

IH70 Motherboard

Mini-ITX SBC with w/ Intel® 4th Generation Core i3/i5/i7 Processor,
VGA, LVDS, Dual Giga Ethernet, USB 3.0 and Mini-PCIe Interface
V110

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Version 1.1
Manual Number: 9171111I101K

Advisory Conventions

Three types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.

**NOTE:**

A note is used to emphasize helpful information

**IMPORTANT:**

An important note indicates information that is important for you to know.

**CAUTION**

A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.

**WARNING!**

An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.

Safety Precautions



WARNING!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.



CAUTION

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user- manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
11. If any of the following situations arises, get the equipment checked by service personnel:
 - A. The power cord or plug is damaged.
 - B. Liquid has penetrated into the equipment.
 - C. The equipment has been exposed to moisture.
 - D. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - E. The equipment has been dropped and damaged.
 - F. The equipment has obvious signs of breakage.

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General Information

This chapter includes the IH70 SBC Motherboard background information.

Sections include:

- 1.1 Introduction
- 1.2 Features
- 1.3 Motherboard Specifications

Chapter 1 General Information

1.1 Introduction

Thank you for choosing the IH SBC 70 motherboard. The motherboard is integrated with Intel®QM87 chipset, 17x17mm, and Socket G3 Intel® 4th Generation Core i7/i5/i3 Processor. The Intel®4th Generation Core™ processor based on 64-bit, multi-core processors built on 22-nanometer process technology. The processors are designed for a two-chip platform consisting of a processor and Platform Controller Hub (PCH) to be used with the Mobile chipset.

IH70 is equipped with rich peripheral connectors: three Mini-PCIe I/O ports, two Serial ATA III (6Gb/s)connectors, six serial ports (three connectors; three pin headers), six super-speed USB 3.0 connectors (four connectors; two pin headers) and four hi-speed USB 2.0 connectors(four pin headers). Additionally, IH70 SBC features build-in a 12V DC-IN power adapter.

Thus, this model can be used in many applications in the industrial computer market, such as Gaming, POS, KIOSK, Industrial Automation, and Programmable Control System. Compact design and high performance meet the demanding requirements of modern business and industrial applications.

1.2 Features

- Mini-ITX Form Factor (170mm x 170mm)
- Support Socket G3 Intel® 4th Generation Core i3/i5/i7 Processor
- System memory up to 16GB DDR3L 1333/1600, SO-DIMM
- Intel® QM87 Chipset
- Intel® HD Graphics 4600. Integrated Graphics Engine.
- Intel® I210IT Gigabit-LAN Controller + I218LM Gigabit-LAN PHY r
- 3 x Mini PCIe, 6 x COM, 6 x USB3.0, 4 x USB 2.0 ,2 x SATAIII, 8 x GPIO ports, 1 x HDMI,1xeDP(By BOM Option),1 x PCIe x 16, 1 x LPT port

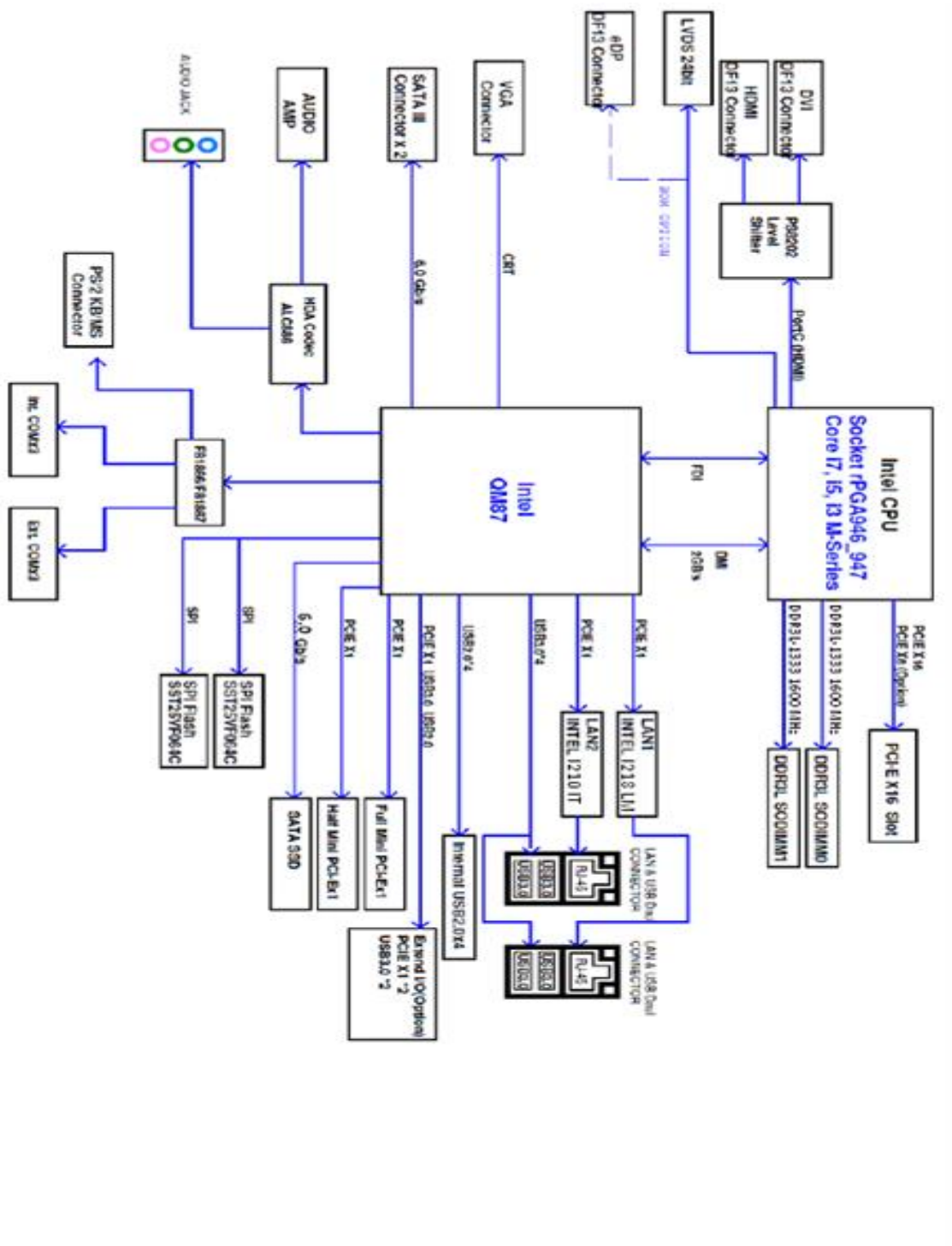
1.3 Motherboard Specifications

1.3.1 Hardware and Software Description

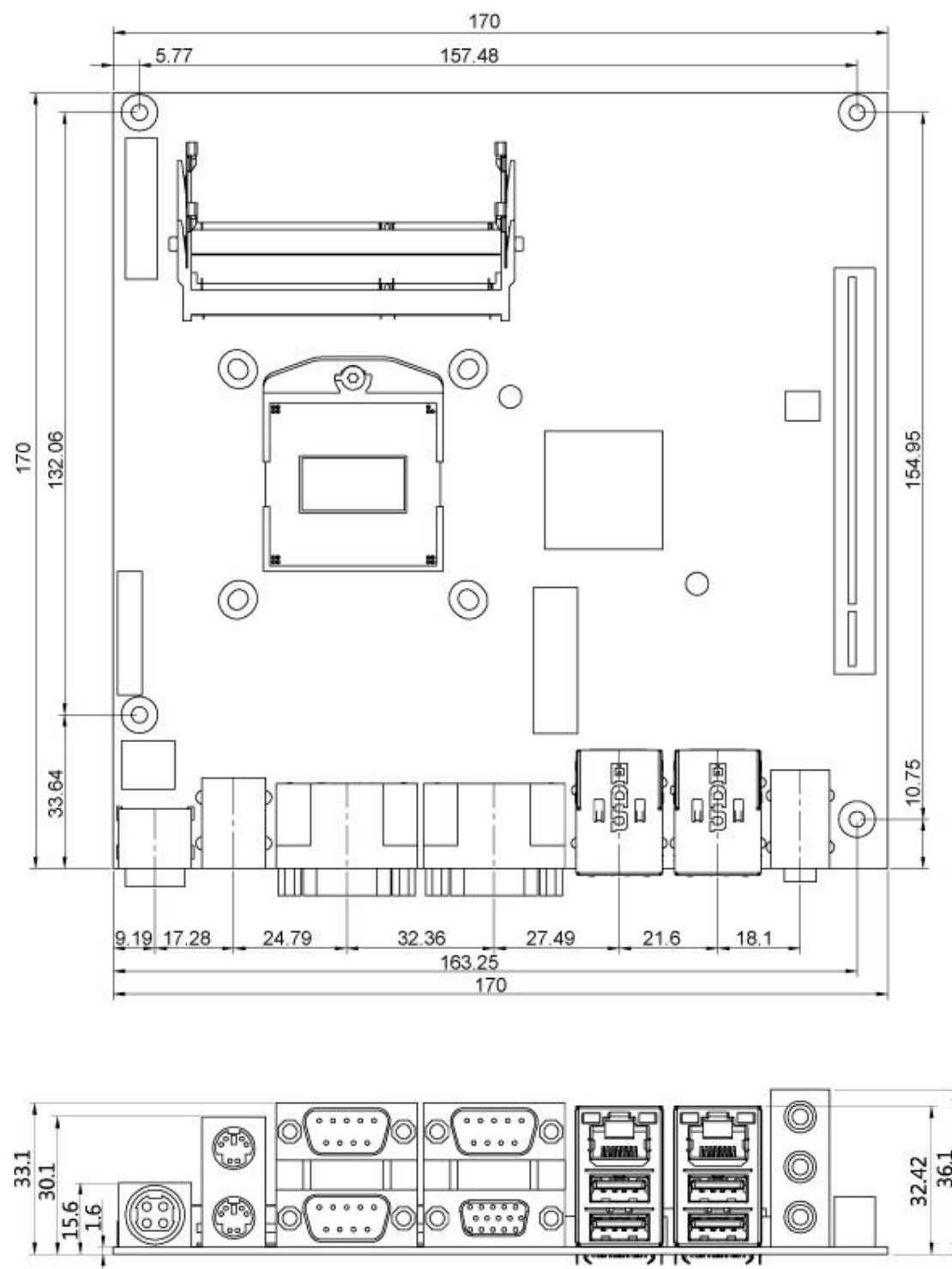
Hardware:	
CPU Type	Intel® 4th Generation Core i3/i5/i7 Processor
Chipset	Intel® QM87
BIOS	AMI System BIOS
Graphic	Intel® HD Graphics 4600 support DX11, OGL4.0
LCD interface	Dual-channel 24 bit LVDS Up to 1440 x 900 @ 60Hz
Resolution	VGA mode: up to 1920 x 1200 @ 60Hz DVI: 1920 x 1200 @ 60Hz HDMI: 1920 x 1200 @ 60Hz LVDS: 1920 x 1200 @ 60Hz ; co-lay eDP(by BOM Option)
LAN	2 x Giga LAN (Intel® I210IT Gigabit-LAN Controller + I218LM Gigabit-LAN PHY)
Memory Type	2 x SO-DIMM socket, supports up to 16GB DDR3L 1333/1600
Super I/O	Fintek F81867
Adio	Realtek ALC886 HD Audio Codec
USB	6 ports, USB 3.0 (4 x USB Connector, 2 x USB pin-header) 4 ports, USB 2.0 (4 x USB pin-header)
Edge Connectors	1 x DC-IN Jack (+12V) 1 x VGA out connector 2 x Gigabit LAN RJ-45 1 x RS232/422/485 2 x RS232 4 x USB 3.0 connector 2 x PS2 1 x Audio Jack(Line in, Line out, Mic in)
On Board Pin-Header Connectors	3 x RS-232 (COM2.COM5.COM6) 2x5 pin-header 4 x USB 2.0 2 x USB3.0 1 x DVI/HDMI by DF-13 20-pin connector 1 x LVDS by DF-13 40-pin connector 1 x eDP by DF-13 20-pin connector(Optional) 2 x SATA III 1 x 2x4-pin wafer for SATA power 2 x 2-pin pin-header for speaker (with Amplifier): Left, Right 1 x 10-pin pin-header for DIO 1 x 3-pin digital panel backlight brightness controller 1 x 7-pin inverter 1 x 2x2-pin DC-in 12V connector 1 x 10-pin wafer for Front Panel(2x5) 2 x 2-pin wafer for +5V external power (Red) 1 x 2-pin wafer for 12V external power (Yellow) 1 x 3-pin pin-header for CPU Fan (smart fan) 1 x 20-pin box header for LPT Port 1 x 6-pin wafer for external SIM Card daughter board
Power Connector	Input: 4-pin power-input connector
Expansion Slots	3 x Mini PCIe slot 1 x PCIe x 16 slot
Form Factor	Mini-ITX
Dimensions	170mm x 170mm

Environmental	Operating temperature: 0°C to 60°C
Software Support:	
Drivers	Intel Chipset Driver Graphics Driver Audio Driver Ethernet Driver Intel® Management Engine Software Fintek COM Port Driver USB 3.0 Driver (Windows 7)
SDK	Digital I/O Watchdog

1.3.2 Function Block (V100)



1.3.3 Board Dimensions (V100)



Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IH 70 SBC Motherboard. Be cautious while working with these modules. Please carefully read the content of this chapter in order to avoid any damages.

The sections include:

- 2.1 Memory Module Installation
- 2.2 I / O Equipment Installation
- 2.3 Jumpers and Connectors
- 2.4 Jumper Settings
- 2.5 Connectors and Pin Assignment

CHAPTER

2

Chapter 2 Hardware Installation

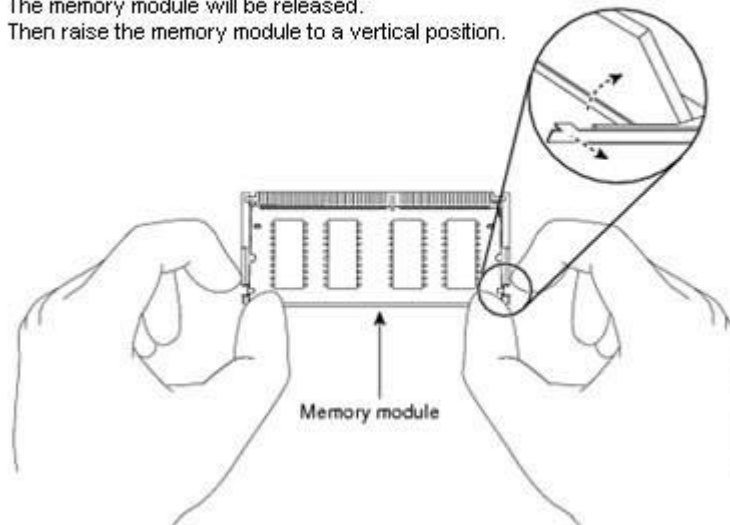
2.1 Memory Module (SO-DIMM) Installation

The IH70 SBC Motherboard has two 204-pin SODIMM slot. The socket supports up to 8GB DDR3L 1333/1600 SDRAM. When installing the –memory unit, please follow the steps below:

Steps 1 Firmly insert the SO-DIMM at an angle of about 30-degree into the slot. Align the SO-DIMM with the slot until it is fully inserted. The notch on the SO-DIMM should match the break on the slot.

Step 2 Press downwards on SO-DIMM until the retaining clips at both ends fully snap closed and the SO-DIMM is properly seated.

Pull the tabs away with your thumbs,
bracing your forefingers against the rails.
The memory module will be released.
Then raise the memory module to a vertical position.



CAUTION

The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if the SO-DIMM is forced into the slot at the incorrect orientation.

2.2 I/O Equipment Installation

2.2.1 12V DC-IN

The IH 70 SBC Motherboard allows plugging 12V DC-IN jack on the board without another power module converter under power consumption by Intel® 4th Generation Core i7/i5/i3 Processor and QM87 chipset.

2.2.2 Serial COM Ports

Three RS-232 connectors build in the rear I/O. One optional COM ports support RS-422/485. When an optional touch-screen is ordered with PPC, serial com port can connect to a serial or an optional touch-screen

2.2.3 VGA

The Motherboard has one VGA port that can be connected to an external CRT/ LCD monitor. Use VGA cable to connect to an external CRT / LCD monitor, and connect the power cable to the outlet. The VGA connector is a standard 15-pin D-SUB connector.

2.2.4 Ethernet Interface

The Motherboard is equipped with Intel® 82574L Gigabit-LAN Controller + I218LM Gigabit-LAN PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol compatible. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.2.5 USB Ports

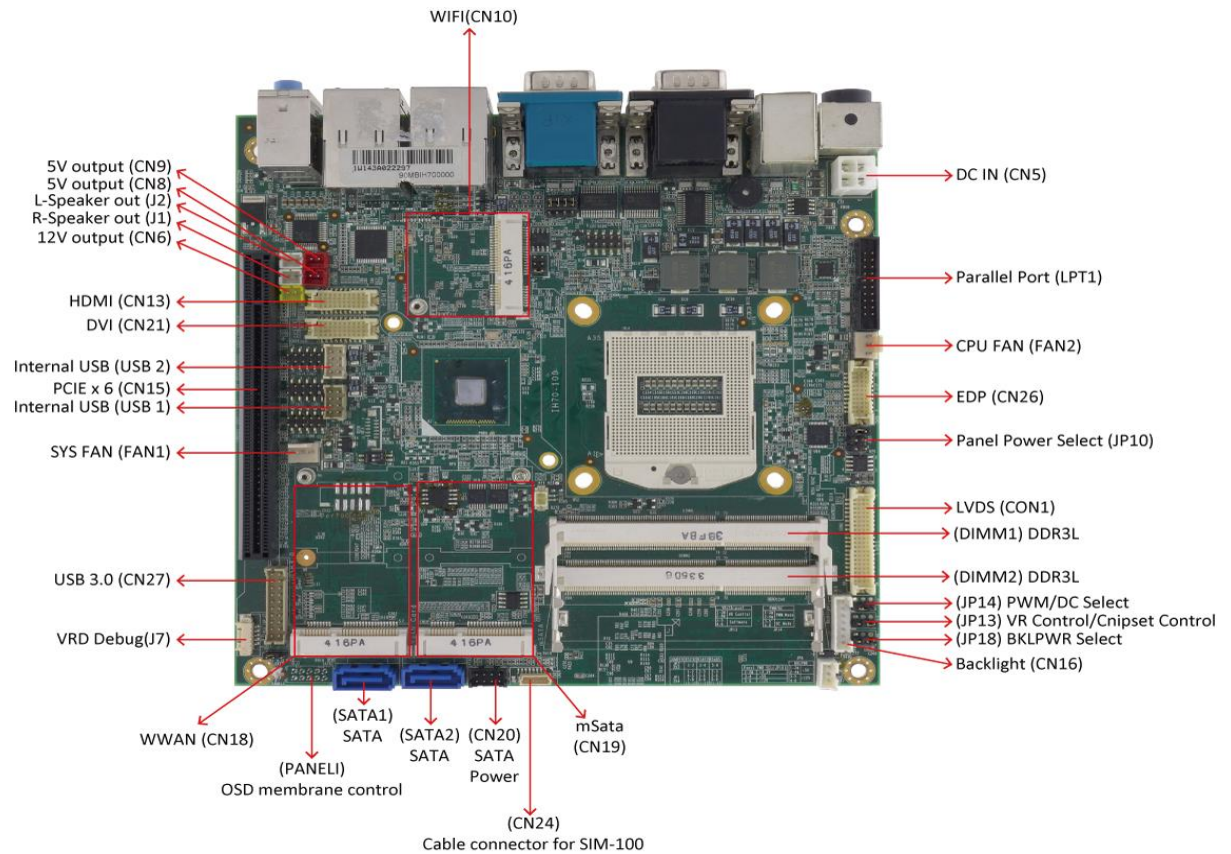
Eight USB devices (four with pin headers) may be connected to the system though an adapter cable. Various adapters may come with USB ports. USB usually connect the external system to the system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

2.2.6 Audio Function

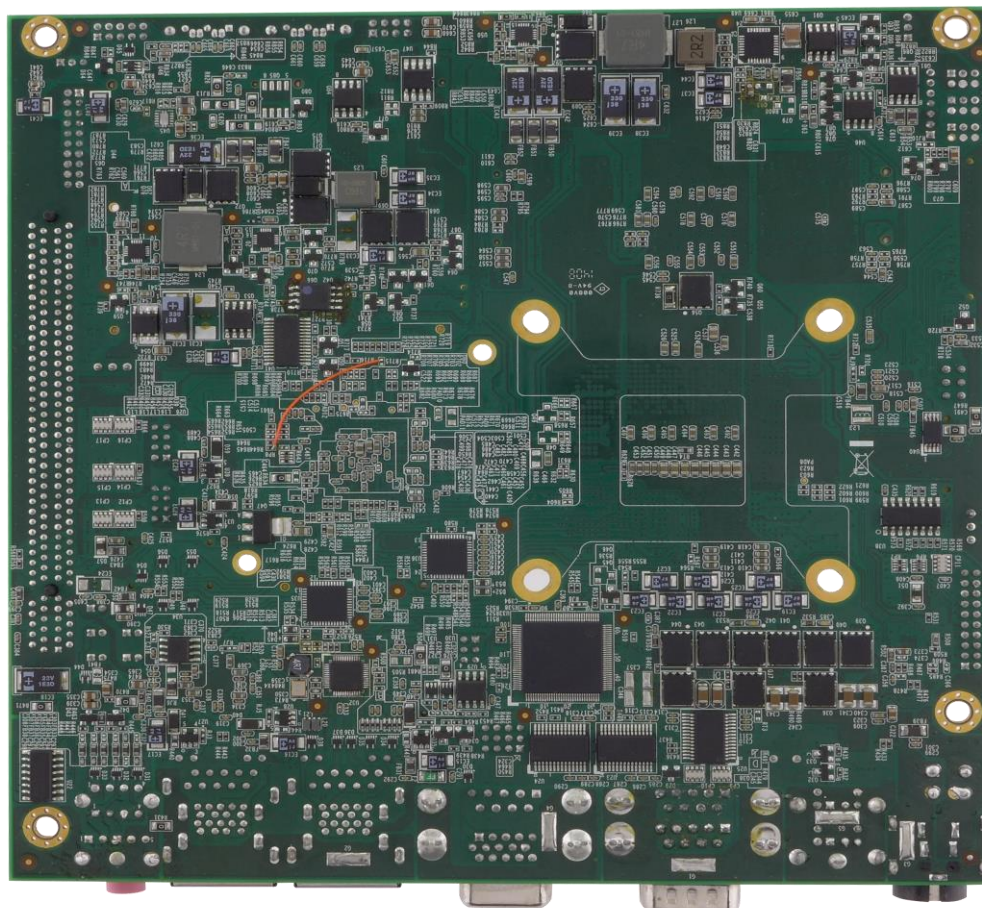
The Audio 7.1 channel capabilities are provided by a Realtek ALC886 chipset supporting digital audio outputs. The audio interface includes three jacks: line-in, line-out and mic in.

2.3 Jumpers and Connectors

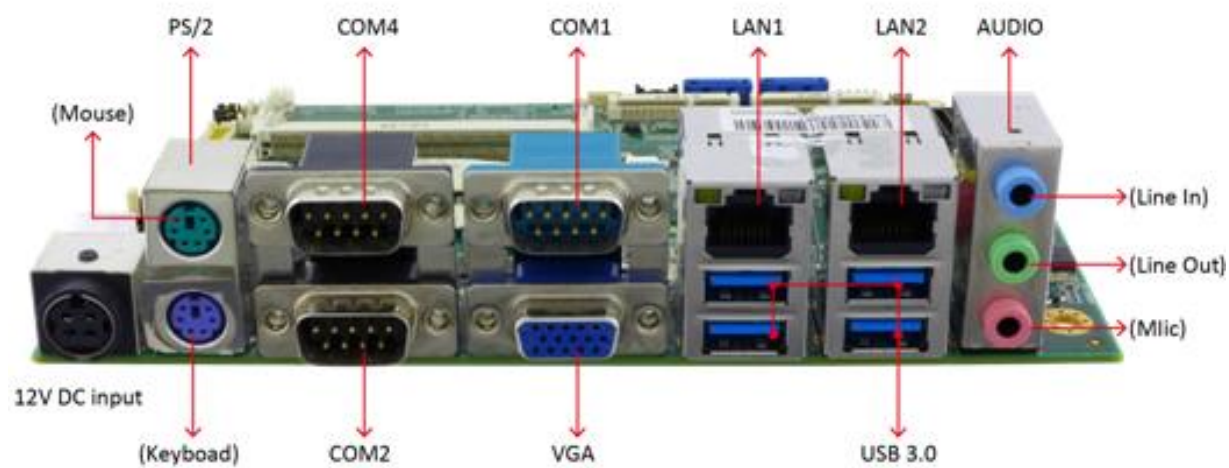
2.3.1 Component Side



2.3.2 Solder Side



2.3.3 I/O Side



2.4 Jumper Settings

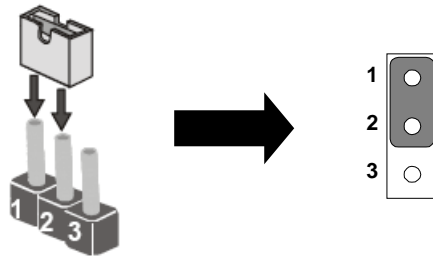
This section explains how to set jumpers for correct configuration of the motherboard.



