eBOX-3250 User Manual

1.0

2023-7-23

Industrial PC

Intel® Core™ 6/7/8th and 10/11th generation

i7/i5/i3/pentium/celeron High-performance processor

Release List:

Name / Organization	Company
	NODKA

Review/Approval:

	Name / Function / Company	Signature
Author:		
Reviewers:		

Update List:

Version	Date	Author	Description
1.0.0	2022-5-31		Initial version
1.1	2022-11-16		Description of the new expansion port, default bare metal does not include any expansion kit, optional
1.2	2023-7-23		Update the physical image, cancel the extended COM5/6, add the 10/11 generation specification

Copyright Notice

Declaration of Recognition

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Intel gentle Atom　do Intel Corporation Trademark of.

IBM、PC/AT、PS/2 gentle VGA do International Business Machines CorporationTrademark of.

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Microsoft Windows do Microsoft Corp. Registered trademark of.

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All other product names and trademarks are the property of their owners.

Declaration of Conformity

These restrictions aim to provide reasonable protection for system operations in commercial environments from harmful interference. This device generates, uses, and emits radio frequency energy. If not installed and used correctly according to the manual instructions, it may cause harmful interference to radio communication. But even if installed and used according to the manual instructions, there is no guarantee that there will be no interference. If this device will cause harmful interference to radio or television signal reception, users can confirm by turning the device on or off. When this device generates harmful interference, users can take the following measures to solve the interference problem：

- 1、Adjusting the direction or position of the receiving antenna；
- 2、Increase the distance between this device and the receiver；
- 3、Plug the power connector of this device into a power outlet that uses a different circuit from the receiver；
- 4、If you need technical support, please consult your dealer or experienced radio technician；

Technical Support and Services

1. For the latest information and documentation on this product, please visit the official website of Nodka www.nodka.com.
2. If users need technical support, please contact the local distributor or sales representative customer service center. Before conducting technical consultation, users must collect complete information on the following products：
   - Product name and serial number；

- Description of peripheral additional devices;
- Description of user software (operating system, version, application software, etc.);
- A complete description of the problem with the product;
- The complete content of each error message;

Safety instructions

1. Before installing, wiring, operating, and inspecting this product, it is necessary to carefully read this manual and the related manuals introduced in the manual, and operate correctly with full attention to safety.
2. Please keep this user manual properly for future reference.
3. Before cleaning the device with a damp cloth, please unplug the power cord from the socket. Do not use liquids or decontamination sprays to clean the equipment.
4. For devices using power cords, there must be easily accessible power sockets around the device.
5. Please ensure that the equipment is placed on a reliable surface before installation, as accidental falls may cause damage to the equipment.
6. Before connecting the device to the power outlet, please confirm if the voltage of the power outlet meets the requirements.
7. Please arrange the power cord in a location that is not easily accessible to people, and do not cover any debris on the power cord.
8. Please pay attention to all warnings and caution slogans on the device.
9. If the device is not used for a long time, please disconnect it from the power socket to avoid damage to the device due to excessive voltage fluctuations.
10. Please do not allow any liquid to flow into the equipment to avoid causing a fire or short circuit.
11. Please do not open the device on your own. To ensure your safety, before turning on the device, all external power supplies used in the system must be disconnected before performing the operation. Please have a certified professional engineer with sufficient electrical knowledge turn on the device。

    If the following situations occur, please have professional personnel repair them:
    - Damaged power cord or plug;
    - There is liquid inflow inside the equipment;
    - The device is not working properly, or you cannot use the user manual to make it work properly;
    - Equipment falling or damaged ;
    - The equipment has obvious appearance damage;
12. Please do not store the device in an environment that exceeds our recommended temperature range, that is, not below -30°C or above 80°C, otherwise it may damage the device.
13. Please regularly clean the dust or replace the fan.

CONTENTS

Chapter 1 Overview

This chapter provides necessary explanations for the product's documentation, functional overview, specifications, etc.

1.1 Reference Documents

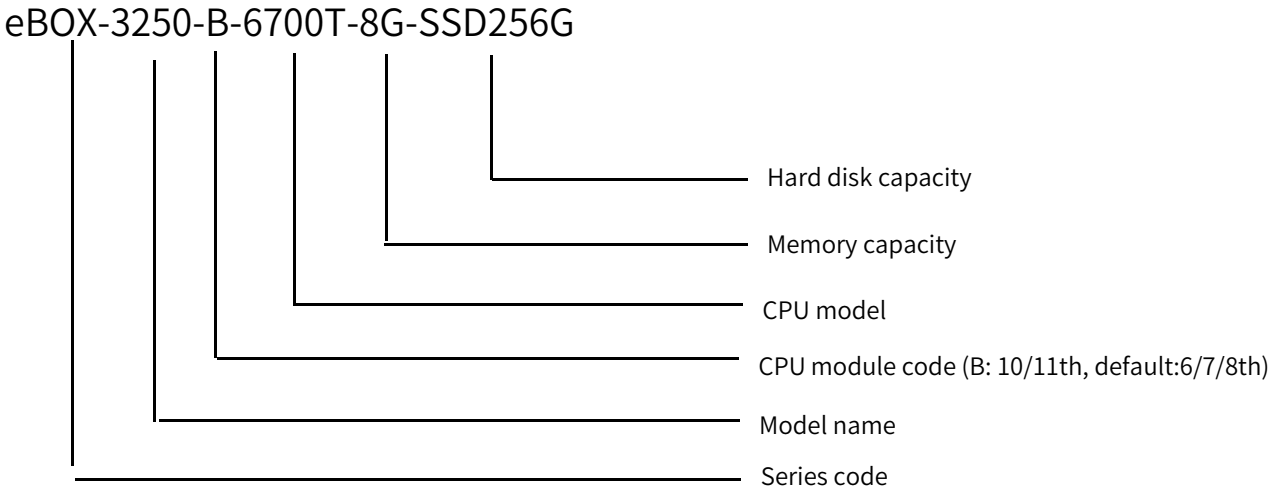
The documentation related to this product can be found in the following list. Please read it before using it.

Document Name	Documentation Targets	Document Content	Document Archiving
User's manual	Before using the product, it is necessary to read	Description of product functions and related settings	Download from the official website of NODKA or obtain from local distributors

Official website document download link: http://www.nodka.com

1.2 Naming format for products

The naming format for the product series is as follows:



1.3 Safety instructions

For safety reasons, the following icons are used in this document to provide users with more safety information prompts when operating the device.

Icon	Describe
	Warning: Indicates a potential hazardous situation that, if not avoided, may result in death, serious injury, or significant property damage.
	Danger: Indicates an imminent hazardous situation that, if not avoided, may result in death, serious injury, or significant property damage.
	Reminder: Indicates important information prompts.

Chapter 2 Product Introduction

This product is a high-performance embedded industrial computer designed for industries such as automation and machine vision, supporting Intel ® Core ™ 6th, 7th, and 8th generation i3, i5, i7,Pentium CPUs, as well as the core 10/11th Generation CPU. The product adopts a sturdy aluminum alloy profile structure, ensuring excellent heat dissipation and durability. The fully enclosed design prevents dust intrusion, while also fully considering the ergonomic structure design.

The hardware structure of the product adopts modular design, and the product is composed of CPU core module carrier boards. Mature modular circuits and devices ensure the stability of the product even more.

- The independent CPU core module facilitates users to replace and upgrade according to actual needs, which can better control costs.
- 8-way isolated DI/DO can be used by users. It can be widely used in 3C manufacturing, pharmaceuticals, packaging, mechanical testing equipment, robots, motion control, intelligent transportation and other fields.

