IH32 Motherboard

3.5” SBC with Intel ® 4th / 5th Generation Dual Core i5 Processors, HDMI, LVDS, VGA, Dual Giga Ethernet, and Mini-PCIe Interface

V110

User Manual

Version 1.1
Manual Number: 9171111I101X

Preface

Copyright Notice

Trademark Acknowledgement

Disclaimer

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Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. (Standard is one year, extended warranty will need to discuss with our sales representatives. If the customer discovers a defect, we will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W11Axxxxxxxx means October of year 2011.

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package:

- IH32 Motherboard
- User Manual & Driver CD

Optional Accessories:

- Power Cord

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Customer Service

We provide a service guide as below for any problem by the following steps:
First, contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You need to prepare the following information before you call:

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Detailed problem description
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

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.

Revision History

Version	Date	Note	Author
1.0	2015.02.24	Initial Draft	Patrick Hsien
1.1	2015.12.15	Added: • Intel® Core i5-5200U Dual Core 2.2GHz (up to 2.7GHz) Processor; • Intel HD Graphics 5500 , support DX11.2 Corrected: • Pin Assignment- Dc_In (CN22), VGA1 Updated: • BIOS Configurations	Patrick Hsien, edited by Anna Kiseleva

Contents

General Information

CHAPTER 1

This chapter includes the IH32 Motherboard background information.

Sections include:

Chapter 1 General Information

1.1 Introduction

Thank you for choosing the IH 32 motherboard. This motherboard can be integrated with Intel® Core i5-4200U Dual Core 1.6GHz (up to 2.6GHz) or Intel® Core i5-5200U Dual Core 2.2GHz (up to 2.7GHz) which offers a high performance computing platform with low power consumption. The new motherboard supports 204-pin SO-DIMM DDR3L at speeds of 1333/1600 MHz, up to 8GB. This motherboard support two generations of Intel® Core™ processors: Intel®4th Generation Core™ based on 64-bit, multi-core processor and built on 22-nanometer process technology, or Intel®5th Generation Core™ based on 64-bit, multi-core processor and built on 14-nanometer process technology.

There is an advanced full set of I/O ports including four USB 3.0, two USB 2.0, two LAN ports and audio jack for microphone, line-in and line-out. The motherboard is designed in 3.5” form factor and measures 146mm x 102mm.

1.2 Features

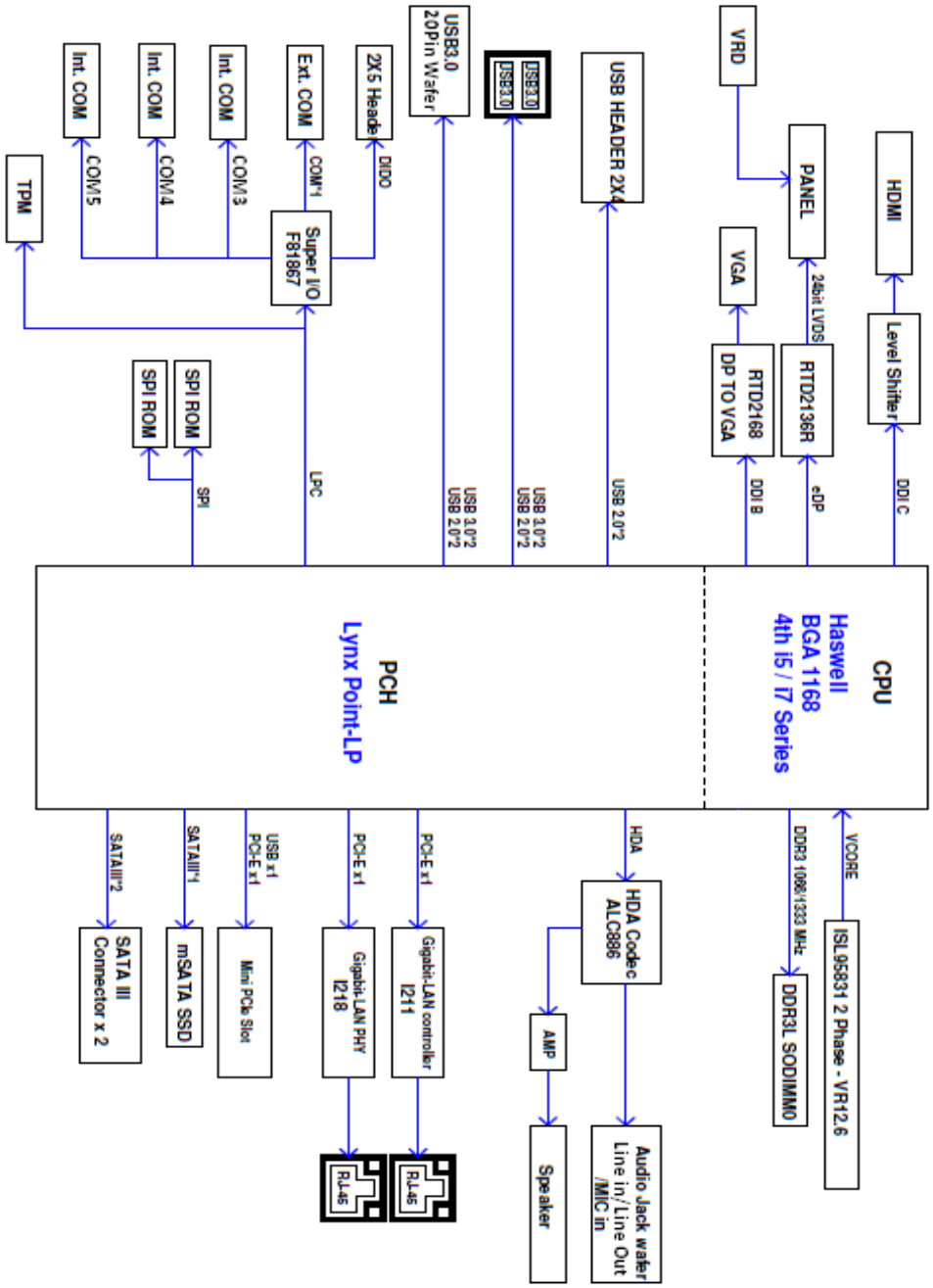
- 3.5” Form Factor (146mm x 102mm / 5.7 x 4 inches)
- Supports:
  - Intel® 4th Generation Core i5 4200U Processor
  - Intel® 5th Generation Core i5 5200U Processor
- System memory up to 8GB DDR3L 1333/1600, SO-DIMM
- Supports:
  - Intel® HD Graphics 4400 Integrated Graphics Engine
  - Intel® HD Graphics 5500 Integrated Graphics Engine
- Intel® I211 Gigabit-LAN Controller + I218LM Gigabit-LAN PHY r
- 2 x Mini PCIe, 4 x COM, 4 x USB3.0, 2 x USB 2.0, 2 x SATAIII, 1 x 12 bit GPIO port, 1 x HDMI, 1xVGA

1.3 Motherboard Specifications

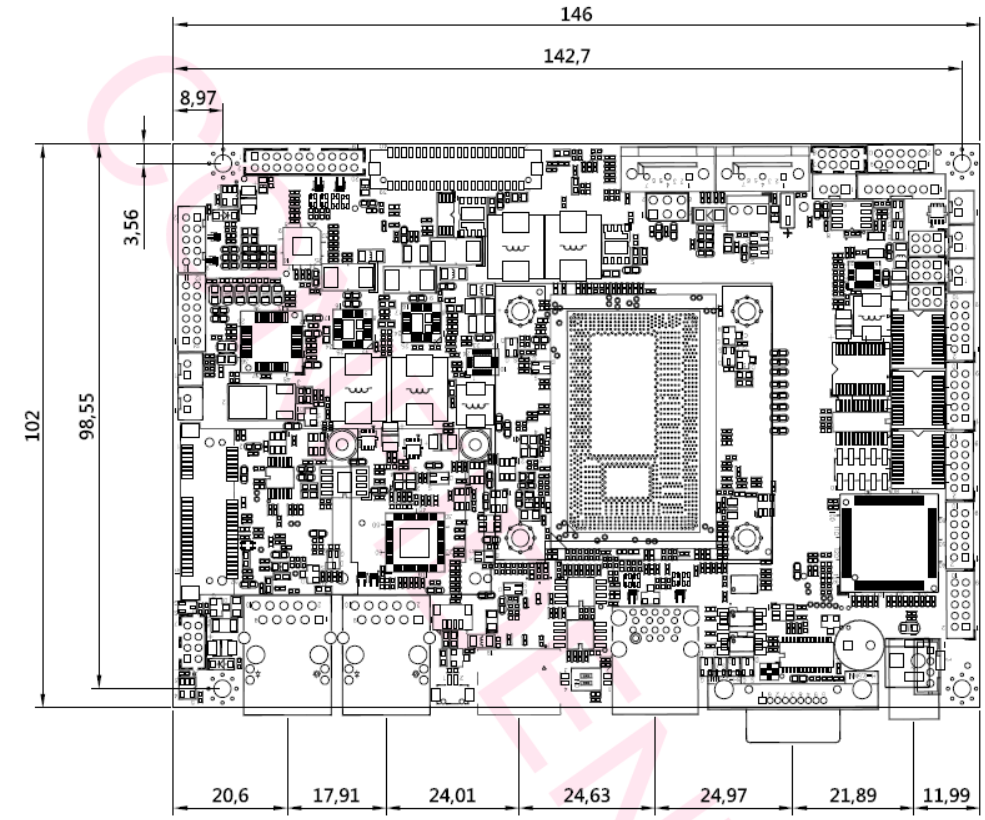
Please refer to the table below for detailed motherboard specifications.

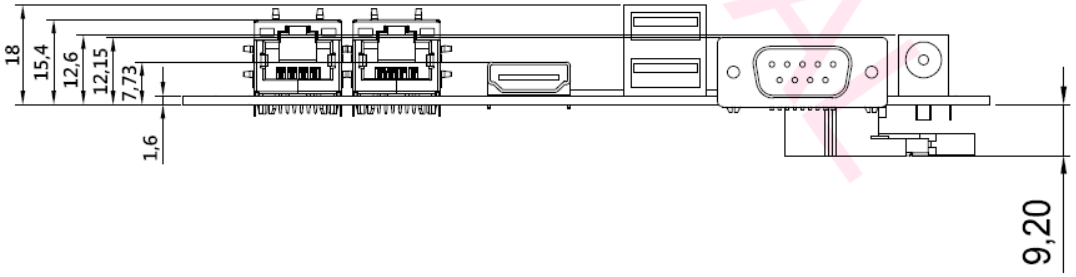
CPU Type	Supports Intel® 4th Generation Core i5 4200U 1.6GHz Processor (up to 2.6GHz) Supports Intel® 5th Generation Core i5 5200U 2.2GHz Processor (up to 2.7GHz)
Chipset	Intel® SoC Integrated
BIOS	AMI System BIOS
Graphics	Intel® HD Graphics 4400 support DX11 Intel HD Graphics 5500 support DX 11.2
LCD interface	Dual-channel 24 bit LVDS Up to 1920 x 1200@ 60Hz
Resolution	VGA mode: up to 1920 x 1200 @ 60Hz HDMI: 1920 x 1200 @ 60Hz LVDS: 1920 x 1200 @ 60Hz
Multiple Display	VGA+LVDS+HDMI
LAN	2 x Giga LAN (Intel® I211 Gigabit-LAN Controller + I218LM Gigabit-LAN PHY)
Memory Type	1x SO-DIMM socket, supports up to 8GB DDR3L 1333/1600
Sound	Realtek ALC886 HD Audio Codec
USB	4 ports, USB 3.0 (2 x USB Connectors, 2 x USB pin-headers) 2 ports, USB 2.0 (2 x USB pin-headers)
I/O Connectors	1 x DC-IN Jack (+12V) 2 x Gigabit LAN RJ-45 1 x RS232/ 422/ 485 2 x USB 3.0 connector 1 x HDMI
On Board Pin-Header Connectors	3 x RS-232 (COM2.COM3.COM4) 2x5 pin-header 2x USB 2.0 2 x USB3.0 (2 x 10 Pin Header) 1 x LVDS by DF-13 40-pin connector 1 x 10-pin (2x5) wafer for VGA 2 x SATA III 1 x 2x4-pin wafer for SATA power 2 x 2- 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 2-pin wafer for 3.3V external power (Blue) 1 x 10-pin wafer for Front Panel (2x5) 1 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 10-pin header for VGA (2x5) 1 x 2x6-pin wafer for Audio (Mic-in / Line-in / Line-out)
Power Connector	1 x 2.5 DC-in 12V connector
Expansion Slots	1 x Mini PCIe Slot for wireless or 3G Card(USB Signal), 1 x Mini PCIe Slot for mSATA SSD(SATAIII Signal)
Form Factor	3.5 inch
Dimensions	146mm x 102mm
Environmental	Operating Temperature: -10~70°C (14~158°F) Operating Humidity: 10~90% relative humidity, non-condensing Requirements: RoHS

Function block (V110)



Board dimensions (V110)





Hardware Installation

CHAPTER 2

This chapter provides information on how to use jumpers and connectors on the IH32 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:

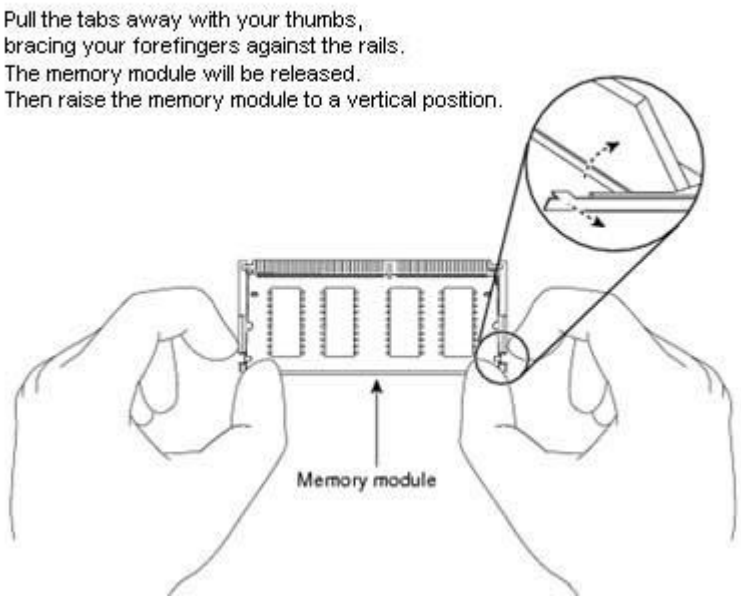
Chapter 2 Hardware Installation

2.1 Memory Module (SO-DIMM) Installation

The IH32 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.



Caution!

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

2.2 I/O Equipment Installation

2.2.1 12V DC-IN

The Motherboard allows plugging in 12V DC-IN jack on the board without another power module converter under power consumption by Intel® 4th/ 5th Generation Core i5 4200U/ 5200U Processor.

2.2.2 Serial COM ports

Three RS-232 connectors build-in the rear I/O. One optional COM port supports RS-422/485. When an optional touch-screen ordered with PPC, serial COM port can be connected to a serial or an optional touch-screen. You can change serial COM port setting through BIOS.

2.2.3 External HDMI

The Motherboard has one HDMI port that can be connected to an external LCD monitor by HDMI cable, and it also needs to be connected to the outlet by power cable. The HDMI connector is a standard 19-pin Type A connector.

2.2.4 Ethernet interface

The Motherboard is equipped with Intel® I211 Gigabit-LAN Controller + I218LM Gigabit-LAN PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.2.5 USB ports

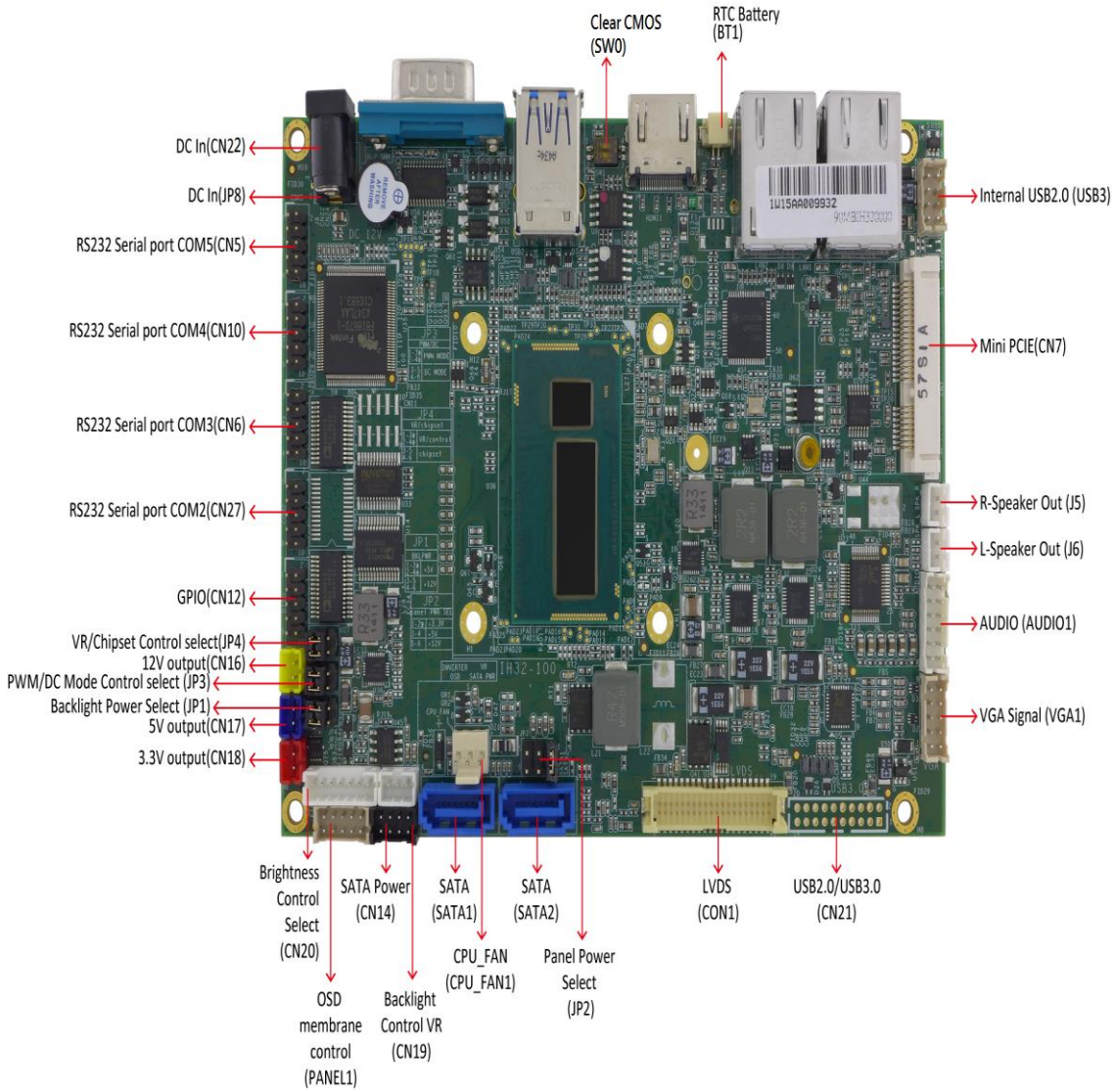
Six USB devices (four with pin headers) can be connected to the system through an adapter cable. Various adapters may come with USB ports. USB usually connected the external system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

2.2.6 Audio function

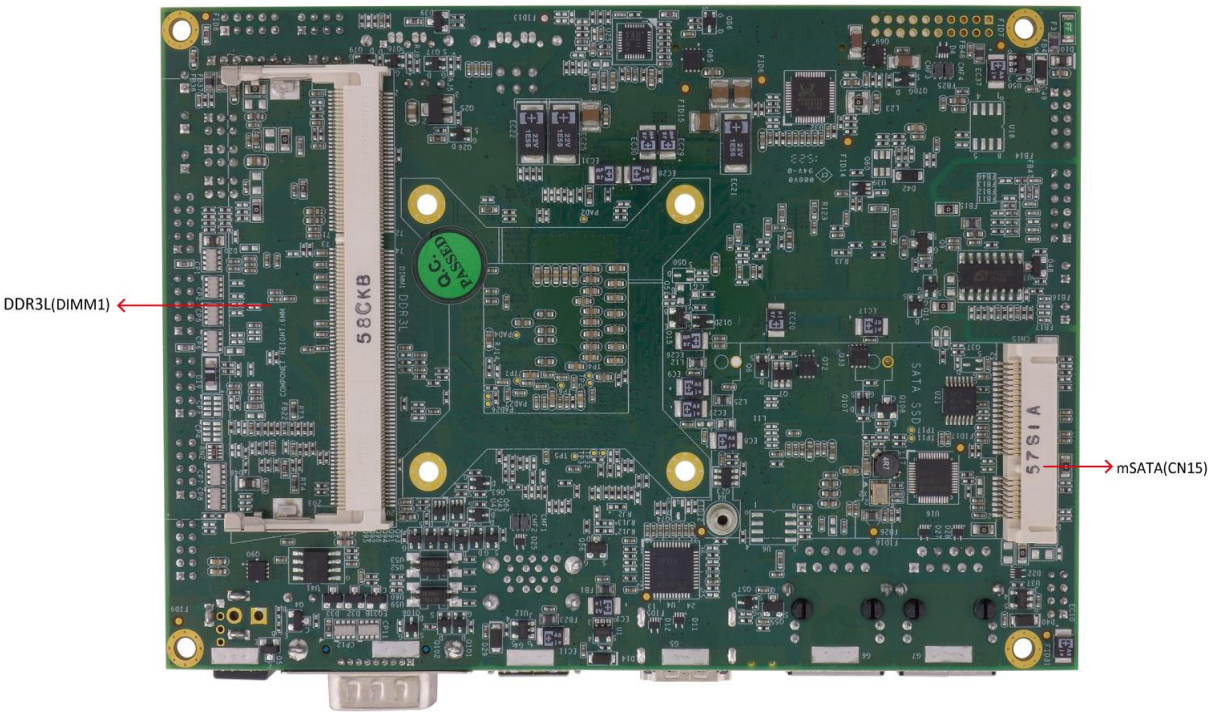
The Audio 7.1 channel capabilities are provided by a Realtek ALC886 chipset supporting digital audio outputs. The audio interface includes three jacks: line-in, line-out and mic-in.

2.3 Jumpers and Connectors

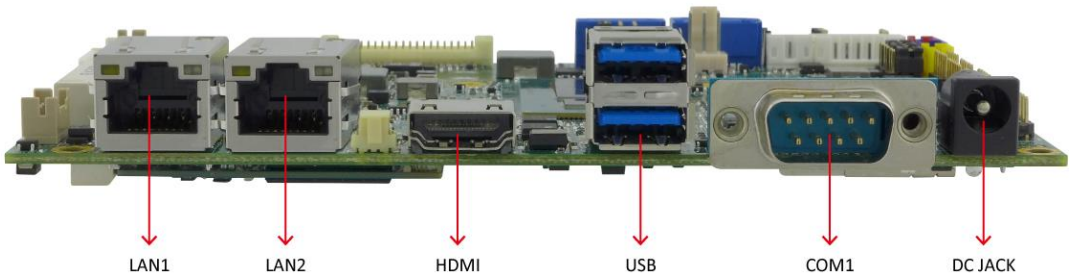
2.3.1 Component Side



2.3.2 Solder Side



2.3.3 I/O Side



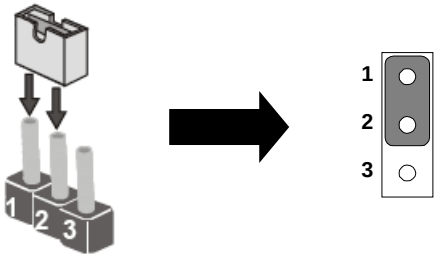
2.4 Jumper Settings

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.