NOTE:

A pair of needle nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is shown below. When the jumper cap is placed on both pins, the jumper is **SHORT**. The illustration below shows a 3-pin jumper; pins 1 and 2 are short. If you remove the jumper cap, the jumper is **OPEN**.



2.4.1 Jumper List

The following table shows the function of each of the board's jumpers.

Label	Function	Note
JP1	Serial Port(RS232/422/485)Select	2x3 header, pitch 2.0mm
JP2	Serial Port(RS232/422/485)Select	3x4 header, pitch 2.0mm
JP8	BKLPWR Select	1x3 Wafer, pitch 2.0mm
JP10	Panel Power Select	1x3 header, pitch 2.0mm
JP13	VR Control/Chipset Control	1x3 header, pitch 2.0mm
JP14	PWM/DC Select	1x3 header, pitch 2.0mm

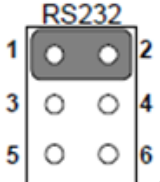
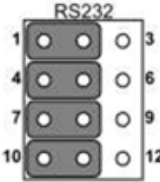
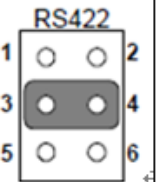
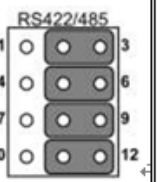
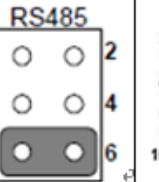
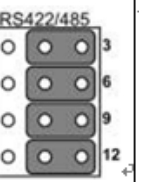
2.4.2 Setting Jumpers

JP1/JP2: COM Serial Port (RS232/422/485) Select

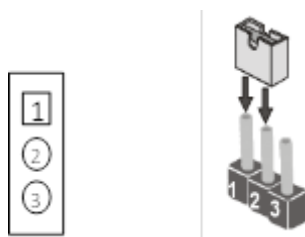
Please refer to JP1/JP2 settings below.

	RS232	RS422	RS485
JP8	1-2	3-4	5-6
JP9	1-2	2-3	2-3
	4-5	5-6	5-6
	7-8	8-9	8-9
	10-11	11-12	11-12

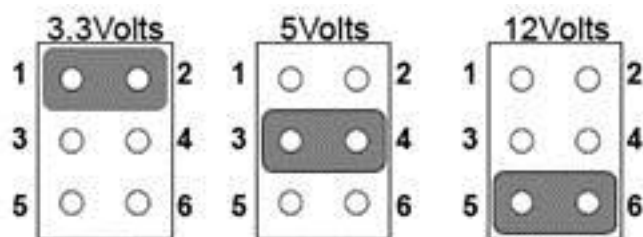
For example: At the picture below you can see RS-232, RS-422, RS-485 (J8/J9) jumper setting. To select RS-232 set Jumper 8 Pin 1-2 to the SHORT position, and Jumper 9 Pin1-2, 4-5, 7-8, 10-11 to the SHORT position.

RS232		RS422		RS485	
JP8	JP9	JP8	JP9	JP8	JP9
					

JP8: BKLPWR Select

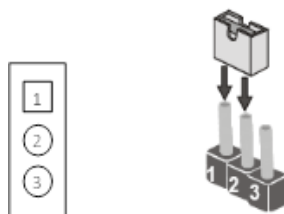


Setting	Function
1-2	+5V
2-3	+12V

JP10: Panel Power Select

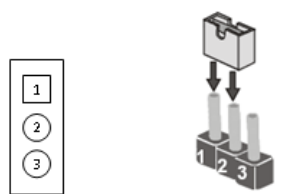
Pin №	Name
1-2*	+3.3V
3-4	+5V
5-6	+12V

*Default

JP13: VR Control/Chipset Control

Setting	Function
1-2	WM to DC mode by
2-3*	VRD Control Mode

*Default

JP14: PWM/DC Select

Setting	Function
1-2*	+ 3.3V
2-3	+ 5.0V

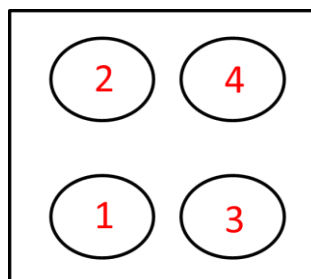
*Default

2.5 Connectors and Pin Assignment

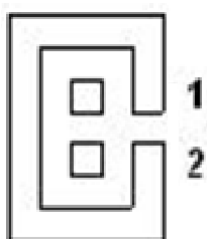
2.5.1 Front Side Setting Description

The table below shows each of front side connectors and its functions.

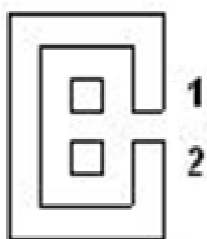
Label	Function	Note
CN5	ATX PWR	2x2 wafer, pitch 4.2mm
CN6	12V output	1x2 wafer, pitch 2.0mm
CN8	5V output	1x2 wafer, pitch 2.0mm
CN9	5V output	1x2 wafer, pitch 2.0mm
CN10	WIFI	Mini-PCle slot
CN13	HDMI	2x10 Wafer, pitch 1.25mm
CN15	PCIEX16	PCI Express x 16
CN16	Backlight	1x7 Wafer, pitch 2.0mm
CN18	WWAN	Mini-PCle slot
CN19	mSATA	Mini-PCle slot
CN20	SATA Power	2x4 Wafer, pitch 2.0mm
CN21	DVI	2x10 Wafer, pitch 1.25mm
CN24	Cable connector for SIM-100	6P Wafer, pitch 1.0mm
CN26	eDP	2x10 Wafer, pitch 1.0mm
CN27	Internal USB2.0	2x Wafer, pitch 2.0mm
CON1	LVDS	2x20 Wafer, pitch 1.25mm
DIMM1	DDR3L	204pin,SODIMM slot
DIMM2	DDR3L	204pin,SODIMM slot
FAN1	SYS_FAN1	3P Wafer, pitch 2.54mm
FAN2	CPU_FAN	3P Wafer, pitch 2.54mm
J1	R-Speaker out	1x2 Wafer, pitch 2.0mm
J2	L-Speaker out	1x2 Wafer, pitch 2.0mm
J7	VRD Debug	1x5 Wafer, pitch 1.25mm
LPT1	Parallel Port	2x10 header, pitch 2.0mm
PANEL1	OSD Membrane Control	2x5 Wafer, pitch 2.0mm
SATA1	SATA	SATA Connector
SATA2	SATA	SATA Connector
USB1	Internal USB2.0	2x4 Wafer, pitch 2.0mm
USB2	Internal USB2.0	2x4 Wafer, pitch 2.0mm

CN5: ATX PWR

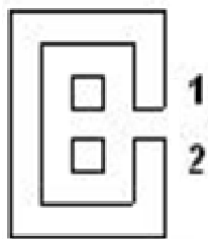
Pin №	Name	Pin №	Name
1	GND	2	GND
3	VCC	4	VCC

CN6:12V Output

Pin №	Name
1	+12V
2	GND

CN8: 5V output

Pin №	Name
1	+5V
2	GND

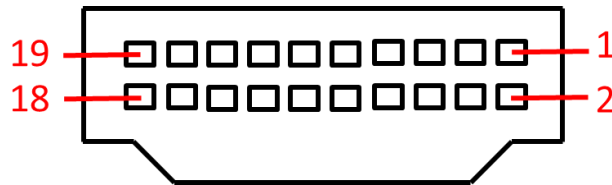
CN9: 5V Output

Pin №	Name
1	+5V
2	GND

CN10: Wifi

Pin №	Name	Pin №	Name
1	PCIE_WAKE#	2	3.3V
3	NC	4	GND
5	BT_EN	6	+1.5V
7	CLK_SLOT2_OE#	8	NC
9	GND	10	NC
11	CLK_PCIE_SLOT2_N	12	NC
13	CLK_PCIE_SLOT2_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	3G_EN
21	GND	22	PCIE_RESET
23	PCIE2_RXN2	24	+3.3V
25	PCIE2_RXP2	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE2_TXN2	32	SMB_DATA
33	PCIE2_TXP2	34	GND

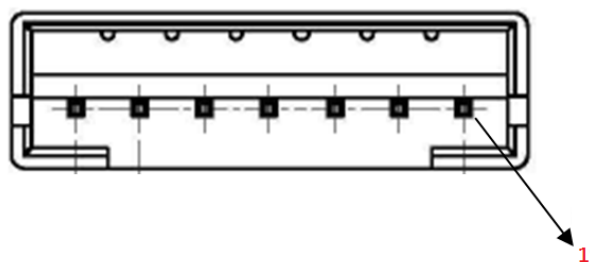
35	GND	36	USB_D-
37	GND	38	USB_D+
39	3.3V	40	GND
41	3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5 V
49	NC	50	GND
51	3.3V	52	3.3V
M1	GND	M2	GND

CN13: HDMI

Pin №	Name	Pin №	Name
1	TMDS_DATA2+	2	GND
3	TMDS_DATA2-	4	TMDS_DATA1+
5	GND	6	TMDS_DATA1-
7	TMDS_DATA0+	8	GND
9	TMDS_DATA0-	10	TMDS_CLOCK+
11	GND	12	TMDS_CLOCK-
13	CEC	14	NC
15	DDC_CLOCK	16	DDC_DATA
17	GND	18	5V
19	Hot Plug Detect		

CN15: PCIEX16

*PCI Express x16 standard

CN16: Backlight

Pin №	Name	Pin №	Name
1	Backlight Power	2	Backlight Power
3	Backlight Power	4	GND
5	Brightness Adjust	6	GND
7	Backlight Enable		

Note: Please refer to [JP8](#) settings to select POWER RATING

CN18: WWAN

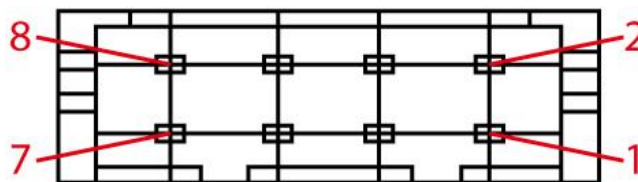
Pin №	Name	Pin №	Name
1	PCIE_WAKE#	2	+3.3V
3	NC	4	GND
5	BT_EN	6	+1.5V
7	CLK_OE#	8	USIM_PWR
9	GND	10	USIM_DATA
11	PCIE_CLKM	12	USIM_CLOCK
13	PCIE_CLKP	14	USIM_RESET
15	GND	16	USIM_VPP
17	NC	18	GND
19	NC	20	Wireless_ENABLE
21	GND	22	PCIE_RESET
23	PCIE_RXM	24	+3.3V
25	PCIE_RXP	26	GND
27	GND	28	+1.5V

29	GND	30	SMB_CLK
31	PCIE_TXM	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	+3.3V	52	+3.3V

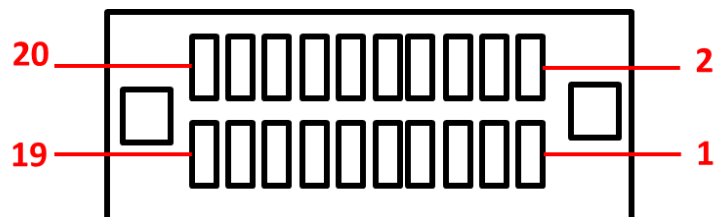
CN19: mSATA

Pin №	Name	Pin №	Name
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	SATA_RXP	24	+3.3V
25	SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_Clock

31	SATA_TXN	32	SMB_Data
33	SATA_TXP	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	SSD_LED#	50	GND
51	NC	52	+3.3V

CN20: SATA Power

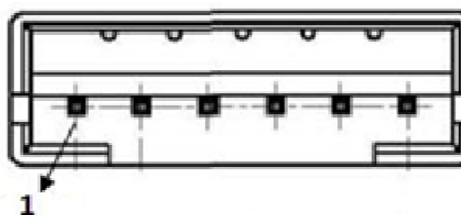
Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

CN21: DVI

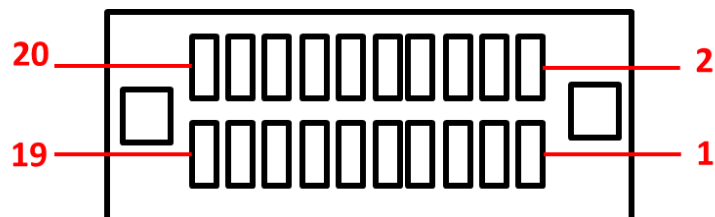
Pin №	Name	Pin №	Name
1	GND	2	TMDS2-
3	GND	4	TMDS2+
5	DVIC_LVDS_DET	6	TMDS1-
7	DVIC_BKLTEN	8	TMDS1+
9	DVIC_VDDEN	10	TMDS0-
11	DVIC_HPD2	12	TMDS0+
13	DVI VPNL	14	CLK-
15	DVI VPNL	16	CLK+
17	DVI_EXT_5V	18	DDC_CLK
19	DVI_EXT_5V	20	DDC_DATA

Note: 1) Refer to [JP10](#) Settings to select POWER RATING for LCDVDD

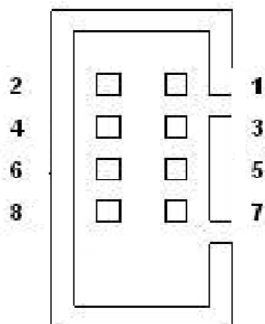
2) Refer to [JP8](#) settings to select BKL PWR

CN24: Cable connector for SIM-100

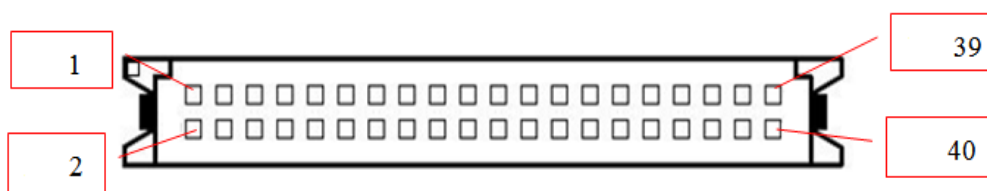
Pin №	Name	Pin №	Name
1	VREG_USIM	2	SIM_RESET
3	SIM_CLK	4	GND
5	SIM_VPP	6	SIM_DATA

CN26: eDP Output Connector

Pin №	Name	Pin №	Name
1	TXP0_C	2	VDD_eDP
3	TXN0_C	4	VDD_eDP
5	GND	6	+VCC_EDP_BKLT
7	TXP1_C	8	+VCC_EDP_BKLT
9	TXN1_C	10	+VCC_EDP_BKLT
11	GND	12	EDP_HPD
13	AUXP	14	GND
15	AUXN	16	GND
17	BKLT_EN	18	GND
19	BKLT_CTRL	20	GND

CN27: Internal USB2.0

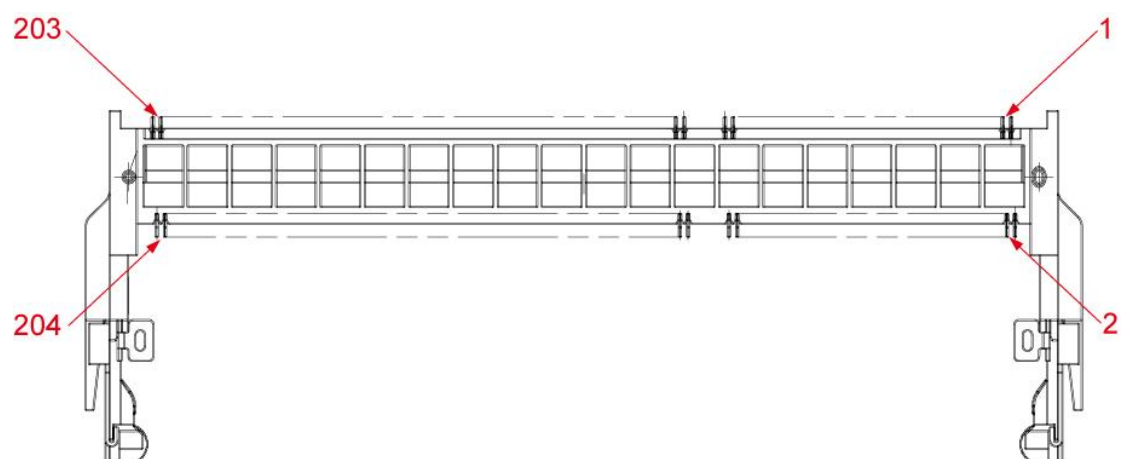
Pin №	Name	Pin №	Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

CON1: LVDS

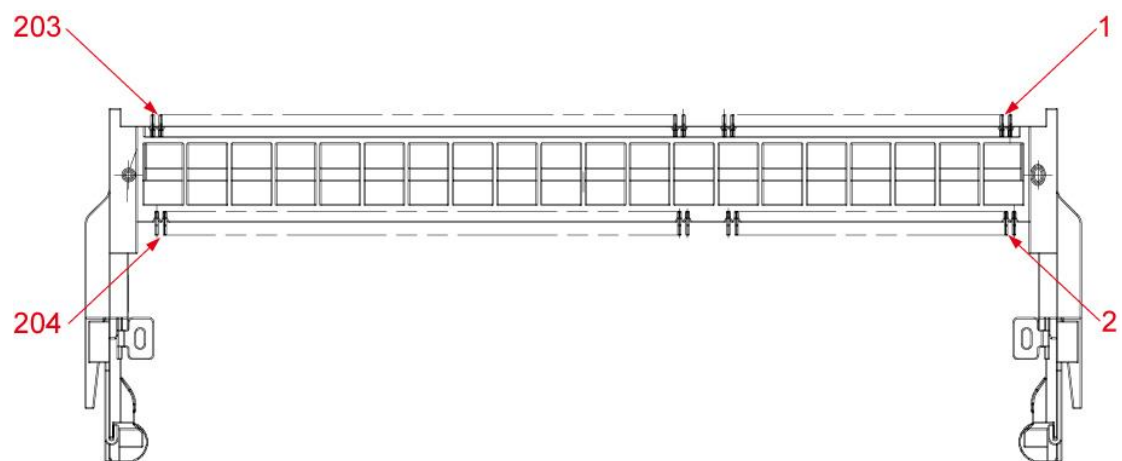
Pin №	Signal Name	Pin №	Signal Name
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	GND	26	LVDS1_TX1_N
27	GND	28	LVDS1_TX1_P
29	GND	30	LVDS1_TX2_N
31	GND	32	LVDS1_TX2_P
33	GND	34	LVDS1_CLK_N
35	GND	36	LVDS1_CLK_P
37	GND	38	LVDS1_TX3_N
39	GND	40	LVDS1_TX3_P

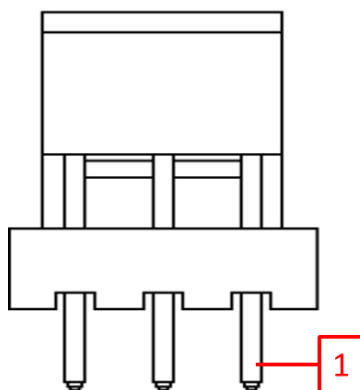
Note: Refer to [JP10](#) setting to select POWER RATING for LCDVDD

DIMM1: DDR3L

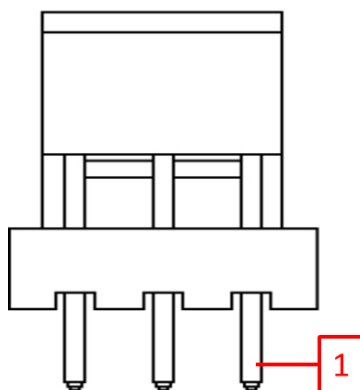


DIMM2: DDR3L

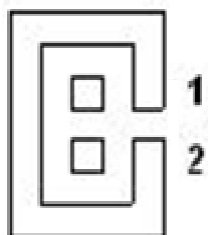


FAN1: SYS_FAN1

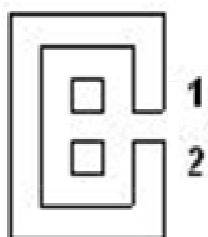
Pin №	Name	Pin №	Name
1	GND	2	+12V
3	SENSE		

FAN2: CPU_FAN

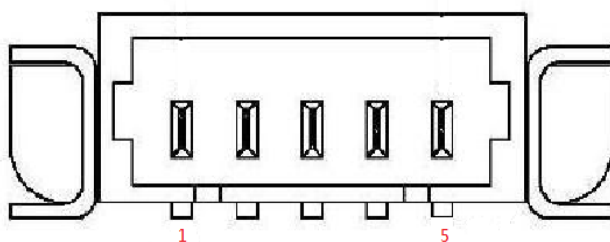
Pin №	Name	Pin №	Name
1	GND	2	+12V
3	SENSE		

J1: R-Speaker out

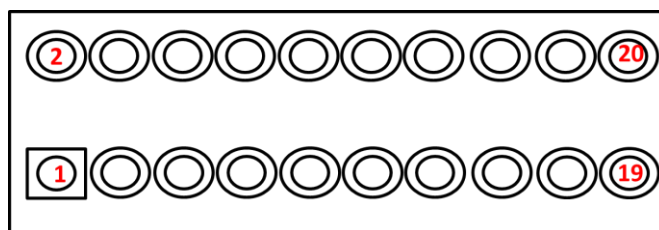
Pin №	Name
1	ROUT-
2	ROUT+

J2: L-Speaker out

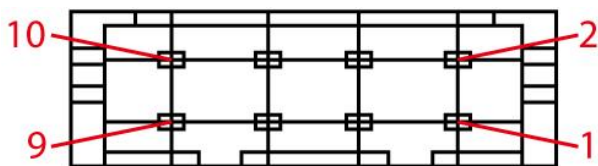
Pin №	Name
1	LOUT-
2	LOUT+

J7: VRD Debug

Pin №	Name	Pin №	Name
1	+3.3V	2	DATA
3	CLOCK	4	RESET
5	GND		

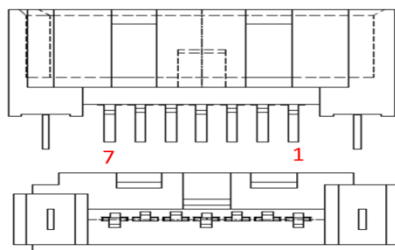
LPT1: Parallel Port

Pin №	Name	Pin №	Name
1	LPT_STB#	2	LPT_PD0
3	LPT_PD1	4	LPT_PD2
5	LPT_PD3	6	LPT_PD4
7	LPT_PD5	8	LPT_PD6
9	LPT_PD7	10	ACK#
11	Busy	12	PE
13	SLCT	14	LPT_AFD#
15	ERR#	16	LPT_INIT#
17	LPT_SLIN#	18-25	GND

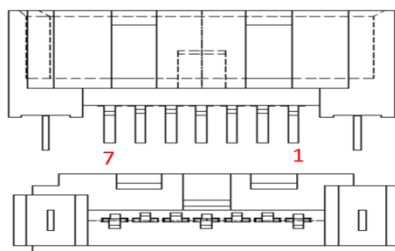
Panel1: OSD Membrane Control

Pin №	Name	Pin №	Name
1	+5V	2	+3.3V
3	GND	4	HDD_LED
5	PWRBTN#	6	GND
7	GND/ Backlight ADJ+	8	Reset
9	NC/Backlight ADJ-	10	+5V

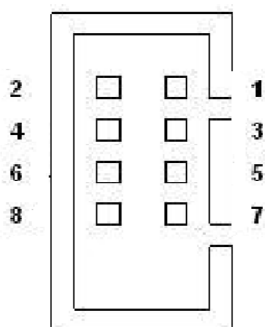
NOTE: Backlight ADJ+ / Backlight ADJ- optional functions

SATA1: SATA

Pin №	Name	Pin №	Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

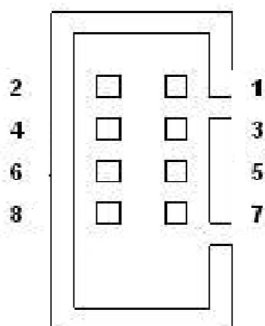
SATA2: SATA

Pin №	Name	Pin №	Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

USB1: Internal USB2.0

Pin №	Name	Pin №	Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

USB2: Internal USB2.0

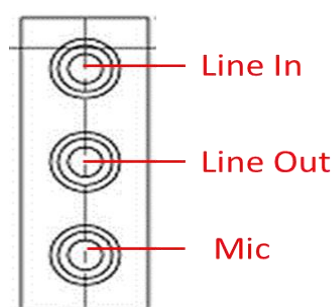
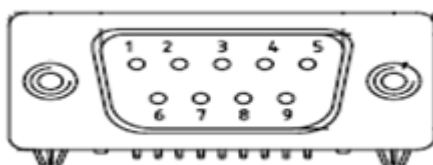


Pin №	Name	Pin №	Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

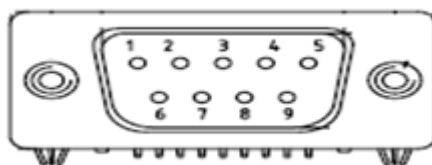
2.5.2 I/O Side

The table below shows each of I/O side connectors and its functions.

