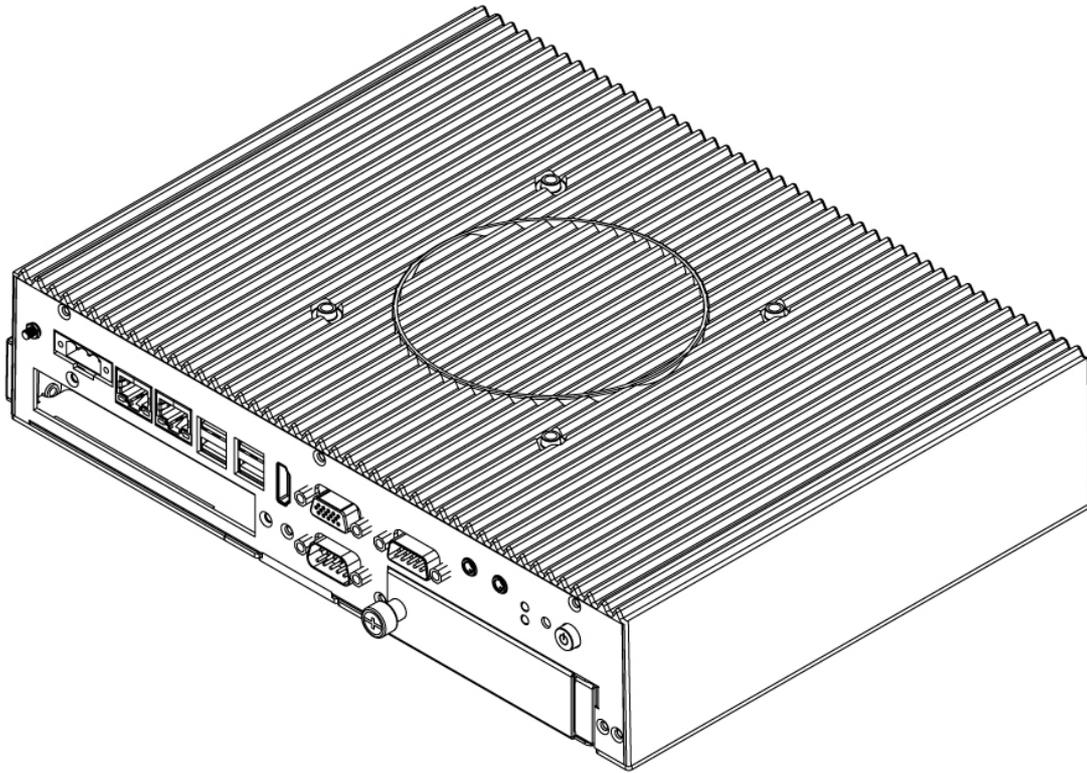


EL4010

Modular PC with Intel® Core™ i5-5200U 2.70 GHz



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User Manual

Version1.0

Safety Precautions



WARNING!

Always completely disconnect the power from OPS module 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.



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 and keep this usermanual for later reference.
2. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
3. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
4. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
5. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
6. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
7. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
8. 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 Industrial
PC background information.



Chapter 1 General Information

This chapter includes EmbeddedLine EL4010 Series Industrial PC background information such as features, hardware specification, dimensions and appearance.

1.1 Introduction

Thank you for choosing the EmbeddedLine EL4010 Series Industrial PC. This is versatile and cost-effective solution for your industrial needs. Intel® Core™ i5-5200U 2.70 GHz processor onboard with fanless cooling system assures steady performance and silent functioning. Motherboard offers various inputs/ output connectors: two Ethernet ports, four USB3.0, HDMI and VGA outputs, two serial ports and one 2.5" SSD Bay.

PRO Series Industrial PC perfectly fits in applications where total costs of ownership (TCO) and quick recovery of failure is important. The flexible system design provides easy access to components and can be serviced by local maintenance team.

Versatile, easy-to-service and upgradable EL4010 offers the best solution for industrial and building automation.

1.2 Features

EmbeddedLine EL4010 Series Industrial PC has the following features:

- Auto detection of the connected display, No settings necessary
- Quick & Easy Replaceable Hard Disk Design, No Tools needed
- Support wide range 12-24V isolation DC input
- Optional with Modular front Display as a Panel PC
- Expansion slot for PCIe x4
- Internal 64G mSATA SSD, Removable 2 Bays 2.5" SSD Slots

1.3 Product Specifications

1.3.1 Hardware Specifications

System Specifications	CPU	Intel® Core™ i5-5200U Processor, 3M Cache 2.2Ghz (Turbo to 2.7GHz)
	BIOS	AMI UEFI BIOS
	Graphic Chipset	Intel® HD graphics 5500
	System Memory	SODIMM DDR3L-1600 4GB,option up to 8GB (2 slots)
	Main Storage	Built-in mSATA 64GB SSD
	Second Storage (Optional)	TwoRemovable 2.5" SSD
	Ethernet	1000 Base-Tx Gigabit Ethernet Compatible
	Audio	Realtek ALC886 codec
I/O Interface	Front I/O	1 x DC in 12-24V with isolation (Terminal Block 3pin) 2 x Gigabite LAN 4 x USB3.0 1 x HDMI Output 1 x D-Sub15 (VGA) Output 1 x RS232/422/485 selectable serial port 2 x RS232 isolation serial port 1 x Audio in Jack 1 x Audio out Jack
	Physical Buttons	1 x Reset Key 1 x Power Button
	Indicator	Two 2.5" SSD indicator
Power Supply	Power Input	12-24V isolation DC in with protection Fuse
	Power Adapter	110-240 AC to 12V DC out 80W power Adapter
Mechanical Specifications	Housing	Aluminum housing
	Mounting	Desktop/Wall Mount
	Dimensions	276.18(L) x 228.80(W) x 45.20(H)
Environmental Specifications	Operating Temp.	0°C~+50°C
	Operating Humidity	30%-95% at 40 (non-condensing, RH)
Optional Operating System	Operating System	Windows 10 IoT Enterprise Windows Embedded 8 Standard Windows Embedded Standard 7

1.3.2 Software Support

The following drivers are available for the EmbeddedLine EL4010 Series Industrial PC:

Item	Driver	Windows 7	Windows 8	Windows 10
1	Chipset Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Graphics Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Audio Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	Ethernet Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Intel Sideband Fabric Device (Intel MBI) Driver	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	Intel Trusted Engine Interface (Intel TXE) Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	USB 3.0 Driver	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Watchdog Driver	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

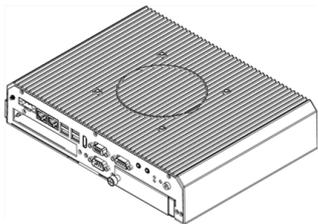
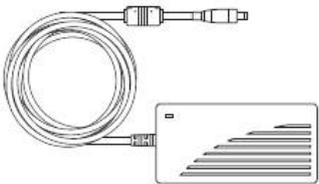
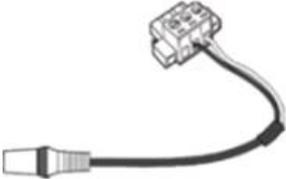
development kits (SDK)

Item	File Type	Description
1	Watchdog SDK & AP	Watchdog SDK and AP

1.4 Packing List

Carefully remove the box and unpack your EL4010 Industrial PC. Please check if all the items listed below are inside your package. If any of these items are missing or damaged contact us immediately.

Standard factory shipment list:

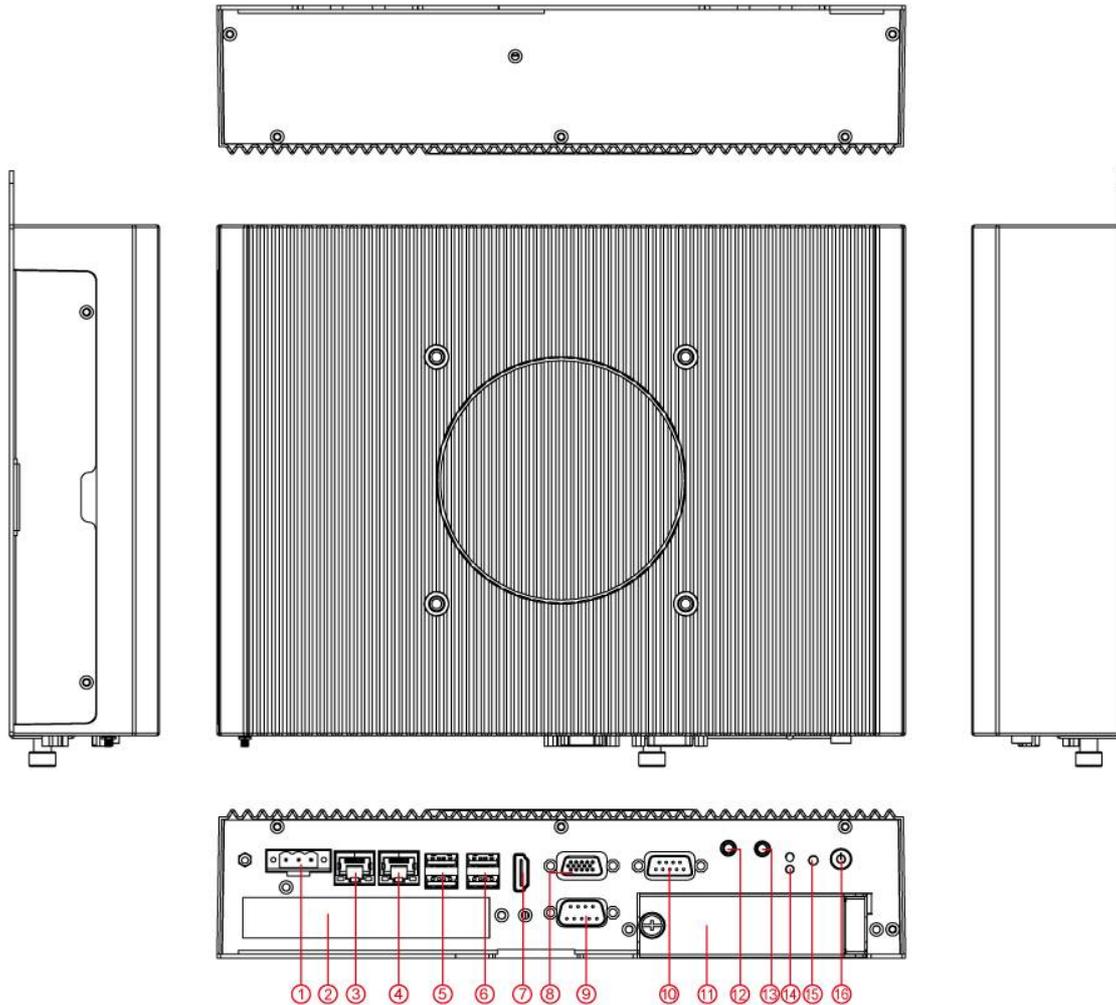
		
<p>Industrial PC</p>	<p>Power Cord</p>	<p>AC Adapter (12V/ 80W)</p>
		
<p>3-pin Terminal Block</p>	<p>Driver CD & User Manual</p>	

1.5 Physical Description

This section explains physical characteristics of the Industrial PC.

1.5.1 I/O Placement

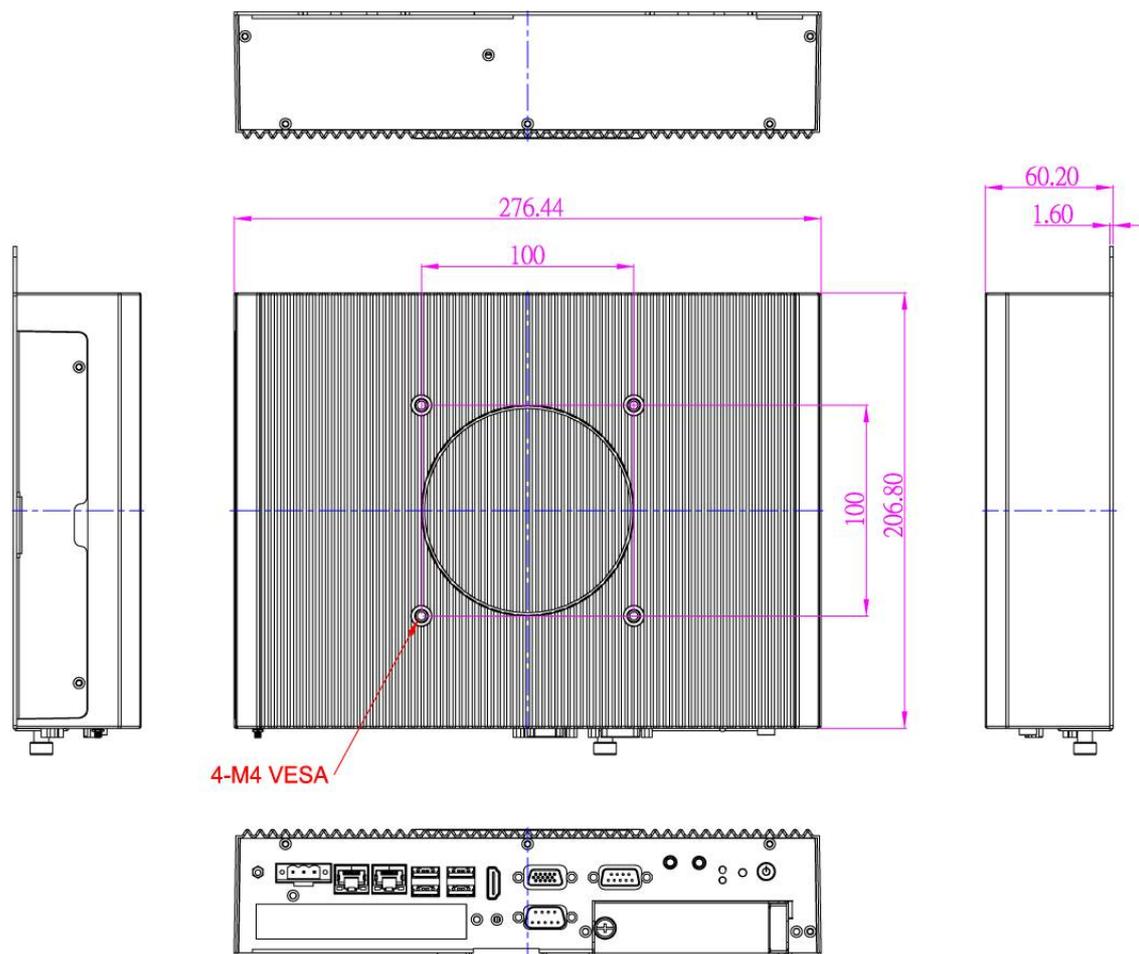
The module front panel consists of 2.5" SSD Bay, power/reset buttons, audio jacks, two RJ45 connectors, HDMI and VGA outputs, and four USB2.0 ports.



- | | |
|--------------------------|--------------------|
| ① 12-24V isolation DC-in | ⑨ COM2 |
| ② Expansion PCIe4 window | ⑩ COM1 |
| ③ LAN | ⑪ Two 2.5" SSD Bay |
| ④ LAN | ⑫ Audio in |
| ⑤ 2 x USB 3.0 | ⑬ Audio out |
| ⑥ 2 x USB3.0 | ⑭ HDD indicators |
| ⑦ HDMI output | ⑮ Reset |
| ⑧ VGA Output | ⑯ Power Button |

1.5.2 Dimensions

The dimensions of the Industrial PC.



Measurements shown in mm

All Dimensions are ± 0.5 mm

**Note: this is a simplified drawing and some components are not marked in detail.*

Hardware Specifications

This chapter provides information on how to use jumpers and connectors on the motherboard, and the Industrial PC hardware specifications and installation instruction.



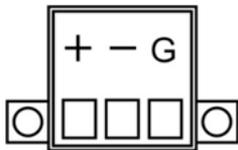
Chapter 2 Hardware Installation

This chapter provides information on how to use jumpers and connectors on the motherboard, and the EmbeddedLine EL4010 Industrial PC hardware specifications and installation instruction.

2.1 Connector Pin Assignments

This section includes I/O side connectors and its pinouts.

2.1.1 Isolated (12~24V) DC-in Connector



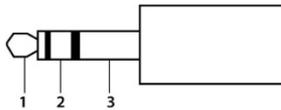
Voltage

Minimum Voltage 12V

Maximum Voltage 24V

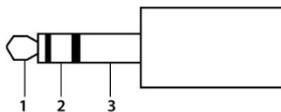
Maximum Current 6.6A

2.1.2 Audio-in (microphone)



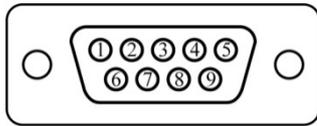
Pin No	Name	Pin No	Name
1	Audio signal in	2	Audio signal in
3	GND		

2.1.3 Audio-out(headphone)



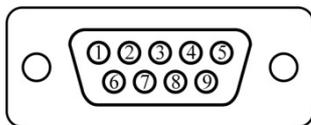
Pin No	Name	Pin No	Name
1	Audio signal out, left channel	2	Audio signal out, right channel
3	GND		

2.1.4 COM1 Serial Port Connector



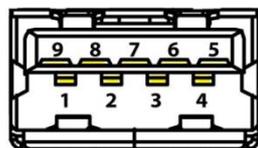
Pin №	RS-232	RS-422	RS-485
1	DCD	TxD-	D-
2	RXD	TxD+	D+
3	TXD	RxD+	NC
4	DTR	RxD-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.1.5 COM2 Serial Port Connector



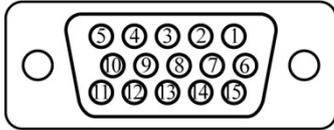
Pin №	Name	Pin №	Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

2.1.6 USB 3.0 Connector



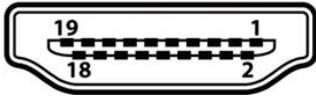
Pin №	Name	Pin №	Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+		

2.1.7 VGA Output Connector



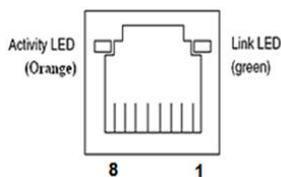
Pin №	Name	Pin №	Name
1	RED	2	GREEN
3	BLUE	4	ID2/RES
5	GND	6	RED_RTN
7	GREEN_RTN	8	BLUE_RTN
9	KEY/PWR	10	GND
11	ID0/RES	12	ID1/SDA
13	HSync	14	VSynс
15	ID3/SCL		

2.1.8 HDMI Output Connector



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		

2.1.9 POE/LAN (RJ45) Connector



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

2.2 Hardware Installation

This section explains how to replace HDD/SDD, install PCI Card/ RAM/ Internal SSD, and replace fuses on the Industrial PC.