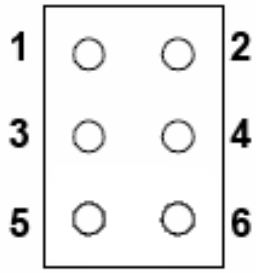
2.4.1 Jumper List

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

Label	Function	Note
JP1	Backlight Power Selector	2x3 header, pitch 2.0mm
JP2	Panel Power Selector	2x3 header, pitch 2.54mm
JP3	PWM/DC Mode Control Selector	2x3 header, pitch 2.0mm
JP4	VR/Chipset Control Selector	2x3 header, pitch 2.0mm
SW0	Clear CMOS	1x3 header, pitch 2.0mm

2.4.2 Setting Jumpers

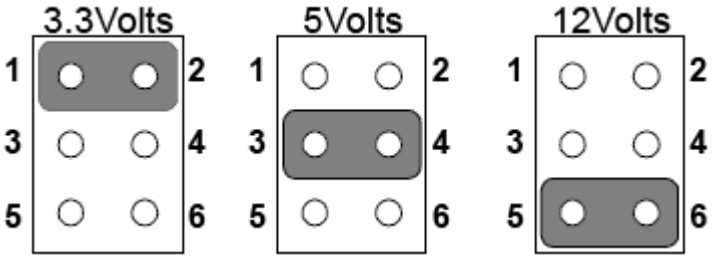
2.4.2.1 JP1: Backlight Power Selector



Setting	Function
1-3*	+5V
2-4*	
3-5	+12V
4-6	

*Default

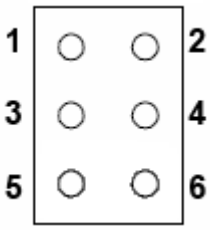
2.4.2.2 JP2: Panel Power Select



Setting	Function
1-2*	+3.3V
3-4	+5V
5-6	+12V

*Default

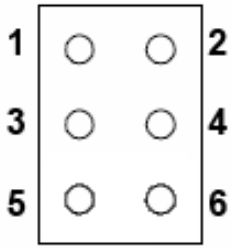
2.4.2.3 JP3: PWM/DC Mode Control Selector



Setting	Function
1-3*	PWM Mode
2-4*	
3-5	DC Mode
4-6	

*Default

2.4.2.4 JP4: VR/Chipset Control Selector

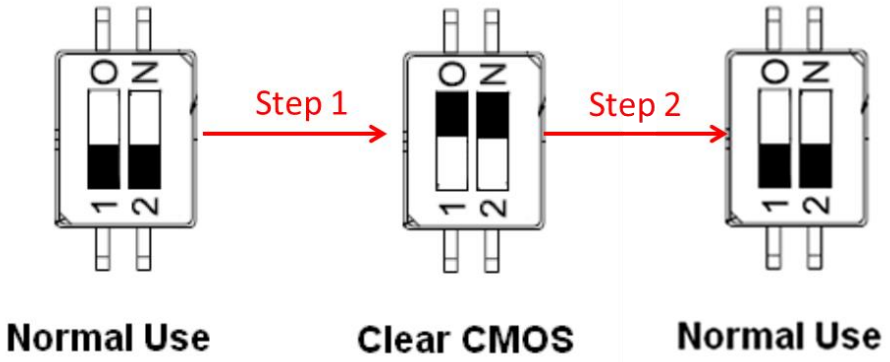


Setting	Function
1-3*	VR Control
2-4*	
3-5	Chipset
4-6	

*Default

2.4.2.5 SW0: Clear CMOS

Please follow the instructions below to change CMOS settings.



Step 1: To set the jumper to “clear” position, switch 1 to 0, 2 to N.

Step 2: To set the jumper to “normal” position, switch 0 to 1, N to 2.

2.5 Connectors and Pin Assignment

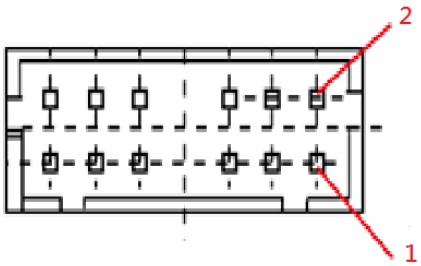
2.5.1 Front Side Setting Description

The table below shows the function of each of the board's connectors.

Label	Function	Note
AUDIO1	AUDIO	2x6 wafer, pitch 2.0mm
BT1	RTC Battery	2P wafer, pitch 1.25 mm
CN5	Serial port (RS232)	2x5 header, pitch 2.0mm
CN6	Serial port (RS232)	2x5 header, pitch 2.0mm
CN7	Mini-PCIE	Mini-PCIe slot
CN10	Serial port (RS232)	2x5 header, pitch 2.0mm
CN12	GPIO	2x5 header, pitch 2.0mm
CN14	SATA Power	2x4 wafer, pitch 2.0mm
CN15	mSATA	Mini-PCIe slot
CN16	12V output	1x2 wafer, pitch 2.0 mm
CN17	5V output	1x2 wafer, pitch 2.0 mm
CN 18	3.3V output	1x2 wafer, pitch 2.0 mm
CN19	Backlight Control VR	1x3 wafer, pitch 2.0mm
CN20	Backlight	1x7 wafer, pitch 2.0 mm
CN21	USB 2.0 / USB 3.0	10x2 wafer, pitch 2.0mm
CN22	DC-In 2.5	1x2P wafer, pitch 3.96mm
CN27	Serial port (RS232)	2x5 header, pitch 2.0mm
CON1	LVDS	2x20 wafer, pitch 1.25mm
CPU_FAN1	CPU_FAN	3P wafer, pitch 2.54mm
DIMM1	DDR3L	204 pin, SODIMM slot
J5	R-Speaker out	1x2 wafer, pitch 2.0 mm
J6	L-Speaker out	1x2 wafer, pitch 2.0 mm

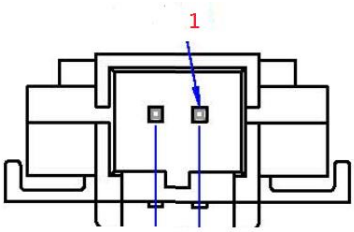
J8	DC In	1x4P wafer, pitch 2.0mm
Panel 1	OSD membrane control	2x5 wafer, pitch 2.0mm
SATA1	SATA	SATA connector
SATA2	SATA	SATA connector
USB3	Internal USB2.0	2x4 wafer, pitch 2.0mm
VGA1	VGA Signal	2x5 wafer, pitch 2.0mm

AUDIO1: Audio



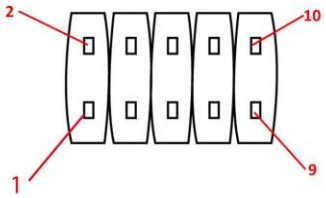
Pin №	Name	Pin №	Name
1	LINE_OUT_R	2	LINE_OUT_L
3	+5V	4	GND
5	LINE_IN_R	6	LINE_IN_L
7	MIC_R	8	MIC_L
9	GND	10	LINE_OUT_JACK DET
11	MIC_JACK DET	12	LINE_IN_JACK DET

BT1: RTC Battery



Pin №	Name	Pin №	Name
1	GND	2	+.3.3V

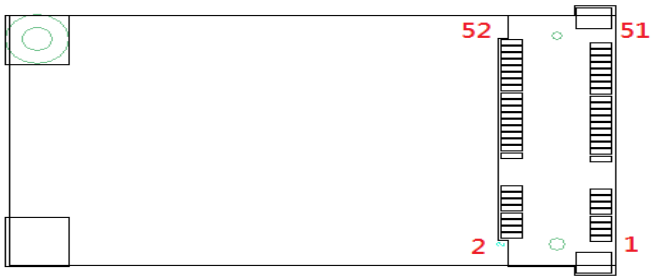
CN5, CN6, CN27, CN10 Serial ports (RS232)



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

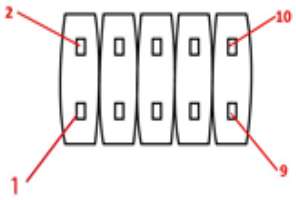
Note: IO_PWR: default is 5V option to 3.3V

CN7: Mini-PCIE



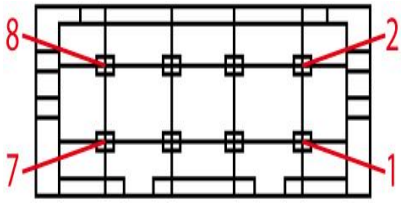
Pin №	Name	Pin №	Name
1	PCIE_WAKE#	2	+3.3V
3	NC	4	GND
5	Bluetooth_ENABLE	6	+1.5V
7	CLK_OE#	8	USIM_PWR
9	GND	10	USIM_DATA
11	PCIE_CLKM	12	USIM_CLOCK
13	PCIE_CLKP	14	USIM_RESET
15	GND	16	USIM_VPP
17	NC	18	GND
19	NC	20	Wireless_ENABLE
21	GND	22	PCIE_RESET
23	PCIE_RXM	24	+3.3V
25	PCIE_RXP	26	GND
27	GND	28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

CN12: GPI0



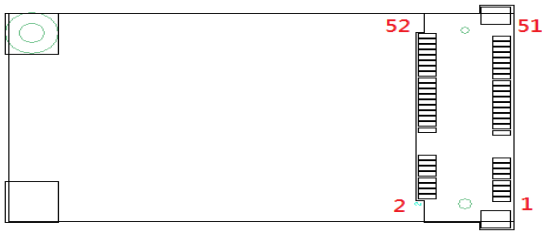
Pin №	Name	Pin №	Name
1	GND	2	+5V
3	DOUT3	4	DOUT1
5	DOUT2	6	DOUT0
7	DINT3	8	DINT1
9	DINT2	10	DINT0

CN14: SATA Power



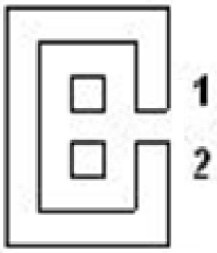
Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

CN15: mSATA



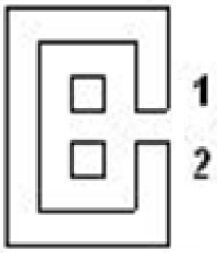
Pin №	Name	Pin №	Name
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	SATA_RXP	24	+3.3V
25	SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	SATA_TXN	32	NC
33	SATA_TXP	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
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

CN16: 12V Output



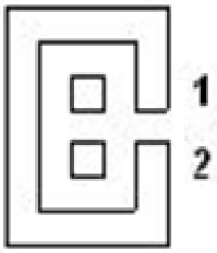
Pin №	Name
1	+12V
2	GND

CN17: 5V Output



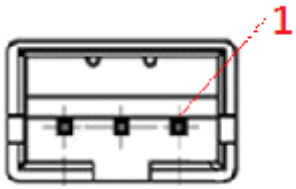
Pin №	Name
1	+5V
2	GND

CN18: 3.3V output



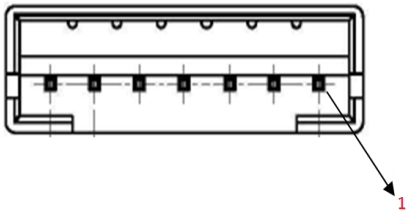
Pin №	Name
1	+3.3V
2	GND

CN19: Backlight Control VR



Pin №	Name	Pin №	Name
1	+5V	2	Black Light Control
3	GND		

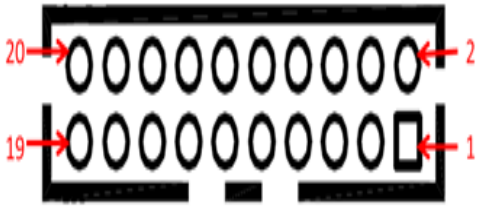
CN20: Backlight



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

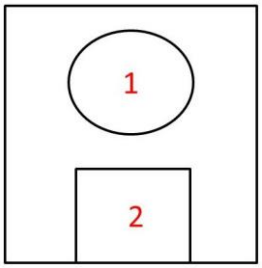
Note: Please refer to JP1 Setting to select Power Rating

CN21: USB 2.0 / USB 3.0



Pin №	Name	Pin №	Name
1	+5V	2	NC
3	USB3_P3_RX -	4	+5V
5	USB3_P3_RX +	6	USB3_P4_RX-
7	GND	8	USB3_P4_RX+
9	USB3_P3_TX-	10	GND
11	USB3_P3_TX+	12	USB3_P4_TX-
13	GND	14	USB3_P4_TX+
15	USB_P3_D-	16	GND
17	USB_P3_D+	18	USB_P4_D-
19	NC	20	USB_P4_D+

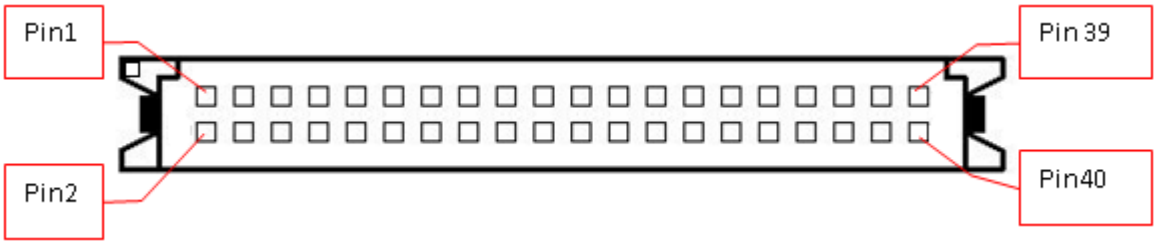
CN22: DC-In 2.5



Pin №	Name	Pin №	Name
1	DC_IN	2	GND
3*	GND		

*Not visible for user

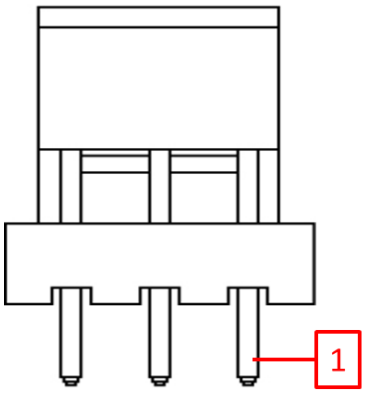
CON1: LVDS



Pin №	Name	Pin №	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

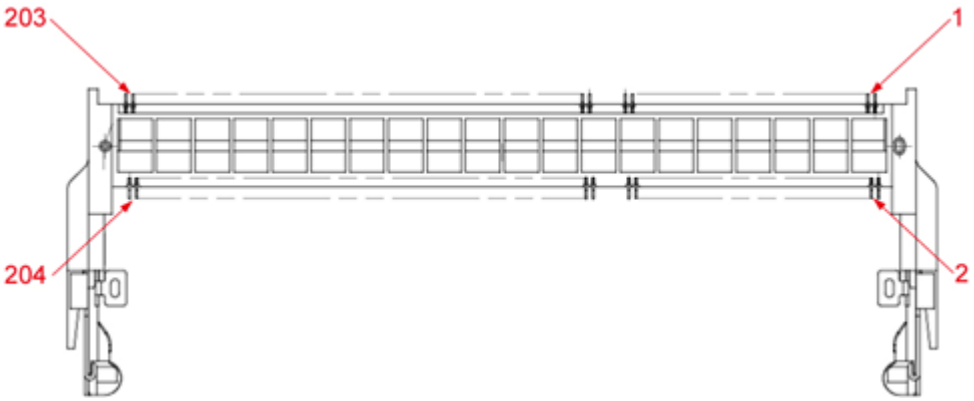
Note: Please refer to CON1 SETTING TO SELECT POWER RATING

CPU_FAN1: CPU FAN

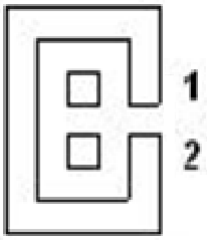


Pin №	Name	Pin №	Name
1	GND	2	+12V
3	RPM_SENSE		

DIMM1: DDR3L

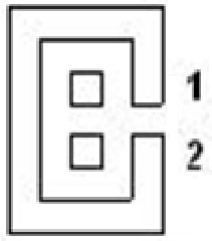


J5: R-Speaker Out



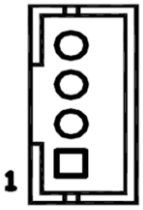
Pin №	Name
1	ROUT+
2	ROUT-

J6: L-Speaker Out



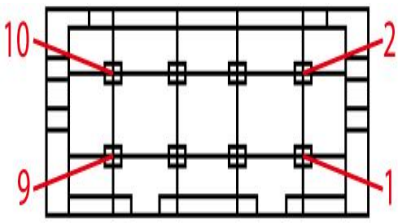
Pin №	Name
1	LOUT+
2	LOUT-

J8: DC-In



Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND

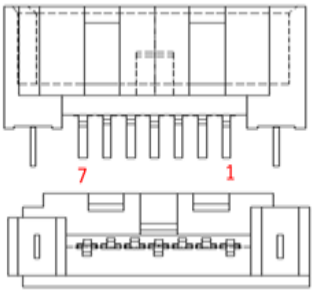
Panel1: OSD Membrane Control



Pin №	Name	Pin №	Name
1	+5V	2	+3.3V
3	GND	4	SATA_LED#
5	PWRBTN#	6	GND
7	Backlight_ADJ+	8	FP_RST_N
9	Backlight_ADJ-	10	+5V

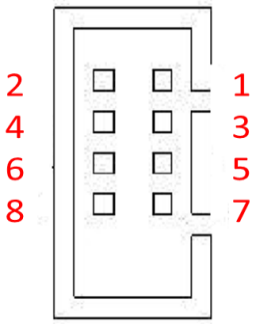
NOTE: Backlight_ADJ+ / Backlight_ADJ- are optinal functions

SATA1, SATA2: SATA



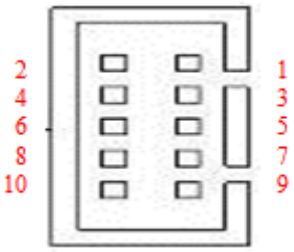
Pin №	Name	Pin №	Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

Two USB3: 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

VGA1: VGA Signal



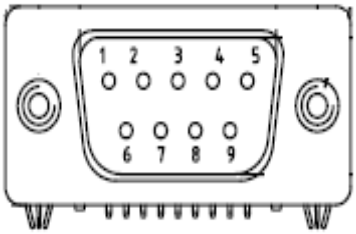
Pin №	Name	Pin №	Name
1	DDC_DATA	2	+5V
3	DDC_CLOCK	4	RED
5	Horizontal Sync	6	GREEN
7	Vertical Sync	8	BULE
9	GND	10	GND

2.5.2 I/O Settings Description

The table below lists each of I/O side board connectors and PIN assignment.

Label	Function	Note
COM1	Serial port (RS232/422/485)	D-Sub9 (Male)
DCJACK	DC JACK	2.5 DC Jack
HDMI	HDMI Signal	HDMI Type A
LAN1	Gigabit Ethernet	RJ45+LED
LAN2	Gigabit Ethernet	RJ45+LED
USB	USB 2.0 / USB 3.0	USB Type A

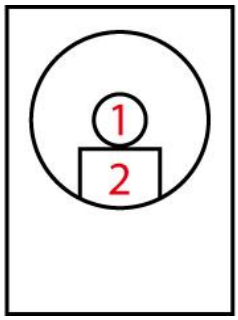
COM1: D-Sub 9 (Male)



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

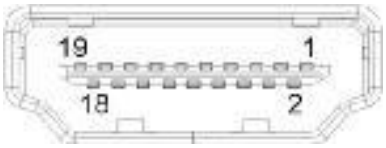
Note: Refer to BIOS to change serial COM port settings

DCJACK: 2.5' DC Jack



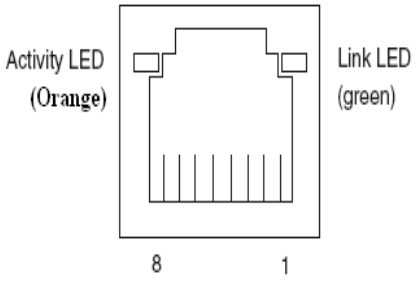
Pin №	Name	Pin №	Name
1	DC_IN	2	GND

HDMI: HDMI Type A



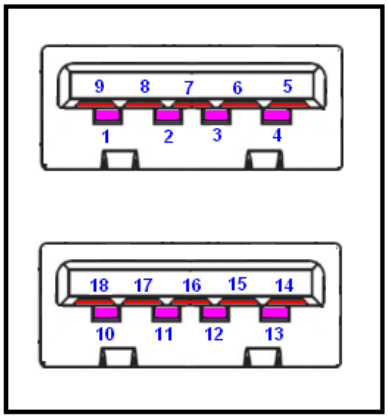
Pin №	Name	Pin №	Name
1	HDMI_DET	2	NC
3	HDMI_D2P	4	GND
5	HDMI_D2M	6	HDMI_D1P
7	GND	8	HDMI_D1M
9	HDMI_D0P	10	GND
11	HDMI_D0M	12	HDMI_CLKP
13	GND	14	HDMI_CLKM
15	HDMI_CEC_OUT	16	GND
17	DDC_CLOCK	18	DDC_DATA
19	+5V	20	GND

LAN1/ LAN2: Gigabit Ethernet



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

Two USB 3.0 (Compliable with USB 2.0)



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+	10	+5V
11	USB_D-	12	USB_D+
13	GND	14	STDA_SSRX-
15	STDA_SSRX+	16	GND
17	STDA_SSTX-	18	STDA_SSTX+

AMI BIOS Setup

CHAPTER 3

This chapter contains BIOS Configuration and OS Recovery information.

Chapter 3 AMI BIOS SETUP

3.1 How and When to Use BIOS Setup

The BIOS Setup allows users to modify system configurations. 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.

Updated BIOS version may be published after the manual released.

Check the latest version of BIOS on the website.

Note

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

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

BIOS Navigation Keys

BIOS navigation keys for keyboard control are shown in the Table below.

Use the error keys to highlight the items.

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

****NOTICE**

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

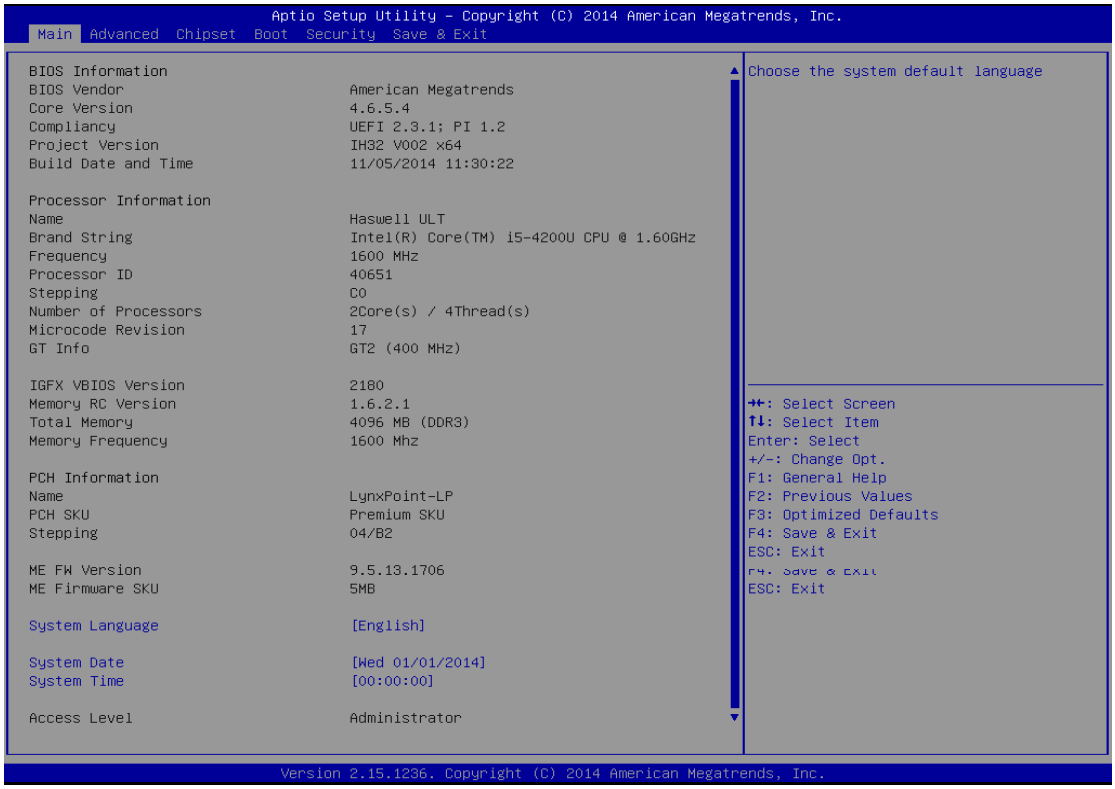
3.2 BIOS Functions

The IH32 motherboard has AMI BIOS built-in and a CMOS SETUP utility that allow users to configure required settings or to activate certain system features. The follwoing sections describe the configuration options found in the menu items.