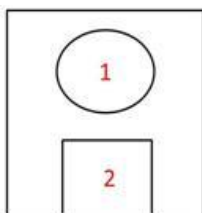
Label	Function	Note
Audio	Line In/Line Out/Mic	
COM1	Serial port (RS232/422/485)	D-Sub 9
COM2/ COM4	Serial port (RS232/422/485)	D-Sub 9
12V DC Input	12V DC INPUT	DIN-4P
LAN1, LAN2	Gigabit Ethernet	RJ45+LED
PS/2	Mouse/Keyboard	MiniDIN-6P
USB	USB 3.0	USB Type A
VGA	Video Graphics Array	D-Sub 15

Audio: Line In/Line Out/Mic**COM1: D-Sub 9**

Pin №	RS232	RS422	RS485
1	DCD	TxD-	D-
2	RXD	TxD+	D+
3	TXD	RxD+	NC
4	DTR	RxD-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

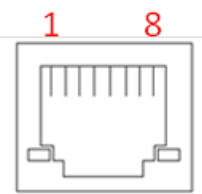
COM2, COM4: Serial port (232)

Pin №	Name	Pin №	Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

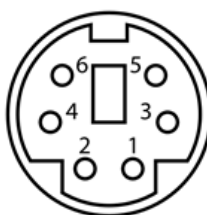
12V DC Input: 12V DC INPUT

Pin №	Name	Pin №	Name
1	+12V	2	GND
3*	GND		

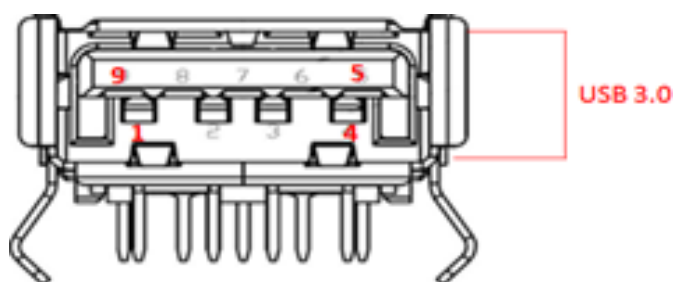
***Note:** Pin 3 is not visible for use

LAN1, LAN2: Gigabit Ethernet

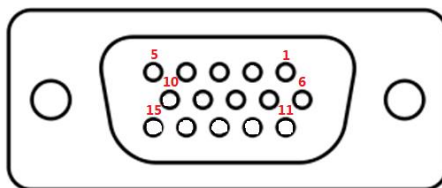
Pin №	Name	Pin №	Name
1	TX1+	2	TX1-
3	TX2+	4	TX2-
5	TX3+	6	TX3-
7	TX4+	8	TX4-

PS/2: Mouse/Keyboard

Pin №	Name	Pin №	Name
1	+DATA	2	Reserved
3	GND	4	Vcc
5	+CLK	6	Reserved

USB: USB 3.0

Pin №	Name	Pin №	Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+		

VGA: Video Graphics Array

Pin №	Name	Pin №	Name
1	RED	2	GREEN
3	BLUE	4	ID2/RES
5	GND	6	RED_RTN
7	GREEN_RTN	8	BLUE_RTN
9	KEY/PWR	10	GND
11	ID0/RES	12	ID1/SDA
13	HSync	14	VSync
15	ID3/SCL		

AMI BIOS Setup

This chapter contains BIOS Configuration and OS Recovery information.

Sections include:

- 3.1 When and How to Use BIOS Setup
- 3.2 BIOS Functions
- 3.3 Using Recovery Wizard to Restore Computer

CHAPTER 3

Chapter 3 AMI BIOS SETUP

3.1 When and How to Use BIOS Setup

To enter the BIOS setup, you need to connect an external USB keyboard, press Del key when the prompt appears on the screen during start up. The prompt screen shows only few seconds so need press Del key quickly.



IMPORTANT:

Updated BIOS version may be published after the manual released.
Check the latest version of BIOS on the website.

You may need to run BIOS setup utility for reasons listed below:

1. Error message on screen indicates to check BIOS setup
2. Restoring the factory default settings.
3. Modifying the specific hardware specifications
4. Necessity to optimize specifications

BIOS Navigation Keys

The following keys are enabled during POST:

Key	Function
Del	Enters the BIOS setup menu.
F7	Display the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER>, select the device used for the boot.
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

The following Keys can be used after entering the BIOS Setup.

Key	Function
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit
Esc	Exit
+/-	Change Opt.
Enter	Select or execute command
Cursor ↑	Moves to the previous item
Cursor ↓	Goes to the next item
Cursor ←	Moves to the previous item
Cursor →	Goes to the next item

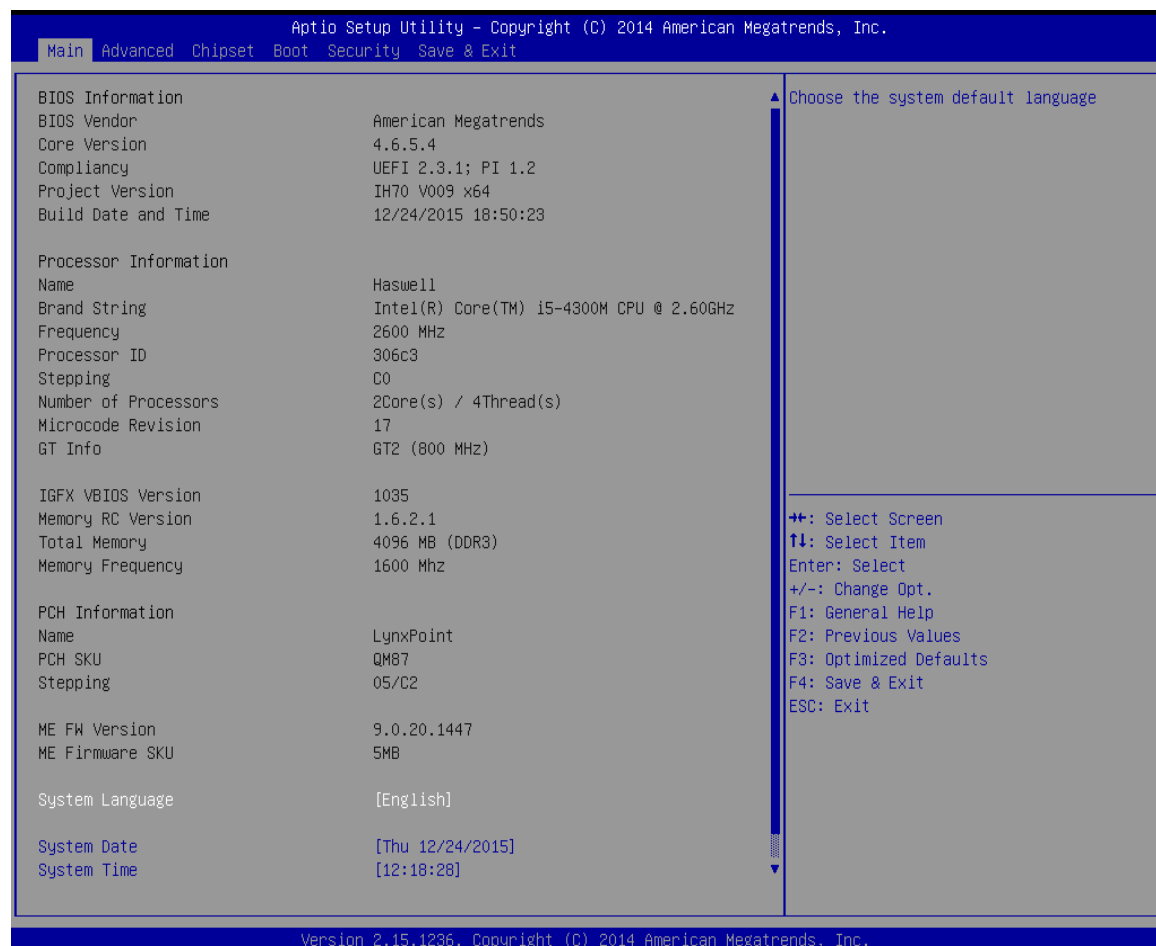
**NOTE:**

You can press the F1, F2, F3, F4, –/+, and Esc keys by connecting a USB keyboard to your computer.

3.2 BIOS Functions

3.2.1 Main Menu

When you enter BIOS setup, the first menu that appears on the screen is the main menu. The Main menu displays the basic information about your system including BIOS version, processor RC version, system language, time, and date. It contains the system information including BIOS version, processor RC version, system language, time, and date.



BIOS Setting	Description	Setting Option	Effect
System Language	Displays the system language. [English] is used by default.	Select the system language	Set the system language. The language of this device is English.
System Date	This is current date setting.	Date changes.	Set the date in the format [mm/dd/yyyy];
System Time	The time is maintained by the battery when the device is turned off.	Time changes	Set the time in the format: [hh/mm/ss]

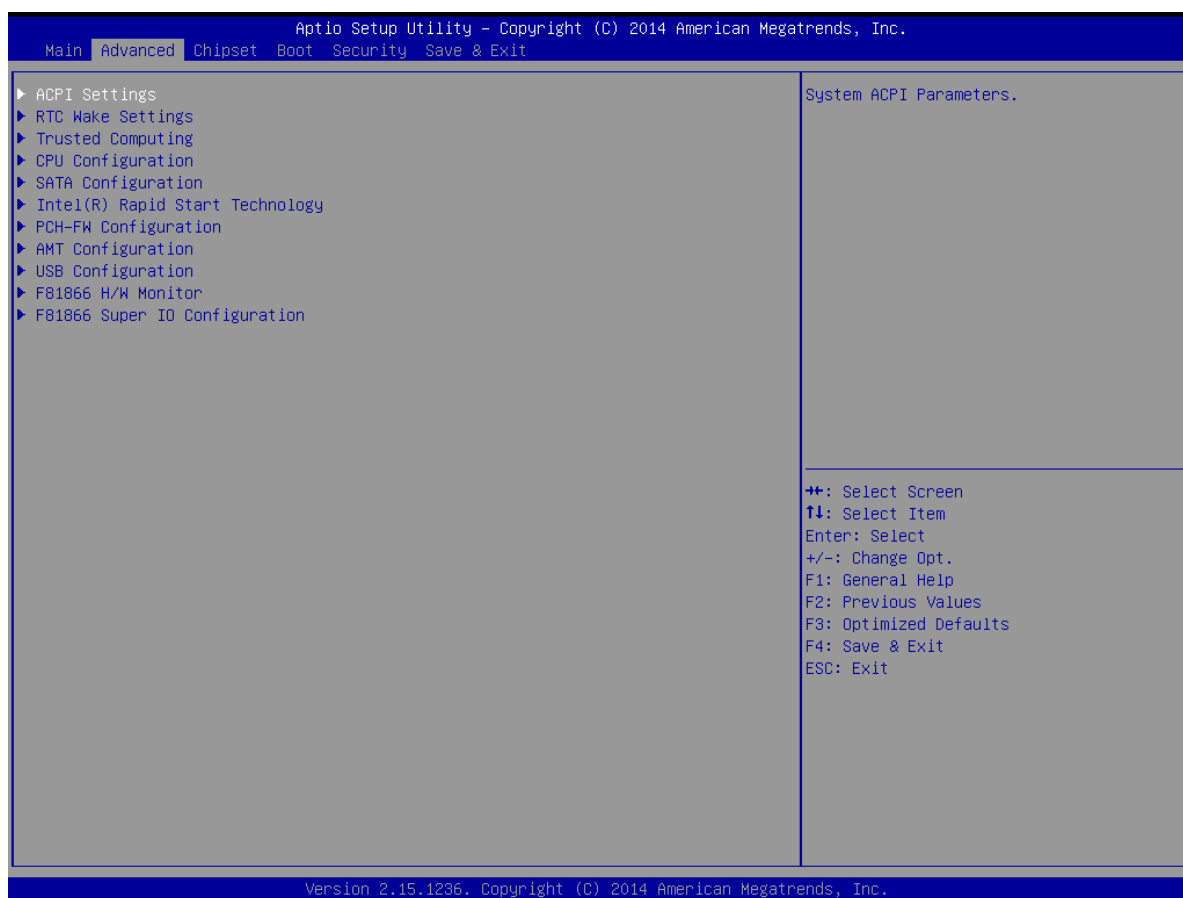
3.2.2 Advanced Menu

The advanced menu also uses to set configuration of the CPU and other system devices. There are sub menus on the left frame of the screen.



CAUTION

Handle advanced BIOS settings page with caution. Any changes can affect the operation of your computer.



BIOS Setting	Description	Setting Option	Effect
ACPI Settings	Configures ACPI settings	Enter	Opens submenu
RTC Wake Settings	Configures RTC Wake parameters	Enter	Opens submenu
Trusted Computing	Configures Trusted Computing parameters	Enter	Opens submenu
CPU Configuration	Configures CPU parameters	Enter	Opens submenu

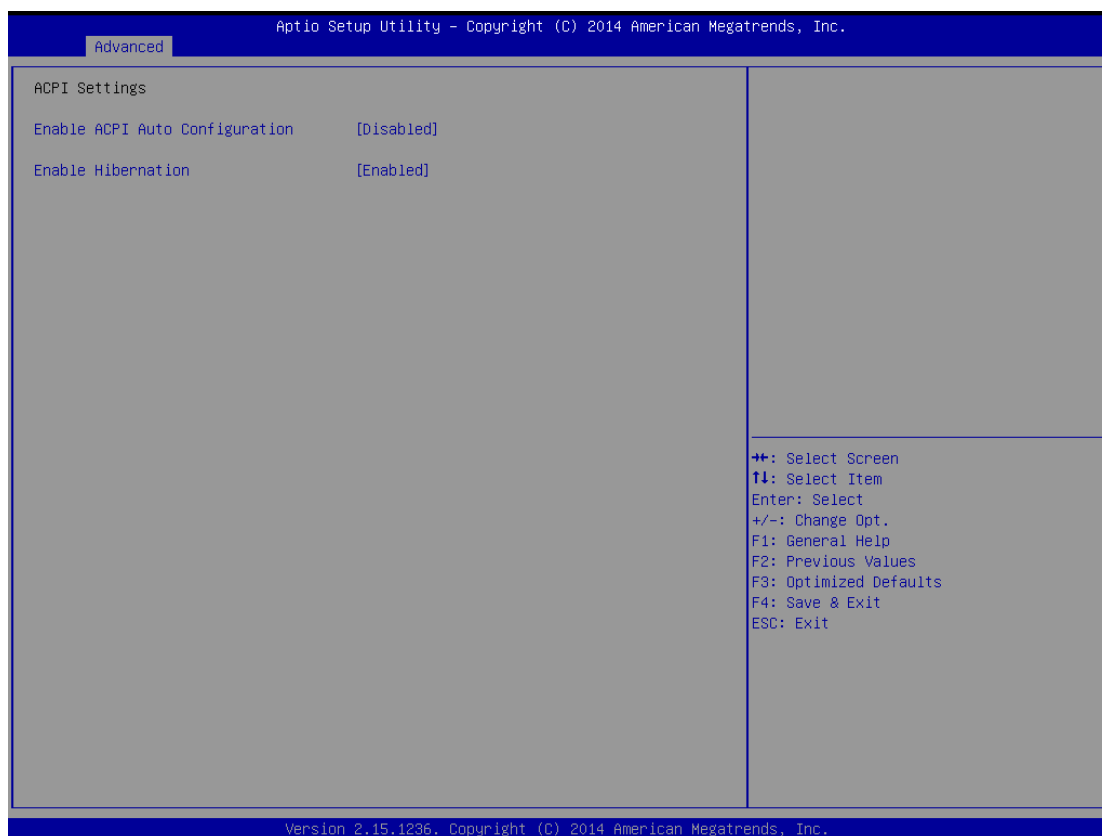
SATA Configuration	Configures SATA parameters	Enter	Opens submenu
Intel ®Rapid Start Technology	Configures Intel ®Rapid Start Technology parameters	Enter	Opens submenu
PCH-FW Configuration	Configures PCH-FW parameters	Enter	Opens submenu
AMT Configuration	Configures AMT parameters	Enter	Opens submenu
USB Configuration	Configures USB parameters	Enter	Opens submenu
F81866 H/W Monitor	Configures F81866 Monitor parameters	Enter	Opens submenu
F81866 Monitor Super IO Configuration	Configures F81866 Monitor Super IO parameters	Enter	Opens submenu

You can select any of the items listed in the table below:

For items marked ► press <Enter> for more options.

ACPI Settings

Advanced Configuration and Power Interface (ACPI) settings allow to control how the power switch operates. The power supply can be adjusted for power requirements. You can use the screen to select options of ACPI configuration. A description of the selected items will appear on the right side of the screen.



BIOS Setting	Description	Setting Option	Effect
Enable ACPI Auto Configuration	Enable or disable BIOS ACPI Auto Configuration	Enabled/Disabled	Enable or disable this function
Enable Hibernation	To enable or disable hibernation	Enabled/Disabled	Enable or disable this function

RTC Wake Settings

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.

Advanced

Wake system with Fixed Time	[Disabled]
Wake system with Dynamic Time	[Disabled]
Wake system from S5	[Disabled]
Wake system from S4	[Disabled]

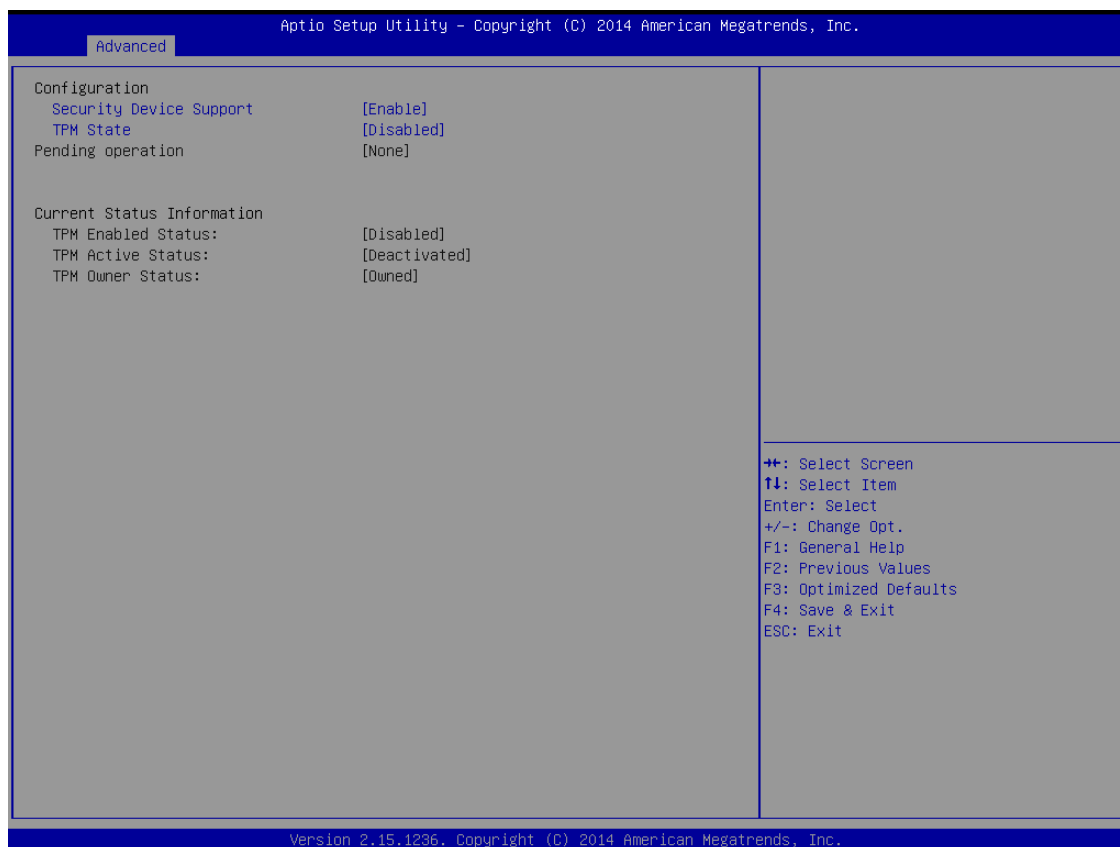
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

Version 2.15.1236. Copyright (C) 2014 American Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
Wake system with Fixed Time	System wake on alarm event	Enabled/ Disabled	Enable or disable this function. When enabled, the system will wake on the hr: min: sec specified.
Wake system with Dynamic Time	System wake on alarm event	Enabled/ Disabled	Enable or disable this function. When enabled, the system will wake on current time+ time specified
Wake system from S5	Configure wake from full shutdown and boot mode (S5) system setting	Enabled/ Disabled	Enable or disable this function. When enabled, the system will wake on full shutdown and boot mode.

Wake system from S4	Configure wake from hibernation mode (S4) system setting	Enabled/ Disabled	When enabled, the system will wake on hibernation mode.
---------------------	--	-------------------	---

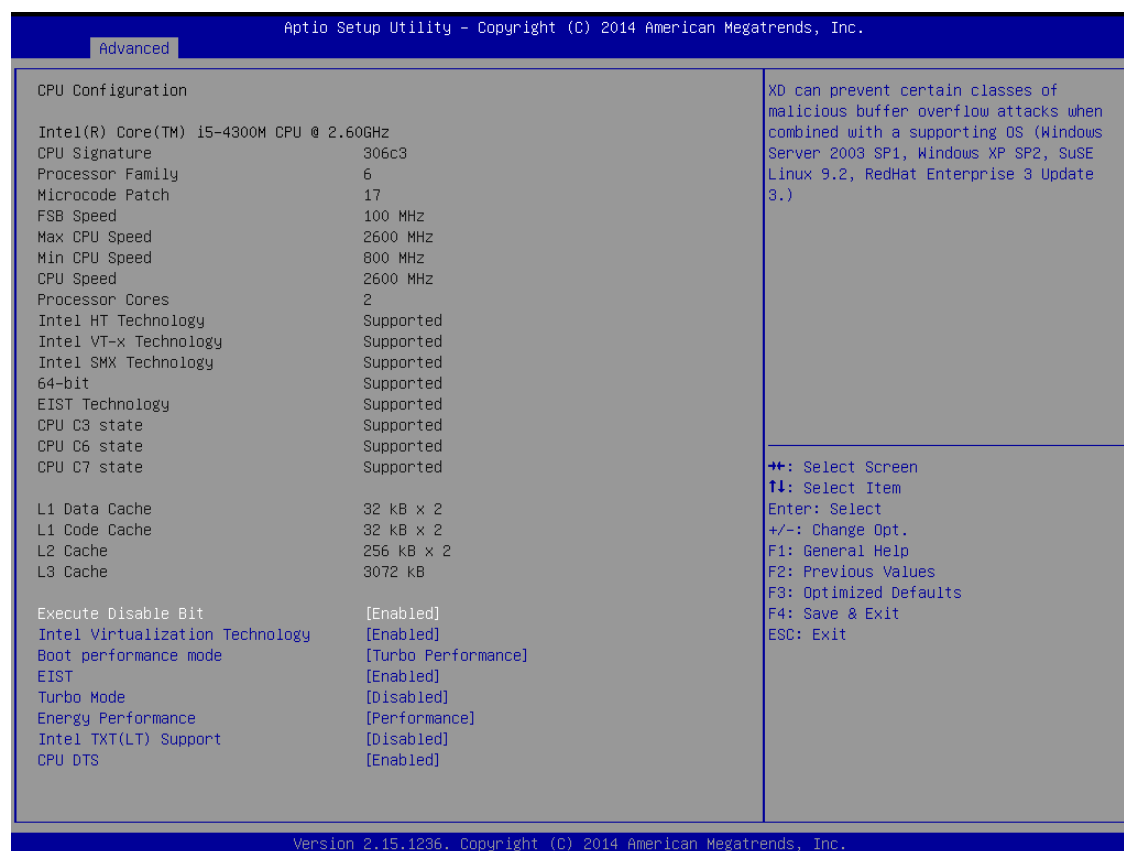
Trusted Computing



BIOS Setting	Description	Setting Option	Effect
Security Device Support	Enable or disable BIOS support for security device.	Enabled/ Disabled	Enable or disable this function.
TPM State	Trusted Platform Module (TPM) parameters.	Enabled/ Disabled	Enable or disable this function.

CPU Configuration

Press **<Enter>** to view current CPU configuration and make settings for the following sub-items.