1.4 Introduction

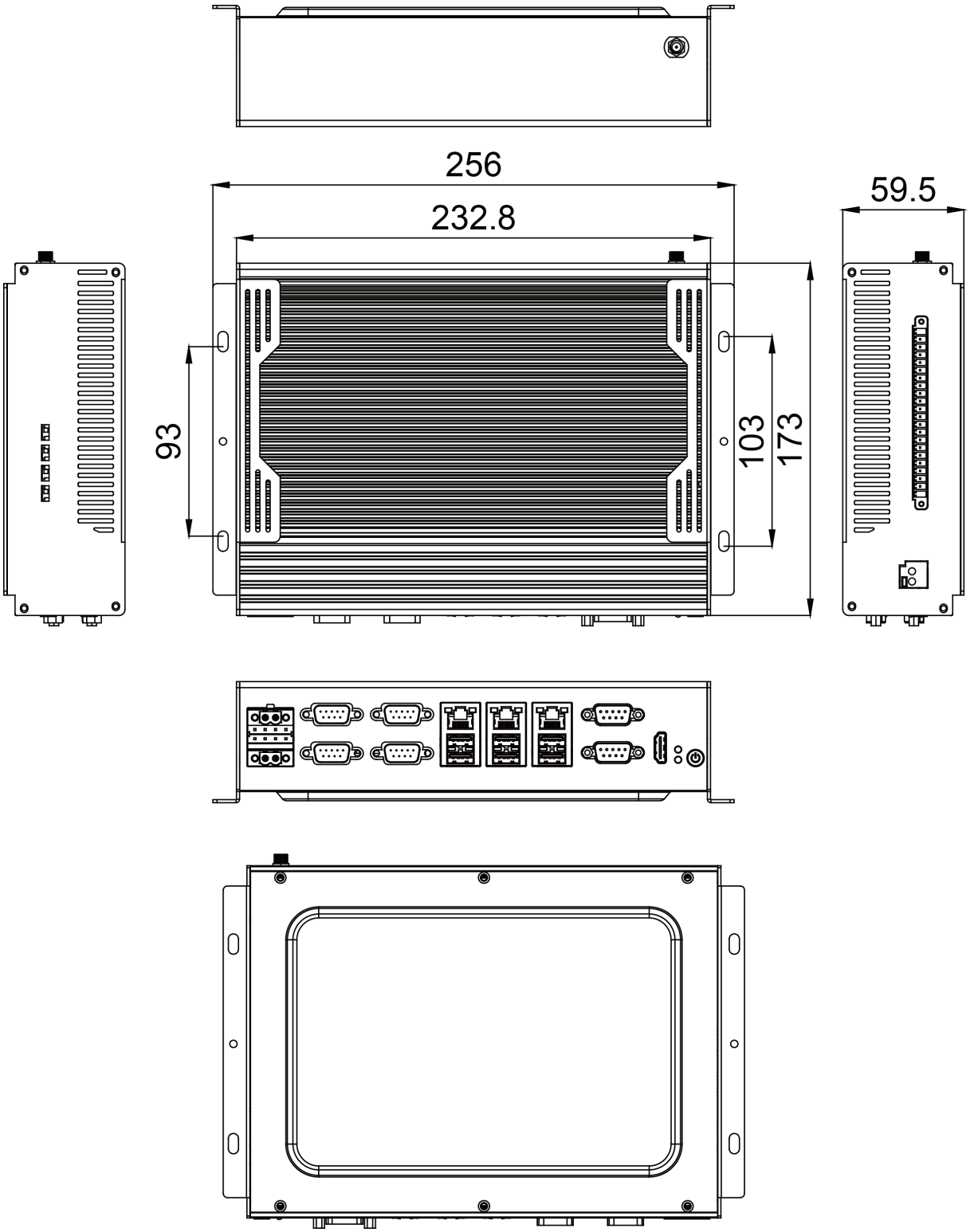
1.4.1 Product Features

- Supports 6/7/8/9/10/11th generation Intel ® Core ™ High performance CPUs such as i7/i5/i3 and Intel LGA 1151 pin pentium/Celeron
- Memory: DDR4-2400MHz, can support up to 32GB
- On board MSATA, M.2 interface
- 3 x 10/100/1000Mbps
- 4 x USB3.0,2 x USB2.0
- 4 x COM (DB-9), supports RS-232/485 mode selection, and RS485 supports automatic data flow control
- HDMI display interface
- Supports DC12~24V power input with overcurrent protection
- Fully enclosed structure, wireless cable design, with strong resistance to electromagnetic interference
- Wide temperature operation: -20~60 °C

1.4.2 Product Specifications

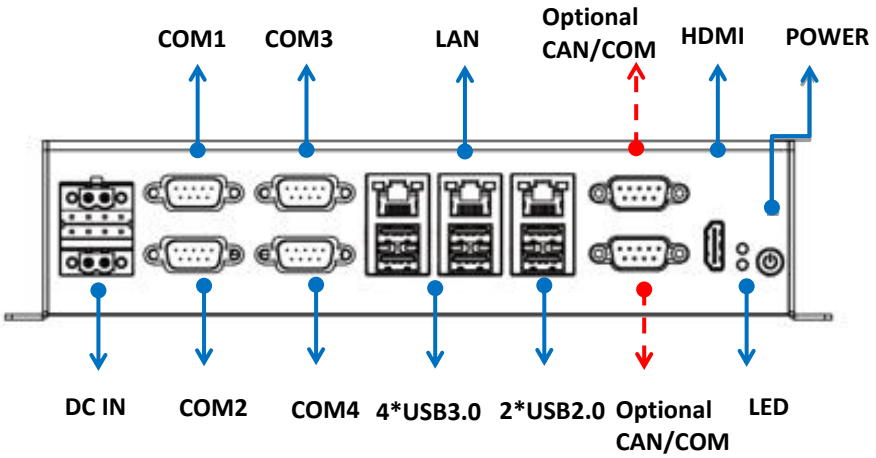
product Name		eBOX-3250	eBOX-3250-B
Hardware Configuration	CPU	Intel® Core™6/7/8/9th generation i7/i5/i3, Pentium/Celeron LGA1151 type CPU. （MAX CPU TDP 35W）	Intel® Core™10/11th generation i7/i5/i3, Pentium/Celeron LGA1200type CPU. （MAX CPU TDP 35W）
	BIOS	AMI UEFI 128Mbit	
	Chipset	H110	L520
	Memory	2 * SO-DIMM Slot, Up to 32GB	
	Storage	1 x mSATA,1 x M.2 Key-M Slot (NVME SSD, 2280)	
	USB	4 x USB3.0,2 x USB2.0	
	COM	4 x RS-232/RS-485 可选(COM1-4)	
	Expansion port	Optional 2 * CAN buses or 2 * RS232/485（COM5-6）	
	Ethernet	3x Intel GbE LAN	
	HDMI	Maximum resolution 4096 x 2160@30Hz	
	Watchdog	Programmable settings for levels 1-255	
Operating System	Microsoft Windows	Windows 7，Windows 10	
	Linux	Ubuntu	
Power Supply	INPUT VOLTAGE	DC12-24V ± 10%, overcurrent, overvoltage, and anti reverse connection protection	
	Overall Power Consumption	35W	
Mechanical Parameters	Structure	Fully enclosed aluminum profile shell	
	Size	(L)256mm x (W)173mm x (H)59.5mm	
	Net Weight	2Kg	
Environment	Operation Temperature	-20°C ~ 60°C(use SSD)	
	Storage Temperature	-40°C ~ 80°C (use SSD)	
	Relative Humidity	5~95% (non-condensing)	
	Vibrate	Using SSD: 5~500Hz, 1.5Grms, following IEC60068-2-64	
	Impact	Using SSD: 20G (duration 11ms, half sine wave), following IEC60068-2-27	
	EMC	CE/FCC Class B	

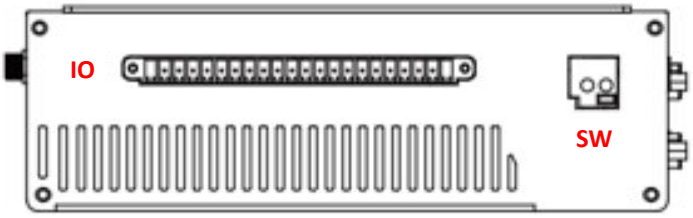
1.4.3 Product Size

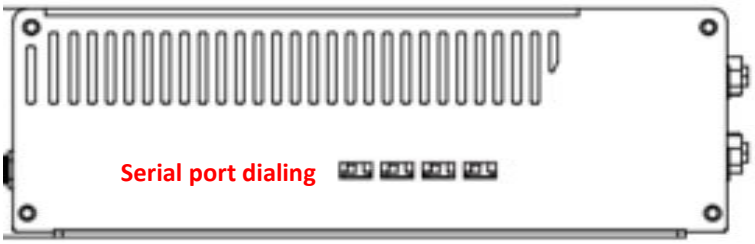


Picture 2.1 eBOX-3250 /eBOX-3250-B Dimension

1.4.4 Product Interface Definition



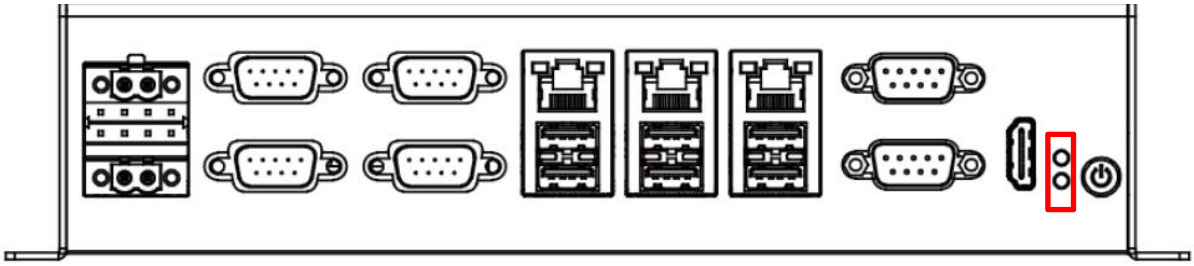




Picture 2.2 eBOX-3250/eBOX-3250-B Interface Definition

1.4.4.1 STATUS LEDs

The product provides two status leds on the front to indicate the status of the power and the storage disk operation

