User Manual Ver1.0

eBOX-3000

Embedded Fanless BOX PC

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Manual conventions

WARNING:

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

CAUTION:

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

NOTE:

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

Declaration of Conformity

This restriction is subject to provide protection for system operation in business environment, which will produce, use and transmit radio frequency energy. Without notice of the instructions of the correct installation and use, it may cause harmful interference to radio communication. The interference prevention cannot be guaranteed even with proper installation according to the manual. If the device gets bad affect on the signal of radio / TV. User could insure by turn device on/off.

When this device produces some harmful interference, user can use the following measure to solve interference problem:

- Set the receiving antenna's direction or location.
- Increase the distance between this device and receiver.
- Plug in this device's power connector into different circuits of the power outlet with receiver

If you need technical support, please inform the dealer or experienced radio/TV technical personnel.

NOTE:

If user changes the setting unauthorized or repairs the device without any approval of the relevant authority, then user's rights of controlling this device will be canceled.

Technical Support and Service

Please visit the Nodka website http://en.nodka.com to get more details.

If you need additional assistance, please contact your system reseller or vendor. Please have the following information ready before you call:

1. Product name and serial number
2. The product specification
3. Description of your software (operational system, vision, application software, etc.)
4. A complete description of the problem
5. The exact wording of any error messages

Ordering Information

Product code	Description
EBOX-3000	No CPU/No memory/No hard disk/6*RS232(2*RS232/485Optional)/ 2 Gigabit Ethernet ports/8*USB2.0（4 of them support USB3.0）/DVI/VGA//HDMI/PS2/Audio card/DC12~24V input /Two-year warranty
EBOX-3000-E	No CPU/No memory/No hard disk/6*RS232(2*RS232/485Optional)/ 2 Gigabit Ethernet ports/8*USB2.0（4 of them support USB3.0）/DVI/VGA//HDMI/PS2/ Audio card /extend PCIe x16 /DC12~24V input / Two-year warranty
EBOX-3000-P	No CPU/No memory/No hard disk/6*RS232(2*RS232/485Optional)/ 2 Gigabit Ethernet ports/8*USB2.0（4 of them support USB3.0）/DVI/VGA//HDMI/PS2/ Audio card /extend PCI/DC12~24V input/ Two-year warranty

Optional equipment:

Name	Description
M-10006-0028A	Adapter CAD120121 2 pin Phoenix terminal
M-11015-0010A	Chinese standard Power Line PSB-10+ST3
Hard disk	Support 2.5", MSATA
Memory	Support DDR4 2400, 2 x 260-pin, SO-DIMM Slot, Up to 32 GB Memory Size
CPU	Optional Intel® Core™ 6th / 7th generation i7 / i5 / i3 / Pentium / Celeron, LGA1151 Inter®Celeron™ Series: G3930/G3930 Inter®Pentium™ Series: G440/G4560/G4600 Inter®Core™ Series: I5-6500T/6500/7500/7500T, I7-6700/6700T/7700/7700T I3-6100/7100

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Chapter 1

Overview

1.1 Introductions

eBOX-3000 is a fanless mini eBOX-3000 is a fanles mini PC based on Intel® Core™ i3/i5/i7/Celeron high performance processor, impact and with large aluminum fin radiator, with no cable inside. The performance has increased 30% than the 6th/7th generation Intel® Core™ processor. It uses dual channel DDR4 SODIMM, up to 32GB. There are 2 Intel210AT Ethernet slots, and can be extended to 6 groups. The design of VGA, DVI and HDMI interface to support multi screen synchronous/asynchronous. 4USB2.0/3.0,4RS232 and 2RS232/485 are optional to support PCI/PCIe/Mini PCIe extender.

OS support: Windows7, Windows10 and Linux.

1.2 Key Features

- Based on Intel Core 6th/7th generation i7/i5/i3/ Pentium/Celeron
- Aluminum alloy box
- Support SATA 2.5 " SSD/ HDD/ mSATA
- 2x Intel i210 Gbe LAN controller
- 4x USB2.0/3.0,6 x RS-232 (COM5~COM6 Optional RS-485 by Jumper)
- 1x PCIe x16 slot or 1x 32bits PCI
- I/O: VGA/DVI/HDMI/2GLAN/8USB/4RS232/PCIe x16+1 PCI
- Support win7,Win7 Embedded,Win10,Linux

1.3 External Overview

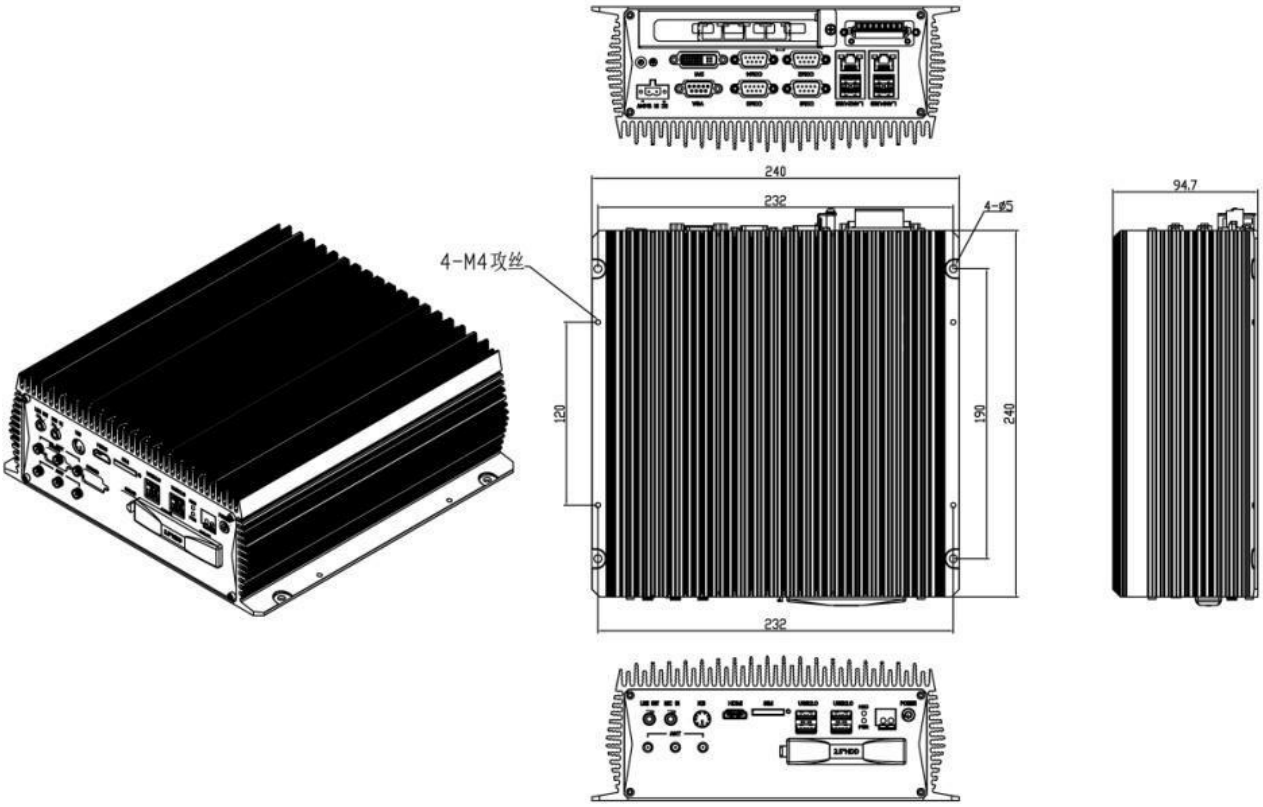
Figure 1-1 Front and rear overview of eBOX-3000

1.4 Specifications

SYSTEM	Ebox-3000	
Processor	CPU	Intel® Core™ 6th / 7th generation i7 / i5 / i3 / Pentium / Celeron
	Chipset	Intel H110 Express Chipset
	BIOS	AMI EFI 64Mbit
Memory	Architecture	DDR4-2400MHz
	Capacity	Up to 32GB
	DIMM	2 x 260-pin SODIMM
Display	VGA	Up to 1920 x 1200
	DVI	Support 1920 x 1200
	HDMI	1920 x1200
	Display	Yes, VGA + DVI+HDMI
LAN	LAN1	Intel i210 Gbe LAN controller
	LAN2	Intel i210 Gbe LAN controller
Audio	Port	Realtek ACL662 Audio controller, Line-out, Mic-in.
	Amplifier	N/A
I/O	COM	6 x RS-232 (COM5~COM6 Optional RS-485)
	LPT	N/A
	USB	4 x USB3.0/2.0/1.1, 4x USB2.0/1.1
Other	Digital IO	N/A
	WatchDog	0~255 seconds programmable
Expansion slot	MiniPCIe	2 * full size PCIe with SIM holder
	PCIe & PCI	1 x PCIe x16 slot or 1 x 32bits PCI
Storage	HDD	1 x 2.5" HDD Bay (Max rate SATA III 6.0 Gb/s)

Medium	SSD	1 * MSATA
OS	Microsoft Windows	Windows 7, Windows 7 Embedded, Windows 10
	Linux	Ubuntu
Power	Type	AT
	Input voltage	12-24VDC ±10%
	Minimum Input	12V/10A, 120W
	Power Adapter	Optional
Power Dissipation	No-load	27Watt
	Full-load	55Watt（According to the CPU set, total power not exceeding 100W）
Mechanism Parameters	Box structure	Aluminum alloy BOX
	Mounting	Support Desktop and Wall-mounted mounting
	Dimensions (L*W*H)	240mm x 240mm x 95mm (9.45" x 9.45" x 3.74")
	NW	4.00kg (8.82lb)
Environmental	Work Temperature	-20 ~ 60°C (-4℉~140℉) (Wide temperature SSD), 0 ~ 45° C (32 ℉ ~113 ℉) (General temperature HDD/SSD)
	Storage Temperature	-40 ~ 80℃ (-40 ~ 176℉)
	Relative humidity	5~95% (Non condensation)
	Shake	SSD applied: 1.5 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr/axis
	Shock	SSD applied: 10 G, IEC 60068-2-64, Half-sine wave, 11ms duration
	EMC	CE/FCC Class A
	Safety Certification	CCC

1.5 Dimensions



1.6 Assembly and disassembly

eBOX-3000 has a unique structure design which makes COM port settings easily and quickly as well as the replacement of the hard disk.

1.6.1 Hard disk replacement

Step1. Find the orange HDD cover.

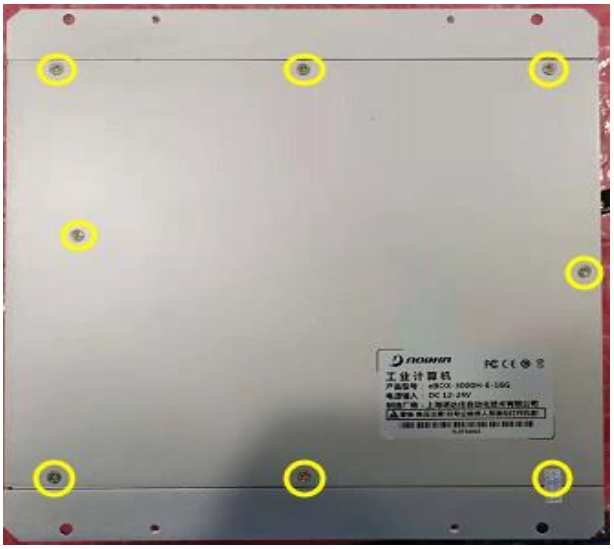
Step 2. Pull out the blue sign.

Step 3. Paste the pull & push sticker and the height adjusting frame on HDD.

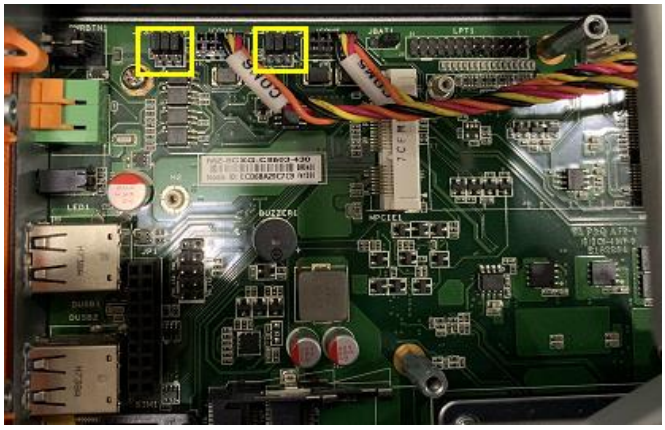
Step 4. Insert the hard disk into the slot along the chute. Cover the orange hard disk cover.