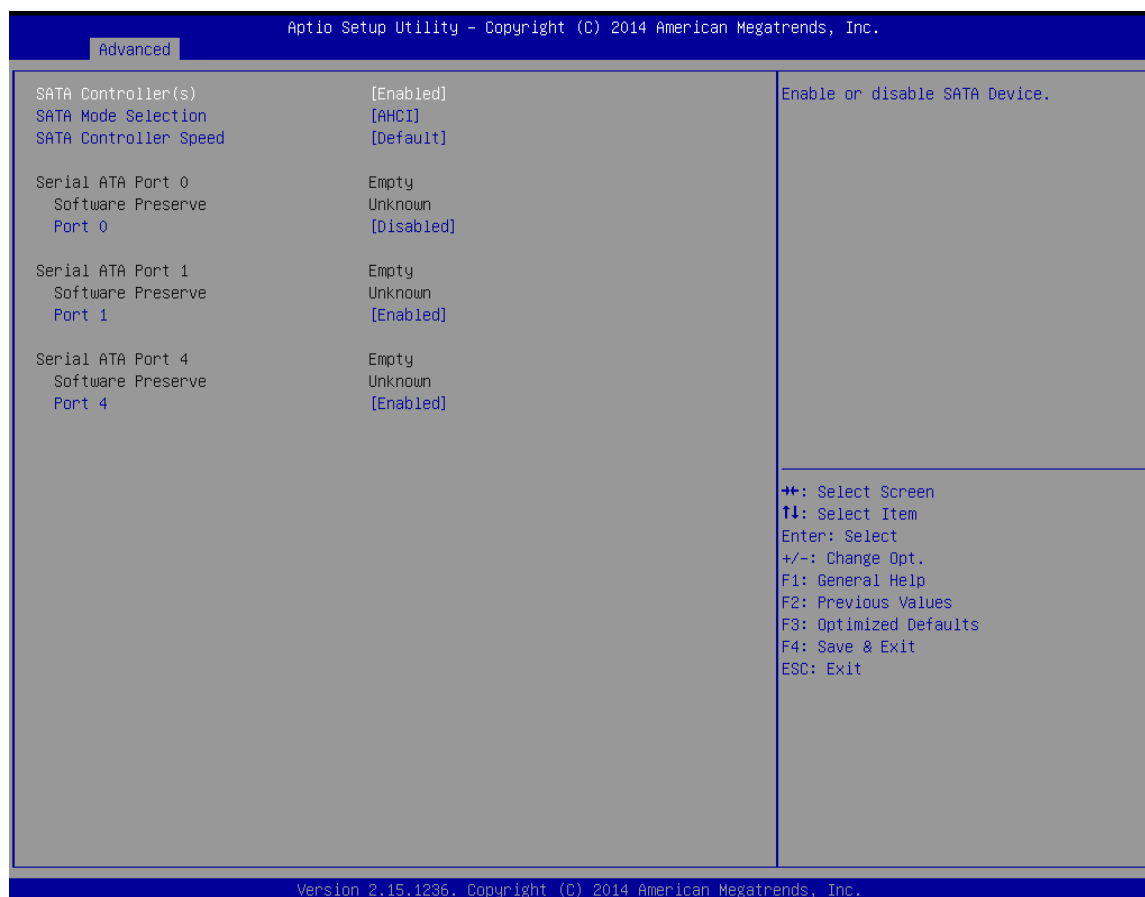


BIOS Setting	Description	Setting Option	Effect
Execute Disable Bit	EDB is a hardware-based security component used in the central processing unit (CPU) to separate areas of a memory as storage of processor instructions or as storage of data.	Enabled	Reduces a computer system's, or a server's, vulnerability to viruses and malicious code attacks
		Disabled	Increases the risk to be infected by viruses
Intel Virtualization Technology	Enables a CPU to act as if you have several independent computers, in order to enable several	Enabled/ Disabled	Enable or disable this function

	operating systems to run at the same time on the same machine.		
Boot Performance Mode	This feature selects the performance state the BIOS will set before the OS hand-off.	Auto	Auto mode
		Standard	Allows processor cores to run at the frequency recommended by the manufacturer.
		Turbo	Allows processor cores to run faster than the frequency recommended by the manufacturer.
EIST	Enhanced Intel SpeedStep Technology gives your OS the ability to switch the processor's speed and voltage up and down, to preserve power when not much is being computed.	Enabled/ Disabled	Enable or disable this function
Turbo Mode	Adjusts the power and clock speed of processor cores as needed to better match processor power to your needs.	Enabled/ Disabled	Enable or disable this function
Energy Performance	This option manages the internal "Power Control Unit" of the processors and optimizes the power management functions of the processors between performance and energy efficiency.	Performance/ Balanced Performance/ Balanced Energy/ Energy Efficient	Select energy performance mode
Intel TXT(LT) Support	Configure Intel Trusted Execution Technology	Enabled/ Disabled	Enable or disable this function

	parameters		
CPU DTS	Digital Thermal Sensors (DTS) parameters.	Enabled/ Disabled	Enable or disable this function

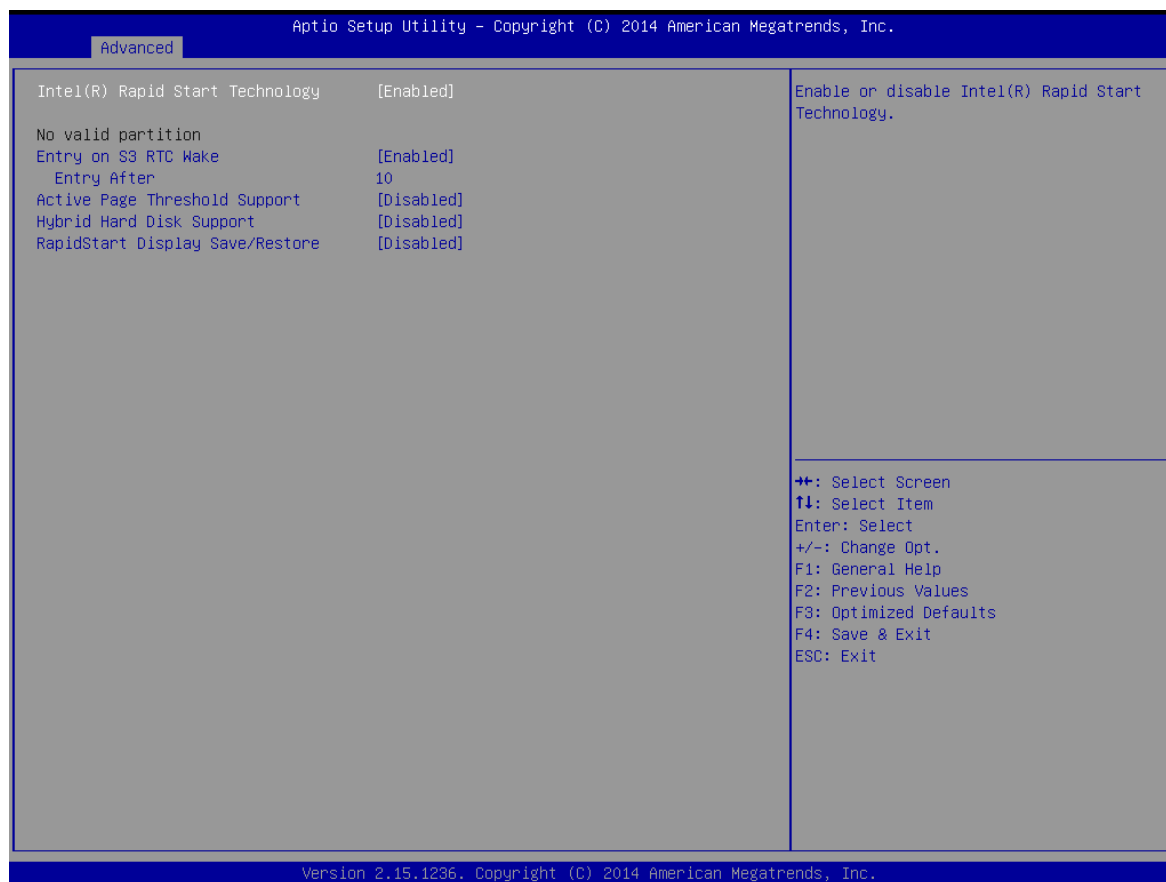
SATA Configuration



BIOS Setting	Description	Setting Option	Effect
SATA Controller(s)	Allows users to enable or disable the SATA controller(s).	Enabled/ Disabled	Enable or disable this function
SATA Mode Selection	Allows users to select mode of SATA controller(s).	AHCI	Work in AHCI mode of SATA controller(s)
SATA Controller Speed	Allows users to select mode of SATA Controller Speed.	Default	SATA Controller Speed default settings
Serial ATA Port 0/1/4	Allows users to enable or disable the SATA Port.	Enabled/ Disabled	Enable or disable this function

INTEL® Rapid Star Technology

Allows users to enable or disable Intel rapid start technology.

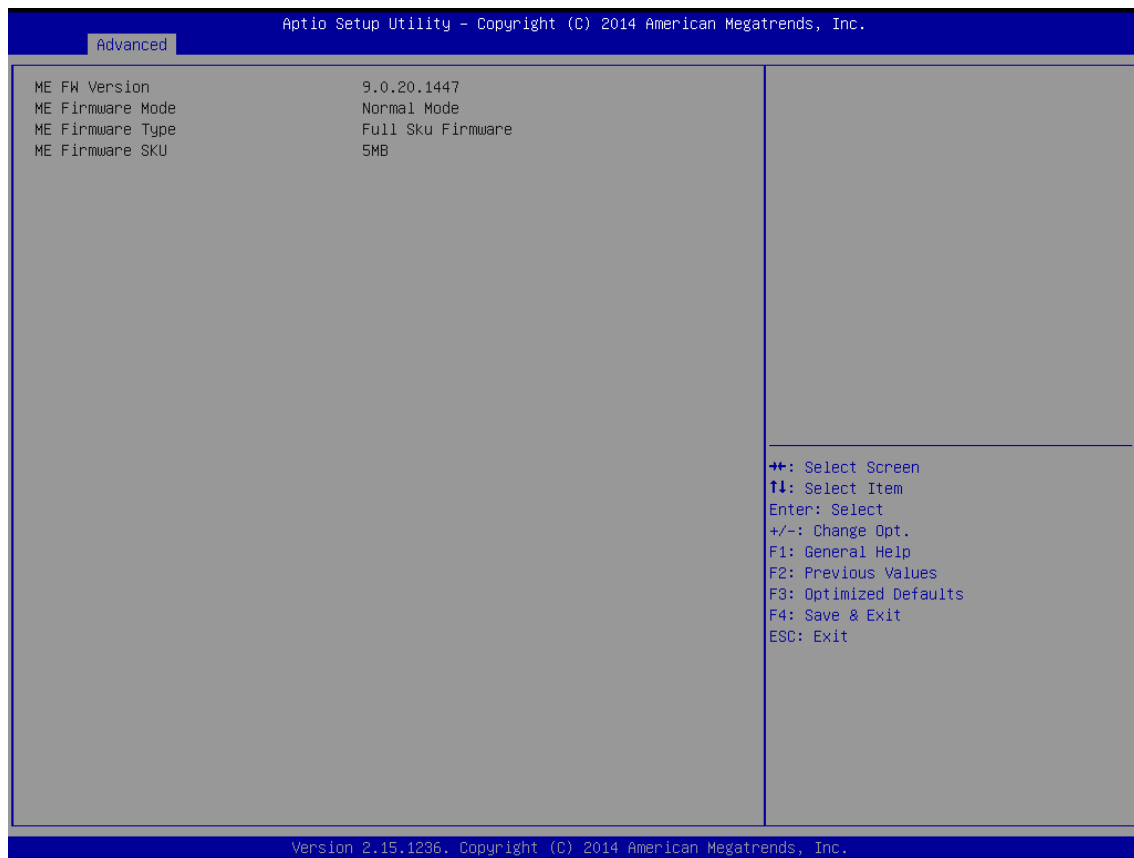


BIOS Setting	Description	Setting Option	Effect
Entry on S3 RTC Wake	The system automatically wakes up and set to Rapid Start Technology S3 mode.	Enabled/ Disabled	Enable or disable this function
Entry After	Allows you to set the RTC wake-up timer at S3 entry.	The time ranges from 0 minute (immediately) to 120 minutes	Set parameters of Wake up timer at S3 entry
Active Page Threshold Support	The system automatically goes into sleep mode when the partition size is not enough for the Intel® Rapid Start Technology to work.	Enabled/ Disabled	Enable or disable this function

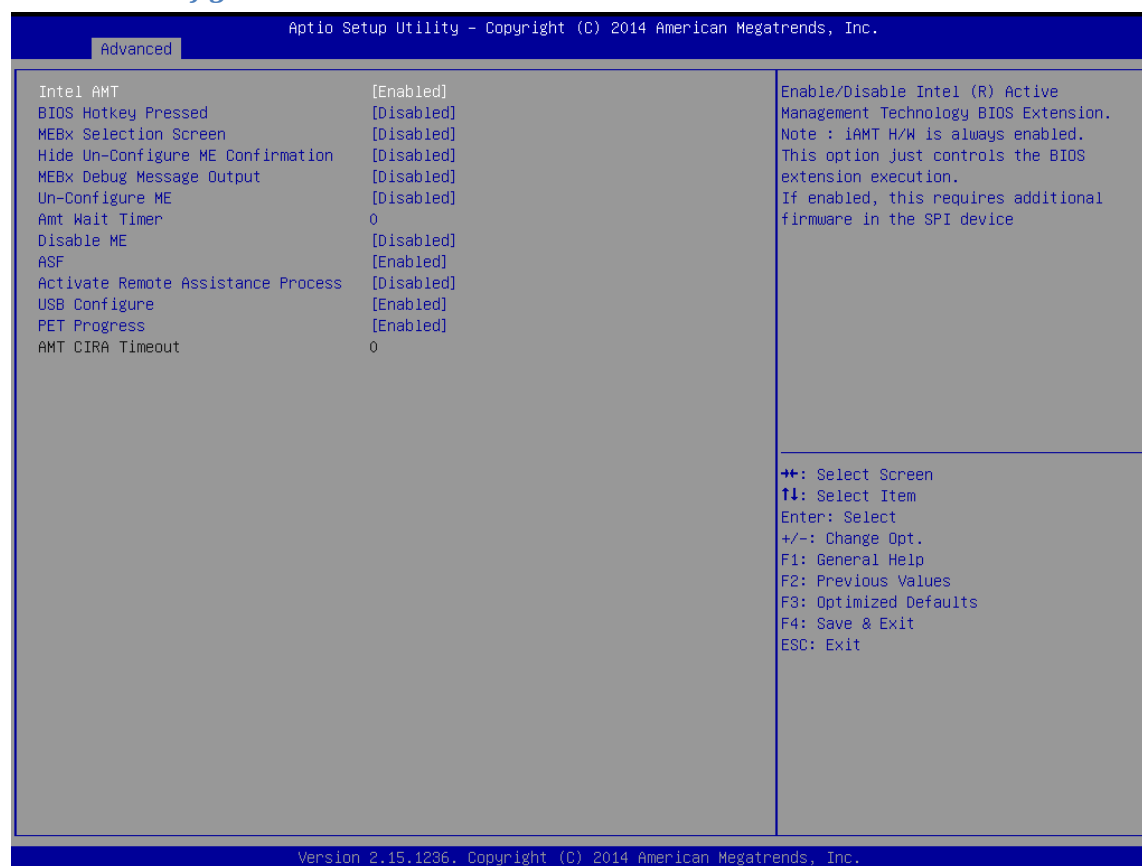
Hybrid Hard Disk Support	Allows you to enable or disable the hybrid hard disk support	Enabled/ Disabled	Enable or disable this function
Rapid Display Save/Restore	Allows you to enable or disable the Rapid Display Save/ Restore	Enabled/ Disabled	Enable or disable this function

PCH-FW Configuration

This menu allows checking which FW Version, Mode, Type and SKU installed on your computer.



Intel AMT Configuration



BIOS Setting	Description	Setting Option	Effect
Intel AMT	Set parameters of Intel® Active management Technology BIOS Extension.	Enabled/ Disabled. Default: Enabled	Enable or disable this function
BIOS Hotkey Pressed	BIOS Hotkey Pressed parameters	Enabled/ Disabled.	Use this item to enable/disable BIOS hotkey press.
MEDx Selection Screen	MEDx Selection Screen parameters	Enabled/ Disabled	Use this item to enable/disable MEBx selection screen.
Hide MEDx Selection Information	Hide MEDx Selection Information	Enabled/ Disabled	Enable or disable this function

MEDx Debug Message Output	MEDx Debug Message Output parameters	Enabled/ Disabled	Enable or disable this function
Un-configure ME	Use this item to un-configure ME	Enabled/ Disabled	Enable or disable this function
AMT Wait Timer	Set up AMT Wait Timer	0	Select wait time number
Disable ME	Use this item to disable ME	Enabled/ Disabled	Enable or disable this function
ASF	Configure ASF parameters	Enabled/ Disabled	Enable or disable this function
Activate Remote Assistant Process	Activate Remote Assistant Process parameters	Enabled/ Disabled	Enable or disable this function
USB Configure	USB Configure parameters	Enabled/ Disabled	Enable or disable this function
PET Progress	PET Progress parameters	Enabled/ Disabled	Enable or disable this function

USB Configuration

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.

