DisplayPort (iDP) connector supporting HDMI, LVDS, VGA, DVI and DisplayPort displays with up to 3840 x 2160 resolutions. Expansion and I/O include one PCIe x4 slot (with PCIe x1 signal), one PCIe Mini slot, two USB 3.0 ports plus two USB 2.0 on the rear panel, four USB 2.0 by pin header, two SATA 3Gb/s connectors, five RS-232 serial ports, and one RS-422/485 connector.

1.2 Model Variations

There are eight models of the KINO-ABT-i2 series. The model variations are listed in **Table 1-1**.

Model	On-board SoC	DDR3L Memory
Standard		
KINO-ABT-i2-J19001	Intel® Celeron® processor J1900 (2 GHz, quad-core, 2 MB cache)	2 x SO-DIMM slots Size: 8 GB (max.)
KINO-ABT-i2-N29301	Intel® Celeron® processor N2930 (1.83 GHz, quad-core, 2 MB cache)	2 x SO-DIMM slots Size: 8 GB (max.)
KINO-ABT-i2-N28071	Intel® Celeron® processor N2807 (1.58 GHz, dual-core, 2 MB cache)	1 x SO-DIMM slot Size: 4 GB (max.)
By Request		
KINO-ABT-i2-E38451	Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache)	2 x SO-DIMM slots Size: 8 GB (max.)
KINO-ABT-i2-E38271	Intel® Atom™ processor E3827 (1.75 GHz, dual-core, 1 MB cache)	2 x SO-DIMM slots Size: 8 GB (max.)
KINO-ABT-i2-E38261	Intel® Atom™ processor E3826 (1.46 GHz, dual-core, 1 MB cache)	2 x SO-DIMM slots Size: 8 GB (max.)
KINO-ABT-i2-E38251	Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache)	1 x SO-DIMM slot Size: 4 GB (max.)
KINO-ABT-i2-E38151	Intel® Atom™ processor E3815 (1.46 GHz, single-core, 512 KB cache)	1 x SO-DIMM slot Size: 4 GB (max.)

Table 1-1: Model Variations

1.3 Benefits

Some of the KINO-ABT-i2 motherboard benefits include:

- Powerful graphics with multiple monitors
- Staying connected with both wired LAN connections
- Speedy running of multiple programs and applications

1.4 Features

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

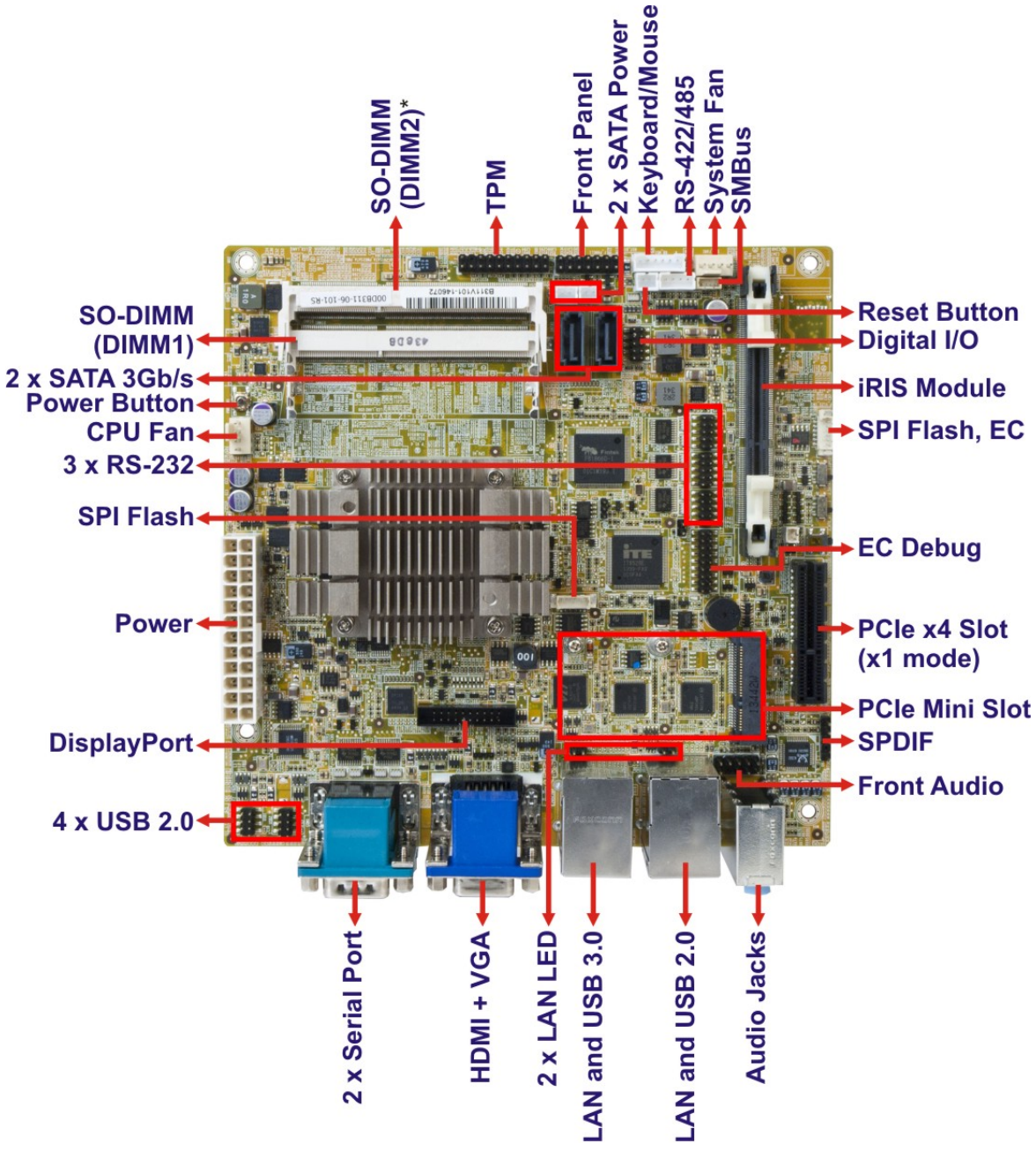
- Mini-ITX form factor
- RoHS compliant
- On-board 22nm Intel® Atom™ or Celeron® processor
- Two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L SDRAM SO-DIMM slots support up to 8 GB of memory (for J1900, N2930, E3845, E3827 and E3826 SKUs)

  or

  One 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMM slot supports up to 4 GB of memory (for N2807, E3825 and E3815 SKUs)
- iDP, VGA and HDMI interfaces for dual independent display
- Supports IPMI 2.0 via IEI iRIS-2400 module
- Two Intel® PCIe GbE connectors
- Two SATA 3Gb/s connectors
- One PCIe Mini card expansion slot
- One PCIe x4 (x1 mode) expansion slot
- Two USB 3.0 ports and six USB 2.0 ports
- Five RS-232 serial ports and one RS-422/485 serial port
- High Definition Audio

1.5 Connectors

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



*DIMM2 slot is only available on J1900, N2930, E3845, E3827 and E3826 models. For detailed information, please refer to **Section 3.2.14**.

Figure 1-2: Connectors

1.6 Dimensions

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

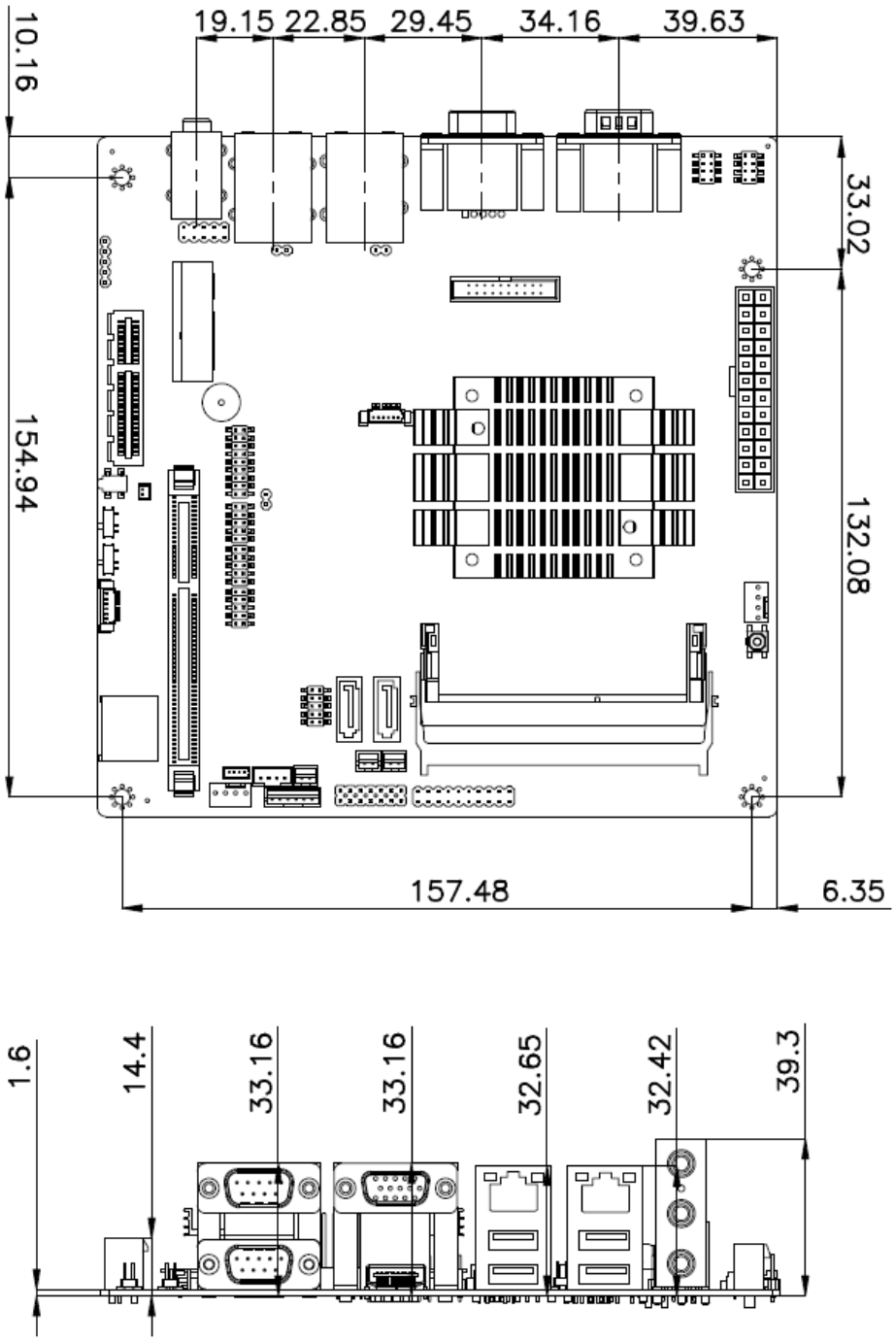


Figure 1-3: KINO-ABT-i2 Main Dimensions (mm)

1.7 Data Flow

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

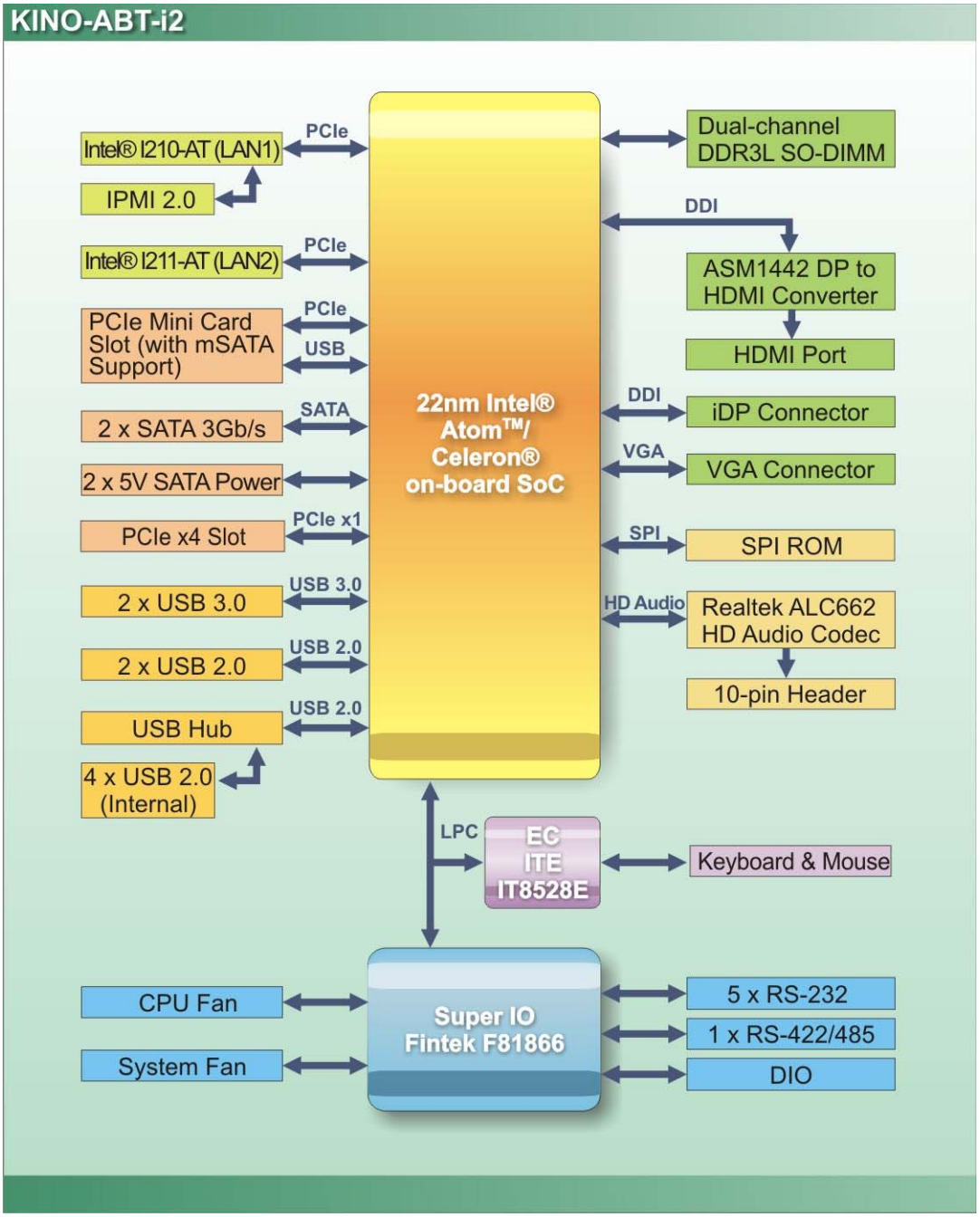


Figure 1-4: Data Flow Diagram

1.8 Technical Specifications

KINO-ABT-i2 technical specifications are listed below.

Specification/Model	KINO-ABT-i2
Form Factor	Mini-ITX
On-board SoC	▪ **Standard** o Intel® Celeron® processor J1900 (2GHz, quad-core, 2MB cache, TDP=10W) o Intel® Celeron® processor N2930 (1.83GHz, quad-core, 2MB cache, TDP=7.5W) o Intel® Celeron® processor N2807 (1.58GHz, dual-core, 2MB cache, TDP=4.5W) ▪ **By request** o Intel® Atom™ processor E3845 (1.91GHz, quad-core, 2MB cache, TDP=10W) o Intel® Atom™ processor E3827 (1.75GHz, dual-core, 1MB cache, TDP=8W) o Intel® Atom™ processor E3826 (1.46GHz, dual-core, 1MB cache, TDP=7W) o Intel® Atom™ processor E3825 (1.33GHz, dual-core, 1MB cache, TDP=6W) o Intel® Atom™ processor E3815 (1.46GHz, single-core, 512KB cache, TDP=5W)
Memory	**For J1900, N2930, E3845, E3827 and E3826 SKUs:** Two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L SDRAM SO-DIMM slots support up to 8 GB of memory **For N2807, E3825 and E3815 SKUs:** One 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMM slot supports up to 4 GB of memory *** Use DIMM1 slot when installing one SO-DIMM. For the SO-DIMM slot location, refer to Figure 3-15.**

Specification/Model	KINO-ABT-i2
Integrated Graphics	Intel® HD Graphics Gen7 with 4 execution units, supporting DirectX 11.1, OpenCL 1.2 and OpenGL 4.2
Audio	Realtek ALC662 HD Audio codec
BIOS	UEFI BIOS ▪ AIxx BIOS version is for Bay Trail I model (CPU: E38xx) ▪ AMxx BIOS version is for Bay Trail M/D model (CPU: J1900/ N2930/N2807)
Ethernet Controllers	**LAN1:** Intel® I210-AT PCIe Ethernet controller with NCSI and IPMI 2.0 support **LAN2**: Intel® I211-AT PCIe Ethernet controller
Digital I/O	8-bit digital I/O (4-bit input, 4-bit output)
IPMI 2.0	Supported by the optional iRIS-2400 module
Super I/O Controller	Fintek F81866D-I
Embedded Controller	ITE IT8528E
Watchdog Timer	Software programmable supports 1 sec – 255 sec system reset
Expansion	
PCIe	One PCIe x4 (x1 mode) slot
PCIe Mini	One PCIe Mini card slot supports mSATA, co-lay SATA 2
I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin)
Display Ports	One VGA port (up to 2560 x 1600, 60Hz) One HDMI port (up to 2560 x 1600, 60Hz) One internal DisplayPort supports HDMI, LVDS, VGA, DVI, DP (up to 3840 x 2160, 60Hz)
Ethernet	Two RJ-45 GbE ports

Specification/Model	KINO-ABT-i2
Keyboard/Mouse	One internal keyboard/mouse connector
Serial Ports	One RS-422/485 via internal wafer connector Three RS-232 via internal pin headers Two RS-232 via D-sub 9 connector
USB ports	Two external USB 3.0 ports Two external USB 2.0 ports Four USB 2.0 ports by two 8-pin headers
Serial ATA	Two SATA 3Gb/s connectors with two 5 V SATA power connectors
LAN LED	Two 2-pin LAN active LED connectors
SMBus	Supported by one 4-pin wafer connector
Environmental and Power Specifications	
Power Supply	ATX power supported
Power Consumption	5 V @ 1.71 A, 12 V @ 0.08 A, Vcore_12 V @ 0.27 A, 3.3 V @ 0.34 A (Intel® Celeron® processor J1900 with two 4 GB 1333 MHz DDR3 memory)
Operating Temperature	-20ºC – 60ºC
Storage Temperature	-30ºC – 70ºC
Humidity	5% – 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	900 g / 450 g

Table 1-2: KINO-ABT-i2 Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions

WARNING!