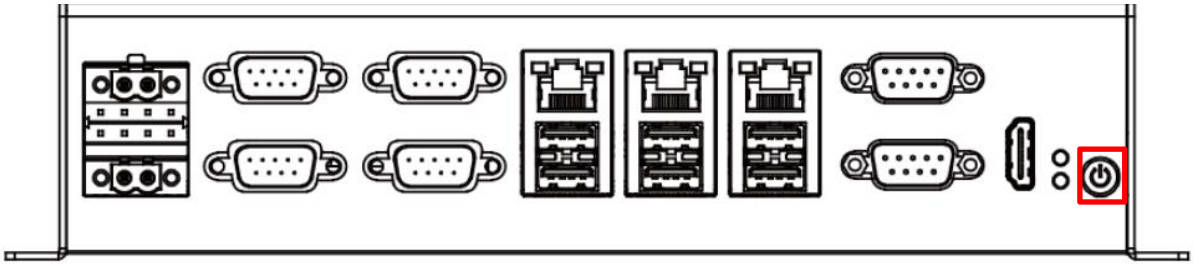


Picture 2.3 eBOX-3250/eBOX-3250-B LED

LED	Status	Description
Power Led	off	The product is power on
	on(Green)	The product is power off
Disk Led	blink(Orange)	The disk is reading or writing

1.4.4.2 Switch Button

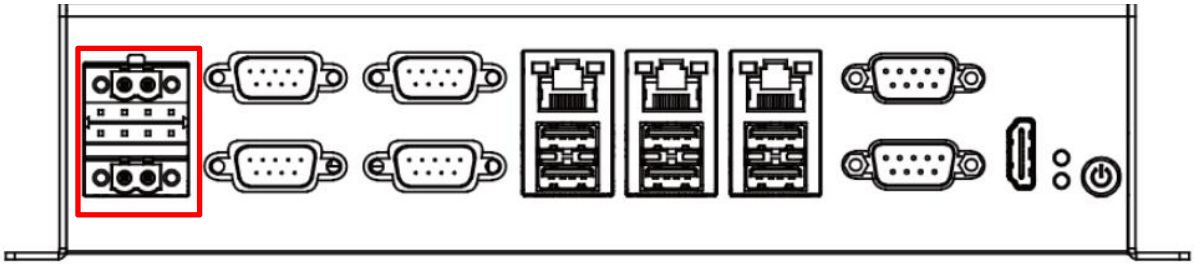
The product provides a power button with power led, which can be used to turn on or turn off the PC in the case of power supply is connected.



Picture 2.4 eBOX-3250/eBOX-3250-B Switch Button

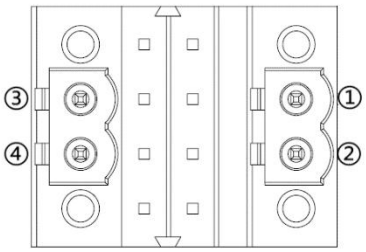
1.4.4.3 Power Interface

To ensure a reliable power connection, two 2-pin power input interfaces are provided on the front panel. Either of them can be used to power the industrial computer. The product support DC12V~24V wide voltage input. Must check the positive and negative pole marks on the housing before connecting to the power. Do not use mains connection (220V).



Picture 2.5 eBOX-3250/eBOX-3250-B Power terminal definition

The signal definition of the power input connector is as follows:

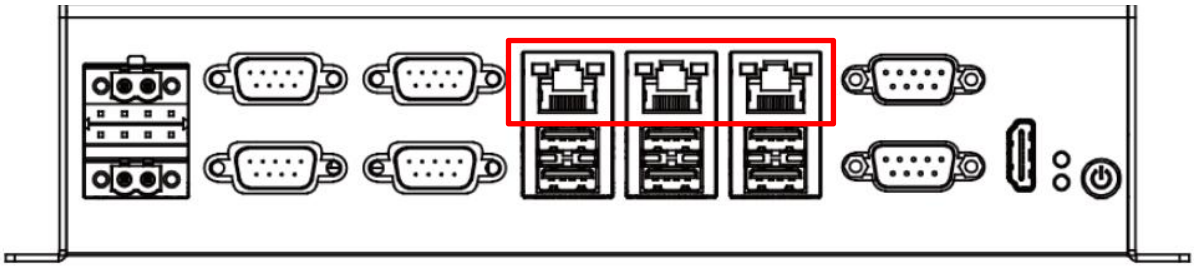


Pin No.	Signal
1	DC 12V-24V
2	GND
3	DC 12V-24V
4	GND

1. When connecting to the power supply, please confirm whether the output voltage of the power supply matches the power supply voltage of the PC.
2. Pay attention to the positive and negative pole markings over the case, do not connect them in reverse, otherwise it may cause hardware damage or electric shock.
3. Do not connect to this terminal using mains voltage (220V) directly .

1.4.4.4 Network interface：LAN1,LAN2，LAN3

The product provides three GbE Lan controllers, they are LAN1, LAN2 and LAN3.

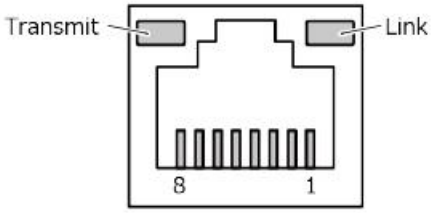


Picture 2.6 eBOX-3250/eBOX-3250-B Gigabit Ethernet

Items	Parameters
Network type	1000BASE-T/100BASE-TX/10BASE-T
Transmission speed*	1000M/100M/10M bps
Max. network path length	100m/segment

* Operation at 1000Mbps requires a category 5e or greater cable.

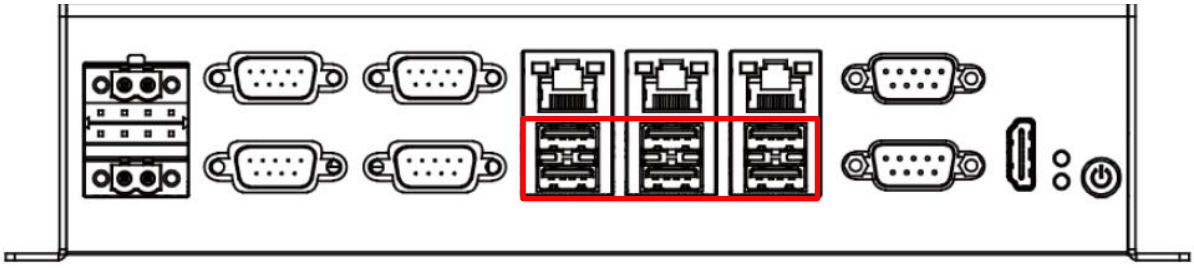
Network Port Signal Definition：



Pin No.	Signal Name	
	100BASE-TX	1000BASE-T
1	TX+	TRD+(0)
2	TX-	TRD-(0)
3	RX+	TRD+(1)
4	N.C.	TRD+(2)
5	N.C.	TRD-(2)
6	RX-	TRD-(1)
7	N.C.	TRD+(3)
8	N.C.	TRD-(3)

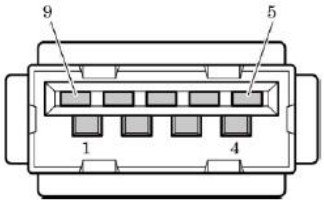
1.4.4.5 USB

The product provide 4 USB3.0 TYPE-A ports and 3 USB2.0 ports.



Picture 2.7 eBOX-3250/eBOX-3250-B USB

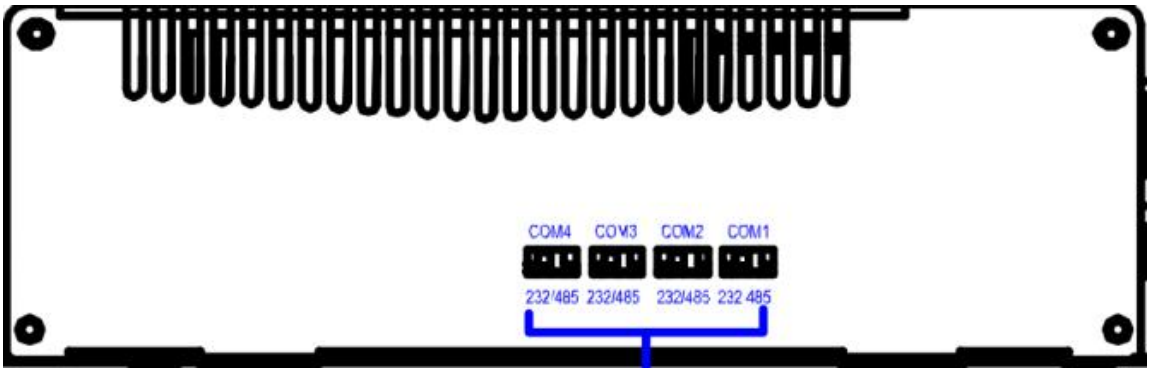
USB3.0 Connector pin definition:：



Pin No.	Signal
1	USB_VCC
2	DATA-
3	DATA+
4	USB_GND
5	SSRX-
6	SSRX+
7	USB_GND
8	SSTX-
9	SSTX+

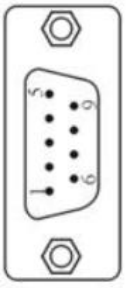
1.4.4.6 Serial port COM1- COM4

The product provide four serial ports, COM1-COM4, on the front. The serial ports use standard DB9-M terminal blocks, and can support RS232 or RS485 communication protocols (selected through the Dip switch at the bottom).