Advanced

```

USB Configuration

USB Module Version           8.10.32

USB Devices:
  1 Drive, 1 Keyboard, 1 Mouse, 1 Hub

Legacy USB Support           [Enabled]
XHCI Hand-off                [Enabled]
EHCI Hand-off                [Disabled]
USB Mass Storage Driver Support [Enabled]

USB hardware delays and time-outs:
USB transfer time-out        [20 sec]
Device reset time-out        [20 sec]
Device power-up delay        [Auto]

Mass Storage Devices:
JetFlashTranscend 16GB 1.00   [Auto]
          
```

```

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

Version 2.15.1236. Copyright (C) 2014 American Megatrends, Inc.

BIOS Setting	Description	Setting Option	Effect
Legacy USB Support	User can enable or disable USB port.	Auto	Disable legacy support if no USB devices are connected
		Disable	Will keep USB devices available only for EFI applications.
		Enable	Enable all the USB devices
XHCI Hand-off	This is a workaround for OSs without XHCI hand- off support. The XHCI ownership Change should claim by XHCI driver.	Disable	Disables this function
		Enable	Enables this function
EHCI Hand-off	This is a workaround for OSs without ECHI hand- off support. The EHCI ownership change should be claimed by EHCI driver.	*Disabled	Disables this function
		Enable	Enables this function
USB Mass Storage Driver Support	User can Enable or disable USB mass storage driver support.	Disable	Disables this function
		Enable	Enables this function
USB Transfer time- out	The time-out value for control, bulk, and interrupt transfers.	1 Sec 5 Sec 10 Sec *20 Sec	Depends on the time-out value
Device Reset time- out	USB mass storage device start unit command time- out.	10 Sec *20 Sec 30 Sec 40 Sec	Depends on the time-out value
Device power-up delay	Maximum time the device will take before it properly reports itself to the host controller.	Auto	Uses default value: for a root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor

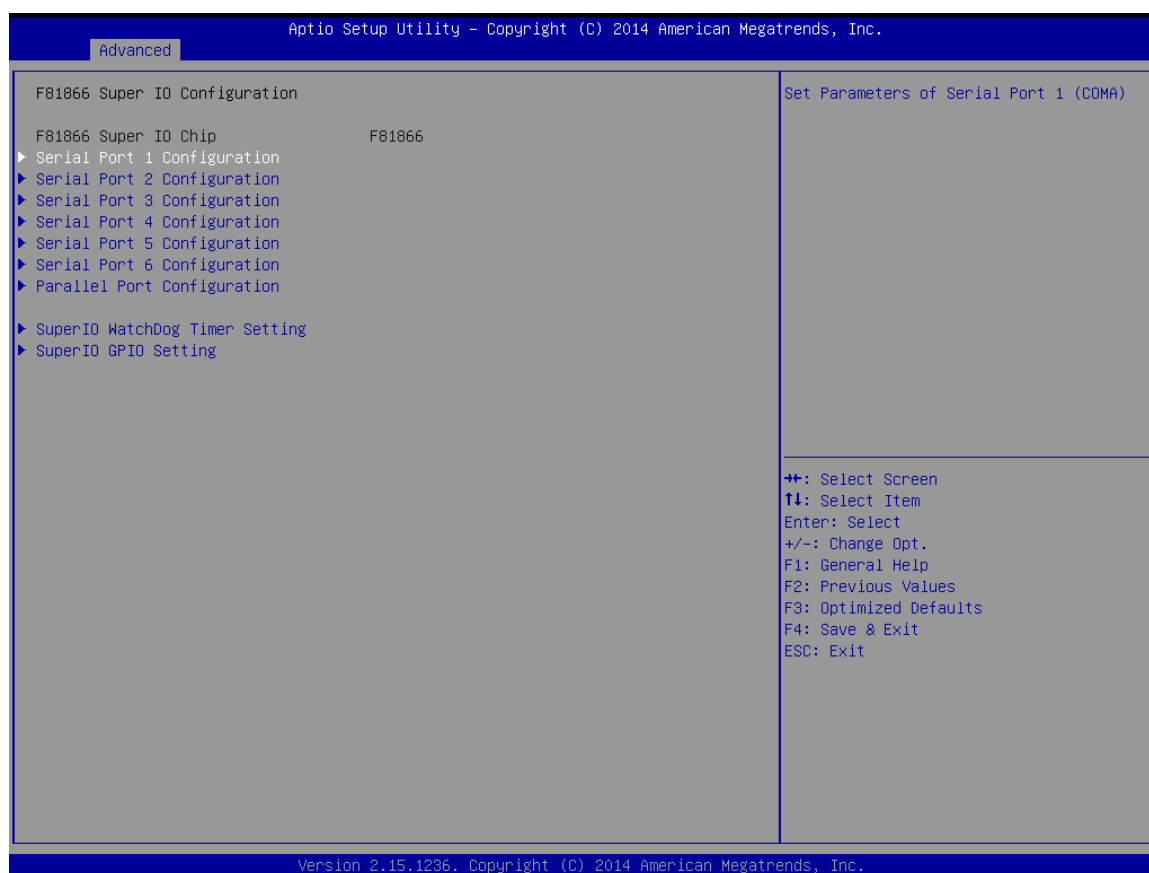
Mass Storage Device	Mass storage device emulation type.	AUTO	Enumerates devices less than 530MB as floppies. Forced FDD option can be used to force HDD formatted drive to boot as FDD.
---------------------	-------------------------------------	------	--

F81866 H/W Monitor

Advanced	
Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.	
Pc Health Status Smart Fan Function [Enabled] ▶ Smart Fan Mode Configuration CPU Temperature : +34 C QM87 Temperature : +37 C CPU Fan Speed : 3614 RPM VCCORE : +1.752 V +12V : +12.232 V +5V : +5.213 V +3.3V : +3.392 V VSB5V : +5.184 V VSB3V : +3.408 V VBAT : +3.296 V	Enable or Disable Smart Fan ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.15.1236. Copyright (C) 2014 American Megatrends, Inc.	

BIOS Setting	Description	Setting Option	Effect
Smart Fan Function	Set parameters of smart fan function	Enabled/ Disabled	Enable or disable this function
Smart Fan Mode Configuration	CPU Smart Fan Mode is responsible for selecting the type of fan design that allows you to determine the type of fan speed control.	Possible Setting Options: Auto, Voltage, PMW	Select the type of fan speed control

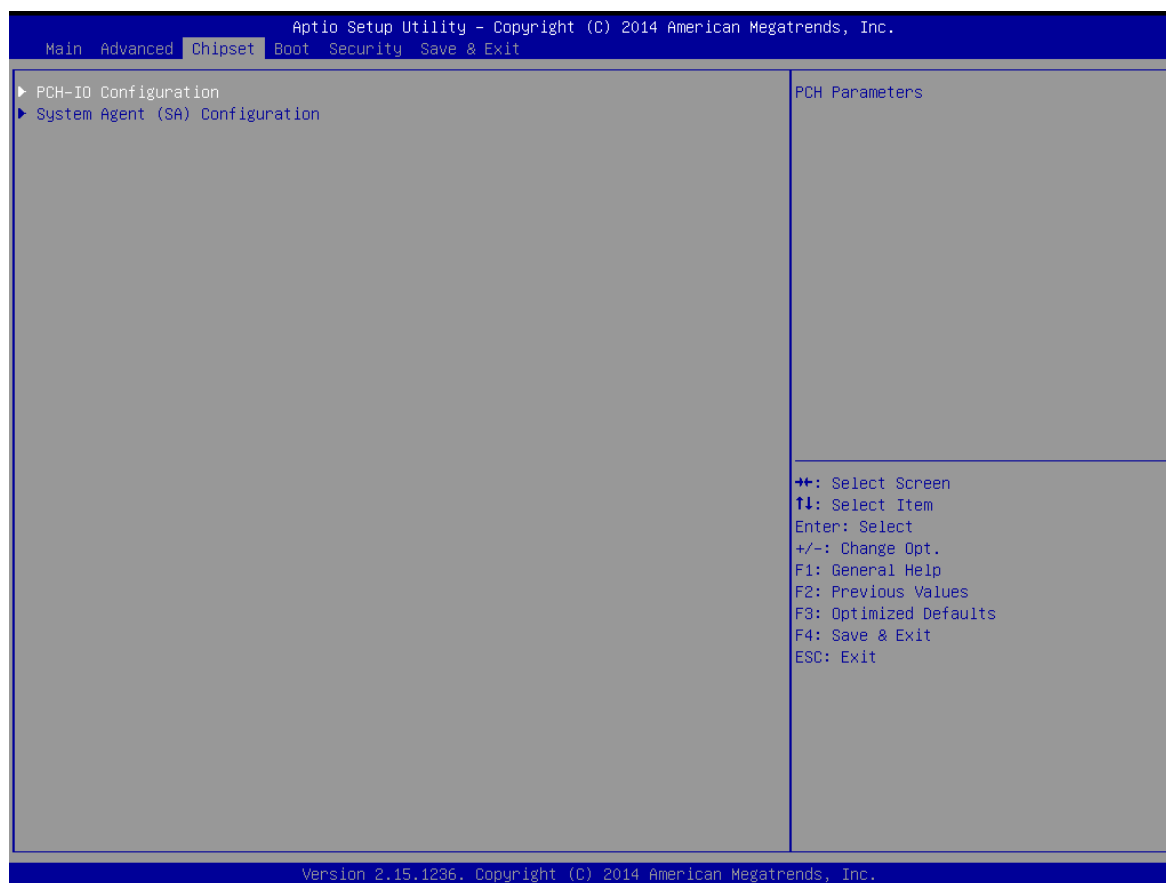
Super IO Configuration



BIOS Setting	Description	Setting Option	Effect
Serial Port 1,2,3 ,4,5,6 Configuration	Set Parameters of Serial Ports. User can Enable/Disable the serial port and select optimal settings for the super IO Device.	Enabled/ Disabled Default: Enable	Enable or disable Serial Port (COM)
Parallel Port Configuration	This option enables monitoring activity of the devices connected to the computer via parallel port.	Enabled	Allow
		Disabled	Forbid
Super IO Watch Dog Timer Setting	This watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function after the programmed period.	Enabled/ Disabled	Enable or disable this function

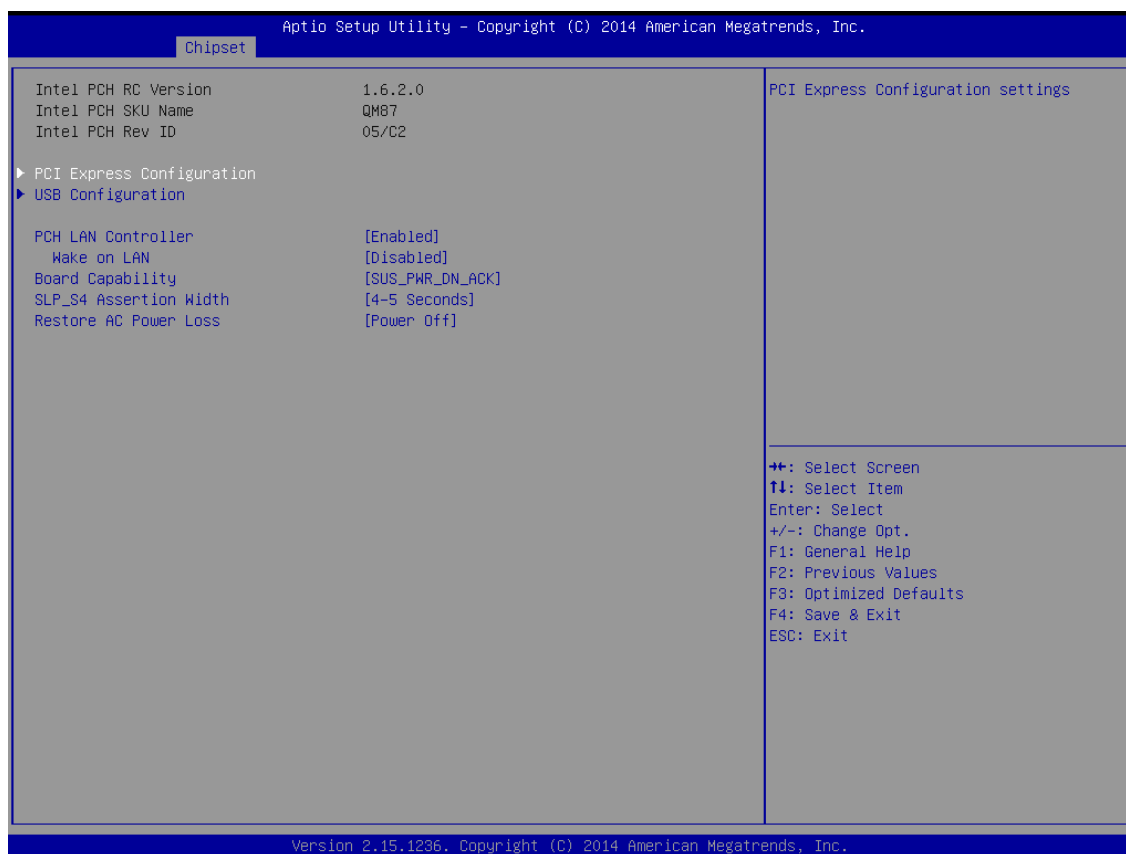
Super IO GPIO Setting	You can use the screen to select options for Super IO Configuration.	A description of the selected item appears on the right side of the screen. For items marked with ►, please press <Enter> for more options.	Change the value of the option selected.
-----------------------	--	---	--

3.2.3 Chipset Menu



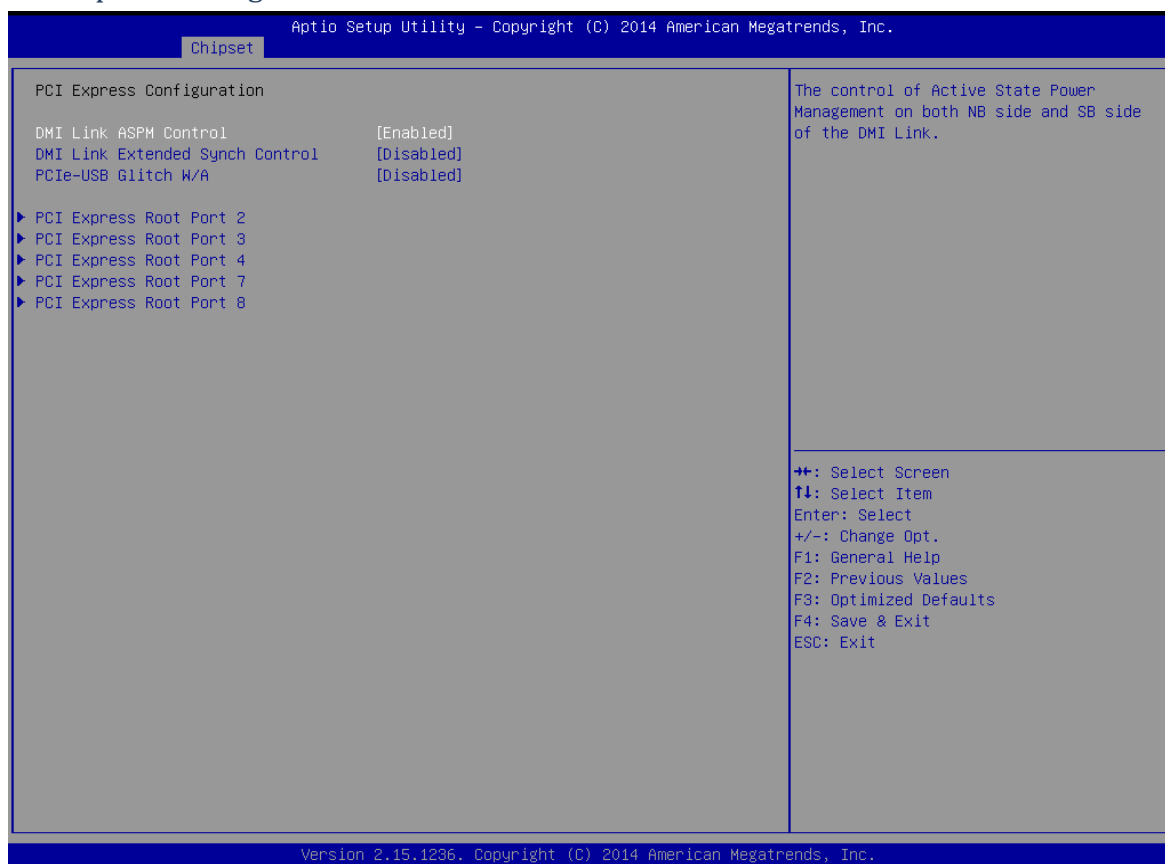
BIOS Setting	Description	Setting Option	Effect
PCH-IO Configuration	PCH Parameters	Enter	Opens submenu
System Agent (SA) Configuration	System Agent (SA) Parameters	Enter	Opens submenu

PCI -IO Configuration



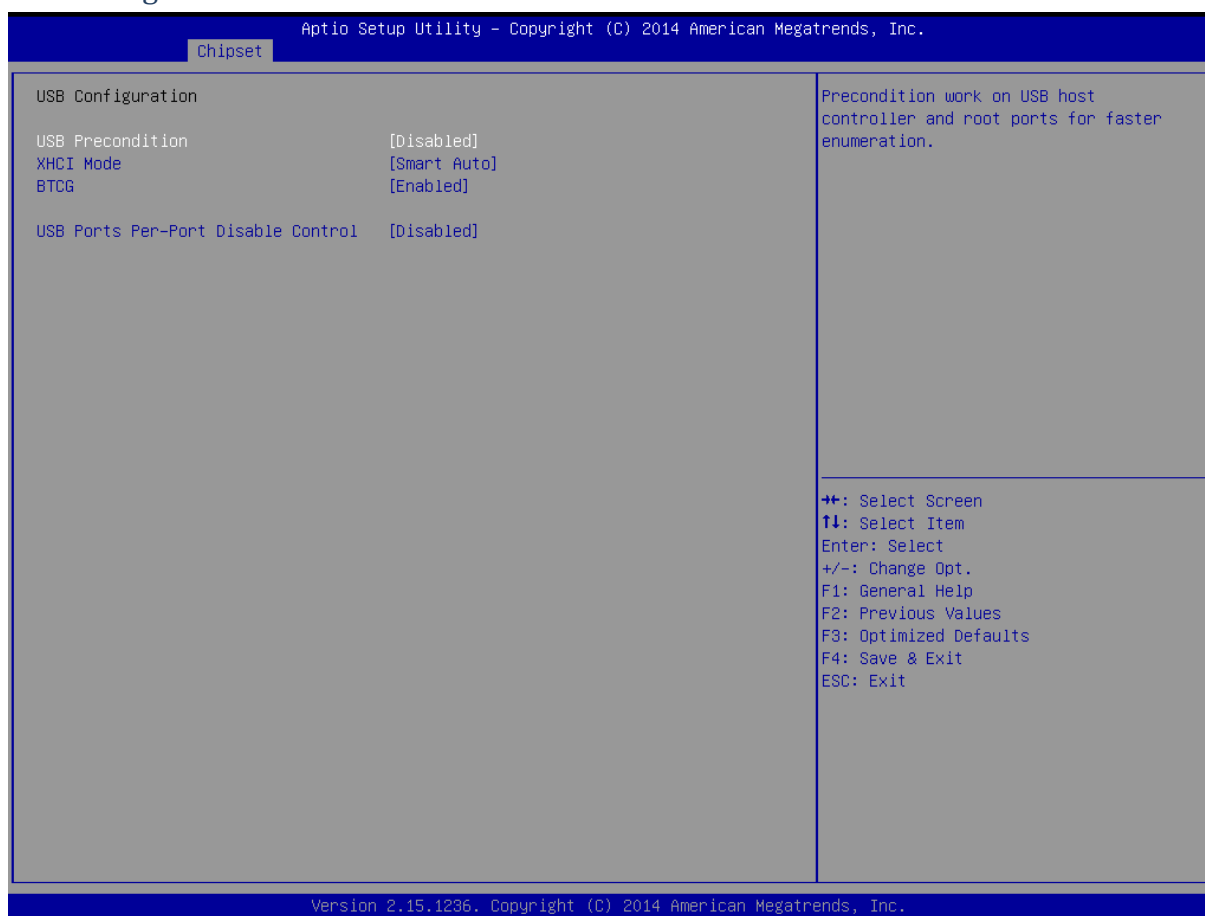
BIOS Setting	Description	Setting Option	Effect
PCI Express Configuration	PCI Express Parameters	Enter	Opens submenu
USB Configuration	USB parameters	Enter	Opens submenu

PCI Express Configuration



BIOS Setting	Description	Setting Option	Effect
DMI Link ASPM Control	The control of Active State Power Management on both NB side and SB side of the DMI Line	Enabled/Disabled	Enable or disable this function