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

Make sure to adhere to the following guidelines:

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

2.2 Unpacking Precautions

When the KINO-ABT-i2 is unpacked, please do the following:

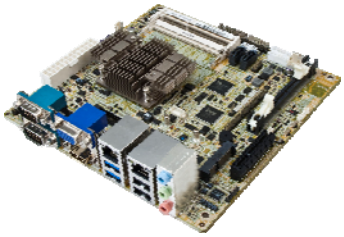
- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

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

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

Quantity	Item and Part Number	Image
1	KINO-ABT-i2 single board computer	
1	SATA and power cable (**P/N:** 32801-000201-300-RS)	
1	Dual-port USB cable (**P/N**: CB-USB02A-RS)	
1	I/O shielding (**P/N**: 45014-0038C0-01-RS)	
1	Utility CD	

Quantity	Item and Part Number	Image
1	Quick Installation Guide	

Table 2-1: Packing List

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
IPMI 2.0 adapter card with AST2400 BMC chip (**P/N**: iRIS-2400-R10)	
Dual USB cable (**P/N**: 32000-070301-RS)	
Keyboard and mouse Y cable (**P/N**: 32006-000300-100-RS)	
RS-232 cable (P/N : 32200-000049-RS)	
RS-422/485 cable, 200mm (**P/N**: 32205-003800-300-RS)	
DisplayPort to DisplayPort converter board for iEi IDP connector (**P/N**: DP-DP-R10)	

Item and Part Number	Image
DisplayPort to DVI-D converter board for iEi IDP connector (**P/N**: DP-DVI-R10)	
DisplayPort to HDMI converter board for IEI IDP connector (**P/N**: DP-HDMI-R10)	
DisplayPort to 24-bit dual-channel LVDS converter board for iEi IDP connector (**P/N**: DP-LVDS-R10)	
DisplayPort to VGA converter board for IEI IDP connector (**P/N**: DP-VGA-R10)	
Infineon TPM module, v3.17 firmware (**P/N**: TPM-IN01-R11)	

Table 2-2: Optional Items

Chapter

3

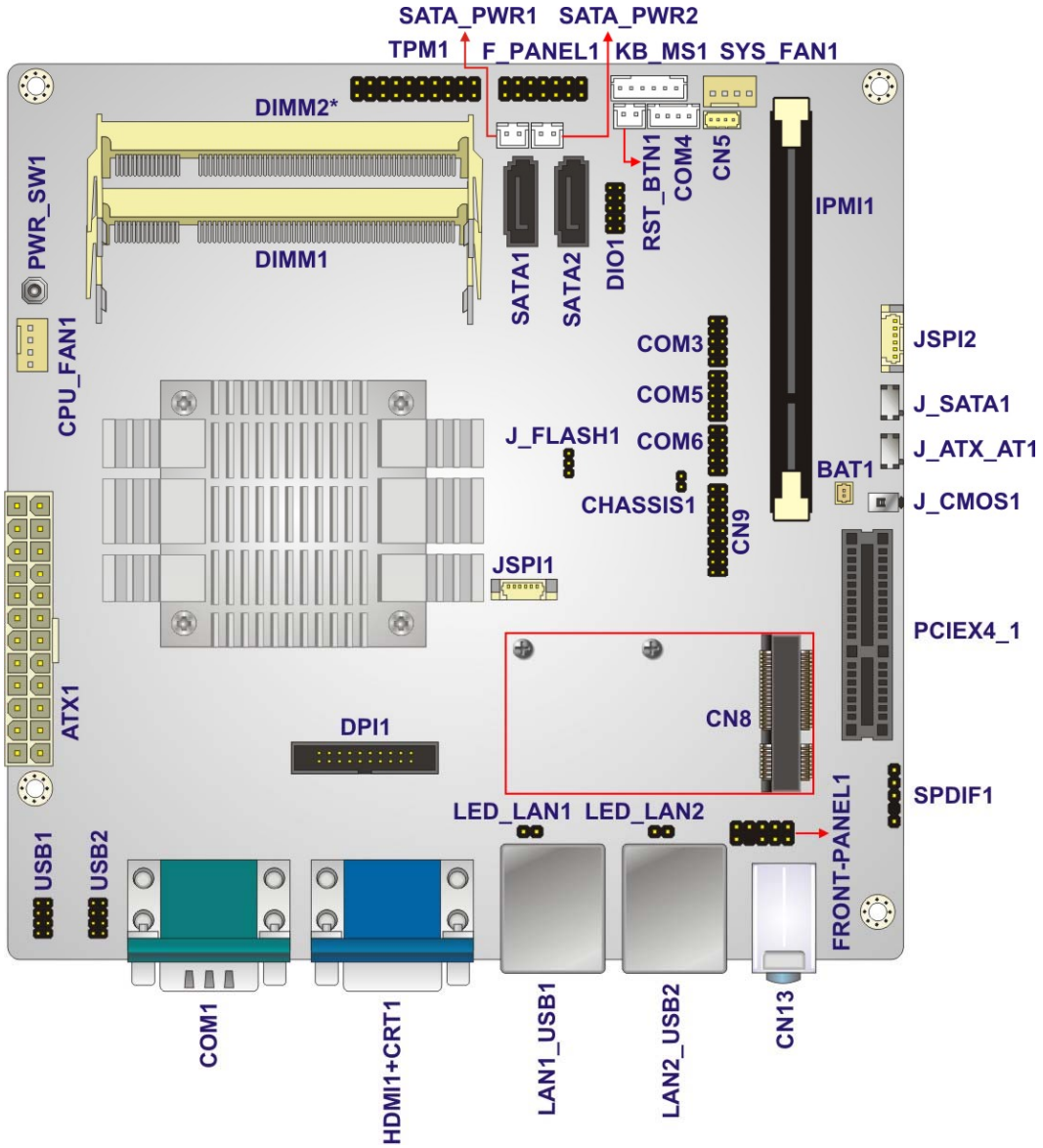
Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 KINO-ABT-i2 Layout

The figures below show all the connectors and jumpers.



*DIMM2 slot is only available on J1900, N2930, E3845, E3827 and E3826 models. For detailed information, please refer to **Section 3.2.14**.

Figure 3-1: Connectors and Jumpers

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
ATX power input connector	24-pin connector	ATX1
Audio connector	10-pin header	FRONT-PANEL1
Battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
Digital I/O connector	10-pin header	DIO1
DisplayPort connector	20-pin box header	DP1
EC debug connector	18-pin header	CN9
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	4-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
iRIS module connector	204-pin SO-DIMM slot	IPMI1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LAN1 LED connector	2-pin header	LED_LAN1
LAN2 LED connector	2-pin header	LED_LAN2
Memory card slot(s)	SO-DIMM slot	DIMM1, DIMM2*
PCIe x4 slot (x1 mode)	PCIe x4 slot	PCIEX4_1
PCIe Mini slot	52-pin PCIe Mini slot	CN8
Power button	Push button	PWR_SW1
Reset button connector	2-pin wafer	RST_BTN1
SATA 3Gb/s drive connectors	7-pin SATA connector	SATA1, SATA2

Connector	Type	Label
SATA power connectors (5 V)	2-pin wafer	SATA_PWR1, SATA_PWR2
Serial ports, RS-232	10-pin header	COM3, COM5, COM6
Serial port, RS-422/485	4-pin wafer	COM4
SMBus connector	4-pin wafer	CN5
SPDIF connector	5-pin header	SPDIF1
SPI flash connector	6-pin wafer	JSPI1
SPI flash connector (EC)	6-pin wafer	JSPI2
TPM connector	20-pin header	TPM1
USB 2.0 connectors	8-pin header	USB1, USB2
*DIMM2 slot is only available on J1900, N2930, E3845, E3827 and E3826 models		

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 connectors	Audio jack	CN13
Ethernet and USB 2.0 combo connector	RJ-45 and USB 2.0	LAN2_USB2
Ethernet and USB 3.0 combo connector	RJ-45 and USB 3.0	LAN1_USB1
HDMI connector	HDMI	HDMI1
Serial port connectors	D-sub 9, male	COM1
VGA connector	D-sub 15, female	CRT1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

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

3.2.1 ATX Power Connector

CN Label: **ATX1**

CN Type: 24-pin connector, p=4.2 mm

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

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

The ATX power input connector provides power to the system.

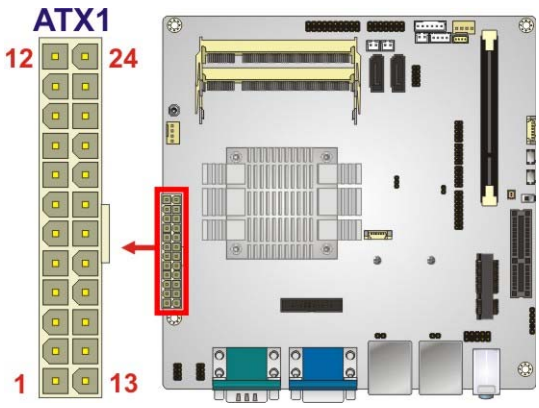


Figure 3-2: ATX Power Connector Location

Pin	Description	Pin	Description
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	-12 V
3	GND	15	GND
4	+5 V	16	PS_ON
5	GND	17	GND
6	+5 V	18	GND
7	GND	19	GND
8	PW-OK	20	-5 V
9	5 VSB	21	+5 V

Pin	Description	Pin	Description
10	+12 V	22	+5 V
11	+12 V	23	+5 V
12	+3.3 V	24	GND

Table 3-3: ATX Power Connector Pinouts

3.2.2 Audio Connector

CN Label: **FRONT-PANEL1**

CN Type: 10-pin header, p=2.54 mm

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

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

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

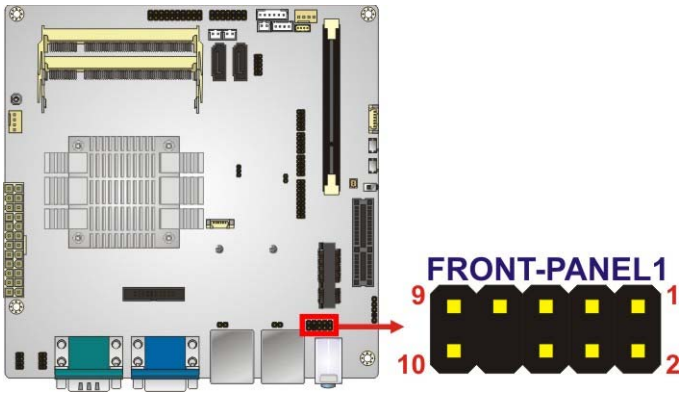


Figure 3-3: Audio Connector Location

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

Table 3-4: Audio Connector Pinouts

3.2.3 Battery Connector

CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

CN Label:	**BAT1**
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-4**
CN Pinouts:	See **Table 3-5**

A system battery is placed in the battery holder. The battery provides power to the system clock to retain the time when power is turned off.

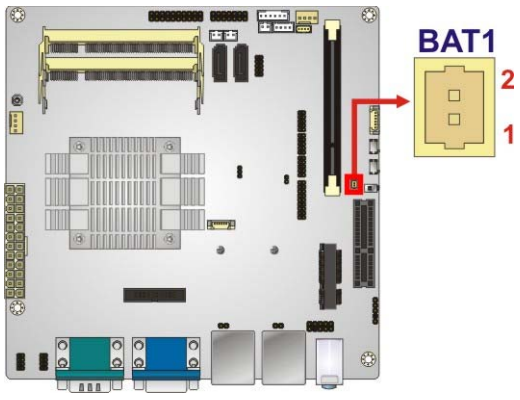


Figure 3-4: Battery Connector Location

Pin	Description
1	VBATT
2	GND

Table 3-5: Battery Connector Pinouts

3.2.4 Chassis Intrusion Connector

CN Label: **CHASSIS1**

CN Type: 2-pin header, p=2.54 mm

CN Location: See **Figure 3-5**

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

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

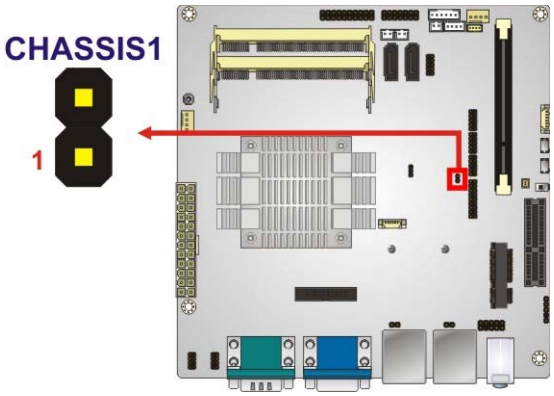


Figure 3-5: Chassis Intrusion Connector Location

Pin	Description
1	+V3.3A_EC
2	CHASSIS_EC

Table 3-6: Chassis Intrusion Connector Pinouts

3.2.5 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header, p=2.00 mm

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

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

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.

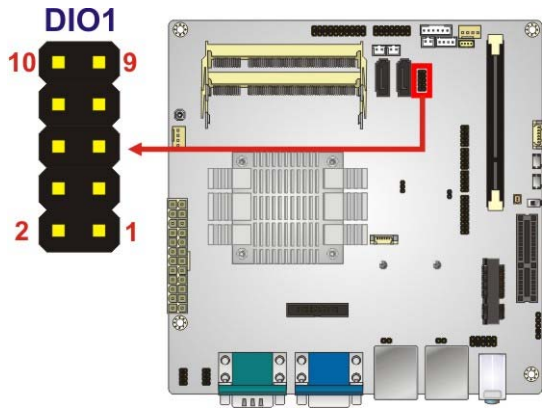


Figure 3-6: Digital I/O Connector Location

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 3-7: Digital I/O Connector Pinouts

3.2.6 DisplayPort Connector

CN Label: **DP1**

CN Type: 20-pin header, p=2.00 mm

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

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

The internal DisplayPort connector supports HDMI, LVDS, VGA, DVI, DP connections with up to 3840 x 2160 resolutions.

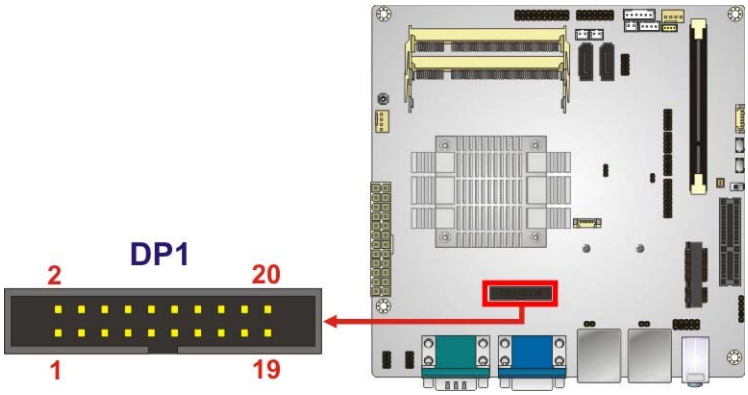


Figure 3-7: DisplayPort Connector Location

Pin	Description	Pin	Description
1	HPD	11	LANE3N
2	AUXP	12	GND
3	GND	13	GND
4	AUXN	14	LANE0P
5	AUX_CTRL_DET_D	15	LANE1P
6	GND	16	LANE0N
7	GND	17	LANE1N
8	LANE2P	18	+3.3V
9	LANE3P	19	+5V
10	LANE2N		

Table 3-8: DisplayPort Connector Pinouts

3.2.7 EC Debug Connector

CN Label: **CN9**

CN Type: 18-pin header, p=2.00 mm

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

CN Pinouts: See **Table 3-9**

The EC debug connector is used for EC debug.

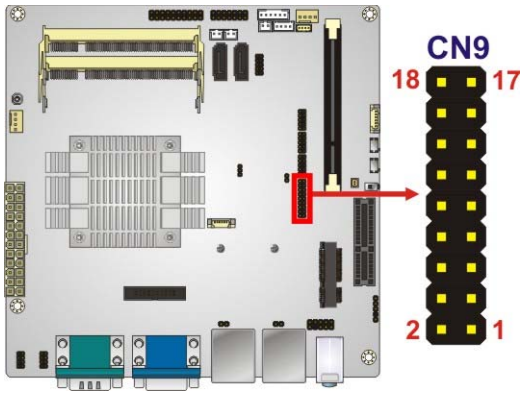


Figure 3-8: EC Debug Connector Location

Pin	Description	Pin	Description
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

Table 3-9: EC Debug Connector Pinouts

3.2.8 Fan Connector (CPU)

CN Label: **CPU_FAN1**

CN Type: 4-pin wafer, p=2.54 mm

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

The fan connector attaches to a CPU cooling fan.

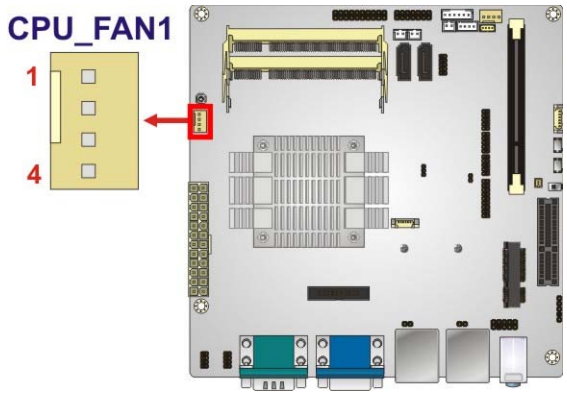


Figure 3-9: CPU Fan Connector Location

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

Table 3-10: CPU Fan Connector Pinouts

3.2.9 Fan Connector (System)

CN Label: **SYS_FAN1**

CN Type: 4-pin wafer, p=2.54 mm

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

Each fan connector attaches to a system cooling fan.

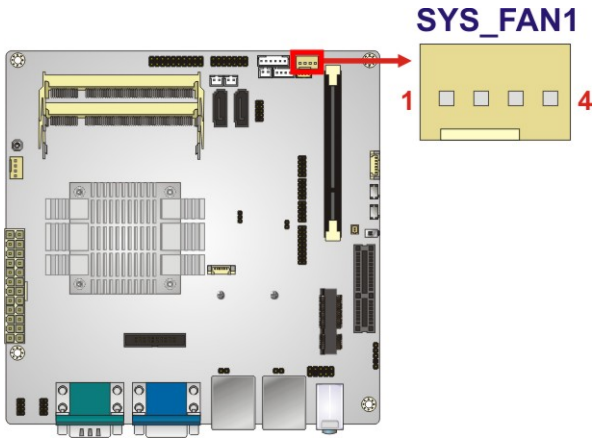


Figure 3-10: System Fan Connector Location

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

Table 3-11: System Fan Connector Pinouts

3.2.10 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header, p=2.54 mm

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

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

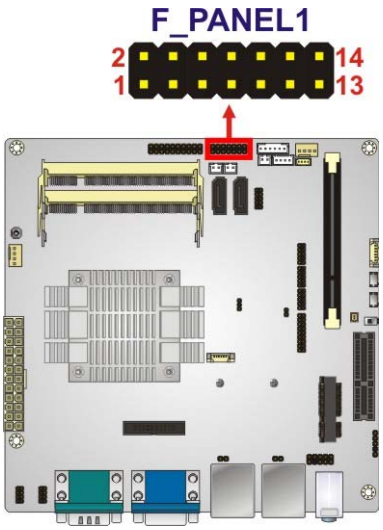


Figure 3-11: Front Panel Connector Location

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	PWR_LED+	Speaker	2	Speaker+
	3	NC	IPMI LED	4	IPMI_LED+
	5	PWR_LED-		6	IPMI_LED-
Power Button	7	PWR_BTN+	Speaker	8	Speaker-
	9	PWR_BTN-		10	NC
HDD LED	11	HDD_LED+	Reset Button	12	Reset+
	13	HDD_LED-		14	Reset-

Table 3-12: Front Panel Connector Pinouts

3.2.11 iRIS Module Slot

CN Label: **IPMI1**

CN Type: 204-pin SOM-DIMM slot

CN Location: See **Figure 3-12**

The iRIS module slot is used to install the IEI iRIS-2400 IPMI 2.0 module.

WARNING:

The iRIS module slot is designed to install the IEI iRIS-2400 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-ABT-i2.

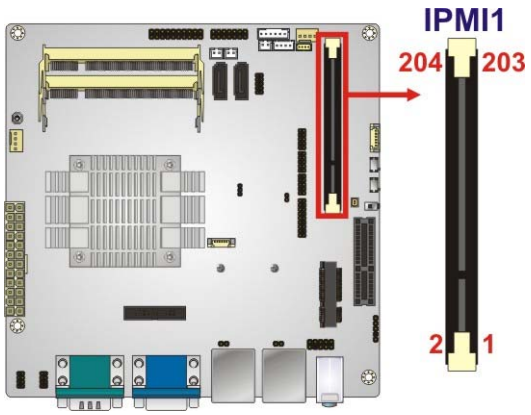


Figure 3-12: iRIS Module Slot Location

3.2.12 Keyboard and Mouse Connector

CN Label:	**KB_MS1**
CN Type:	6-pin wafer, p=2.00 mm
CN Location:	See **Figure 3-13**
CN Pinouts:	See **Table 3-13**

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

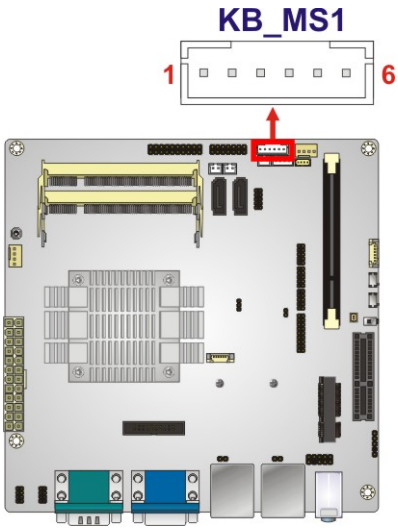


Figure 3-13: Keyboard and Mouse Connector Location

Pin	Description
1	VCC
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GND

Table 3-13: Keyboard and Mouse Connector Pinouts

3.2.13 LAN LED Connectors

CN Label: **LED_LAN1, LED_LAN2**

CN Type: 2-pin header, p=2.54 mm

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

CN Pinouts: See **Table 3-14** and **Table 3-15**

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

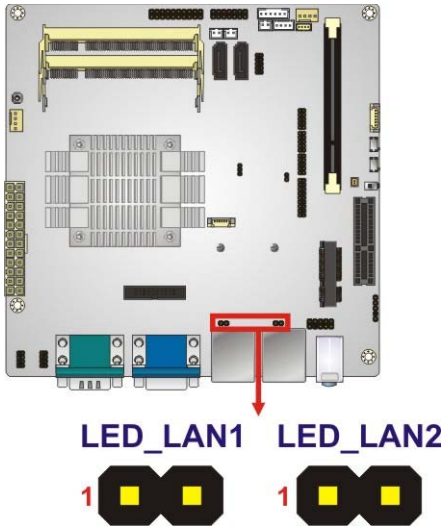


Figure 3-14: LAN LED Connector Locations

Pin	Description
1	+3.3 V
2	LAN1_LINK_ACT-

Table 3-14: LAN1 LED Connector Pinouts

Pin	Description
1	+3.3 v
2	LAN2_LINK_ACT-

Table 3-15: LAN2 LED Connector Pinouts

3.2.14 Memory Card Slot(s)

CN Label: **DIMM1, DIMM2**

CN Type: DDR3 SO-DIMM slot

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

The SO-DIMM slots are for installing DDR3 Low Voltage SO-DIMM memory modules.

- **For J1900, N2930, E3845, E3827 and E3826 SKUs:**
  Two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L SDRAM SO-DIMM slots (DIMM1 and DIMM2) support up to 8 GB of memory
- **For N2807, E3825 and E3815 SKUs:**
  One 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMM slot (DIMM1) supports up to 4 GB of memory

NOTE:

Use **DIMM1** slot when installing one SO-DIMM.