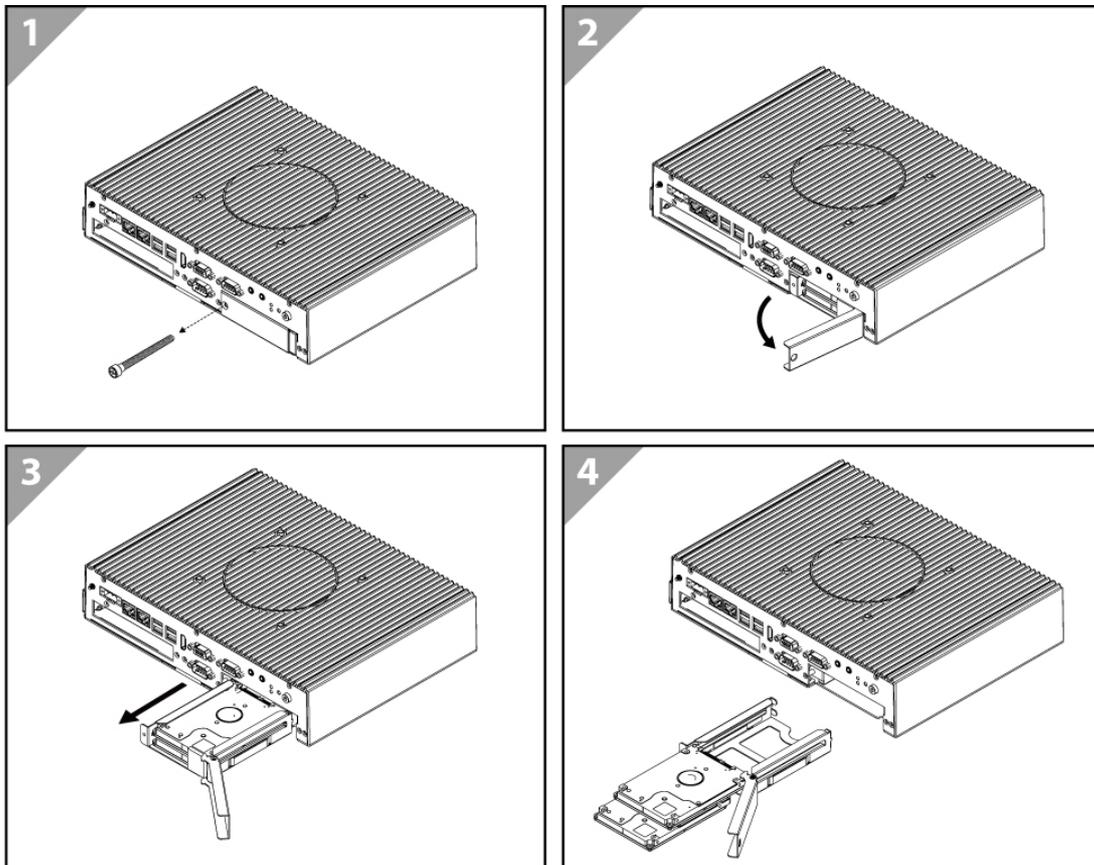
WARNING!

Switch off the power and unplug the power cord. Each time the EL4010 Industrial PC is serviced, users should be aware of this condition.

2.2.1 Hard Disk Replacement

To remove the hard disk:

1. Loosen by hand one thumbscrew on the rear bottom side of the device. In order to loosen the screw slightly push the screw and turn it to the left.
2. Open the cover door.
3. Carefully pull the 2.5" hard disk bay out of the slot.
4. The harddisk bay don't not fall out by itself, the retaining springs hold it in place. Hard disk can't be inserted in the wrong direction.

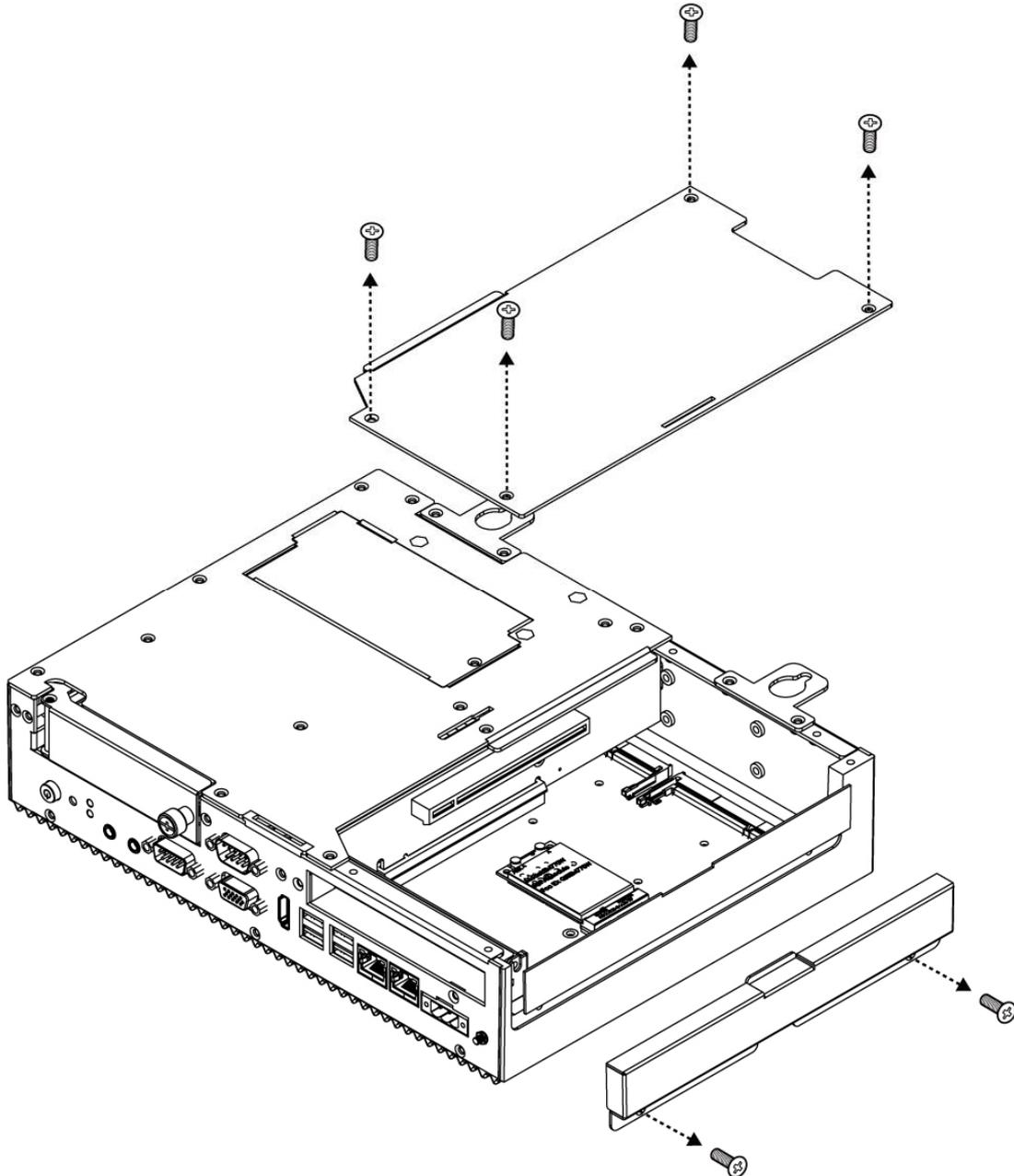


Reverse this procedure to install the hard disk bay.

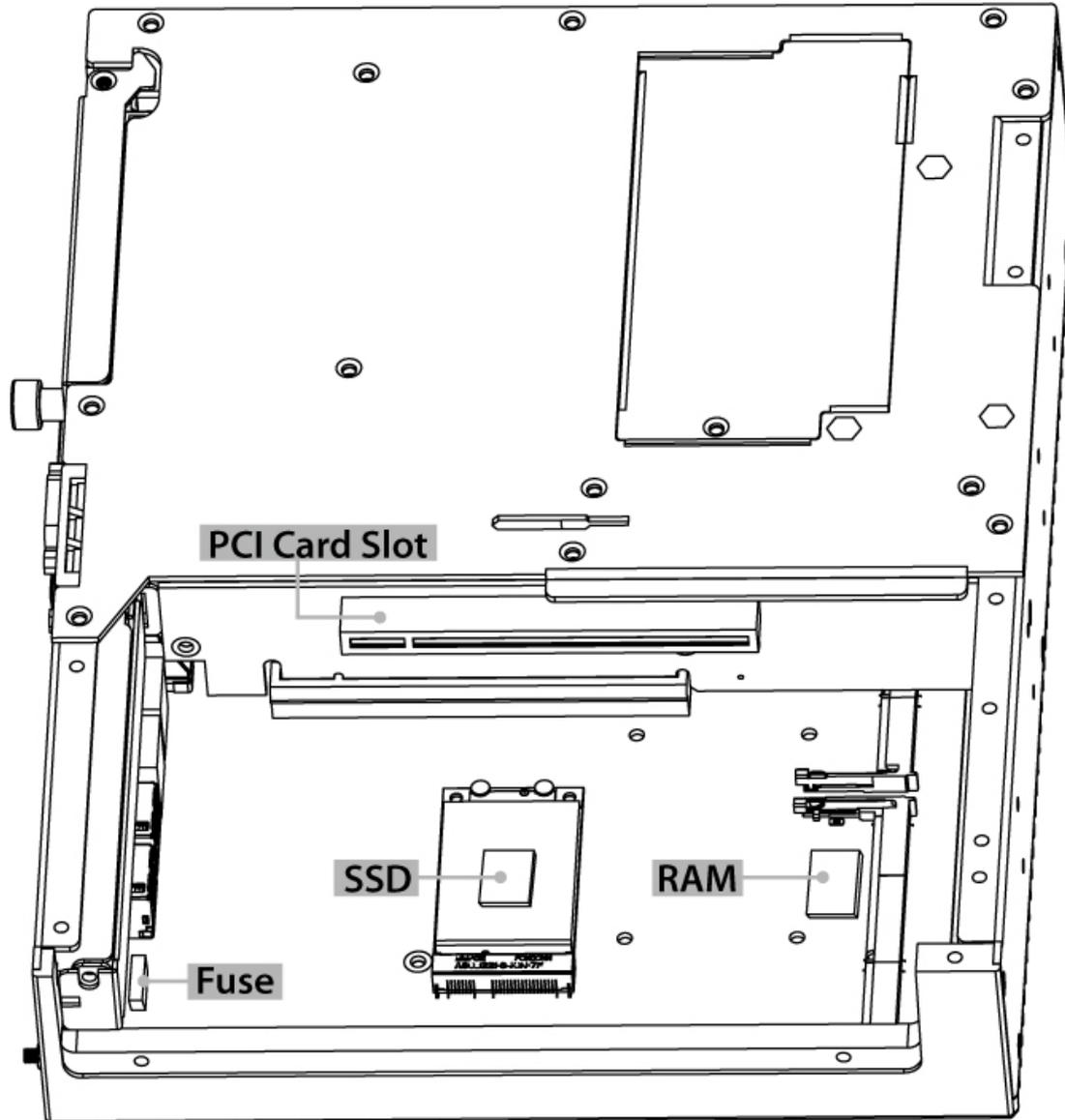
2.2.2 PCI Card/ RAM/ Internal SSD/ Fuse Replacement

To remove the PCI card/ RAM/ Internal SSD/ Fuse:

1. Turn the device right-side up, with the back toward you.
2. Loosen two Philips M3x5 screws that secure side cover.
3. Loosen four Philips M3x5 screws that secure top cover.



4. Remove PCI card/ RAM/ Internal SSD/ Fuse



Reverse this procedure to install the PCI card/ RAM/ Internal SSD/ Fuse.

Driver Installation

This chapter provides driver installation instructions.

3

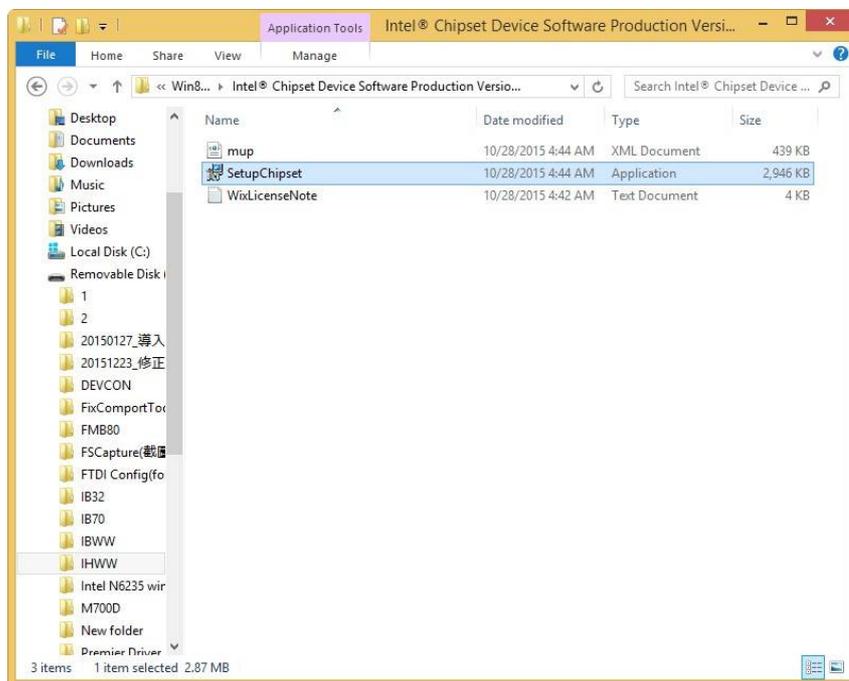
3 Driver Installation

This chapter provides driver installation instructions.

3.1 Chipset Driver

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.

Step1 Insert the CD that comes with the motherboard. Open the file document “Chipset Driver” and click “SetupChipset.exe” to install driver.



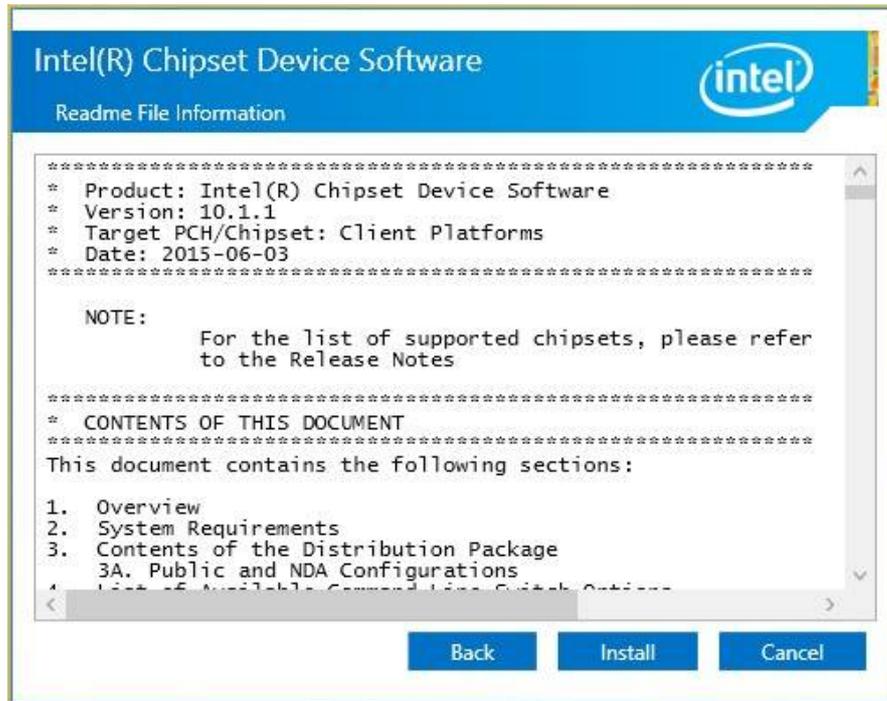
Step2 Click “Next” to start the installation.



Step3 Click **Accept** to agree with the license terms and continue the installation.



Step 4 Check **ReadMe** File information, and then click **Install** to continue.



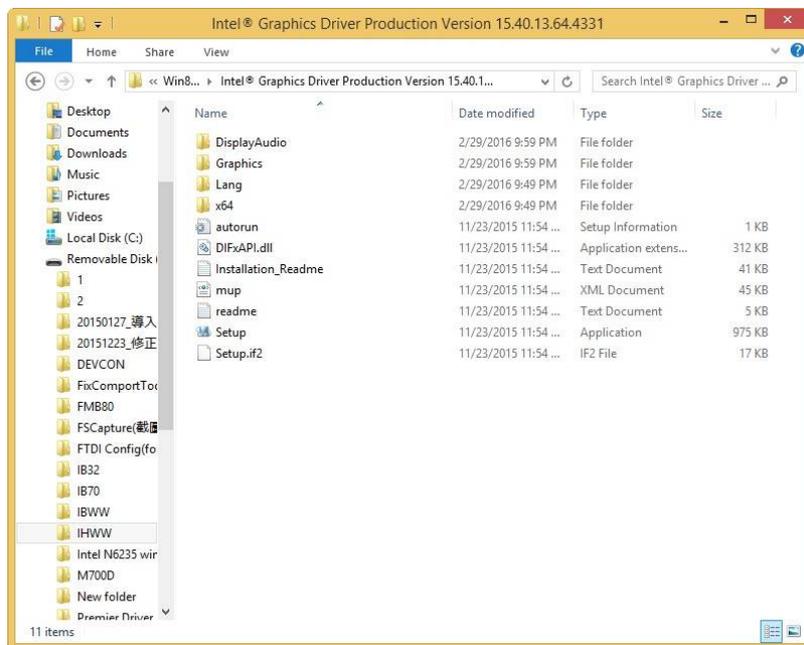
Step 5 Click **Restart Now** to finish the installation and restart the computer.



3.2 Graphics Driver

The 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 Graphics 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.

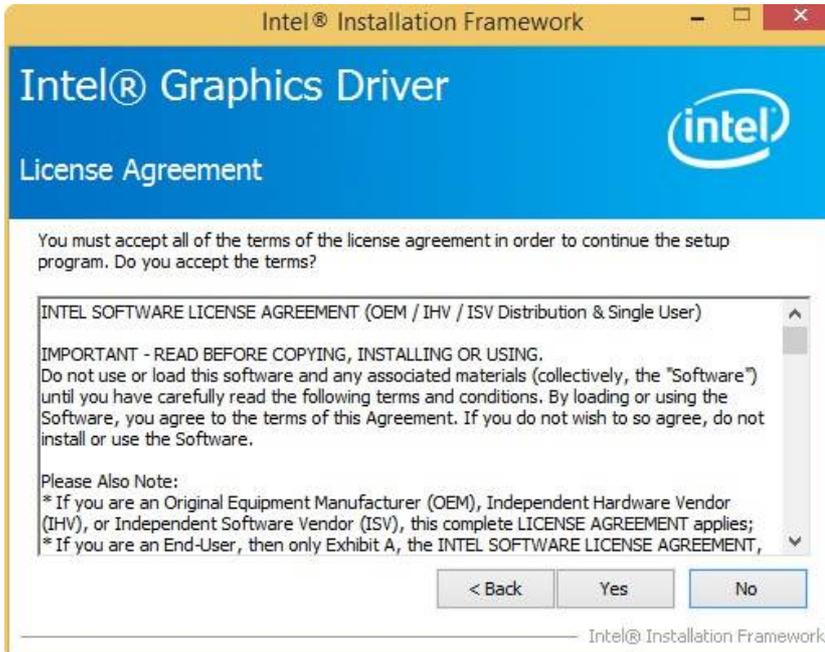
Step1 Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "Graphic Driver" folder and click "setup.exe" to start the installation.



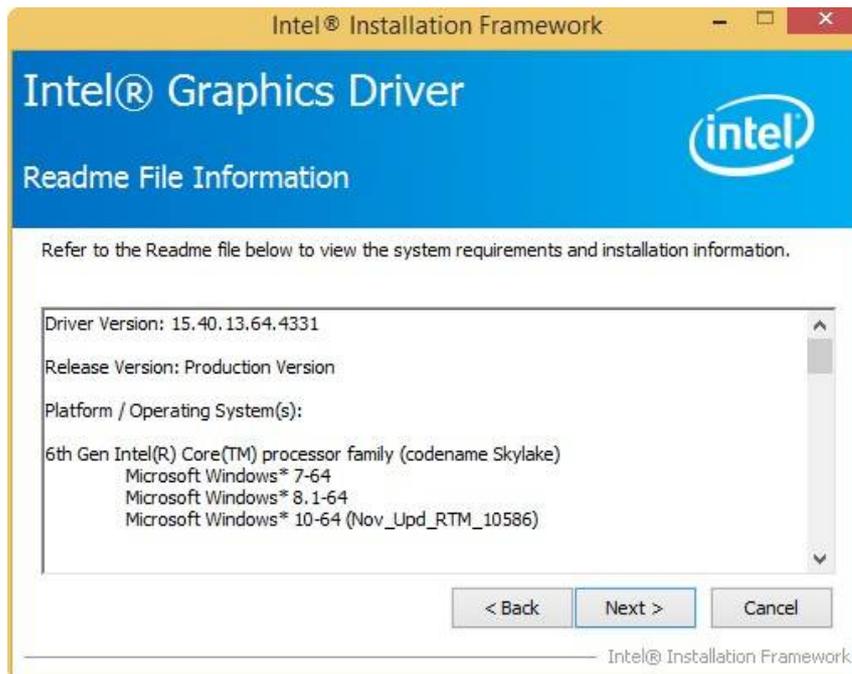
Step 2 Click **Next** to continue.