DMI Link Extended Synch Control	DMI Link Extended Synch Control parameters	Enabled/Disabled	Enable or disable this function
PCIe- USB Glitch W/A	PCIe- USB Glitch W/A parameters	Enabled/Disabled	Enable or disable this function
PCI Express Root Port 2~8	PCI Express Root Port 2~8 Parameters		

USB Configuration



BIOS Setting	Description	Setting Option	Effect
USB Precondition	Allows user to enable or disable USB Precondition	Enabled/ Disabled	Enable or disable this function
XHCI Mode	Allows user to enable or disable XHCI Mode	Smart Auto, Enabled/ Disabled	Enabled/ Disabled
BTCG	BTCG Parameters	Enabled/ Disabled	Enabled/ Disabled
USB Ports Per-Port Disable Control	Control each of the USB ports (0~13) disabling	Enabled/ Disabled	Enable or disable this function

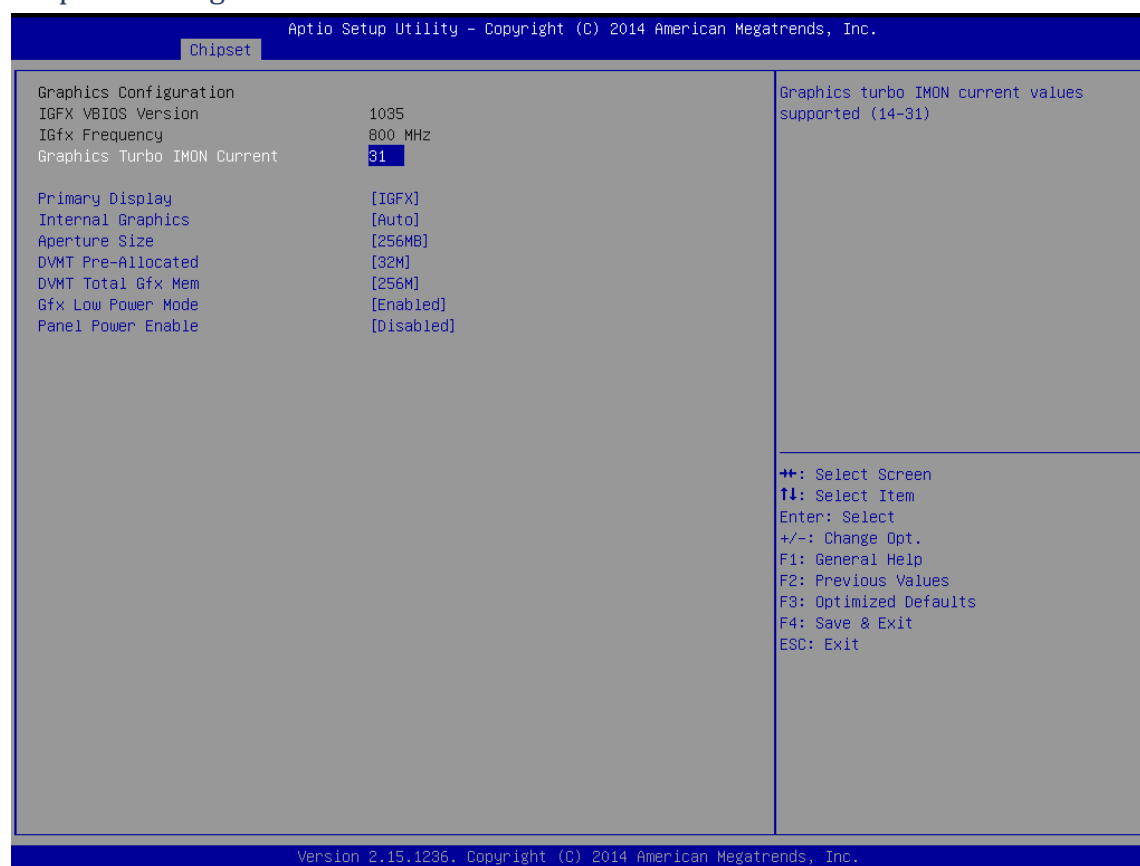
System Agent (SA) Configuration

Aptio Setup Utility - Copyright (C) 2014 American Megatrends, Inc.		
Chipset		
System Agent Bridge Name	Haswell	Check to enable VT-d function on MCH.
System Agent RC Version	1.6.2.0	
VT-d Capability	Supported	
VT-d	[Enabled]	
▶ Graphics Configuration		
▶ NB PCIe Configuration		
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.15.1236. Copyright (C) 2014 American Megatrends, Inc.		

● VT-d

Allows users to enable or disable Intel Virtualization Technology for Directed I/O.

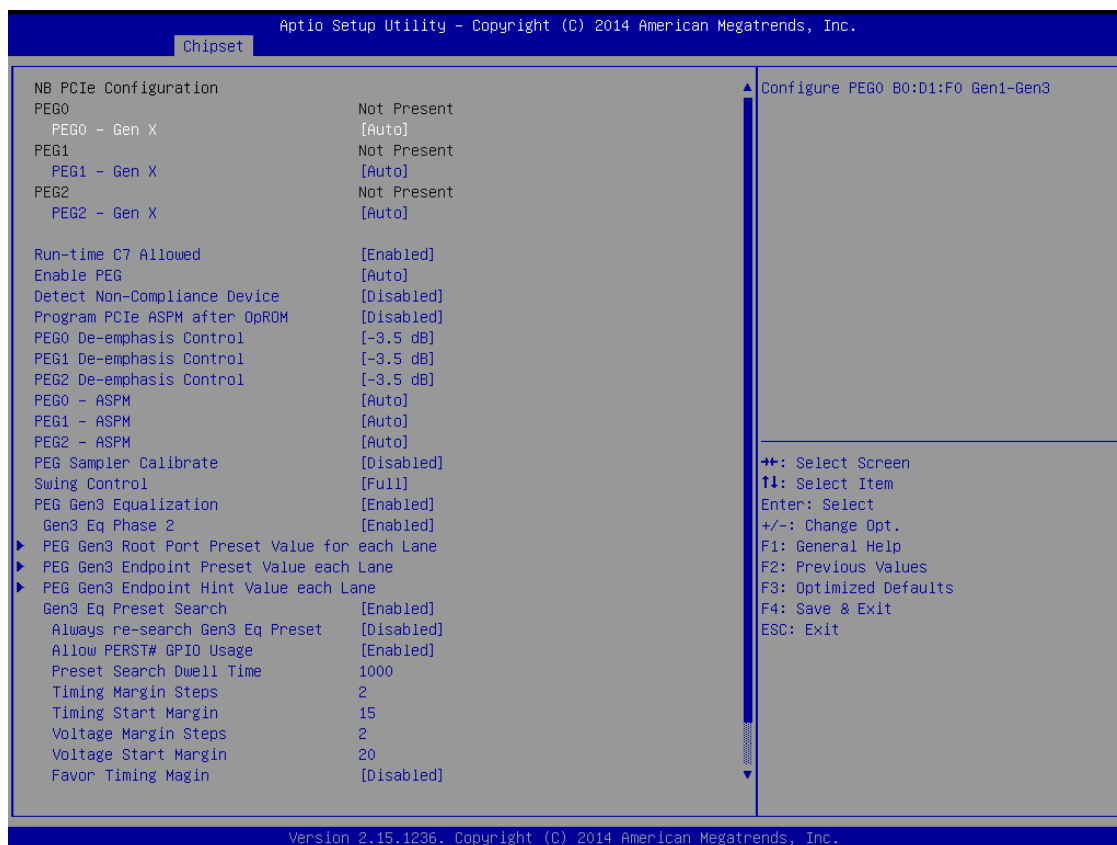
Graphics Configuration



BIOS Setting	Description	Setting Option	Effect
Graphics Turbo IMON Current	Allows users to select which Graphics Turbo IMON Current.	31	Set Turbo IMON Current parameter
Primary Display	Allows users to select Primary Display	[IGFX], [Auto]	Select Primary Display
Internal Graphics	Allows users to enable or disable IGD	Auto, Enabled/ Disabled	Enabled or Disabled IGD
Aperture Size	This item allows users to select aperture size	256M	Select aperture size
DVMT Pre-Allocated	Allows users to select DVMT pre-allocated memory size.	32M	Select DVMT pre-allocated memory size.
DVMT Total Gfx Mem	Allows users to select DVMT total memory size.	256M	Select DVMT total memory size
Gfx Low Power	Allows users to enable or	Enabled/	Enable/Disable

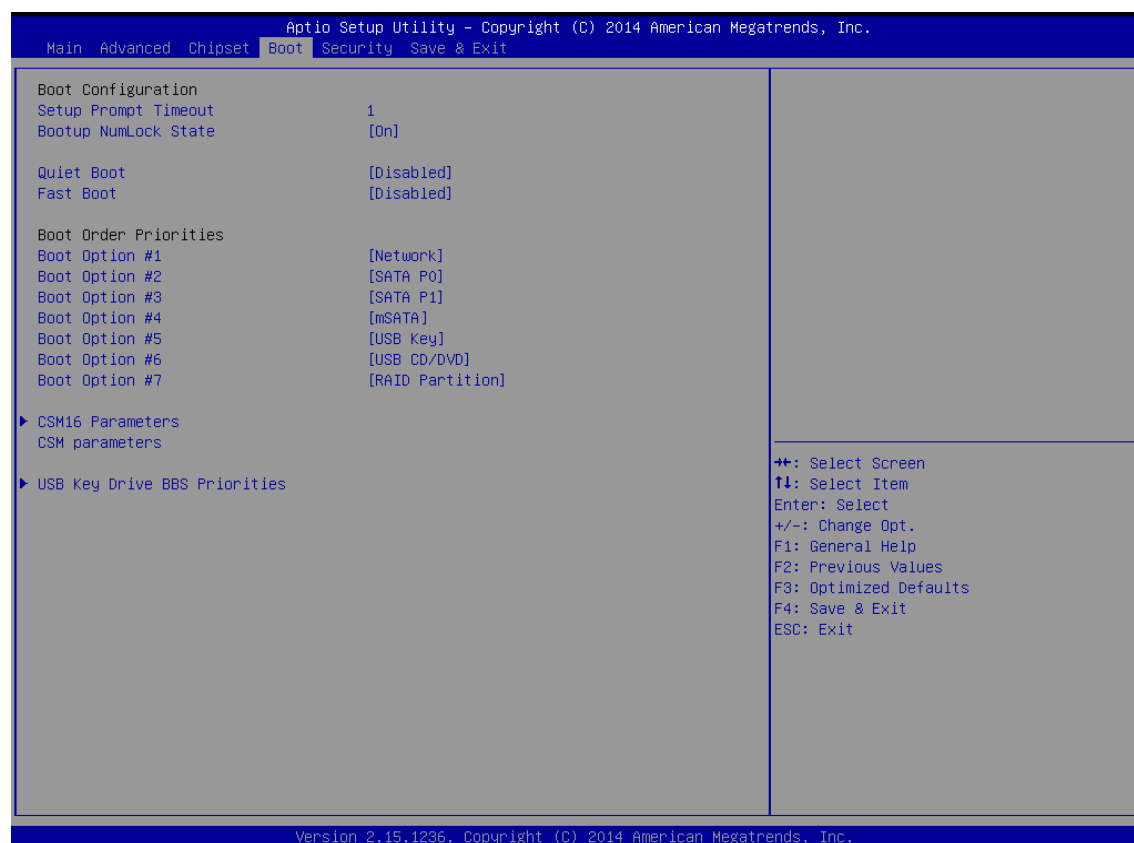
Mode	disable IGD low power mode.	Disabled	this function
Panel Power Enable	Allows users to enable or disable Panel Power.	Enabled/ Disabled	Enable/Disable this function

NB PCIe Configuration



3.2.4 Boot Menu

The Boot menu sets the sequence of the devices to be searched for the operating system. The bootable devices will be automatically detected during POST and shown here, allowing you to set the sequence that the BIOS use to look for a boot device from which to load the operating system.

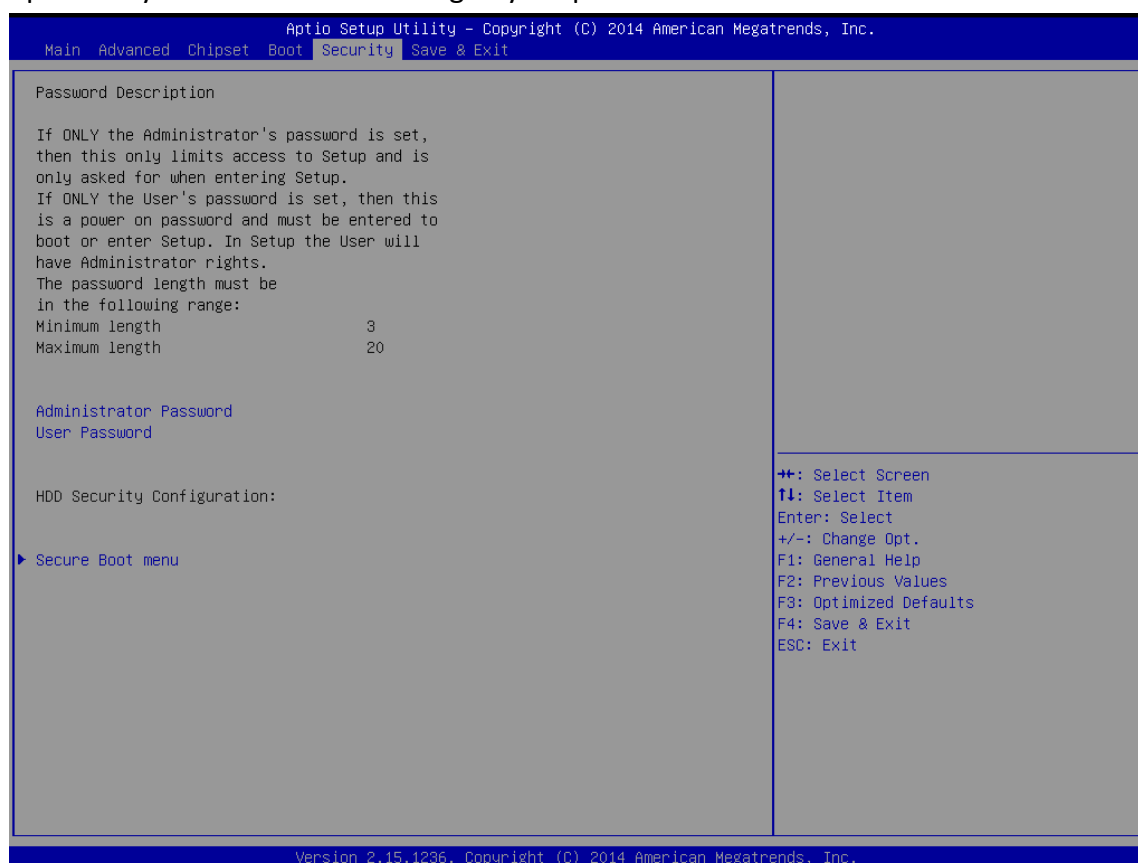


BIOS Setting	Description	Setting Option	Effect
Setup Prompt Timeout	Allows user to configure the number of seconds to stay in BIOS setup prompt screen.	Enter	Set the prompt timeout
Boot NumLock State	Enables or disables NumLock feature on the numeric keypad of the keyboard after the POST (Default: On).	On	Remains On
		Off	Remains OFF
Quiet Boot	Determines if POST message or OEM logo	Disabled	Disables this function

	(default = Black background) is displayed.	Enabled	Enables this function
Fast Boot	Enables or disables Fast Boot to shorten the OS boot process. (Default: Disabled).	Disabled	Disables this function
		Enabled	Enables this function
Boot Option Priorities	Specifies the overall boot order from the available devices	Ex: Boot Option#1 (network); Options: #1~#7	Ex.: Set Network as the first priority
CSM 16 parameters	Specifies the boot order for a CSM parameters	Enter	Enter the submenu
USB Key Drive BBS Priorities	Specifies the boot order for USB Key Drive BBS parameters	Enter	Enter the submenu

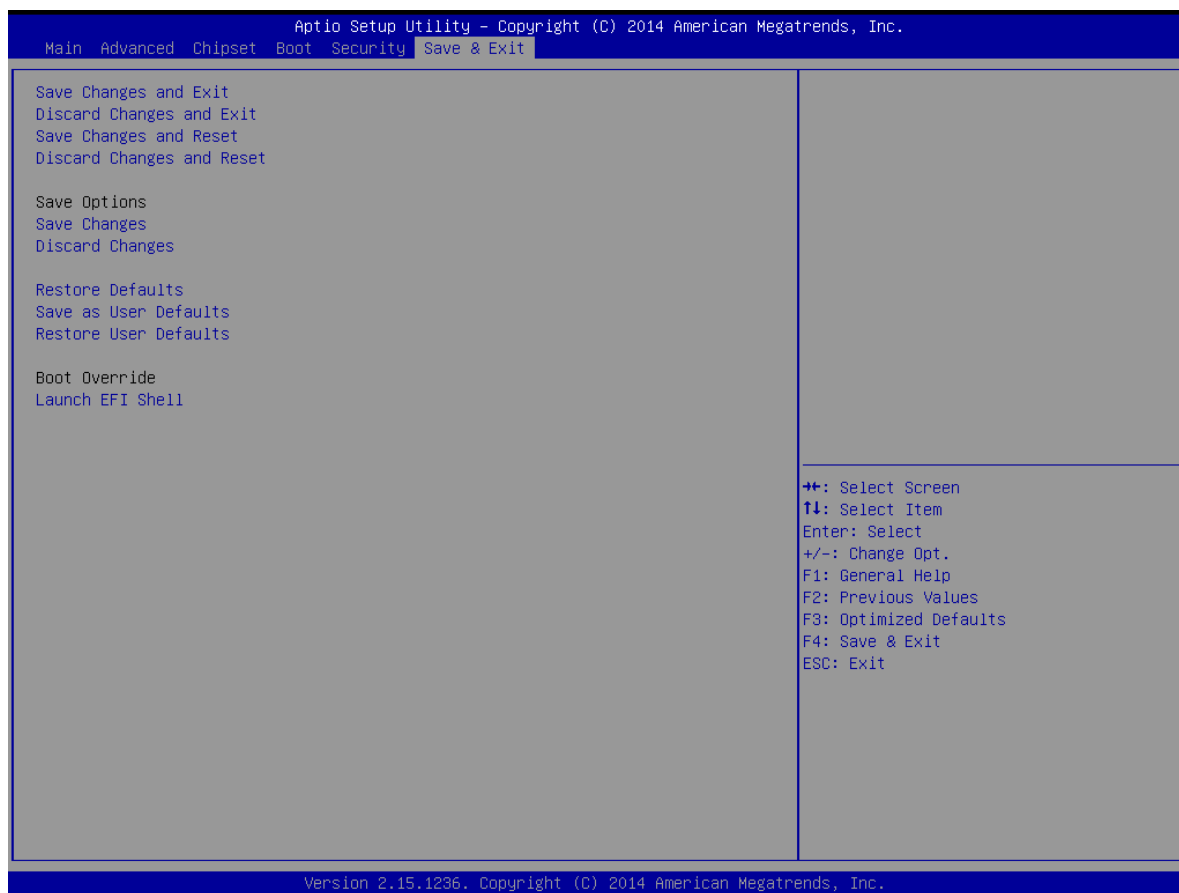
3.2.5 Security Menu

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



BIOS Setting	Description	Setting Option	Effect
Administrator Password	Displays whether or not an administrator password has been set.	Enter	Enter password
User Password	Display whether or not a user Password has been set.	Enter	Enter password
Secure Boot Menu	This feature designed to prevent malicious software and unauthorized media from loading during the boot process.	Enable/Disable	Enable or disable this function

3.2.6 Save & Exit



BIOS Setting	Description	Setting Option	Effect
Save Changes and Exit	This saves the changes to the CMOS and exits the BIOS Setup program.	<YES>	Save changes
Discard Changes and Exit	This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Save Changes and Reset	Reset the system after saving the changes.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Discard Changes	Reset system setup without saving	<YES>	Saves the changes

and Reset	any changes	<NO>	Return to the BIOS Setup Main Menu