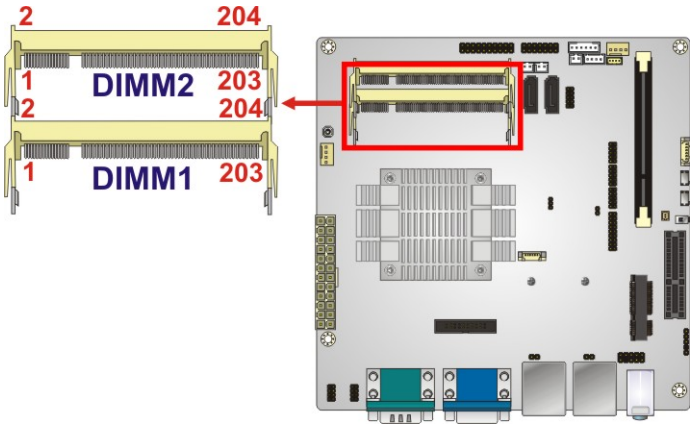


Figure 3-15: Memory Card Slot Locations

3.2.15 PCIe x4 Slot

CN Label:	**PCIEX4_1**
CN Type:	PCIe x4 slot
CN Location:	See **Figure 3-16**

The PCIe x4 interface provides x1 speed for PCIe expansion cards.

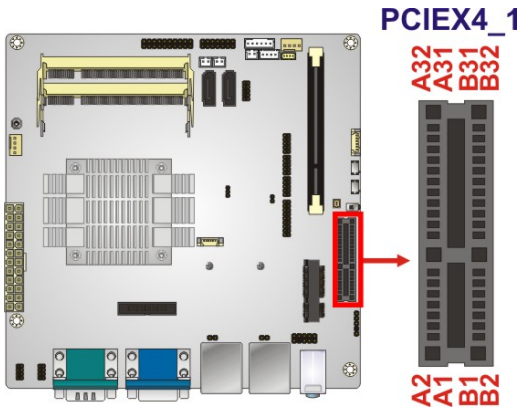


Figure 3-16: PCIe x4 Slot Location

3.2.16 PCIe Mini Card Slot

CN Label:	**CN8**
CN Type:	PCIe Mini card slot
CN Location:	See **Figure 3-17**
CN Pinouts:	See **Table 3-16**

The PCIe Mini card slot is for installing PCIe Mini expansion cards, such as mSATA modules or Wi-Fi modules.

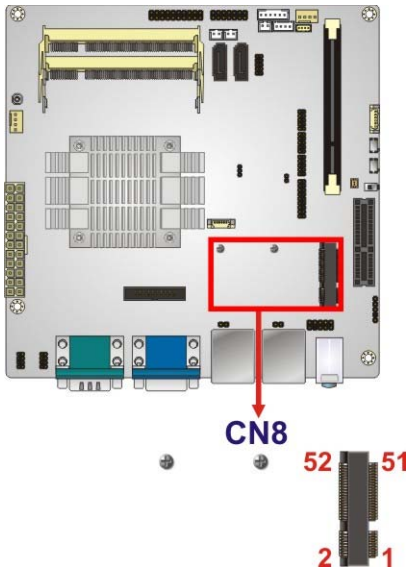


Figure 3-17: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	+3.3 V
3	N/C	4	GND
5	N/C	6	+1.5 V
7	N/C	8	N/C
9	GND	10	N/C
11	MSATA_CLK-	12	N/C
13	MSATA_CLK+	14	N/C
15	GND	16	N/C
17	PLTRST_N	18	GND
19	N/C	20	+3.3 V
21	GND	22	PLTRST_N
23	SATA_RX+	24	+3.3 V
25	SATA_RX-	26	GND
27	GND	28	+1.5 V
29	GND	30	SMB_CLK
31	SATA_TX-	32	SMBD_ATA
33	SATA_TX+	34	GND
35	GND	36	USB_DATA-
37	GND	38	USB_DATA+
39	+3.3 V	40	GND
41	+3.3 V	42	N/C
43	+3.3 V	44	N/C
45	CLINK_CLK	46	N/C
47	CLINK_DATA	48	+1.5 V
49	CLINK_RST#	50	GND
51	MSATA_DET	52	+3.3 V

Table 3-16: PCIe Mini Card Slot Pinouts

3.2.17 Power Button

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

The on-board power button controls system power.

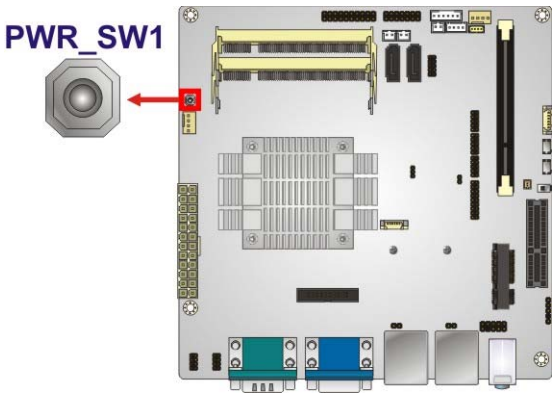


Figure 3-18: Power Button Location

3.2.18 Reset Button Connector

CN Label:	**RST_BTN1**
CN Type:	2-pin wafer, p=2.00 mm
CN Location:	See **Figure 3-19**
CN Pinouts:	See **Table 3-17**

The reset button connector is connected to a reset switch on the system chassis.

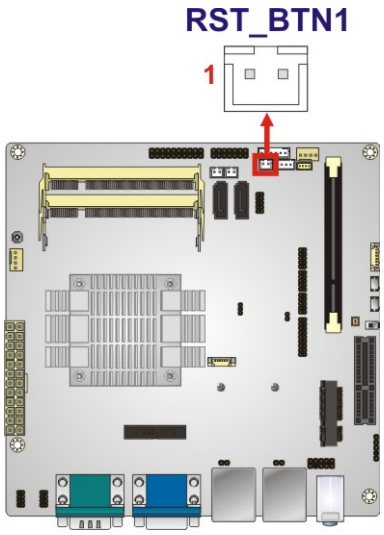


Figure 3-19: Reset Button Connector Location

Pin	Description
1	PM_SYSRST_R#
2	GND

Table 3-17: Reset Button Connector Pinouts

3.2.19 SATA 3Gb/s Drive Connectors

CN Label: **SATA1, SATA2**

CN Type: 7-pin SATA drive connectors

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

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

The SATA drive connectors can be connected to SATA drives.

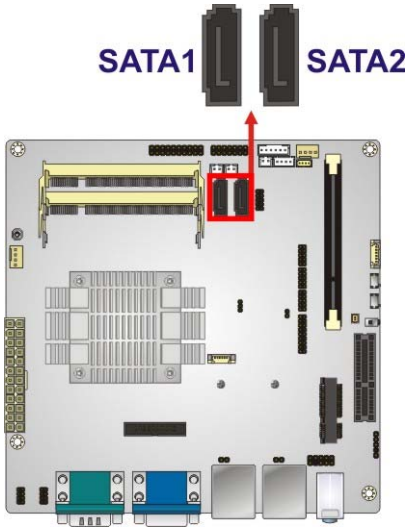


Figure 3-20: SATA 3Gb/s Drive Connector Locations

Pin	Description
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

Table 3-18: SATA 3Gb/s Drive Connector Pinouts

3.2.20 SATA Power Connectors

CN Label: **SATA_PWR1, SATA_PWR2**

CN Type: 2-pin wafer, p=2.00 mm

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

CN Pinouts: See **Table 3-19**

Use the SATA Power Connector to connect to SATA device power connections.

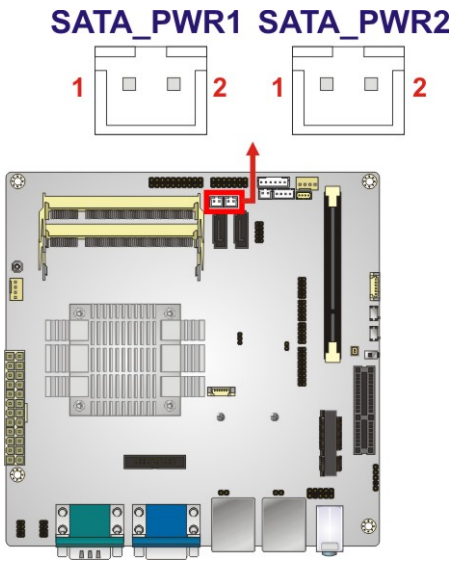


Figure 3-21: SATA Power Connector Locations

Pin	Description
1	+5VS
2	GND

Table 3-19: SATA Power Connector Pinouts

3.2.21 Serial Port Connectors, RS-232

CN Label: **COM3, COM5, COM6**

CN Type: 10-pin header, p=2.00 mm

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-20**

The connector provides RS-232 port connection.

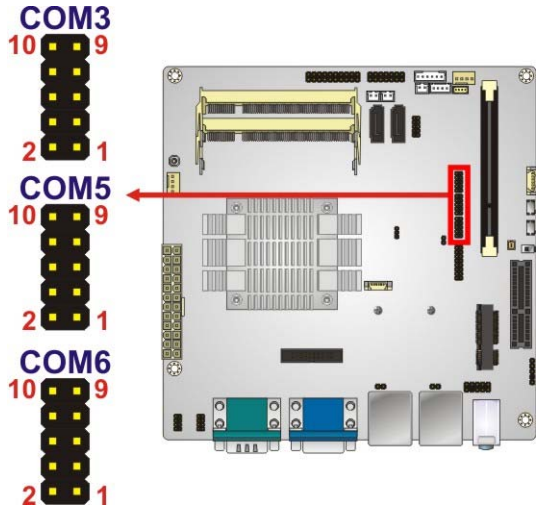


Figure 3-22: RS-232 Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	SIN	4	RTS
5	SOUT	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-20: RS-232 Serial Port Connector Pinouts

3.2.22 Serial Port Connector, RS-422/485

CN Label: **COM4**

CN Type: 4-pin wafer, p=2.00 mm

CN Location: See **Figure 3-23**

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

Used for RS-422/485 communications.

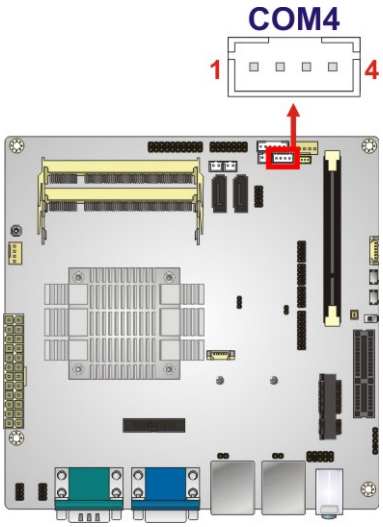


Figure 3-23: RS-422/485 Connector Location

PIN NO.	DESCRIPTION
1	RXD422-
2	RXD422+
3	TXD422+/TXD485+
4	TXD422-/TXD485-

Table 3-21: RS-422/485 Connector Pinouts

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

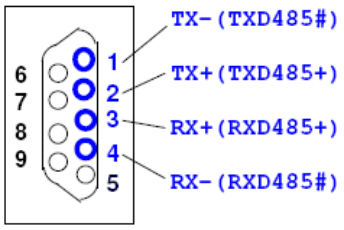
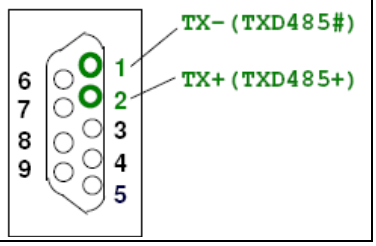
RS-422 Pinouts	RS-485 Pinouts
	

Table 3-22: RS-422/485 Pinouts of D-sub 9 Connector

3.2.23 SMBus Connector

CN Label: **CN5**

CN Type: 4-pin wafer, p=1.25 mm

CN Location: See **Figure 3-24**

CN Pinouts: See **Table 3-23**

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

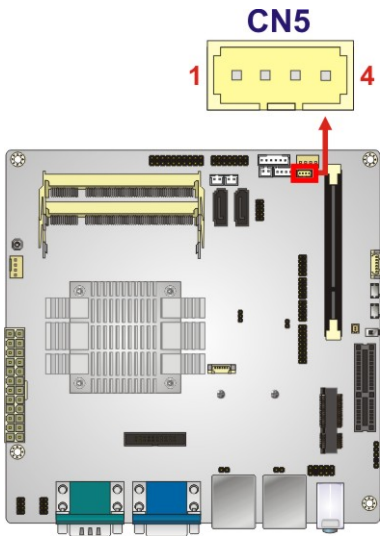


Figure 3-24: SMBus Connector Location

PIN	DESCRIPTION
1	GND
2	SMB_DATA
3	SMB_CLK
4	+5 V

Table 3-23: SMBus Connector Pinouts

3.2.24 SPDIF Connector

CN Label: **SPDIF1**

CN Type: 5-pin header, p=2.54 mm

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-24**

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

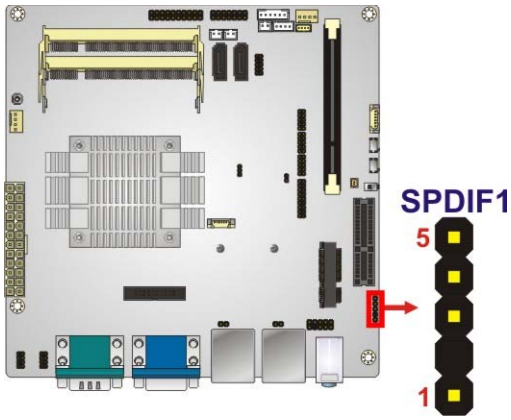


Figure 3-25: SPDIF Connector Location

Pin	Description
1	+5 V
2	N/A
3	SPDIF OUT
4	GND
5	SPDIF IN

Table 3-24: SPDIF Connector Pinouts

3.2.25 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 6-pin wafer, p=1.25 mm

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

CN Pinouts: See **Table 3-25**

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

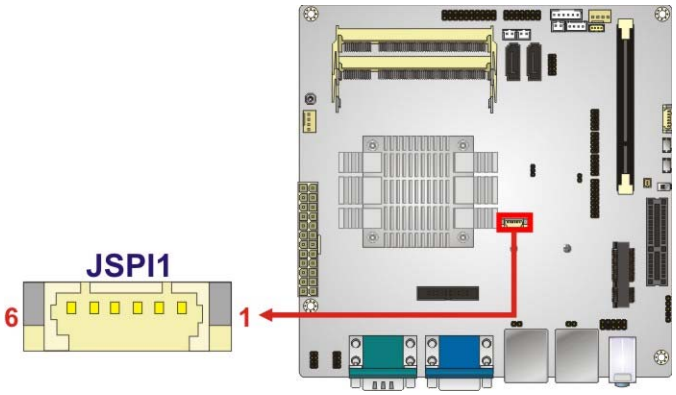


Figure 3-26: SPI Flash Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+1.8 V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

Table 3-25: SPI Flash Connector Pinouts

3.2.26 SPI Flash Connector, EC

CN Label: **JSPI2**

CN Type: 6-pin wafer, p=1.25 mm

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-26**

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

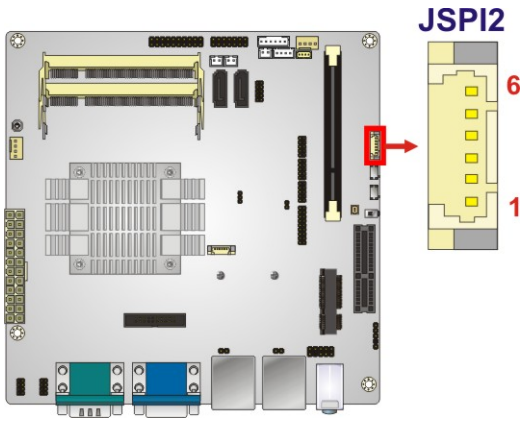


Figure 3-27: SPI EC Flash Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+1.8 V	4	SPI_CLK
2	SPI_CS#	5	SPI_SI
3	SPI_SO	6	GND

Table 3-26: SPI EC Flash Connector Pinouts

3.2.27 TPM Connector

CN Label: **TPM1**

CN Type: 20-pin header, p=2.54 mm

CN Location: See **Figure 3-28**

CN Pinouts: See **Table 3-27**

The TPM connector connects to a TPM module.

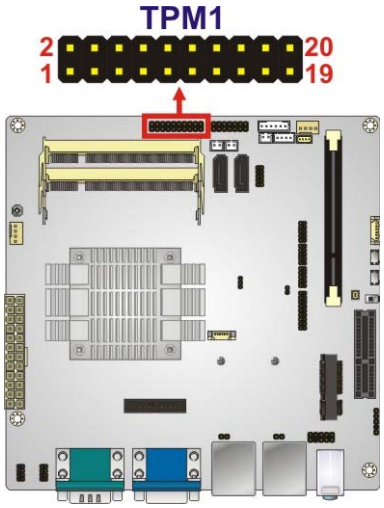


Figure 3-28: TPM Connector Location

Pin	Description	Pin	Description
1	LPC_CLK	2	GND
3	LPC_FRAME#	4	N/A
5	BUF_PLT_RST#	6	+5V
7	LPC_AD3	8	LPC_AD2
9	+3.3V	10	LPC_AD1
11	LPC_AD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	+3.3 V	16	INT_SERIRQ
17	GND	18	PM_GLKRUN#
19	+3.3 V	20	TPM_DRQ#

Table 3-27: TPM Connector Pinouts

3.2.28 USB 2.0 Connectors

CN Label: **USB1, USB2**

CN Type: 8-pin header, p=2.00 mm

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

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

The USB 2.0 connector connects to USB 2.0 devices. Each pin header provides two USB 2.0 ports.

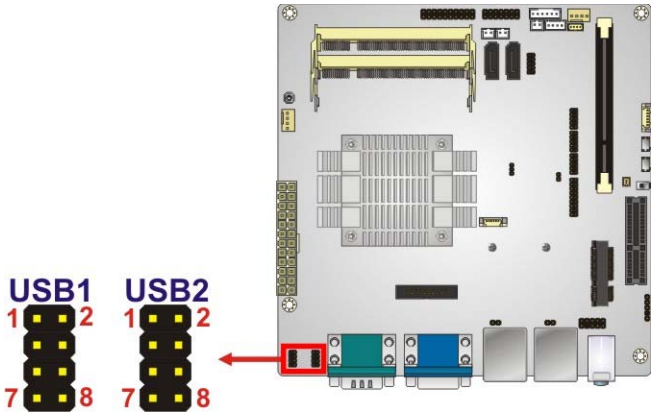


Figure 3-29: USB 2.0 Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+VCC_USB45	2	GND
3	DATA4-	4	DATA5+
5	DATA4+	6	DATA5-
7	GND	8	+VCC_USB45

Table 3-28: USB1 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+VCC_USB67	2	GND
3	DATA6-	4	DATA7+
5	DATA6+	6	DATA7-
7	GND	8	+VCC_USB67

Table 3-29: USB2 Pinouts

3.3 External Peripheral Interface Connector Panel

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

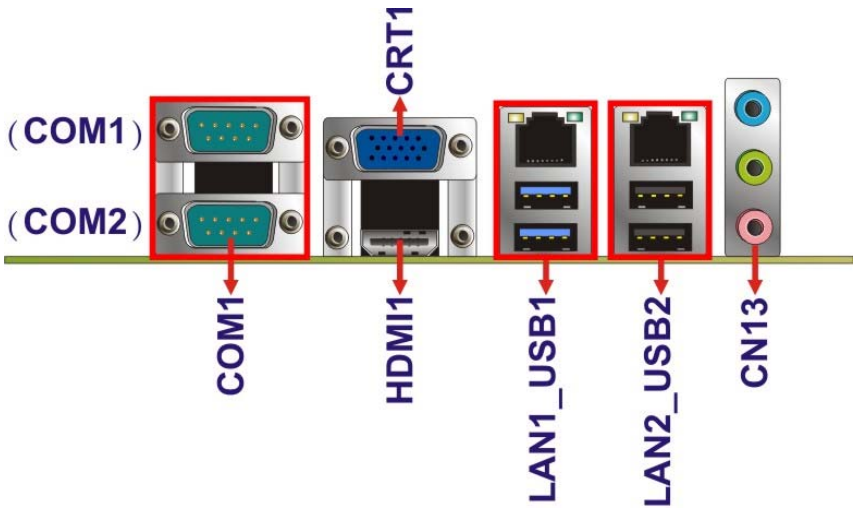


Figure 3-30: External Peripheral Interface Connector

3.3.1 Audio Connector

CN Label:	**CN13**
CN Type:	Audio jacks
CN Location:	See **Figure 3-30**

The audio jacks connect to external audio devices.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other 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.

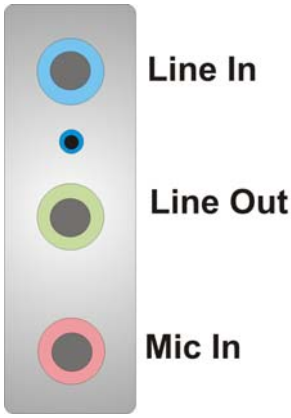


Figure 3-31: Audio Connector

3.3.2 Ethernet and USB 2.0 Combo Connector

CN Label: **LAN2_USB2**

CN Type: RJ-45 and USB 2.0 connector

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-30** and **Table 3-32**

A 10/100/1000 Mb/s connection can be made to a Local Area Network.