1.7 COM Jumper setting

Step 1. Turn the device to the backside, then screws the screws as shown in the figure below.



Step 2. Remove the cover. Then use jumper cap to set jumper.



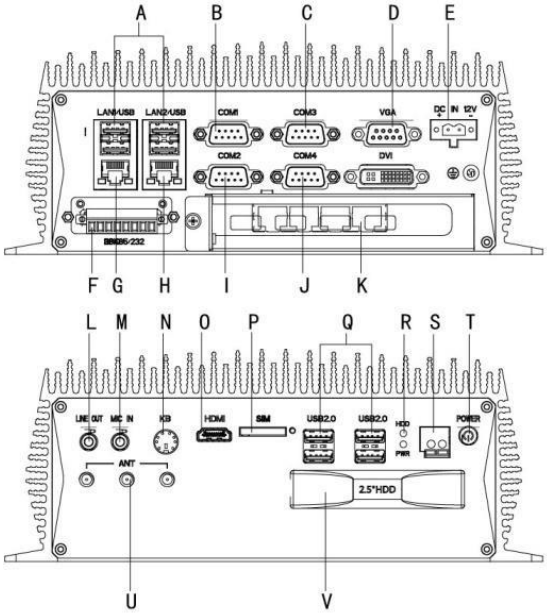
The definition of J232_485_6 jumper configuration is in the table below.

PIN	Definition	PIN	Definition
1	NDCD6	2	SIN6_485TX-
3	RS485_TX-6	4	PWMOUT
5	SOUT6_485TX+	6	RS485_TX+6
7	COM_RST	8	RST_OF6
9	GND		

Chapter 2

System installation

2.1 Connectors Definition



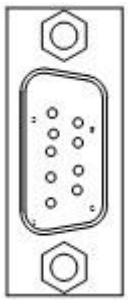
A:USB
B:COM1
C:COM3
D:VGA
E:DC IN 12V
F:232/485 port
G:LAN1
H:LAN2
I:COM2
J:COM4
K:Expansion cards

L:Line Out
M:Mic In
N:Keyboard PS/2
O:HDMI
P:SIM
Q:4x USB2.0
R:HDD&Power LED
S:SW
T:Power Switch
U:ANT
V:External hard disk port

Figure 2-1 Definition of connectors

2.1.1 COM Ports

eBOX-3000 has 6 COMs. COM 1~4 are R232 type DB9 connector. PIN9 on DB9 defaults RI. The definitions are as follows:



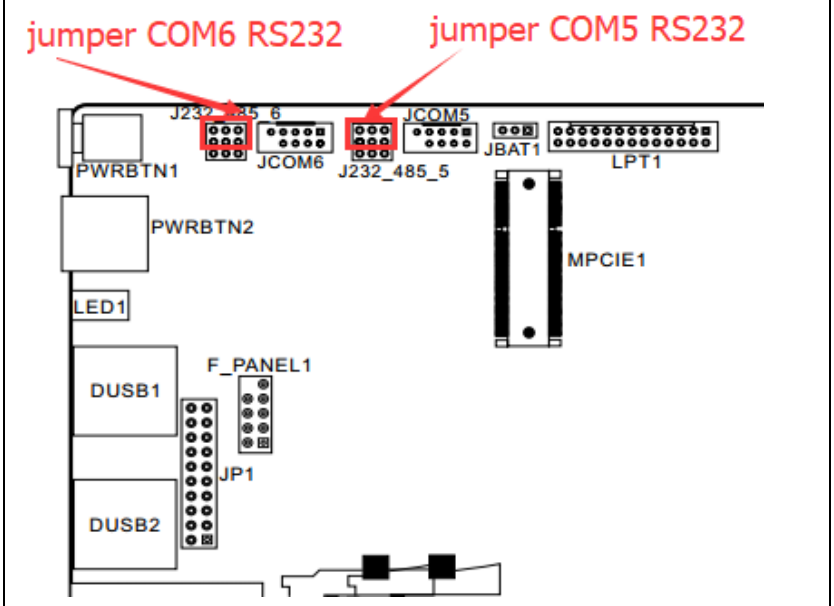
PIN	SIGNAL
	RS232
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

COM 5~6 is 8P. Definitions are as follows.

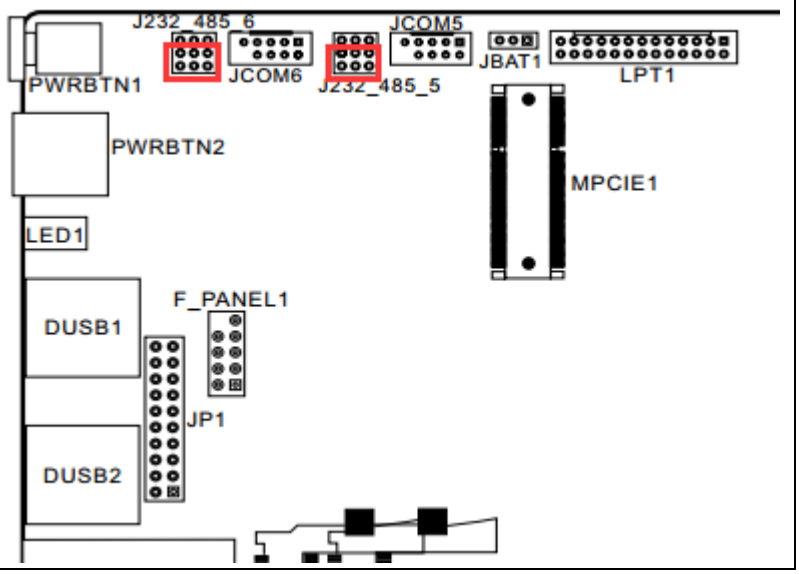
	COM5				COM6			
	1	2	3	4	1	2	3	4
RS232		RX	TX	G		RX	TX	G
RS485	485-	485+		G	485-	485+		G

Default

RS232

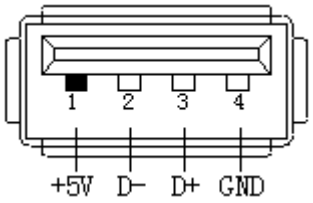


RS485



2.1.2 USB

We provide a standard single deck USB port in front panel and 2 x 2 standard double-deck USB interface on I/O interfaces, you can use the 5 USB interfaces at the same time.



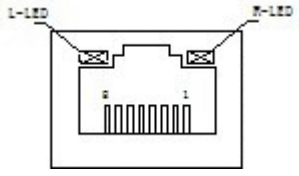
PIN	SIGNAL
1	+5V
2	Date-
3	Date+
4	GND

2.1.3 Audio interface (LINE_OUT)

We provide a standard Ø3. 5 Phone Jack audio output interface (LINE_OUT), you can use it directly.

2.1.4 Ethernet Interfaces (LAN1, LAN2)

We provide two 10/100/1000Mbps RJ-45 Ethernet interfaces, you can use it directly. There are two status indicators, links status on the left side, data transmission status on the right side.

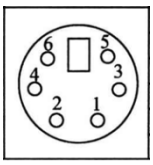


PIN	SIGNAL	PIN	SIGNAL
1	TX0+	5	TX2+
2	TX0-	6	TX2-
3	TX1+	7	TX3+
4	TX1-	8	TX3-

Indicators of LAN connector.

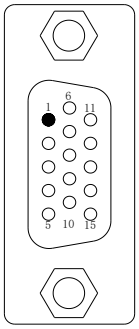
Network status	Left (LILED) double colors (Orange / Green)		Right (ACTLED) single color (Yellow)	
1000M	N/A	Constant ON	FLASH	OFF
100M	Constant ON	N/A	FLASH	OFF
10M	OFF	OFF	FLASH	OFF
Active description	GREEN	ORANGE	Data Transferring	No Data Transferring
	Linking indicator		Active status indicator	

2.1.5 PS2 Keyboard/Mouse Connector

Slot	Pin	Definition	Pin	Definition
	**1**	**KB_Data**	**2**	**MS_DATA**
	3	**GND**	**4**	**+5V**
	5	**KB_Clock**	**6**	**MS_Clock**

2.1.6 CRT interface

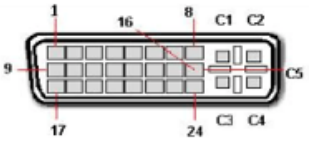
We provide a standard DB15 monitor interface, you can connect it directly.



PIN	SIGNAL	PIN	SIGNAL
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC_Data
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC_Clock
8	GND		

2.1.7 DVI interface

We provide a DVI-D interface in the rear panel which makes double display with VGA possible. The definition is as below.

DVI-1 Connector	PIN	FUNCTION	PIN	FUNCTION
	1	TMDS Data 2-	13	TMDS Data 3+
	2	TMDS Data 2+	14	`+5V DCPower
	3	TMDS Data 2/4 Shield	15	Earth (+5 circuit)
	4	TMDS Data	16	HPD
	5	TMDS Data	17	TMDS Data 0-
	6	DDC clock	18	TMDS Data 0+
	7	DDC Data	19	TMDS Data 0/5 Shield
	8	Analog Vertical Synchronization	20	TMDS Data 5-
	9	TMDS Data 1-	21	TMDS Data 5+
	10	TMDS Data 1+	22	TMDS Data clock Shield
	11	TMDS Data 1/3 Shield	23	TMDS Data clock+
	12	TMDS Data 3-	24	TMDS Data clock-
	C1	Analog Vertical Synchronization	C4	Analog horizontal synchronization
	C2	Analog Green	C5	Analog Earth(RGB circuit)
	C3	Analog Blue		

2.1.8 Switch button (PWR)

On rear panel, we provide an ATX power touch switch button (PWR) to power up.

2.1.9 Power connector

PRODUCT offers a 2-pins power input.

	PIN	SIGNAL
	1	GND
	2	12V

2.1.10 PWR, hard drive status indicators

We provide a set of indicators to show the status of the power and the hard drive. Continuous green light indicates that the power is switched on. Flashing red light on hard drive indicator means that the hard drive is reading/writing data.

2.2 BIOS Setup

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

NOTE:

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

2.2.1 Starting setup

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

1. Press the **DEL** key as soon as the system is turned on.

2. Press the **DEL** key when the **Press Del to enter SETUP** tip appears on the screen. If the message disappears before the **DEL** key is pressed, restarted the computer and try again. General Introduction

2.2.2 Using setup

Use the arrow keys to highlight items. Press **ENTER** to select, use the **PAGE UP** and **PAGE DOWN** keys to change entries. Press **F1** for help and press **ESC** to quit.

Navigation keys are shown as table below.