Save Changes	Save changes done so far to any of the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Discard Changes	Discard changes done so far to any of the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Restore Defaults	Restore/load default values for all the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Save as User Defaults	Save the changes done so far as User defaults.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Restore User Defaults	Restore the User Defaults to all the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Launch EFI Shell	Launch Extensible Firmware Interface menu	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu

3.3 Using Recovery Wizard to Restore Computer

IH70 computer has a dedicate recovery partition stored on the hard drive of the PC to enable quick one-key recovery process. This partition occupies about 11GB of the storage space, and comes built-in to each IH70 series PC.

**IMPORTANT:**

Before starting the recovery process, be sure to backup all user data, as all data will be lost after the recovery process.

Follow the procedure below to enable quick one-key recovery procedure:

- Plug-in the AC adapter to IH70 series computer. Make sure the computer stays plugged in to power source during the recovery process.
- Turn on the computer, and when the boot screen shows up, press the **F6** to initiate the Recovery Wizard.
- The following screen shows the Recovery Wizard. Click on “Recovery” button to continue.



A warning message about data loss will show up. Make sure the data is backed up before recovery, and click “Yes” to continue.



Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. The system will restart automatically after recovery completed.



Driver Installation

This chapter offers information on all of the recommend driver installation.

Sections include:

- 4.1 Intel Chipset Driver
- 4.2 Graphics Driver
- 4.3 Audio Driver
- 4.4 Ethernet Driver
- 4.5 Intel® Management Engine Software
- 4.6 Fintek COM Port Driver Installation
- 4.7 USB 3.0 Driver Installation (Windows 7)

CHAPTER

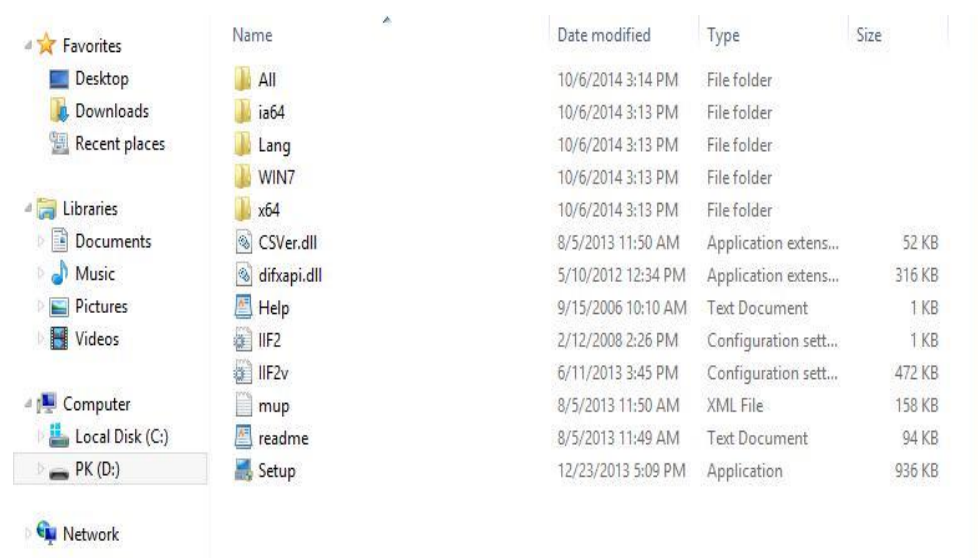
4

Chapter 4 Driver Installation

4.1 Intel Chipset Driver

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

Step 1 Insert the CD that comes with the motherboard. Open the file document “Chipset Driver” and click on “Setup.exe” to install driver.



Step 2 Click on “Next” to install the driver.



Step 3 Click Next to install the driver.



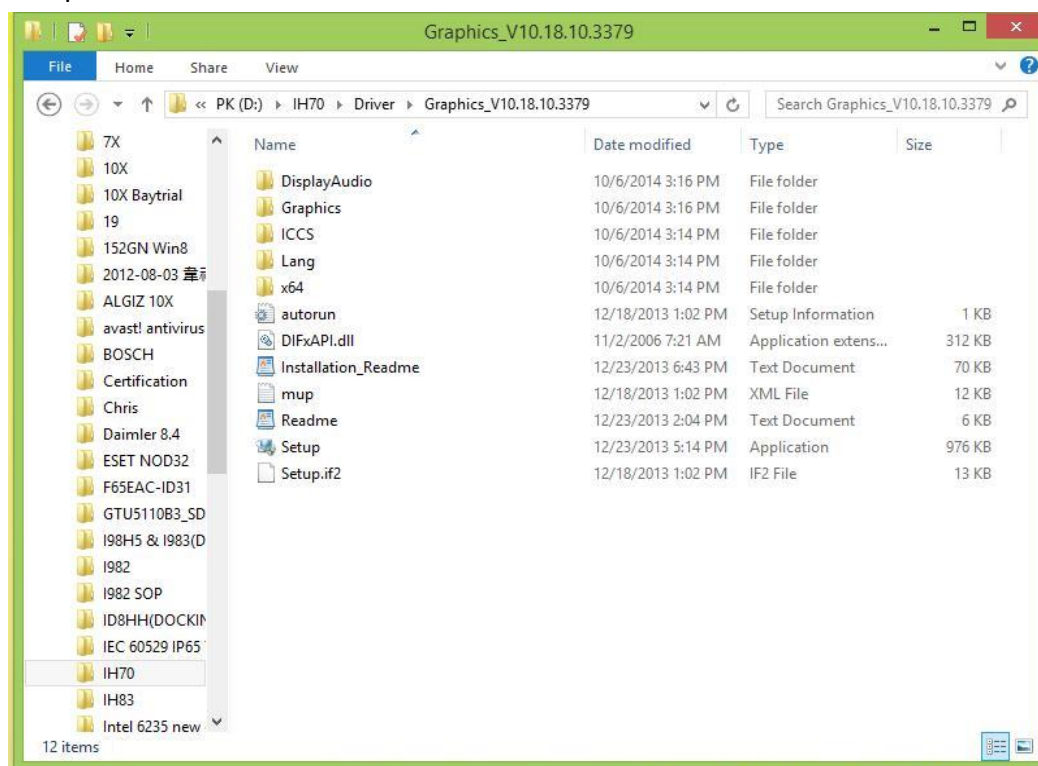
Step 4 Click “Yes, I want to restart this computer now” to continue.



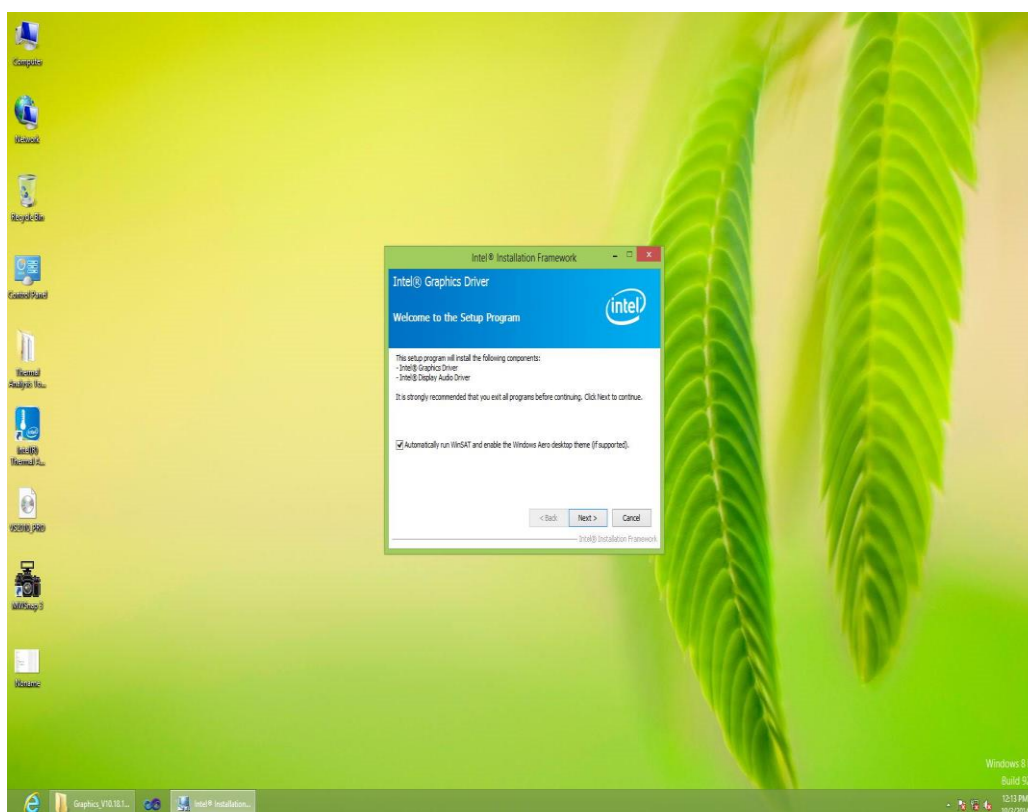
4.2 Graphics Driver

IH70 Motherboard comes with Intel mobile Core i7/i5/i3 dual core CPU and with an integrated graphics controller. You need to install the Graphic driver to enable the function. Intel Graphic supports versatile display options and 32-bit 3D graphics engine. Triple independent display, enhanced display modes for widescreen flat panels for extend, twin, and clone display mode.

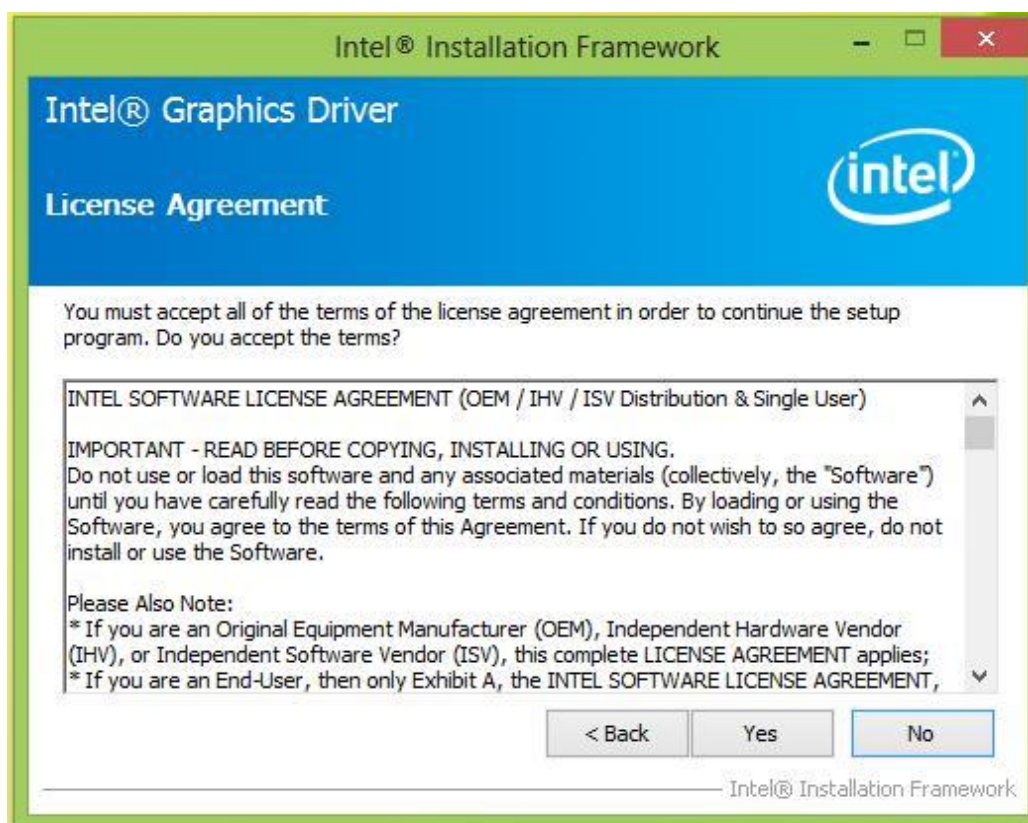
Step 1 Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the “Graphic Driver” folder and click "setup.exe" to complete the installation.



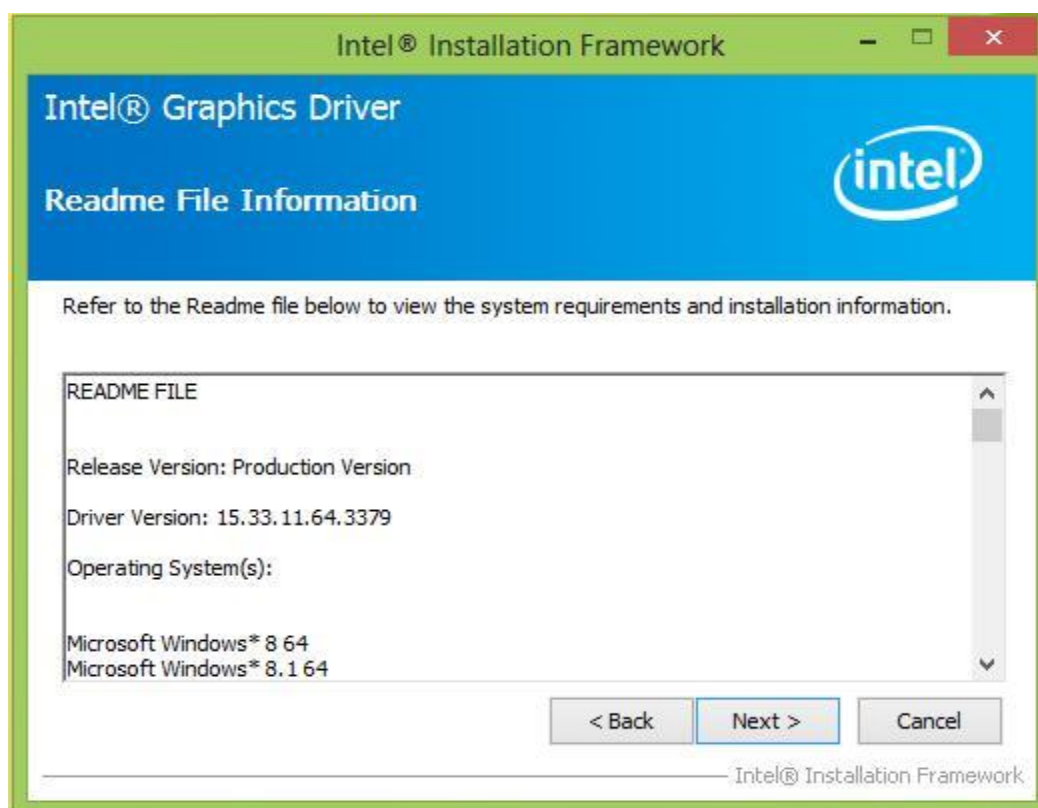
Step 2 Click on “Next” to install the driver.



Step 3 Click “Yes” to agree with the License terms.



Step 4 Click “Next” to install the driver.



Step 5 Click “Yes, I want to restart this computer now” to finish the installation and restart your computer.



4.3 Audio Driver

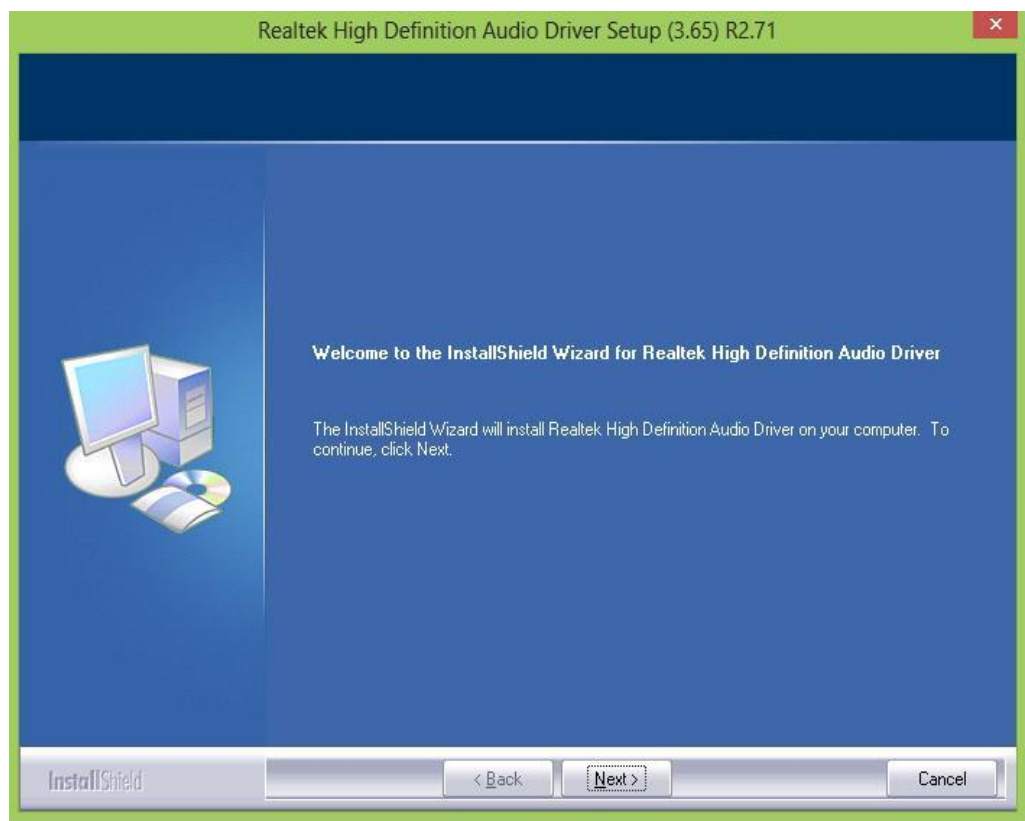
The ALC886 series are high-performance 7.1+2 Channel High Definition Audio Codecs providing ten DAC channels that simultaneously support 7.1 sound playbacks, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel stereo outputs. The series integrates two stereo ADCs that can support a stereo microphone, and feature Acoustic Echo Cancellation (AEC), Beam Forming (BF), and Noise Suppression (NS) technology.

The user must make sure which operating system you are using in the IH70 Motherboard before installing the Audio drivers. Follow the steps below to complete the installation of the Realtek ALC886 Audio drivers. You will quickly complete the installation.

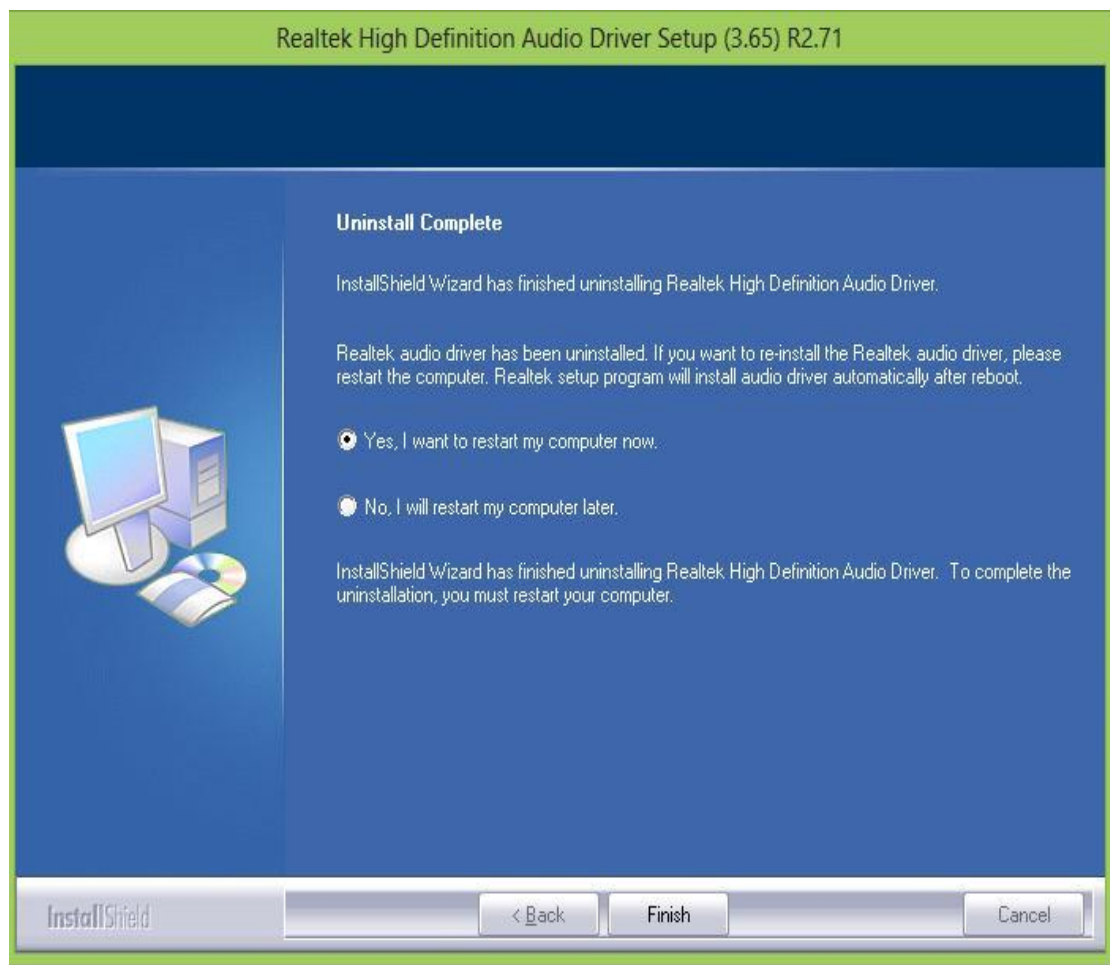
Step 1 Insert the CD that comes with the motherboard. Open the folder “Audio Driver” and click “Audio (64bit_Vista_Win7_Win8_R271)” to execute the setup.

 Audio(64bit_Vista_Win7_Win8_R271	9/10/2013 5:45 PM	Application	79,973 KB
--	-------------------	-------------	-----------

Step 2 Click “Next” to install the driver.



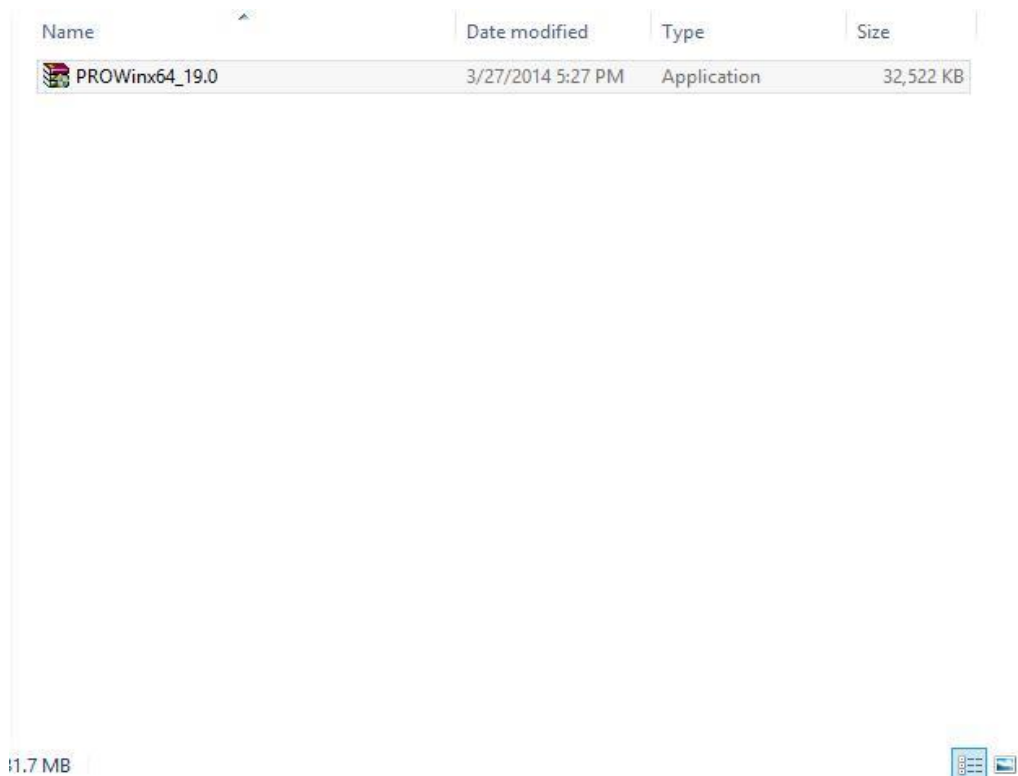
Step 3 Select “Yes, I want to restart my computer now” to finish the installation and restart the computer, and click Finish.



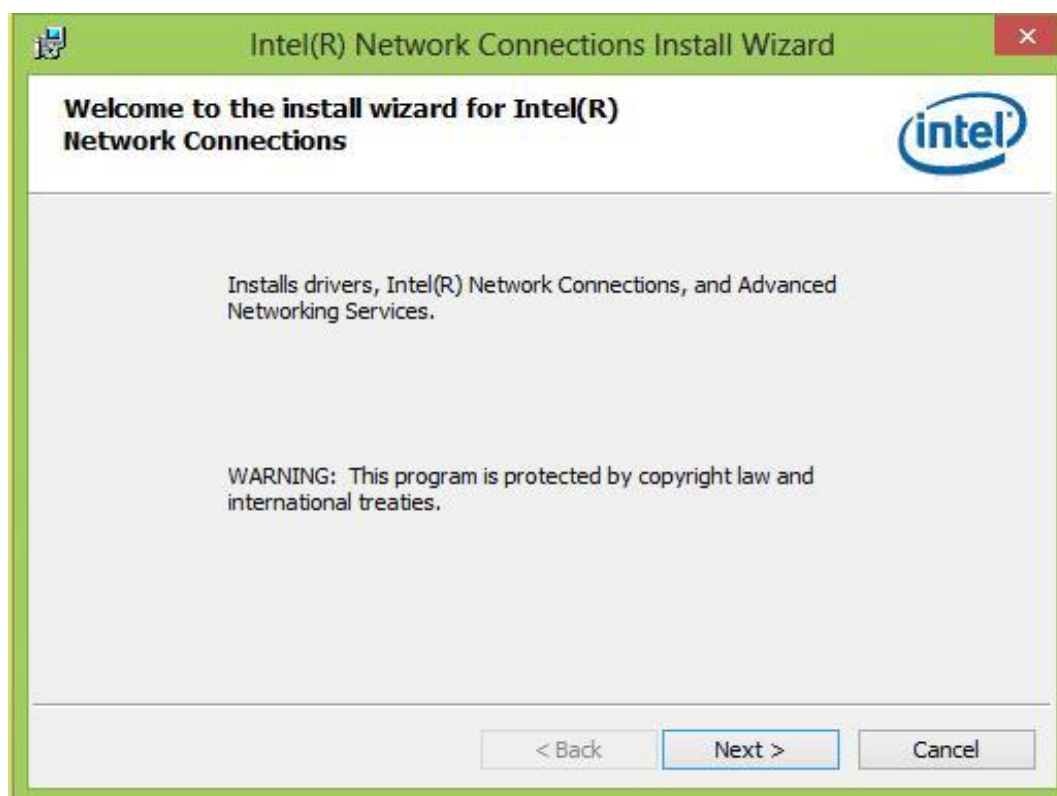