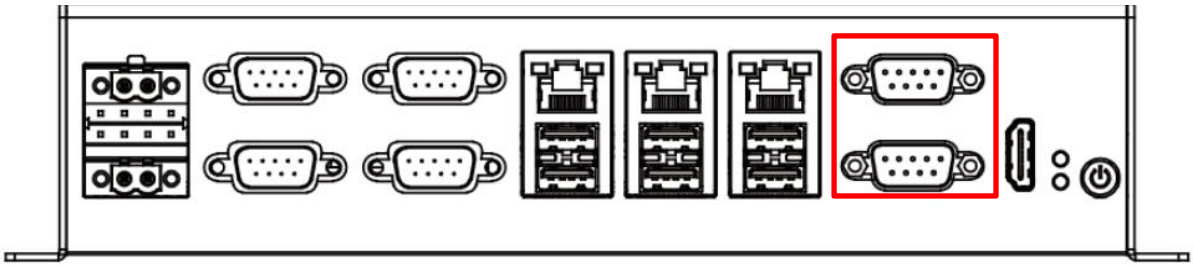
Picture 2.8 eBOX-3250/eBOX-3250-B Serial port interface

The serial signal definition of the DB9 male terminal of COM1-COM4 is as follows:

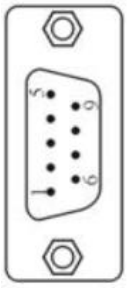
	Pin No.	Signal Name	
		RS232	RS485
 DB9 Male	1	N.C.	B
	2	RXD	A
	3	TXD	N.C.
	4	N.C.	N.C.
	5	GND	GND
	6	N.C.	N.C.
	7	RTS	N.C.
	8	CTS	N.C.
	9	N.C.	N.C.

1.4.4.7 Expansion port 5 - 6

The product option 2 CAN ports or additional 2 COM ports COM5-COM6. The ports use standard DB9-M terminal blocks.



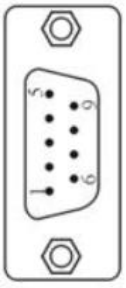
The CAN port signal of the DB9 male terminal of COM5-COM6 is defined as follows:



DB9 Male

Pin No.	Signal Name		
	RS232	RS485	CAN
1	N.C.	B	N.C.
2	RXD	A	CAN_L
3	TXD	N.C.	GND
4	N.C.	N.C.	N.C.
5	GND	GND	N.C.
6	N.C.	N.C.	GND
7	RTS	N.C.	CAN_H
8	CTS	N.C.	N.C.
9	N.C.	N.C.	N.C.

The COM port signal of the DB9 male terminal of COM5-COM6 is defined as follows:

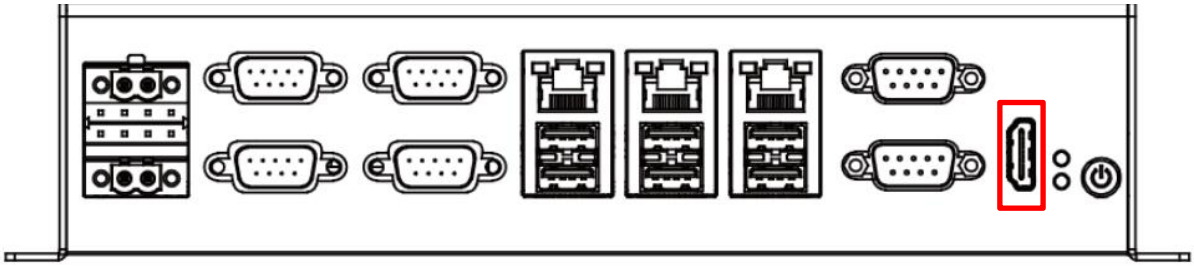


DB9 Male

Pin No.	Signal Name	
	RS232	RS485
1	N.C.	B
2	RXD	A
3	TXD	N.C.
4	N.C.	N.C.
5	GND	GND
6	N.C.	N.C.
7	RTS	N.C.
8	CTS	N.C.
9	N.C.	N.C.

1.4.4.8 Display Interface

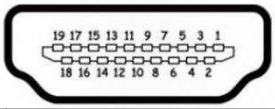
eBOX-3250 Provide standard HDMI video interface.



Picture 2.9 eBOX-3250/eBOX-3250-B Video Interface

1.4.4.8.1 HDMI

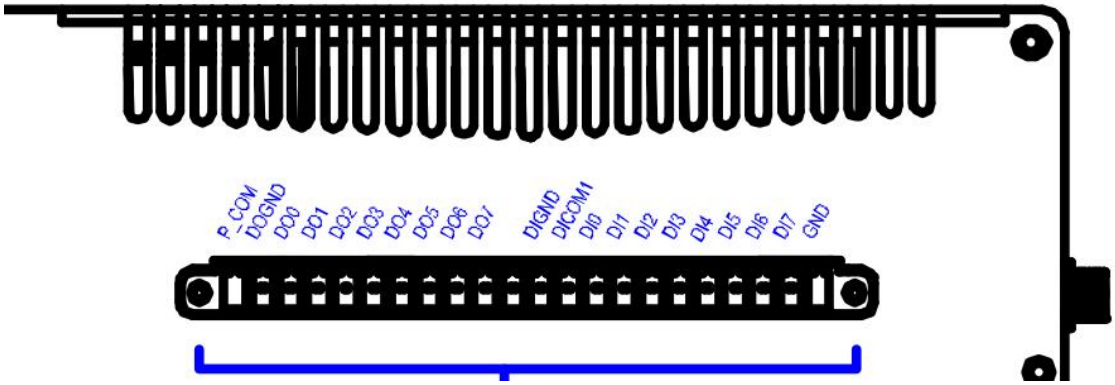
The device also has an HDMIA type high-definition multimedia video display interface, and the definition of terminal signals is as follows:

HDMI type A Connector			
Pin No.	Signal Name	Pin No.	Signal Name
1	TMDS DATA 2+	11	TMDS CLOCK SHIELD
2	TMDS DATA 2 SHIELD	12	TMDS CLOCK-
3	TMDS DATA 2-	13	CEC
4	TMDS DATA 1+	14	N.C.
5	TMDS DATA 1 SHIELD	15	DDC CLOCK
6	TMDS DATA 1-	16	DDC DATA
7	TMDS DATA 0+	17	GND
8	TMDS DATA 0 SHIELD	18	+5V PWR
9	TMDS DATA 0-	19	HOT PLUG DETECT
10	TMDS CLOCK+		

:

1. When HDMI is not connected before restarting BIOS settings, the monitor may not be able to display relevant content, and then the startup information will be displayed when the system boots.
2. When using HDMI, the working environment temperature should be between 0 and+45°C.

1.4.4.9 Quarantine DIO



Picture 2.1-1 4 eBOX-3250/eBOX-3250-B DIO

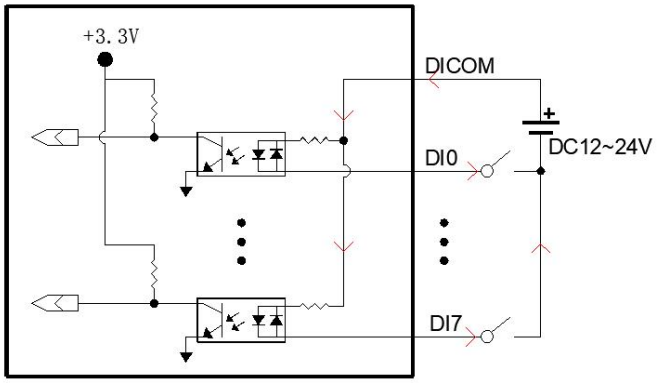
The DIO signal of the Phoenix terminal is defined as follows:：

Pin No.	Signal Name	Pin No.	Signal Name
1	PCOM	2	DOGND
3	DO0	4	DO1
5	DO2	6	DO3
7	DO4	8	DO5
9	DO6	10	DO7
11	DI-24V	12	DIGND
13	DICOM	14	DI0
15	DI1	16	DI1
17	DI3	18	DI3
19	DI5	20	DI5
21	DI7	22	GND

1.4.4.9.1 DI

The expansion board provides 8-Channel DI, and the user can choose the dry and wet contact connection method for DI. The wiring must follow the wiring diagram.

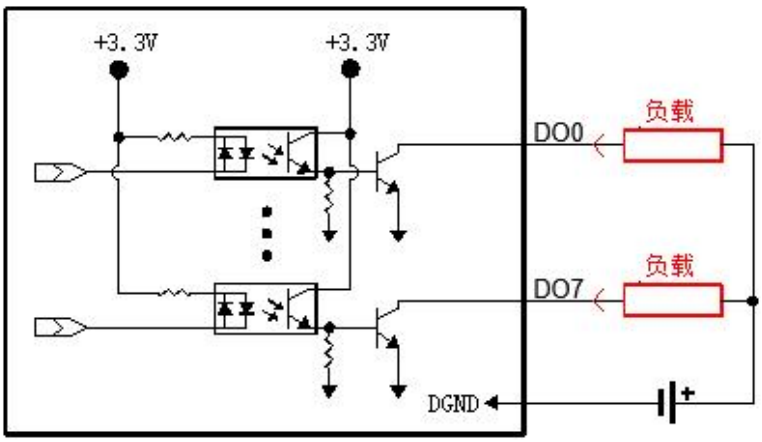
- When wet contacts are used, the NPN wiring method is shown in the figure:



Notice：When bidirectional optocoupler is used, DICOM/DI0-7 can be connected in reverse..