Pin	Description	Pin	Description
L1	TRD2P0	L5	TRD2N2
L2	TRD2N0	L6	TRD2N1
L3	TRD2P1	L7	TRD2P3
L4	TRD2P2	L8	TRD2N3

Table 3-30: LAN2 Ethernet Connector Pinouts

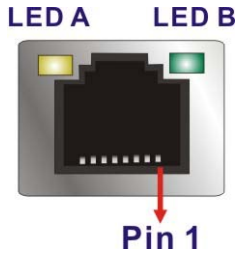


Figure 3-32: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-31: Connector LEDs

The USB 2.0 connector can be connected to a USB 2.0 device.

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

Table 3-32: USB 2.0 Port Pinouts

3.3.3 Ethernet and USB 3.0 Combo Connector

CN Label: **LAN1_USB1**

CN Type: RJ-45 and USB 3.0 connector

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-33** and **Table 3-35**

A 10/100/1000 Mb/s connection can be made to a Local Area Network. The LAN1 Ethernet connector supports IPMI 2.0.

Pin	Description	Pin	Description
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

Table 3-33: LAN1 Ethernet Connector Pinouts

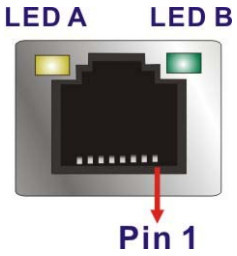


Figure 3-33: Ethernet Connector

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-34: Connector LEDs

The USB 3.0 connector can be connected to a USB device.

Pin	Description	Pin	Description
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_ DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_ RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-35: USB 3.0 Port Pinouts

3.3.4 HDMI Connector

CN Label: **HDMI1**

CN Type: 23-pin HDMI port

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-36** and **Figure 3-34**

The HDMI connector can connect to an HDMI device. The HDMI connector supports up to 2560 x 1600 resolutions.

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

Table 3-36: HDMI Connector Pinouts

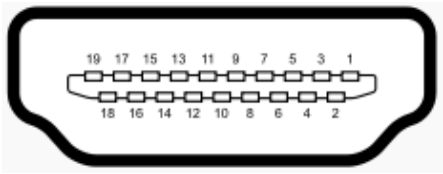


Figure 3-34: HDMI Connector

3.3.5 Serial Port Connectors (COM1 and COM2)

CN Label: **COM1**

CN Type: D-sub 9

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-37** and **Figure 3-35**

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

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

Table 3-37: Serial Port Pinouts

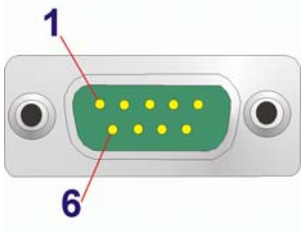


Figure 3-35: Serial Port Pinouts

3.3.6 VGA Connector

CN Label: **CRT1**

CN Type: D-sub 15 female

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-38** and **Figure 3-36**

The VGA connector can be connected to monitors that accept standard VGA input for easy dual display setup. The VGA connector supports up to 2560 x 1600 resolutions.

PIN	DESCRIPTION	PIN	DESCRIPTION
V1	RED	V2	GREEN
V3	BLUE	V4	NC
V5	GND	V6	GND
V7	GND	V8	GND
V9	VCC	V10	GND
V11	NC	V12	DDCDA
V13	HSYNC	V14	VSYNC
V15	DDCCLK		

Table 3-38: VGA Connector Pinouts

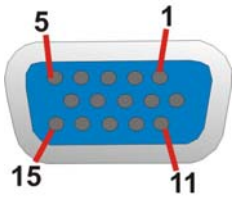


Figure 3-36: VGA Connector

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-ABT-i2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-ABT-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-ABT-i2, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-ABT-i2.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

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

WARNING:

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

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

- Read the user manual:
  - The user manual provides a complete description of the KINO-ABT-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-ABT-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-ABT-i2 off:
  - When working with the KINO-ABT-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-ABT-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 an SO-DIMM, please follow the steps below and refer to Figure 4-1.

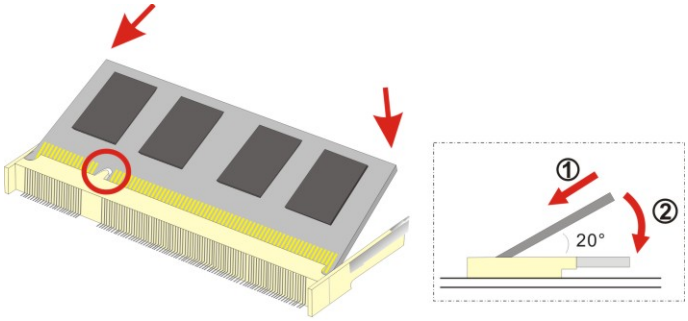


Figure 4-1: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket** on the solder side of the KINO-ABT-i2. Place the board on an anti-static mat.

Step 2: **Align the SO-DIMM with the socket**. Align the notch on the memory with the notch on the memory socket.

Step 3: **Insert the SO-DIMM**. Push the memory in at a 20º angle. (See **Figure 4-1**)

Step 4: **Seat the SO-DIMM**. Gently push downwards and the arms clip into place. (See **Figure 4-1**)

4.2.2 iRIS-2400 Module Installation

WARNING:

The iRIS module slot is designed to install the IEI iRIS-2400 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-ABT-i2.

To install the iRIS-2400 module, please follow the steps below and refer to **Figure 4-2**.

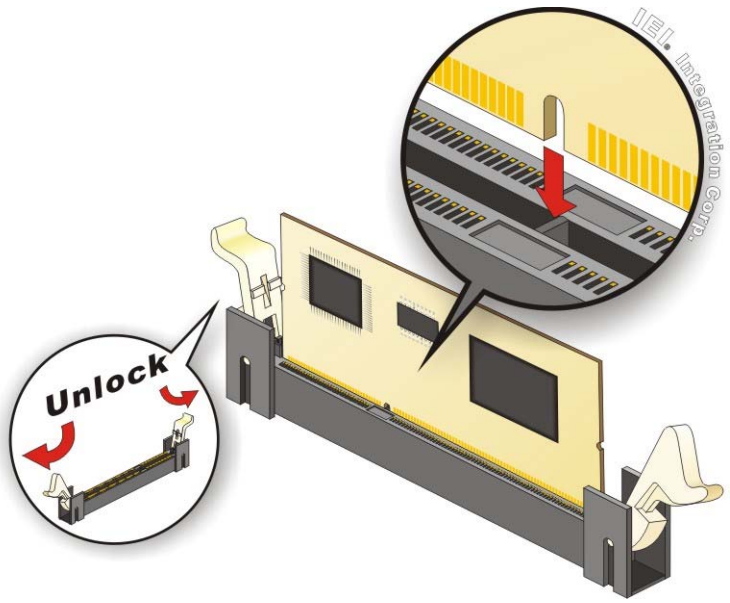


Figure 4-2: iRIS Module Installation

Step 1: **Locate the iRIS module slot**. See **Figure 3-12**.

Step 2: **Open the socket handles**. Open the two handles outwards as far as they can. See **Figure 4-2**.

Step 3: **Align the iRIS-2400 module with the socket**. Align the iRIS-2400 module so the notch on the module lines up with the notch on the socket. See **Figure 4-2**.

Step 4: **Insert the iRIS-2400 module**. Once aligned, press down until the iRIS-2400 module is properly seated. Clip the two handles into place. See **Figure 4-2**.

Step 5: **Removing the iRIS-2400 module**. To remove the iRIS-2400 module, push both handles outward. The module is ejected by a mechanism in the socket.

NOTE:

After installing the iRIS-2400 module, use **LAN1_USB1** port to establish a network connection. Please refer to **Section 4.5** for IPMI setup procedures.

4.2.3 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

NOTE:

The PCIe Mini card slot supports full-size and half-size PCIe Mini cards. The following instruction diagrams take full-size cards as an example to show users how to install. To install a half-size card, please remove the corresponding retention screw.

Step 1: Locate the PCIe Mini card slot. Remove the preinstalled retention screw on the screw pillar of the PCIe Mini card slot as shown in (**Figure 4-3)**.

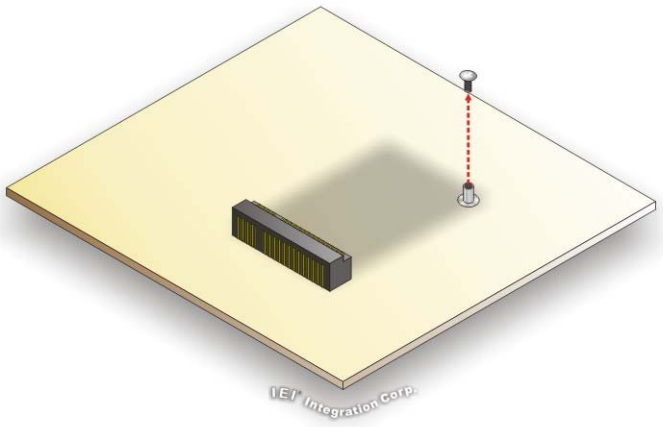


Figure 4-3: PCIe Mini Card Retention Screw Removal

Step 2: Line up the notch on the PCIe Mini card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º.

Step 3: Push the other end of the PCIe Mini card down and secure the card with the previously removed retention screw (**Figure 4-4**).

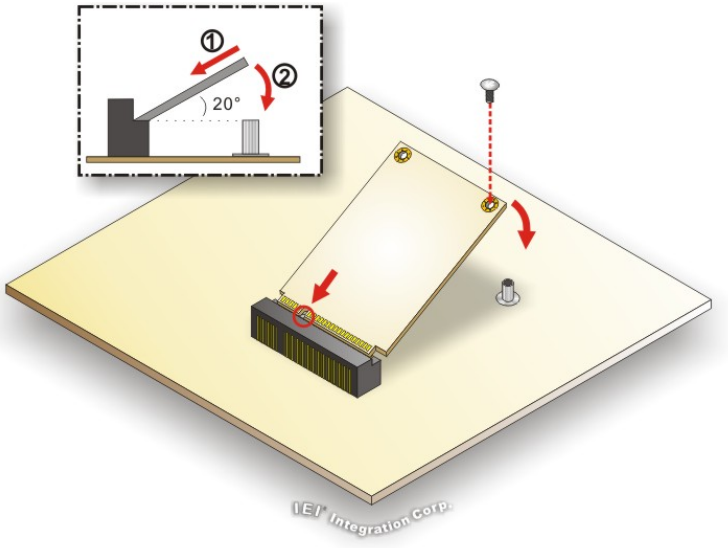


Figure 4-4: PCIe Mini Card Installation (Full-size)

4.3 System Configuration

The KINO-ABT-i2 is a jumperless single board computer. The system configuration is controlled by buttons and switches. The system configuration must be performed before installation.

4.3.1 AT/ATX Power Mode Setting

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-5**.

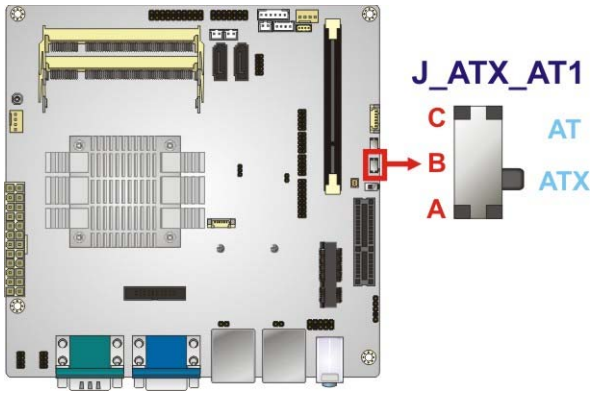


Figure 4-5: AT/ATX Power Mode Switch Location

4.3.2 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-6**.

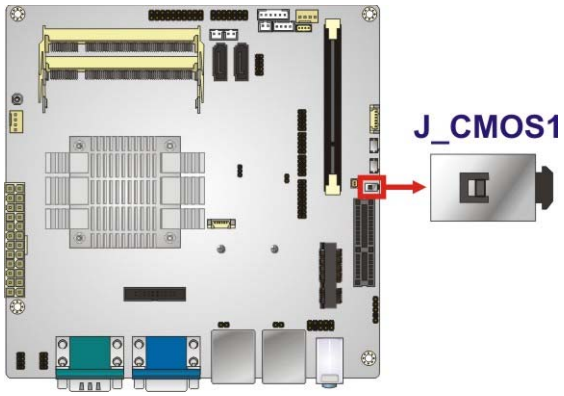


Figure 4-6: Clear CMOS Button Location

4.3.3 Flash Descriptor Security Override

The Flash Descriptor Security Override jumper (J_FLASH1) specifies whether to override the flash descriptor.

Setting	Description
Short 1-2	No override
Short 2-3	Override

Table 4-1: Flash Descriptor Security Override Jumper Settings

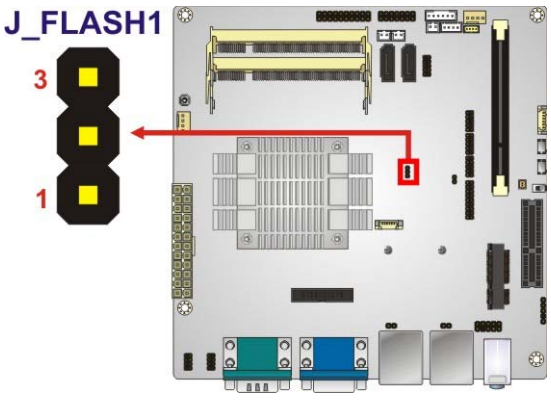


Figure 4-7: Flash Descriptor Security Override Jumper Location

4.3.4 mSATA/SATA Selection

Use the J_SATA1 switch to select whether to automatically detect mSATA devices.

Setting	Description
A-B	Automatically detect mSATA device (Default)
B-C	Enable mSATA device

Table 4-2: mSATA/SATA Switch Settings

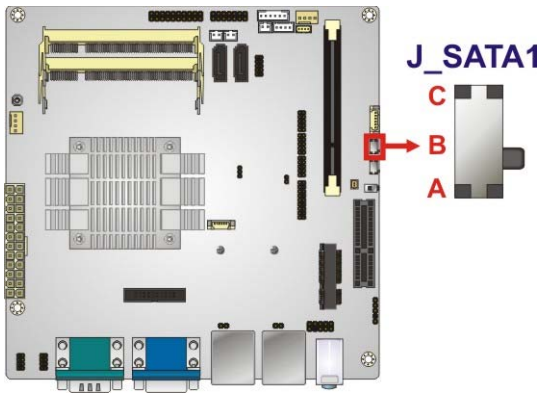


Figure 4-8: mSATA/SATA Switch Location

4.3.5 USB Power Select

The USB power selection is made through the BIOS options in “Chipset → South Bridge” BIOS menu. Use the **USB SW1** and the **USB SW2** BIOS options to configure the power source to the corresponding USB ports (see **Table 4-3**).

BIOS Options	Configured USB Ports
USB SW1	LAN1_USB1 (external USB 3.0 ports) LAN2_USB2 (external USB 2.0 ports)
USB SW2	USB1, USB2 (internal USB 2.0 ports)

Table 4-3: BIOS Options and Configured USB Ports

Please refer to **Section** for detailed information.

4.4 Internal Peripheral Device Connections

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

4.4.1 SATA Drive Connection

The KINO-ABT-i2 is shipped with two SATA drive cables. 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 4-9**.

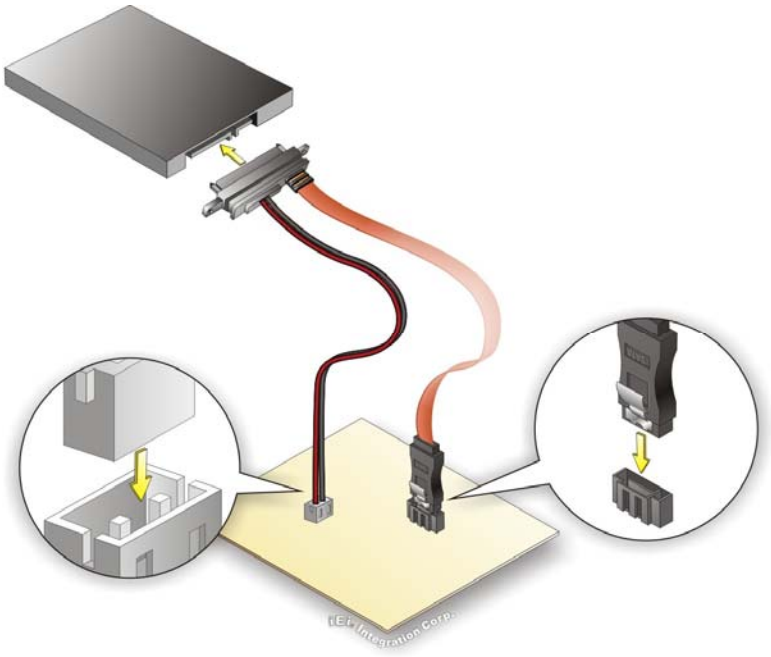


Figure 4-9: SATA Drive Cable Connection

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 4-9**.

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

4.4.2 USB Cable Connection

The KINO-ABT-i2 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the KINO-ABT-i2 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the KINO-ABT-i2, connect the cable connectors to the on-board connectors. See Figure 4-10.

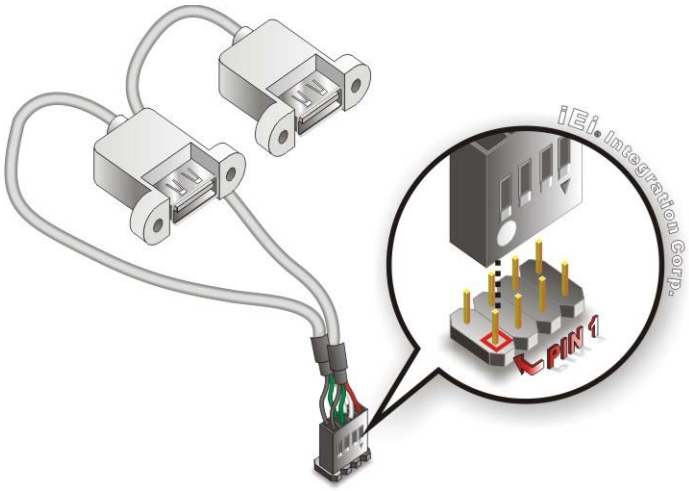


Figure 4-10: Dual USB Cable Connection

Step 4: **Attach the USB connectors to the chassis**. The USB 2.0 connectors each of two retention screw holes. To secure the connectors to the chassis please refer to the installation instructions that came with the chassis.

4.5 IPMI Setup Procedure

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

4.5.1 Managed System Hardware Setup

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

Step 1: Install an iRIS-2400 module to the IPMI module socket (refer to **Section 4.2.2**).

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

Step 3: Connect an Ethernet cable to the RJ-45 connector labeled **LAN1_USB1** (**Figure 3-30**).

4.5.2 Using the IEI iMAN Web GUI

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

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

a. Copy the **Ipmitool.exe** file to a bootable USB flash drive.

b. Insert the USB flash drive to the KINO-ABT-i2

c. The KINO-ABT-i2 boots from the USB flash drive

d. Enter the following command: **ipmitool 20 30 02 01 03 00 00**

(there is a space between each two-digit number)

e. A serial of number shows. The last four two-digit hexadecimal numbers are the IP address. Convert the hexadecimal numbers to decimal numbers.

Step 2: On the remote management console, open a web browser. Enter the managed system IP address in the web browser (**Figure 4-11**).

Figure 4-11: IEI iMAN Web Address

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

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

-Username: **admin**

-Password: **admin**

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

Step 6: The IEI iMAN Web Interface appears.

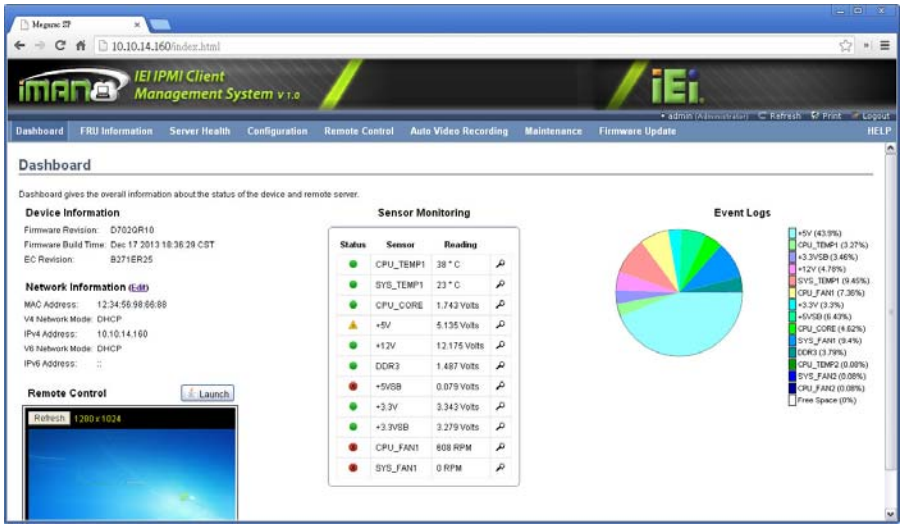


Figure 4-12: IEI iMAN Web GUI

NOTE:

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

Chapter

5

BIOS

5.1 Introduction

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

NOTE:

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in **Table 5-1**.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side

Key	Function
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	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 clear CMOS button described in **Chapter 4**.