Table 2-1 Keys of BIOS navigation

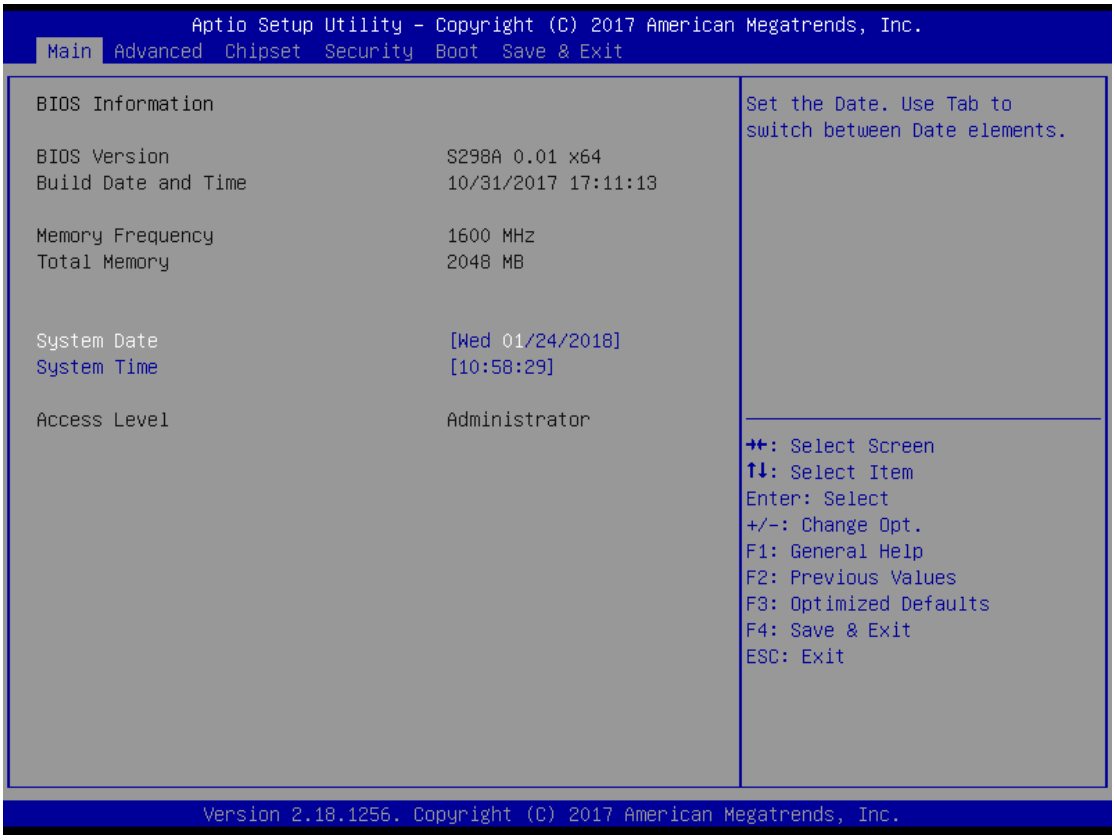
Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left side
Right arrow	Move to the item on the right side
ESC	Reset
+	Increase the numeric value or make changes
-	Decrease the numeric value make changes

F1	General help, only for the status page setup menu and option page setup menu
F2	Previous value
F3	Optimized defaults
F4	Save all the CMOS changes and reset

The menu bar which is anchored to the top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings
- Chipset – Changes the chipset settings.
- Security – Sets user and supervisor passwords.
- Boot – Changes the system boot configuration.
- Exit – Selects exit options and loads default settings.

2.2.3 Main settings



The **Main** menu has two user configurable fields.

System Time:

Set the system time, the time format is HH: MM: SS

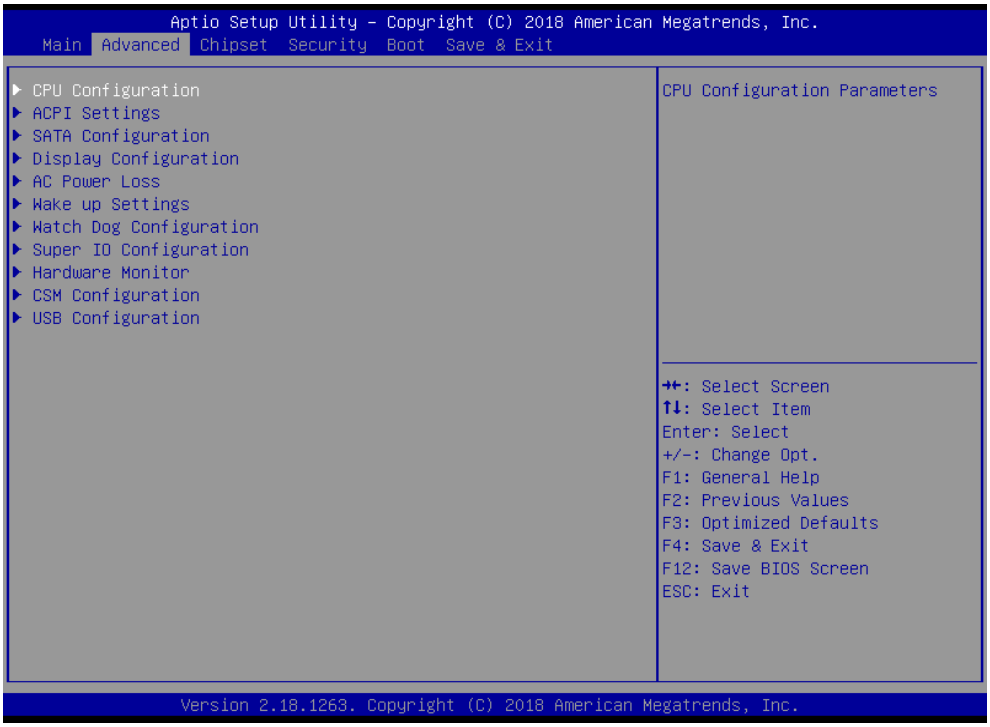
System Date:

Set the system date, the date format is MM/DD/YY

Day: Note that the 'Day' automatically changes when you set the date.

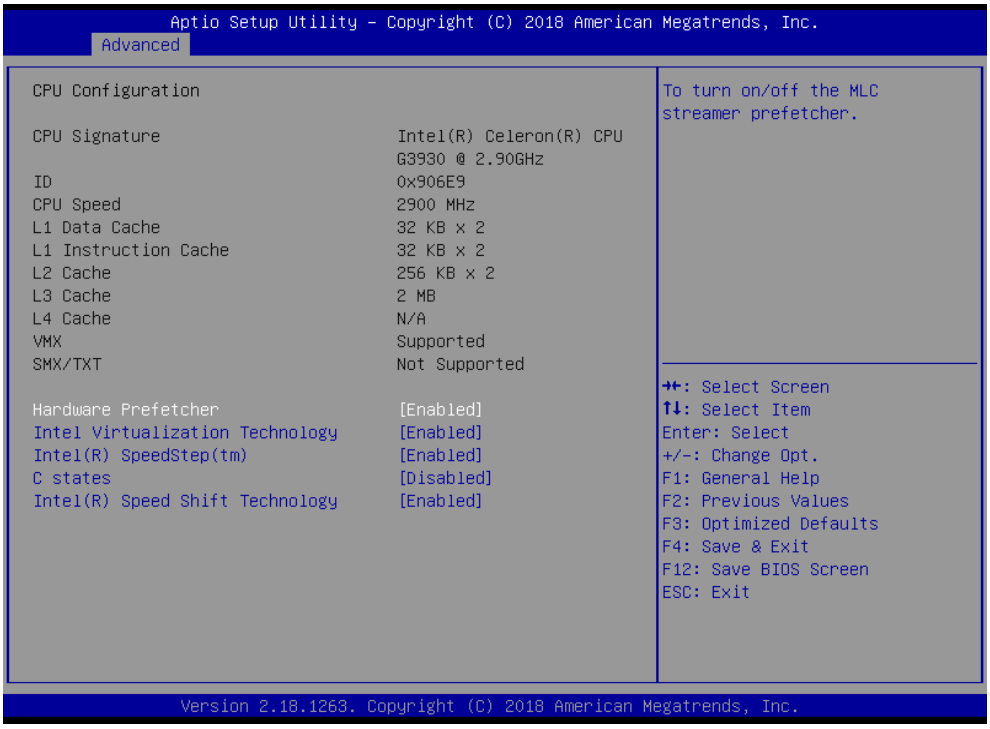
2.2.4 Advanced setting

The Advanced BIOS Setup screen is shown as below. The sub menus are described on the following pages.

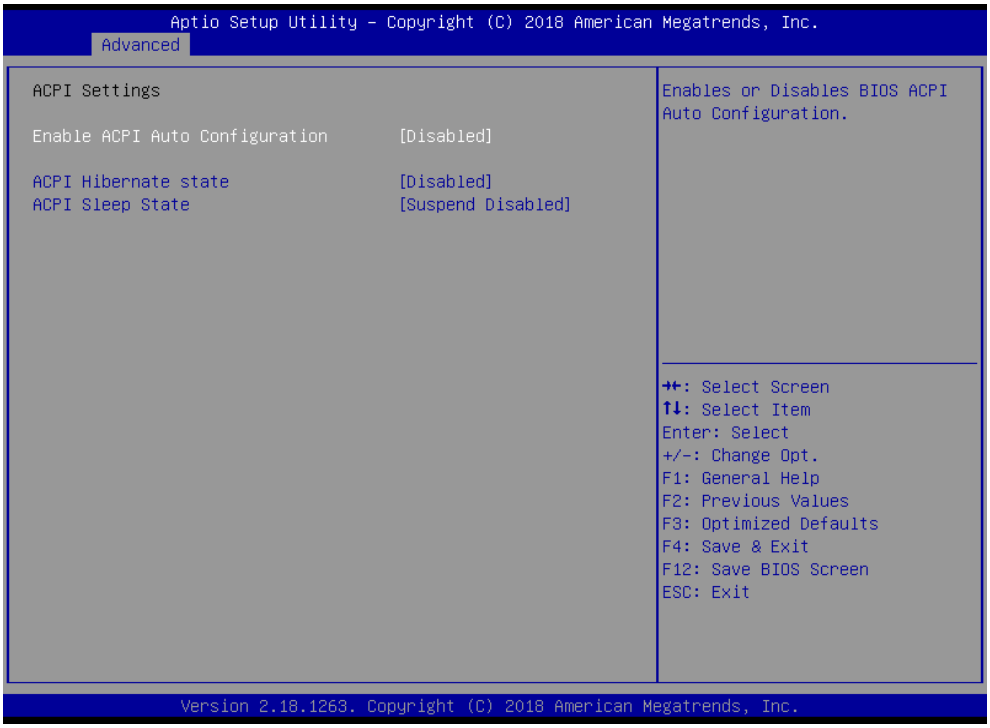


a. Advance - CPU Configuration

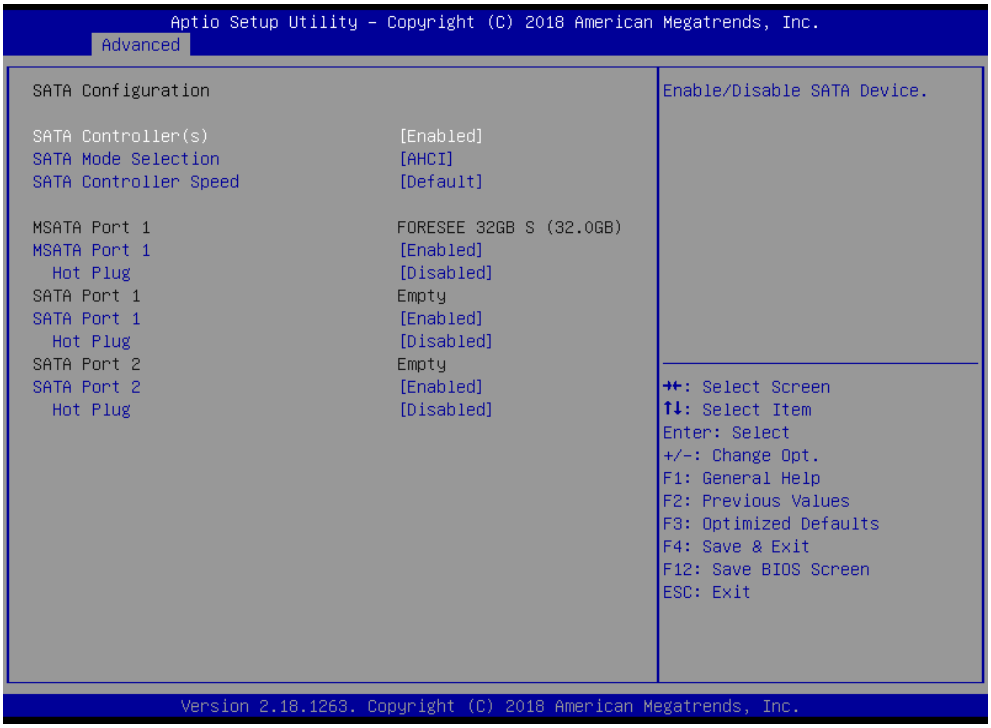
Choose CPU configuration menu in **Advanced** menu to view detailed CPU specifications or enable the Intel Virtualization Technology.