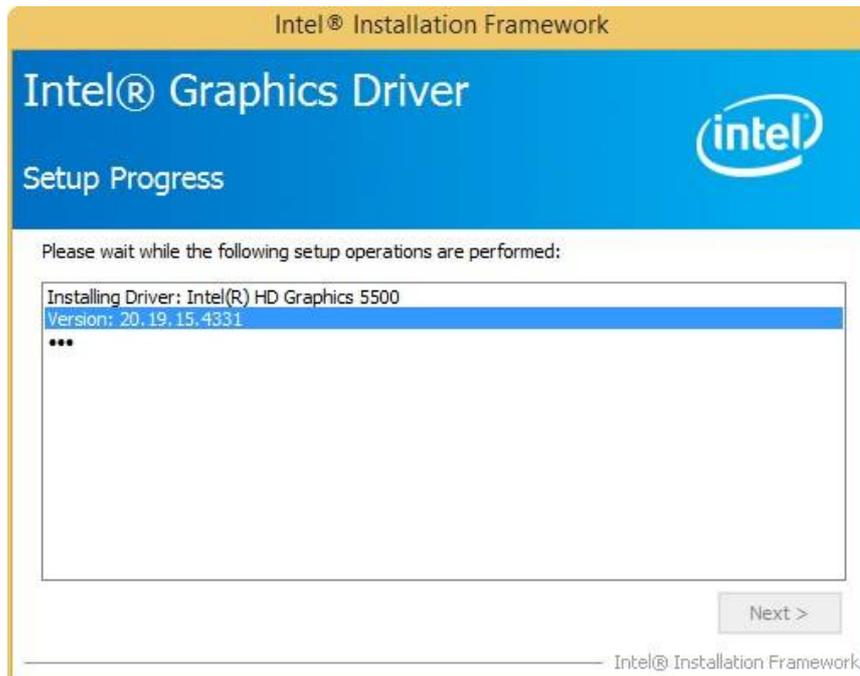
Step 3 Click **Yes** to agree with the license terms and continue the installation.



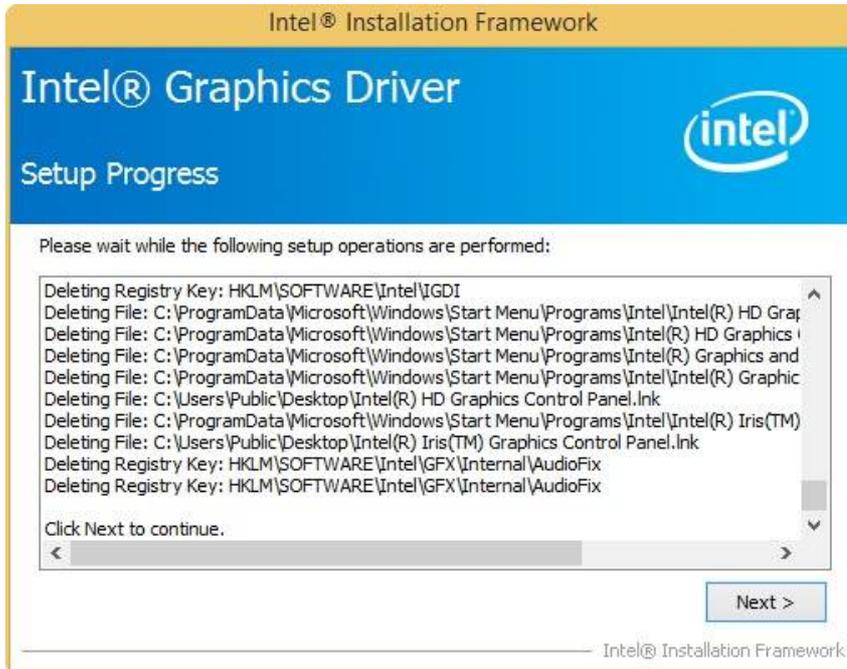
Step4 Check **ReadMe File Information** and then click **Next** to install the driver.



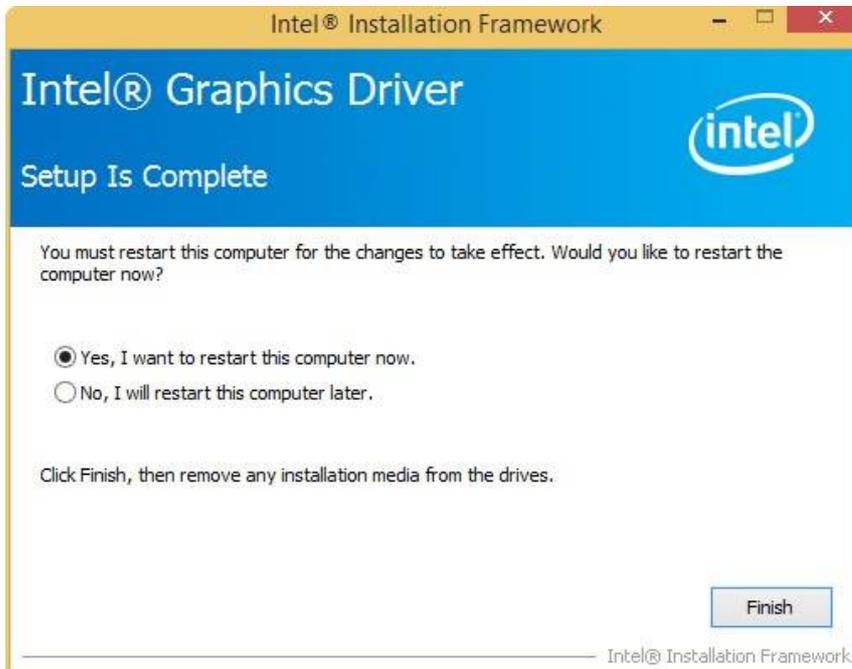
Step5 Wait while the following operations are performed:



And then click **Next** to continue.



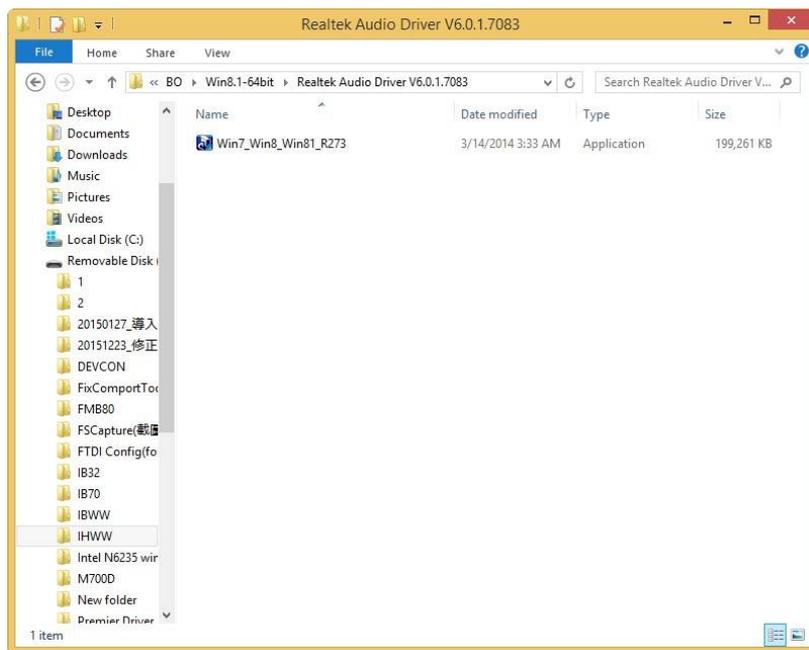
Step 6 Select “Yes, I want to restart this computer now”, and click **Finish** to complete the installation.



3.3 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. Follow the steps below to complete the installation of the Realtek ALC886 Audio drivers. You will quickly complete the installation.

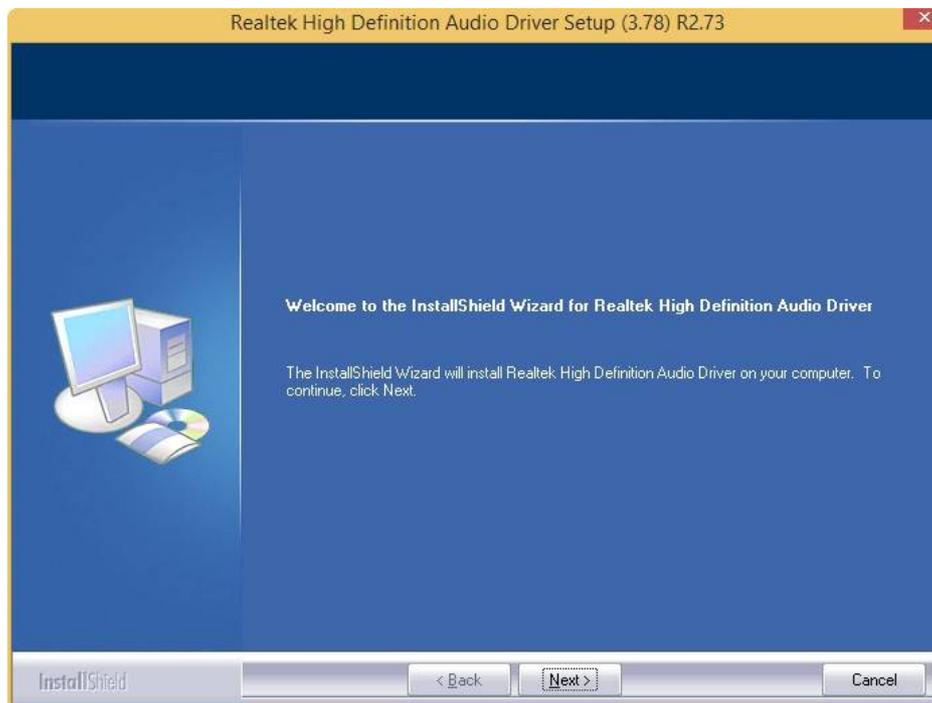
Step1 Insert the CD that comes in the package. Open the folder “RealtekAudio Driver” and click Win7_Win8_Win81_R273 to execute the setup.



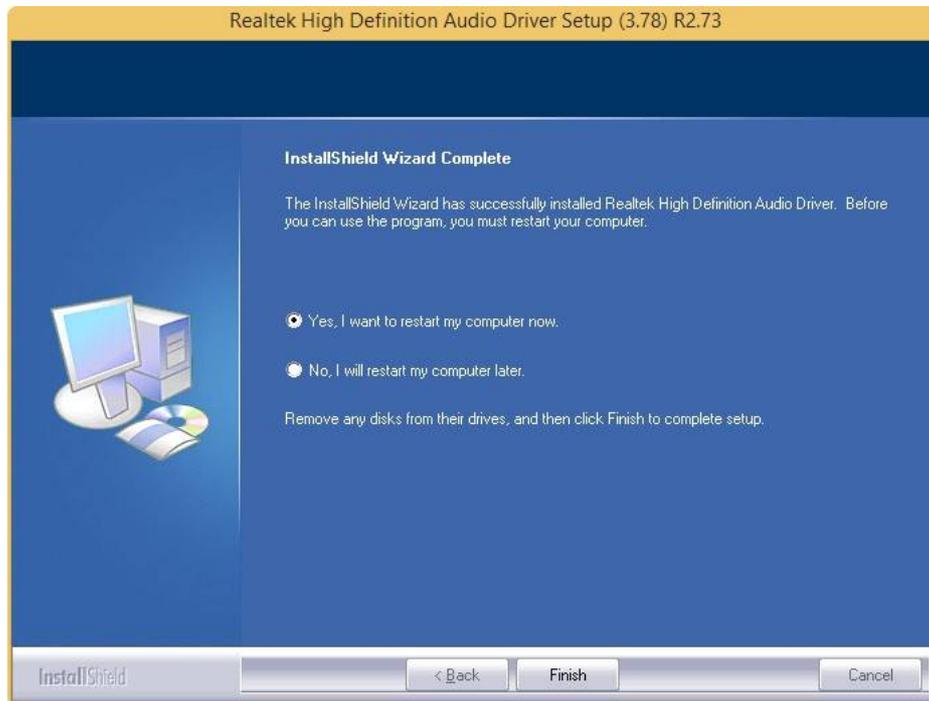
Step 2 Wait while the InstallShield Wizard extracts the files needed to install Realtek HD Audio on your computer, and then click **Next** to continue the installation.



Step 3 Click **Next** to continue the installation.



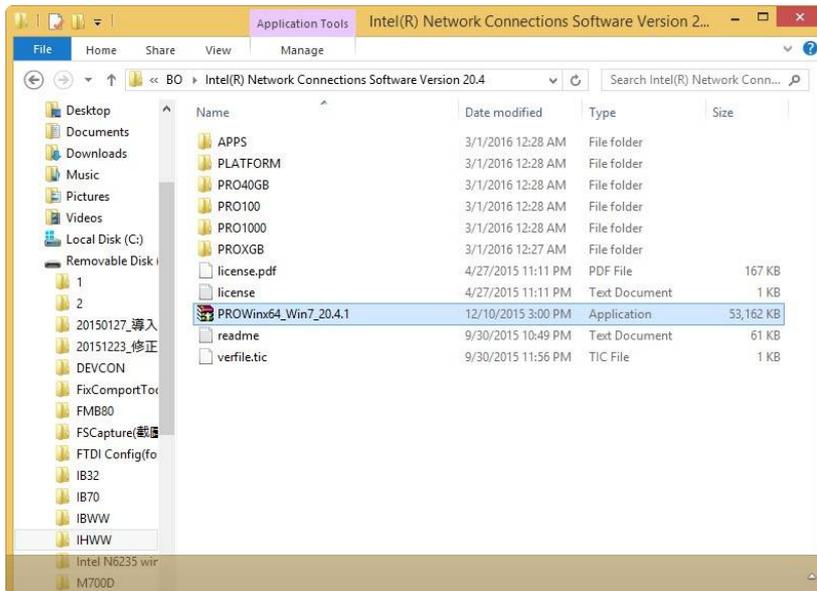
Step 4 Select “Yes, I want to restart my computer now”, and then click **Finish** to complete the installation.



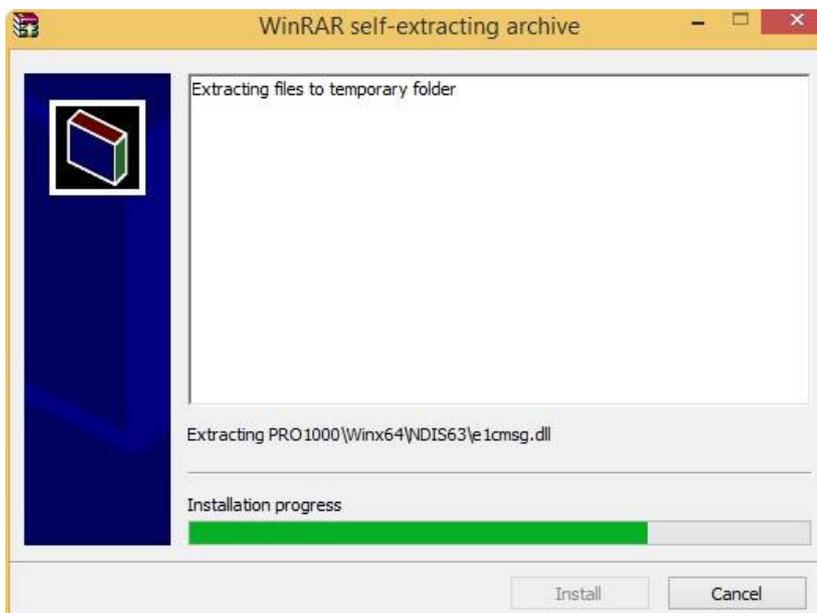
3.4 Ethernet Driver

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

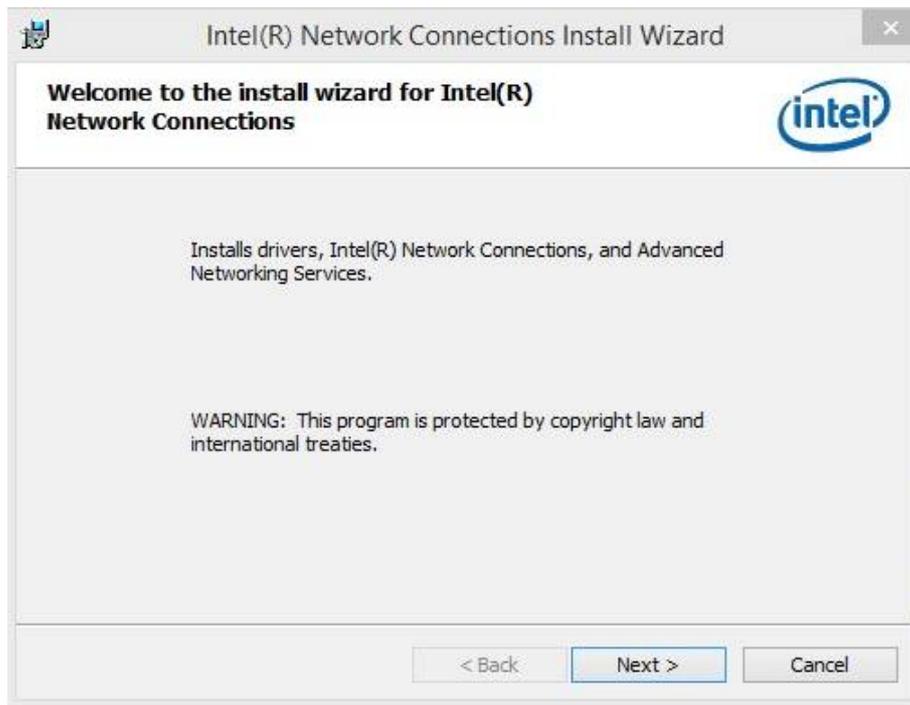
Step1 Open the folder “Intel® Network Connections Software” and open PROWin64_Win7_20.4.1 archive to execute the setup.



Step2 Wait while the system is extracting files to temporary folder, and then click **Install**.



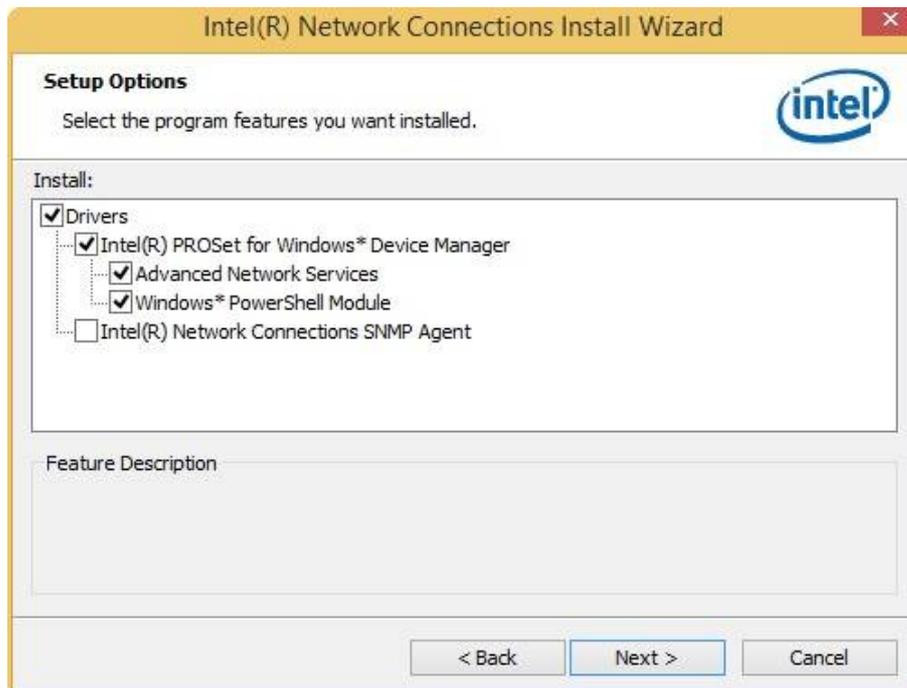
Step 3 Click **Next** to continue.