1.4.4.9.2 DO

The expansion board provides 8-way DO, which is an OC gate output with a single channel overcurrent capacity of 0.3A.



Notice:

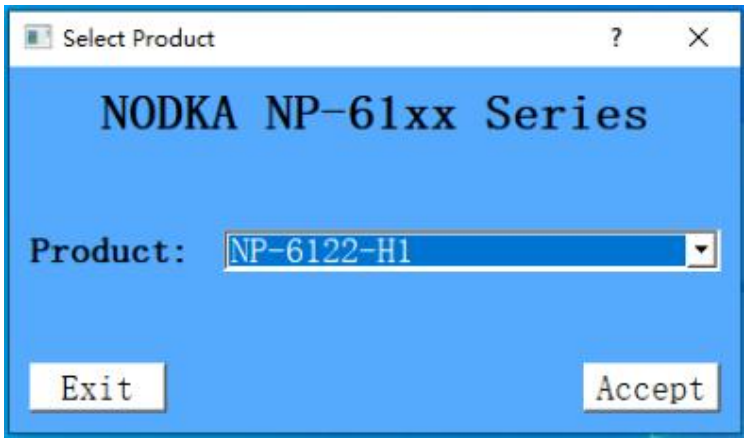
PCOM port, connected when using inductive loads, integrated with freewheeling diode to protect circuits and components.

1.4.4.10 Isolation of DIO upper computer software and API usage

1.4.4.10.1 Upper computer installation

- Using the latest installation package, choose to install the upper computer program

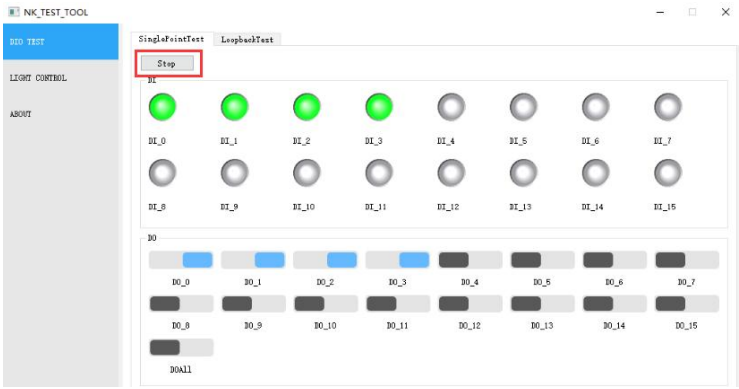
- After successful installation, select the corresponding model to open the program, as shown in the following figure:



- After opening the program, click on the "star" button to test

The LED of the corresponding channel will light up green, if DI has an input signal..

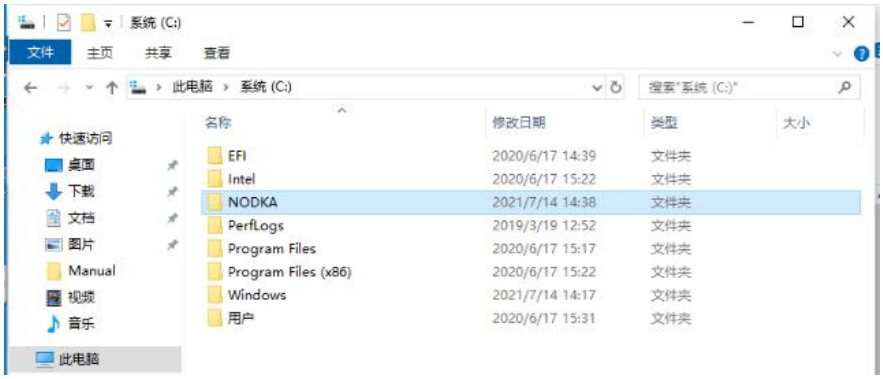
1. DO manual setting output, OC gate output switch signal



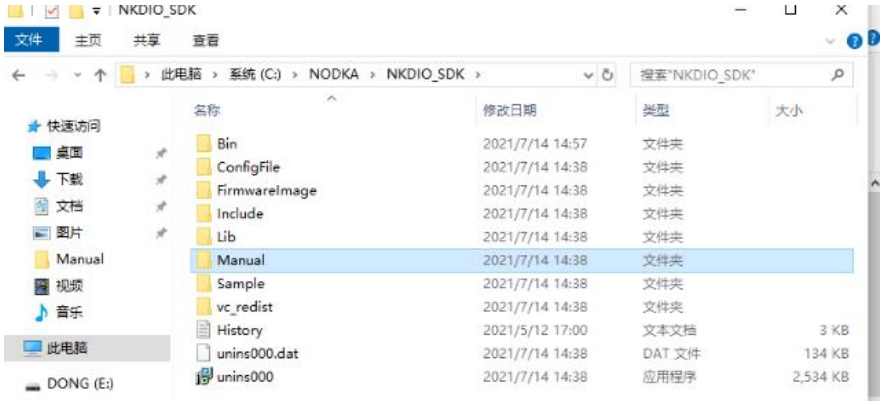
- After testing, click on "stop" and exit.

1.4.4.10.2 IO API usage

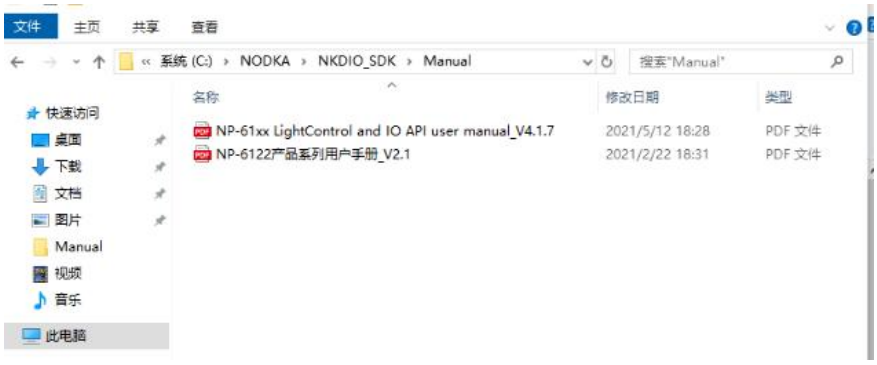
- In the system disk "C" subdirectory file: NODKA, find the corresponding requirement file.



- Open the "NODKA" file and the visible directory folder is as follows:



- There is a corresponding IOAPI call description in the folder "Manual", as shown in the following figure:



- There are function application examples in the folder "Sample", as shown in the following figure

NOTICE:

The corresponding files used for IO calls are all in NODKA ->NKDIO_ Found in the SDK folder. If you have any questions, please consult technical personnel.

Chapter 3 BIOS Settings

1.5 Introduction to this Chapter

This section describes how to use AMI's BIOS configuration program to set up your system. Setting BIOS parameters correctly can ensure stable and reliable operation of the system, while also improve the overall performance of the system. Improper or even incorrect BIOS parameter settings can greatly reduce the system's performance, making it unstable or even unable to function properly.

When the BIOS setting content in CMOS is damaged, the system will also request to enter the BIOS setting program. All setting values modified through BIOS are also saved in the system's CMOS memory, which is powered by the battery. Even if the external power supply is cut off, its content will not be lost unless an operation to clear the CMOS content is performed.

1.6 Boot BIOS Settings

When the system is powered on and turned on normally, you can see the message prompted to enter the BIOS setup program.

Press <DEL> or <ESC> to enter setup.

At this point (invalid for other times), press the key specified in the prompt message (usually the<Del>key) to enter the BIOS setup program.

If this prompt message has disappeared but the BIOS setup system needs to be re-entered, the computer needs to be powered off and restarted, or the system needs to be reloaded using the<Ctrl>+<Alt>+<Delete>key combination. Follow the above prompt message to re-enter the BIOS setup interface.

1.7 BIOS Setup Method

Usually, you can select the Settings tab through the arrow keys on the keyboard, enter the Settings tab with the<Enter>key, switch between the "+" and "-" keys, obtain help information with the<F1>key, and exit the Settings tab with the<Esc>key.

Please refer to the table below for details.