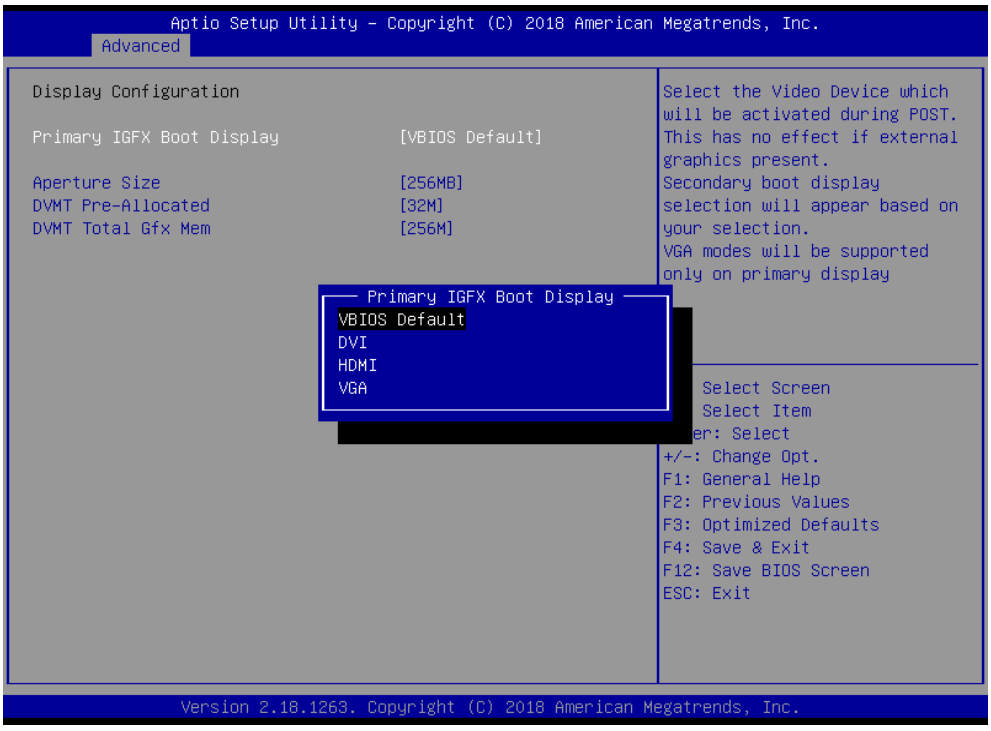
b. Advance - ACPI Configuration



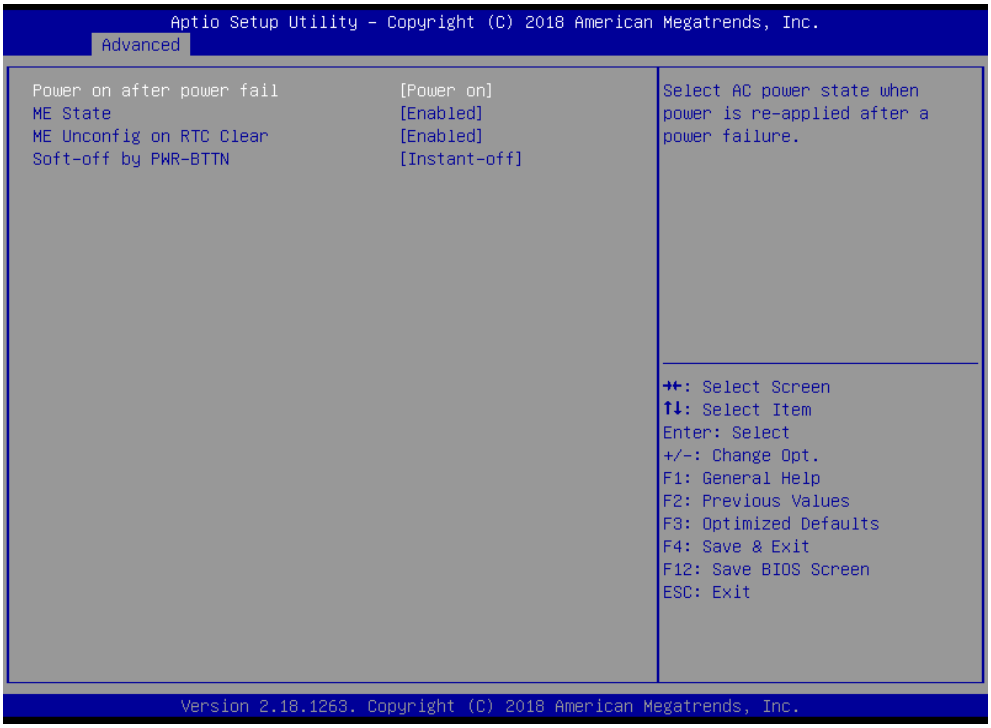
c. SATA Configuration



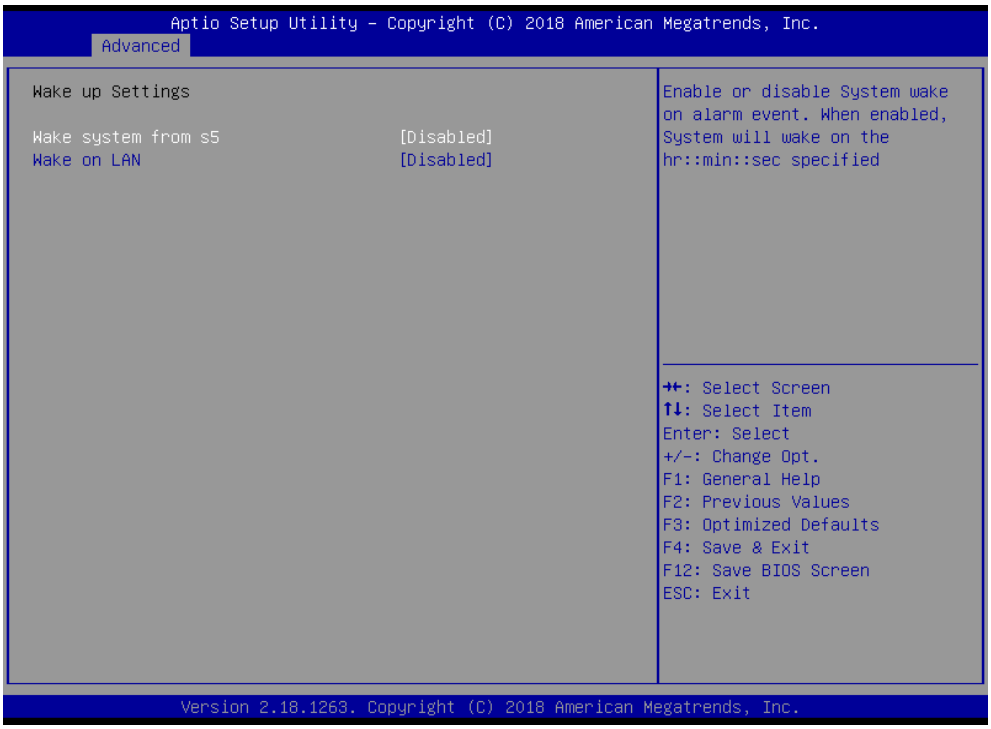
d. Display Configuration



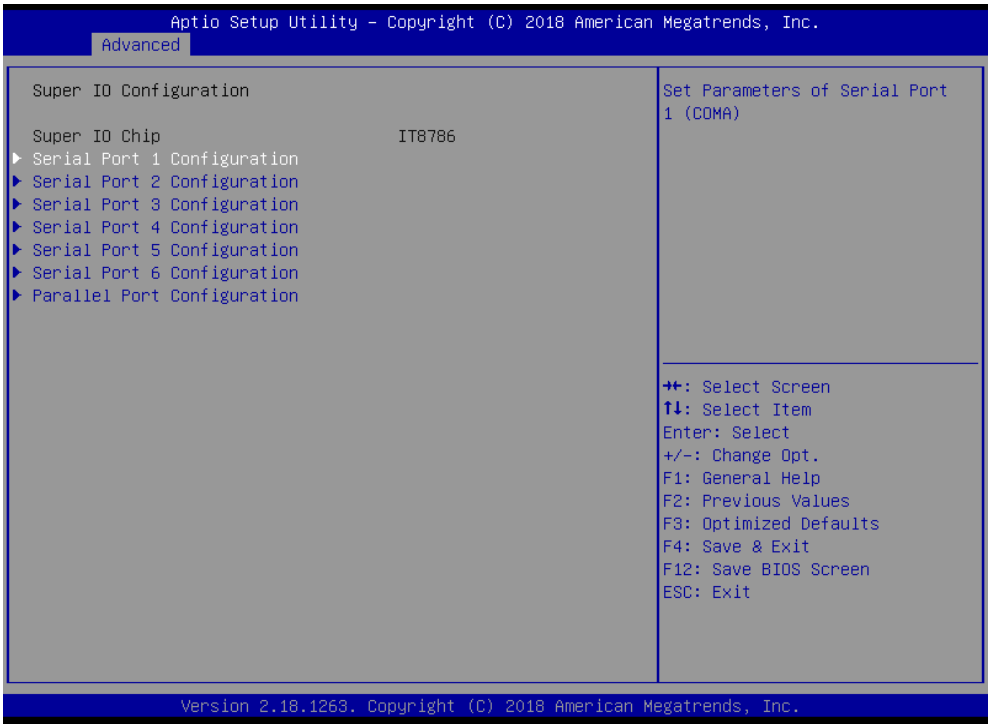
e. AC Power Loss



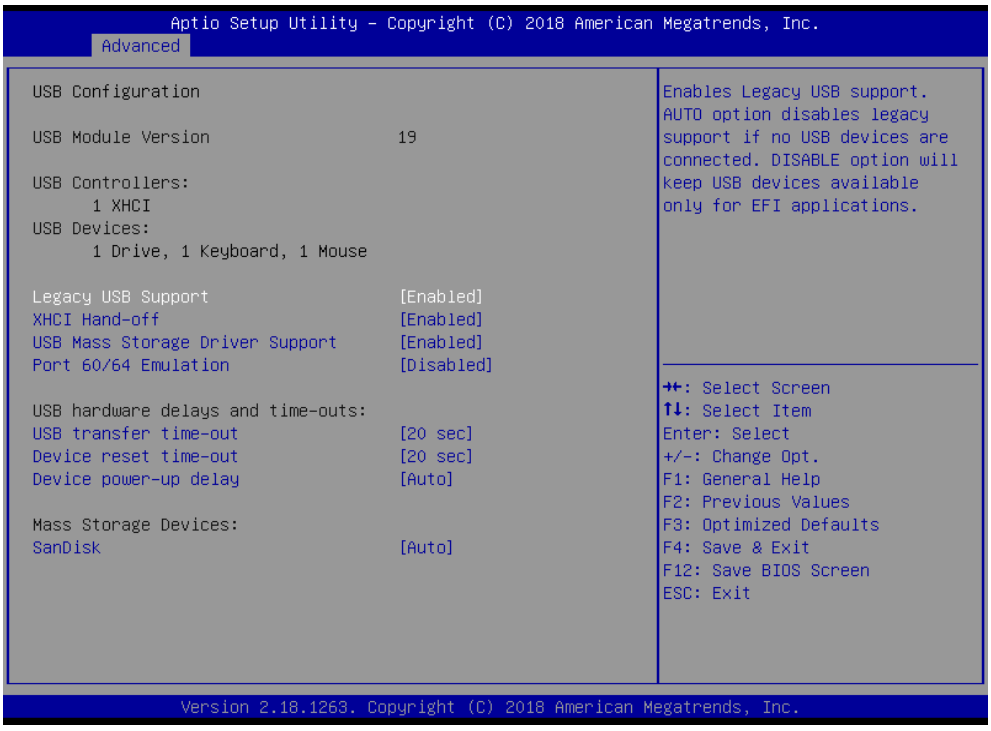
f. Wake up Settings



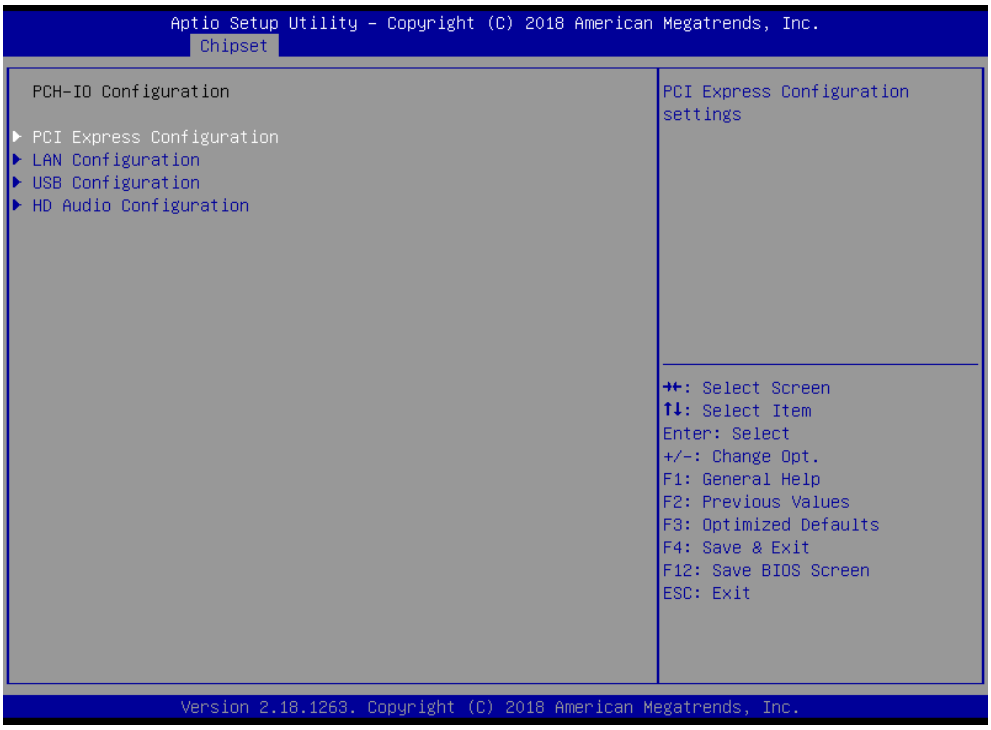
g. Super IO Configuration

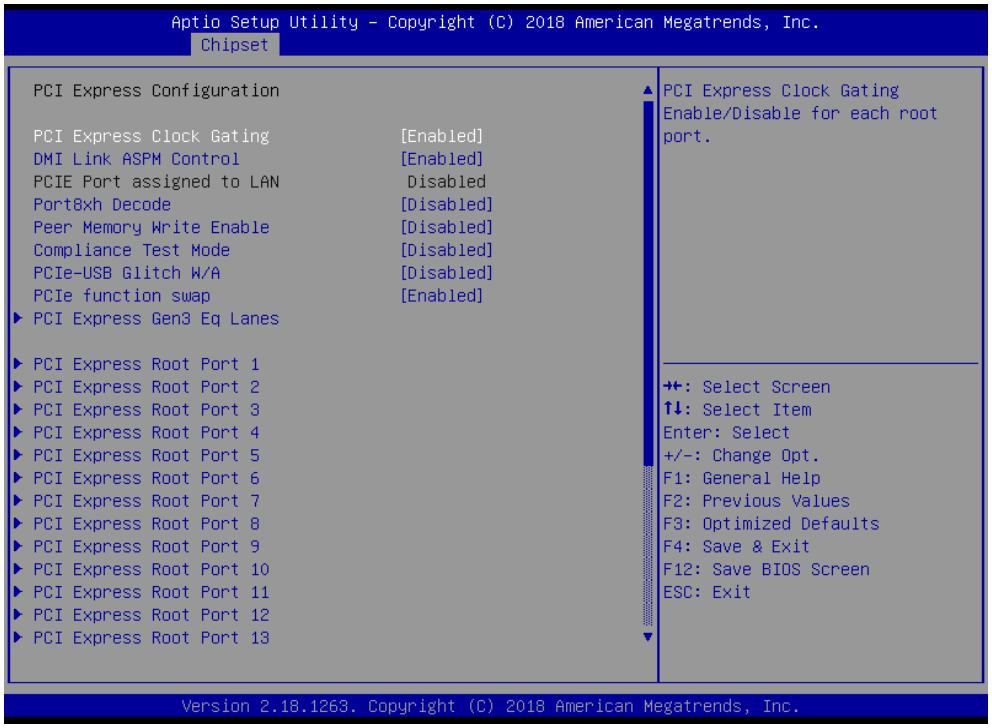


h. USB Configuration

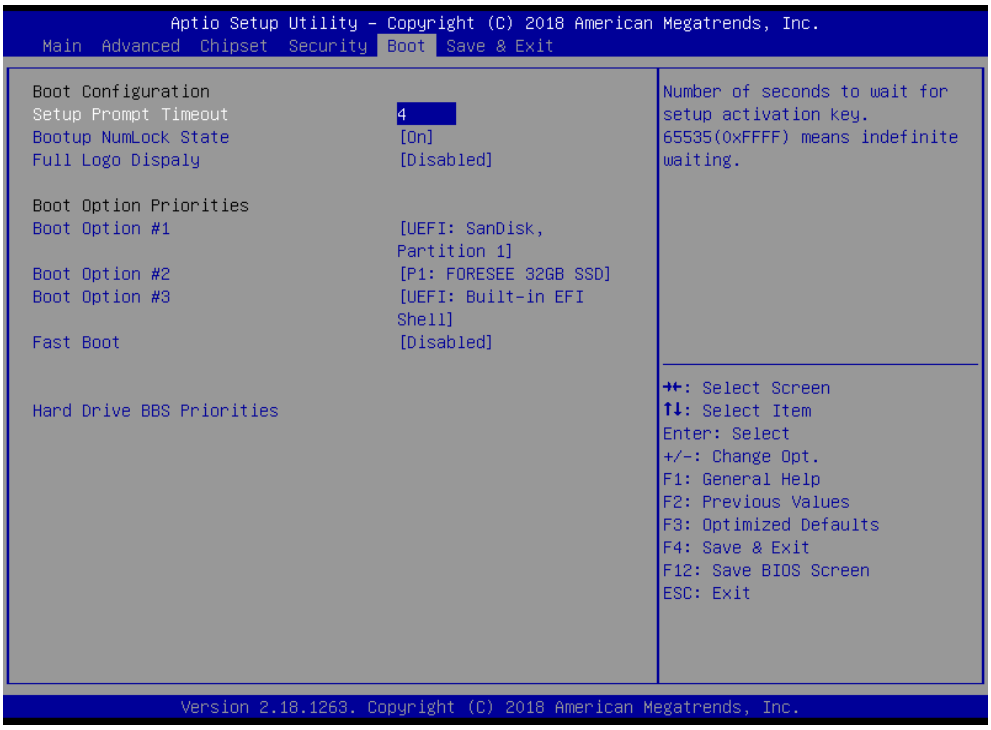


2.2.5 Chipset configuration

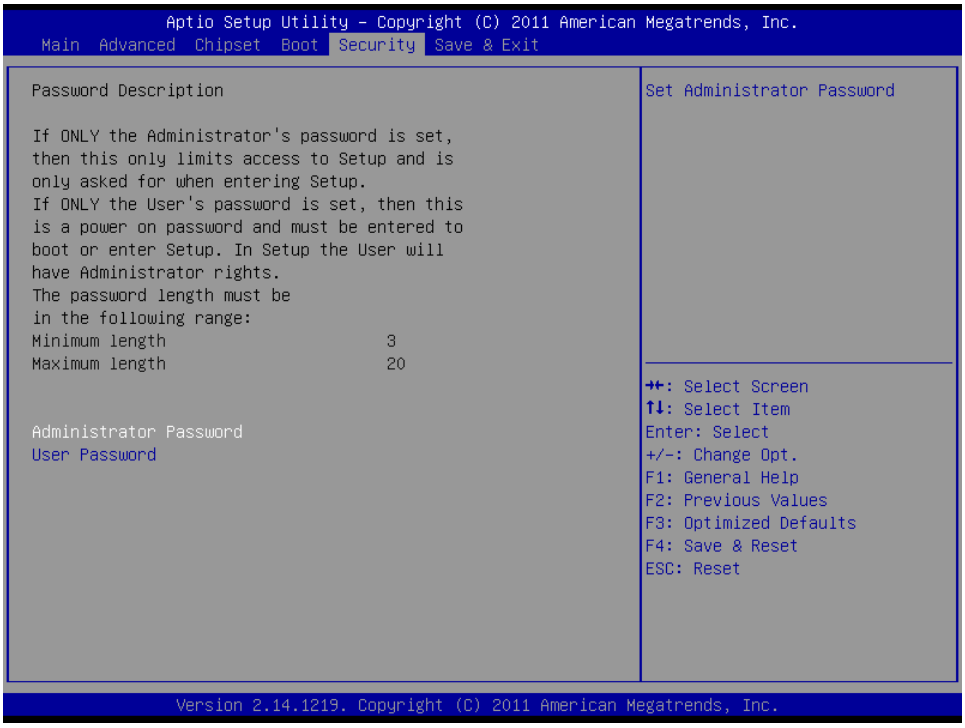




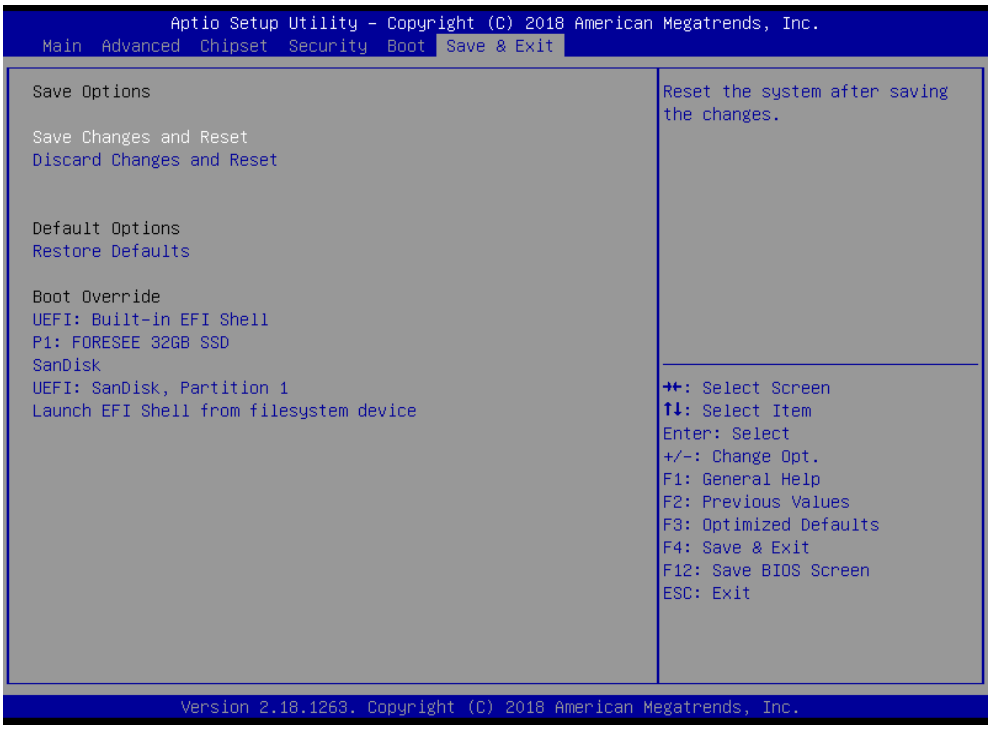
2.2.6 BOOT Configuration



2.2.7 Security settings



2.2.8 Save & Exit Option



a. Save Changes and Exit