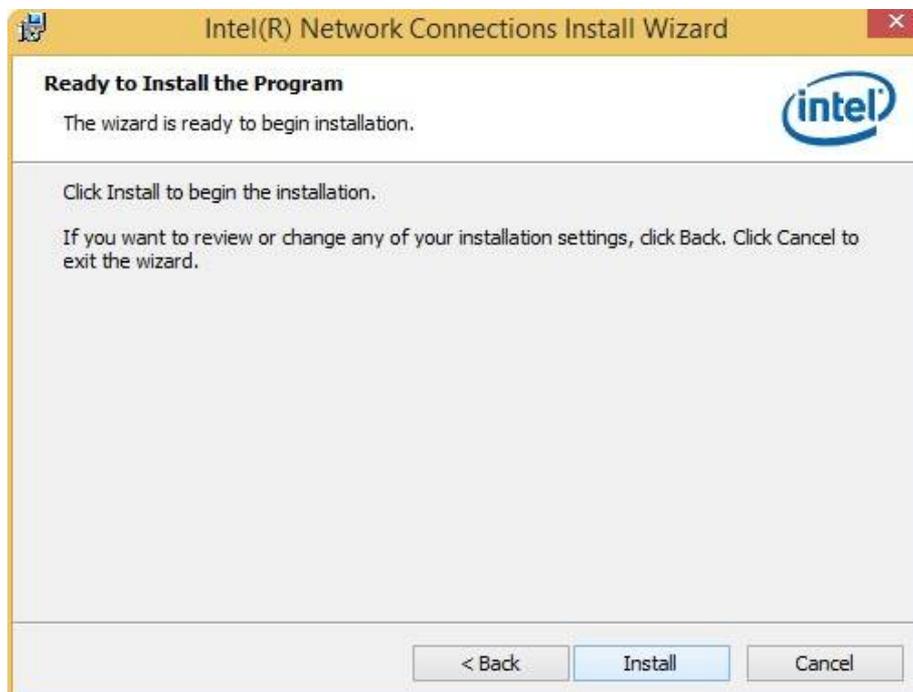
Step 4 Click **Yes** to agree with the license terms and continue the installation.



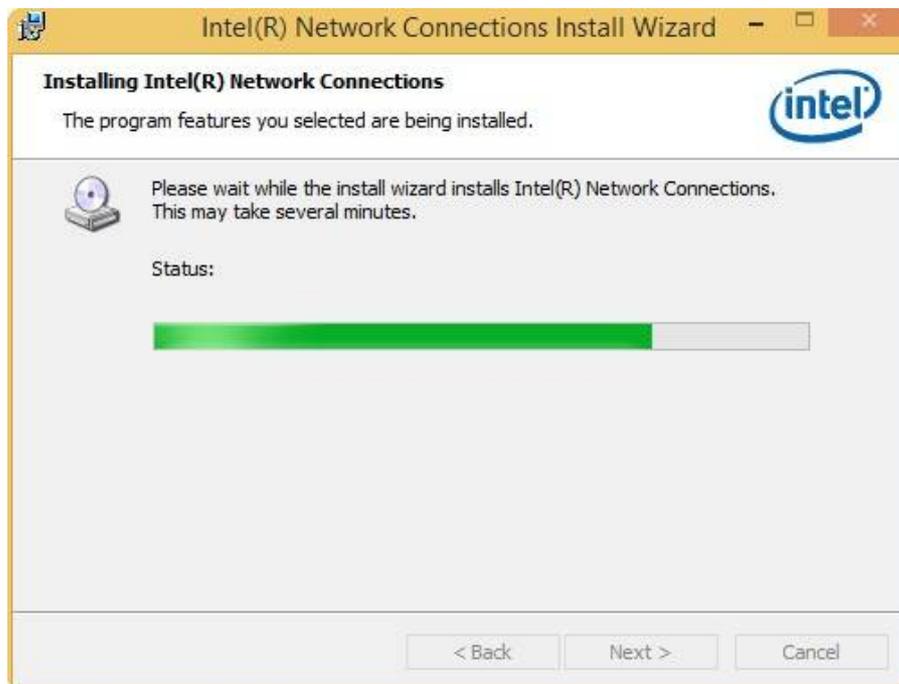
Step 5 Select the program features you want to install, and then click **Next** to continue.



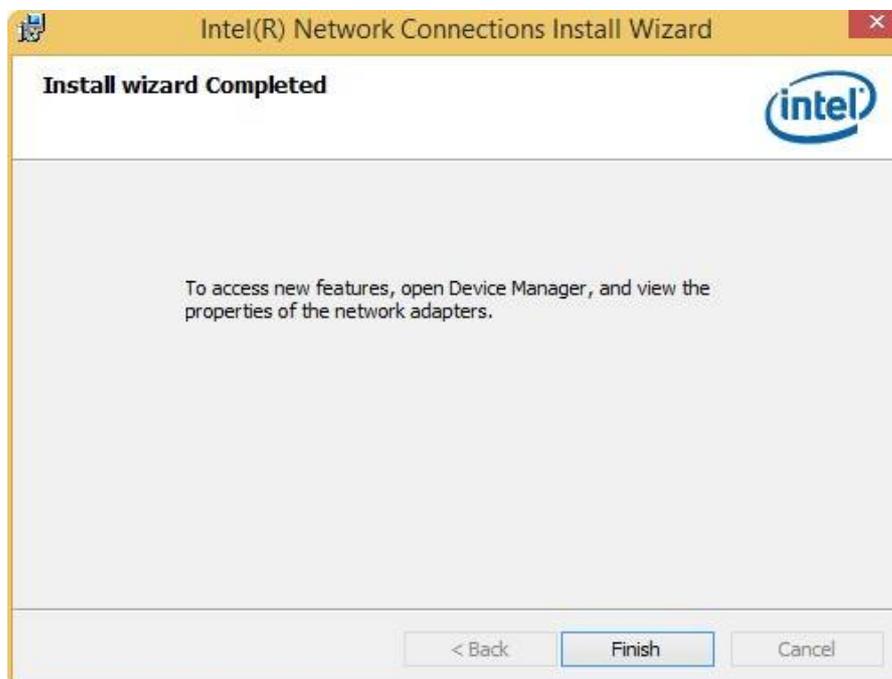
Step 6 Click **Install** to continue the installation.



Step 7 Please wait while the install wizard installs Intel® Network Connections, and then click **Next** to continue.



Step 8 Click **Finish** to complete the installation.



3.5 Fintek COM Port Driver

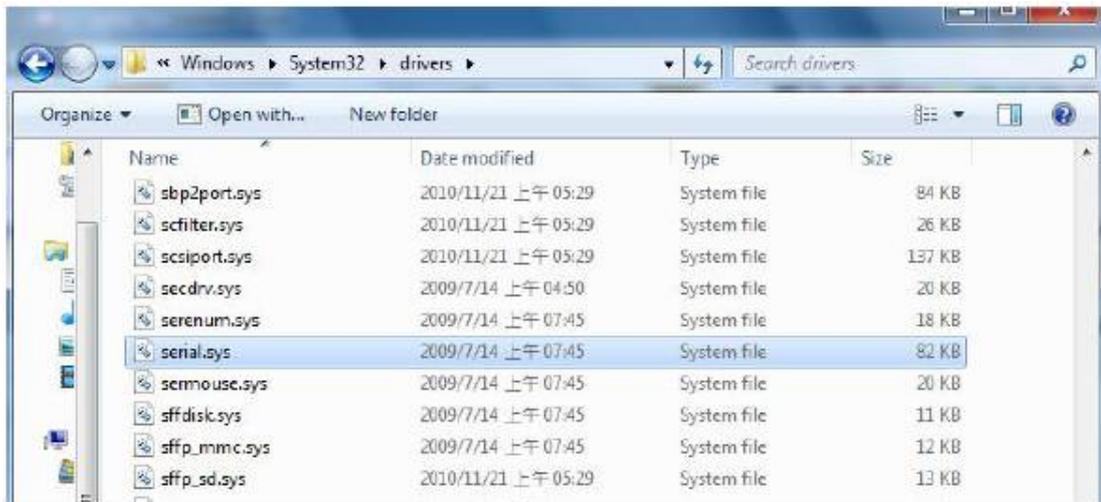
Step 1 If your system is WIN7, please first close UAC(refer to the following“Disabling User Account”)Control (UAC) in Windows 7”

Step 2 Extract the Patch_0408.zip to a folder.

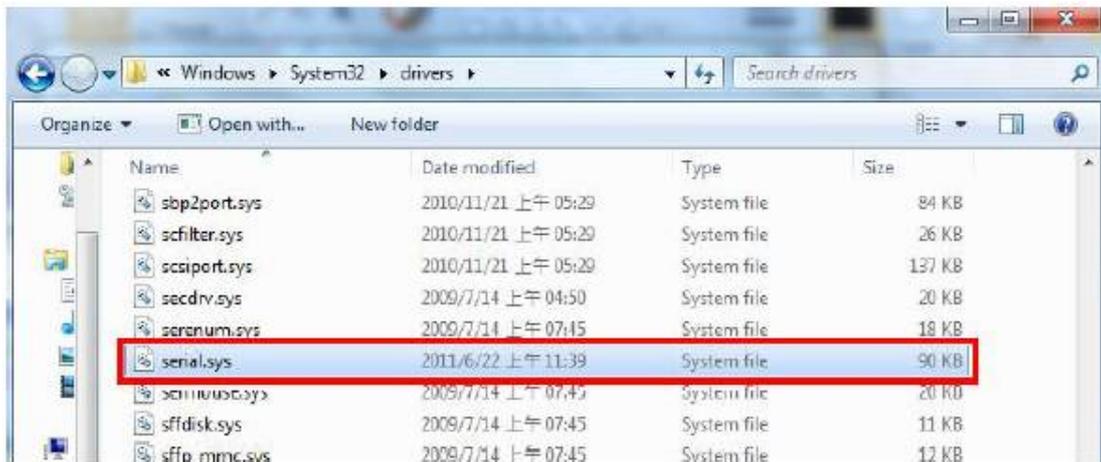
Step 3 Double-click batch file(patch.bat) to install the driver.

Step 4 Check the driver installation success.

There is a screenshot before the update below.



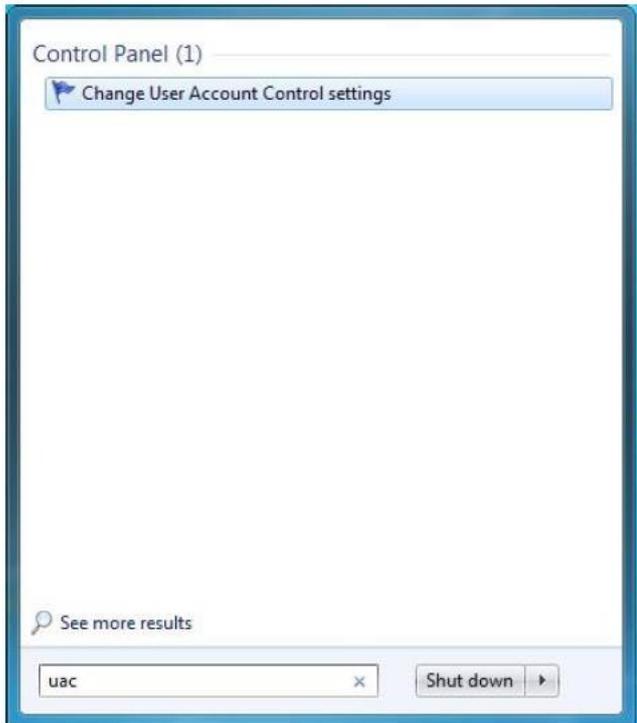
There is a screenshot after the update and update success below.



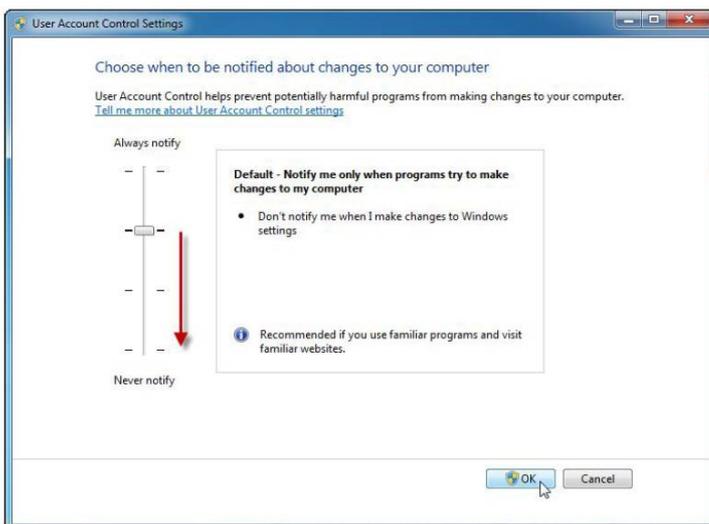
Step 5 Restart the computer to complete driver installation.

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.

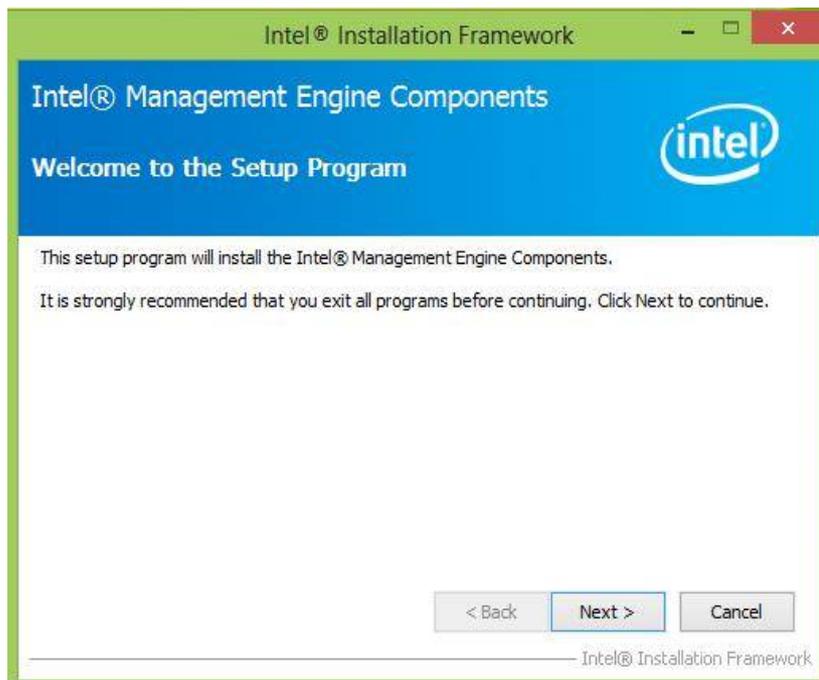
3.6 Intel® Management Engine Software

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

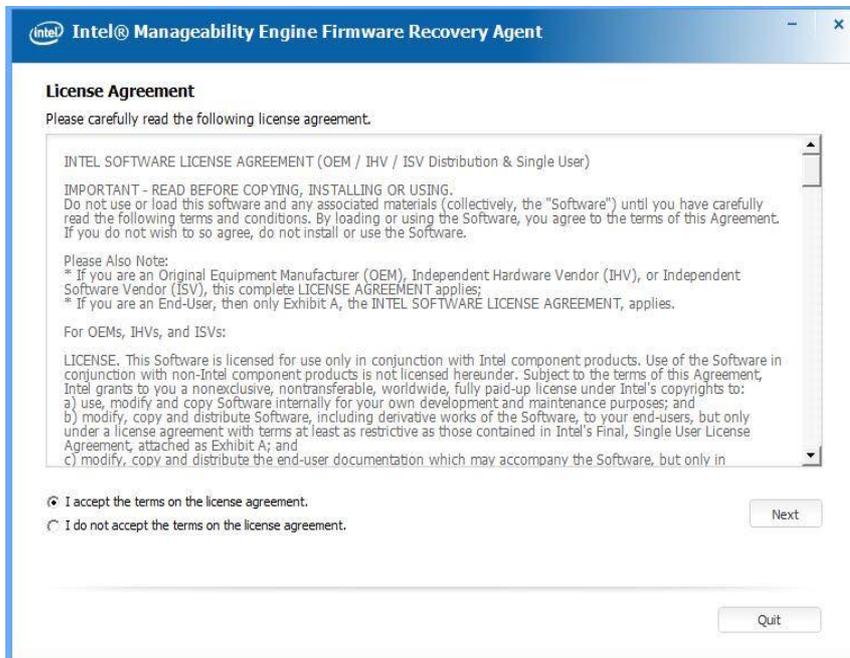
Step 2 Click “Next” to continue the installation.



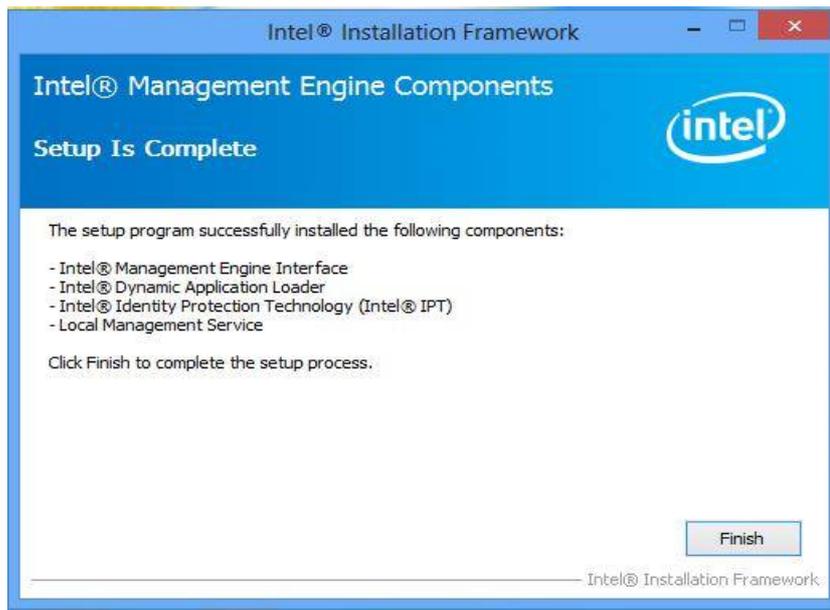
Step 3 Click “Yes” to agree with the License terms.



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.

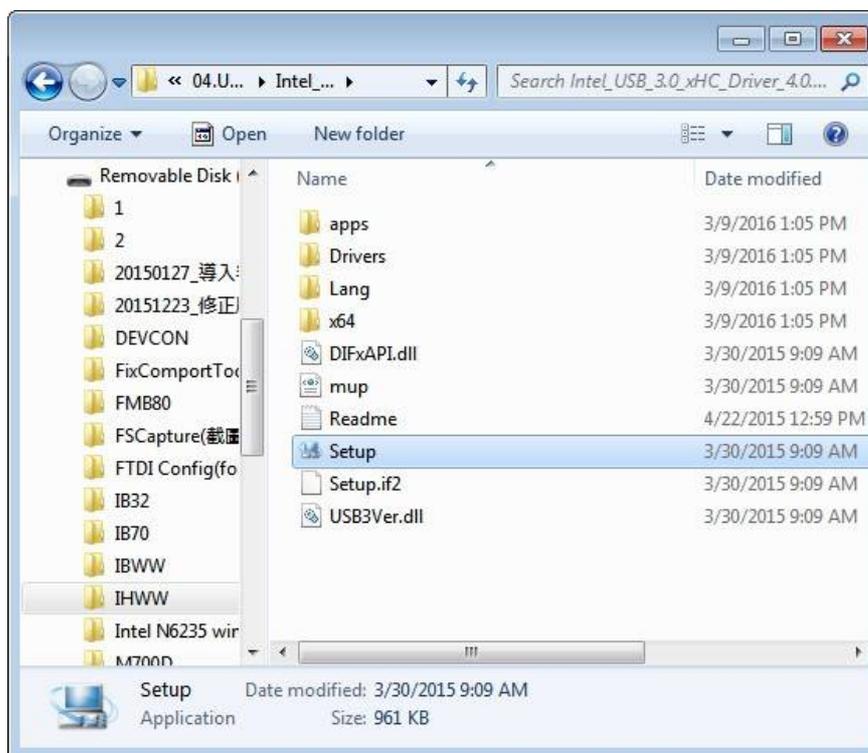


3.7 USB 3.0 Driver Installation (Windows 7)

**NOTE:**

If the operating system of the device is Windows 10 IoT or Windows Embedded 8 Standard, please 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*. Double-click the “Setup.exe” from this directory.