3.2.1 Main Menu

The Main menu displays the basic information about yoursystem including BIOS version, processor RC version, system language, time, and date.

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



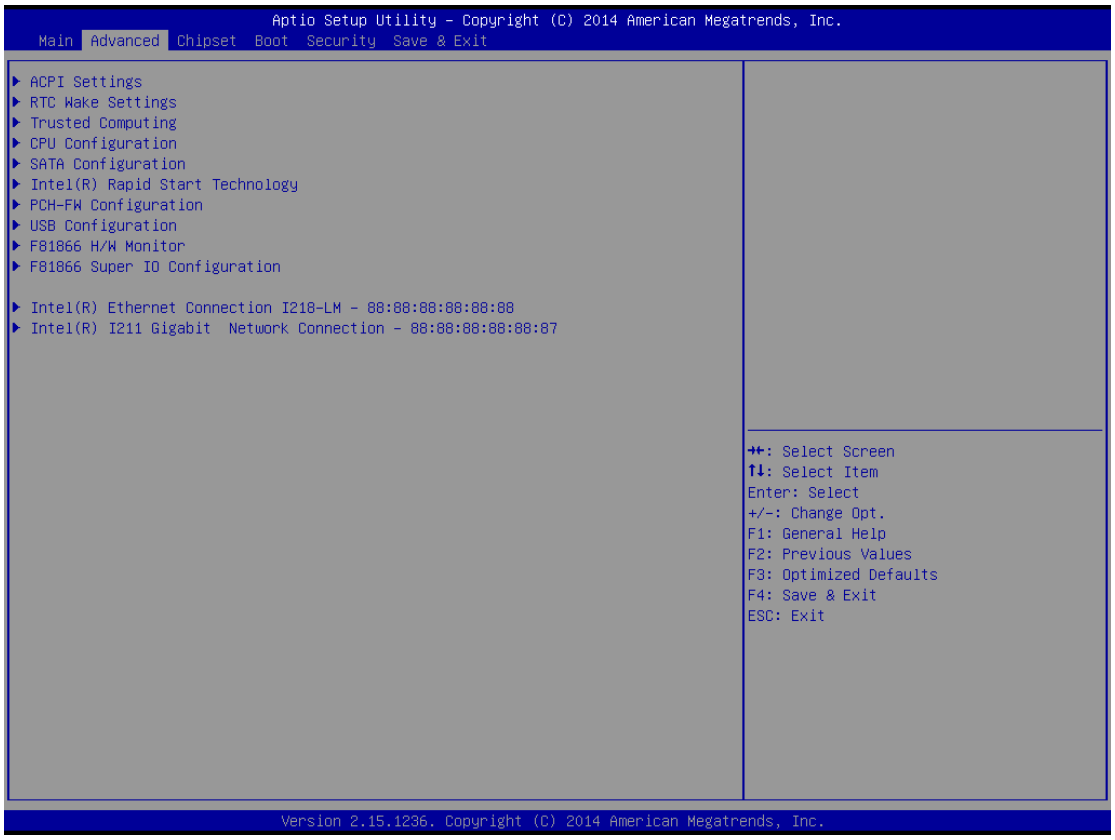
BIOS Setting	Description	Setting Option	Effect
System Language	Displays the system language. [English] is set up by default.	Adjustment of the language	Set the language in other language. The language in this device is English.
System Date/Time	This is current date setting. The time is maintained by the battery when the device is turned off.	Date and time changes.	Set the date in the format [mm/dd/yyyy]; The time in the format: [hh/mm/ss]
Access Level	The current user access settings	Changes to the level of access	Administrator is set up by the default

3.2.2 Advanced Settings

Select the Advanced Tab from the IH32 setup menu to enter the advanced BIOS setup screen. You can select any of the items on the left frame of the screen to go to the sub menu for the item, such as CPU Configuration. You can use the <Arrow> keys enter all advanced BIOS setup options. The advanced BIOS setup menu is shown below. The submenus described on the following pages.

Note

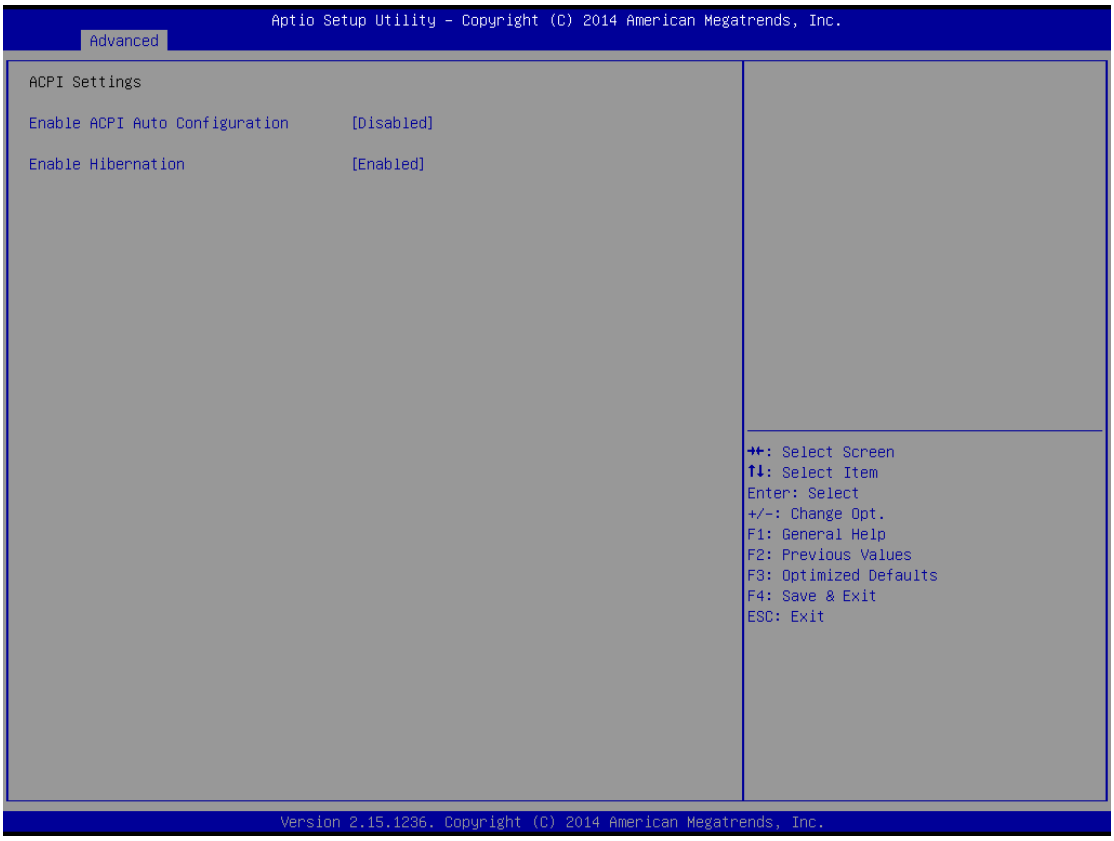
Handle advanced BIOS settings page with caution. Any changes can affect the operation of your computer.



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 settings	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
USB Configuration	Configures USB parameters	Enter	Opens submenu
F81866 H/W Monitor	Configures H/W Monitor settings	Enter	Opens submenu
F81866 Super I/O Configuration	Configures Super I/O settings	Enter	Opens submenu
Intel Ethernet Connection	Configures Intel Ethernet Connection settings	Enter	Opens submenu
Intel I211 Gigabit Network Connection	Configures Intel I211 Gigabit Network Connection settings	Enter	Opens submenu

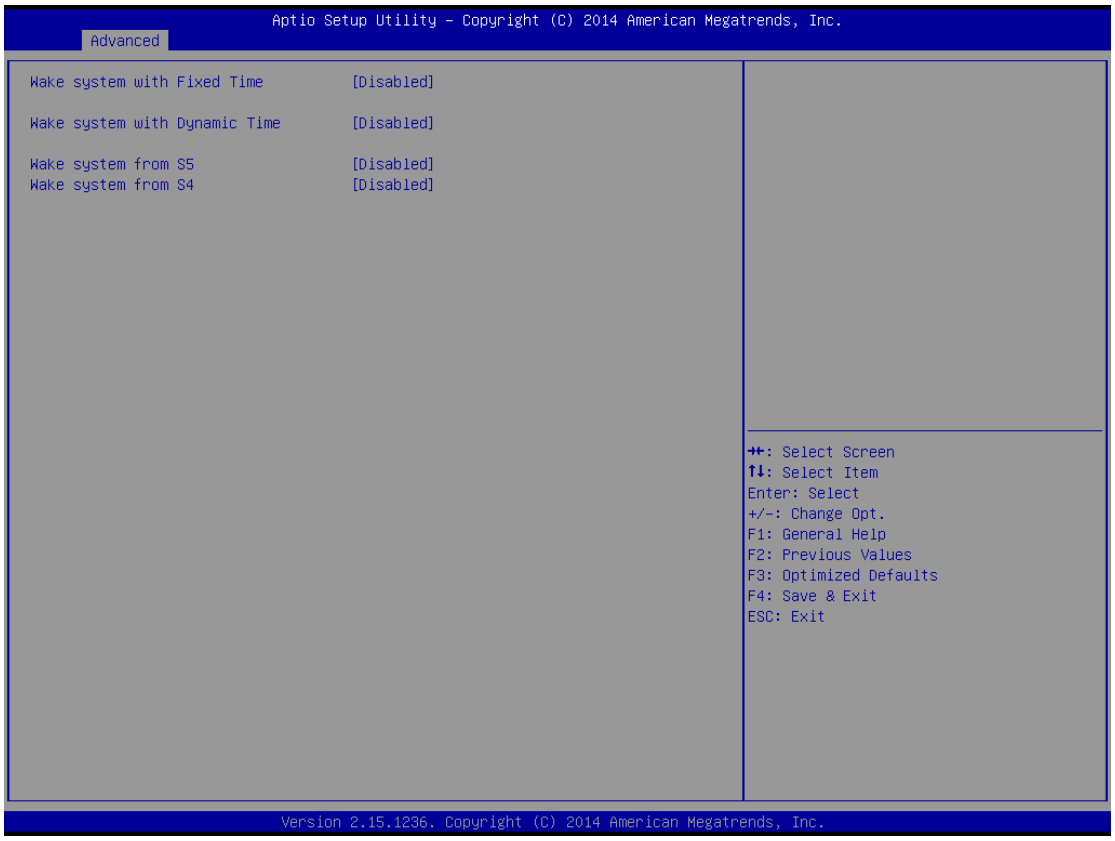
For items marked ► press **<Enter>** for more options.

3.2.2.1 ACPI Settings



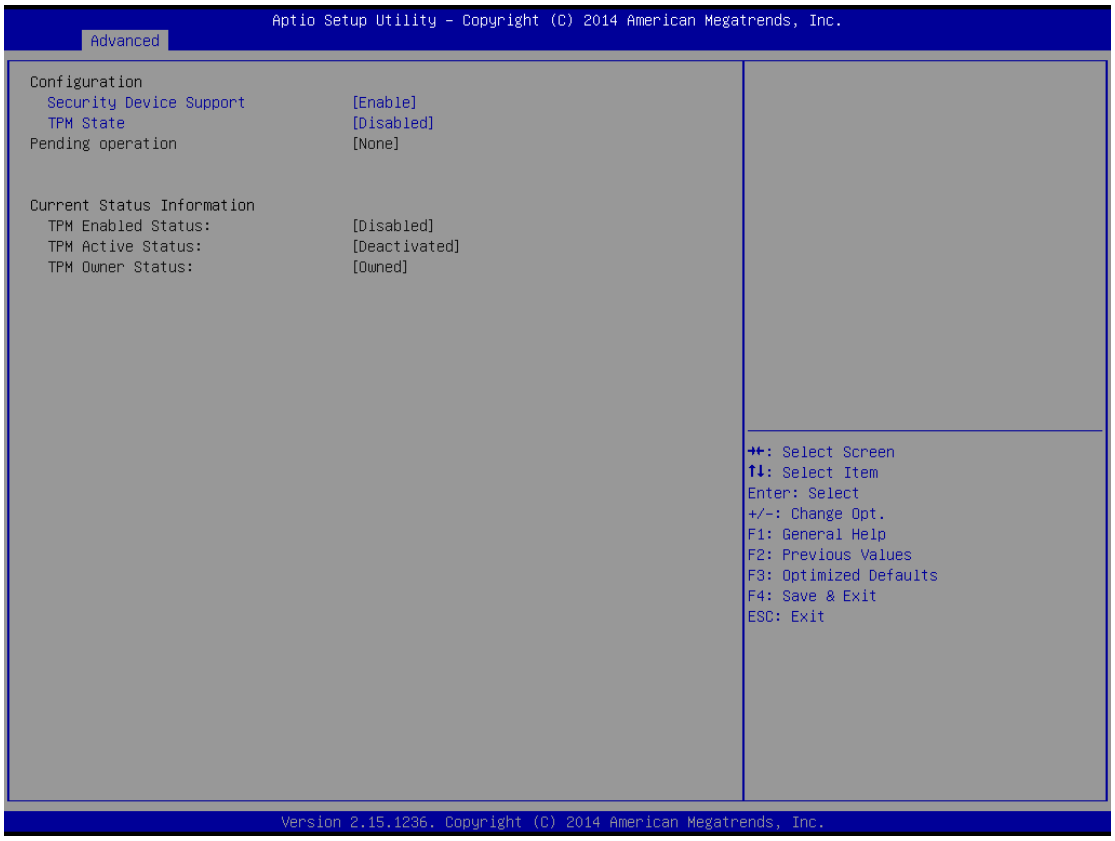
BIOS Setting	Description	Setting Option	Effect
Enable ACPI Auto Configuration	BIOS ACPI Auto Configuration	Enable/ Disable	Enables or Disables this function
Enable Hibernation	Control hibernation	Enable/ Disable	Enables or Disables this function

3.2.2.2 RTC Wake



BIOS Setting	Description	Setting Option	Effect
Wake system with Fixed Time	System awake on alarm events.	Enabled/ Disabled	System will awake at the hr: min: sec specified
Wake system with Dynamic Time	S set the system to wake on the current time + increase minute (s).	Enabled/ Disabled	System will awake at current time+ increase minute (s).
Wake System from S5	Enables or disables system wake on alarm event. It allows you to wake up the system in a certain time.	Enabled/ Disabled	System will awake at the hr: min: sec specified

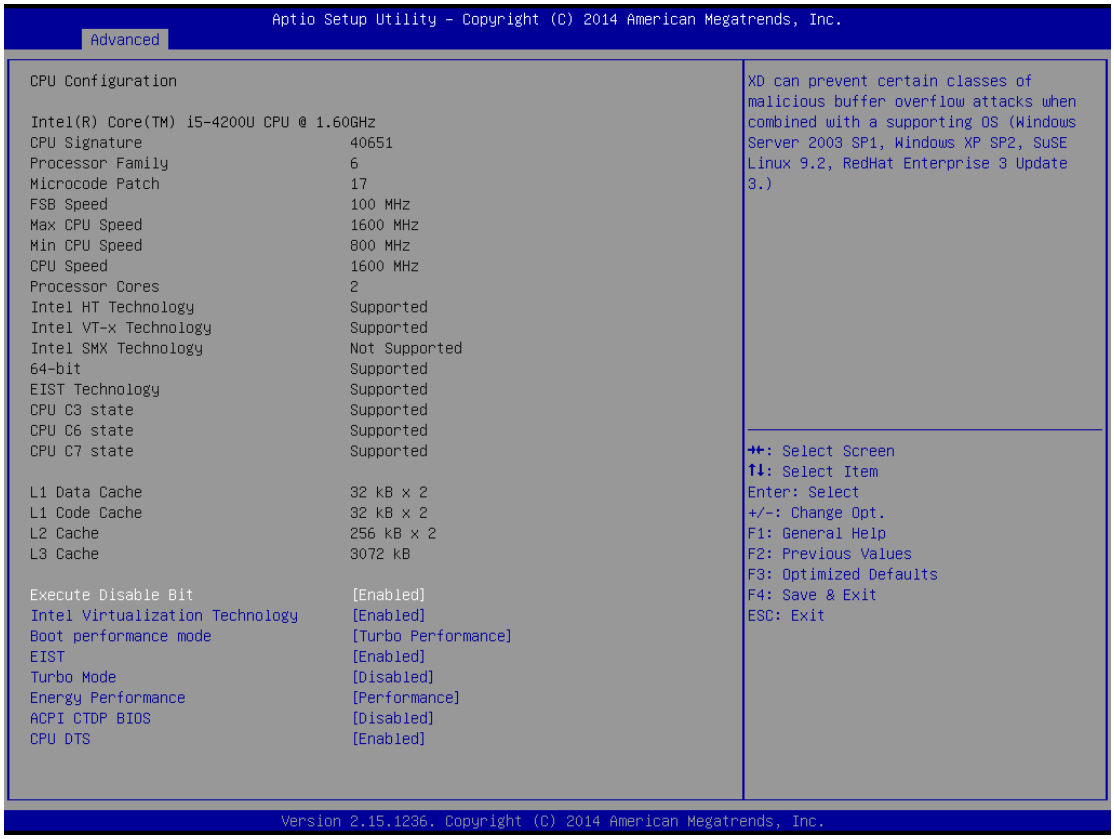
3.2.2.3 Trusted Computing



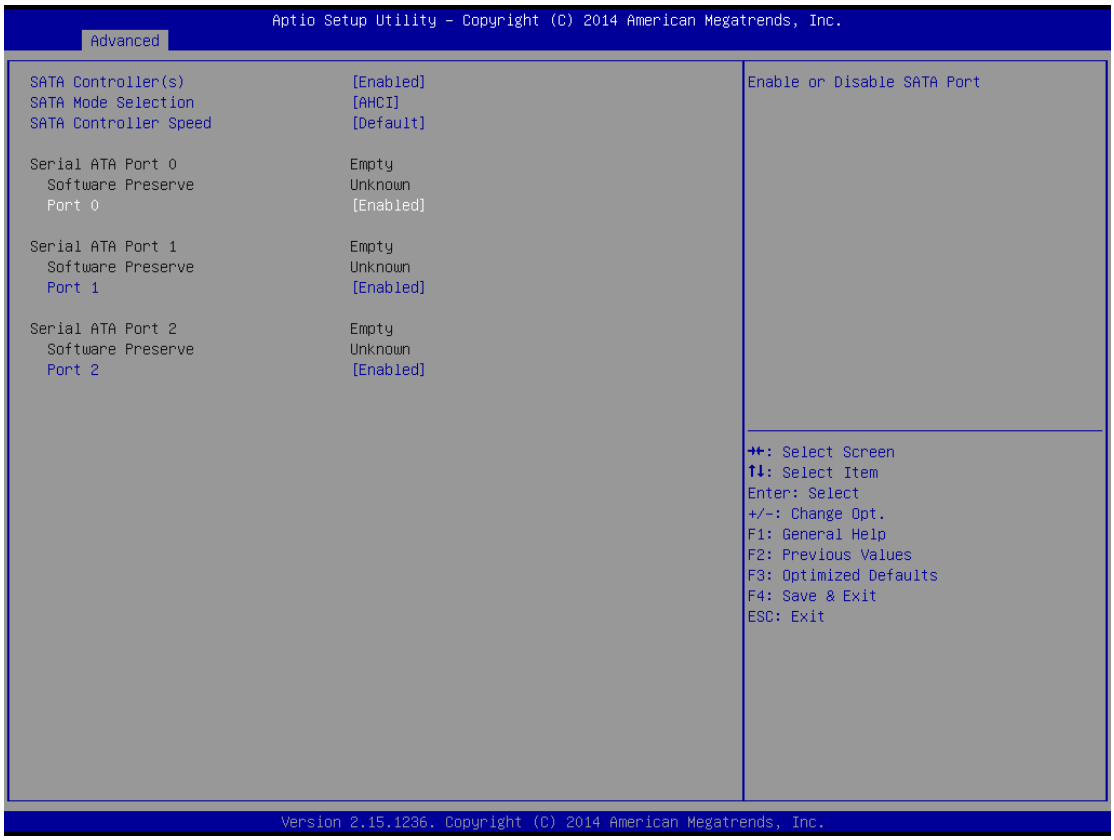
BIOS Setting	Description	Setting Option	Effect
Security Device Support	Enable or disable BIOS support for security device	Enabled/Disabled	Set desirable configuration
TPM State	Enable or disable TPM state.	Enabled/Disabled	Set desirable configuration

3.2.2.4 CPU Configuration

CPU Configuration allows you to change CPU settings. Use key arrows to navigate through the menu.



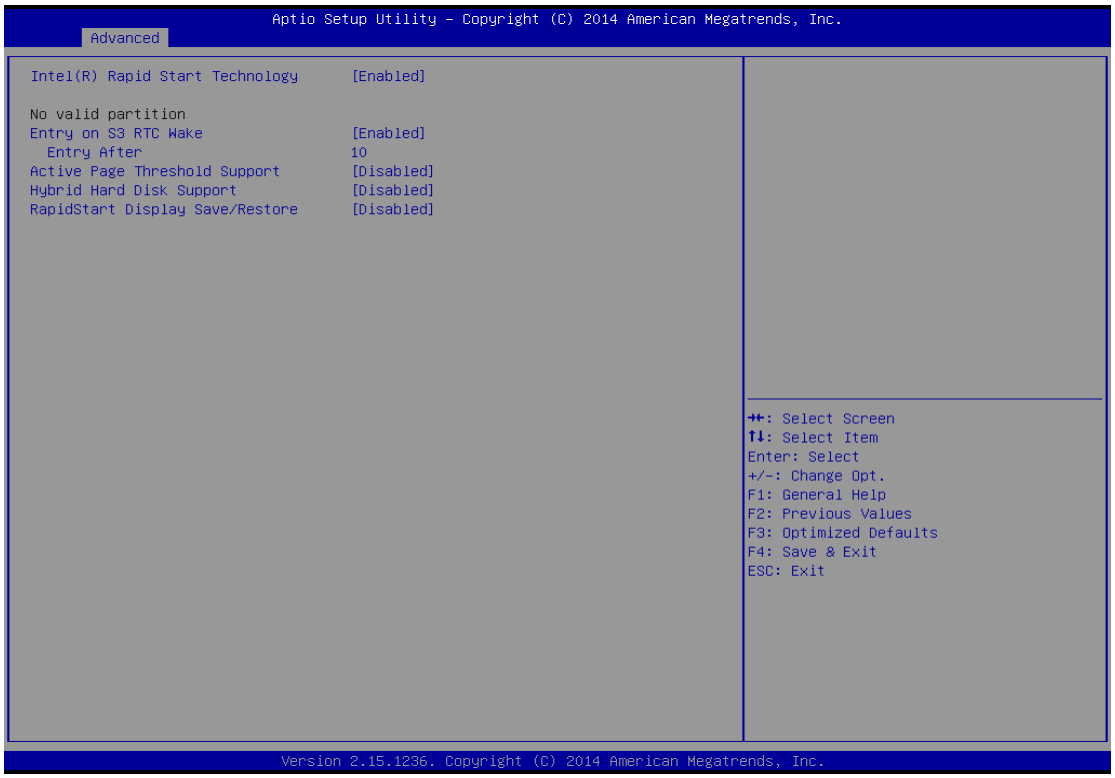
3.2.2.5 SATA Configuration



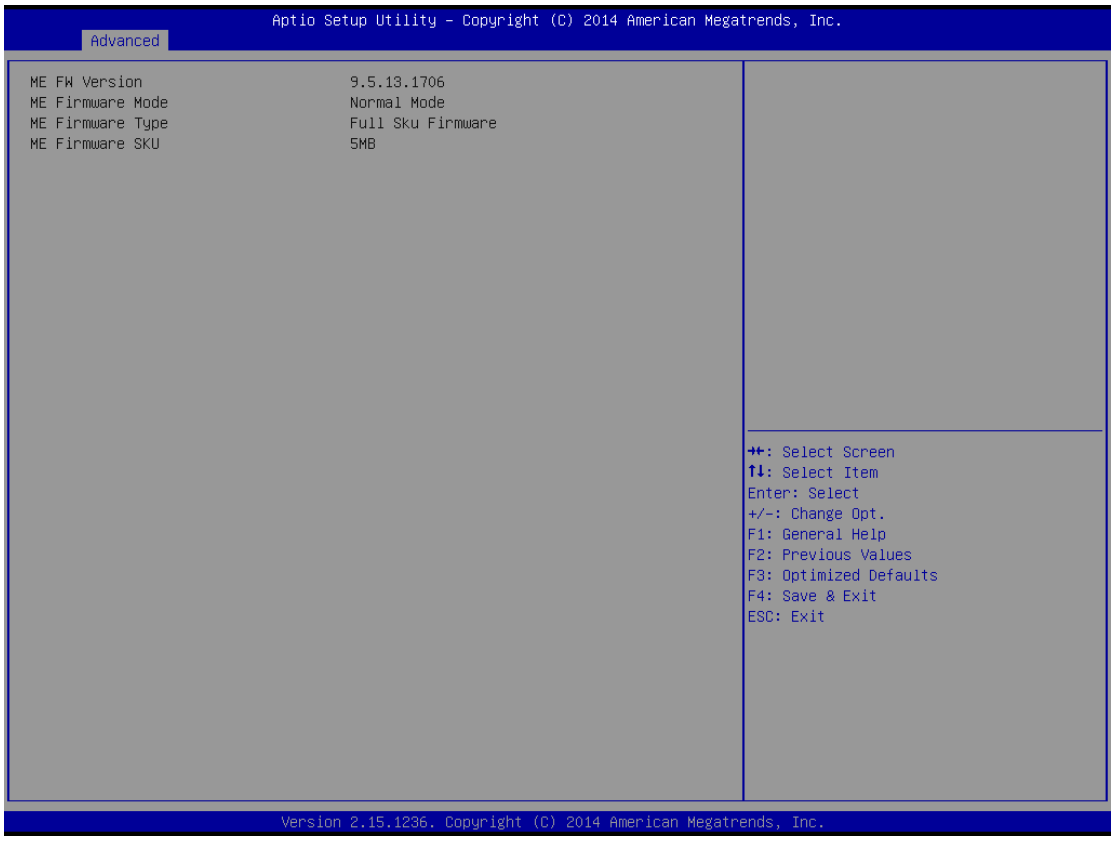
BIOS Setting	Description	Setting Option	Effect
SATA Controller (s)	Allows users to enable or disable the SATA controller (s)	Enabled/ Disabled	Set desirable configuration
SATA Mode Selection	Allows users to select mode of SATA controller (s)	Enabled/ Disabled	Set desirable configuration
SATA Controller Speed	Allows users to select mode of SATA Controller Speed	Enabled/ Disabled	Set desirable configuration
Serial ATA Port 0/1/2	Allows users to enable or disable the SATA Port	Enabled/ Disabled	Set desirable configuration