4.4 Ethernet Driver

The users must confirm which operating system is used on the IH70 Motherboard before installing the Ethernet drivers. Follow the steps below to complete the installation of the Intel® I210IT Gigabit-LAN Controller + I218LM Gigabit-LAN drivers. You will quickly complete the installation.

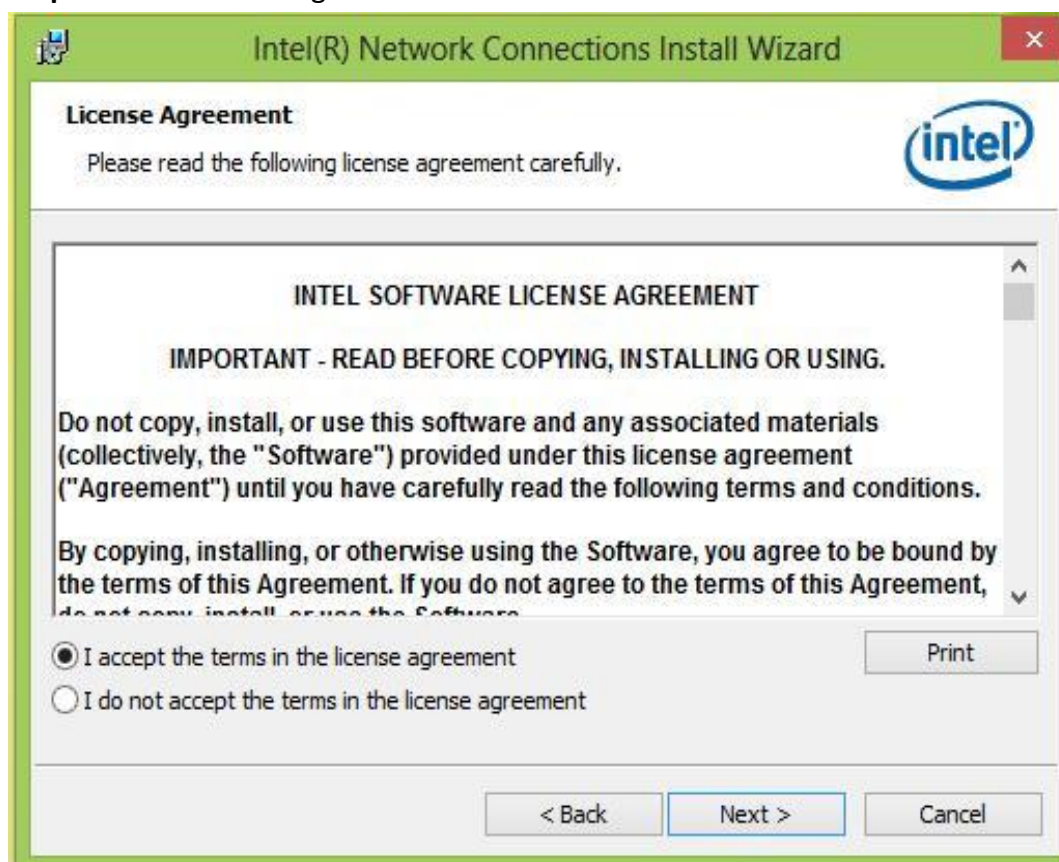
Step 1 Insert the driver CD and select the “LAN Driver” folder.



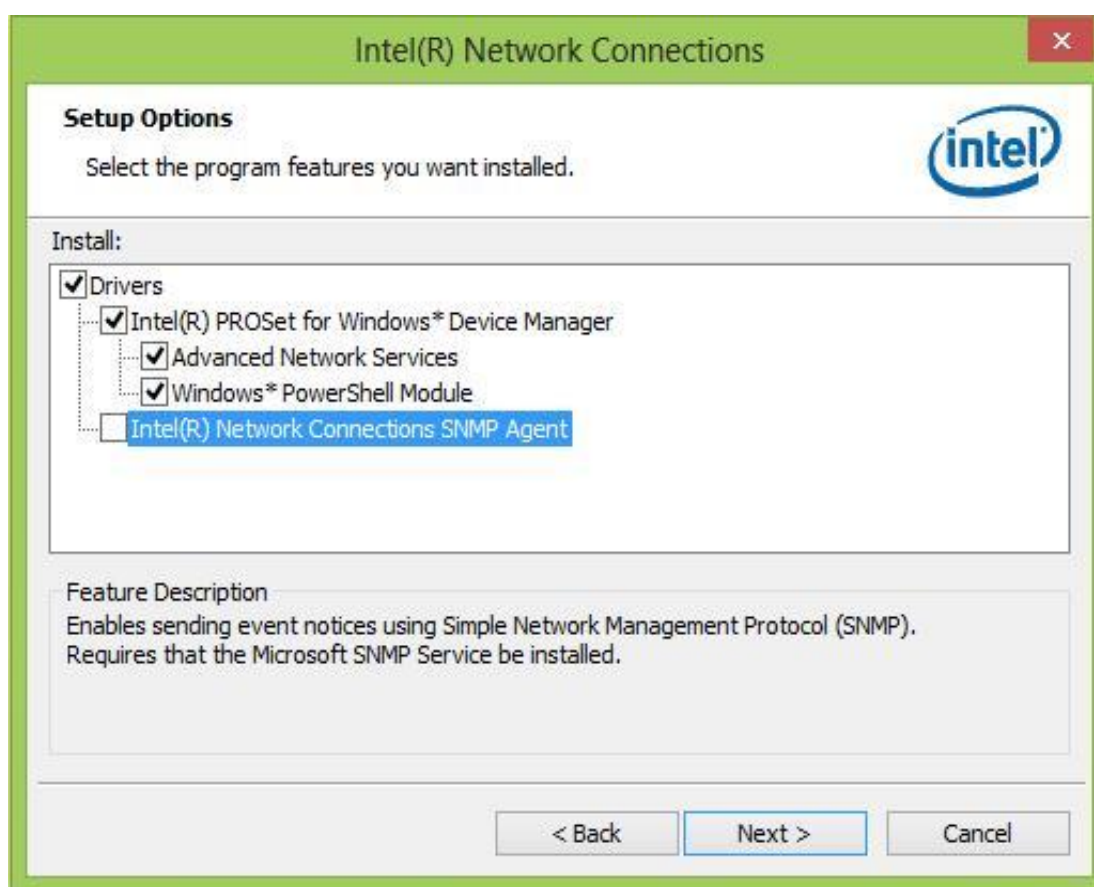
Step 2 Extract the “PROWinX64_19.0” file and click “Next” to install the driver.



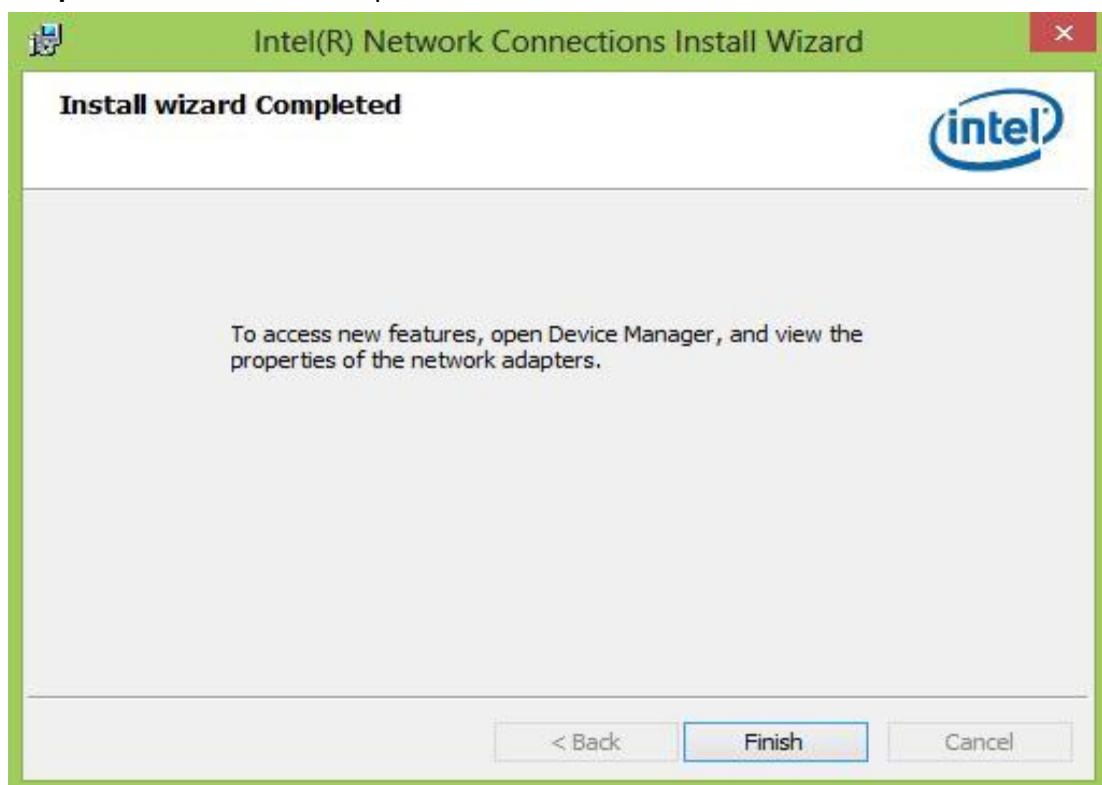
Step 3 Click “Next” to agree with the License terms.



Step 4 Click “Next” to install the driver.



Step 5 Click “Finish” to complete the driver installation.



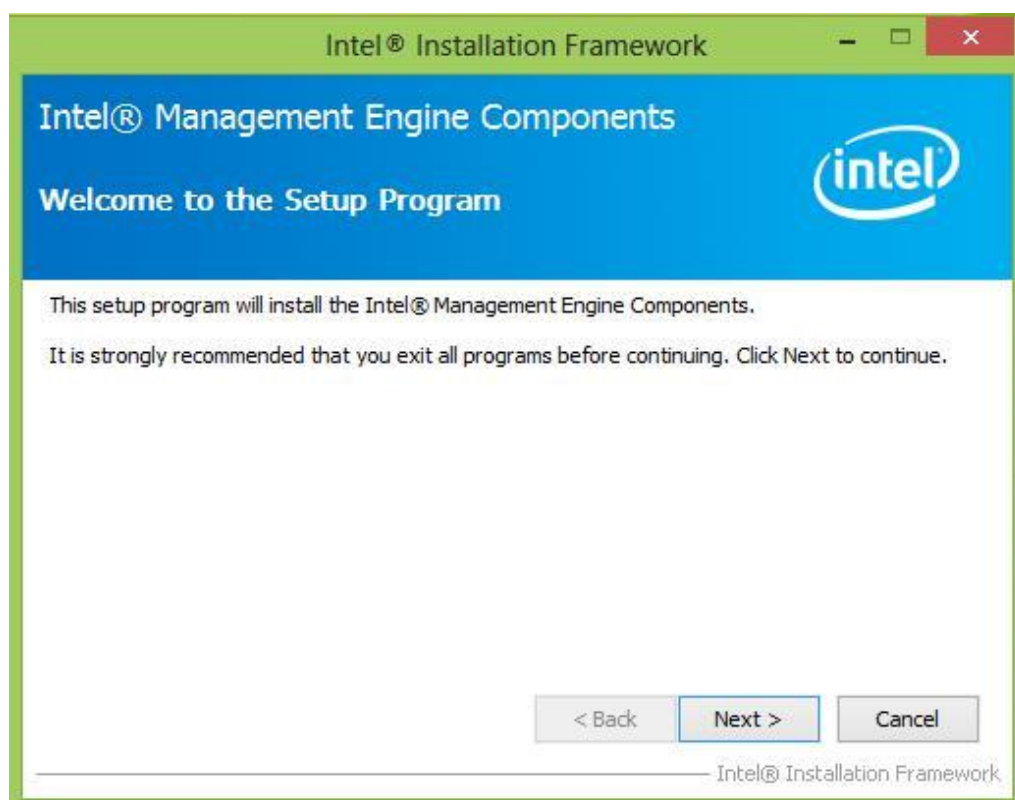
4.5 Intel® Management Engine Software

This installation program installs the Intel® ME software components required for the Platform on which you are installing, and install only those components that matches your platform capabilities.

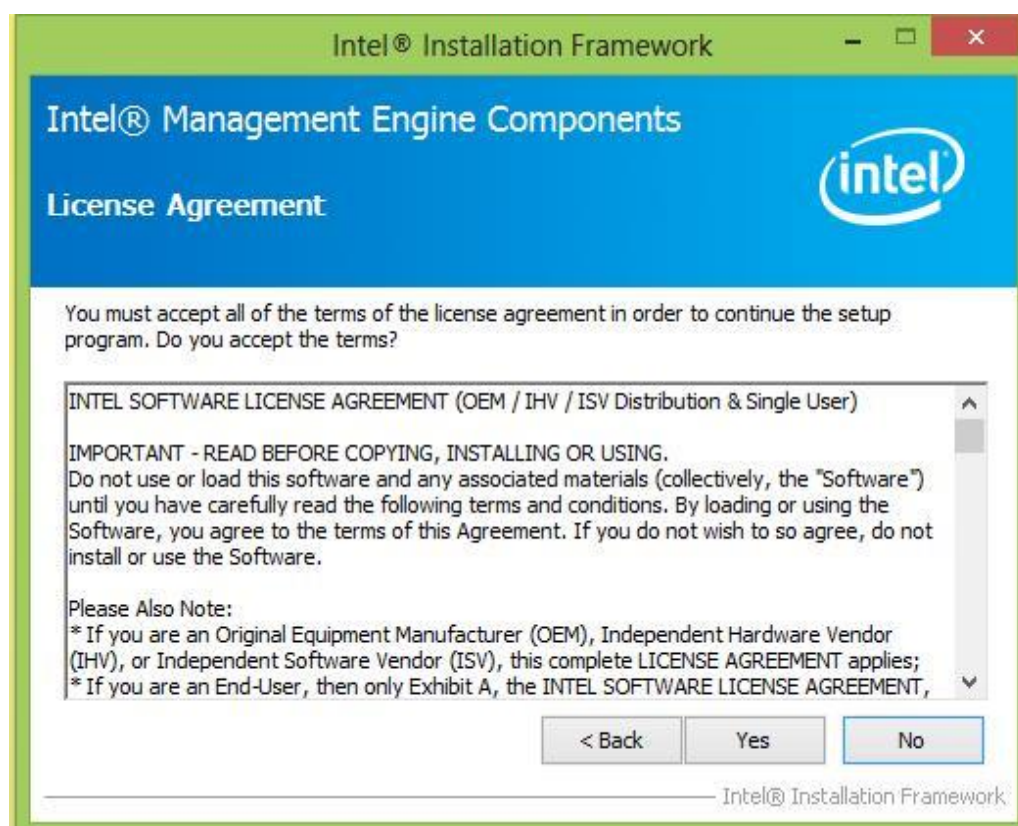
Step 1 Insert the driver CD and select the “Intel ME 9.0” folder and click “Setup.exe”

Name	Date modified	Type	Size
DAL	10/6/2014 3:17 PM	File folder	
Drivers	10/6/2014 3:17 PM	File folder	
Firmware Recovery Agent	10/6/2014 3:16 PM	File folder	
IFR	10/6/2014 3:16 PM	File folder	
Intel Control Center	10/6/2014 3:16 PM	File folder	
IntelMEFWVER	10/6/2014 3:16 PM	File folder	
IUS	10/6/2014 3:16 PM	File folder	
Lang	10/6/2014 3:16 PM	File folder	
LMS	10/6/2014 3:16 PM	File folder	
NAC_PP	10/6/2014 3:16 PM	File folder	
x64	10/6/2014 3:16 PM	File folder	
autorun	8/8/2013 1:25 PM	Setup Information	1 KB
DIFxAPI.dll	8/8/2013 1:25 PM	Application extens...	312 KB
mup	8/8/2013 1:25 PM	XML File	9 KB
Setup	8/8/2013 1:25 PM	Application	966 KB
Setup.if2	8/8/2013 1:25 PM	IF2 File	24 KB
version	8/8/2013 1:25 PM	Configuration sett...	1 KB

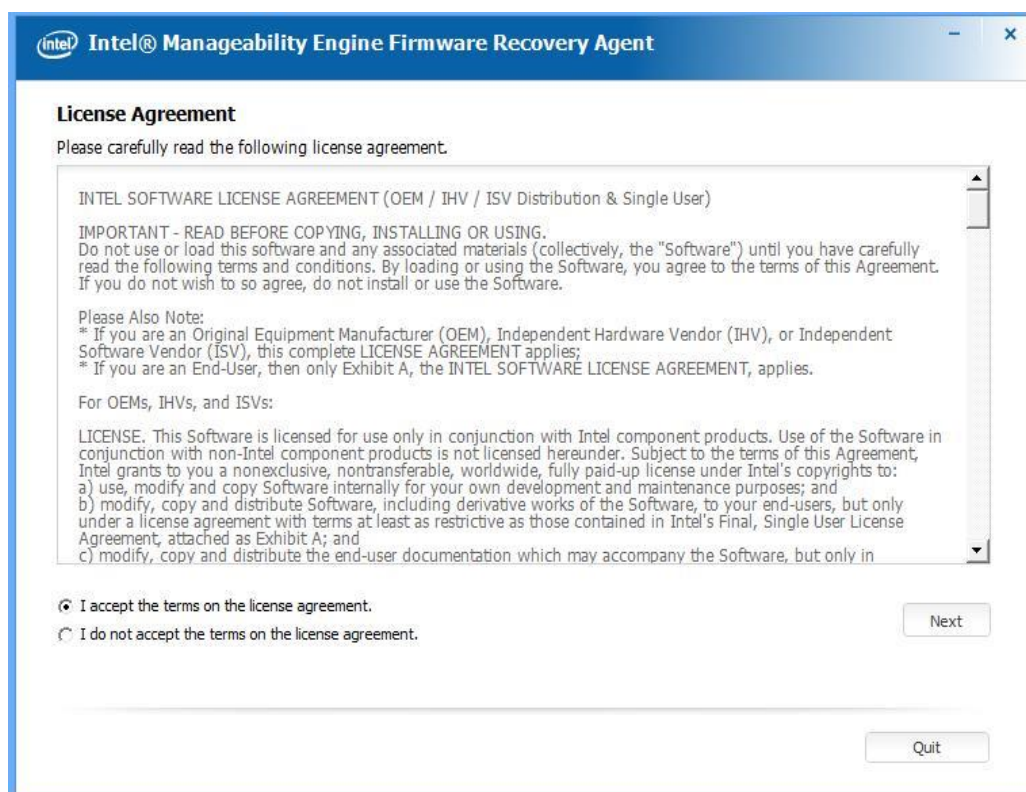
Step 2 Click the checkbox for Install Intel® Control Center & click “Next”.



Step 3 Click “Yes” to agree with the License terms.



Step 4 Carefully read the License Agreement and select “I accept the terms of the license agreement” to continue the installation.



Step 5 Click “Finish” to complete the software installation.



4.6 Fintek COM Port Driver

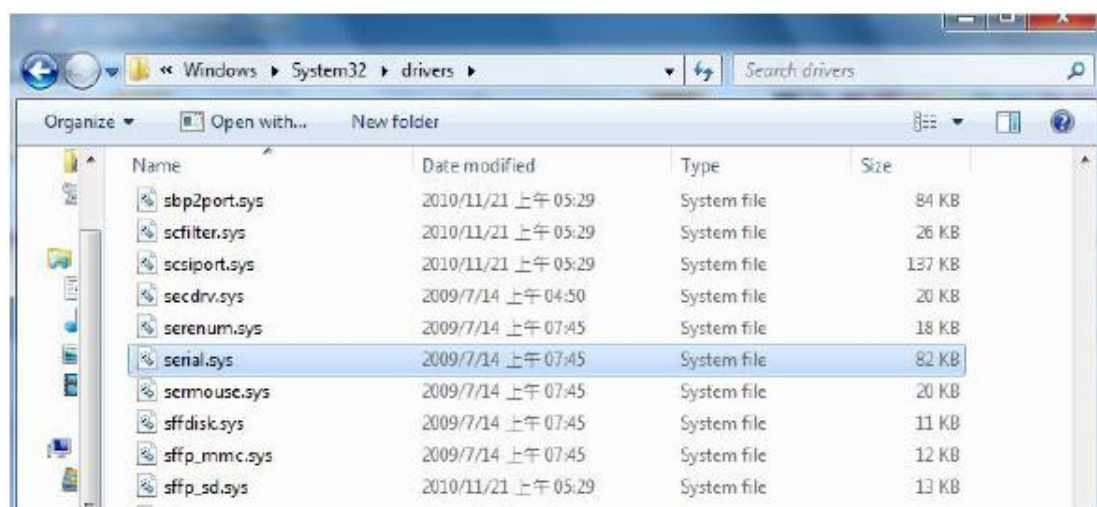
STEP 1 If the system is WIN7 please firstly close UAC (Refer following “Disabling User Account Control (UAC) in Windows 7”)

STEP 2 Extract the Patch_0408.zip to a folder.

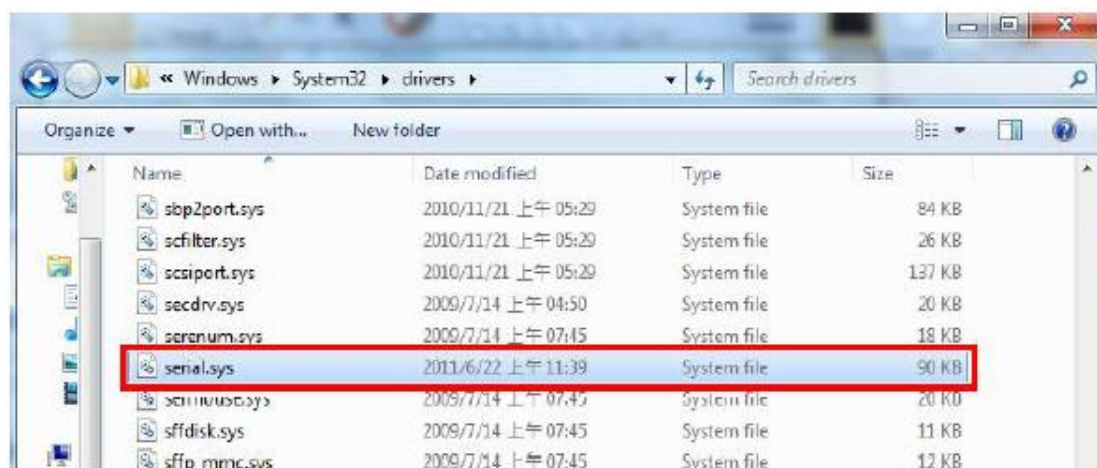
STEP 3 Double-click batch file (patch.bat) will install driver.

STEP 4 Check driver install success.

Before the update or update fail.



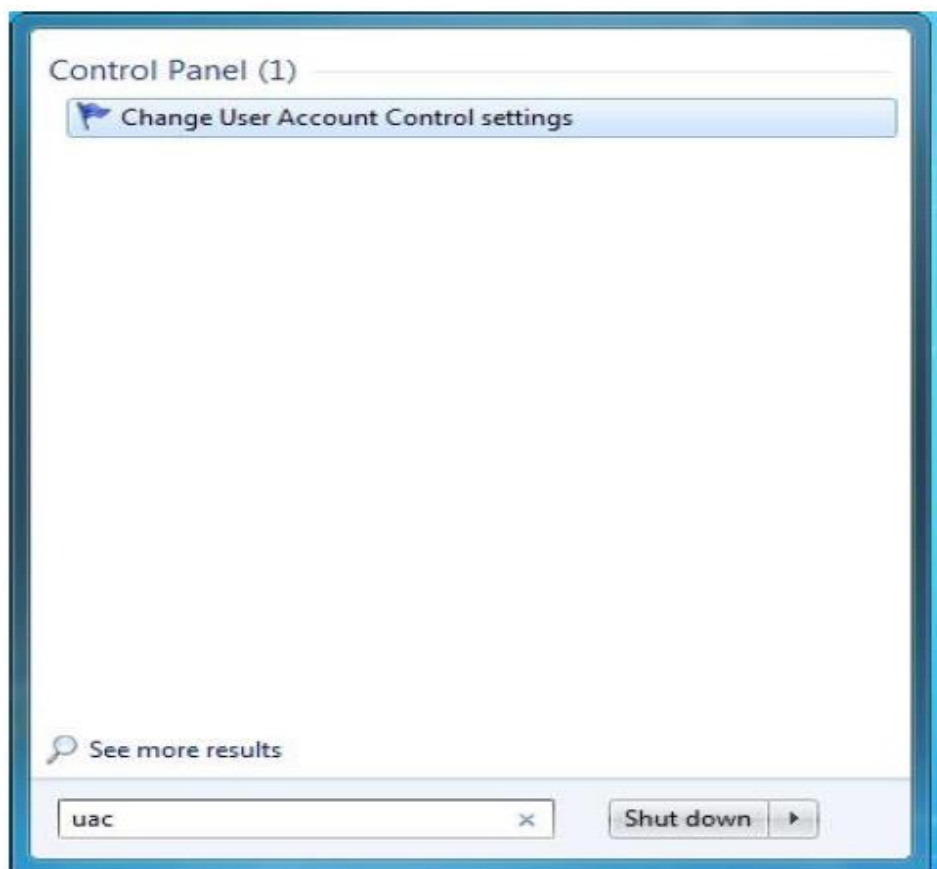
After the update and update success.



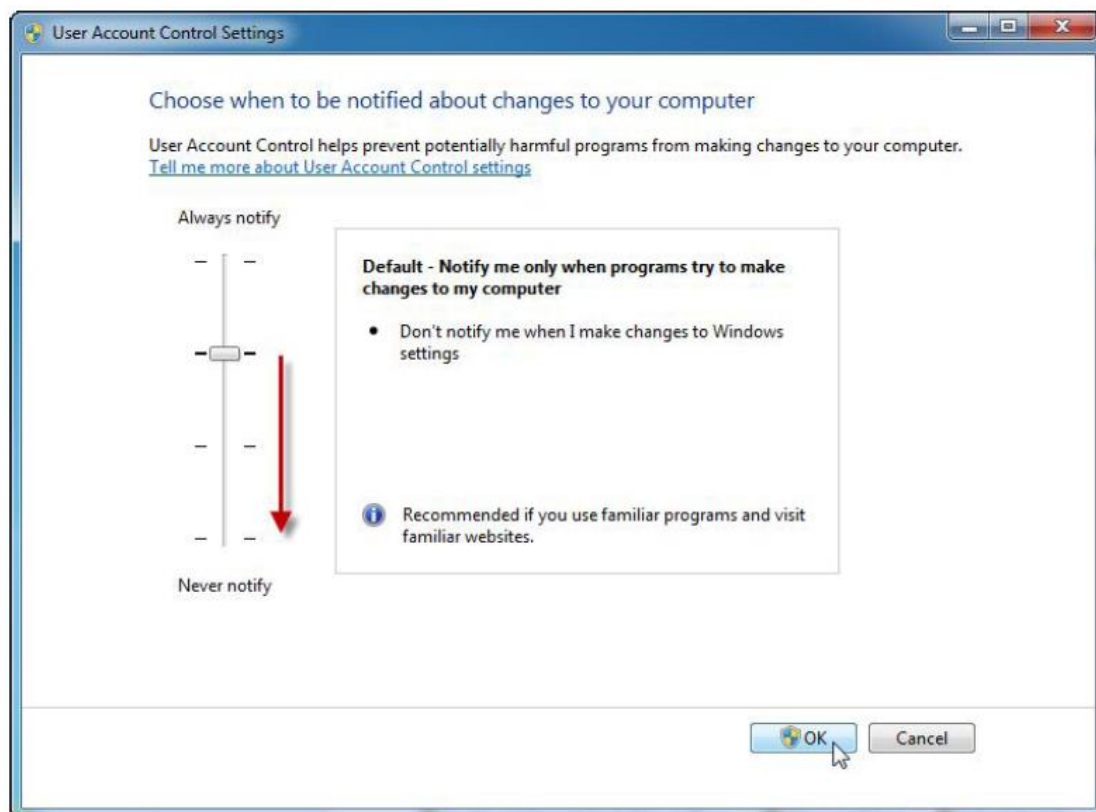
STEP 5 You will need to restart your computer for driver install success.

Type in this command from the Run menu:

C:\Windows\System32\UserAccountControlSettings.exe or uac



To turn off UAC, move the slider to the Never notify position, and then click OK. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.



To turn UAC back on, move the slider to choose when you want to be notified, and then click OK. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

You will need to restart your computer for UAC to be turned off.

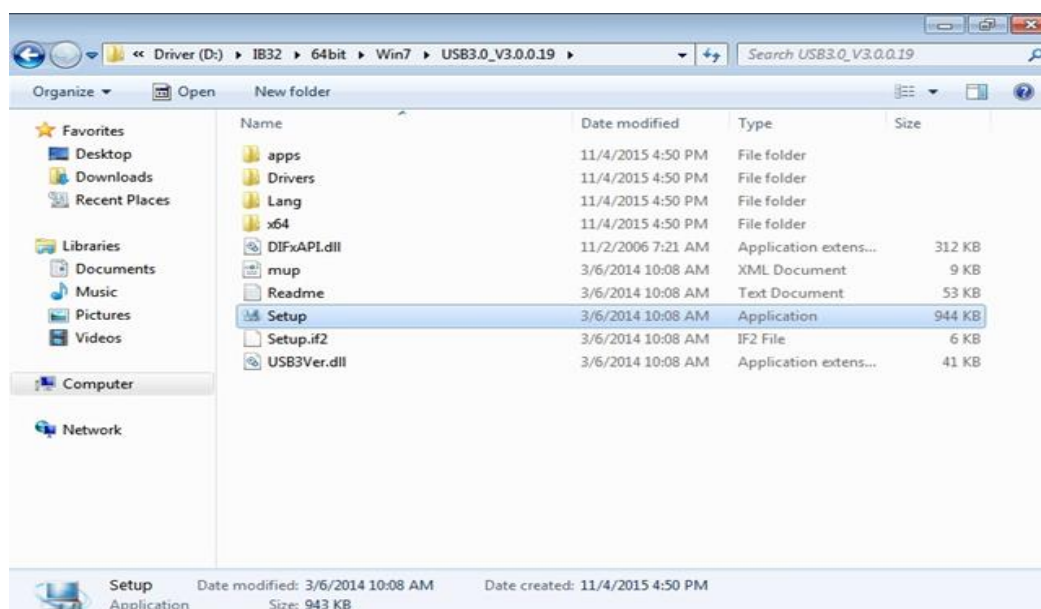
4.7 USB 3.0 Driver (Windows 7)

**NOTE:**

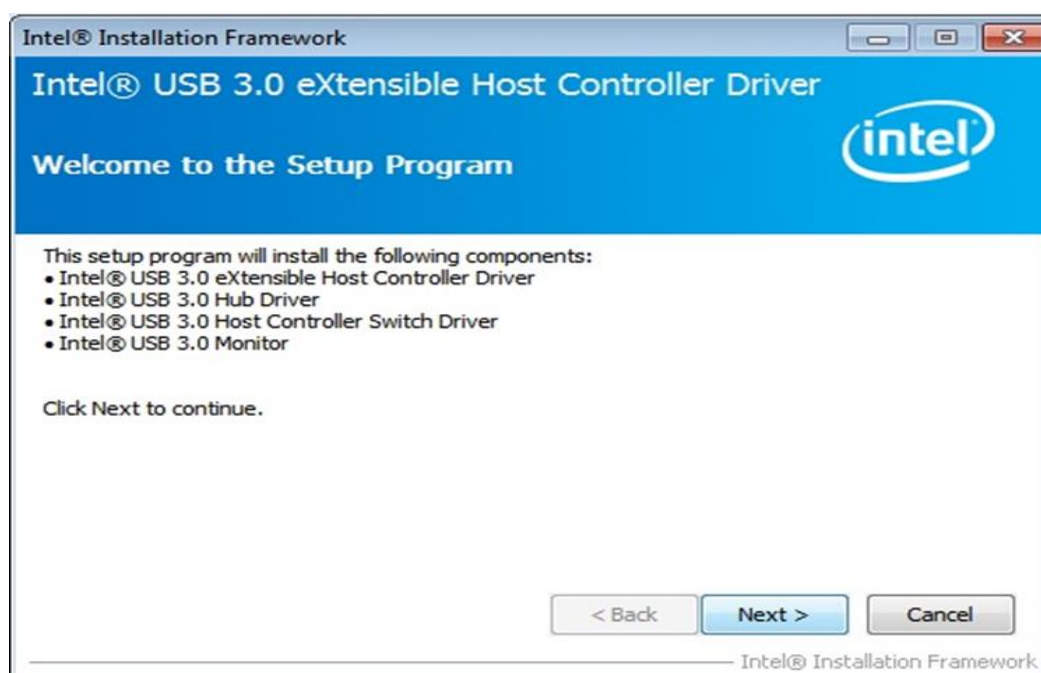
If the operating system of the device is Windows Embedded 8.1 Industry or Windows Embedded 8 Standard, users can skip this installation.

Step 1 Locate the hard drive directory where the driver files are stored with the browser or the explore feature of Windows*.

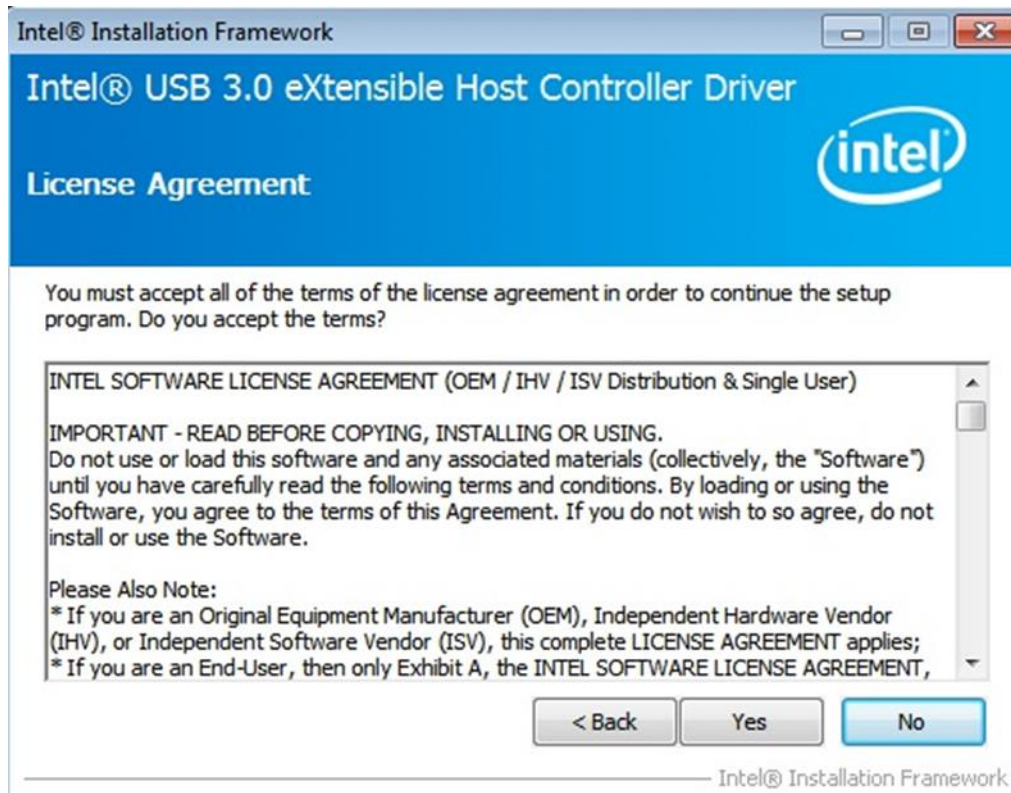
Step 2 Double click the “Setup.exe” from this directory.



Step 3 Click “Next” to continue.



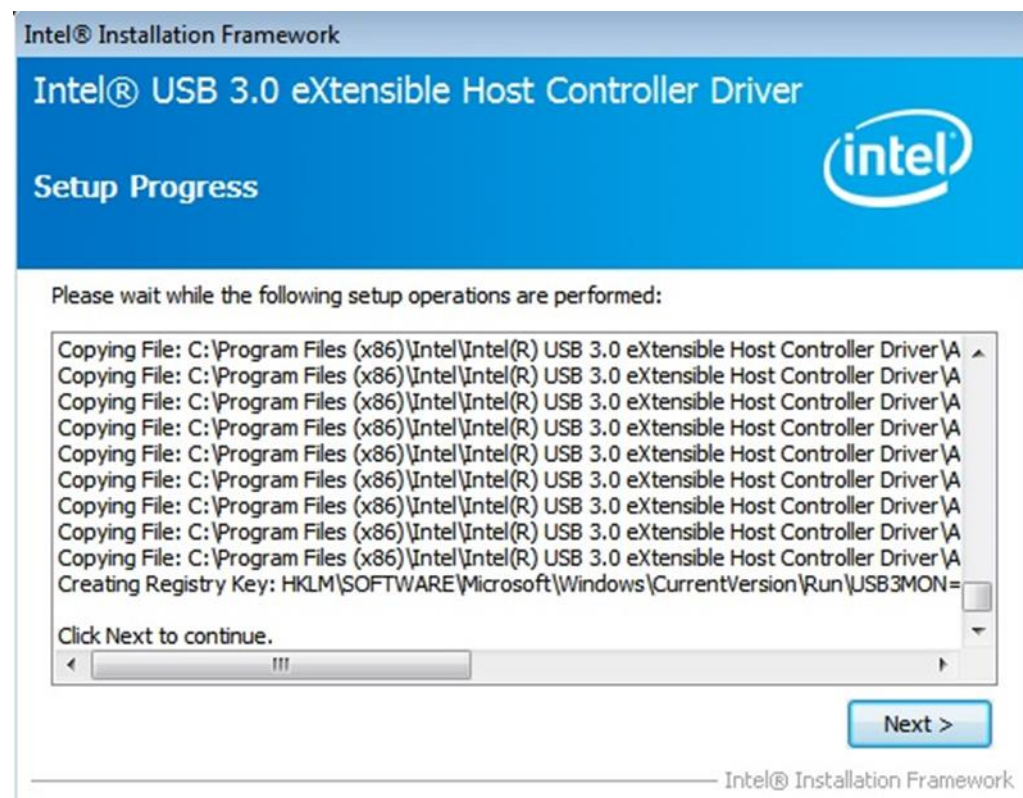
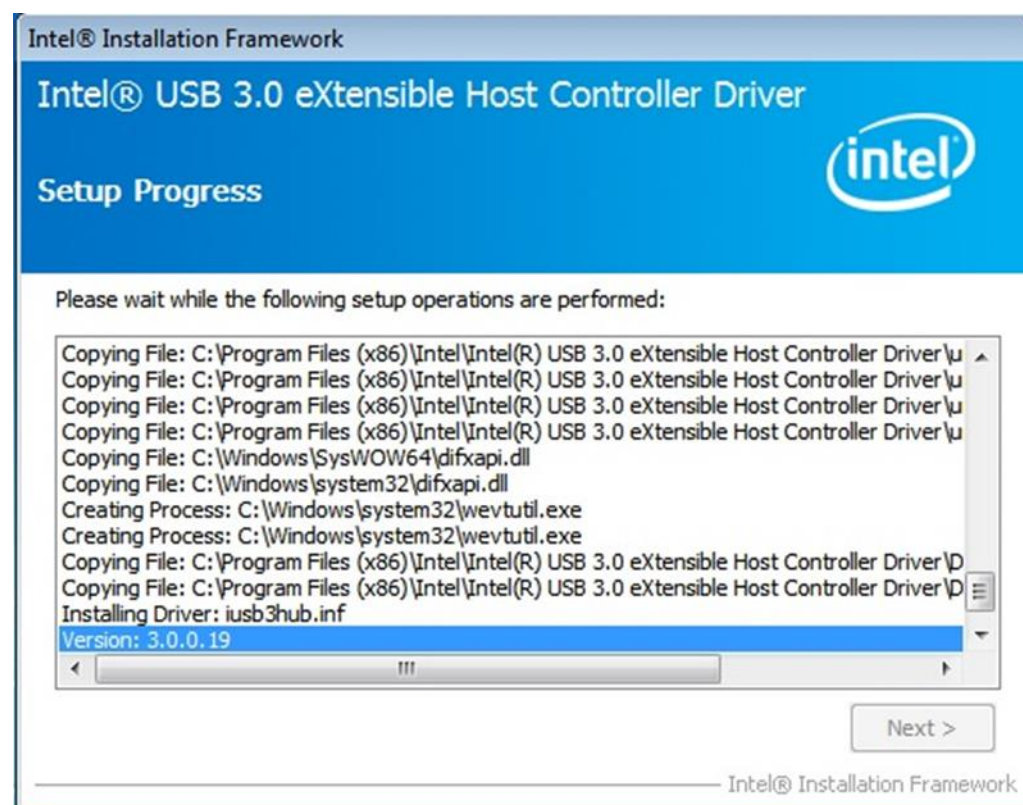
Step 4 Read License Agreement and click “Yes” to proceed.



Step 5 Review Readme File Information and click “Next” to proceed.



Step 6 When the Setup Progress is complete click “Next” to proceed.



Step 7 Click “Yes, I want to restart this computer now” to finish the installation and restart your computer.



Technical Support Documents

This chapter includes SDK list for this User Manual.

5.1 Digital I/O SDK

5.2 Watchdog SDK

Chapter 5: Technical Support Documents

SDK List

You can download SDK from our download center, please click the link below.

<https://www.dropbox.com/s/I3klrmigy2lip6/SDK.rar?dl=0>

5.1 Digital I/O SDK

To find the Digital I/O Sample code, please refer to the IH70 driver CD SDK or contact us.

5.2 Watchdog SDK

To find the Watchdog Sample code, please refer to the IH70 driver CD SDK or contact us