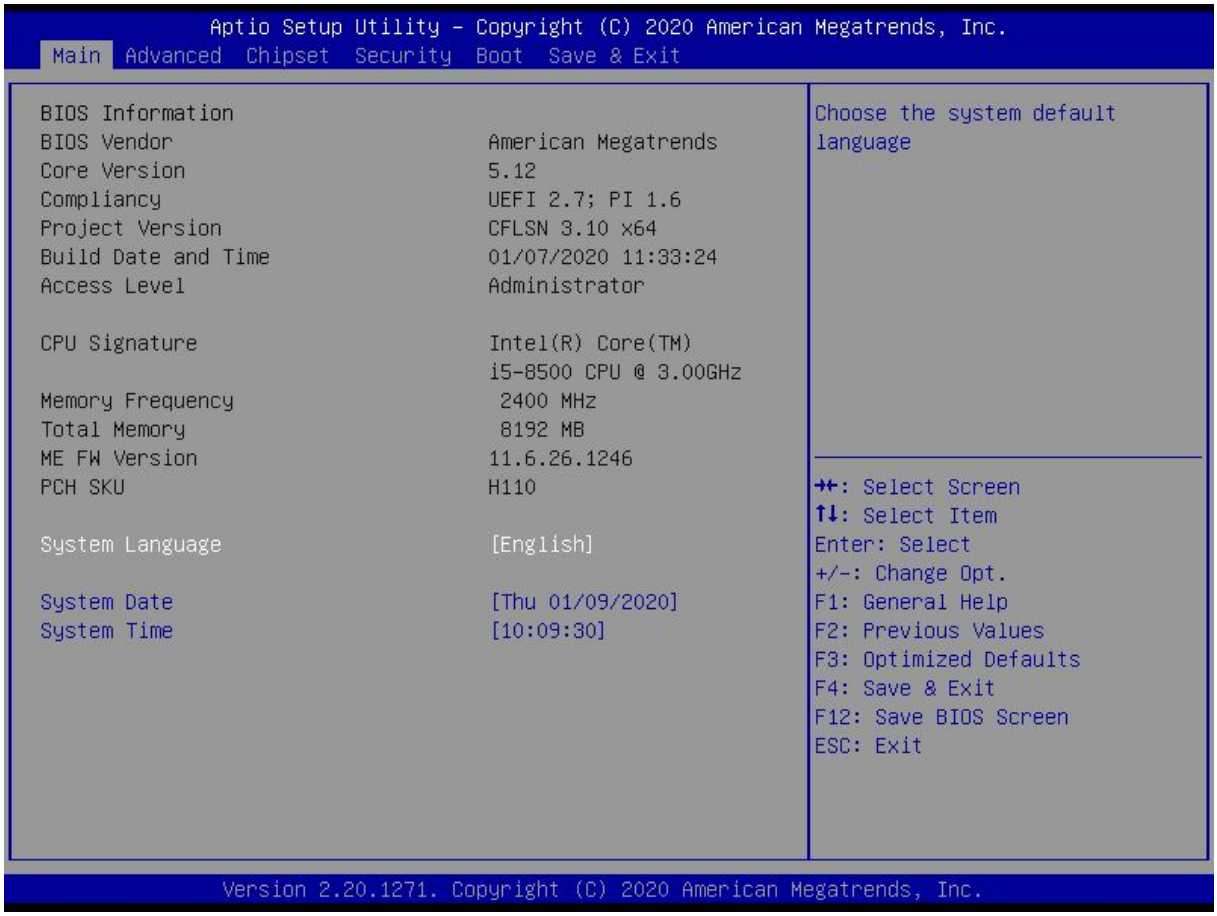
Key	Function Description
< ↑ >	Move one item forward
< ↓ >	Move one item back
<← >	Move one item to the left (main menu item)
<→>	Move one item to the right (main menu item)
<Esc>	Exit or return to the main interface
<Enter>	Enter Selection
< + >	Add or change options
< - >	Reduce or change options
< F1 >	Get help information
< F2 >	Load previous settings from CMOS
< F3 >	Load default optimization settings
< F4 >	Maintain the set values and exit the BIOS setup interface

1.1 BIOS Settings

：Due to the BIOS program being updated from time to time, the following BIOS setup interface and description are for reference only.

1.1.1 BIOS Main Interface

Once entering the BIOS setup system, the Main interface will be displayed.



Picture 3.4-1 BIOS-Main

The following menu items can be switched through the<←>and<→>directional keys on the keyboard:

- **Main**
  - In this menu, you can view basic system configuration information, set language, and system time.
- **Advanced**
  - In this menu, specific system functions can be set.
- **Chipset**
  - In this menu, you can set the functions of the system on a chip set.
- **Security**

- In this menu, you can set password protection and other security functions for the system.

➢ **Boot**

- In this menu, the system startup order can be set.

➢ **Save & Exit**

- In this menu, you can load or save settings and exit the BIOS setup system.

1.1.2 Main

This interface is mainly used to confirm the basic configuration information of the system.

- Display items

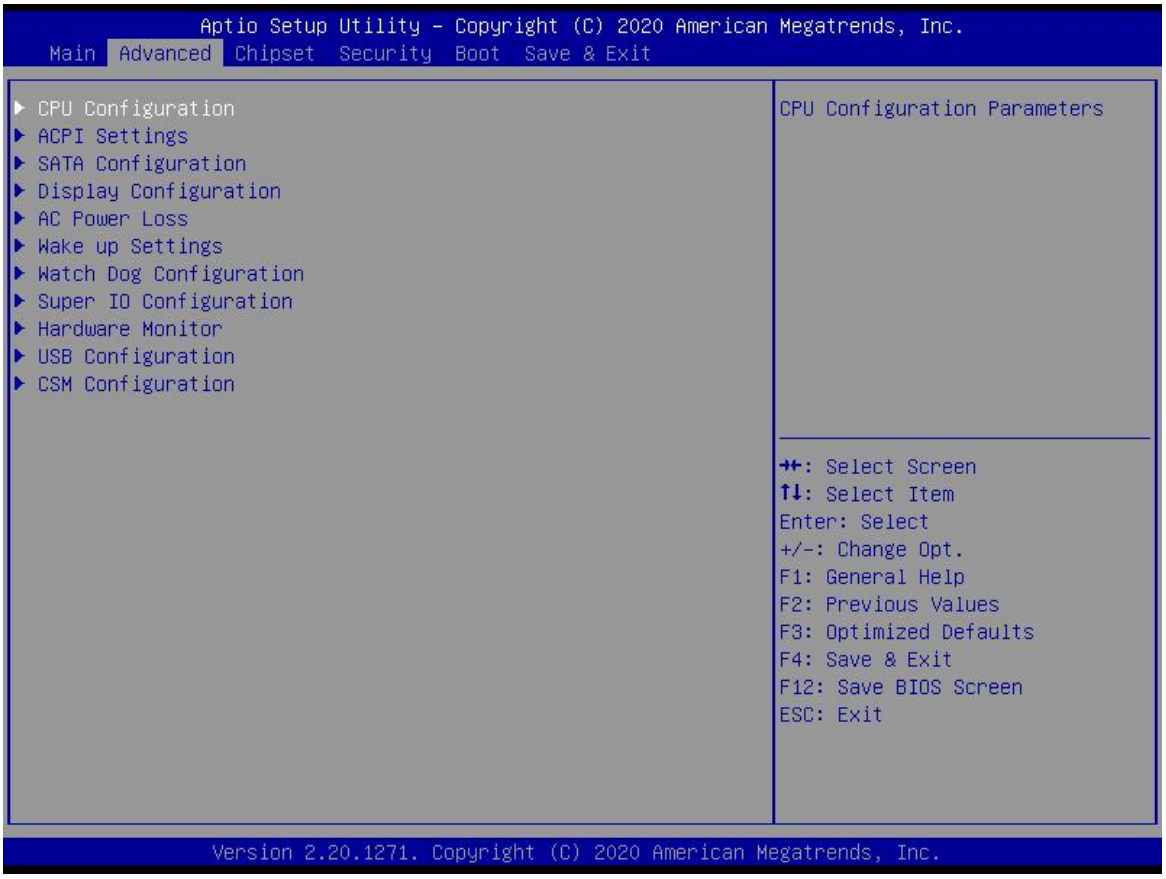
Project	Content	Describe
Project Version	xxxxx x.xx x64	BIOS version
Build Date and Time	xx/xx/xxxx xx:xx:xx	Creation time of BIOS

- Settable items

Project	Content	Describe
System Language	[English]	Set the language of BIOS, default English version
System Date	Week Day Month / Day / Year	Set the date of the system
System TIme	Hour : Minute : Second	Set the time for the system

1.1.3 Advanced

In this menu, set the detailed functions of the system, and the functional items that can be set are as follows:



Picture 3.4-2 BIOS-Advanced

- CPU Configuration
  - The main function of this item is to display specific information and configuration items of the CPU.
- ACPI Settings
  - This is a setting item related to ACPI (Advanced Configuration and Power Management Interface).
- SATA Configuration
  - The main function of this item is the setting of SATA.
- Display Configuration
  - The main function of this item is display configuration.
- AC Power Loss
  - The main function of this item is power management settings.
- Wake up settings
  - The main function of this item is to set the system's sleep and wake-up functions.
- Watch Dog Configuration
  - This is the setting of the system's watchdog.
- Super IO Configuration
  - This is the setting of IO parameters for the system.
- Hardware Monitor

- The main function of this item is to display hardware monitoring parameters such as CPU temperature.

➢ USB Configuration

- The main function of this item is to set up the USB interface.