3.2.2.6 Intel® Rapid Start Technology

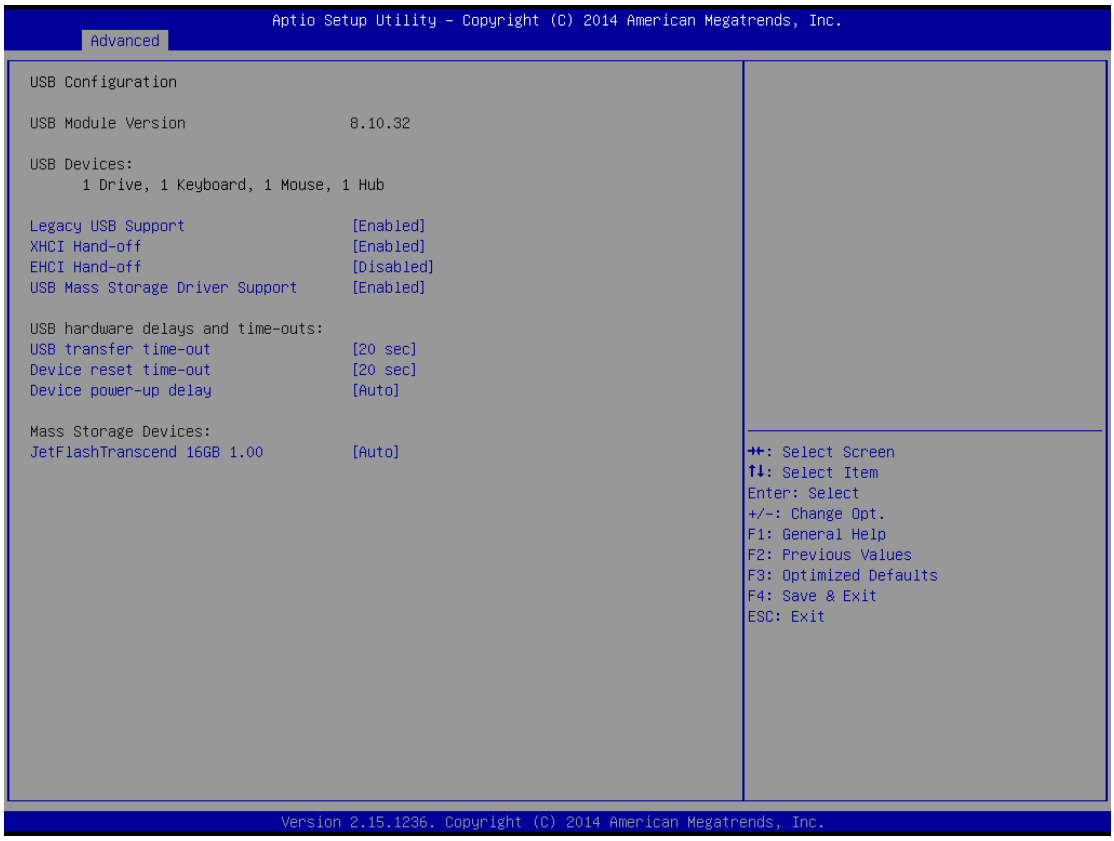
Allows users to enable or disable Intel rapid start technology.



3.2.2.7 PCH (FW) Configuration



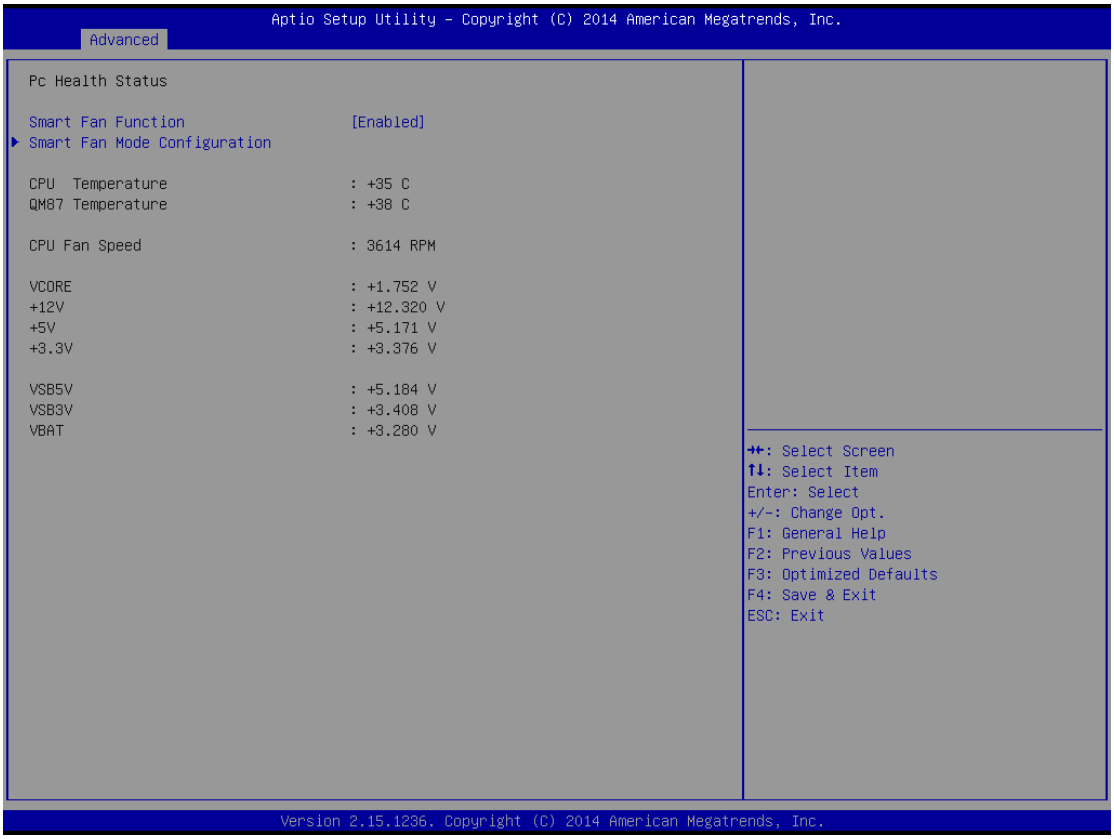
3.2.2.8 USB Configuration



BIOS Setting	Description	Setting Option	Effect
Legacy USB Support	User can enable or disable USB port.	Disabled	Will keep USB devices available only for EFI applications.
		Enabled	Enable all the USB devices
XHCI Hand-off	This is a workaround for OSs without XHCI hand- off support.	Disabled	Disables this function
		Enabled	Enables this function
EHCI Hand-off	This is a workaround for OSs without ECHI hand- off support.	Disabled	Disables this function
		Enabled	Enables this function
USB Mass Storage Driver Support	User can Enable or disable USB mass storage driver support.	Disabled	Disables this function
		Enabled	Enables this function
USB Transfer	The time-out value for	1 Sec	Depends on the time-out

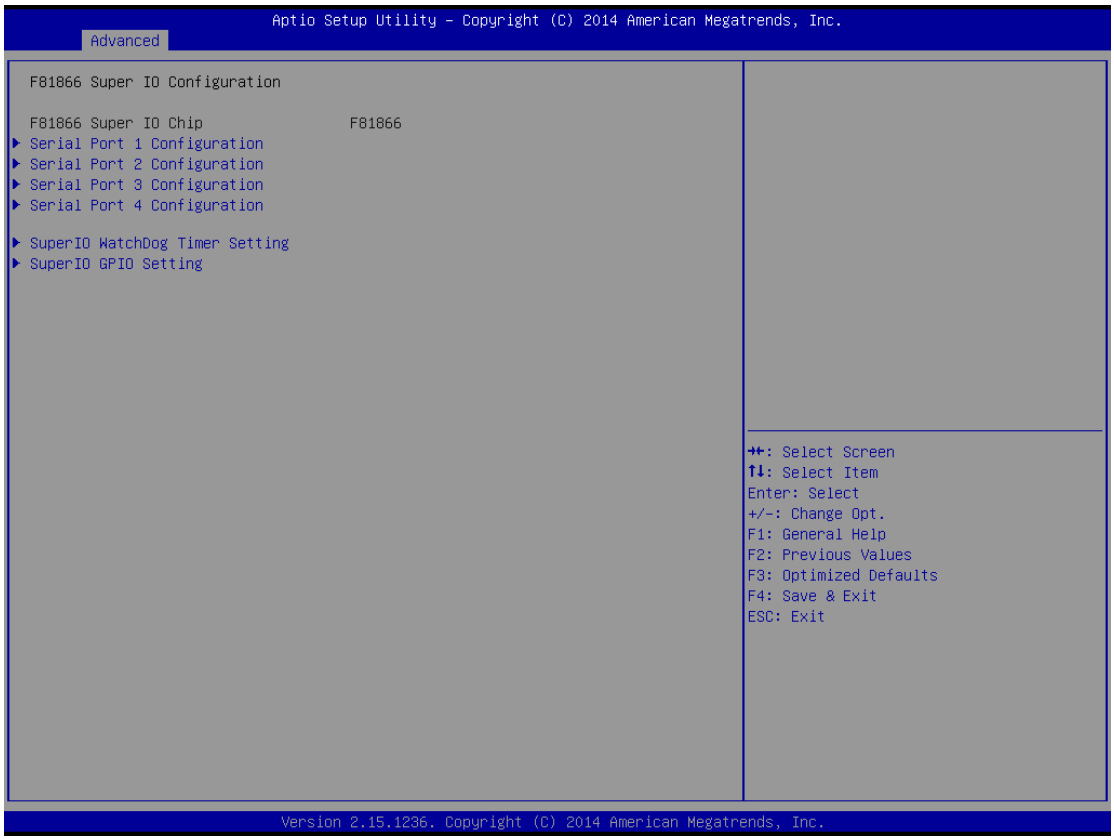
time- out	control, bulk, and interrupt transfers.	5 Sec 10 Sec 20 Sec	value
Device Reset time- out	USB mass storage device start unit command time- out.	10 Sec 20 Sec 30 Sec 40 Sec	Depends on the time-out value
Device power-up delay	Maximum time the device will take before it properly reports itself 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	Configure mass storage device emulation type

3.2.2.9 F81866 H/W Monitor



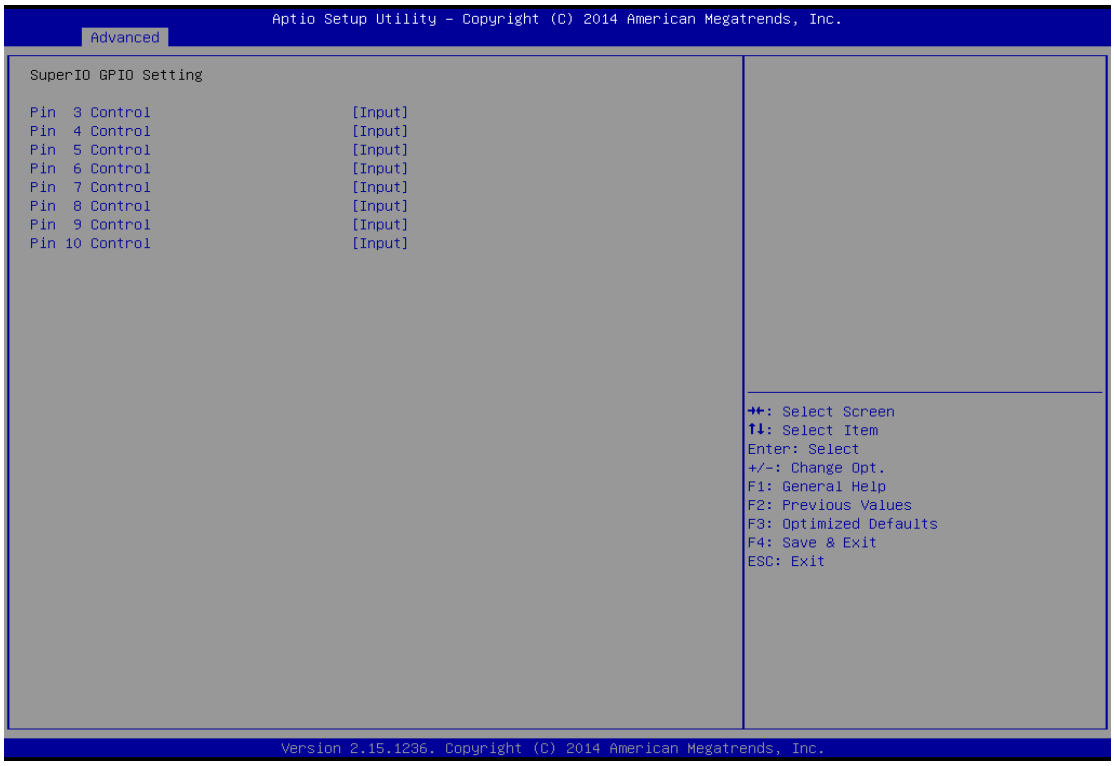
BIOS Setting	Description	Setting Option	Effect
Smart Fan Function	Set parameters of smart fan function	Enabled/ Disabled	Enable or disable this function
Smart Fan Mode Configuration	Configure smart fan mode settings		

3.2.2.10 F81866 Super IO Configuration

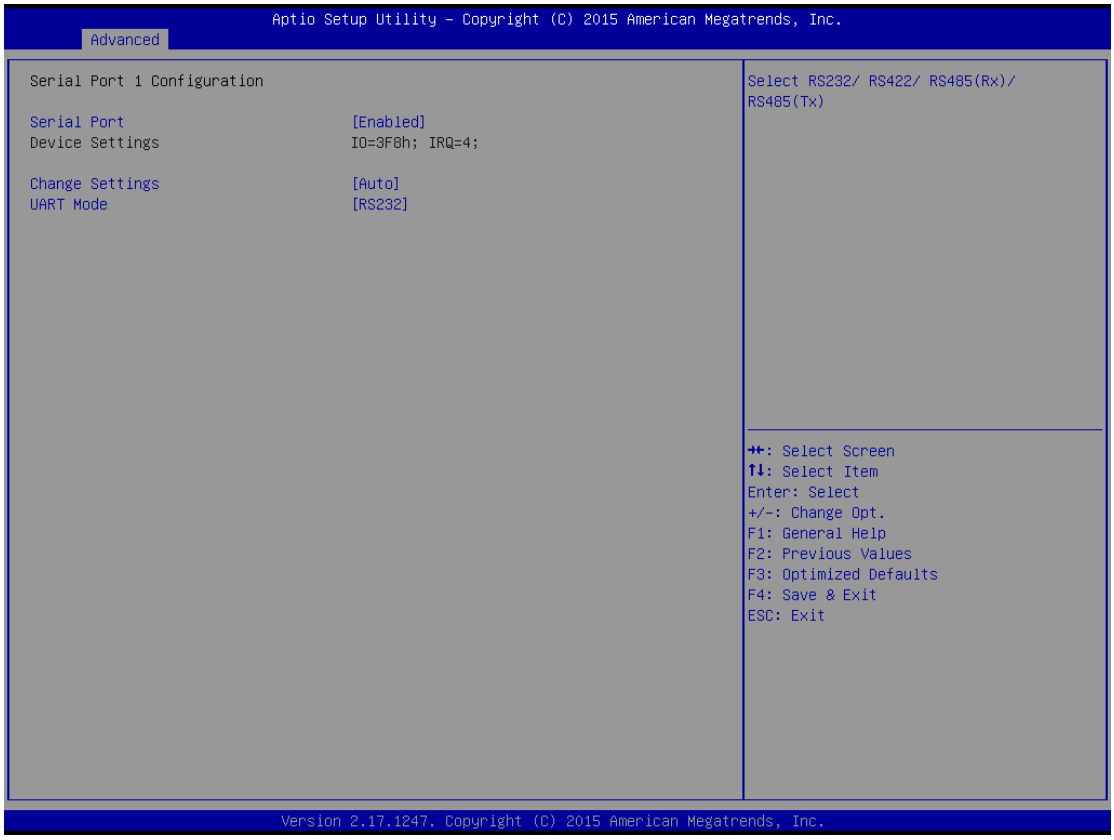


BIOS Setting	Description	Setting Option	Effect
Setting Serial Port Parameters	User can Enable/Disable the serial port and select optimal settings for the Super IO Device.	Enable/Disable **Default:** Enable	Enable or Disable Serial Port (COM).
Super IO Watch Dog Timer Setting	The watchdog timer circuit has to be triggered within a specified time by the application software. If the watchdog is not triggered because proper software execution fails or a hardware malfunction occurs, it will reset the system.		

Pin 3~ Pin 10 Control Settings.

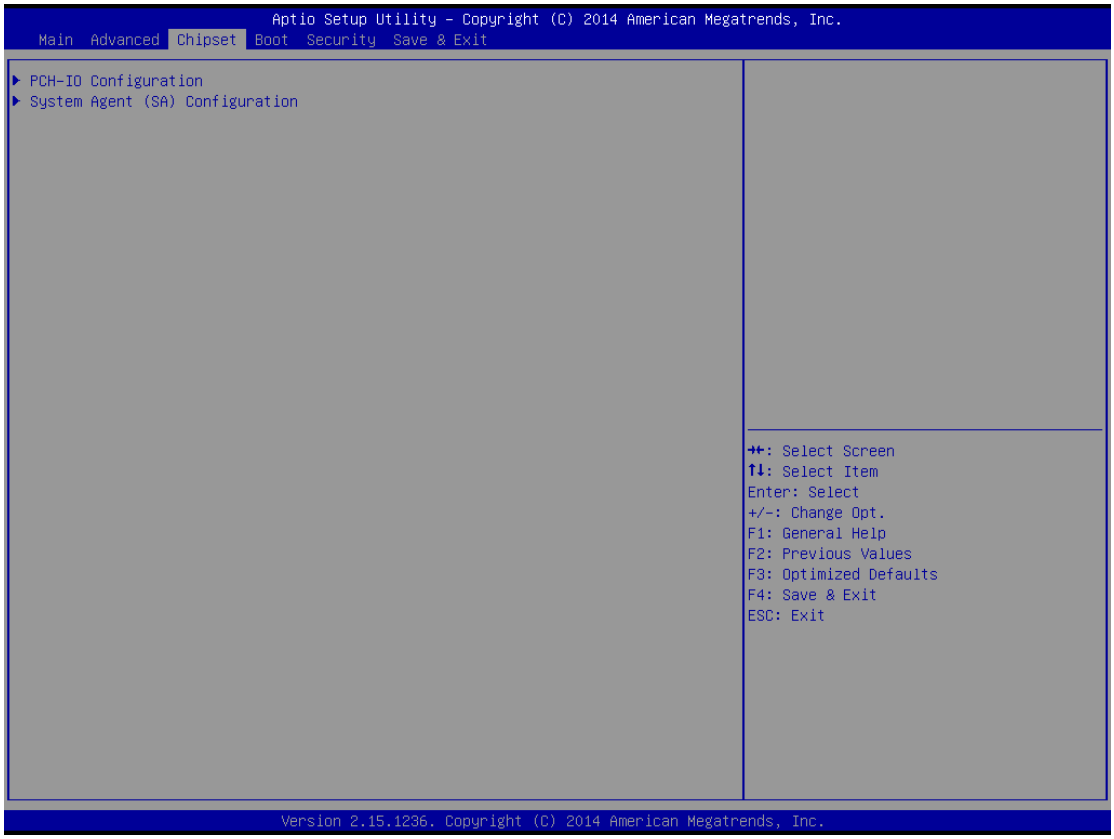


3.2.2.11 Serial Port RS232/RS422/RS485 Settings

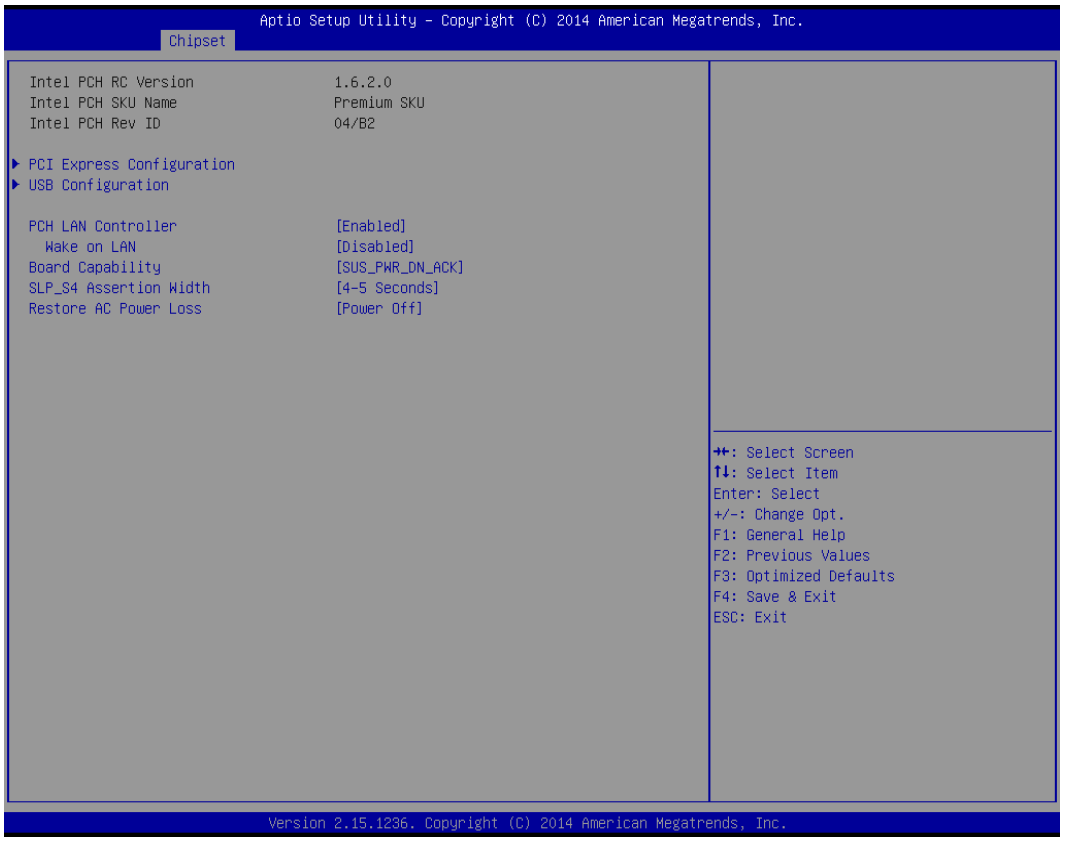


BIOS Setting	Description	Setting Option	Effect
Serial Port	Select Serial Port	RS232 / RS422 RS485 (Rx)/ RS485(Tx)	Choose Serial Port Settings
Change Settings	Allow Change Serial Port Settings	[AUTO]	
UART Mode	Show which serial port is used		