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer. So the new system configuration parameters can take effect.

1. Select **Exit Saving Changes** from the **Exit** menu and press **Enter**. The following message appears: **Save Configuration Changes and Exit Now? [Ok] [Cancel]**

2. Select **Ok** or **cancel**.

b. Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select **Exit Discarding Changes** from the **Exit** menu and press **Enter**. The following message appears: **Discard Changes and Exit Setup Now? [Ok] [Cancel]**

2. Select **Ok** to discard changes and exit.

2.3 Driver installation

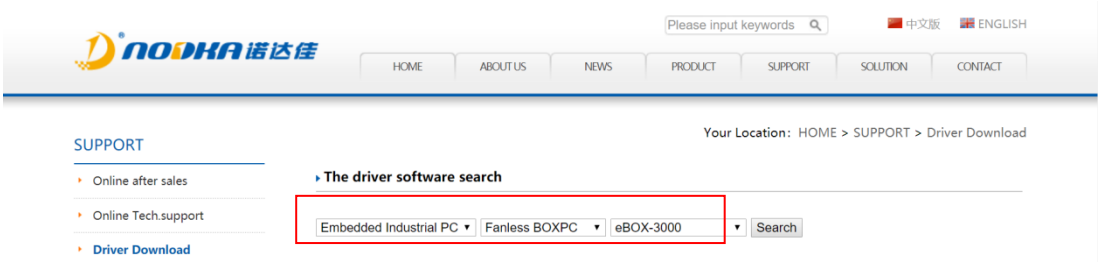
NOTE:

Please Install Operating system first. All drivers of eBOX-3000 are under the Windows XP.