5.1.5 BIOS Menu Bar

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

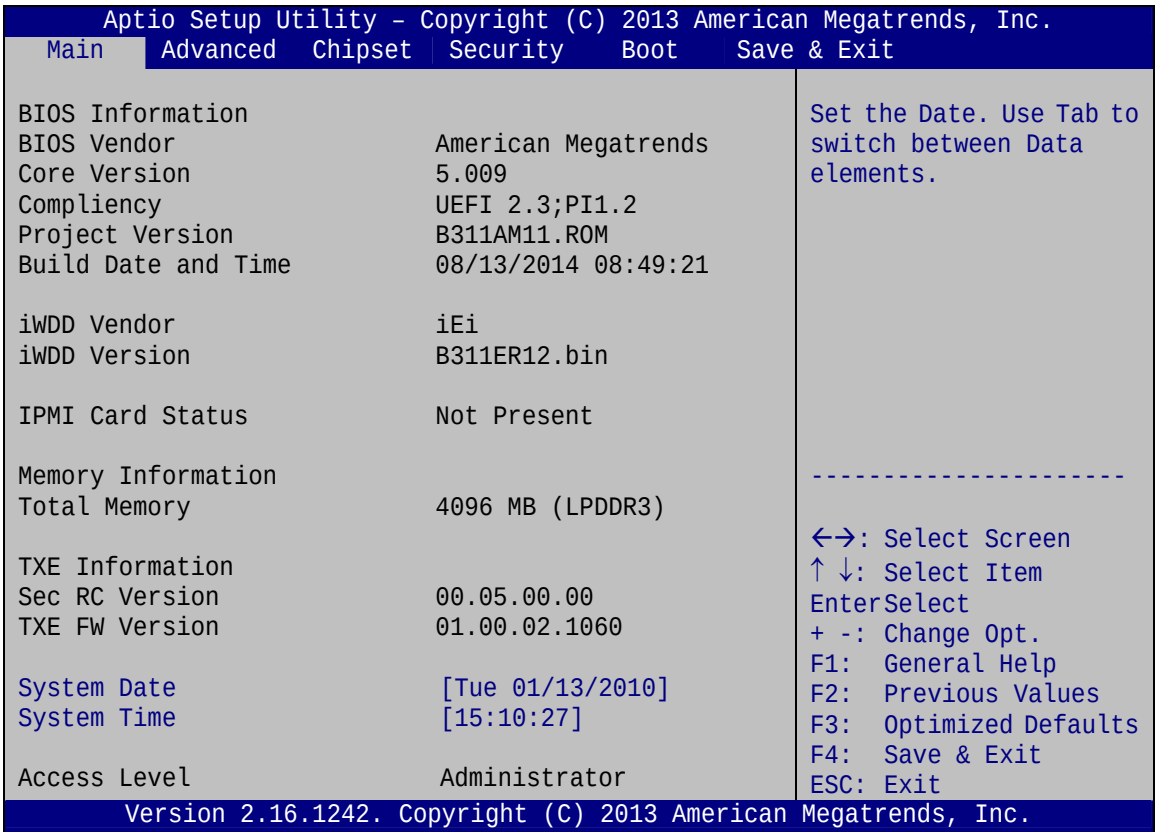
- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.

- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

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

5.2 Main

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



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

- **Compliency:** Current compliant version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

➔ **Memory Information**

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

- **Total Memory:** Current total memory of the system

➔ **TXE Information**

The **TXE Information** lists a brief summary of Intel® Trusted Execution Engine (TXE). The fields in **TXE Information** cannot be changed. The items shown in the system overview include:

- **Sec RC Version:** Current sec reference code version
- **TXE FW Version:** Current Intel® TXE firmware version

The System Overview field has two user configurable fields:

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

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

5.3 Advanced

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

WARNING!

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

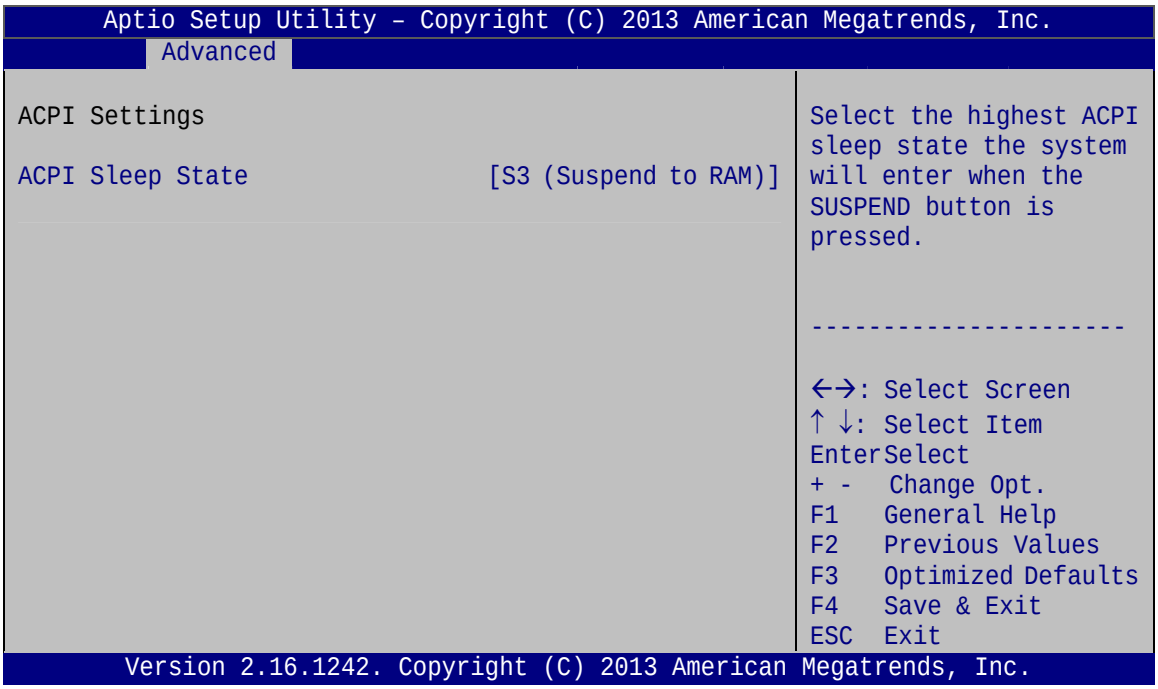
```
      Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
  Main   Advanced  Chipset  Security   Boot   Save & Exit

> ACPI Settings                                System ACPI Parameters
> Super IO Configuration
> iWDD Hardware Monitor
> RTC Wake Settings
> Serial Port Console Redirection              ----------------------
> CPU Configuration
> IDE Configuration                            ←→: Select Screen
> Trusted Computing                            ↑ ↓: Select Item
> USB Configuration                            EnterSelect
                                               + -   Change Opt.
                                               F1    General Help
                                               F2    Previous Values
                                               F3    Optimized Defaults
                                               F4    Save & Exit
                                               ESC   Exit
      Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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



BIOS Menu 3: ACPI Configuration

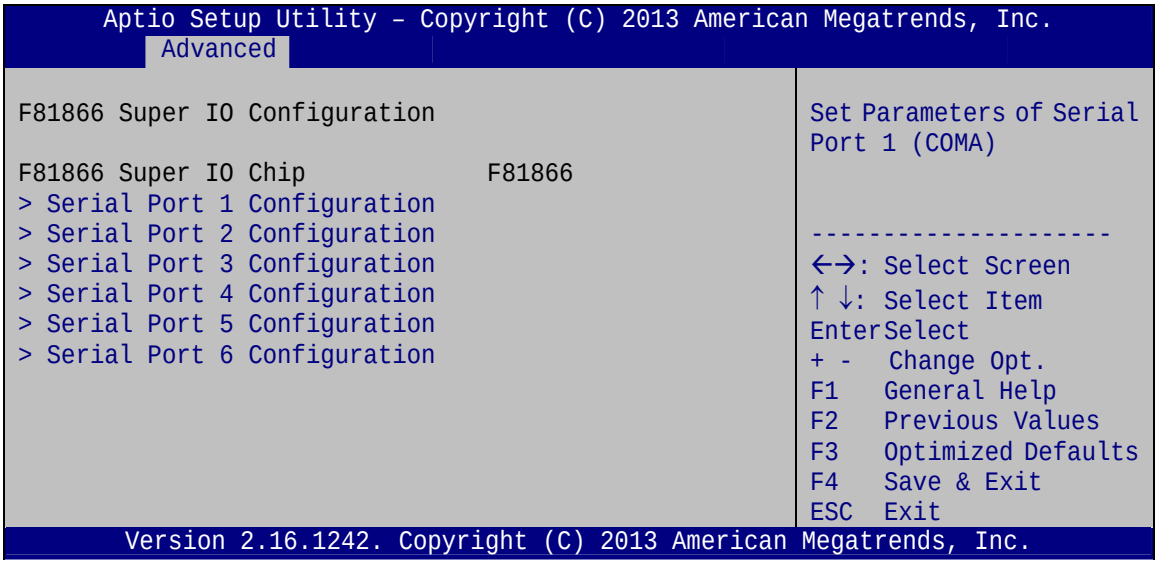
➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

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

➔ **S3 (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 Super IO Configuration

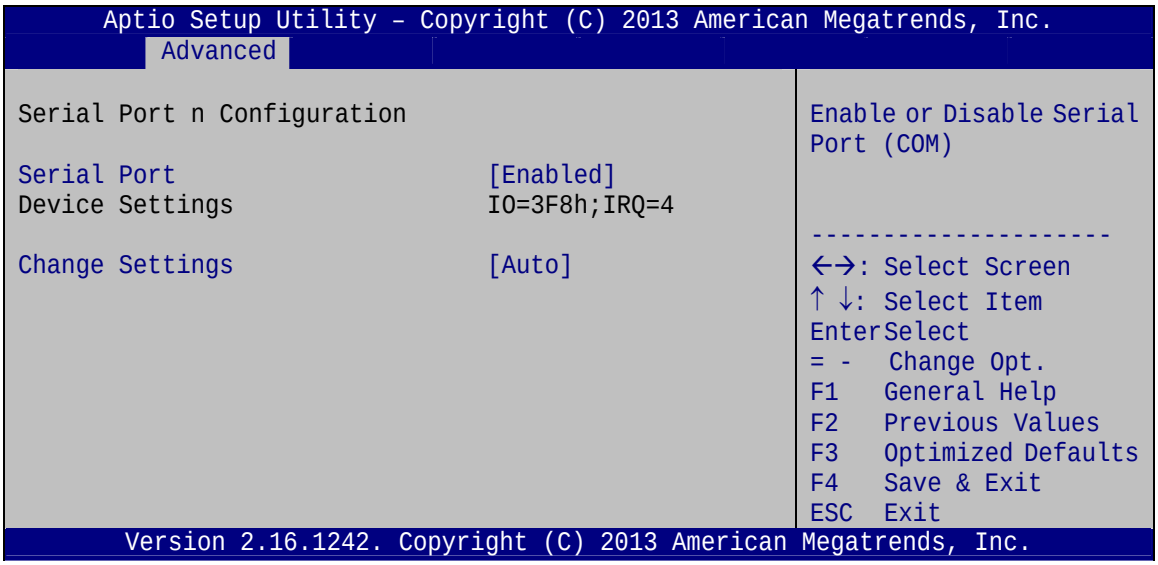
Use the **Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



BIOS Menu 4: Super IO Configuration

5.3.2.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 5**) to configure the serial port n.



BIOS Menu 5: Serial Port n Configuration Menu

5.3.2.1.1 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, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.2.1.2 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, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.2.1.3 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=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.2.1.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [Auto]**

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

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

➔ **IO=2E8h; IRQ=10**	Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.2.1.5 Serial Port 5 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [Auto]**

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

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2D0h; IRQ=11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ11
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.2.1.6 Serial Port 6 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]**

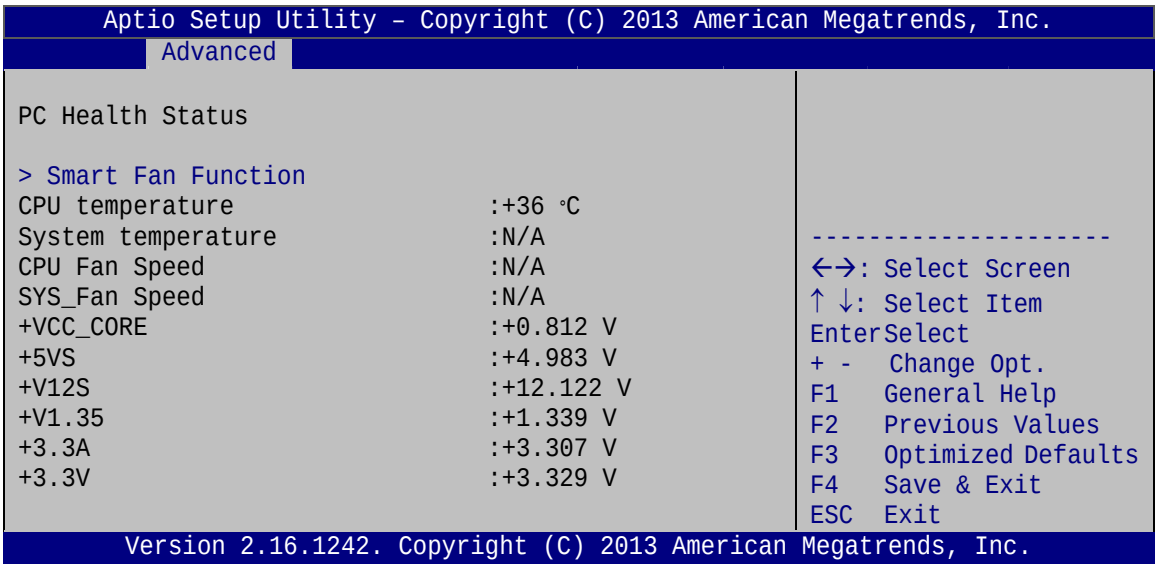
Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2D8h; IRQ=11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ11
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**	Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.3 iWDD Hardware Monitor

The **iWDD Hardware Monitor** menu (**BIOS Menu 6**) contains the fan configuration submenus and displays operating temperature and system voltages.



BIOS Menu 6: iWDD Hardware Monitor

➔ Smart Fan Function

Use the **Smart Fan Function** BIOS option to enable or disable the smart fan connected to the system.

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

➔ PC Health Status

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

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan
  - System Fan
- Voltages:
  - +VCC_CORE
  - +5VS

- +V12S
- +V1.35
- +3.3A
- +3.3V

5.3.3.1 Smart Fan Function

Use the **Smart Fan Function** submenu (**BIOS Menu 7**) to configure smart fan temperature and speed settings.

```
Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
        Advanced
Smart Fan Mode Configuration                    CPU Smart Fan control
                                                settings.
CPU Smart Fan Control           [Auto PWM Mode]
Temperature of Off              75
Temperature if Start            80
Start PWM                       30
Slope (Duty Cycle)              [4]
                                                ---------------------
SYS Smart Fan Control           [Auto PWM Mode] ←→: Select Screen
Temperature of off              75              ↑ ↓: Select Item
Temperature if Start            80              Enter Select
Start PWM                       30              + -   Change Opt.
Slope (Duty Cycle)              [4]             F1    General Help
                                                F2    Previous Values
                                                F3    Optimized Defaults
                                                F4    Save & Exit
                                                ESC   Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

BIOS Menu 7: Smart Fan Function

➔ **CPU Smart Fan Control [Auto PWM Mode]**

Use the **CPU Smart Fan Control** option to configure the CPU smart fan.

➔ **Manual PWM Mode**	The fan spins at the speed set in Manual Mode settings.
➔ **Auto PWM DEFAULT Mode**	The fan adjusts its speed using Auto Mode settings.

➔ **SYS Smart Fan Control [Auto PWM Mode]**

Use the **SYS Smart Fan Control** option to configure the system smart fan.

➔ **Manual PWM Mode**	The fan spins at the speed set in Manual Mode settings.
➔ **Auto PWM Mode DEFAULT**	The fan adjusts its speed using Auto Mode settings.

➔ **Temperature of Off**

Use the + or – key to change the **Temperature of Off** value. Enter a decimal number between 1 and 127.

➔ **Temperature of Start**

Use the + or – key to change the **Temperature of Start** value. Enter a decimal number between 1 and 127.

➔ **Start PWM**

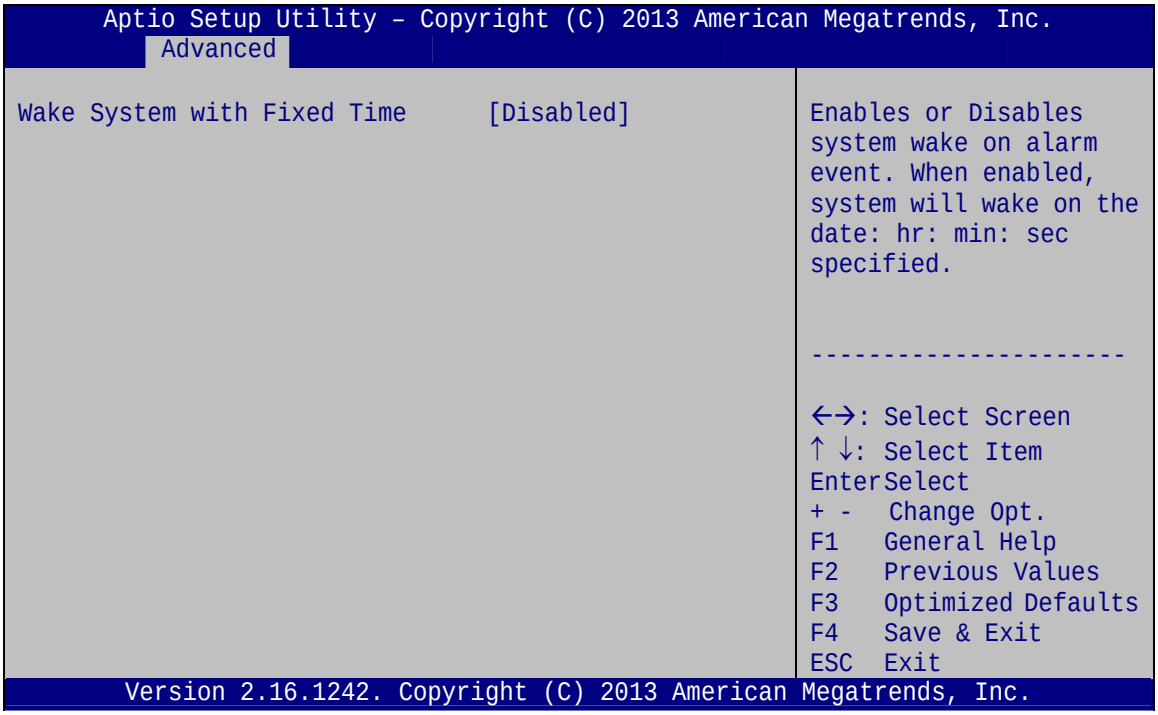
Use the + or – key to change the **Start PWM** value. Enter a decimal number between 1 and 100.

➔ **Slope (Duty Cycle)**

Use the + or – key to change the **Slope (Duty Cycle)** value. Enter a decimal number between 1 and 64.

5.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 8**) configures RTC wake event. The RTC wake function is supported in ACPI (S3/S4/S5) and APM soft off modes.