3.2.2.12 Chipset Menu

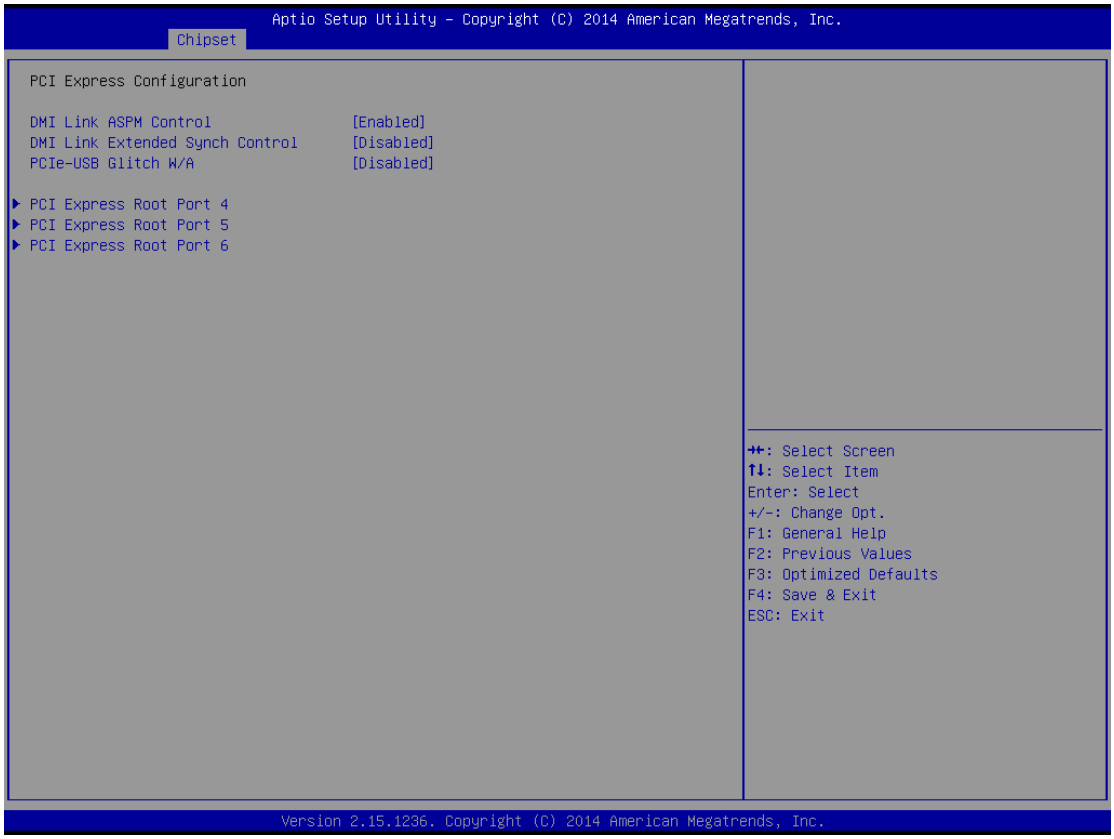


3.2.2.13 PCH- IO Configuration



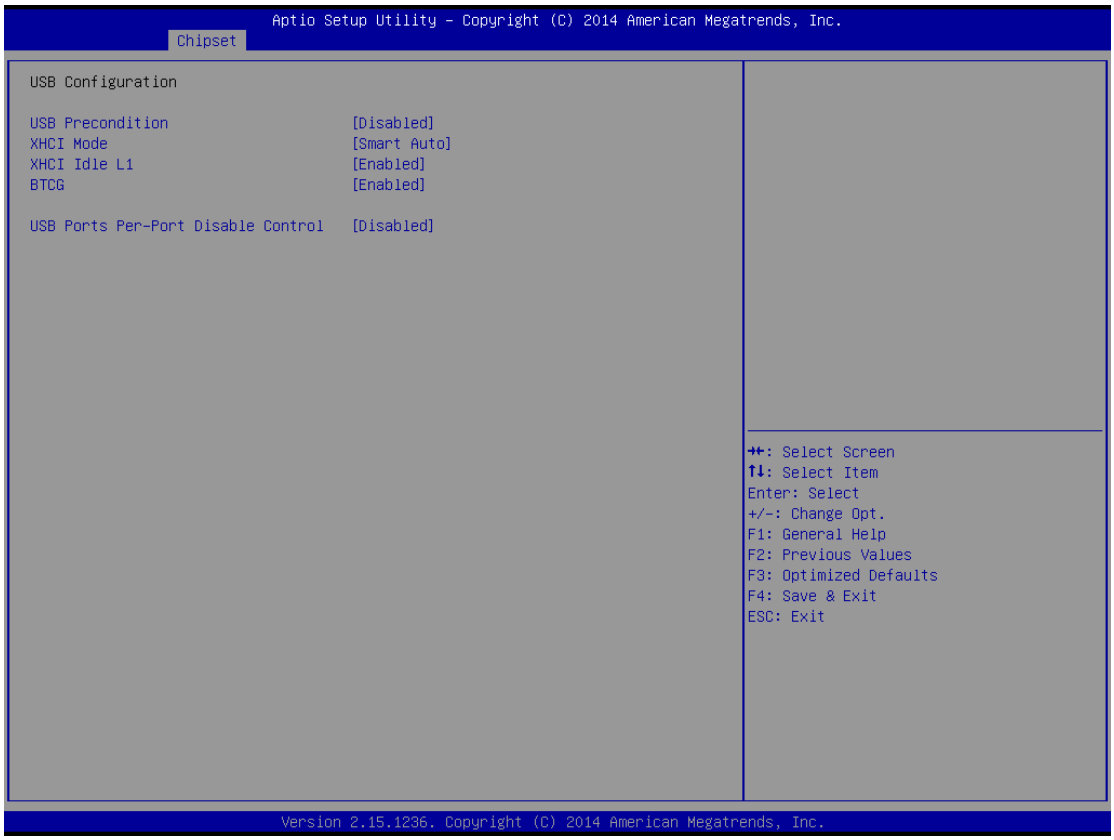
BIOS Setting	Description	Setting Option	Effect
PCI Express Configuration	Detail of PCI Express items.	N/A	Set desirable parameters
USB Configuration	Details of USB items	N/A	Set desirable parameters
PCH LAN controller	Enables or disables the LAN1/2 controller.	Enabled/ Disabled	Set desirable parameters
Wake On LAN	Enables or disables LAN1/2 wake up from sleep state.	Enabled/ Disabled	Set desirable parameters
SLP_S4 Assertion Width	Sets a minimum assertion width for the SLP_S4# signal	[4-5 seconds]	Set desirable parameters
Restore AC Power Loss	This item allows users to select off, on and last state.	Power on/ Power off	Set desirable parameters

3.2.2.14 PCI Express Configuration



BIOS Setting	Description	Setting Option	Effect
DMI Link ASPM Control	Allows users to enable or disable the DMI Link ASPM Control	Enabled/ Disabled	Set desirable parameters
DMI Link Extended Synch Control	Allows users to configure Mini PCI Express setting	Enabled/ Disabled	Set desirable parameters
PCIe- USB Glitch W/A	For bad USB devices connected behind PCIE/PEG port	Enabled/ Disabled	Set desirable parameters

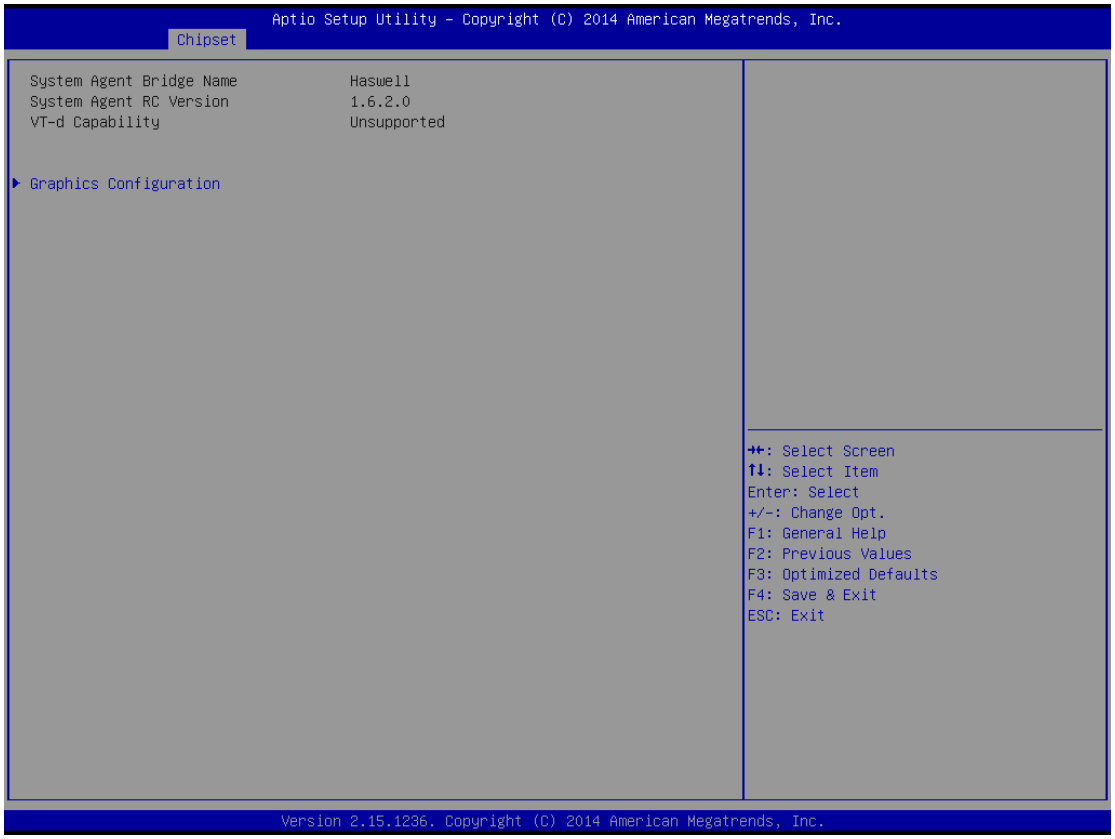
3.2.2.15 USB Configuration



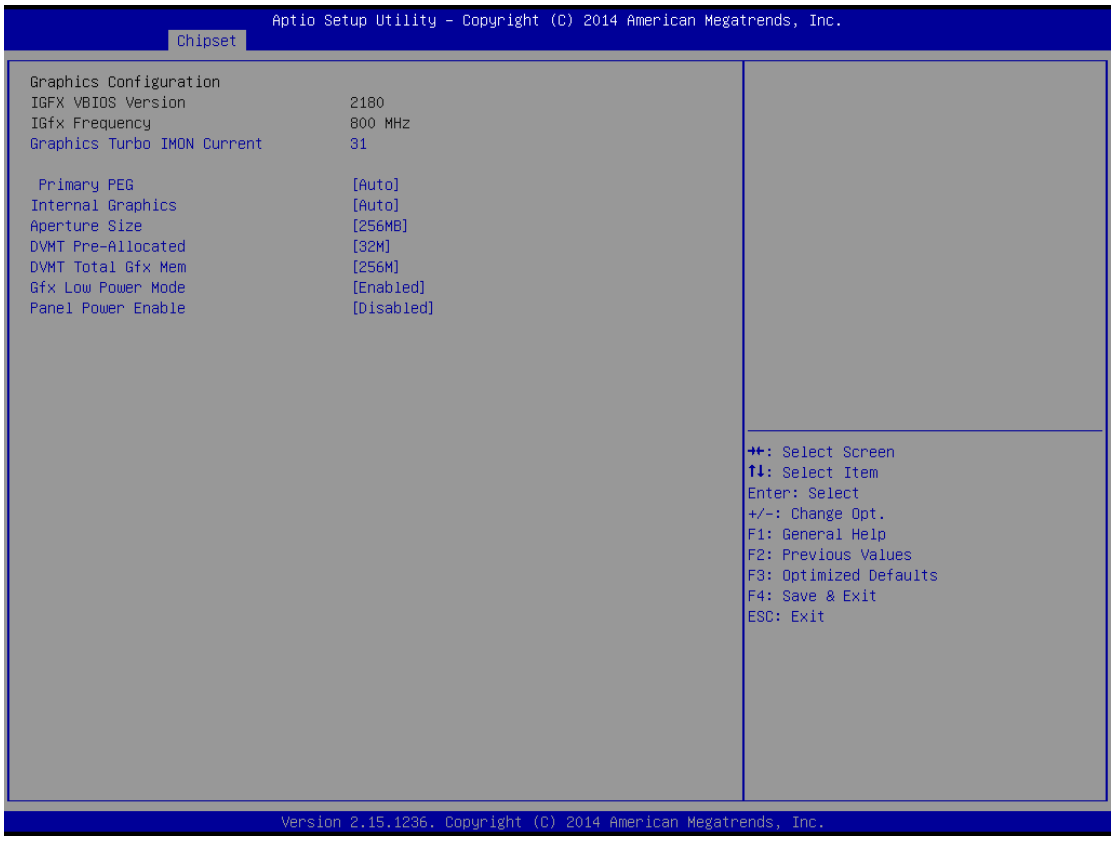
BIOS Setting	Description	Setting Option	Effect
USB Precondition	Allows user to enable or disable USB precondition	Enabled/ Disabled	Set desirable parameters
XHCI Mode	Allows user to enable or disable XHCI mode.	[Smart Auto]	Set desirable parameters
USB Ports Per-Port Disable Control	Control each of the USB ports (0~13) disabling	Enabled/ Disabled	Set desirable parameters

3.2.2.16 System Agent (SA) Configuration

Allows users to enable or disable VT-d.



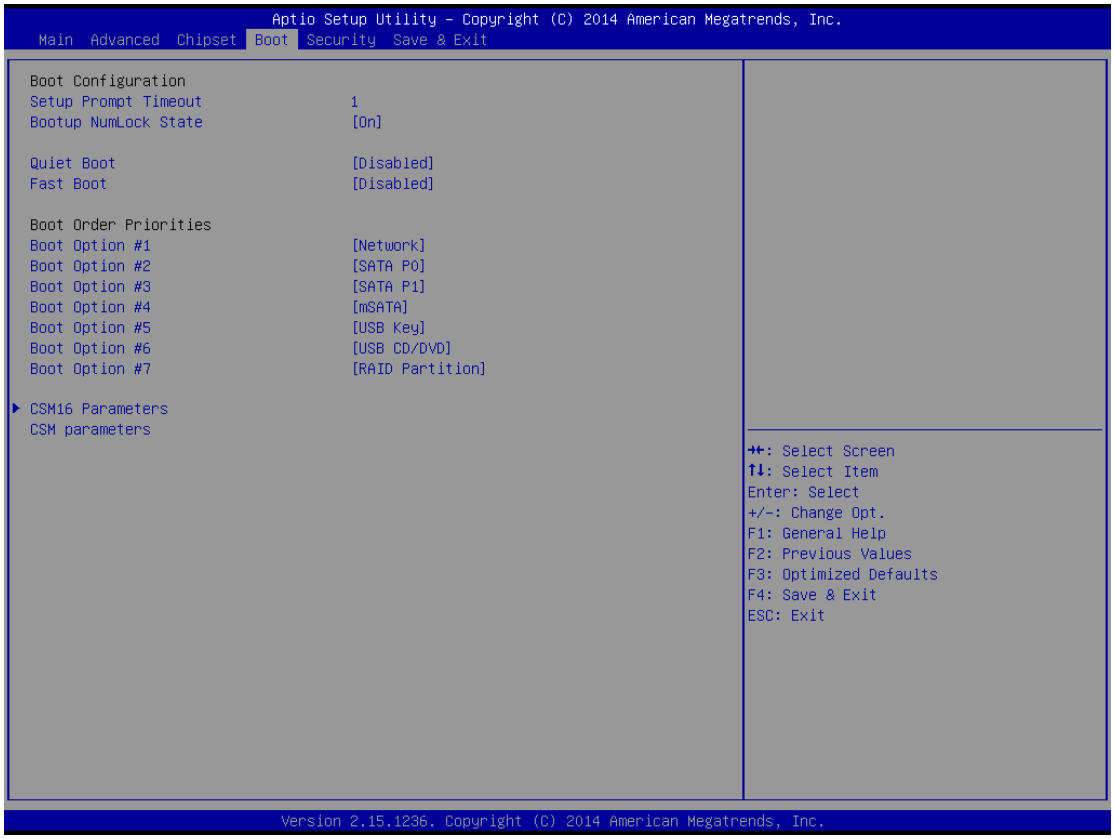
3.2.2.17 Graphics Configuration



BIOS Setting	Description
Graphics Turbo IMON Current	Allows users to select which Graphics Turbo IMON Current
Internal Graphics	Allows users to enable or disable IGD
Aperture Size	This item allows users to select aperture size
DVMT Pre-Allocated	Allows users to select DVMT pre-allocated memory size
DVMT Total Gfx Mem	Allows users to select DVMT total memory size
Gfx Low Power Mode	Allows users to enable or disable IGD low power mode
Panel Power Enable	Allows users to enable or disable Panel Power

3.2.3 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.

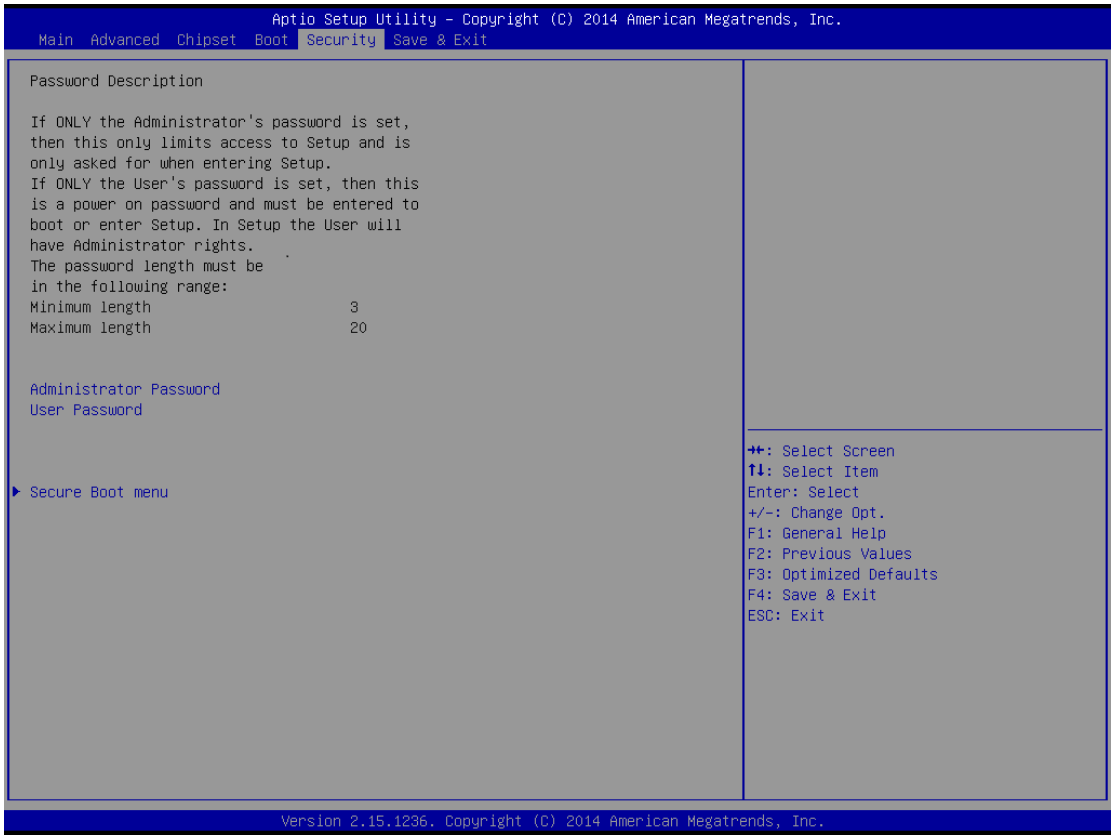


BIOS Setting	Description	Setting Option	Effect
Setup Prompt Timeout	Allows user to configure the number of seconds to stay in BIOS setup prompt screen.	Enter	Set the prompt timeout
Boot NumLock State	Enables or disables NumLock feature on the numeric keypad of the keyboard after the POST (Default: On).	On	Remains On
		Off	Remains OFF
Quite Boot	Determines if POST message or OEM logo (default = Black background) is displayed.	Disabled	Disables this function
		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 (hard drive)	Hard drive as the first priority

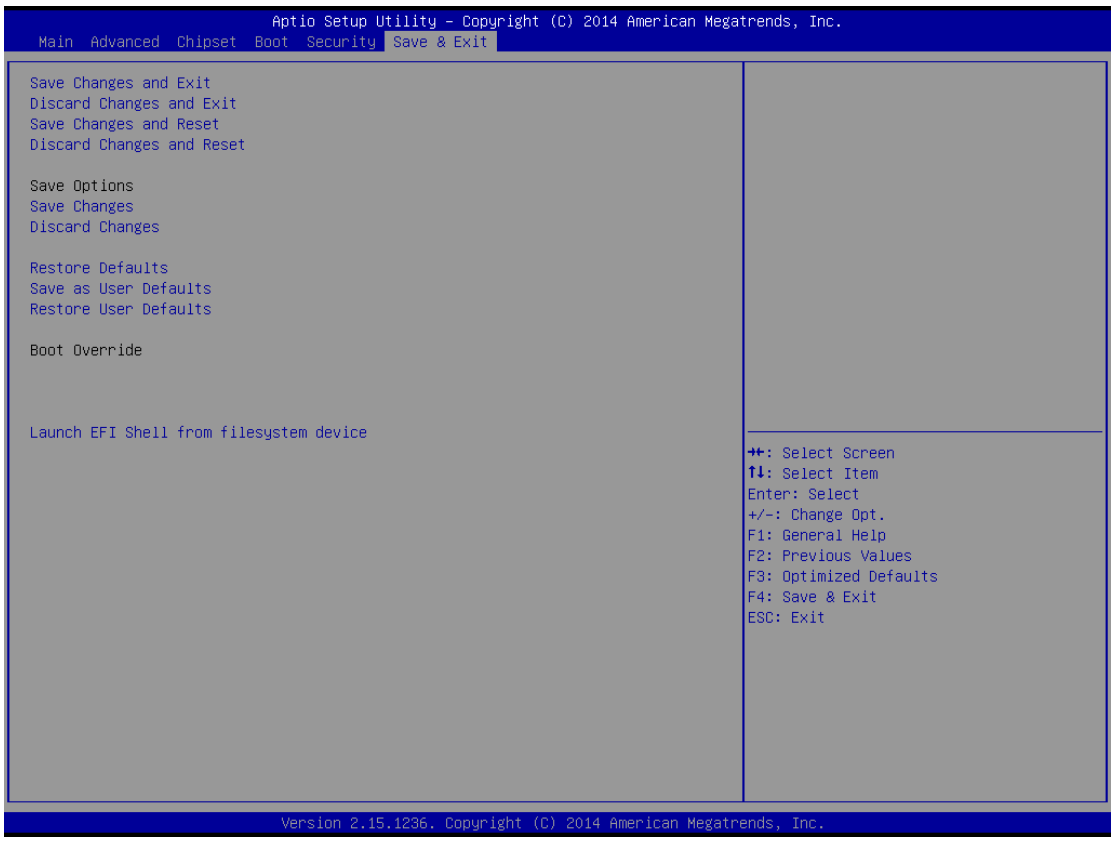
3.2.4 Security Menu

This section allows to configure and improve system, and set up some system features according to your preferences.