Step 2 Click “Next” to continue



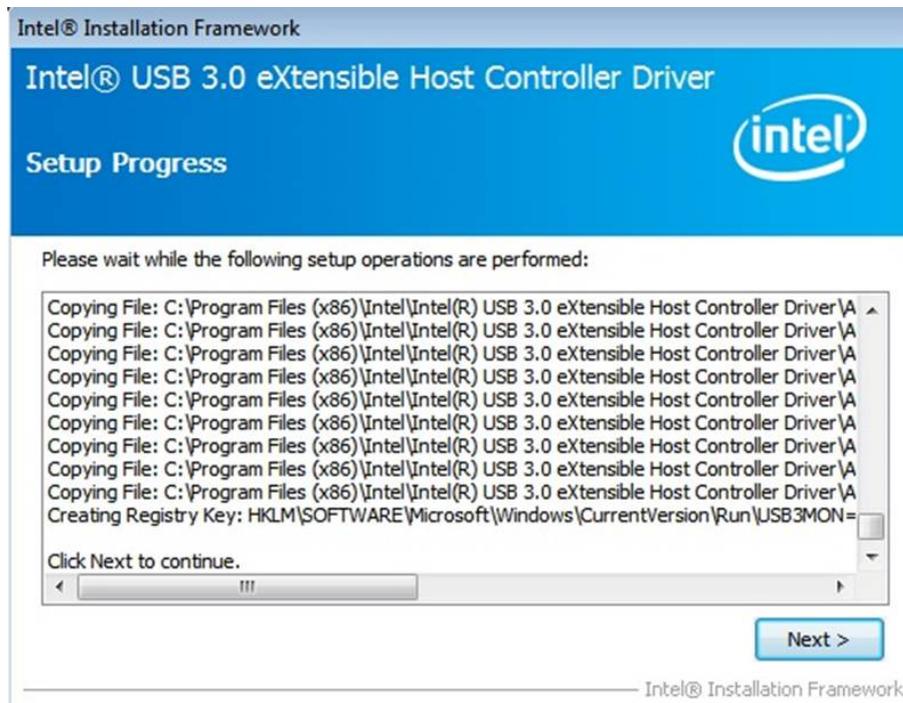
Step 3 Read the License Agreement and click “Yes” to proceed.

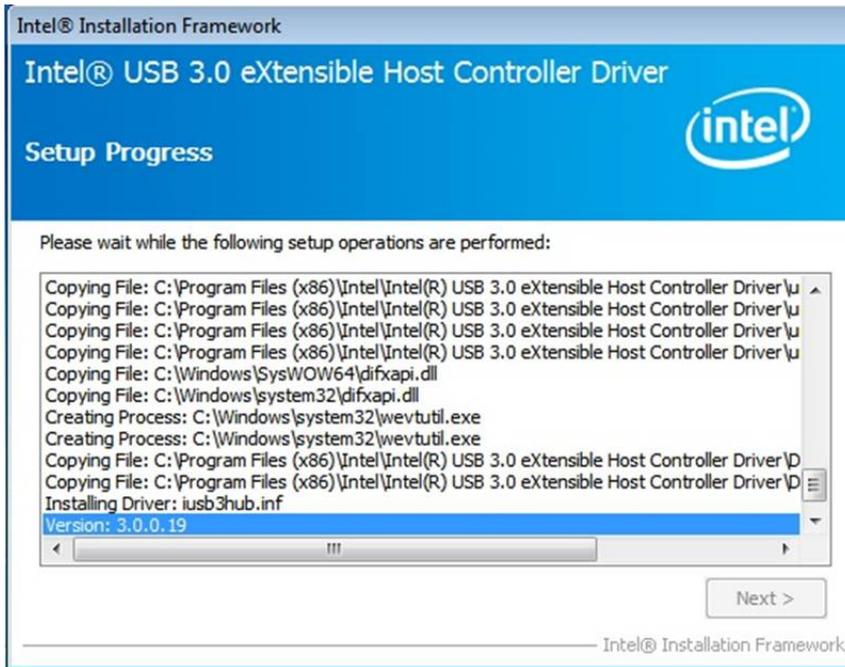


Step5 Review Readme File Information and click “Next” to proceed.



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 and then restart your computer.



AMI UEFI BIOS Setup

BIOS Setup Utility is a program for configuration basic Input/ Output system settings of the computer for optimum use. This chapter provides information on how to use BIOS setup, its functions and menu.

4

4AMI UEFI BIOS Setup

BIOS Setup Utility is a program for configuration basic Input / Output system settings of the computer for optimum use. This chapter provides information on how to use BIOS setup, its functions and menu.

4.1 When and How to Use BIOS Setup

To enter the BIOS setup, you need to connect an external USB keyboard, press key when the prompt appears on the screen during start up. The prompt screen shows only few seconds,you need to press key quickly. If the message disappears before your respond, restart the system by turning it OFF and ON, and enter the BIOS again.



IMPORTANT:

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

Run BIOS setup utility for:

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

4.2 BIOS Functions

BIOS Navigation Keys

BIOS navigation keys for keyboard control are listed below.

The following keys are enabled during Power-On Self-Test (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 resumethe POST.

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

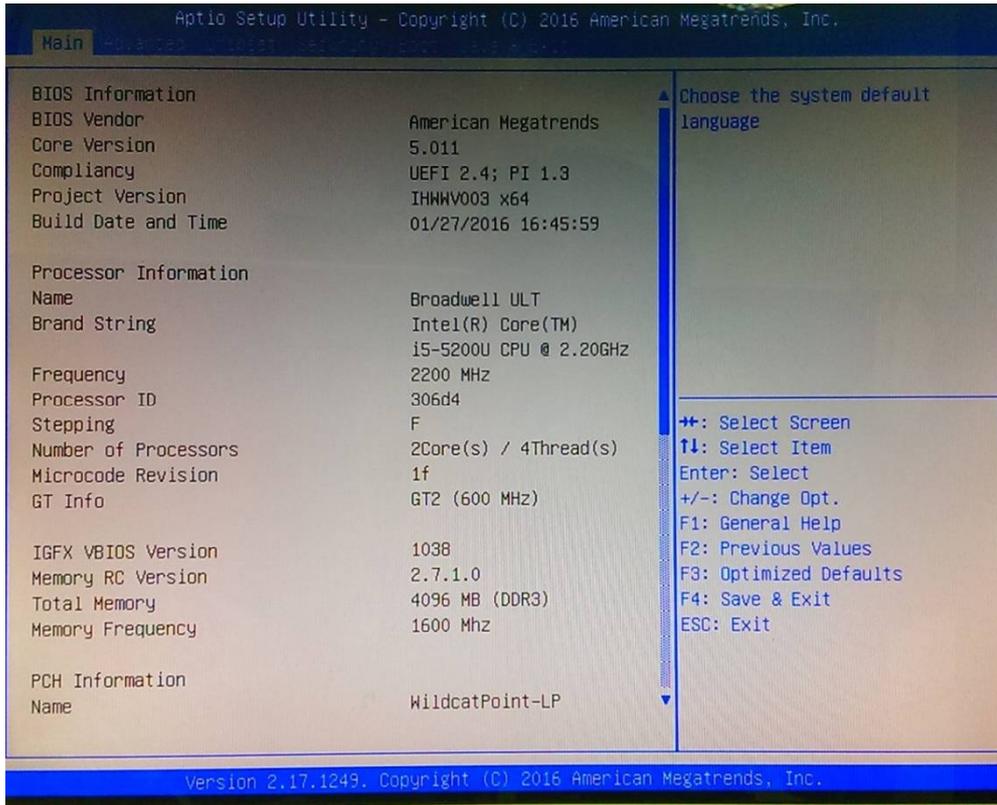
Key	Function
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit
Esc	Exit
+/-	Change Opt.
Enter	Select or execute command
Cursor ↑	Moves to the previous item
Cursor ↓	Goes to the next item
Cursor ←	Moves to the previous item
Cursor →	Goes to the next item

**NOTE:**

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

4.2.1 Main Menu

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. Immediately after the **[DEL]** key is pressed during startup, the main BIOS setup menu appears.



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

4.2.2 Advanced Menu

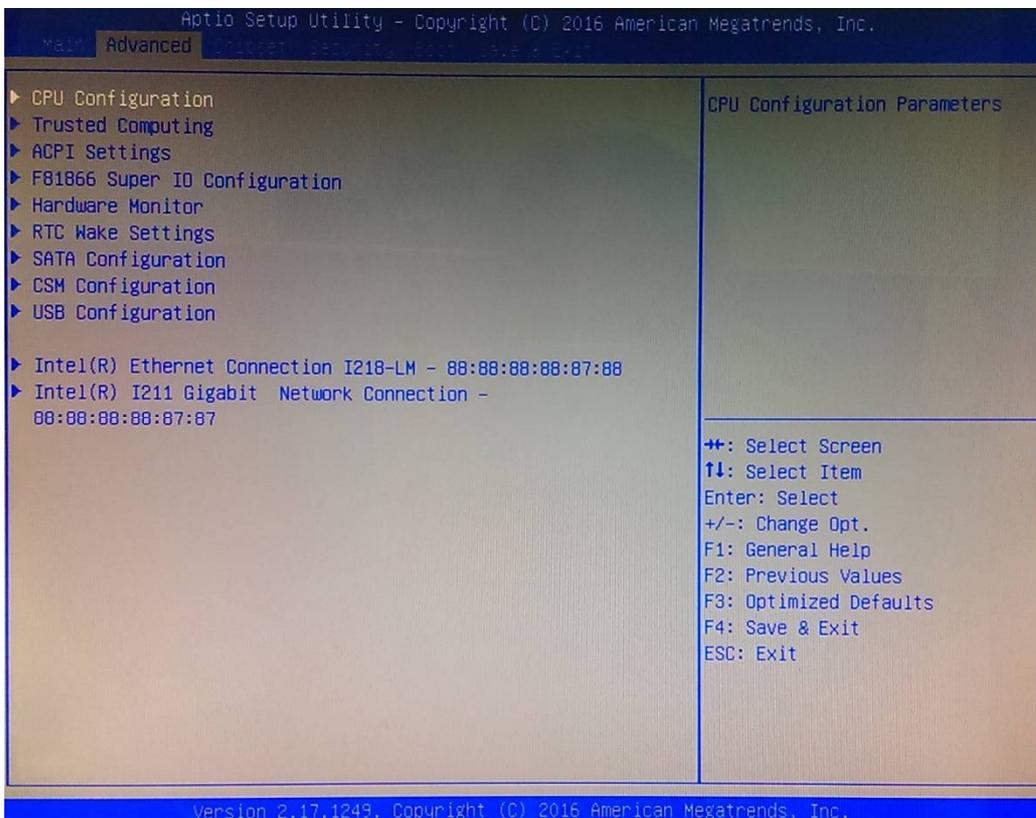
The advanced menu also uses to set configuration of the CPU and other system devices. There are sub menus on the left frame of the screen.

**IMPORTANT:**

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

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

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.

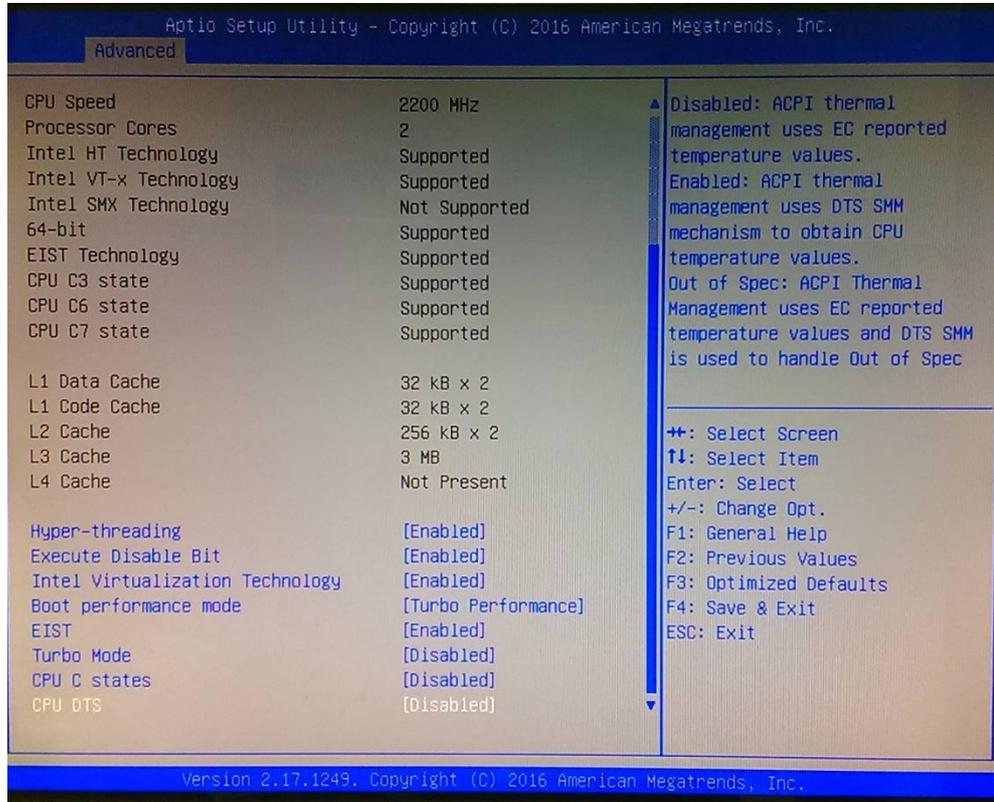


BIOS Setting	Description	Setting Option	Effect
CPU Configuration	Configures CPU settings	Enter	Opens submenu
Trusted Computing	Configures Trusted Computing settings	Enter	Opens submenu
ACPI Settings	Configures ACPI Settings	Enter	Opens submenu
F81866 Super IO Configuration	Configures F81866 Super IO settings	Enter	Opens submenu
Hardware Monitor	Configures Hardware Monitor settings	Enter	Opens submenu
RTC Wake Settings	Configures RTC Wake parameters	Enter	Opens submenu
SATA Configuration	Configures SATA parameters	Enter	Opens submenu
CSM Configuration	Configures CSM parameters	Enter	Opens submenu
USB Configuration	Configures USB Settings	Enter	Opens submenu

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

4.2.2.1 CPU Configuration

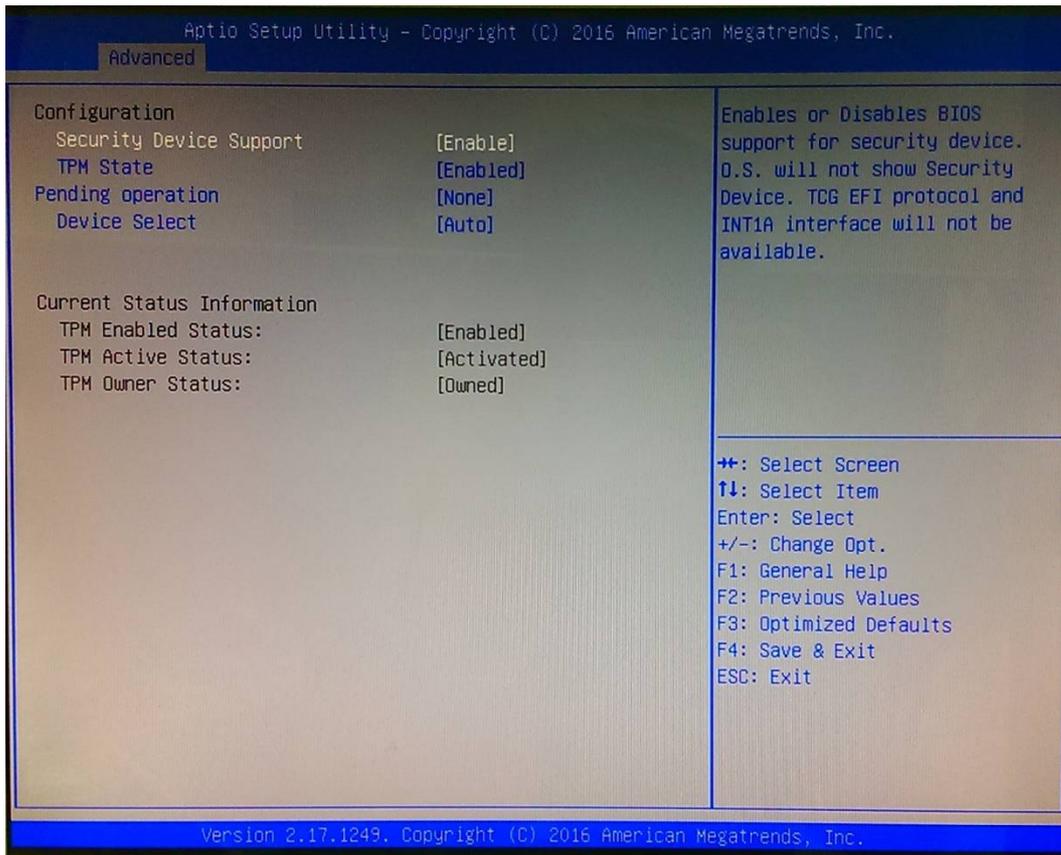
CPU Configuration allows you to change CPU settings. Use key arrows to navigate through the menu.