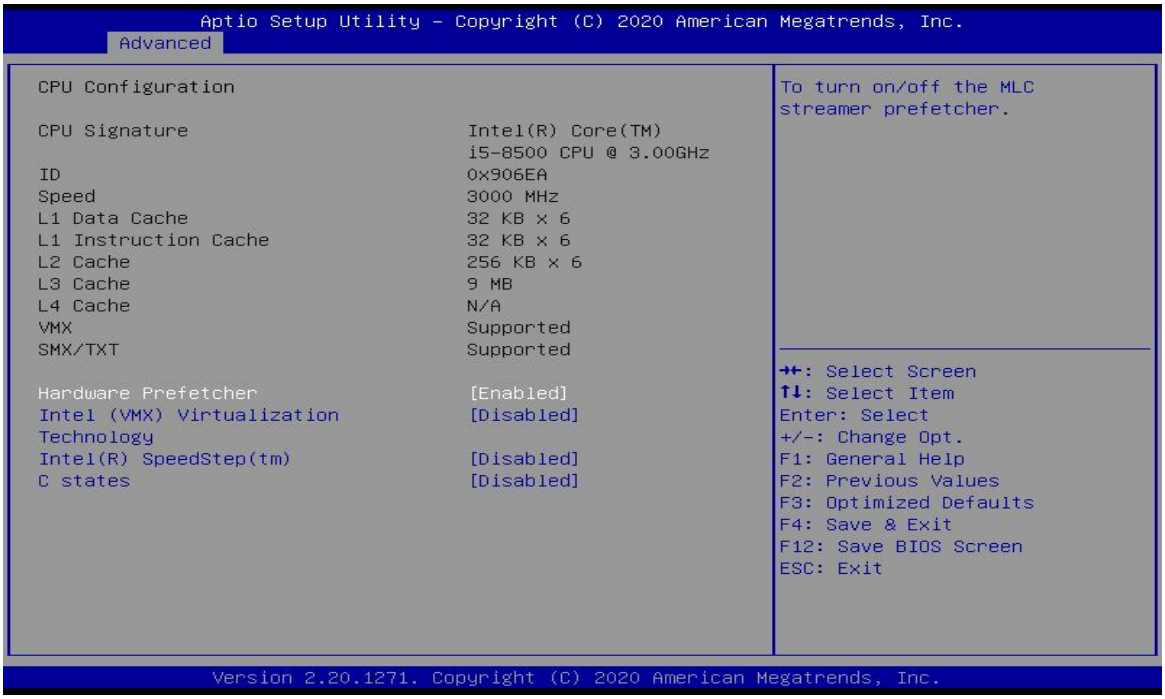
➢ CSM Configuration

- This is the setting for the Compatibility Support Module. This option is specifically designed for compatibility with devices that can only work in Legacy mode and operating systems that do not support or cannot fully support UEFI.

: Please set it carefully under the guidance of technical support. Improper setting may cause the system to fail to start or hardware damage!

1.1.3.1 CPU Configuration

In this interface, you can view CPU configuration information and make relevant settings for the CPU.



Picture 3.4-3 BIOS-CPU Configuration

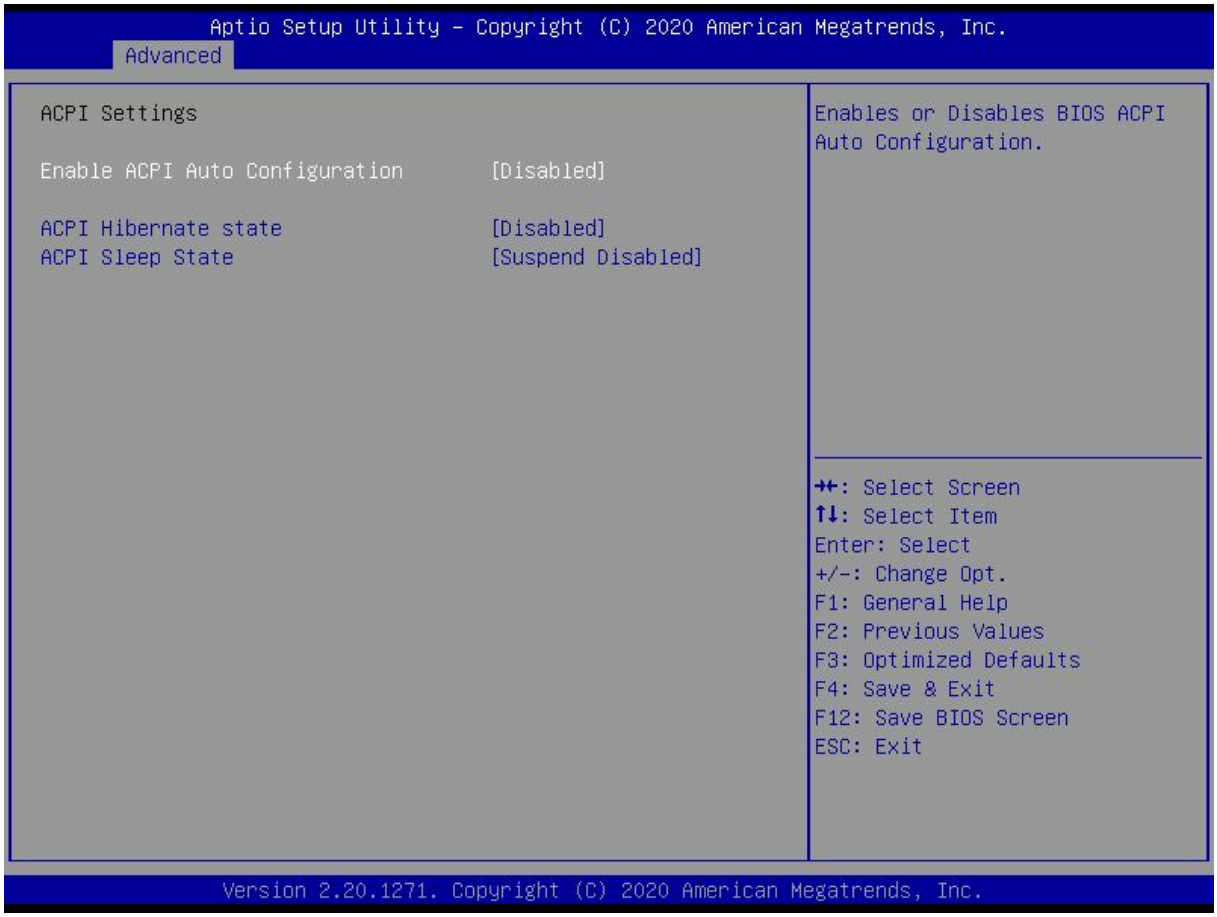
- **CPU Configuration:**

Project	Content	Describe
Hardware Prefetcher	Disabled / Enabled	The hardware prefetching option refers to the CPU having hardware prefetching function. Before the CPU processes instructions or data, it prefetches them from memory to the L2 cache, thereby reducing memory read time, helping to eliminate potential bottlenecks, and improving

		system performance. It is usually recommended to set it to Enabled.
Intel (VMX) Virtualization Technology	Disabled / Enabled	Intel virtualization technology, which allows a CPU to work like multiple CPUs running in parallel, making it possible to run multiple operating systems simultaneously within a computer. Normally set to Disabled state.
Intel(R) SpeedStep(tm)	Disabled / Enabled	This option is Intel's intelligent frequency reduction technology, where the CPU automatically adjusts voltage and frequency doubling based on usage to reduce power consumption and heat generation. The state needs to be set to Disabled.
C states	Disabled / Enabled	It refers to the standby state of the CPU, which adjusts the clock and voltage according to different states, or completely turns off. It needs to be set to Disabled.

1.1.3.2 ACPI Settings

In this interface, you can set the relevant parameters of ACPI (Advanced Configuration and Power Management Interface).