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

3.2.5 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.	Enter <YES>	Save changes
Discard Changes and Exi	This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu

Save Changes and Reset	Reset the system after saving the changes.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Discard Changes and Reset	Reset system setup without saving any changes	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Save Changes	Save changes done so far to any of the setup options.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Discard Changes	Discard changes done so far to any of the setup options.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Restore Default	Restore/load default values for all the setup options.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Save as User Defaults	Save the changes done so far as User defaults.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Restore User Defaults	Restore the User Defaults to all the setup options.	Enter <YES>	Saves the changes
		Enter <NO>	Return to the BIOS Setup Main Menu
Boot Override	Boot device selection can override your boot priority	Enter <YES>	Saves the changes

		Enter <NO>	Return to the BIOS Setup Main Menu

3.3 Using Recovery Wizard to Restore Computer

IH32 motherboard 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 IH32 series PC.

Warning!

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 IH32 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 computer will restart automatically after recovery completed.

Driver Installation

CHAPTER 4

This chapter offers information on the chipset software installations utilities.

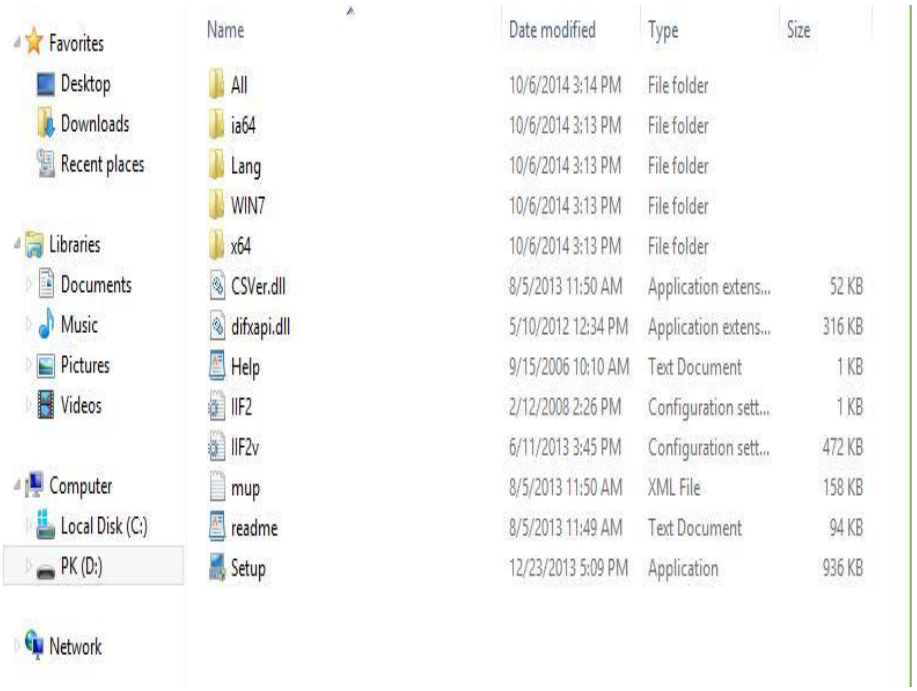
Sections include:

Chapter 4 Driver Installation

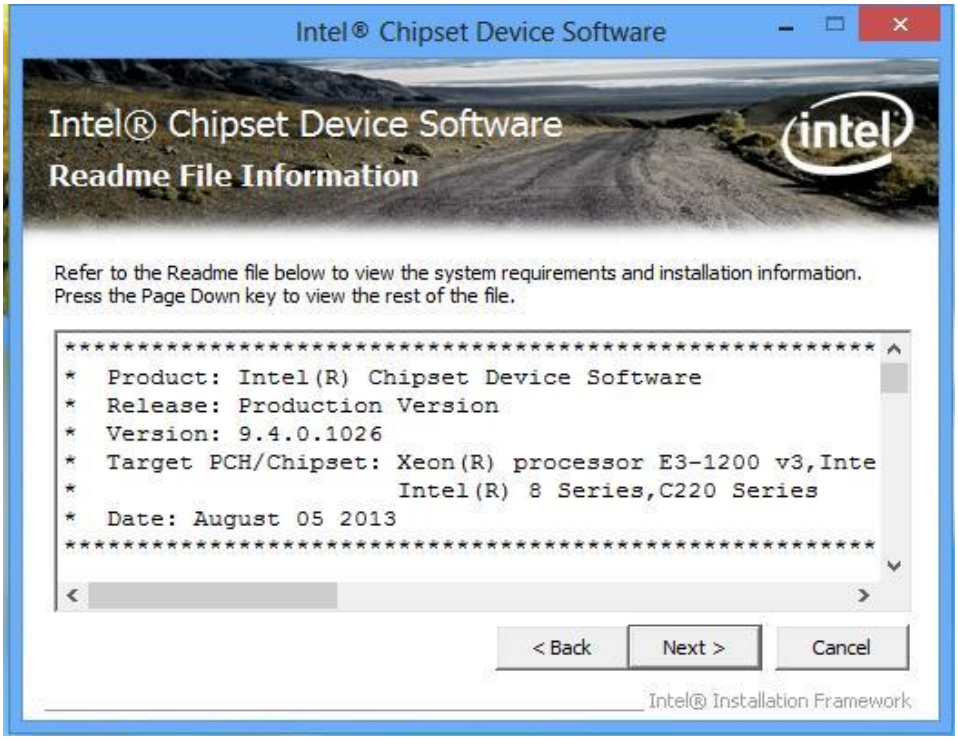
4.1 Chipset Driver Installation

The Intel Chipset Drivers should be installed first before the software drivers 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 “Setup.exe” to install driver.



Step 2 Click “Next” to start the installation.



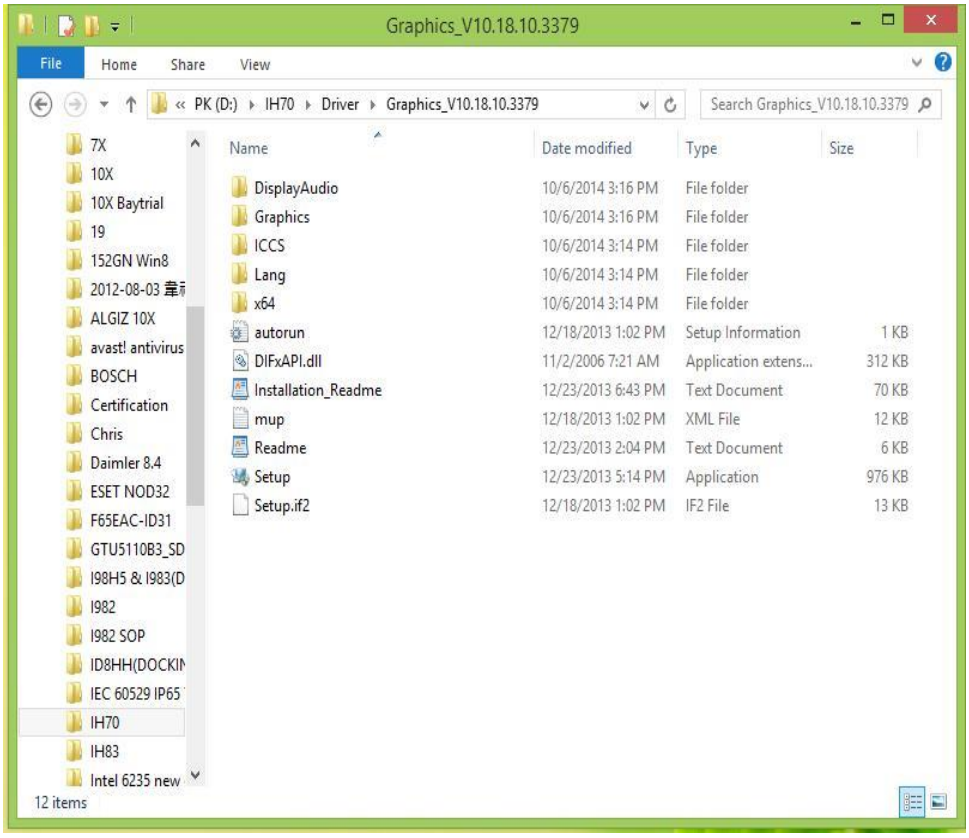
Step 3 Click “Next” to continue the installation.

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

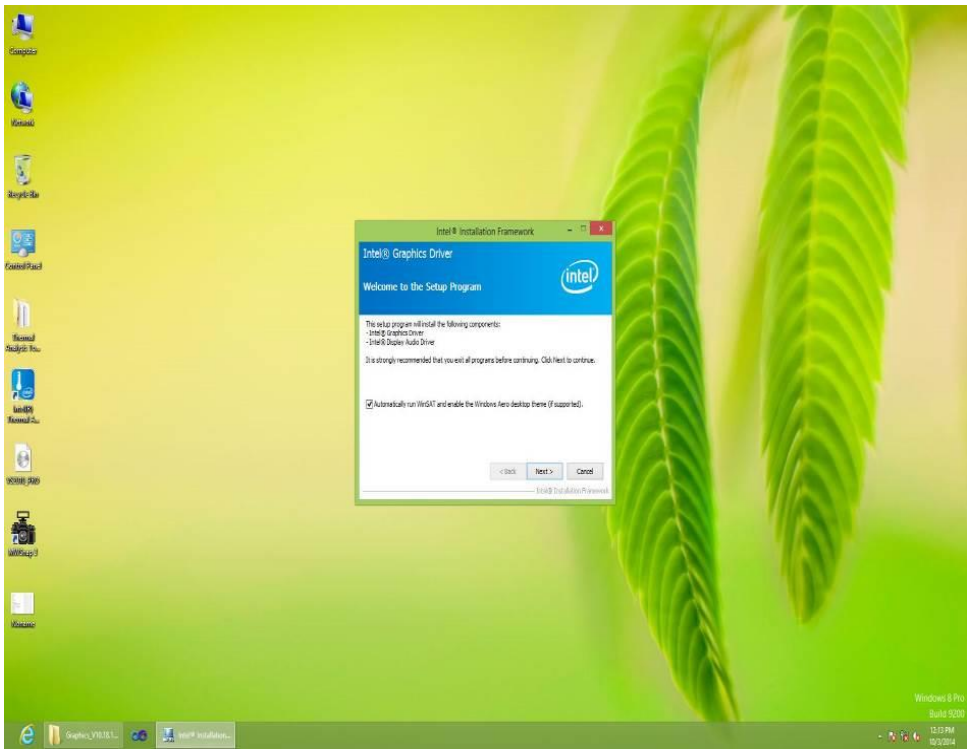
4.2 Graphic Driver Installation

IH32 Motherboard comes with Intel mobile Core i5 Dual Core CPU and integrated graphic 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.

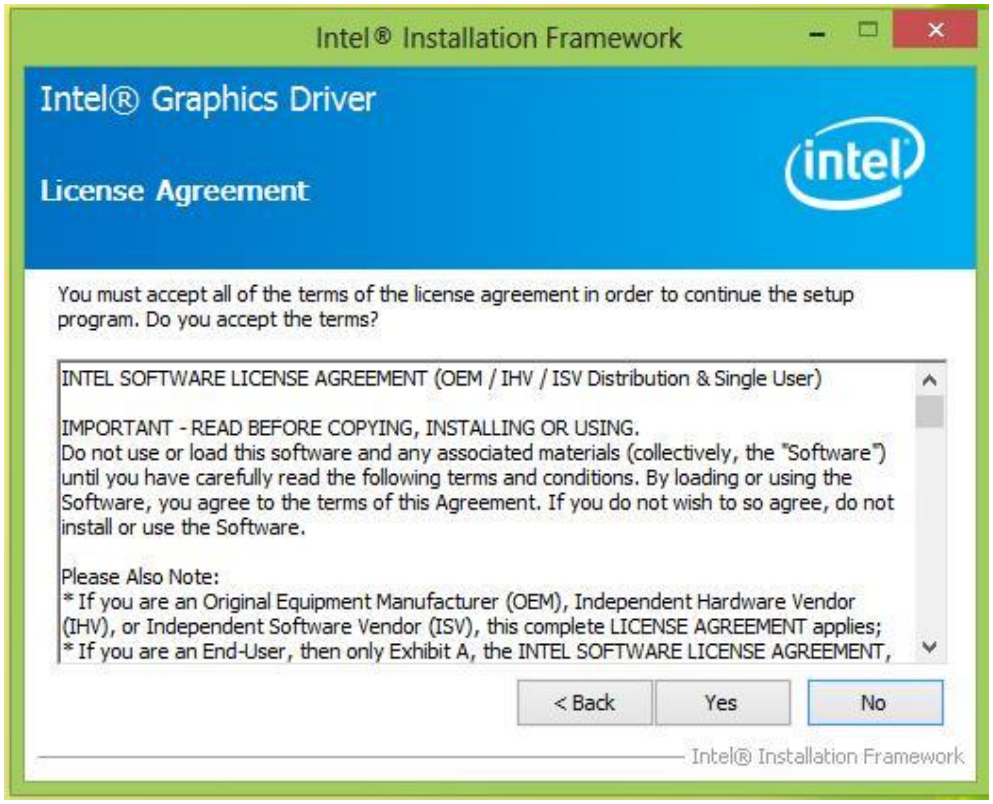
Step 1 Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the “Graphic Driver” folder and click "setup.exe" to complete the installation.



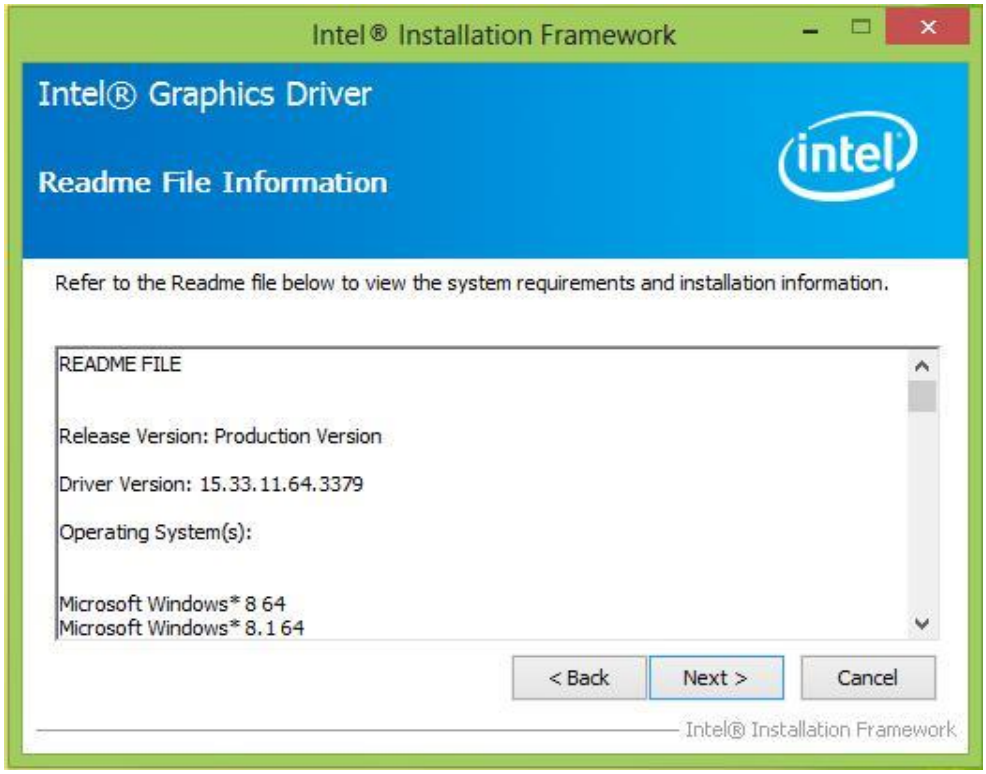
Step 2 Click “Next” to install the driver.



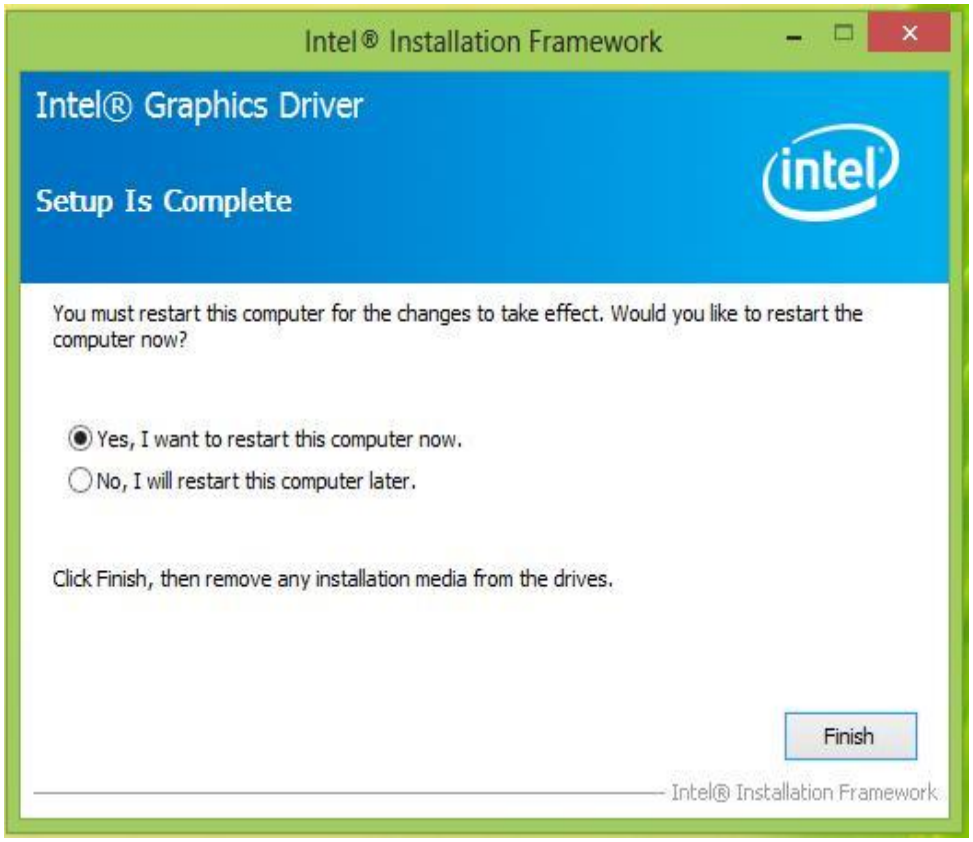
Step 3 Click “Yes” to agree with the license terms.



Step 4 Click “Next” to install the driver.



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

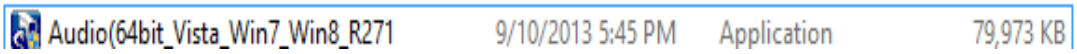


4.3 Audio Driver Installation

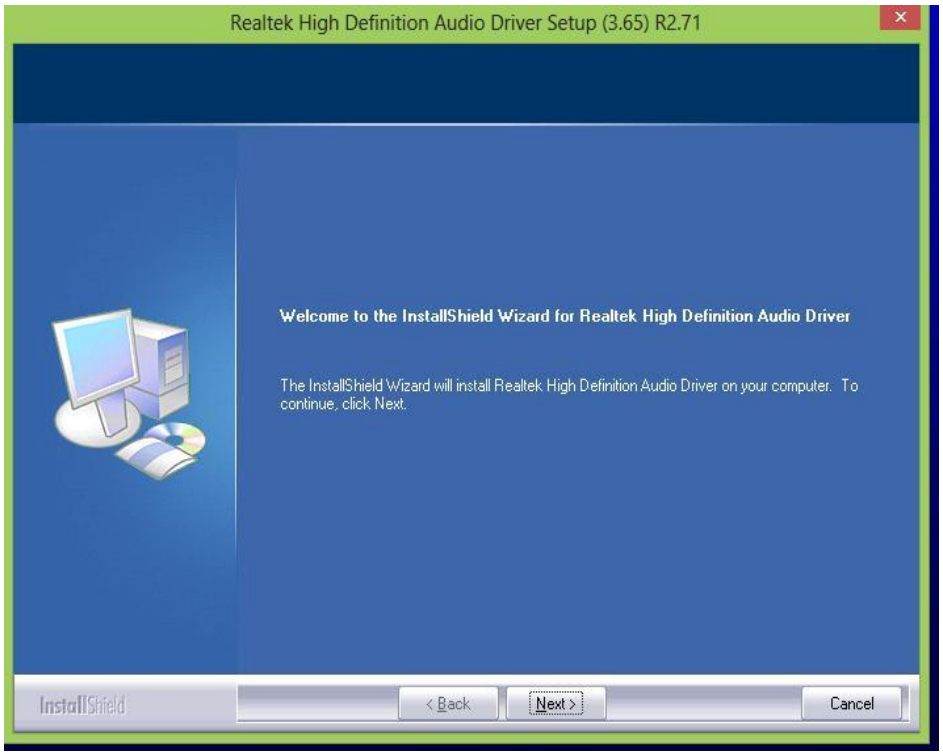
The ALC886 series are high-performance 7.1+2 Channel High Definition Audio Codecs providing ten DAC channels that simultaneously support 7.1 sound playbacks, plus 2 channels of independent stereo sound output (multiple streaming) through the front panel stereo outputs. The series integrates two stereo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

The user must confirm which operating system is running on the IH32 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.

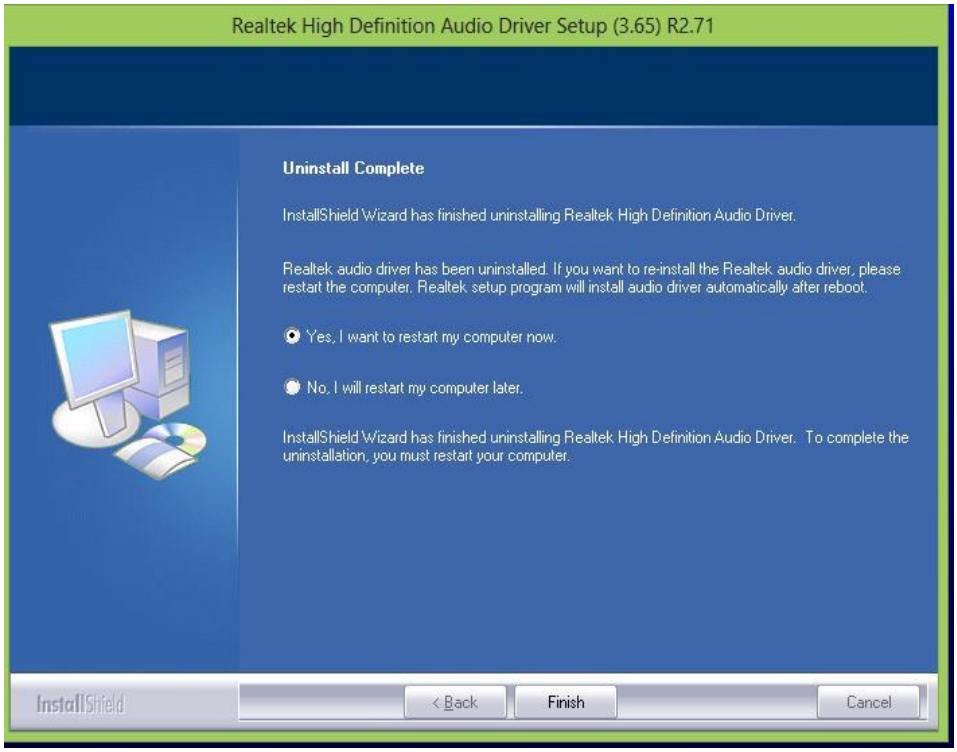
Step 1 Insert the CD that comes with the motherboard. Open the folder “Audio Driver” and click on “Audio” (64bit_Vista_Win7_Win8_R271) to execute the setup.



Step 2 Click “Next” to start the installation.