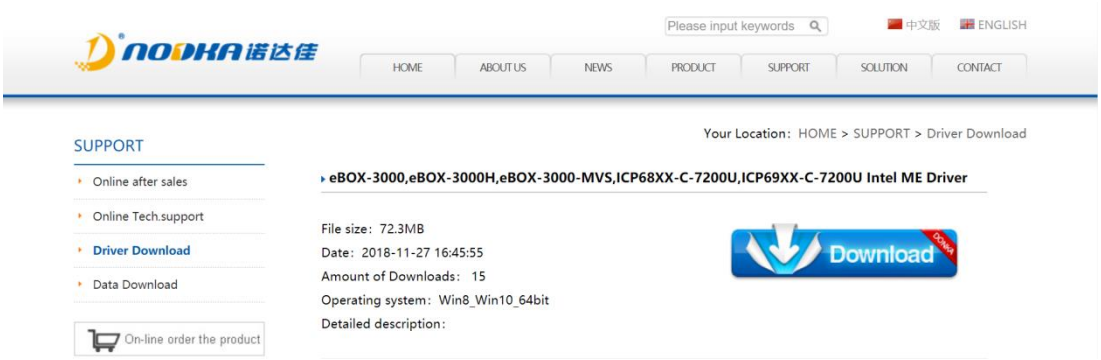
When first using the system, users need to set up corresponding drivers to make sure all functions are normal. To install the drivers, please follow the steps below:

Step 1. Please download the drivers from http://en.nodka.com/service/Download/.

Step 2. Select the correct diver corresponding with the model of your product.



Step 3. Enter the download page of the corresponding diver and click **Download** button.



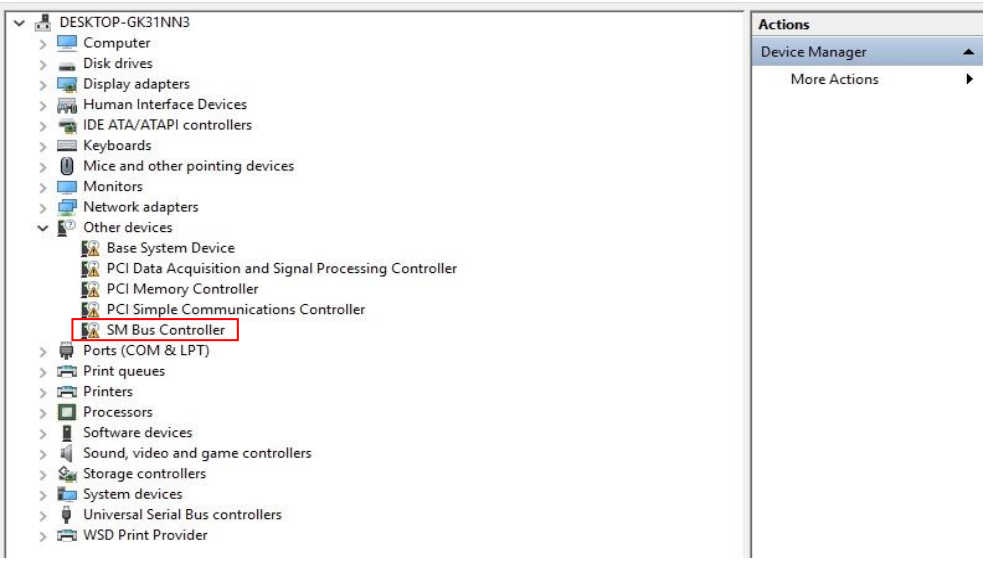
NOTE:

You must first install the Intel chipset diver (INF) before proceeding with the installation of other drivers. It is best to restart the system according to the prompt after installing the driver every time.

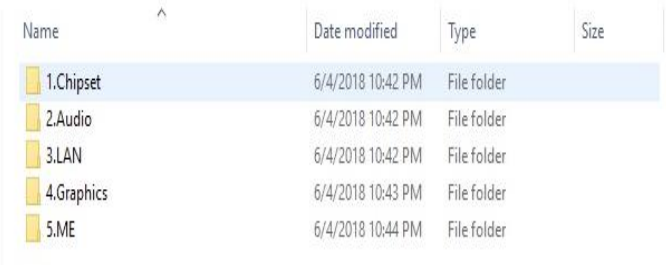
2.3.1 Chipset driver

To install the chipset diver, please follow the steps below.

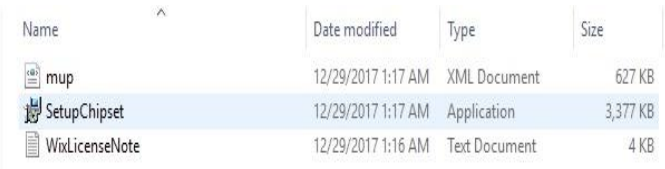
Step 1. Right select management into the computer management window. Then right click to update **SM bus controller** as shown in the figure below.



Step 2. Double-click **Chipset**.



Step 3. Click **SetupChipset**.



Step 4. Click **Next**.

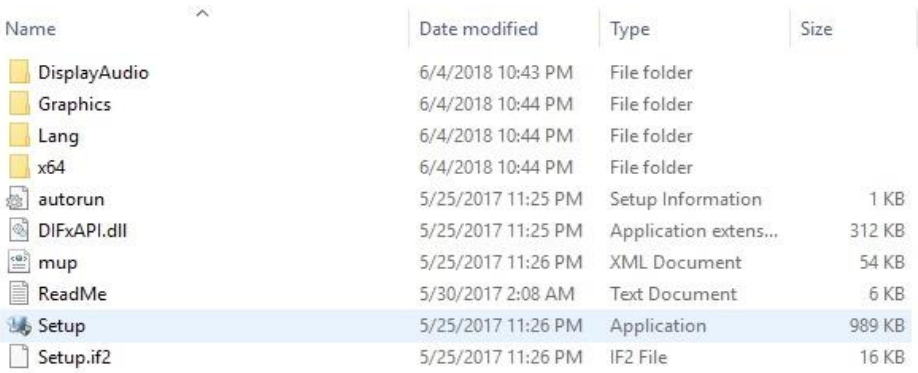
Step 5. Read the license agreement. Click **Accept**.

Step 6. Click **Restart Now**.

2.3.2 Graphics driver

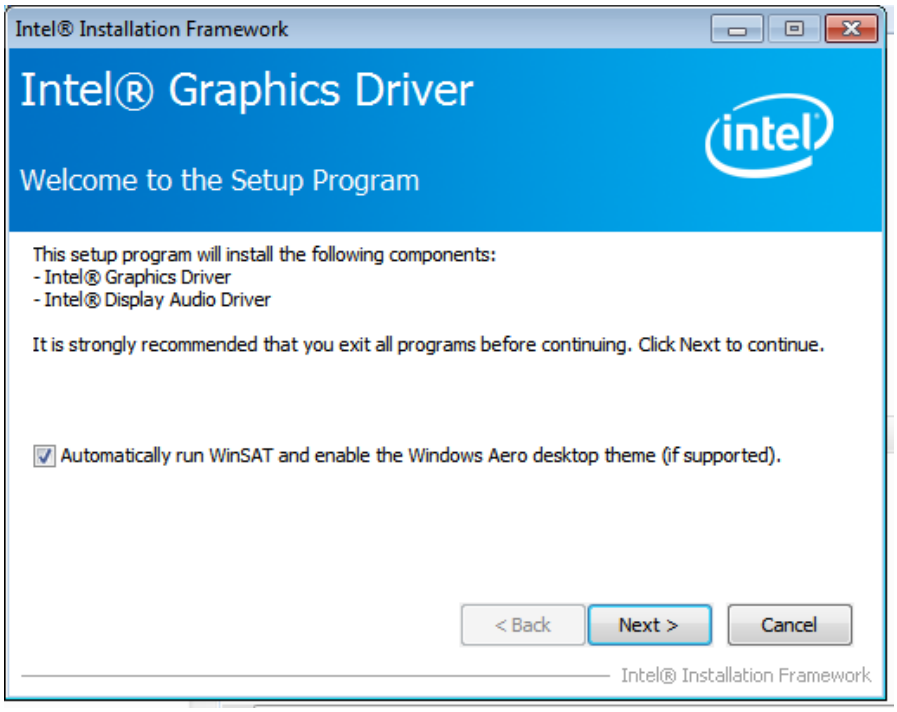
To install graphics diver, please follow the steps below.

Steps 1. Select the application of graphics driver.

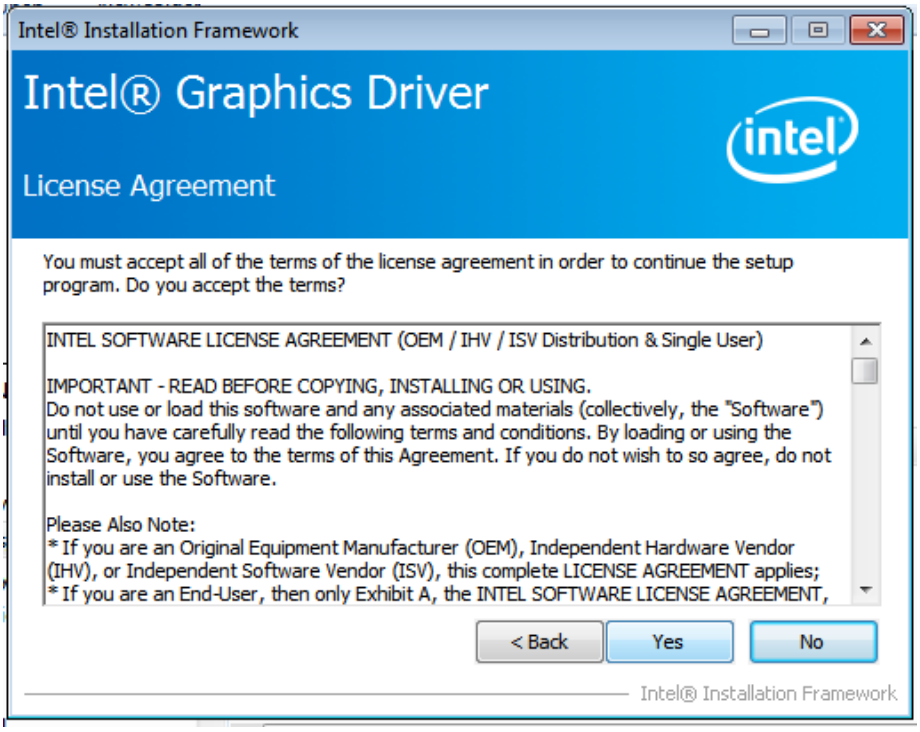


Name	Date modified	Type	Size
DisplayAudio	6/4/2018 10:43 PM	File folder	
Graphics	6/4/2018 10:44 PM	File folder	
Lang	6/4/2018 10:44 PM	File folder	
x64	6/4/2018 10:44 PM	File folder	
autorun	5/25/2017 11:25 PM	Setup Information	1 KB
DIFxAPI.dll	5/25/2017 11:25 PM	Application extens...	312 KB
mup	5/25/2017 11:26 PM	XML Document	54 KB
ReadMe	5/30/2017 2:08 AM	Text Document	6 KB
Setup	5/25/2017 11:26 PM	Application	989 KB
Setup.if2	5/25/2017 11:26 PM	IF2 File	16 KB

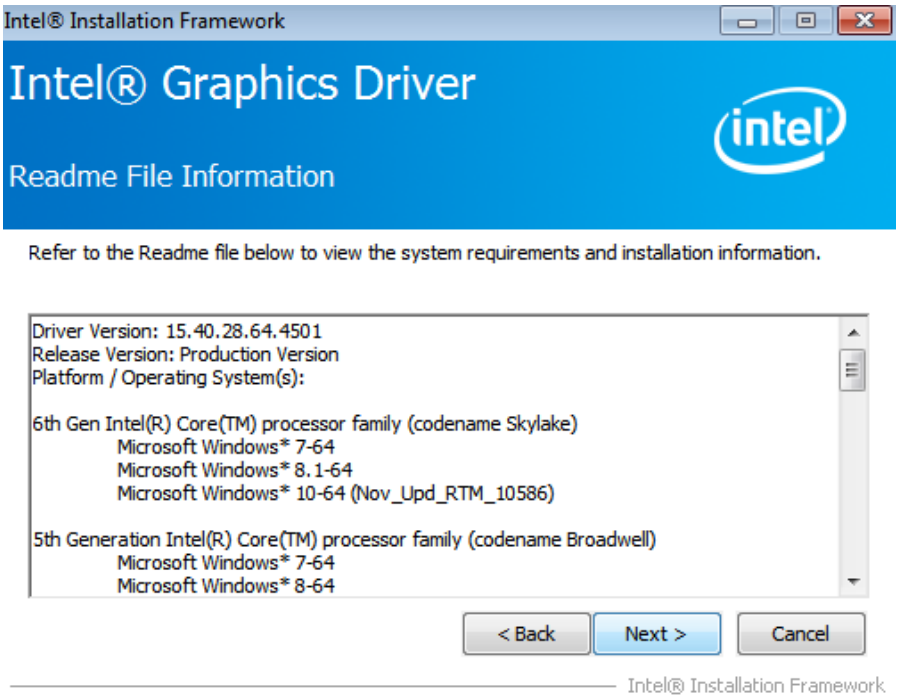
Step 2. Click **Automatically run WinSAT and enable the Windows Aero desktop theme (if supported)**. Click **Next**.