BIOS Menu 8: RTC Wake Settings

➔ **Wake System with Fixed Time [Disabled]**

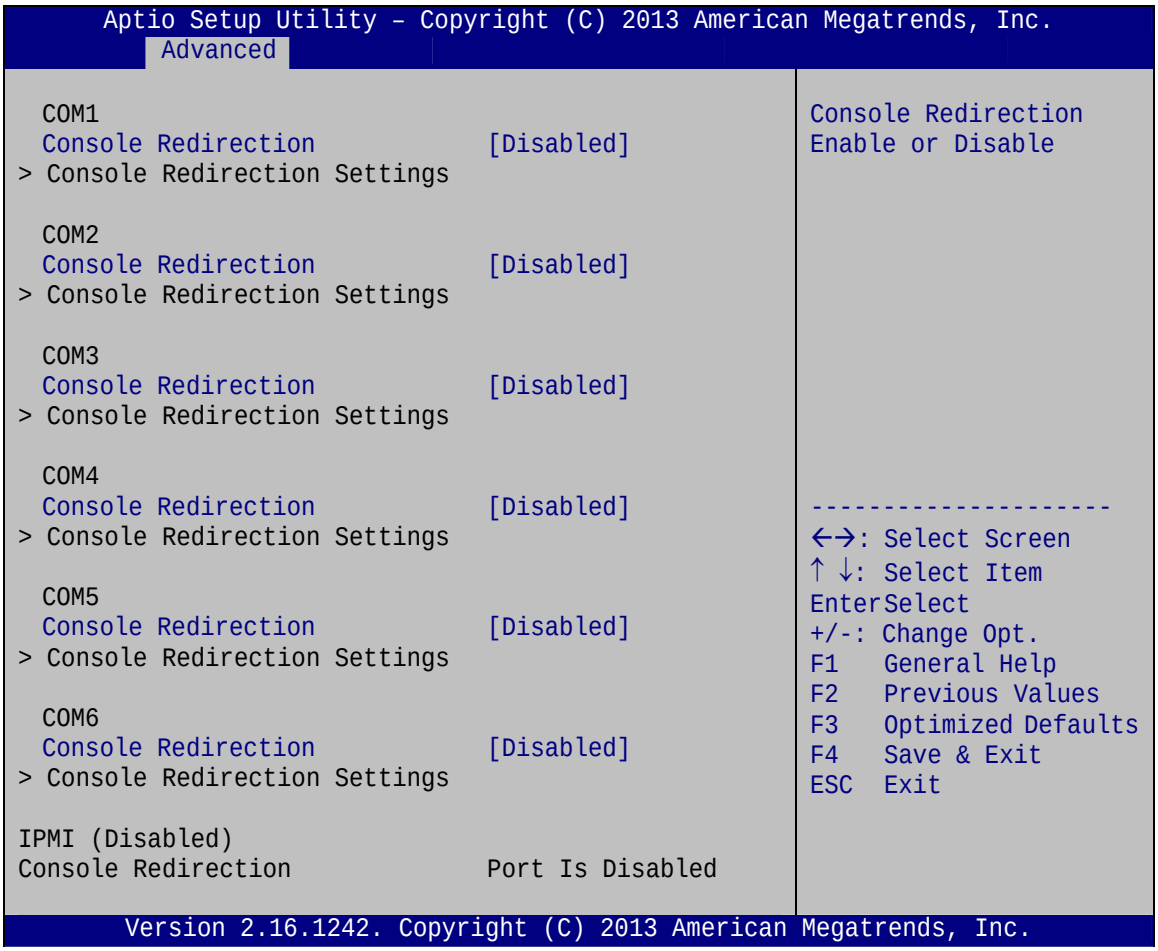
Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

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

➔ **Enabled**	If selected, the following appears with values that can be selected: *Wake up every day *Wake up date *Wake up hour *Wake up minute *Wake up second After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.5 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 9**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 9: 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

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

➔ **Terminal Type [ANSI]**

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

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

➔ **Bits per second [115200]**

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

- ➔ **9600** — Sets the serial port transmission speed at 9600.
- ➔ **19200** — Sets the serial port transmission speed at 19200.
- ➔ **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.

5.3.6 CPU Configuration

Use the **CPU Configuration** BIOS menu (**BIOS Menu 10**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Advanced

CPU Configuration                                  Number of cores to enable
                                                   in each processor
Intel(R) Celeron(R) CPU N2930 @ 1.83GHz            package.
CPU Signature                    30678
Microcode Patch                  809
Max CPU Speed                    1830 MHz
Min CPU Speed                    500 MHz
Processor Cores                  4
Intel HT Technology              Not Supported     ----------------------
Intel VT-x Technology            Supported
                                                   ←→: Select Screen
L1 Data Cache                    24 kB x 4         ↑ ↓: Select Item
L1 Code Cache                    32 kB x 4         Enter Select
L2 Cache                         1024 kB x 2       + -   Change Opt.
L3 Cache                         Not Present       F1    General Help
CPU Speed                        1834 MHz          F2    Previous Values
64-bit                           Supported         F3    Optimized Defaults
                                                   F4    Save & Exit
Intel Virtualization Technology  [Enabled]         ESC   Exit
EIST                             [Enabled]

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

BIOS Menu 10: CPU Configuration

The CPU Configuration menu (**BIOS Menu 10**) lists the following CPU details:

- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ **Intel Virtualization Technology [Enabled]**

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

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

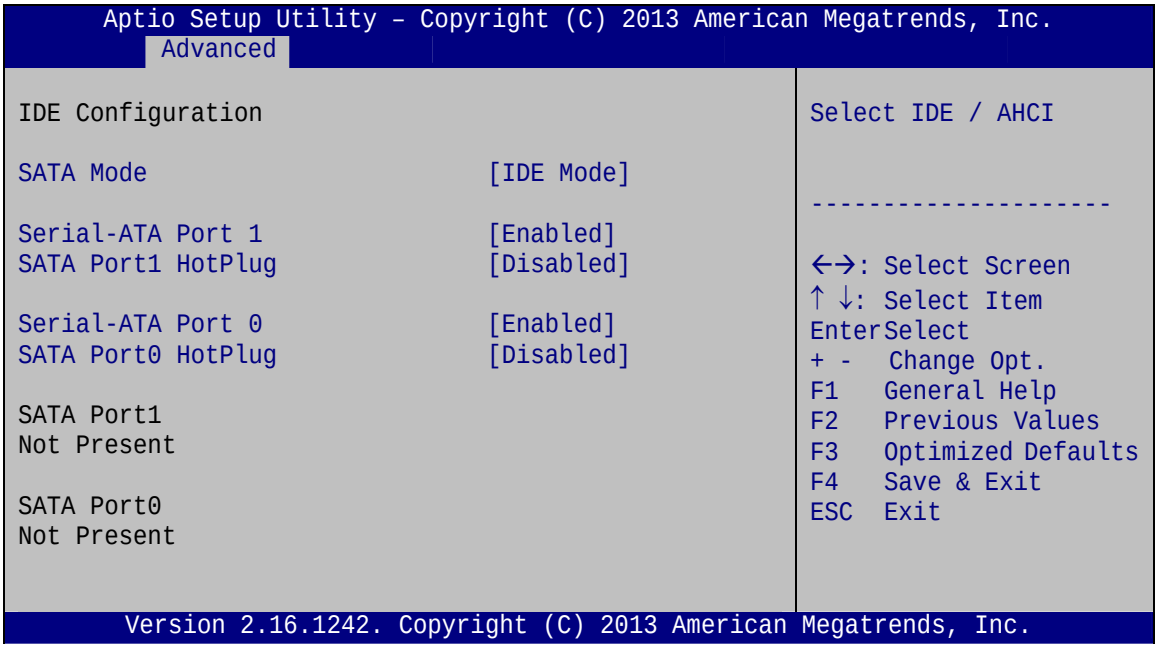
➔ **EIST [Enabled]**

Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

➔ **Disabled**		Disables Enhanced Intel SpeedStep® Techonology.
➔ **Enabled**	**DEFAULT**	Enables Enhanced Intel SpeedStep® Techonology.

5.3.7 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 11**) to change and/or set the configuration of the SATA devices installed in the system.



BIOS Menu 11: IDE Configuration

➔ **SATA Mode Selection [IDE Mode]**

Use the **SATA Mode Selection** option to configure SATA devices as normal IDE devices.

➔ **IDE Mode** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **AHCI Mode** Configures SATA devices as AHCI device.

➔ **Serial-ATA Port 1 [Enabled]**

Use the **Serial-ATA Port 1** option to enable or disable the serial ATA port 1.

➔ **Enabled** **DEFAULT** Enables the SATA port 1.

➔ **Disabled** Disables the SATA port 1.

➔ **SATA Port1 HotPlug [Disabled]**

Use the **SATA Port1 HotPlug** option to enable or disable hotplug function of SATA port 1.

➔ **Enabled**		Enables SATA port 1 hotplug.
➔ **Disabled**	**DEFAULT**	Disables SATA port 1 hotplug.

➔ **Serial-ATA Port 0 [Enabled]**

Use the **Serial-ATA Port 0** option to enable or disable the serial ATA port 0.

➔ **Enabled**	**DEFAULT**	Enables the SATA port 0.
➔ **Disabled**		Disables the SATA port 0.

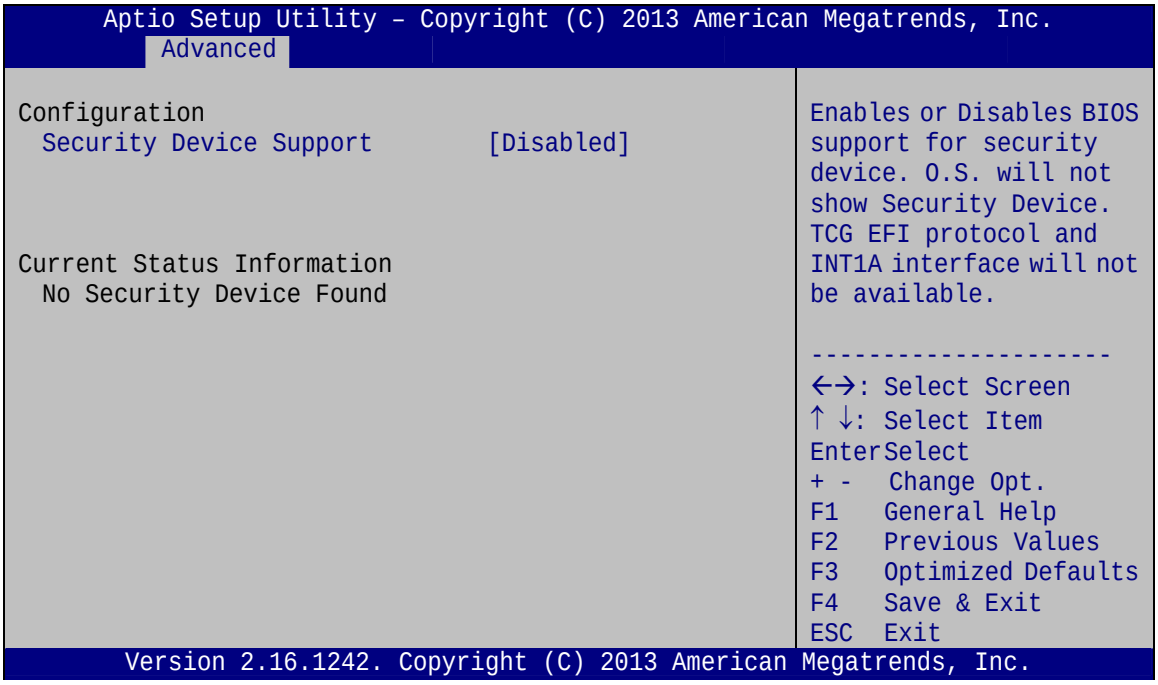
➔ **SATA Port0 HotPlug [Disabled]**

Use the **SATA Port0 HotPlug** option to enable or disable hotplug function of SATA port 0.

➔ **Enabled**		Enables SATA port 0 hotplug.
➔ **Disabled**	**DEFAULT**	Disables SATA port 0 hotplug.

5.3.8 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 13**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 12: Trusted Computing

➔ **Security Device Support [Disabled]**

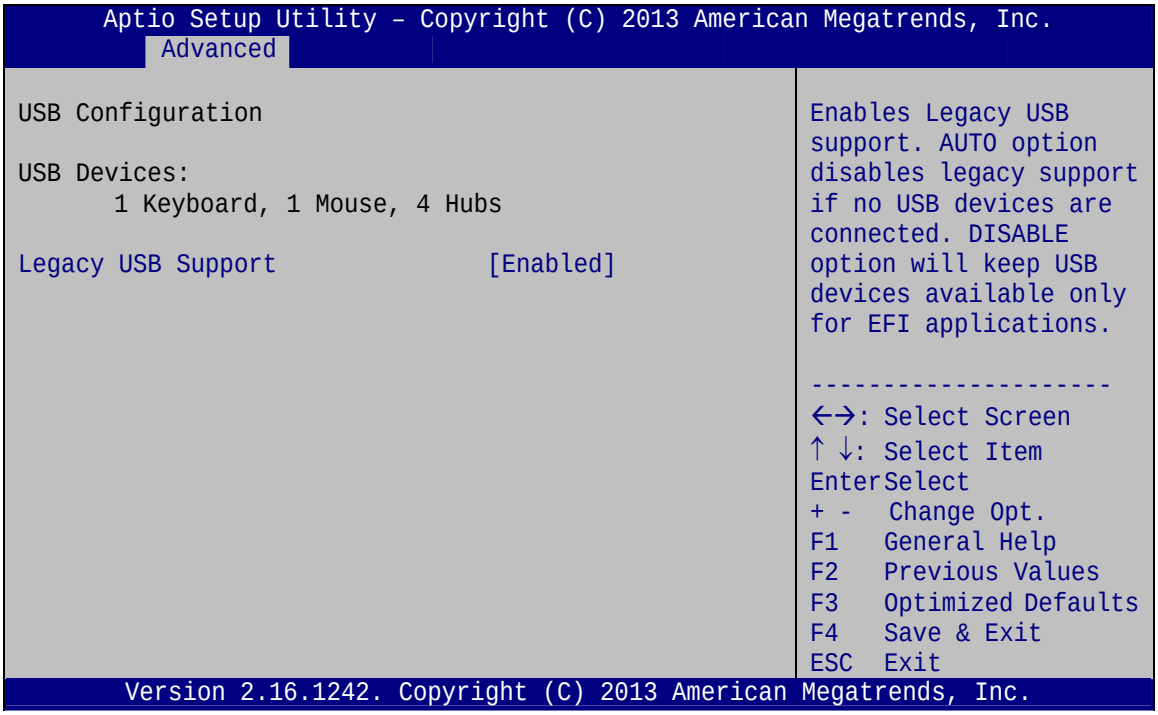
Use the **Security Device Support** option to configure support for the security device.

➔ **Disabled** **DEFAULT** Security device is disabled

➔ **Enabled** Security device is enabled

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: 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

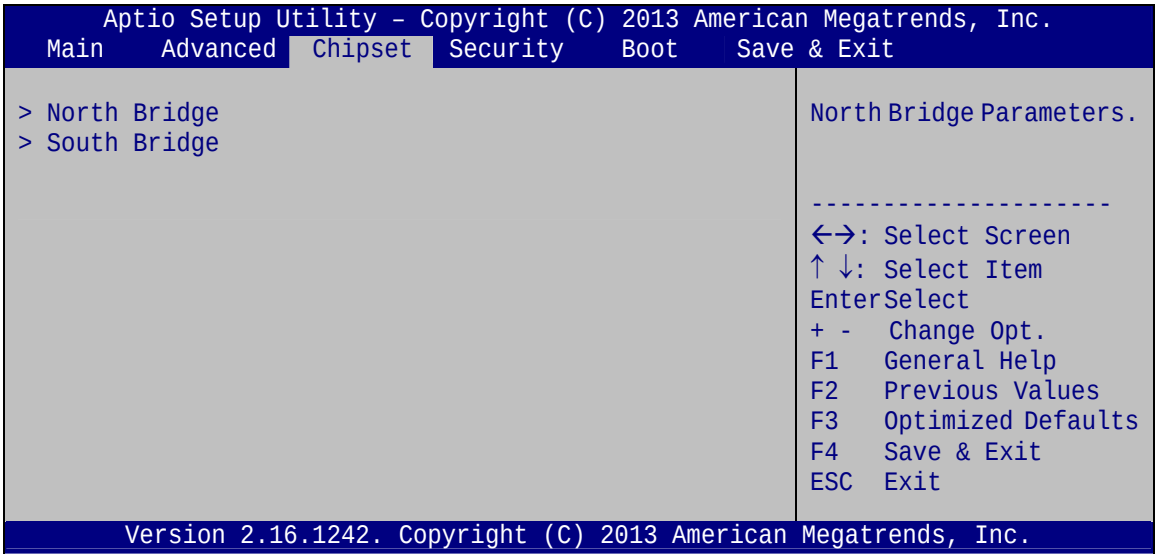
➔	**Disabled**	Legacy USB support disabled
➔	**Auto**	Legacy USB support disabled if no USB devices are connected

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 14**) to access the North Bridge and South Bridge subsystem configuration menus.

WARNING!

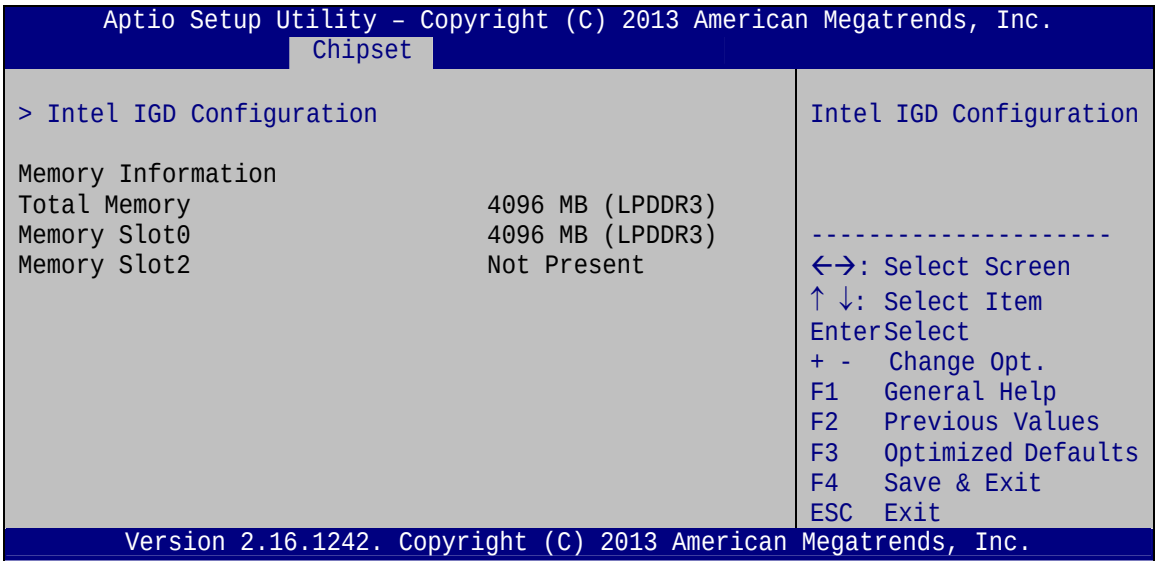
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 14: Chipset

5.4.1 North Bridge

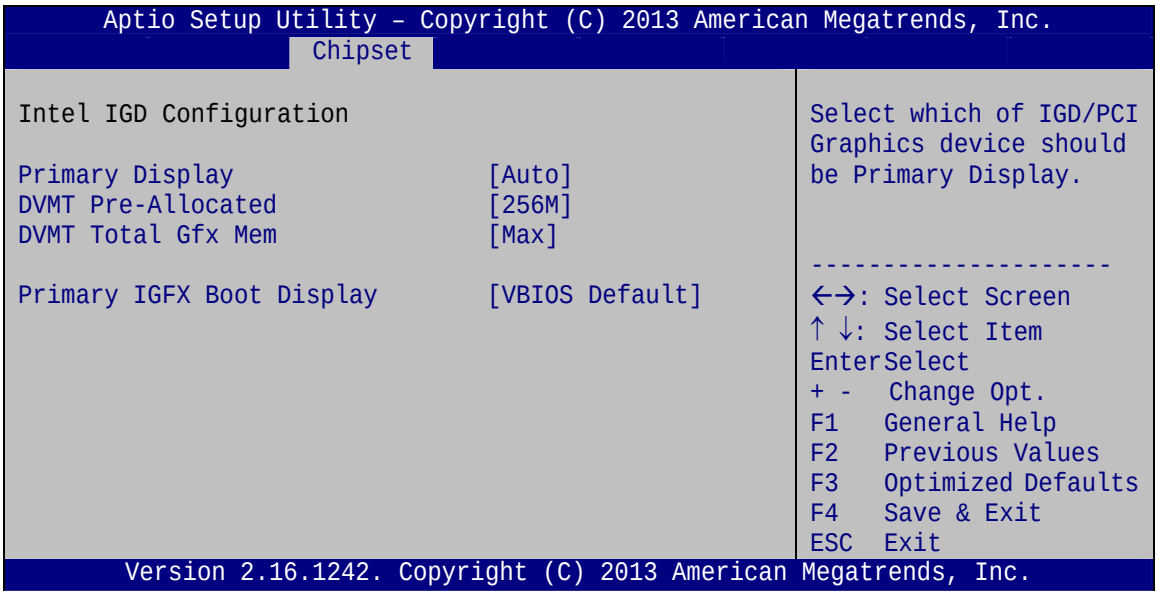
Use the **North Bridge** menu (**BIOS Menu 15**) to configure the north bridge parameters.



BIOS Menu 15: North Bridge

5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** submenu (**BIOS Menu 16**) to configure the graphics settings.



BIOS Menu 16: Intel IGD Configuration

➔ **Primary Display [Auto]**

Use the **Primary Display** option to select which IGD/PCI graphics device will be the primary display or to select SG for switchable Gfx. Configuration options are listed below.