BIOS Setting	Description	Setting Option	Effect
Hyper-threading	Hyper-threading is a function in processors that speeds up computer performance.	Enable/ Disable	Enables or Disables this function
Execute Disabled 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	Enable	Reduces a computer system's, or a server's, vulnerability to viruses and malicious code attacks
		Disable	Increases the risk to be infected by viruses

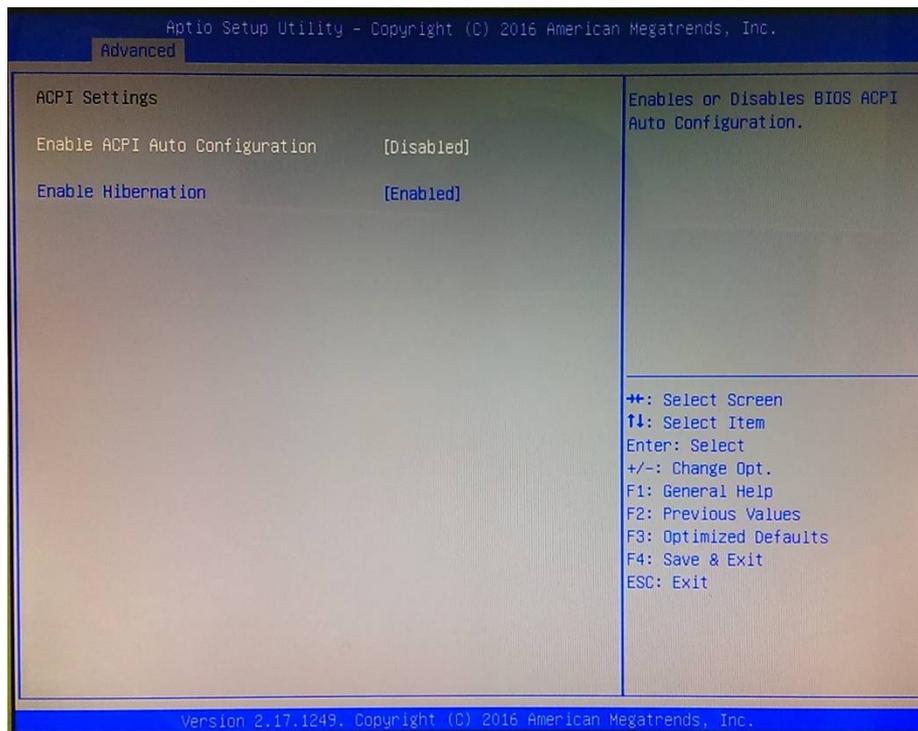
	of data.		
Intel Virtualization Technology	Enables a CPU to act as if you have several independent computers, in order to enable several operating systems to run at the same time on the same machine.	Enable/ Disable	Enable or disable this function
Boot Performance Mode	This feature selects the performance 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
CPU C states	Configure CPU C states parameters	Enabled/ Disabled	Enable or disable this function
CPU DTS	Digital Thermal Sensors (DTS) parameters.	Enabled/ Disabled	Enable or disable this function

4.2.2.2 Trusted Computing



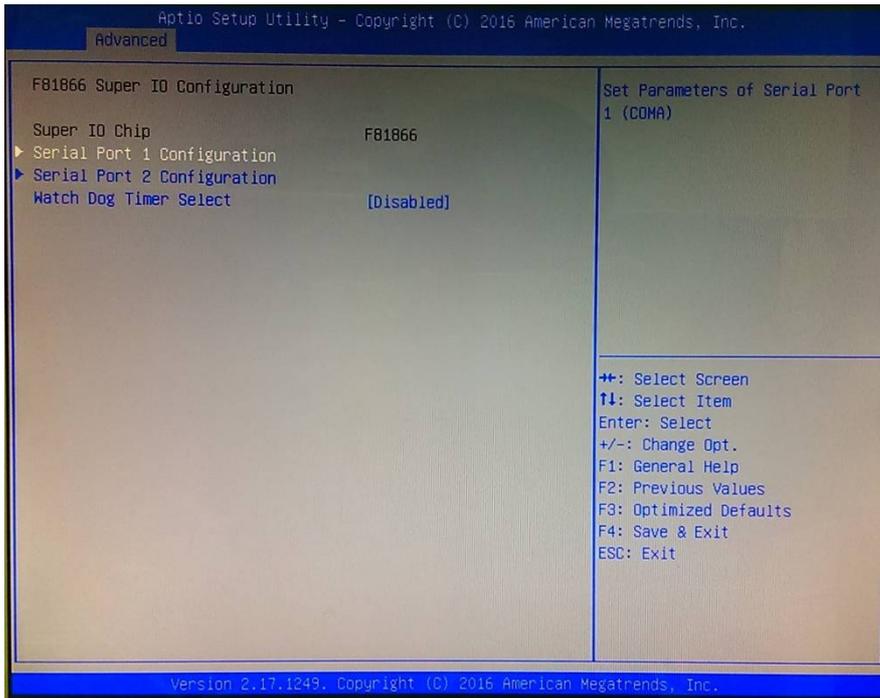
BIOS Setting	Description	Setting Option	Effect
Security Device Support	Enable or disable BIOS support for security device.	Enabled/ Disabled	Enable or disable this function.
TPM State	Trusted Platform Module (TPM) parameters.	Enabled/ Disabled	Enable or disable this function.
Pending operation	Pending operation parameters	None	Shows the number of pending operations
Device Select	Selects the device	Auto	

4.2.2.3 ACPI Settings



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

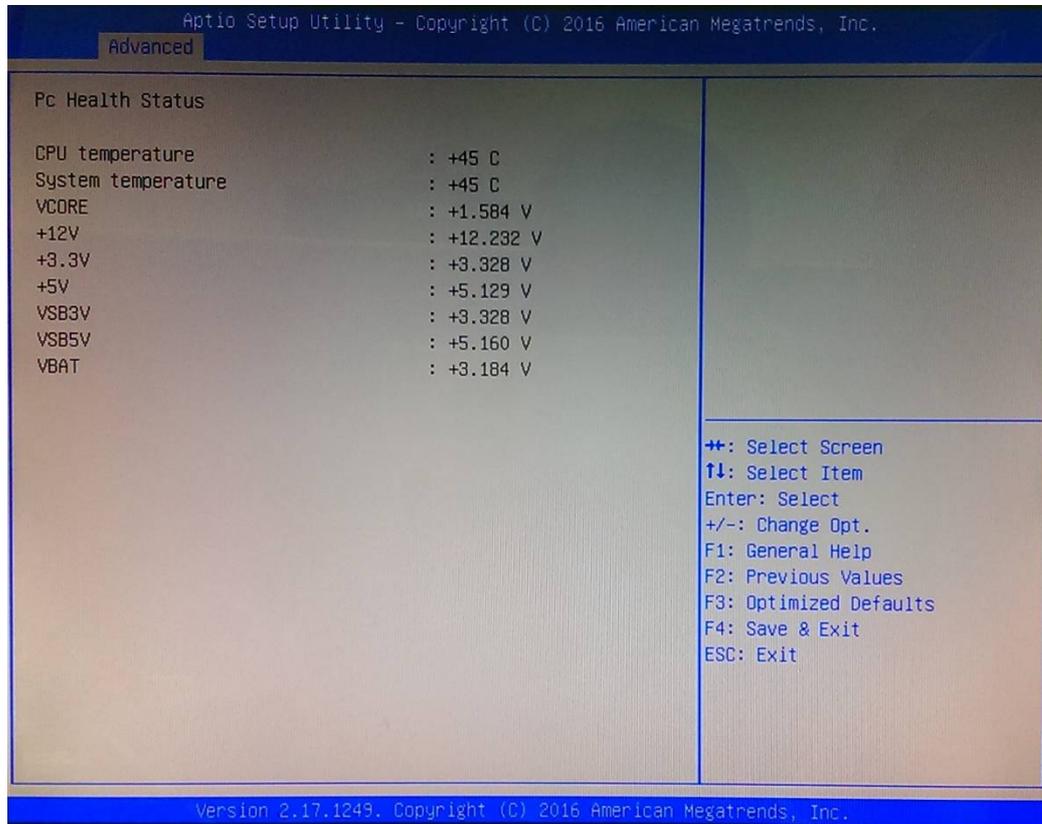
4.2.2.4 F81866 Super IO Configuration



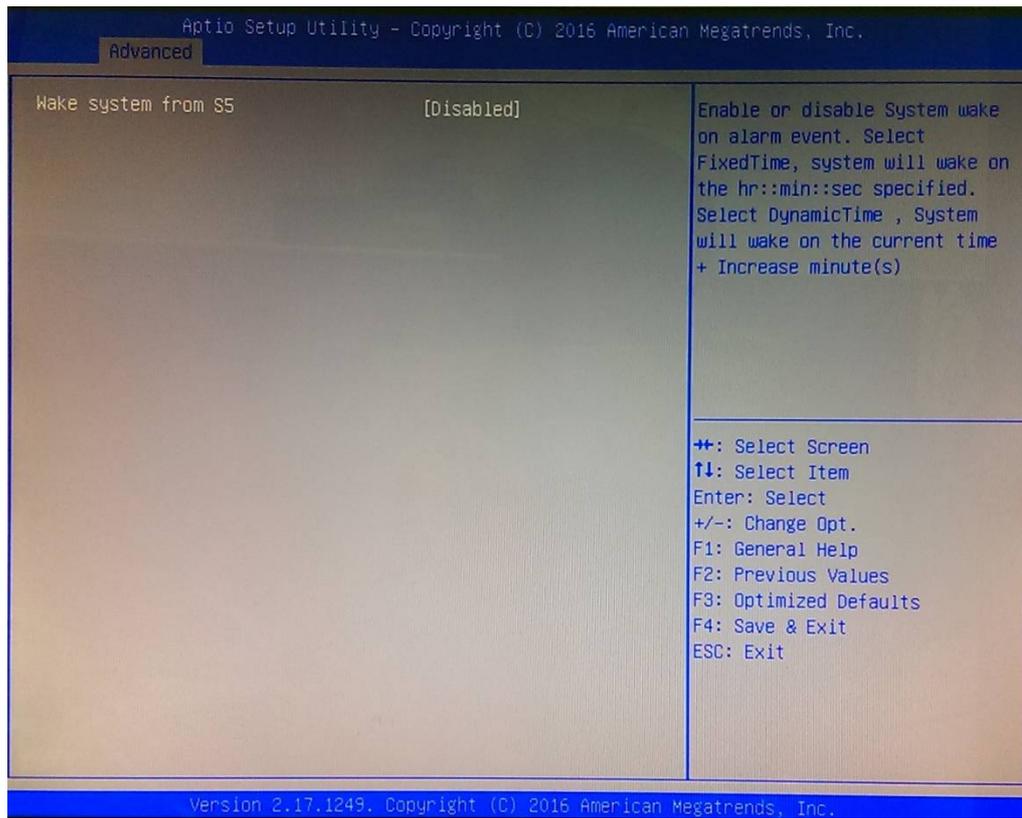
BIOS Setting	Description	Setting Option	Effect
Serial Port 1,2 Configuration	Set Parameters of Serial Ports. User can Enable/Disable the serial port and select optimal settingsfor the super IO Device.	Enabled/ Disabled Default: Enable	Enable or disable Serial Port (COM)
Watch Dog Timer Select	This watchdog 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

4.2.2.5 Hardware Monitor

You can check PC Health Status parameters such as system temperature, fan speed etc.

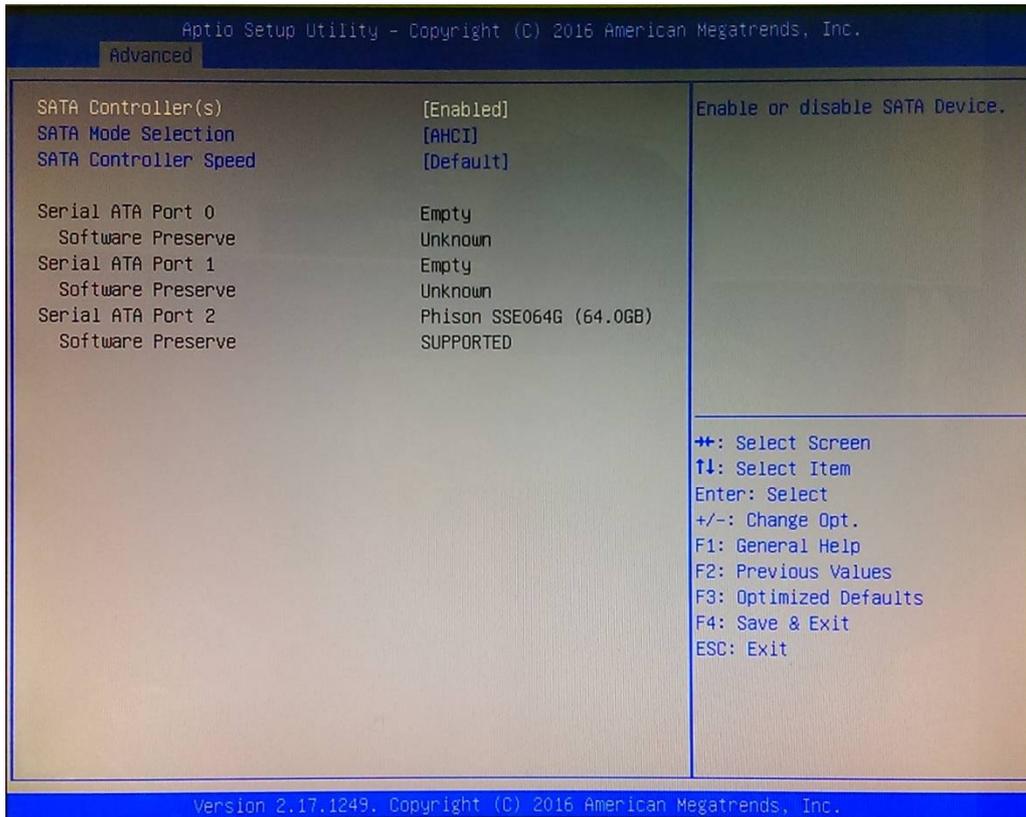


4.2.2.6 RTC Wake Settings



BIOS Setting	Description	Setting Option	Effect
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.

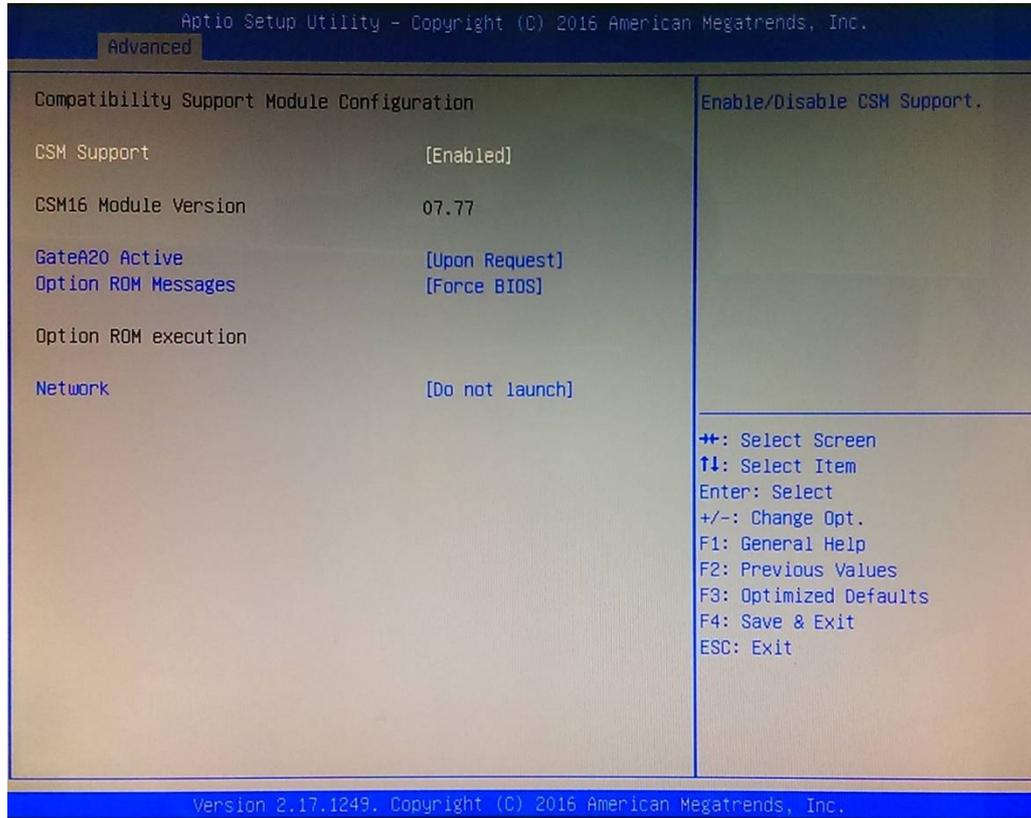
4.2.2.7 SATA Configuration



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 0/1/2	Allows users to enable or disable the SATA Port.	Enabled/ Disabled	Enable or disable this function

4.2.2.8 CSM Configuration

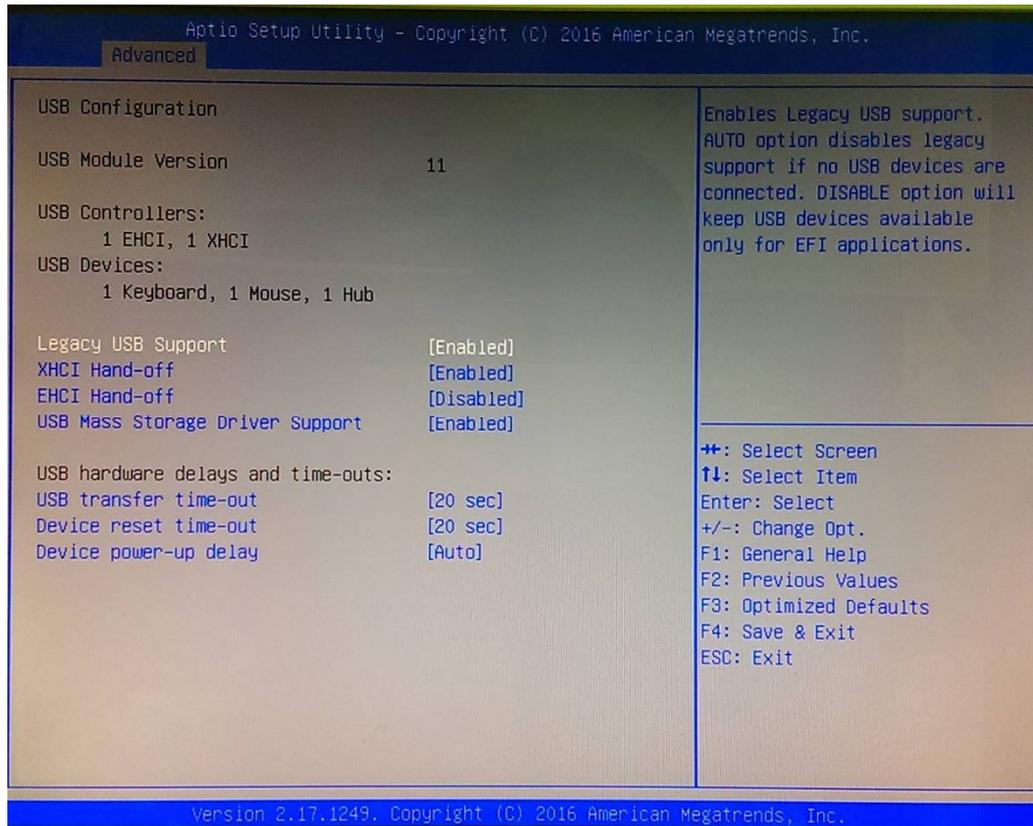
Compatibility Support Module Configuration.