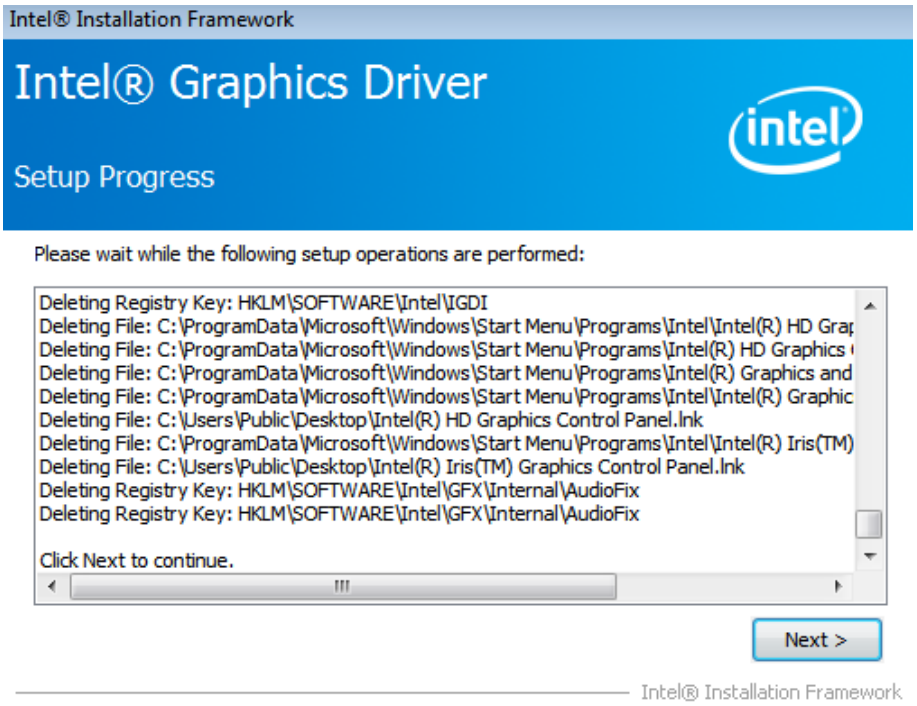
Step 3. Read license agreement. Click **Yes**.



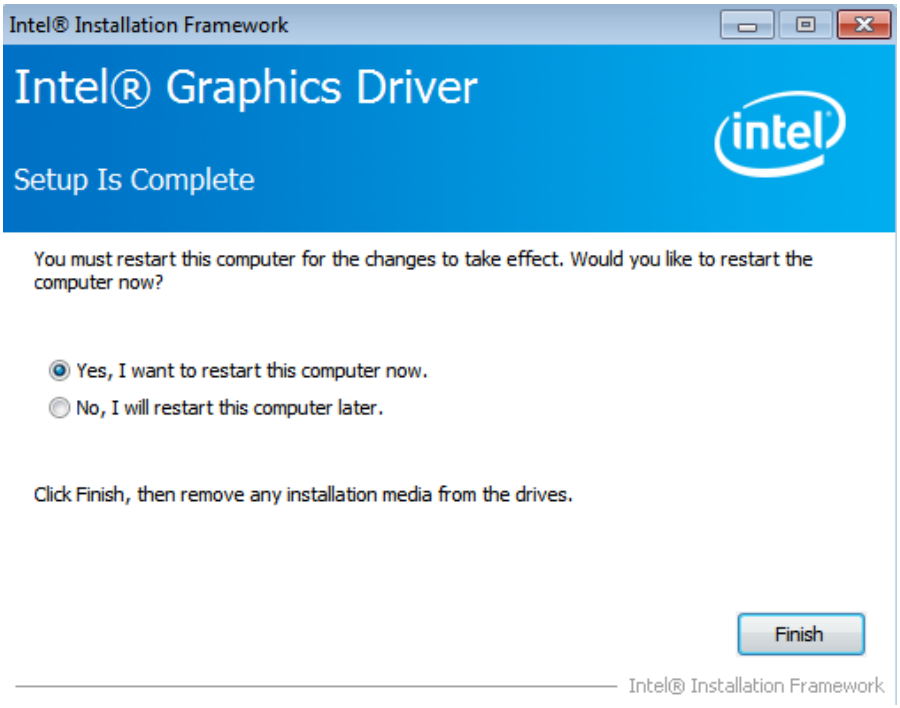
Step 4. Click **NEXT** to continue.



Step 5. Click **Next**.



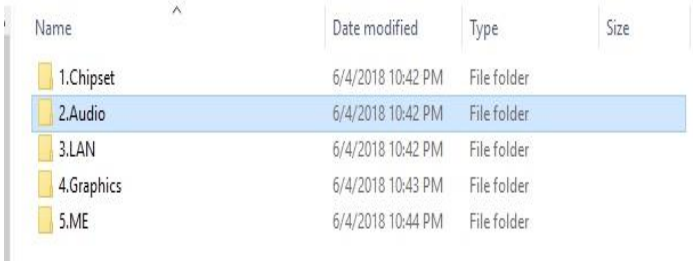
Step 6. Select **Yes, I want to restart this computer now.**. Click **Finish** to complete the installation.



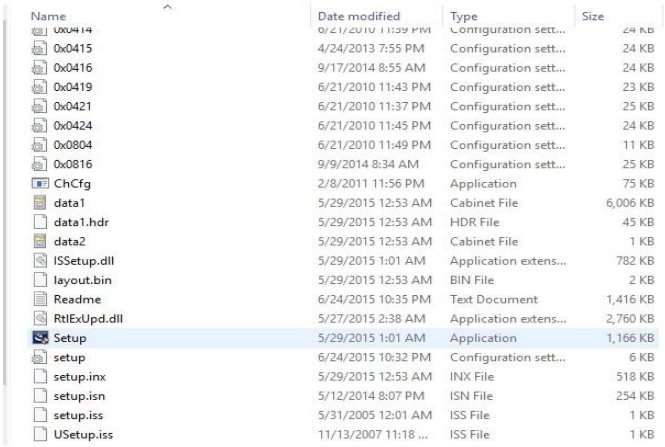
2.3.3 Audio driver

To install audio diver, please follow the steps below.

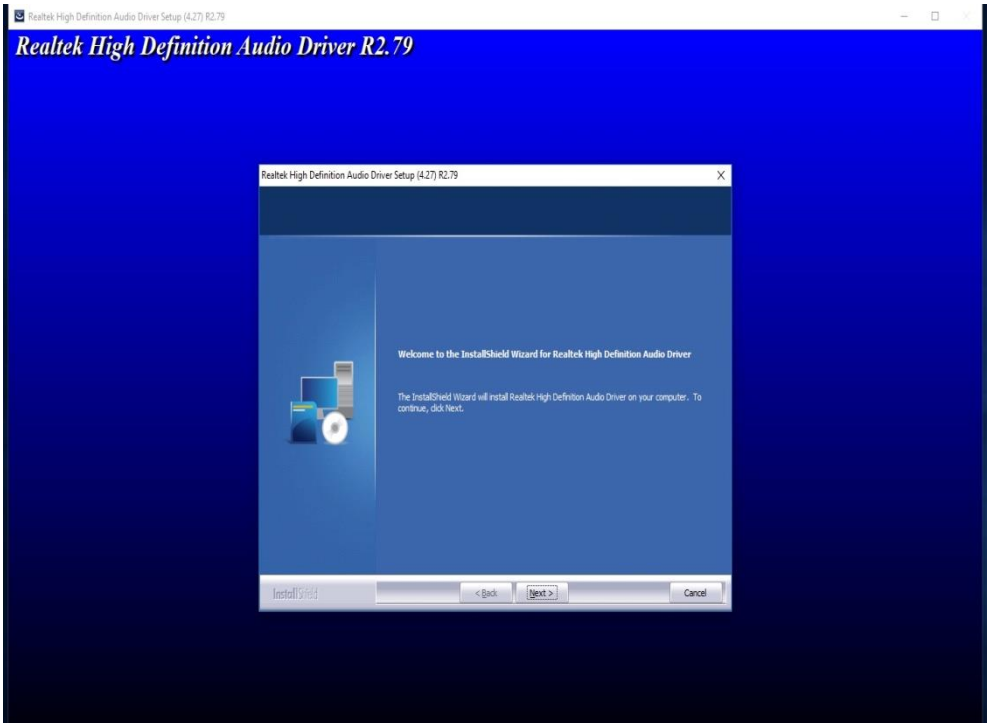
Step1. Double click the folder of audio driver.