- Auto **DEFAULT**
- IGD
- PCI
- SG

➔ **DVMT Pre-Allocated [256M]**

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

➔ **64M**		64 MB of memory used by internal graphics device
➔ **128M**		128 MB of memory used by internal graphics device
➔ **256M**	**DEFAULT**	256 MB of memory used by internal graphics device
➔ **512M**		512 MB of memory used by internal graphics device

➔ **DVMT Total Gfx Mem [Max]**

Use the **DVMT Total Gfx Mem** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128MB
- 256MB
- Max **Default**

➔ **Primary IGFX Boot Display [VBIOS Default]**

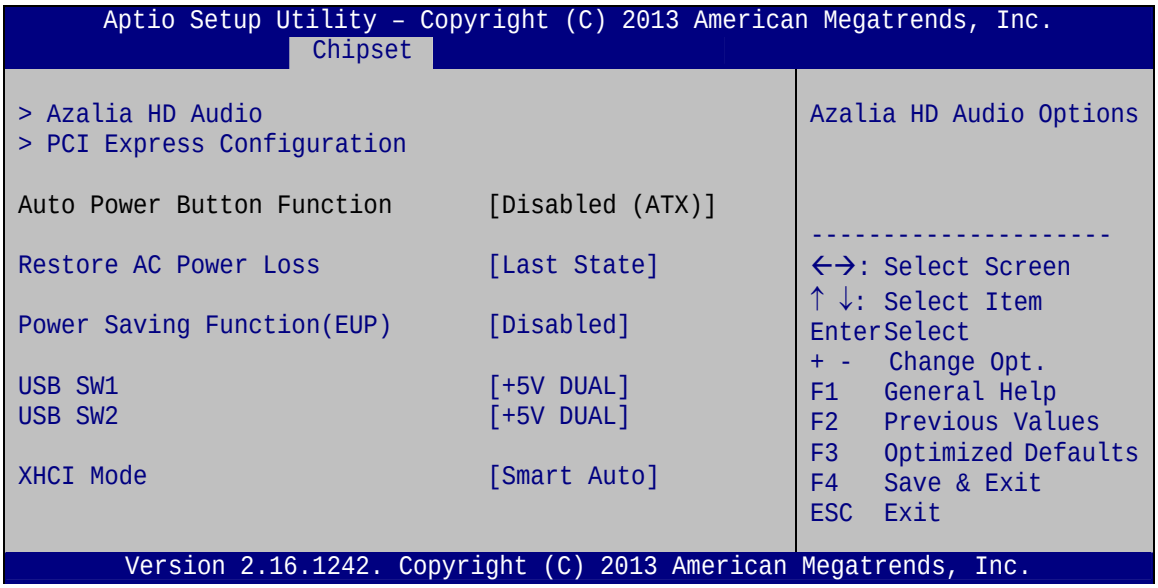
Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**

- CRT
- DisplayPort
- HDMI

5.4.2 South Bridge

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



BIOS Menu 17: South Bridge

➔ **Restore on AC Power Loss [Last State]**

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

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

➔ **Power Saving Function [Disabled]**

Use the **Power Saving Function** BIOS option to enable or reduce power consumption in the S5 state. When enabled, the system can only be powered-up using the power button.

➔ **Enabled** Power Saving Function support enabled

➔ **Disabled** **DEFAULT** Power Saving Function support disabled

➔ **USB SW1 [+5V DUAL]**

Use the **USB SW1** BIOS option to configure the USB power source for the corresponding USB connector (**Table 5-2**).

➔ **+5V** Set the USB power source to +5V

➔ **+5V DUAL** **DEFAULT** Set the USB power source to +5V dual

➔ **USB SW2 [+5V DUAL]**

Use the **USB SW2** BIOS option to configure the USB power source for the corresponding USB connector (**Table 5-2**).

➔ **+5V** Set the USB power source to +5V

➔ **+5V DUAL** **DEFAULT** Set the USB power source to +5V dual

BIOS Options	Configured USB Ports
USB SW1	LAN1_USB1 (external USB 3.0 ports) LAN2_USB2 (external USB 2.0 ports)
USB SW2	USB1, USB2 (internal USB 2.0 ports)

Table 5-2: BIOS Options and Configured USB Ports

➔ **XHCI Mode [Smart Auto]**

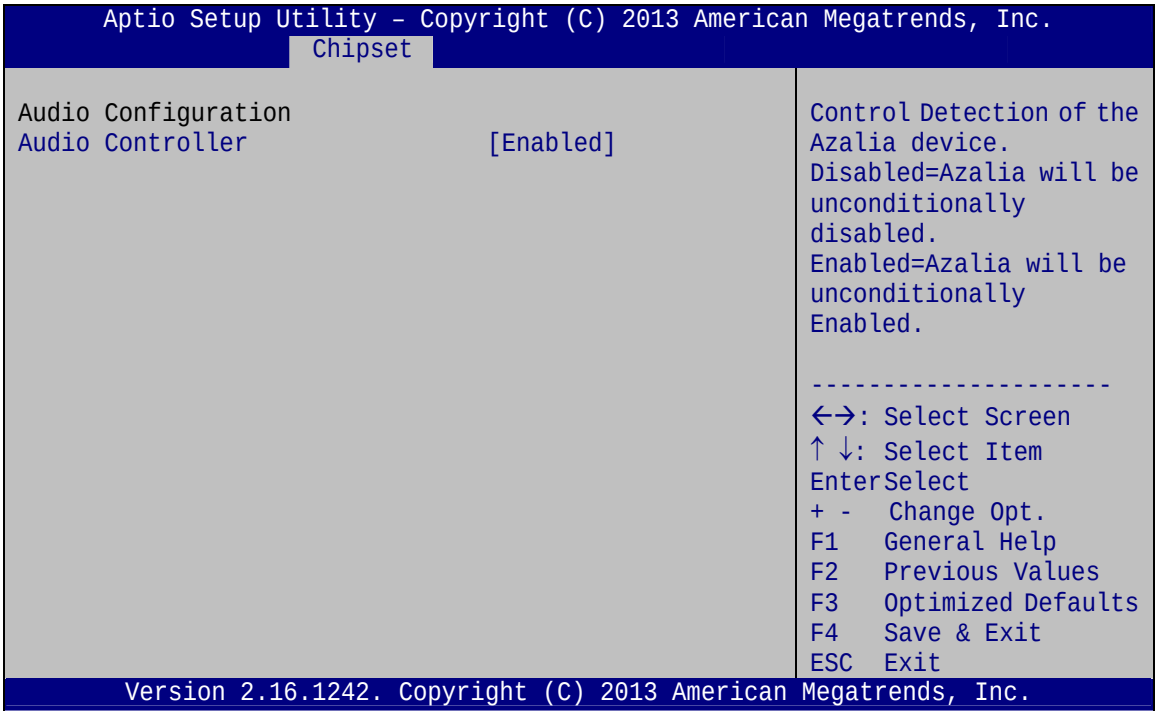
Use the **XHCI Mode** BIOS option to configure the USB xHCI (USB 3.0) controller.

➔ **Enabled** Enable the xHCI controller. USB 3.0 ports behave as USB 3.0 ports.

➔ **Smart Auto** **DEFAULT** Allow the use of USB 3.0 devices prior to OS boot. USB 3.0 ports function as USB 3.0 ports even during a reboot.

5.4.2.1 Azalia HD Audio

Use the **Azalia HD Audio** submenu (**BIOS Menu 18**) to configure the High Definition Audio codec.



BIOS Menu 18: Azalia HD Audio

➔ **Audio Controller [Enabled]**

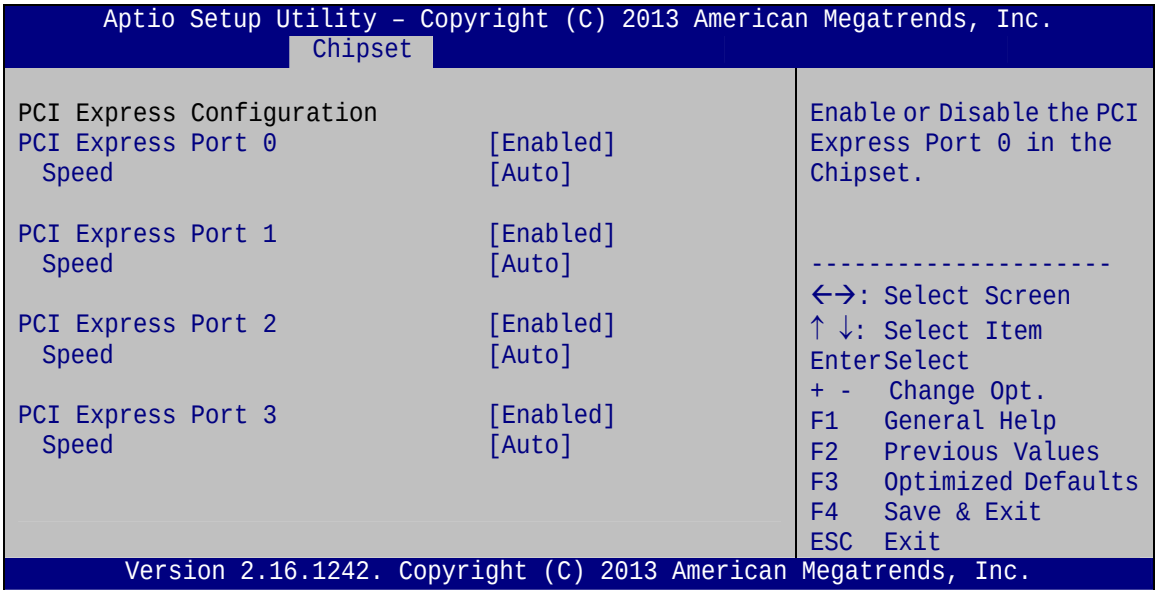
Use the **Audio Controller** BIOS option to enable or disable the High Definition Audio controller.

➔ **Disabled** The High Definition Audio controller is disabled.

➔ **Enabled** **DEFAULT** The High Definition Audio controller is enabled.

5.4.2.2 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 19**) to configure the PCI Express slots.



BIOS Menu 19: PCI Express Configuration

➔ **PCI Express Port n [Enabled]**

Use the **PCI Express Port n** option to enable or disable the corresponding PCIe slot.

➔ **Enabled** **DEFAULT** The PCIe slot is enabled.

➔ **Disabled** The PCIe slot is disabled.

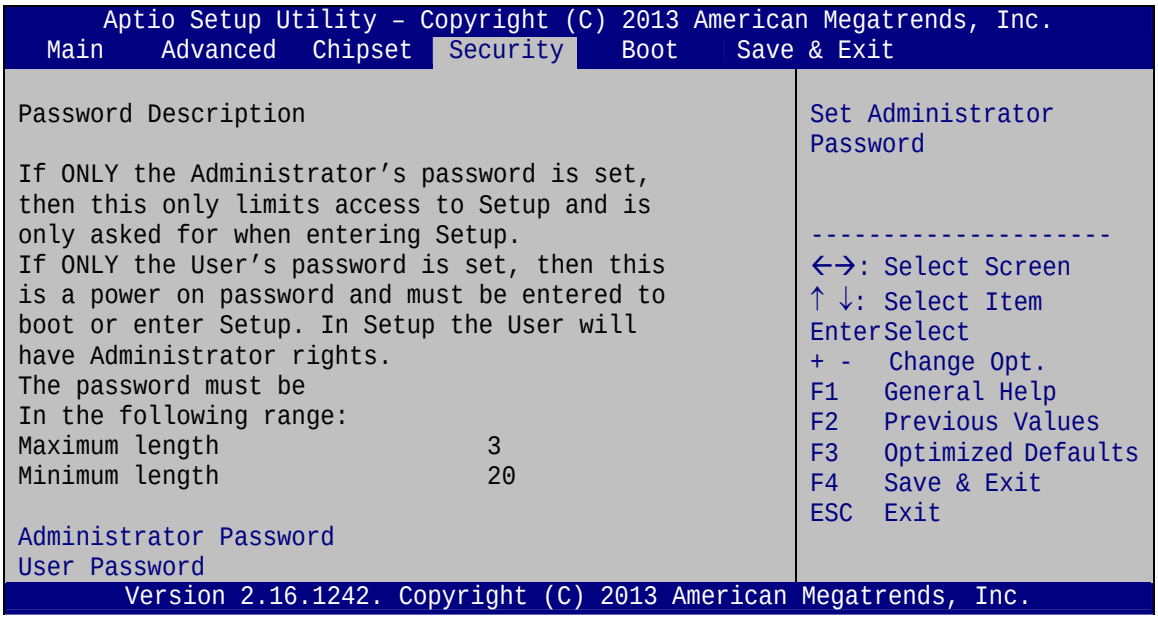
➔ **Speed [Auto]**

Use the **Speed** option to configure the speed of the corresponding PCIe slot.

- Auto **DEFAULT**
- Gen 2
- Gen 1

5.5 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ **Administrator Password**

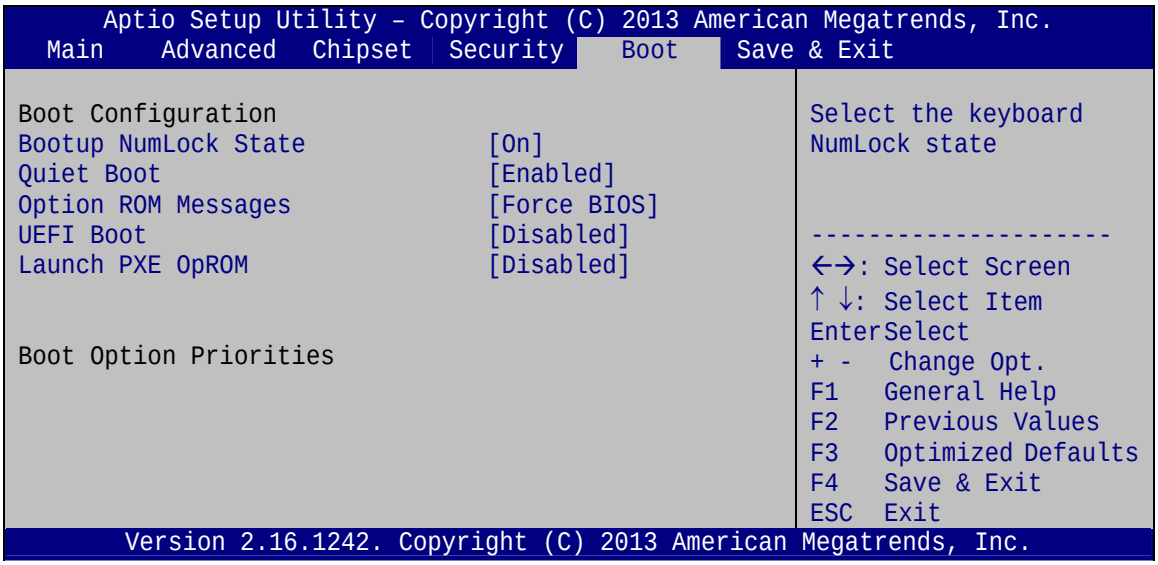
Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

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

5.6 Boot

Use the **Boot** menu (**BIOS Menu 21**) to configure system boot options.



BIOS Menu 21: Boot

➔ **Bootup NumLock State [On]**

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

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

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

➔ **Quiet Boot [Enabled]**

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

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

➔ **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 a UEFI device.

➔	**Enabled**		Enable to boot from a UEFI device.
➔	**Disabled**	**DEFAULT**	Disable to boot from a UEFI device.

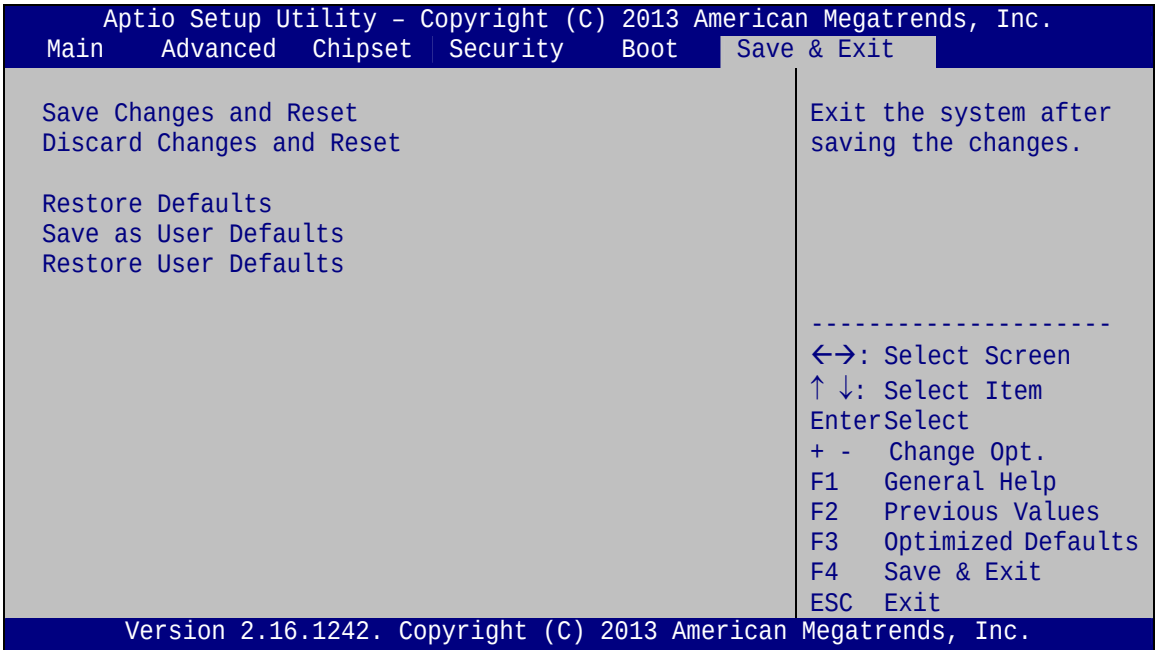
➔ **Launch PXE OpROM [Disabled]**

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

5.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22:Exit

➔ **Save Changes and Reset**

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

➔ **Discard Changes and Reset**

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

➔ **Restore Defaults**

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

➔ **Save as User Defaults**

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

➔ **Restore User Defaults**

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

Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

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

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN

Installation instructions are given below.

6.2 Software Installation

All the drivers for the KINO-ABT-i2 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

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

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

Step 3: Click **NANO-BT-i1**.

Figure 6-1: Driver CD Main Menu

Step 4: A new screen with a list of available drivers appears (**Figure 6-2**).

Figure 6-2: Available Drivers

Step 5: Install all of the necessary drivers in the menu.

6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

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

Step 2: Click "**1-Bay Trail SOC**" and select the folder which corresponds to the operating system.

NOTE:

The remainder of this installation assumes Windows 8 as the operating system.

Step 3: Locate the setup file (infinst_autol_9.4.4.1006.exe) and double click on it.

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

Figure 6-3: Chipset Driver Welcome Screen

Step 5: The **License Agreement** in **Figure 6-4** appears.

Step 6: Click **Yes** to accept the agreement and continue.

Figure 6-4: Chipset Driver License Agreement

Step 7: The **Read Me** file in **Figure 6-5** appears.

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

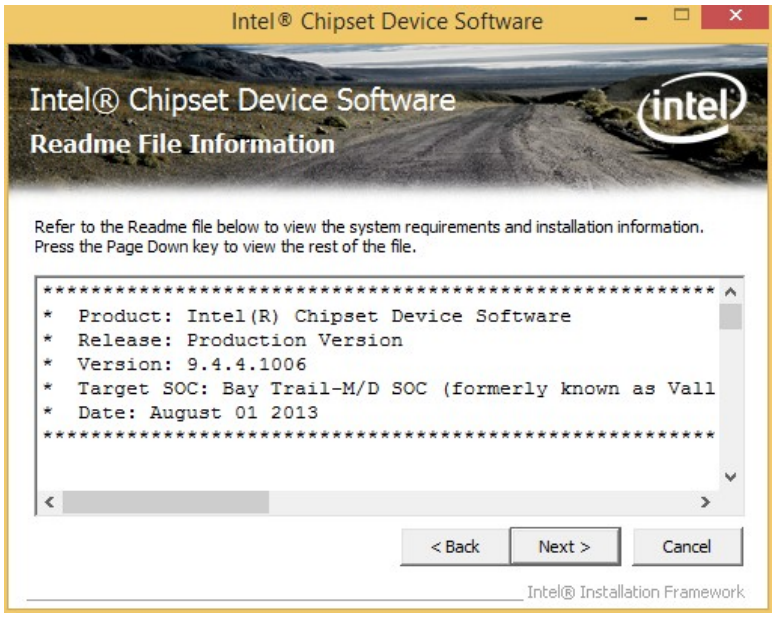


Figure 6-5: Chipset Driver Read Me File

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

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

Figure 6-6: Chipset Driver Setup Operations

Step 11: The **Finish** screen in **Figure 6-7** appears.

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

Figure 6-7: Chipset Driver Installation Finish Screen

6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

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

Step 2: Click "**1-Bay Trail SOC**" and select the folder which corresponds to the operating system.

NOTE:

The remainder of this installation assumes Windows 8 as the operating system.

Step 3: Unzip the file called **15.33.7.3366.zip**, and then locate the setup file and double click on it to start the installation. If a 64-bit operating system is installed, please unzip the 15.33.7.64.336.zip file to install the graphics driver.

NOTE:

To install graphics driver on a **32-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_PC_VERSION_36_15_0_1064.7Z.

To install graphics driver on a **64-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_BETA_VERSION_37_15_0_1055.7Z.

Step 4: The **Welcome Screen** in **Figure 6-8** appears.