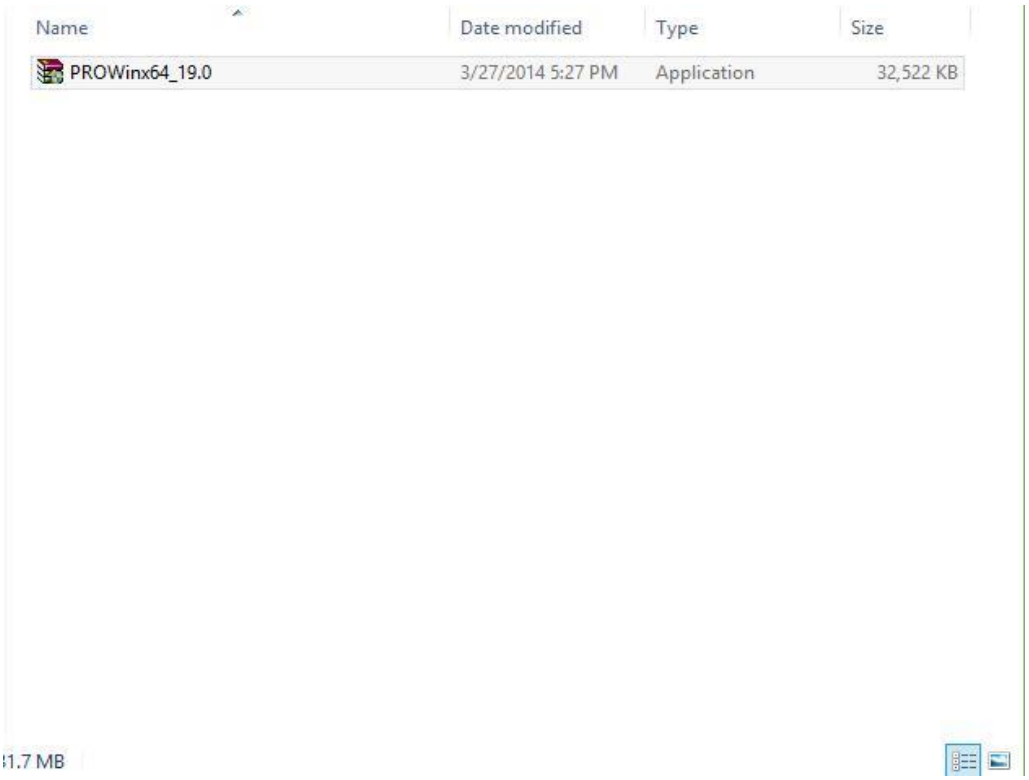
Step 3 Click “Yes, I want to restart my computer now” to finish the installation.



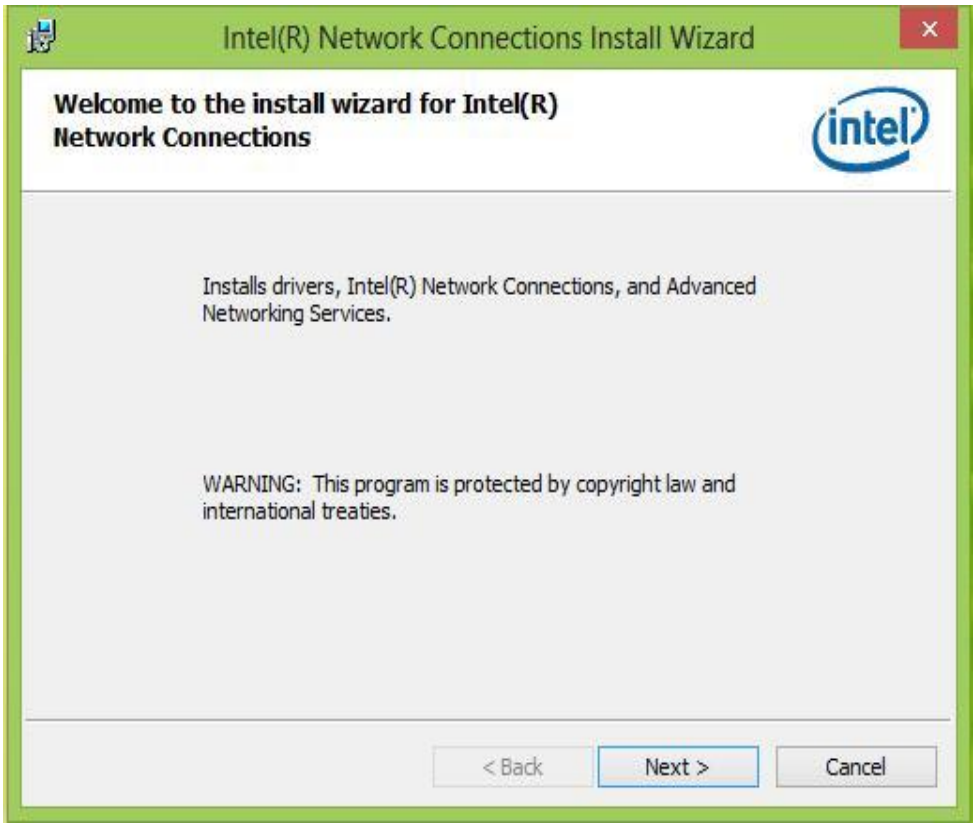
4.3 Ethernet Driver Installation

The users must confirm which operating system is used on the IH32 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.

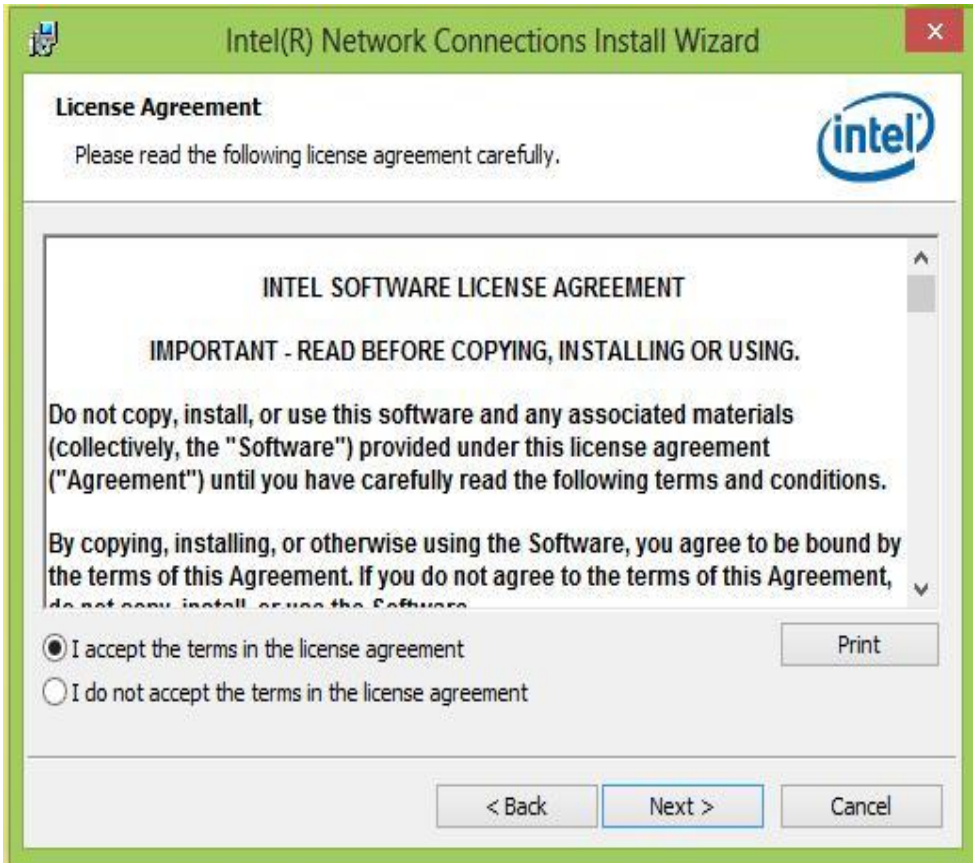
Step 1 Insert the driver CD and select the “LAN Driver” folder.



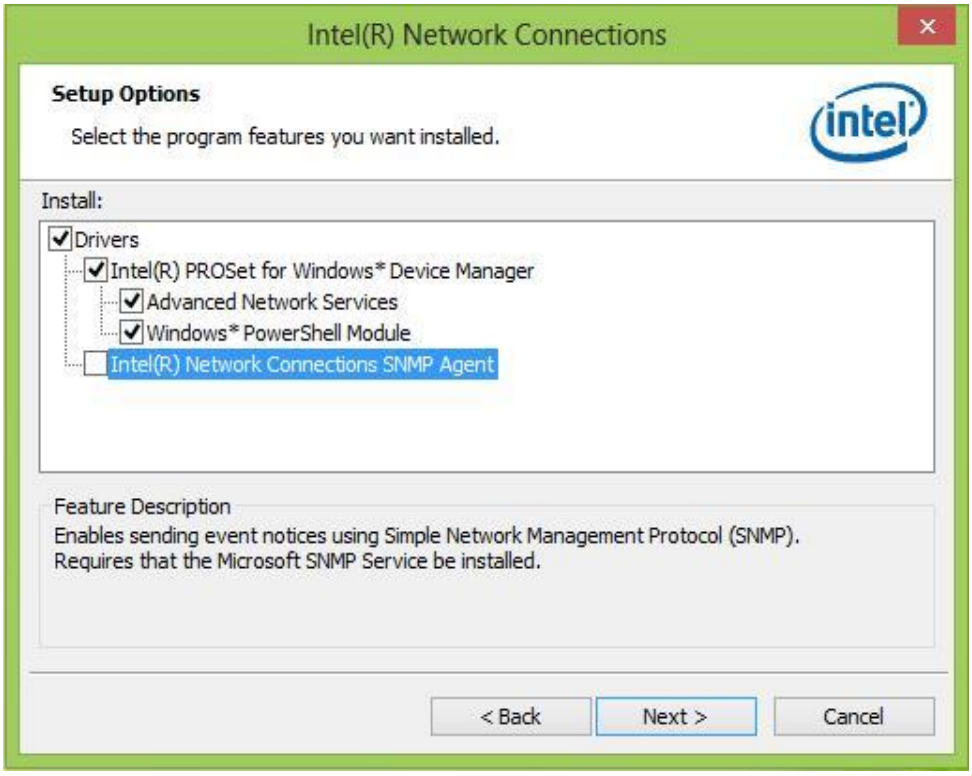
Step 2 Extract the “PROWinX64_19.0” file and click “Next” to install the driver.



Step3 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 Fintek COM Port Driver Installation

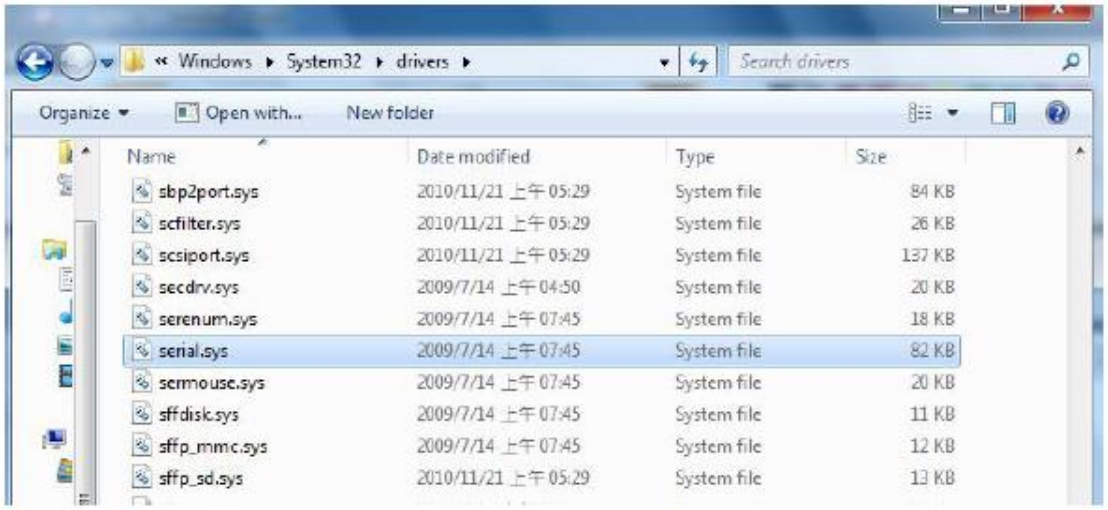
Step 1 If your system is WIN7, please first close UAC (refer to the following "Disabling User Account")
Control (UAC) in Windows 7"

Step 2 Extract the Patch_0408.zip to a folder.

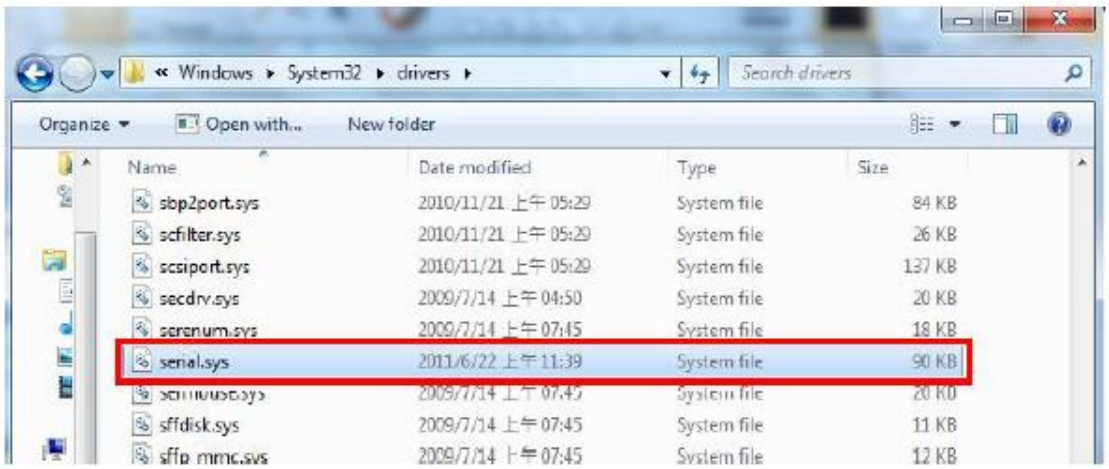
Step 3 Double-click batch file (patch.bat) to install the driver.

Step 4 Check the driver installation success.

There is a screenshot before the update below.



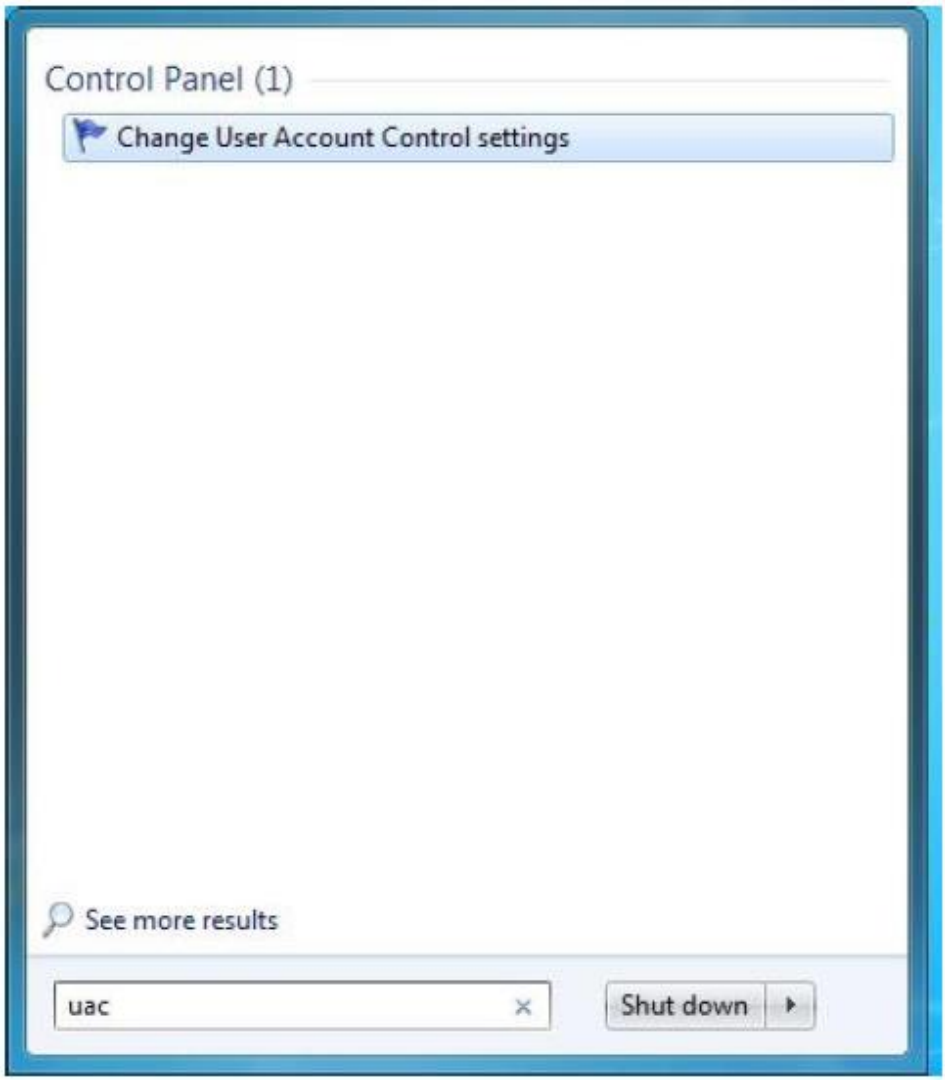
There is a screenshot after the update and update success below.



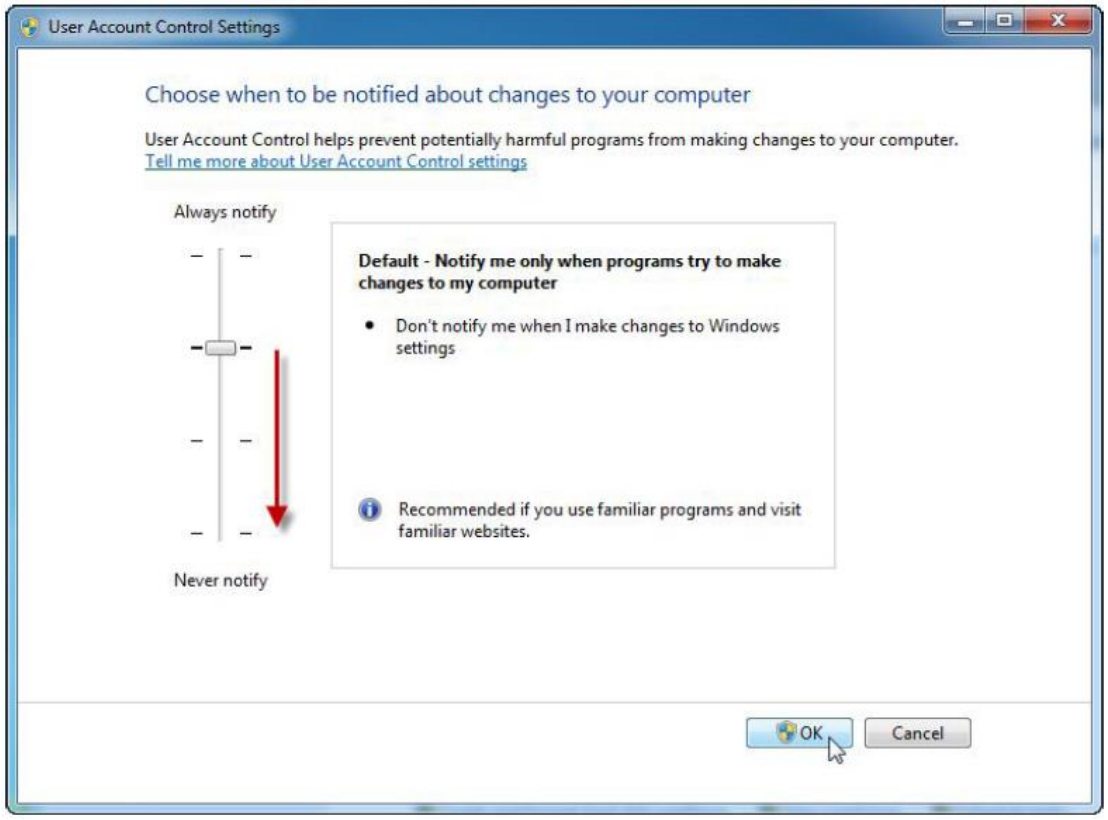
Step 5 Restart the computer to complete driver installation.

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.



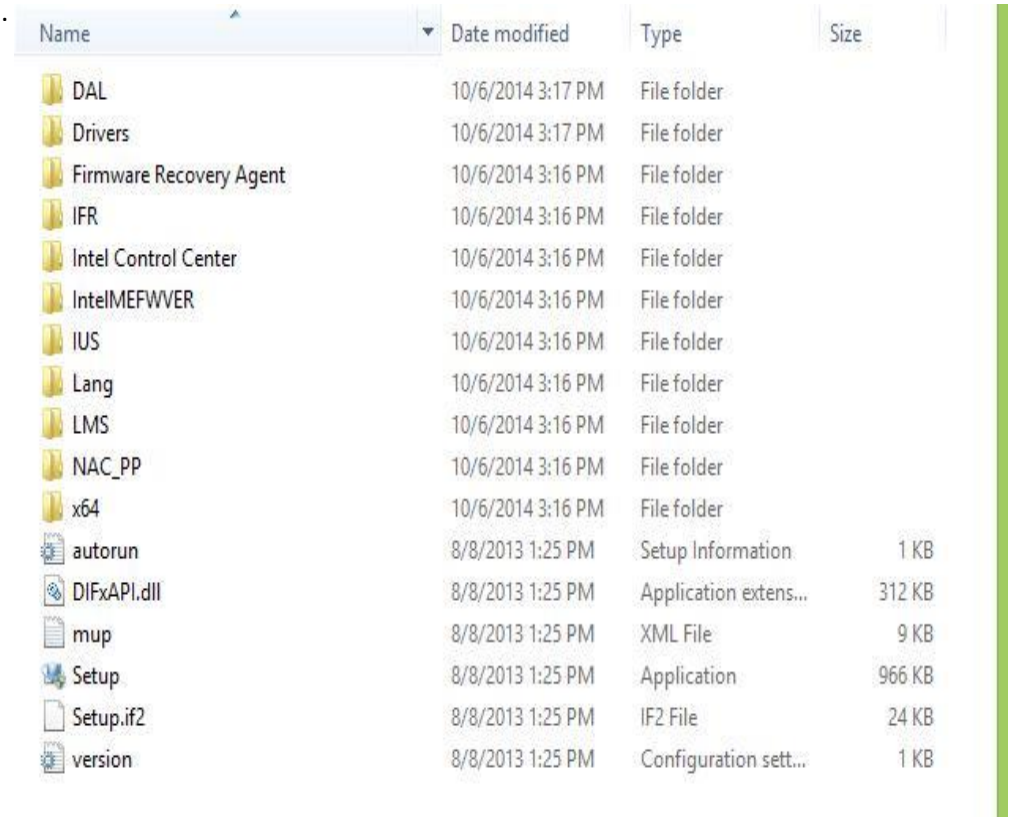
To turn UAC back on, move the slider to choose when you want to be notified, and then click OK. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

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

4.6 Intel® Management Engine Software Installation

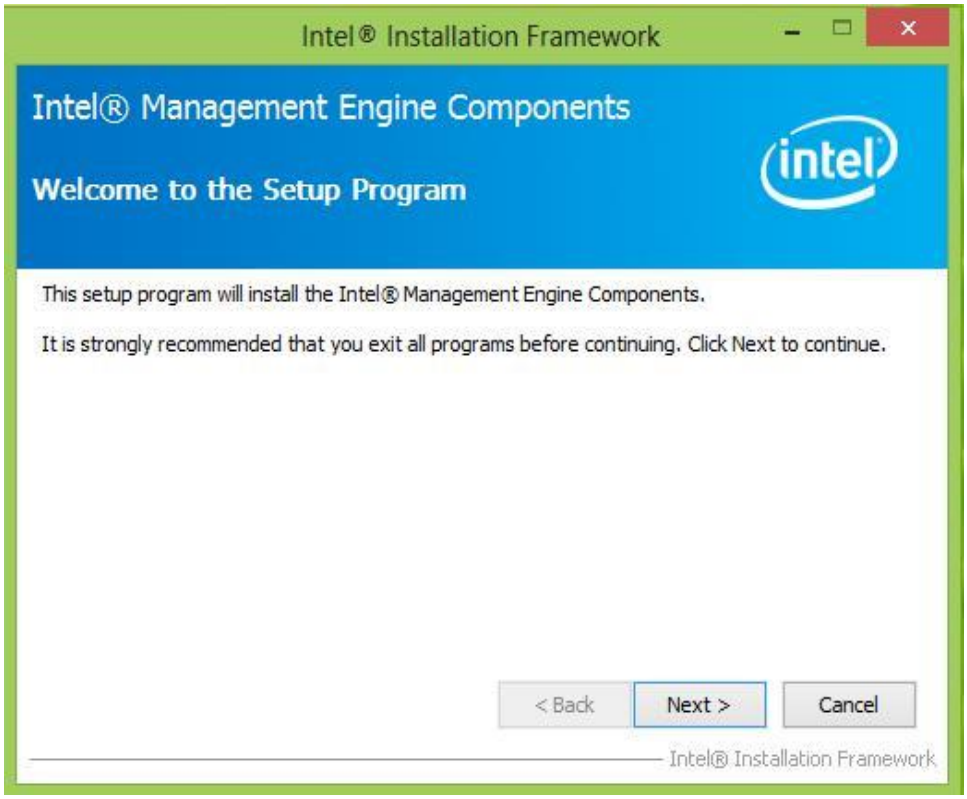
This installation program installs the Intel® ME software components required for the platform on which you are installing, and installs only those components that match your platform's capabilities.