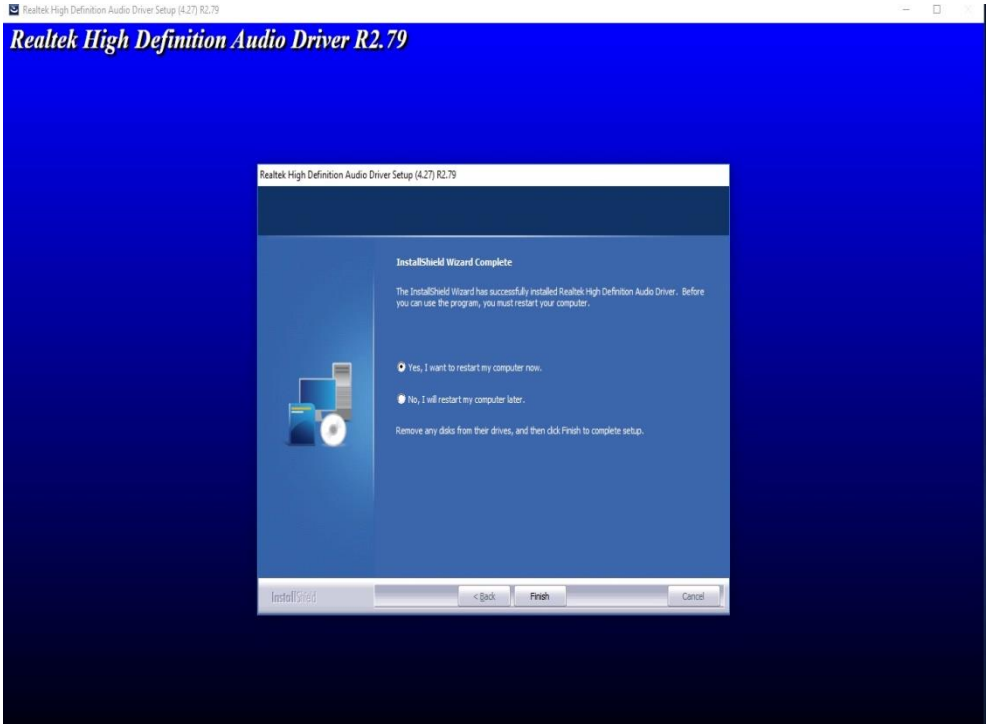
Step 2. Click **Setup**



Step 3. Click **Next** to continue



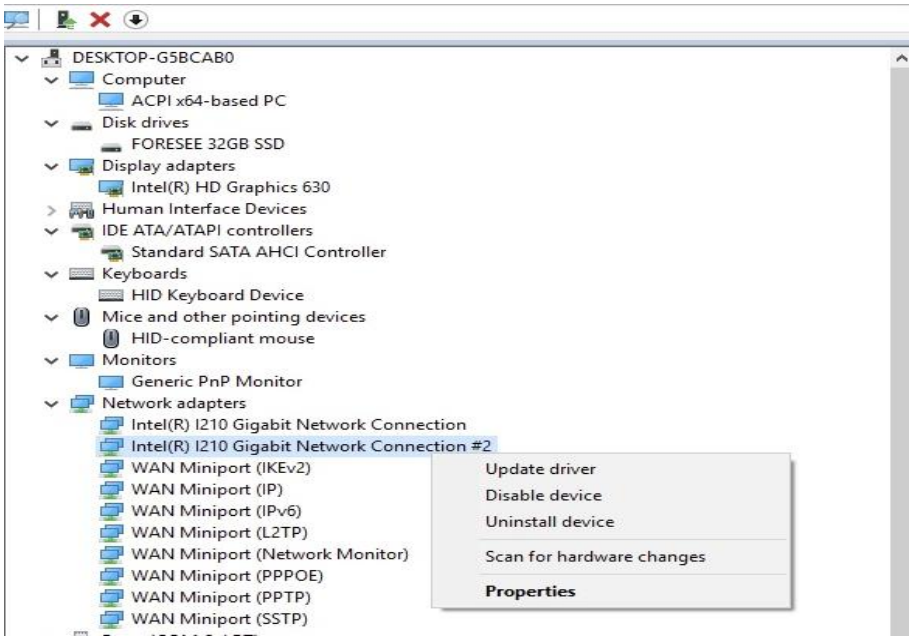
Step 4. Click **Finish**



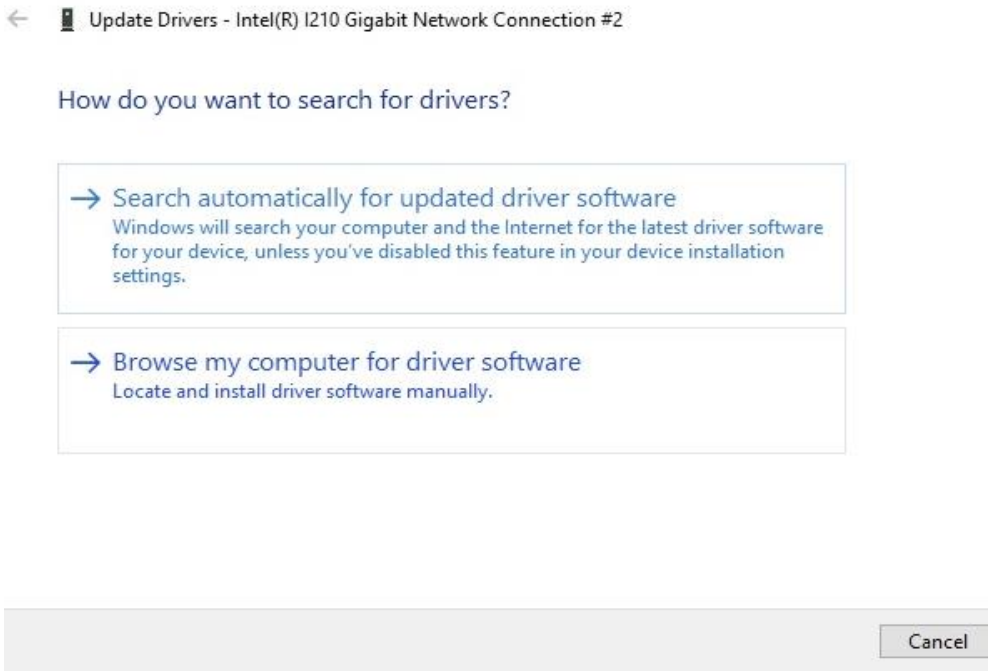
2.3.4 LAN driver

To install LAN driver, please follow the steps below.

Step 1. Right select management into the computer management window. Then right click to update **Intel(R) I210 Gigabit Network Connection#2** as shown in the figure below.



Step 2. Choose **Browse my computer for diver software**.



Step 3. Wait for the installation process to complete.

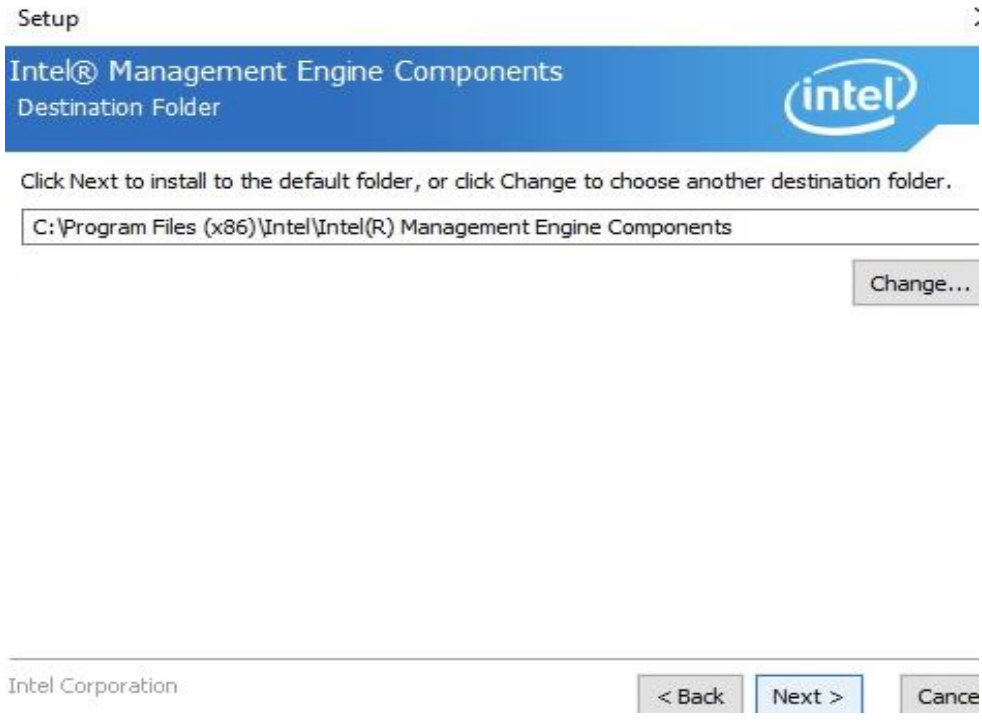
2.3.5 Me diver

To install ME driver, please follow the steps below.

Step 1. Click **SetupME**

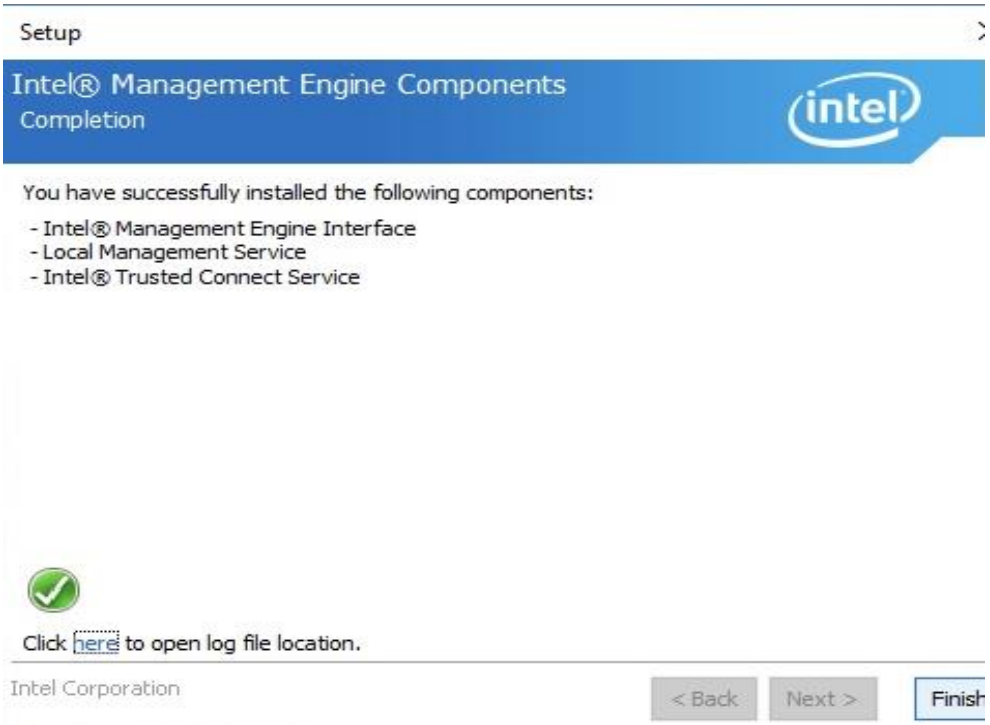
Step 2. Click **Next**

Step 3. Click **Next.**



Step 4. Read license agreement. Choose **I accept the terms in the License Agreement.**, Click **Next.**

Step 5. Click **Finish**.



Appendix A Safety Precautions

CAURION:

The precautions outlined in this chapter should be strictly followed. Failure to do so may cause permanent damage to the product.

A.1 General Safety Precautions

Please read the following safety precautions carefully. Make sure you always follow the precautions. Keep this User Manual for later reference.

1. Always follow the **Anti-static precautions (A.2)** when the product is opened.
2. **Make sure the power is turned off and the power cord is disconnected** when the PRODUCT is being installed, moved or modified.
3. When the PRODUCT is running, **electric shocks may occur if the chassis of product is open**.
4. If amounts of dust, water, or fluids enter the product, please immediately **turn off the power supply and pull out the plug**, then contact the vendor.
5. DO NOT APPLY A VOLTAGE WHICH EXCEEDS THE SPECIFIED VOLTAGE RANGE. OTHERWISE, THIS MAY RESULT IN FIRE OR ELECTRIC SHOCK.
6. DO NOT DROP OR INSERT ANY OBJECTS INTO THE VENTILATION OPENINGS OF THE PRODUCT.
7. DO NOT DROP THE PRODUCT AGAINST A HARD SURFACE.
8. DO NOT STRIKE OR EXERT EXCESSIVE FORCE ONTO THE LCD PANEL.
9. DO NOT TOUCH ANY OF THE LCD PANELS WITH A SHARP OBJECT.
10. DO NOT STORE THE PRODUCT IN OUT OF THE TEMPERATURE RANGE WHAT WE SUGGESTED, NOT LESS THEN -30°C OR HIGHER THAN 80°C, OR MAY DAMAGE THE DEVICE.

A.2 Anti-static Precautions

WARNING:

During the installation of the product, failure to take ESD precautions may result in permanent damage to the device and cause severe injury to the user.

Electrostatic discharge (ESD) may cause severe damage to electronic components of product, especially during dry weather. Therefore, please strictly observe the anti-static precautions when opens the product to handle any electrical components inside.

1. **Wear an anti-static wristband** to prevent ESD from damaging any electrical components.
2. Before and during handling the electrical components, **please frequently touch grounded conducting materials to ground yourself.**
3. When configuring or working with an electrical component, **please put the component on an anti-static pad** in order to reduce the possibility of ESD damage.
4. **Only touch the edges of the electrical component**, when handling it.

A.3 Disposing of the Equipment

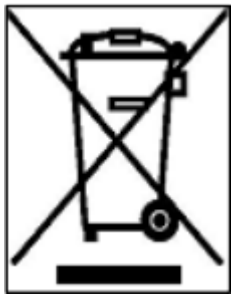
CAURION:

If the battery is replaced with the wrong type, there might be a risk of a battery explosion. Only certified engineers can replace the on-board battery.

NOTE:

Disposal of used batteries must be in accordance with local environmental regulations.

Within the European Union:



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

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

Outside the European Union:

If you want to dispose the used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

A.4 Maintenance and Cleaning Precautions

When maintaining or cleaning the product, please follow the guidelines below.

A.4.1. Maintenance and Cleaning

Prior to cleaning any part or component of the product, please read the details below.

1. Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.
2. The interior does not require cleaning. Keep fluids away from the interior.
3. Be careful not to damage the small, removable components inside.
4. Turn off before cleaning.
5. Never drop any objects or liquids through the openings.
6. Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning.
7. Avoid eating, drinking and smoking nearby.

A.4.2. Cleaning Tools

Some components may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use for cleaning.

1. **Cloth** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended.
2. **Water or rubbing alcohol** – A cloth moistened with water or rubbing alcohol should be used.
3. **Using solvents** – The use of solvents is not recommended as they may damage the plastic parts.
4. **Vacuum cleaner** – Using a vacuum specifically designed for computers is one of the best methods of cleaning. Dust and dirt can restrict the airflow and cause circuitry to corrode.

5. **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
6. **Foam swabs** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix B

B.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC without Mercury

The details provided in Appendix B are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

B-1 Poisonous or hazardous substances or element in products

Component	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium(Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.