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

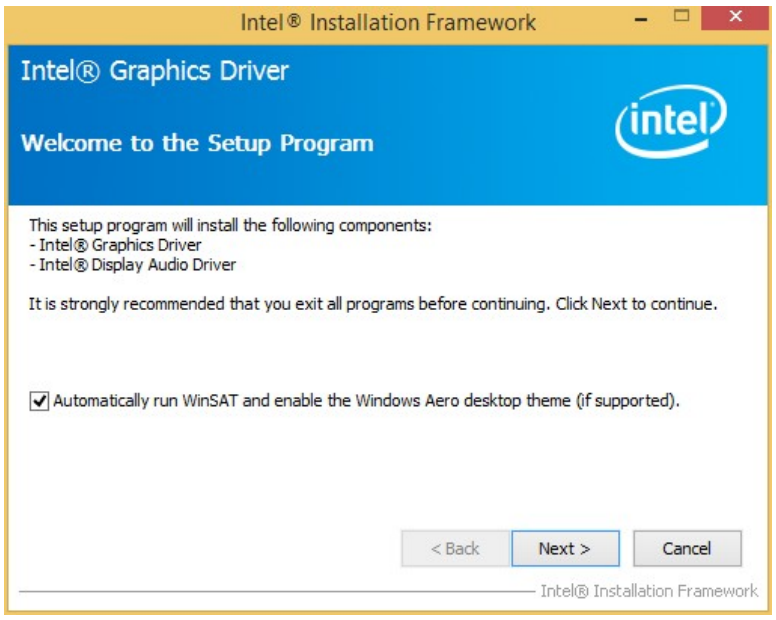


Figure 6-8: Graphics Driver Welcome Screen

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

Step 7: Click **Yes** to accept the agreement and continue.

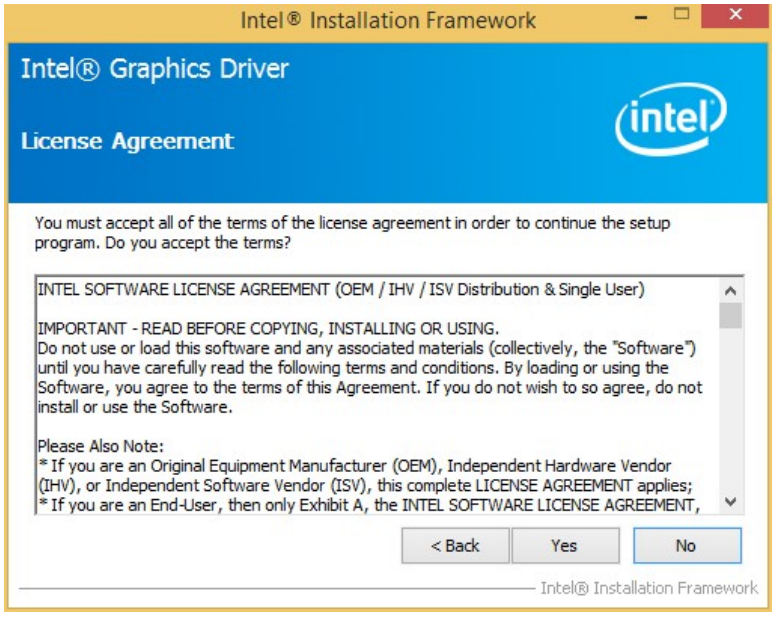


Figure 6-9: Graphics Driver License Agreement

Step 8: The **Read Me** file in **Figure 6-10** appears. Click **Next** to continue.

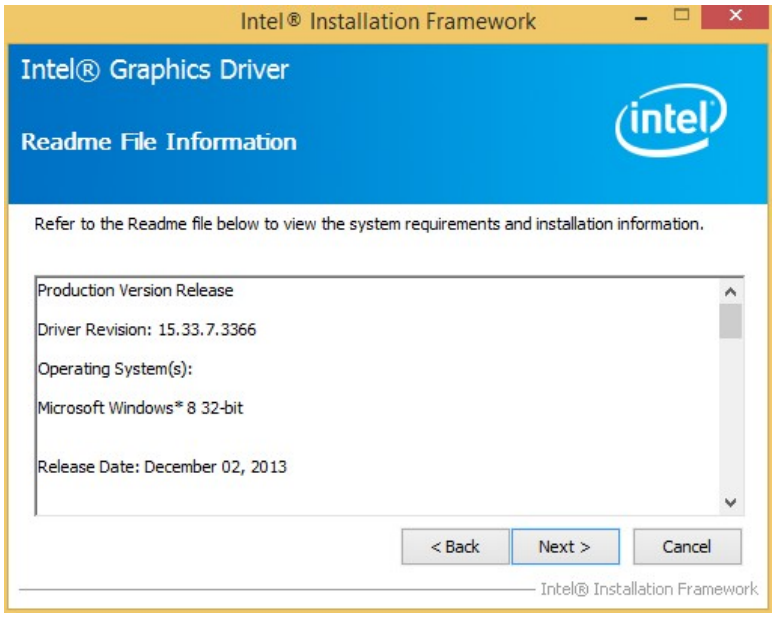


Figure 6-10: Graphics Driver Read Me File

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

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

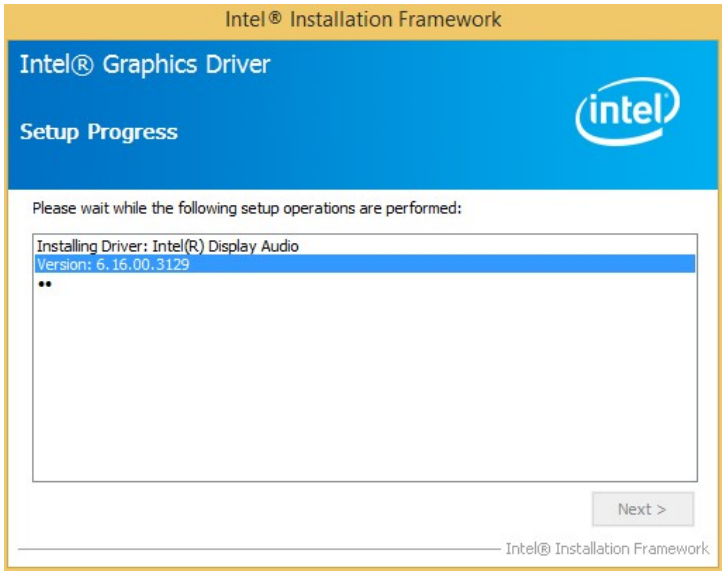


Figure 6-11: Graphics Driver Setup Operations

Step 11: The system starts installing the Graphics Driver.

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

Step 13: Select "**Yes, I want to restart this computer now**" and click **Finish**.

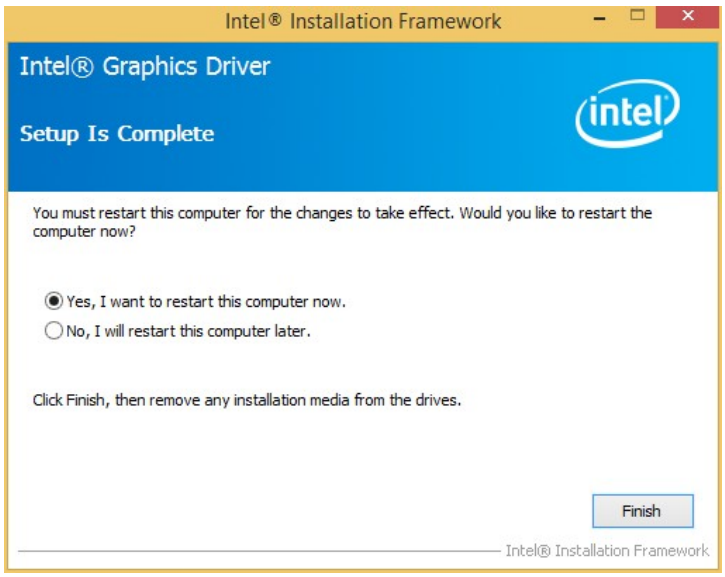


Figure 6-12: Graphics Driver Installation Finish Screen

6.5 LAN Driver Installation

To install the LAN driver, please do the following.

Step 1: Right-click This PC icon on the desktop and select **Properties**. (**Figure 6-13**).

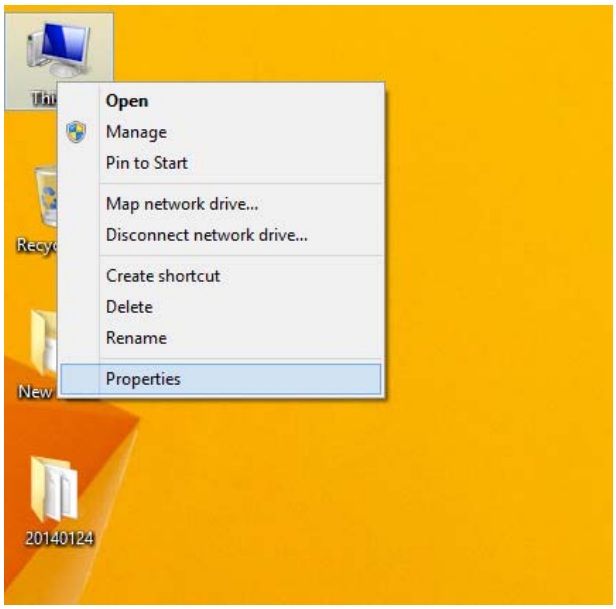


Figure 6-13: PC Properties

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

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

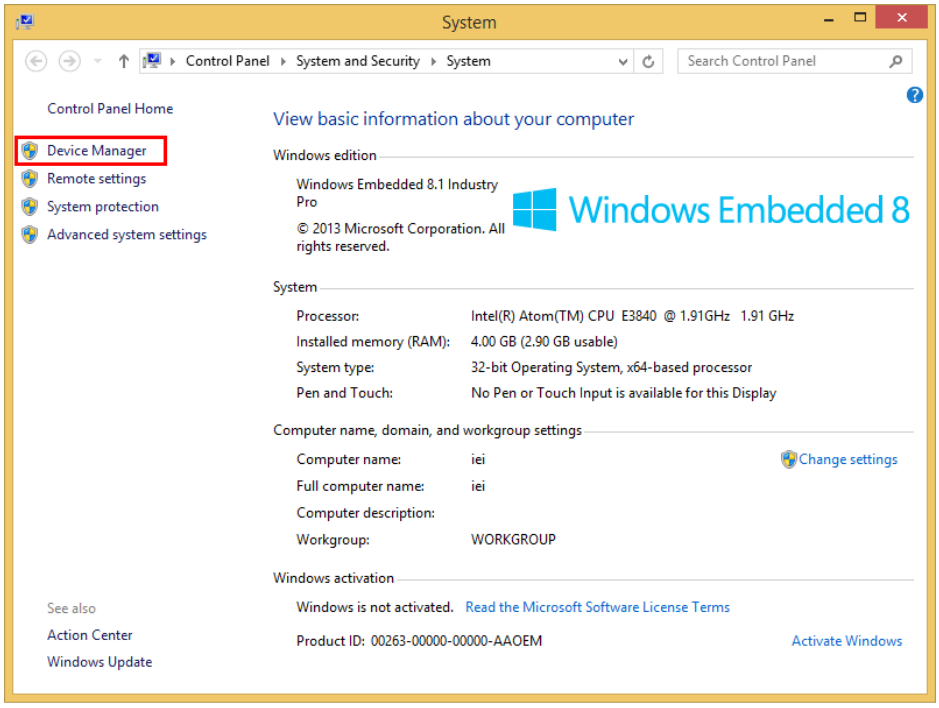


Figure 6-14: System Control Panel

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

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

Step 6: Select **Update Driver Software**. See **Figure 6-15**.

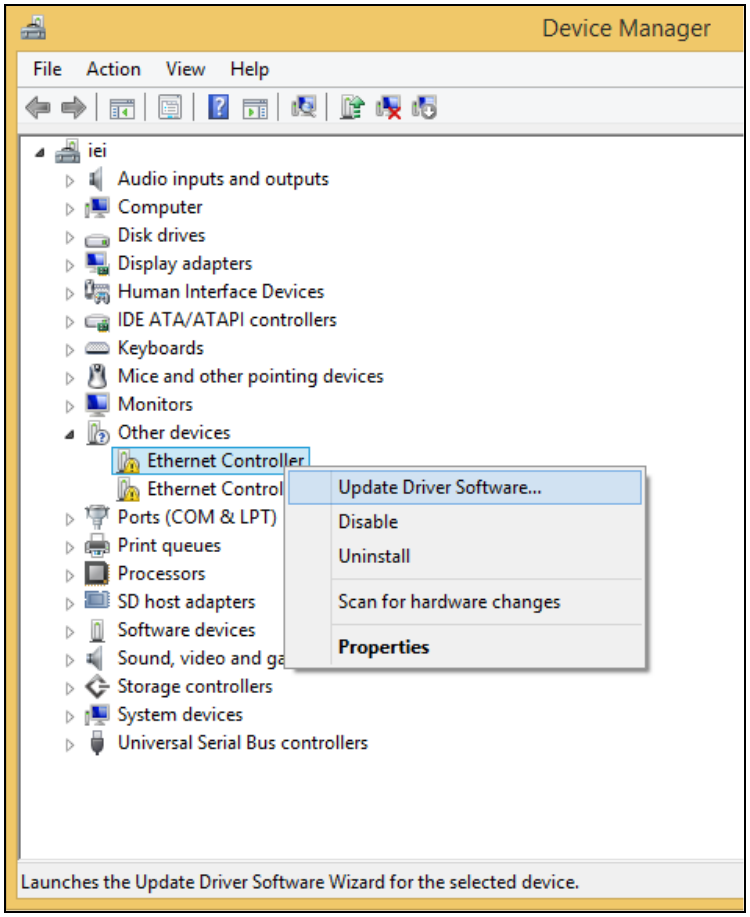


Figure 6-15: Device Manager List

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

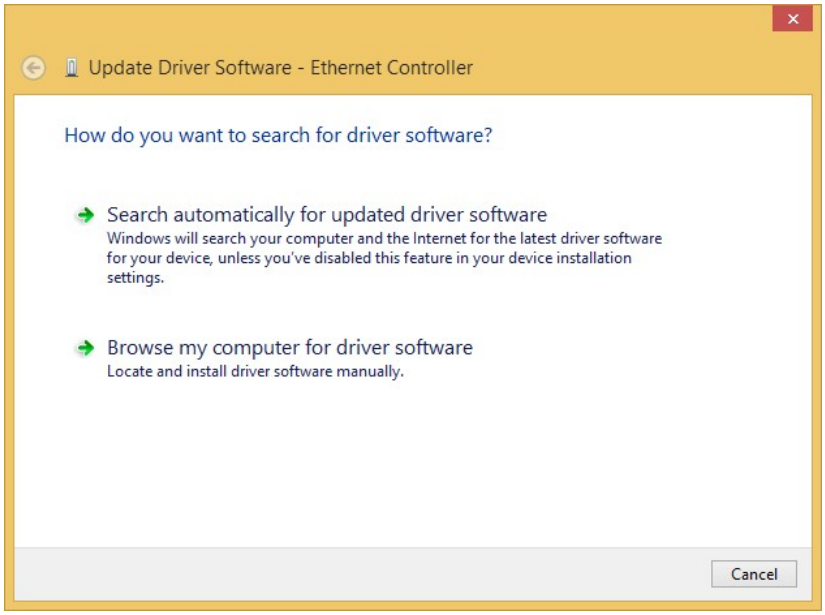


Figure 6-16: Update Driver Software Window

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

Step 9: Click Browse to select "**X:\2-LAN\Intel**" directory in the **Locate File** window, where "**X:\"** is the system CD drive. (**Figure 6-17**).

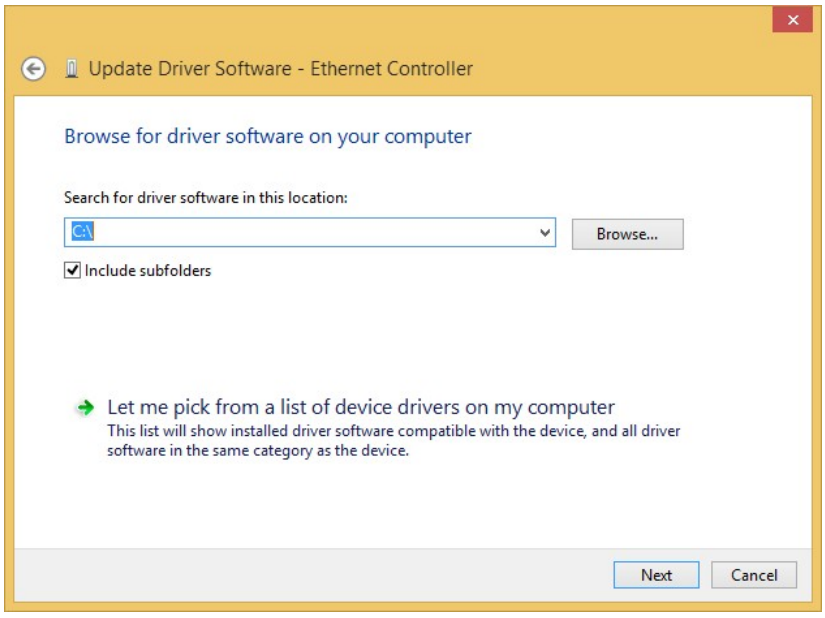


Figure 6-17: Locate Driver Files

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

Step 11: Driver Installation is performed. When the **Finish** screen appears, click **Close** to exit.

Step 12: Right-click the other Ethernet controller that has question marks next to it as shown in **Figure 6-15**. Repeat **Step 6** – **Step 11** to install the second Ethernet controller driver.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

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

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

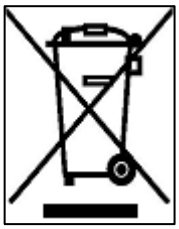
Product Disposal

CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union – If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

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

Appendix

C

BIOS Options

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

BIOS Information 72
Memory Information 73
TXE Information 73
System Date [xx/xx/xx] 73
System Time [xx:xx:xx] 73
ACPI Sleep State [S3 (Suspend to RAM)] 75
Serial Port [Enabled] 77
Change Settings [Auto] 77
Serial Port [Enabled] 78
Change Settings [Auto] 78
Serial Port [Enabled] 79
Change Settings [Auto] 79
Serial Port [Enabled] 80
Change Settings [Auto] 80
Serial Port [Enabled] 81
Change Settings [Auto] 82
Serial Port [Enabled] 83
Change Settings [Auto] 83
Smart Fan Function 85
PC Health Status 85
CPU Smart Fan Control [Auto PWM Mode] 86
SYS Smart Fan Control [Auto PWM Mode] 86
Temperature of Off 87
Temperature of Start 87
Start PWM 87
Slope (Duty Cycle) 87
Wake System with Fixed Time [Disabled] 88
Console Redirection [Disabled] 90
Terminal Type [ANSI] 90
Bits per second [115200] 91
Data Bits [8] 91
Parity [None] 91
Stop Bits [1] 92

Intel Virtualization Technology [Enabled] 93
EIST [Enabled] 93
SATA Mode Selection [IDE Mode] 94
Serial-ATA Port 1 [Enabled] 94
SATA Port1 HotPlug [Disabled] 95
Serial-ATA Port 0 [Enabled] 95
SATA Port0 HotPlug [Disabled] 95
Security Device Support [Disabled] 96
USB Devices 97
Legacy USB Support [Enabled] 97
Primary Display [Auto] 100
DVMT Pre-Allocated [256M] 100
DVMT Total Gfx Mem [Max] 100
Primary IGFX Boot Display [VBIOS Default] 100
Restore on AC Power Loss [Last State] 101
Power Saving Function [Disabled] 101
USB SW1 [+5V DUAL] 102
USB SW2 [+5V DUAL] 102
XHCI Mode [Smart Auto] 102
Audio Controller [Enabled] 103
PCI Express Port n [Enabled] 104
Speed [Auto] 104
Administrator Password 105
User Password 105
Bootup NumLock State [On] 106
Quiet Boot [Enabled] 107
Option ROM Messages [Force BIOS] 107
UEFI Boot [Disabled] 107
Launch PXE OpROM [Disabled] 107
Save Changes and Reset 108
Discard Changes and Reset 108
Restore Defaults 108
Save as User Defaults 109
Restore User Defaults 109

Appendix

D

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.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male D-sub 9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.

DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.

IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.

USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

E

Digital I/O Interface

The DIO connector on the KINO-ABT-i2 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 8-bit digital inputs and 8-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

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

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH	
Sub-function:	
AL – 8	:Set the digital port as INPUT
AL	:Digital I/O input value

Assembly Language Sample 1

```
MOV     AX, 6F08H       ;setting the digital port as input
INT     15H             ;
```

AL low byte = value

AH – 6FH	
Sub-function:	
AL – 9	:Set the digital port as OUTPUT
BL	:Digital I/O output value

Assembly Language Sample 2

```
MOV     AX, 6F09H       ;setting the digital port as output
MOV     BL, 09H                 ;digital value is 09H
INT     15H             ;
```

Digital Output is 1001b

Appendix

F

Watchdog Timer

NOTE:

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

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

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

INT 15H:

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

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

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

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

NOTE:

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

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

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

;
; ADD THE APPLICATION PROGRAM HERE
;

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

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

;
; EXIT ;
```

Appendix

G

Hazardous Materials Disclosure

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 following table.

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	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
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 (now replaced by GB/T 26572-2011).

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 (now replaced by GB/T 26572-2011).

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	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
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/T 11363-2006 (现由 GB/T 26572-2011 取代) 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/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。