BIOS Setting	Description	Setting Option	Effect
CSM Support	The Compatibility Support Module (CSM) is a component of the UEFI firmware that provides legacy BIOS compatibility by emulating a BIOS environment, allowing legacy operating systems and some option ROMs that do not support UEFI to still be used.	Enabled/ Disabled	Enable or disable the Compatibility Support Module
GetaA20 Active	Activate GetaA20	Upon Request	Enable or disable this function
Option ROM Messages	Receiving ROM Messages Settings	Force BIOS	Set ROM messages parameters
Network	Specifies which Network option	UEFI	Only UEFI

	ROM is booted		option ROMs are booted
		Legacy	Only Legacy option ROMs are booted

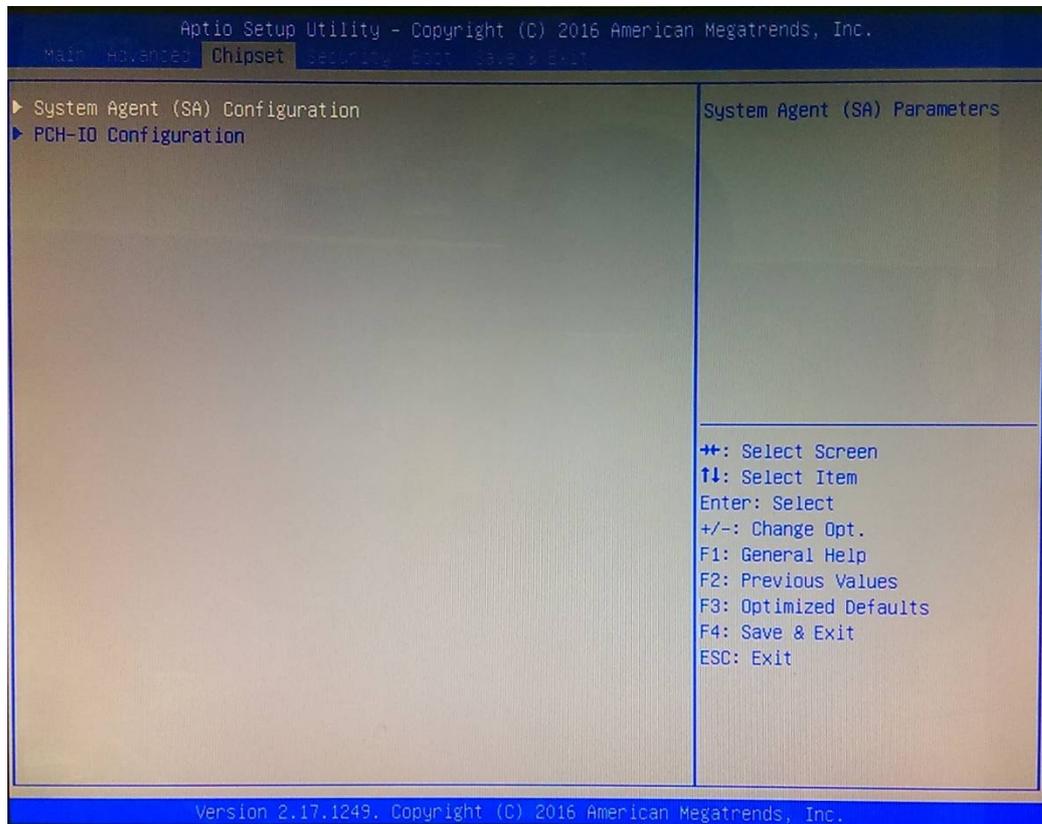
4.2.2.9 USB Configuration



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

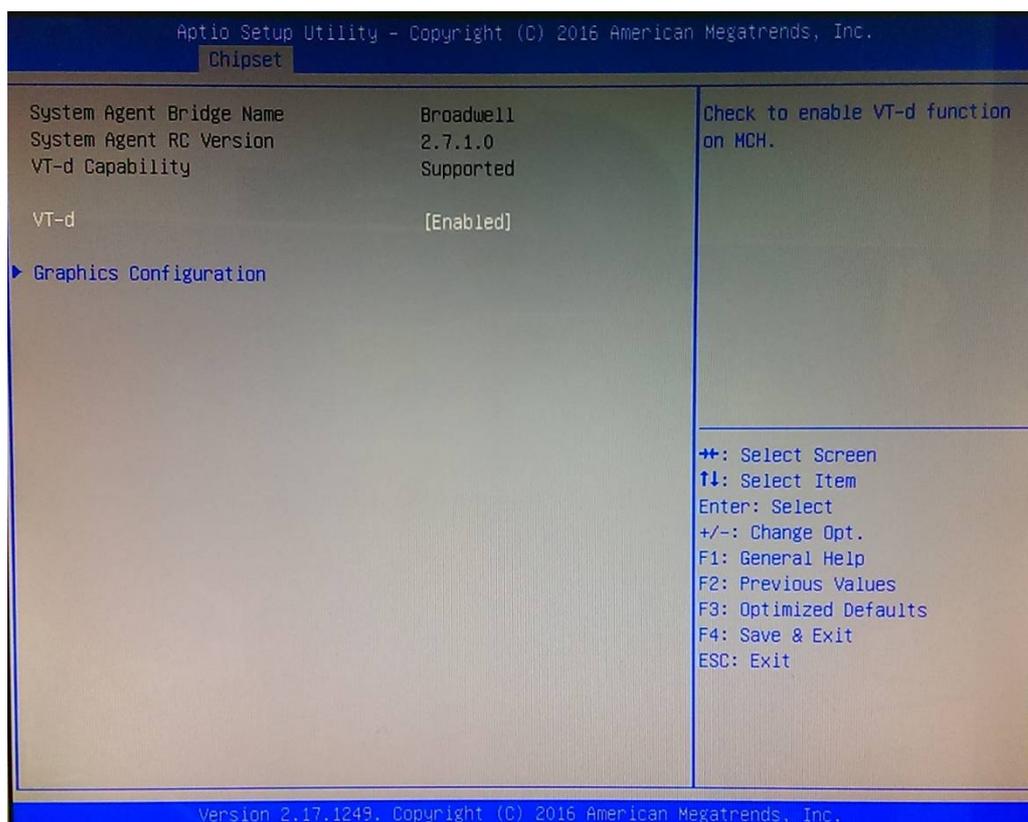
XHCI Hand-off	This is a workaround for OSs without XHCI hand-off support. The XHCI ownership Change should claim by XHCI driver.	Disable	Disables this function
		Enable	Enables this function
EHCI Hand-off	This is a workaround for OSs without ECHI hand-off support. The EHCI ownership change should be 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

4.2.3 Chipset Menu



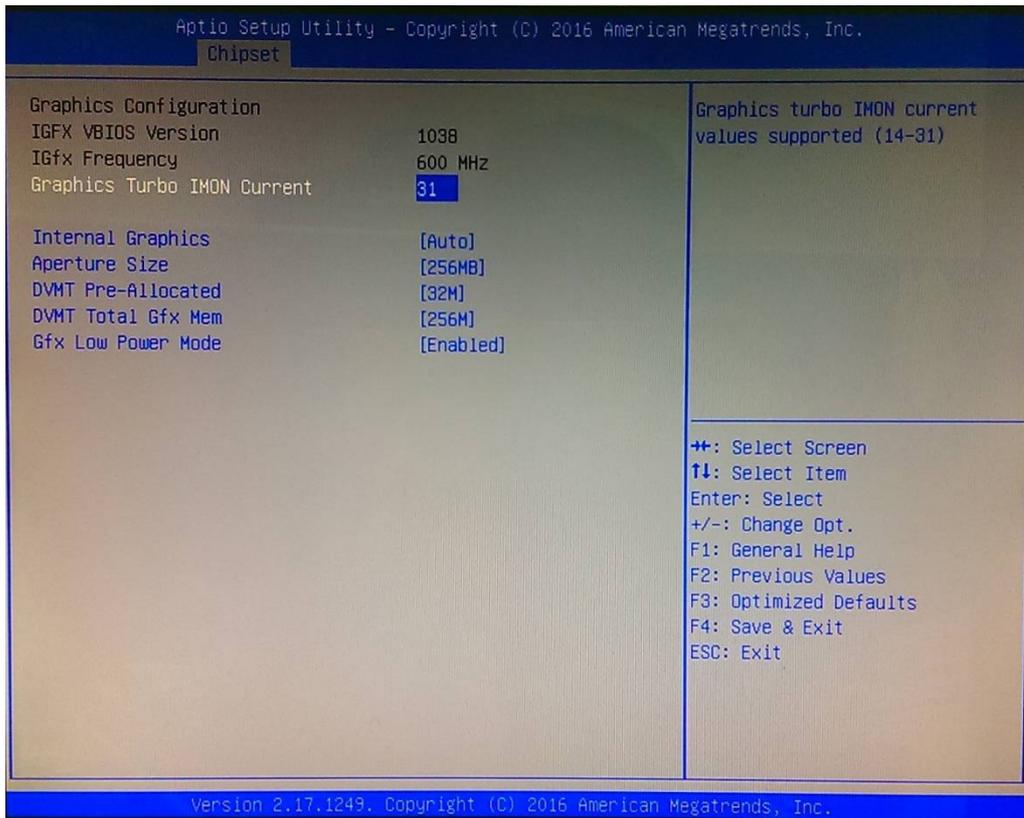
BIOS Setting	Description	Setting Option	Effect
System Agent (SA) Configuration	System Agent (SA) Parameters	Enter	Opens submenu
PCH-IO Configuration	PCH Parameters	Enter	Opens submenu

4.2.3.1 System Agent (SA) Configuration



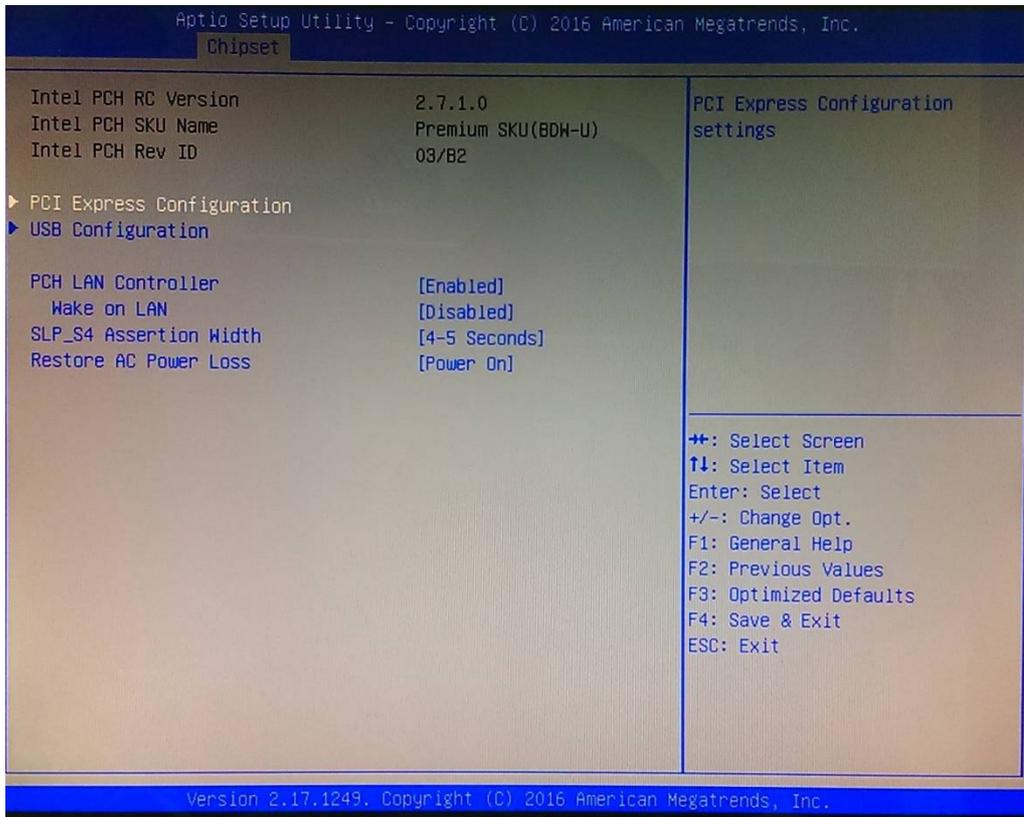
BIOS Setting	Description	Setting Option	Effect
VT-d	VT-d can help end users improve security and reliability of the systems and also improve performance of I/O devices in virtualized environment.	Enable/Disable	Enables or disables this function
Graphics Configuration	Configures Graphics parameters	Enter	Opens submenu

4.2.3.1.1 Graphics Configuration



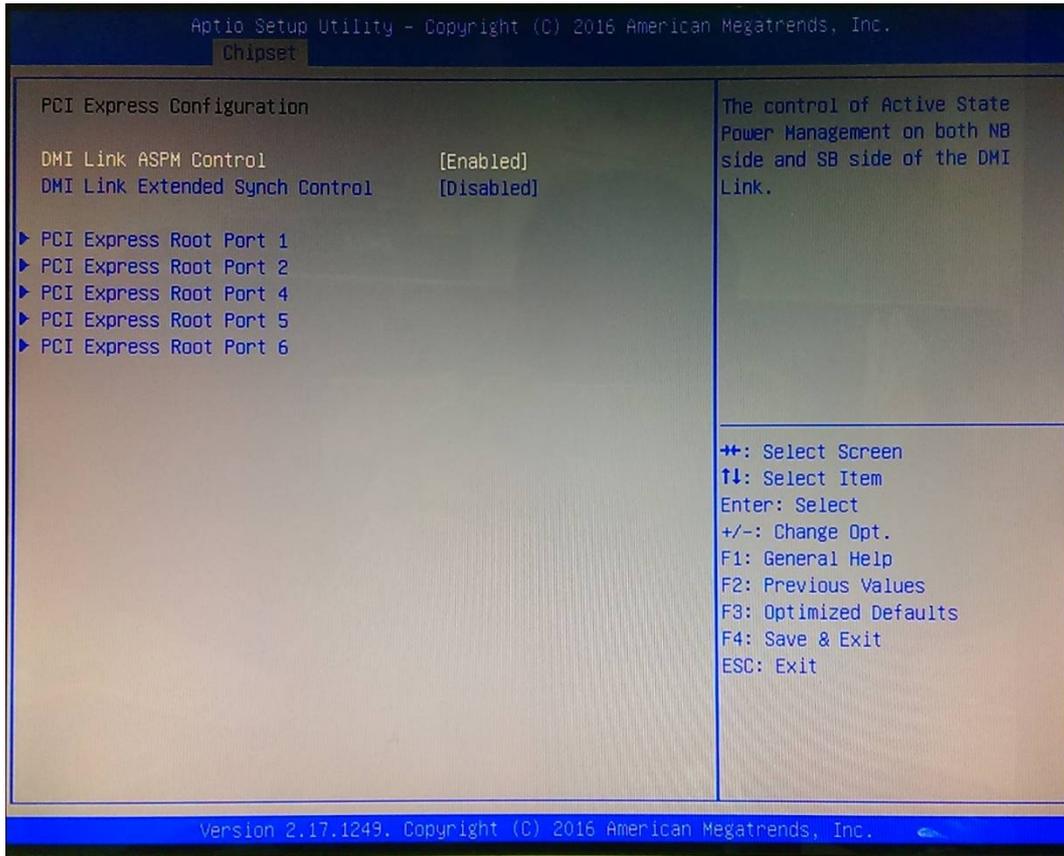
BIOS Setting	Description	Setting Option	Effect
Graphics Turbo IMON Current	Graphics turbo IMON current values supported 14~31	14~31	Set up the value of Graphics turbo IMON current
Internal Graphics	Configures Internal Graphics parameters	Auto	Set up internal graphics parameters
Aperture Size	Configures aperture size settings	256MB	Set up aperture size parameters
DVMT Pre-Allocation	Configures DVMT Pre-Allocation parameters	32M	Set up DVMT Pre-Allocation parameters
DVMT Total GfxMem	Configures DVMT Total GfxMem parameters	256M	Set up DVMT Total GfxMem parameters
Gfx Low Power Mode	Configures Gfx Low Power Mode settings	Enable/Disable	Enables or disables this function

4.2.3.2 PCI Configuration



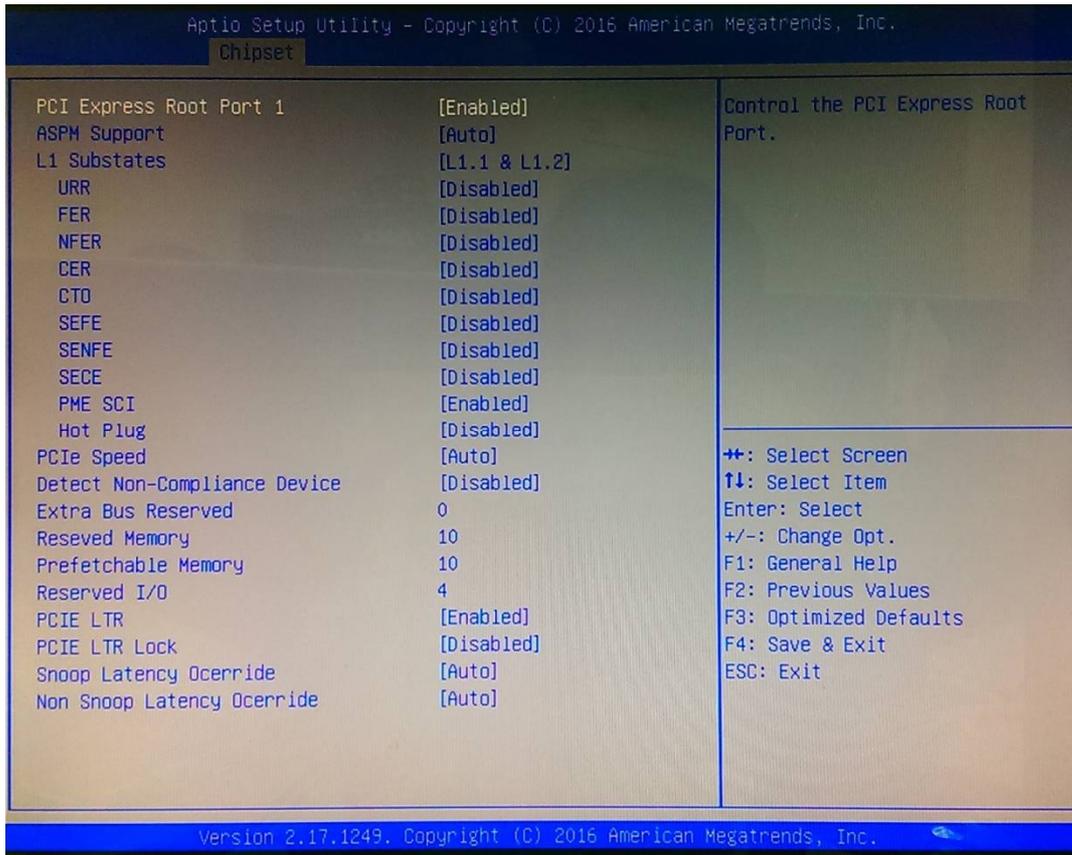
BIOS Setting	Description	Setting Option	Effect
PCI Express Configuration	Configures PCI Express parameters	Enter	Opens submenu
USB Configuration	Configures USB parameters	Enter	Opens submenu
PCH LAN Controller	Configures PCH LAN Controller parameters	Enable/Disable	Enables or disables this function
Wake on LAN	Set up wake on LAN function	Enable/Disable	Enables or disables this function
SLP_A4 Assertion Width	Configures SLP_A4 Assertion Width parameters	4-5 seconds	Set up SLP_A4 Assertion Width parameters
Restore AC Power Loss	Enabling this will allow the computer to power up once house hold power is established.	Power On	Set Restore AC Power Loss parameters

4.2.3.2.1 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 Link.	Enable/Disable	Enables or disables this function
DMI Link Extended Synch Control	The control of DMI Link Extended Synch parameters	Enable/Disable	Enables or disables this function
PCI Express Root Port 1~6	PCI Express Root Port 1~6 parameters	Enter	Opens sub-menu (see next section)

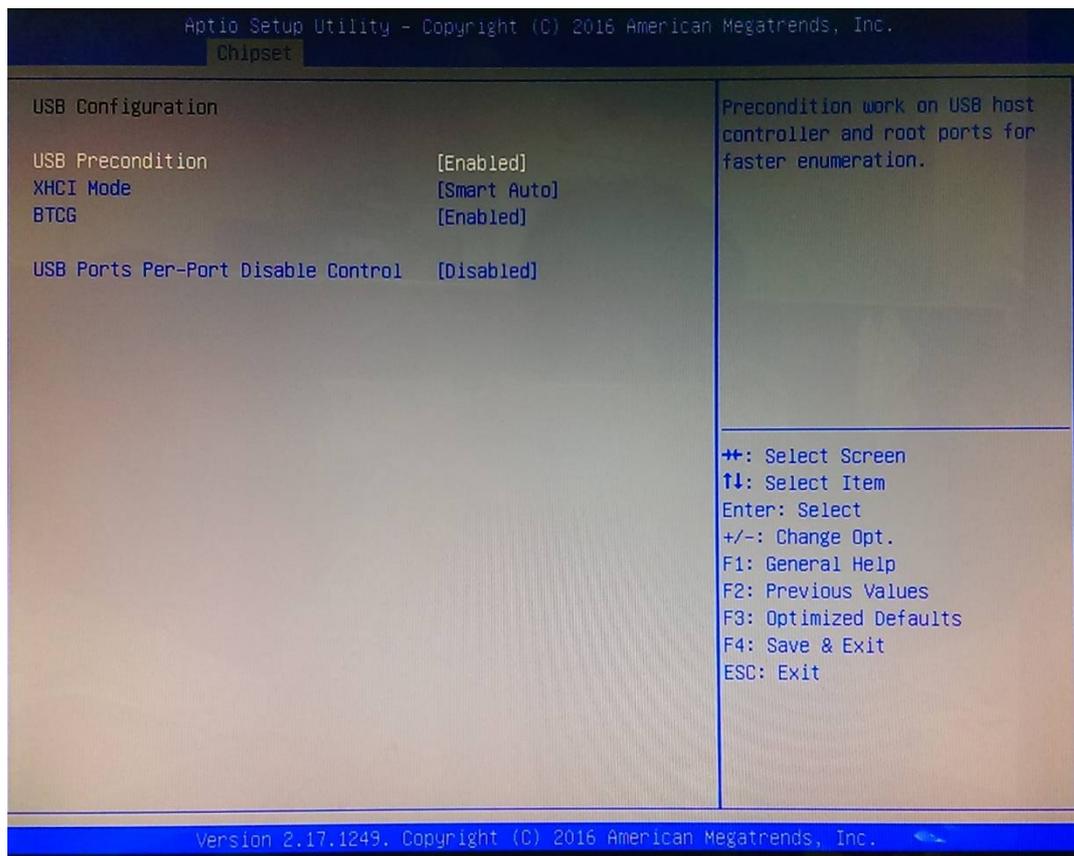
PCI Express Root



BIOS Setting	Description	Setting Option	Effect
PCI Express Root Port 1	The control of PCI Express Root Port	Enable/Disable	Enables or disables this function
ASPM Support	Configures ASPM Support parameters	Enable/Disable	Enables or disables this function
L1 Substates	Configures L1 Substates parameters	L1.1 & L1.2	Setting up L1 Substates parameters
PCI Speed	Configures PCI Speed parameters	Auto	Setting up PCI Speed
Detect Non-Compliance Device	Detect the device that is not compliant to the system settings	Enable/Disable	Enables or disables this function
Extra Bus Reserved	Configures Extra Bus Reserved parameters	Set the value	Setting up the value