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

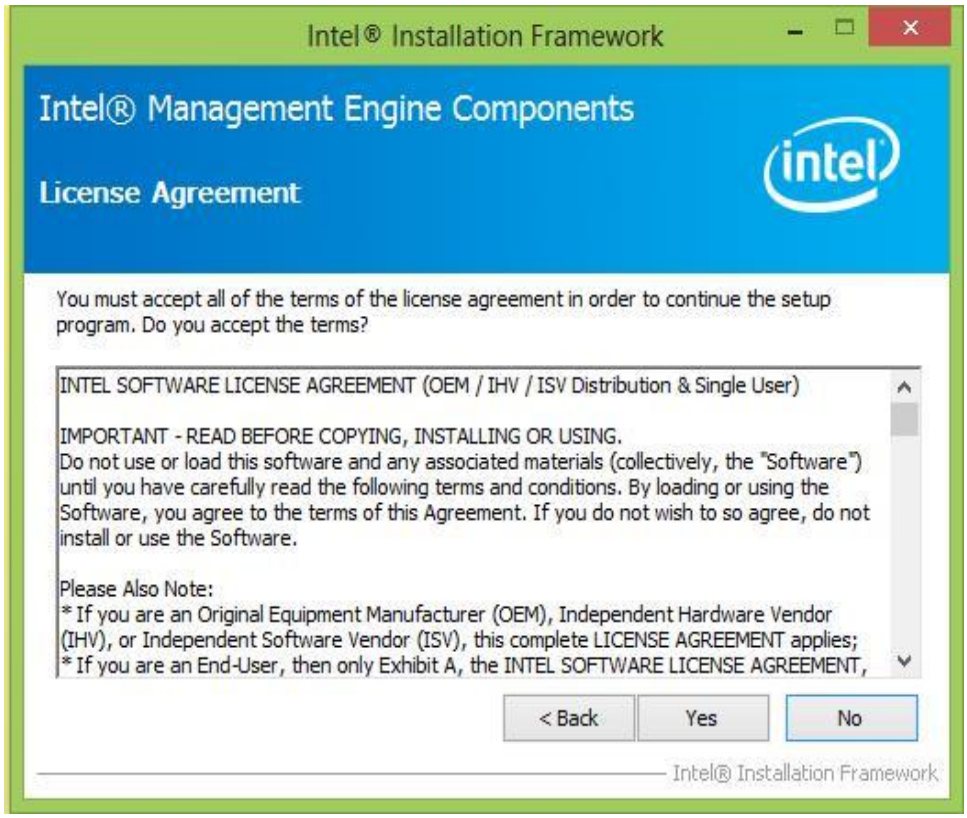


Name	Date modified	Type	Size
DAL	10/6/2014 3:17 PM	File folder	
Drivers	10/6/2014 3:17 PM	File folder	
Firmware Recovery Agent	10/6/2014 3:16 PM	File folder	
IFR	10/6/2014 3:16 PM	File folder	
Intel Control Center	10/6/2014 3:16 PM	File folder	
IntelMEFWVER	10/6/2014 3:16 PM	File folder	
IUS	10/6/2014 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

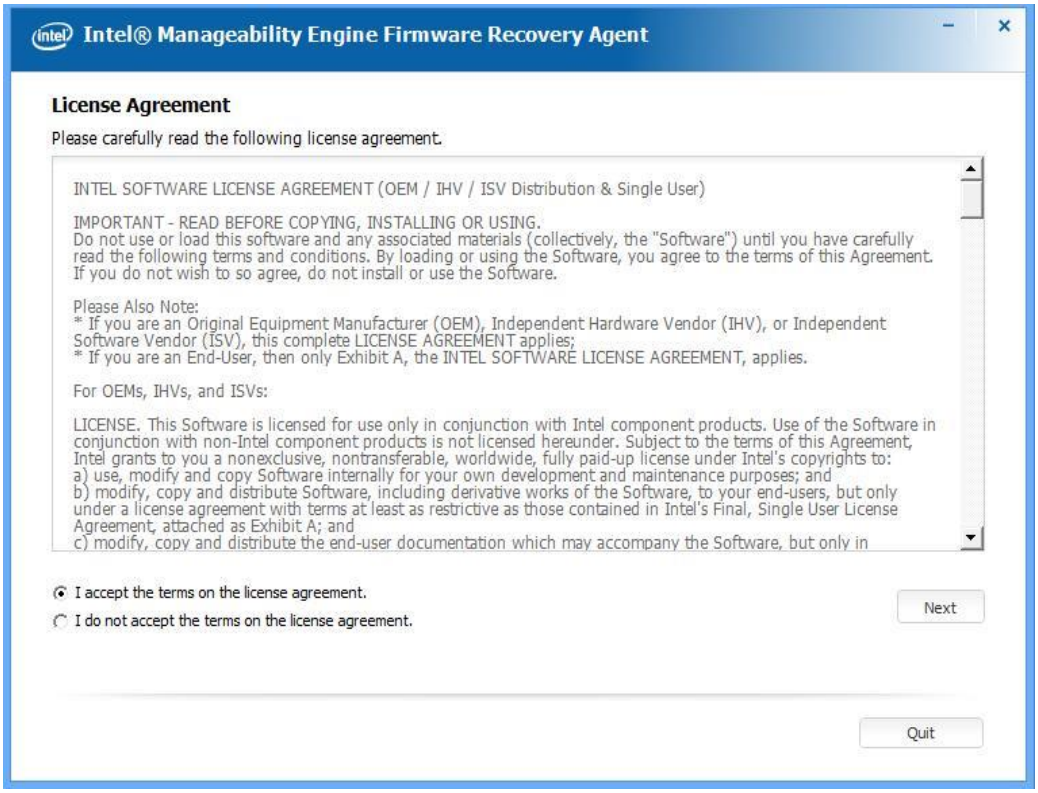
Step 2 Click “Next” to continue the installation.



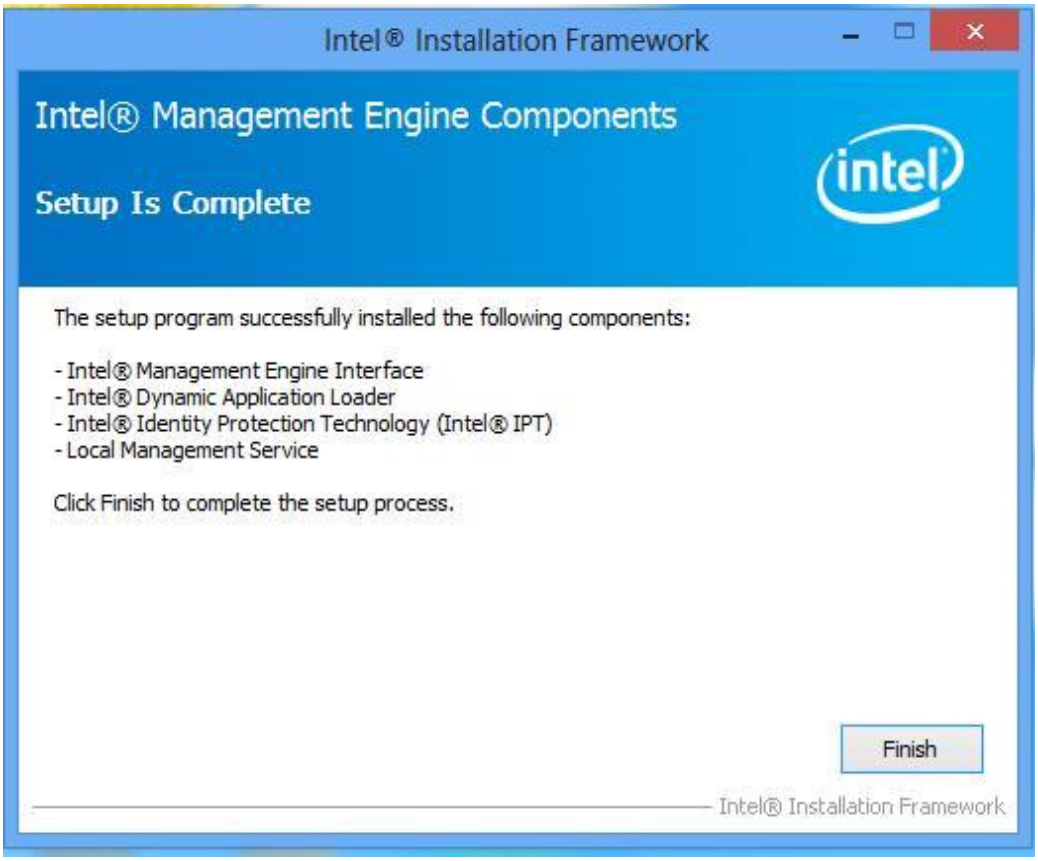
Step 3 Click “Yes” to agree with the License terms.



Step 4 Choose “I accept the terms of the license agreement”, and click “Next” to continue.



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

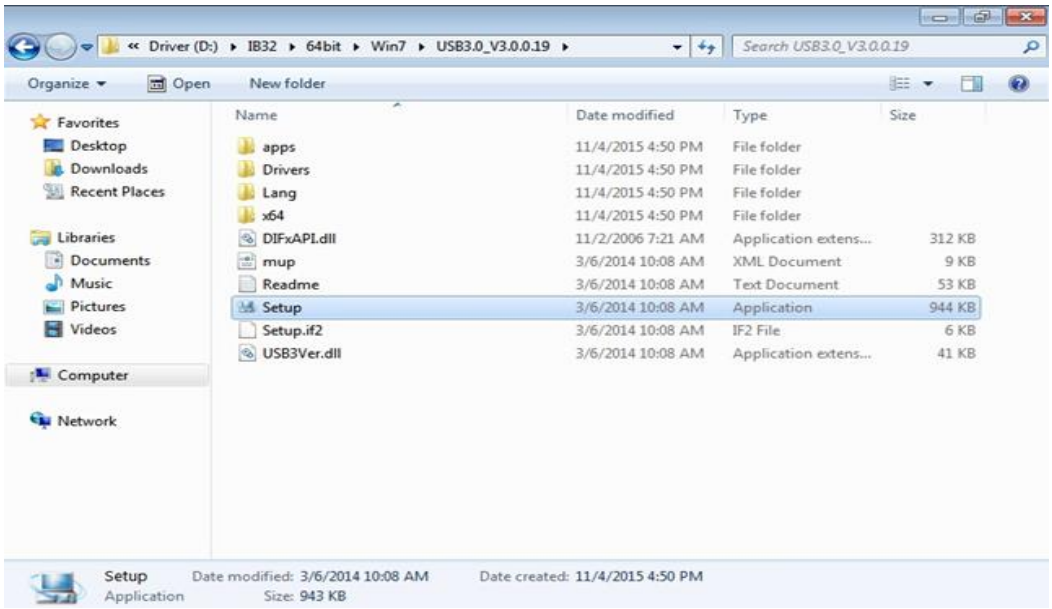


4.7 USB 3.0 Driver Installation (for Windows 7)

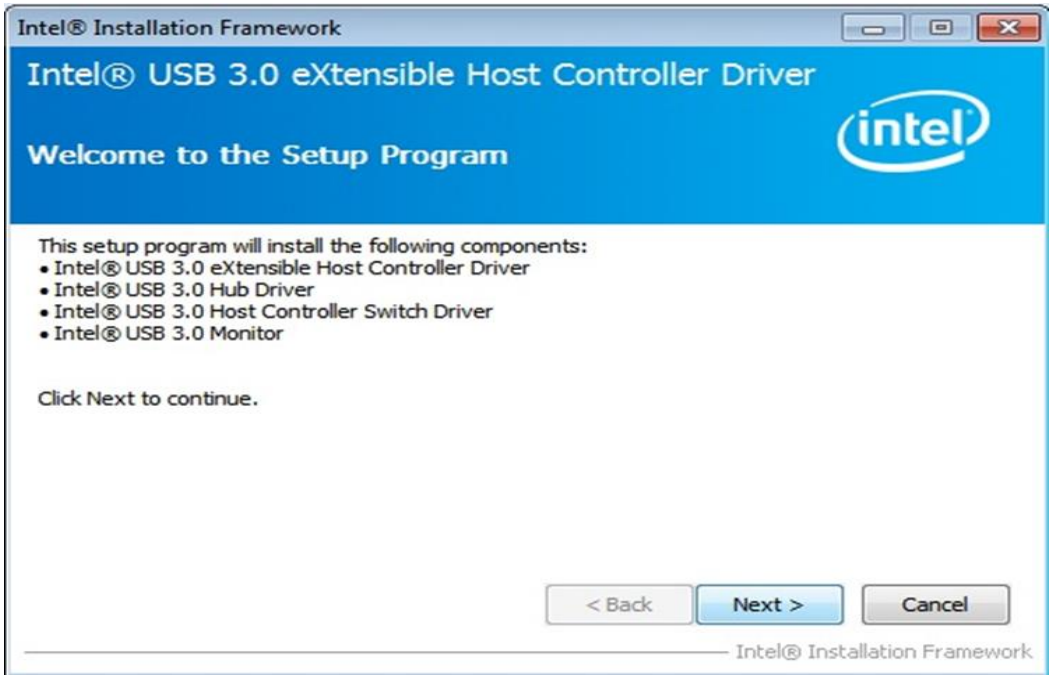
Note If the operating system of the device is Windows Embedded 8.1 Industry or Windows Embedded 8 Standard, users can skip this installation.

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.

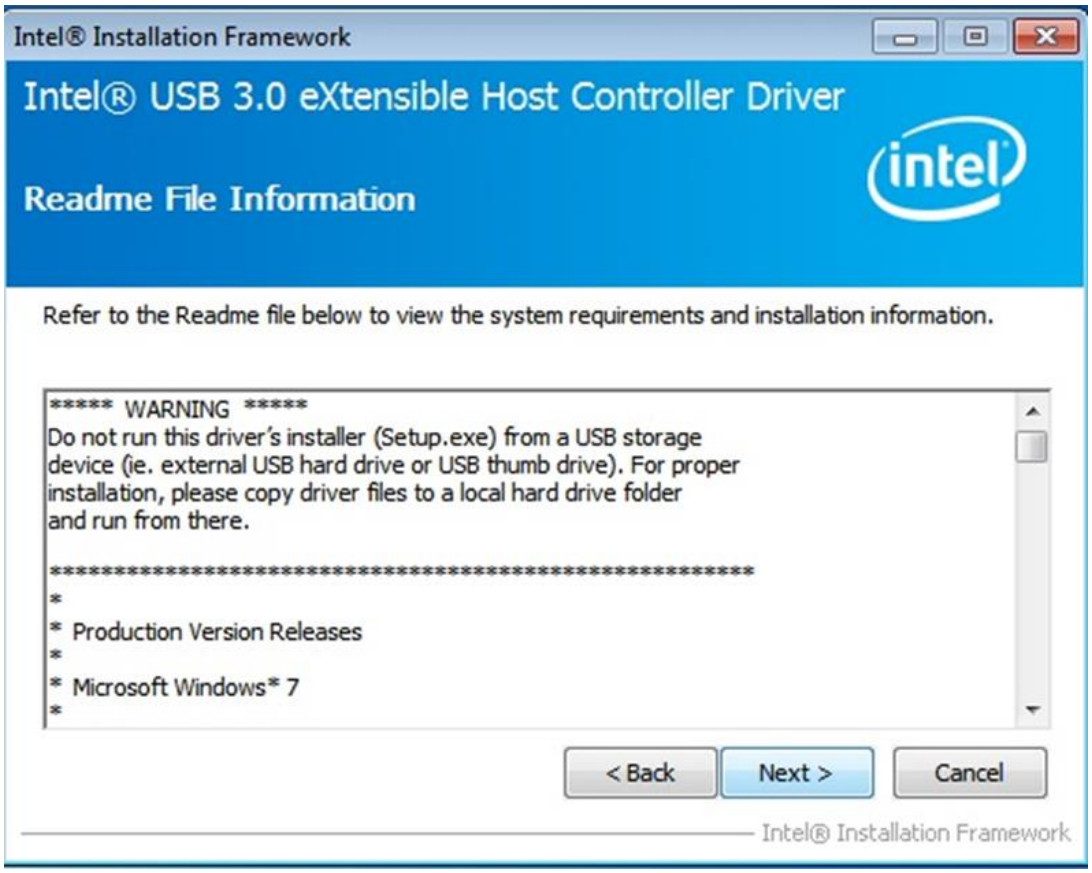


Step 3 Click “Next” to continue

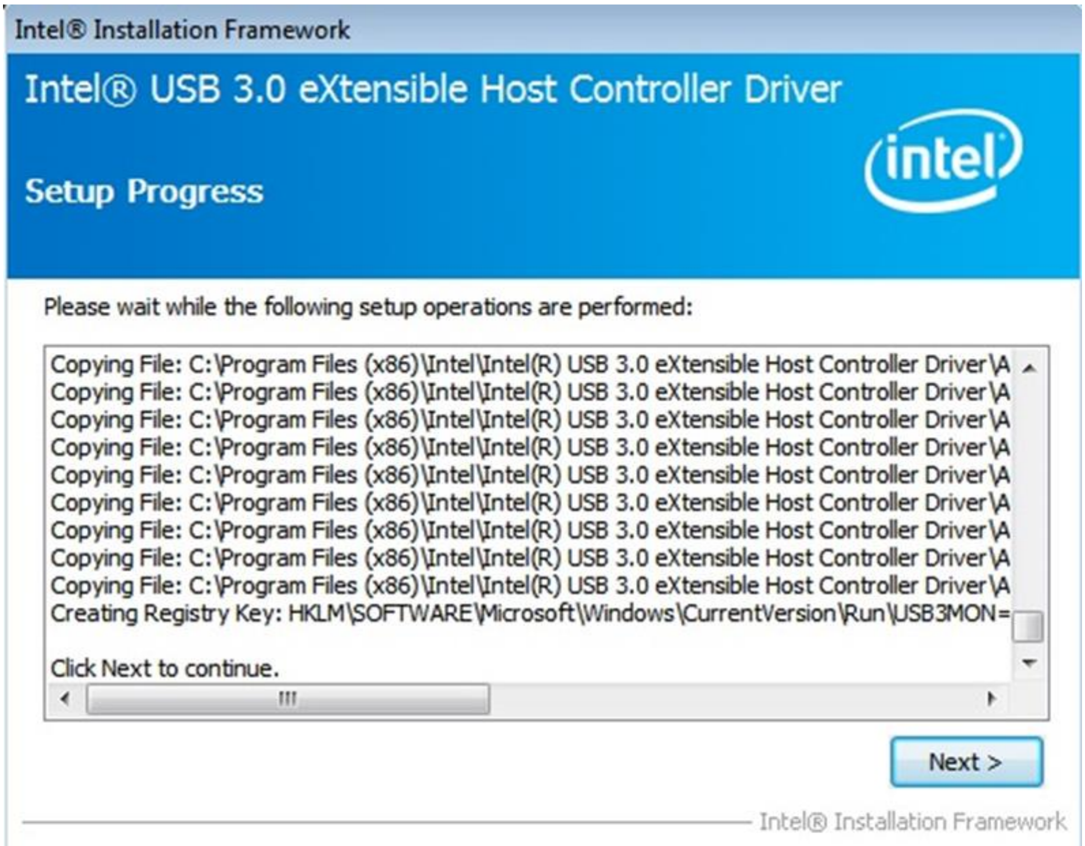


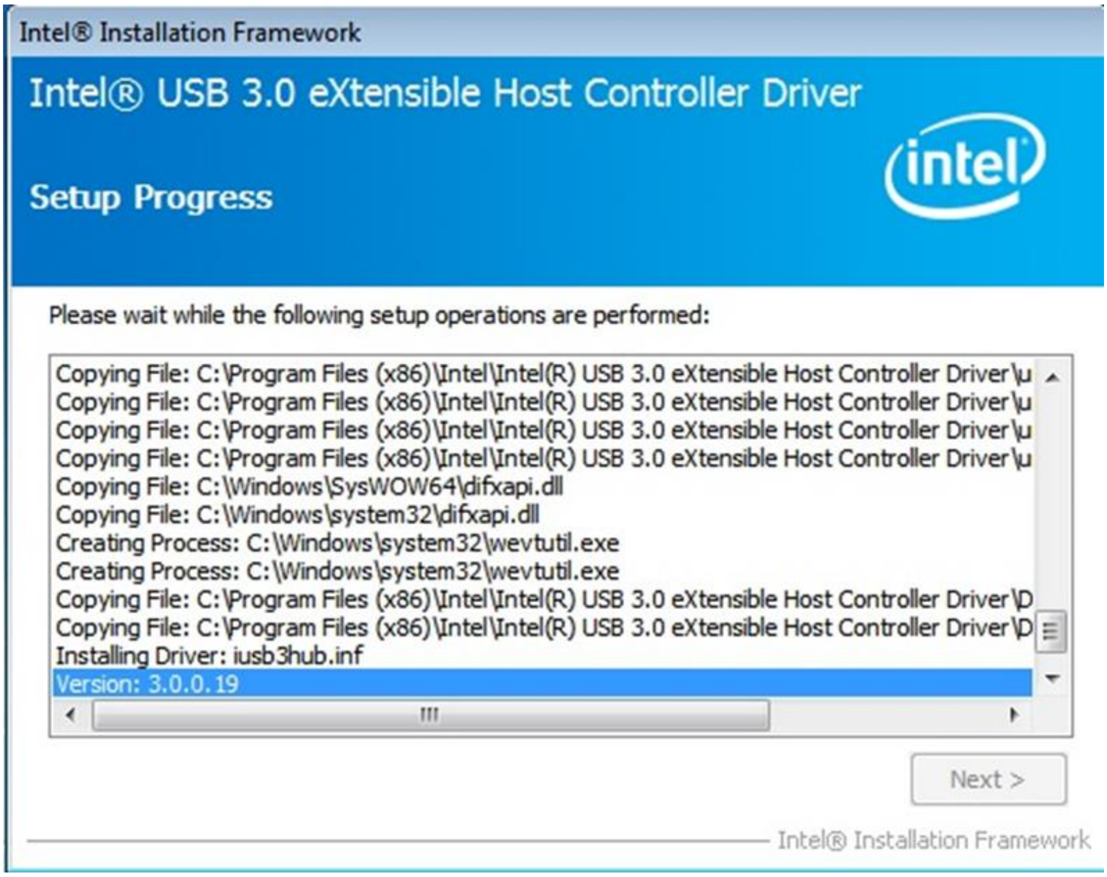
Step 4 Read the License Agreement and click “Yes” to proceed.

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


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
***** WARNING *****
Do not run this driver's installer (Setup.exe) from a USB storage
device (ie. external USB hard drive or USB thumb drive). For proper
installation, please copy driver files to a local hard drive folder
and run from there.
****
*
* Production Version Releases
*
* Microsoft Windows* 7
*
< Back
Next >
Cancel
Intel® Installation Framework

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 and then restart your computer.

CHAPTER 5

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/l3lklrmiqy2lip6/SDK.rar?dl=0

5.1 Digital I/O SDK

To find the Digital I/O Sample code, please refer to the IH32 driver CD SDK or contact us.

5.2 Watchdog SDK

To find the Watchdog Sample code, please refer to the IH32 driver CD SDK or contact us.