Reserved Memory	Configures Reserved Memory parameters	Set the value	Setting up the value
Prefetchable Memory	Configures Prefetchable Memory parameters	Set the value	Setting up the value
Reserved IO	Configures Reserved IO parameters	Set the value	Setting up the value
PCI LTR	Configures PCI LTR parameters	Enable/Disable	Enables or disables this function
PCI LTR Lock	Configures PCI LTR Lock parameters	Enable/Disable	Enables or disables this function
Snoop Latency Override	Configures Snoop Latency Override parameters	Auto	Enables or disables this function
Non-Snoop Latency Override	Configures Non-Snoop Latency Override parameters	Auto	Enables or disables this function

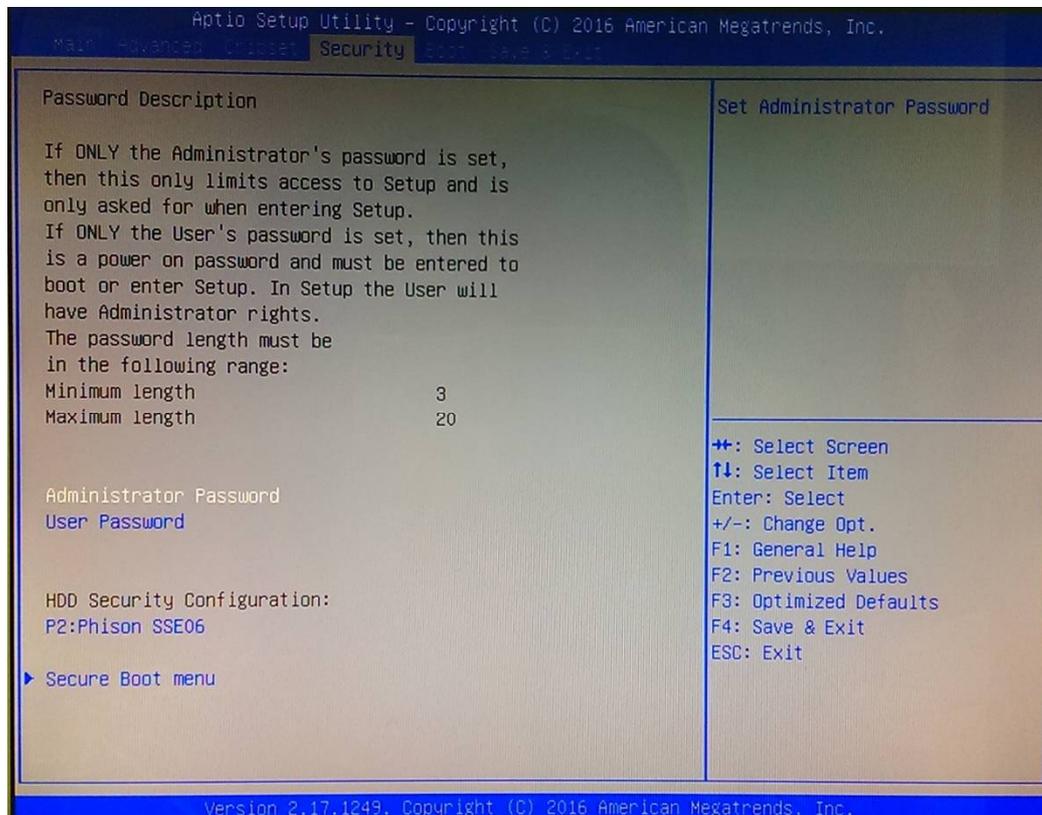
USB Configuration



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

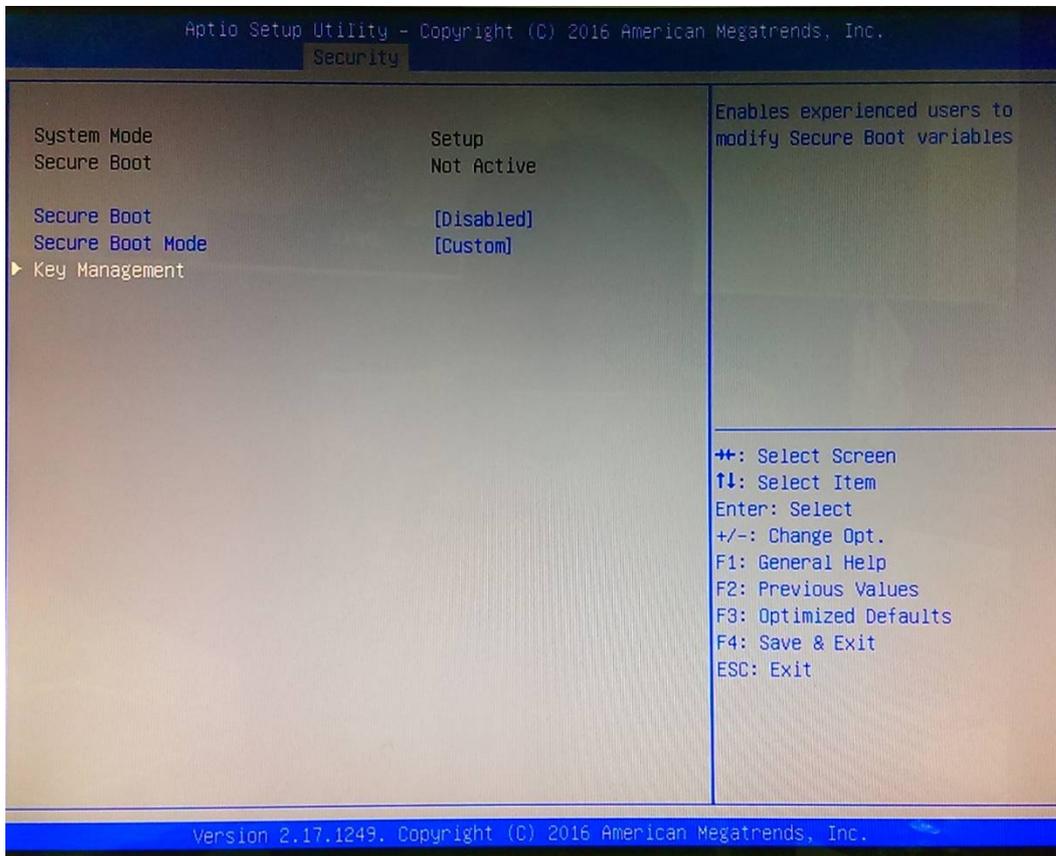
4.2.4 Security Menu

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.	Enter	Opens sub-menu

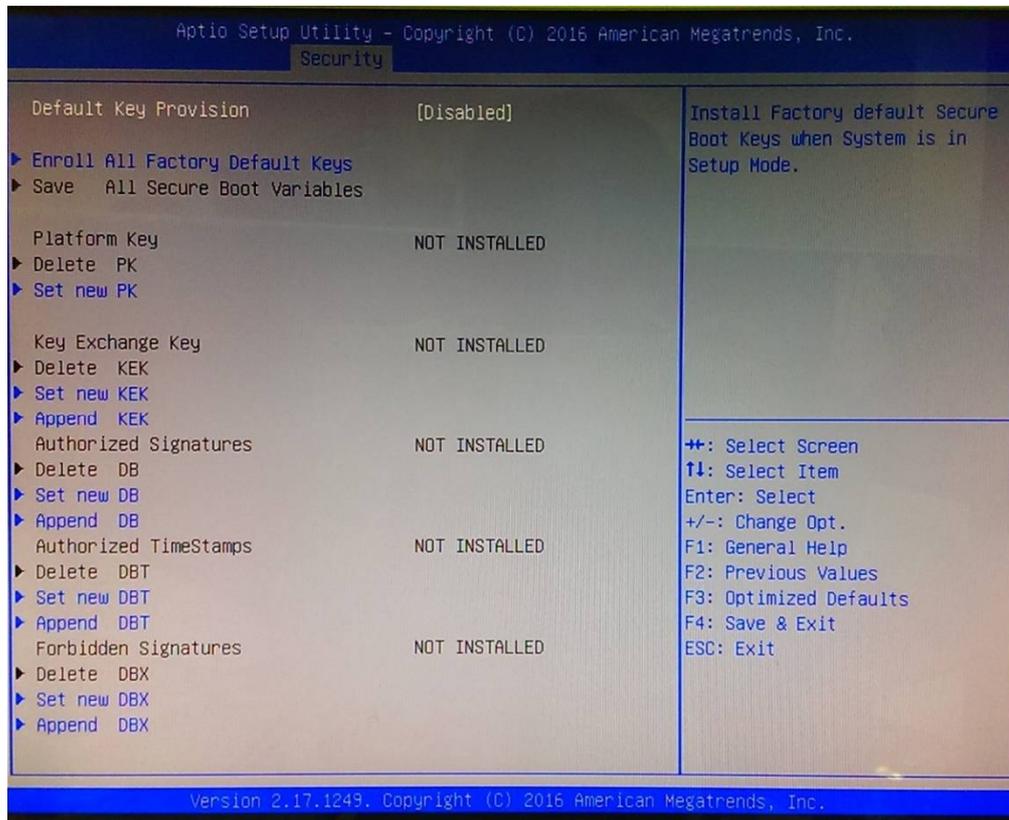
4.2.4.1 Security Boot Menu



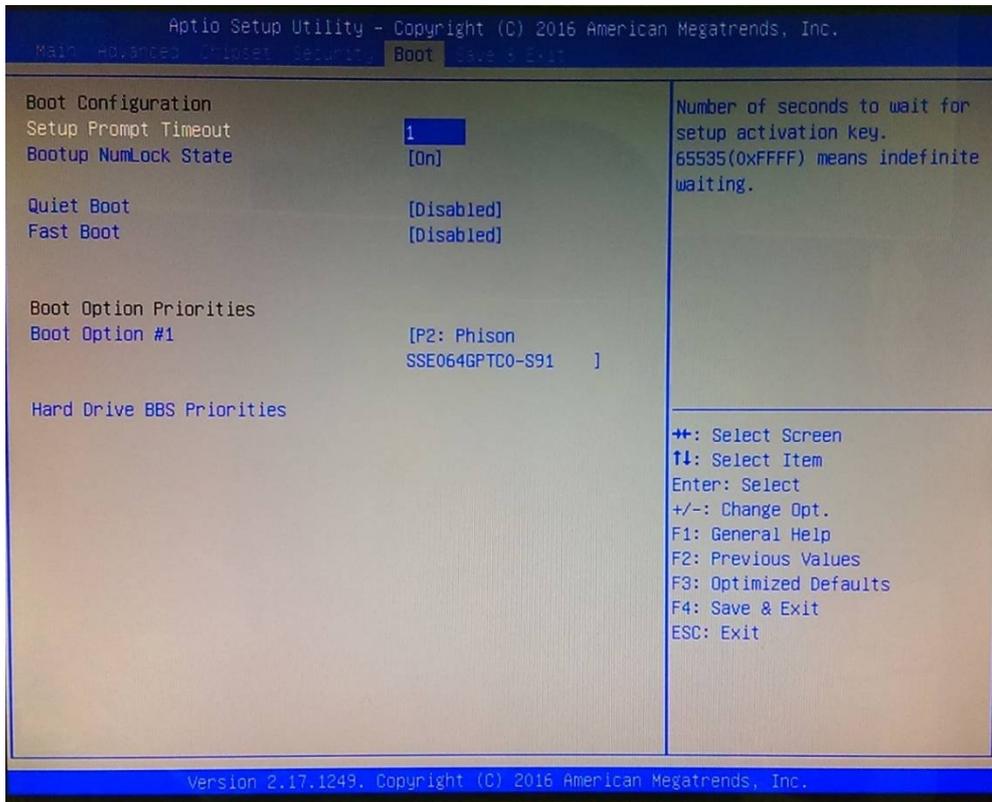
BIOS Setting	Description	Setting Option	Effect
Secure Boot	Secure Boot is a feature designed to prevent malicious software and unauthorized media from loading during the boot process.	Enable/Disable	Enables or disables this function

Secure Boot Management	Manage Secure Boot settings	Custom	Configure Secure Boot parameters
Key Management	Setting Key Management parameters	Enter	Opens sub-menu

4.2.4.1.1 Key Management

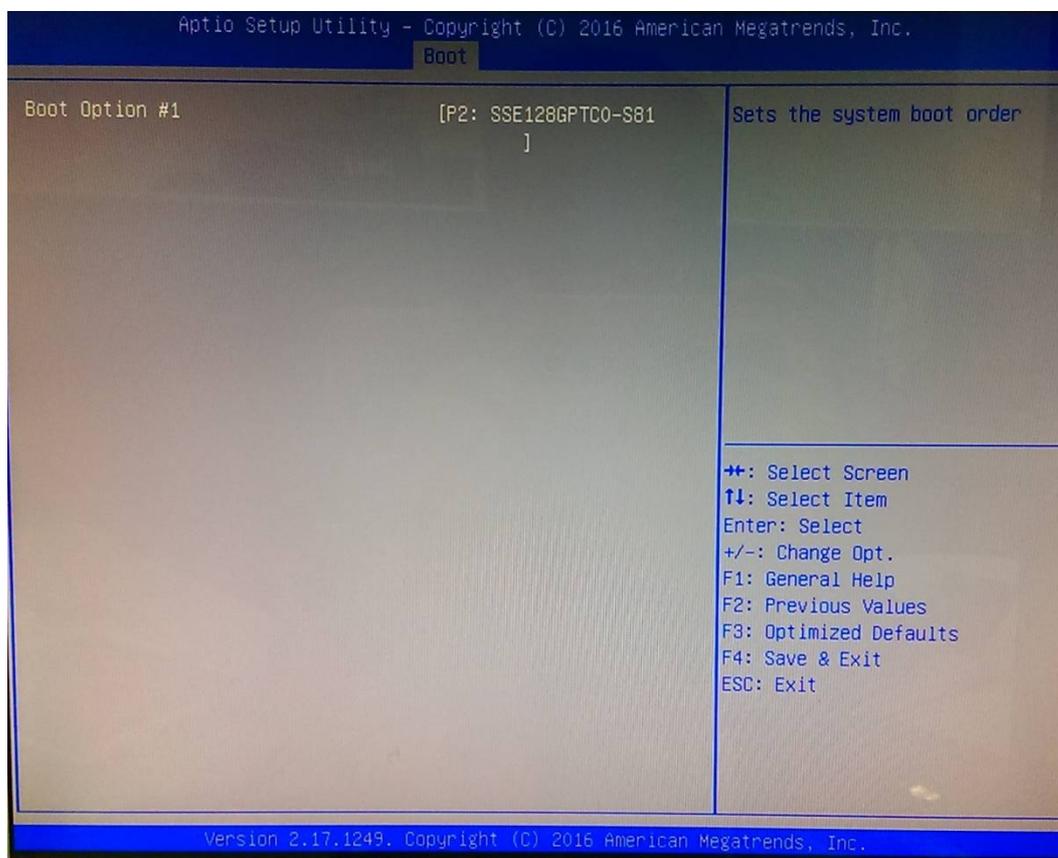


4.2.5 Boot Menu

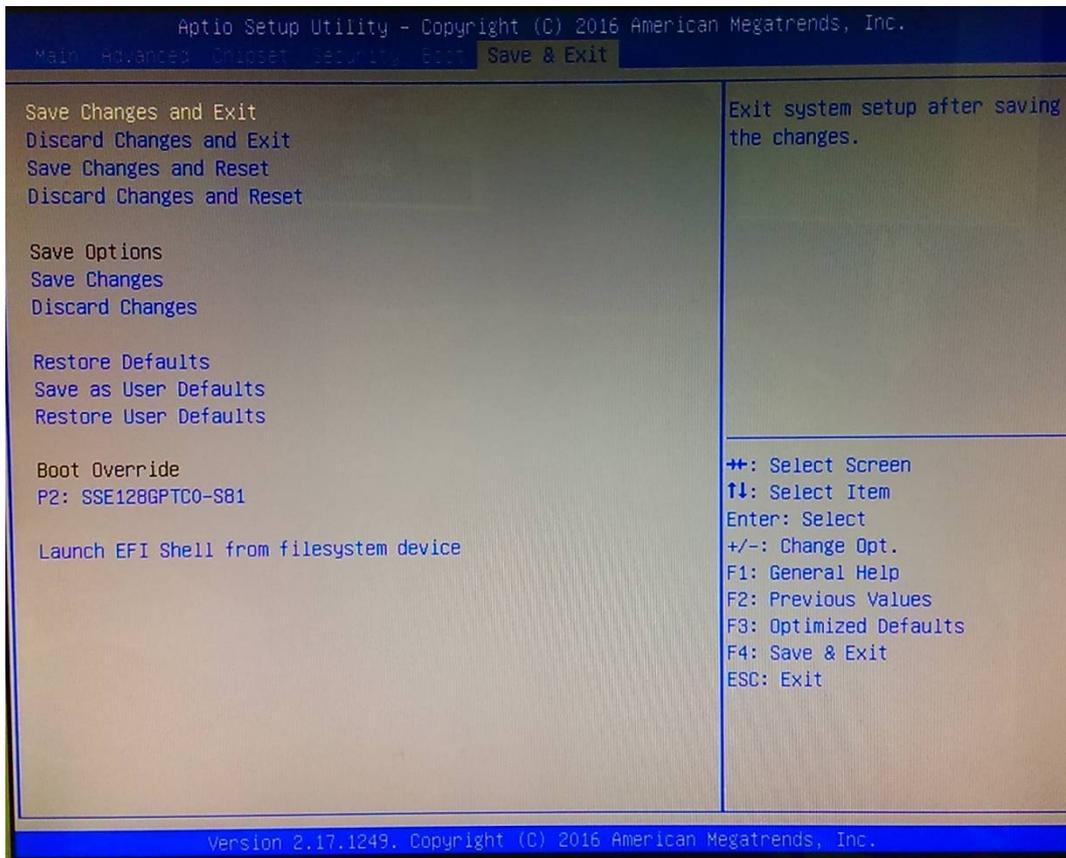


BIOS Setting	Description	Setting Option	Effect
Setup Prompt Timeout	Allows user to configure the number of seconds to stay in BIOS setup prompt screen.	Enter	Set the prompt timeout
Boot NumLock State	Enables or disables NumLock feature on the numeric keypad of the keyboard after the POST (Default: On).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

	process. (Default: Disabled).	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
Hard Drive BBS Priorities	Specifies the boot order for Hard Drive BBS parameters	Enter	Enter the submenu



4.2.6 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 and Reset	Reset system setup without saving any changes	<YES>	Saves the 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

4.3 Using Recovery Wizard to Restore Computer

**Note:**

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

To enable quick one-key recovery procedure:

- Plug-in the AC adapter to the 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 **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.