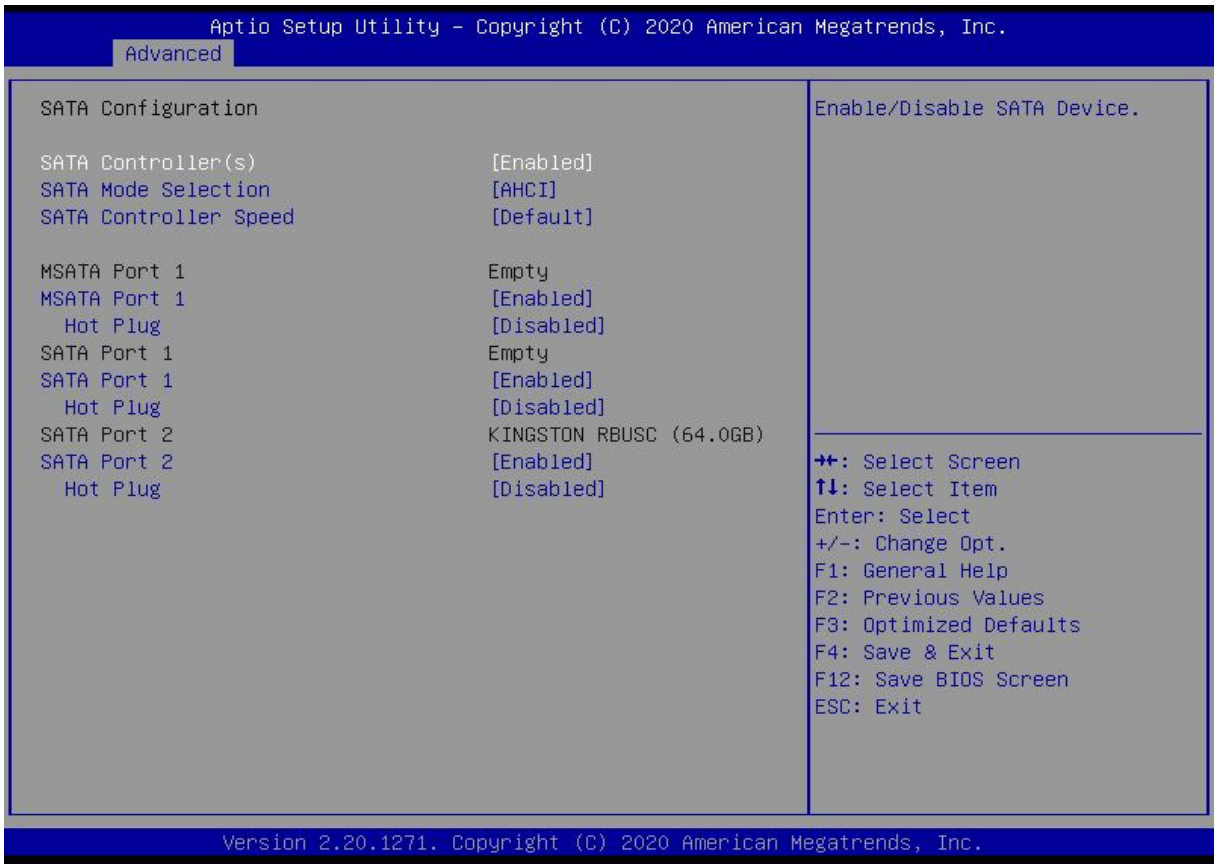
Picture 3.4-4 BIOS ACPI Settings

- **ACPI Settings:**

Project	Content	Describe
Enable ACPI Auto Configuration	Disabled / Enabled	Allow ACPI automatic configuration. Usually set to Disabled state.
ACPI Hibernate state	Disabled / Enabled	Allow ACPI to enter Hibernate mode. Usually set to Disabled.
ACPI Sleep state	Suspend Disabled	Allow ACPI to enter sleep mode. The default is Suspend Disabled.

1.1.3.3 SATA Configuration

In this interface, SATA controllers can be configured.



Picture 3.4-5 BIOS SATA Configuration

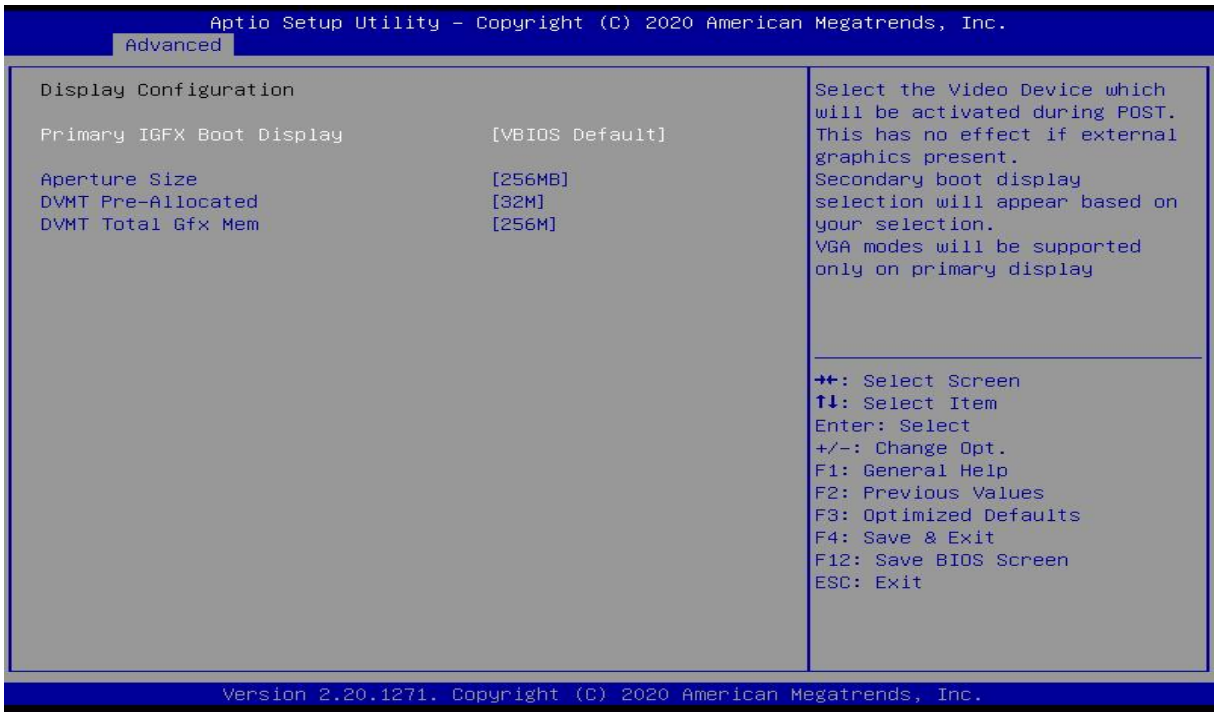
■ SATA Configuration:

Project	Content	Describe
SATA Controller(s)	Disabled / Enabled	Whether to use the SATA interface controller. If change, you may need to reinstall the system, do not change this item.
SATA Mode Selection	AHCI	Please do not change the access mode of SATA.
SATA Controller Speed	Default/Gen1/Gen2/Gen 3	The access speed of the SATA controller. Do not change this item.
MSATA Port 1	-	Whether to enable the MSATA Port 1 interface and display the mSATA hard drive information connected to the MSATA Port 1 interface.
SATA Port 1	-	Whether to enable the MSATA Port 2 interface and display the information of the SATA hard drive connected to the SATA Port 1 interface.

SATA Port 2	-	Whether to enable the SATA Port 2 interface and display the information of the SATA hard drive connected to the SATA Port 2 interface.

1.1.3.4 Display Configuration

In this interface, you can set the parameters related to the integrated graphics card.



Picture 3.4-6 BIOS-Display Configuration

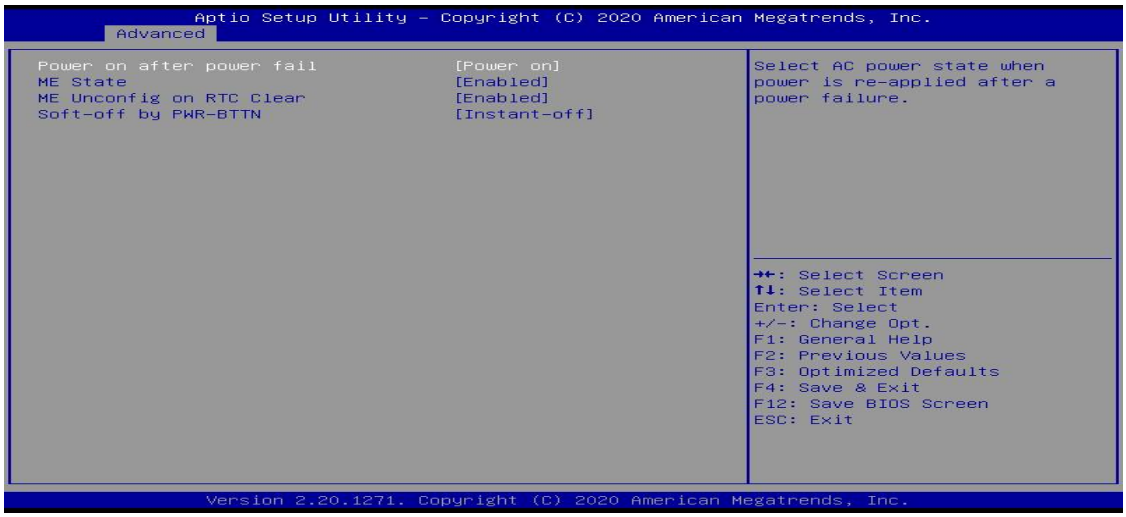
■ **Display Configuration:**

Project	Content	Describe
Primary IGFX Boot Display	VBIOS Default / DVI / HDMI / VGA	Indicates which device is connected to the integrated graphics card during the POST self check at startup. The default is VBIOS.
Aperture Size	128MB/256MB/512MB/1024MB/2048MB	This parameter is the maximum memory limit that the integrated graphics card can call when necessary. Just keep it as default, do not change it.
DVMT Pre-Allocated	0-60M	This parameter is the default value for dynamic shared

		graphics memory, which refers to allocating this size of memory as graphics memory when the system starts up. If it is not enough, it will be allocated again. Default is 32MB.
DVMT Total Gfx Mem	256M/128M/MAX	The total allocated dynamic memory capacity is 256M by default, please do not change it arbitrarily.

1.1.3.5 AC Power Loss

In this interface, you can set the power on self start.



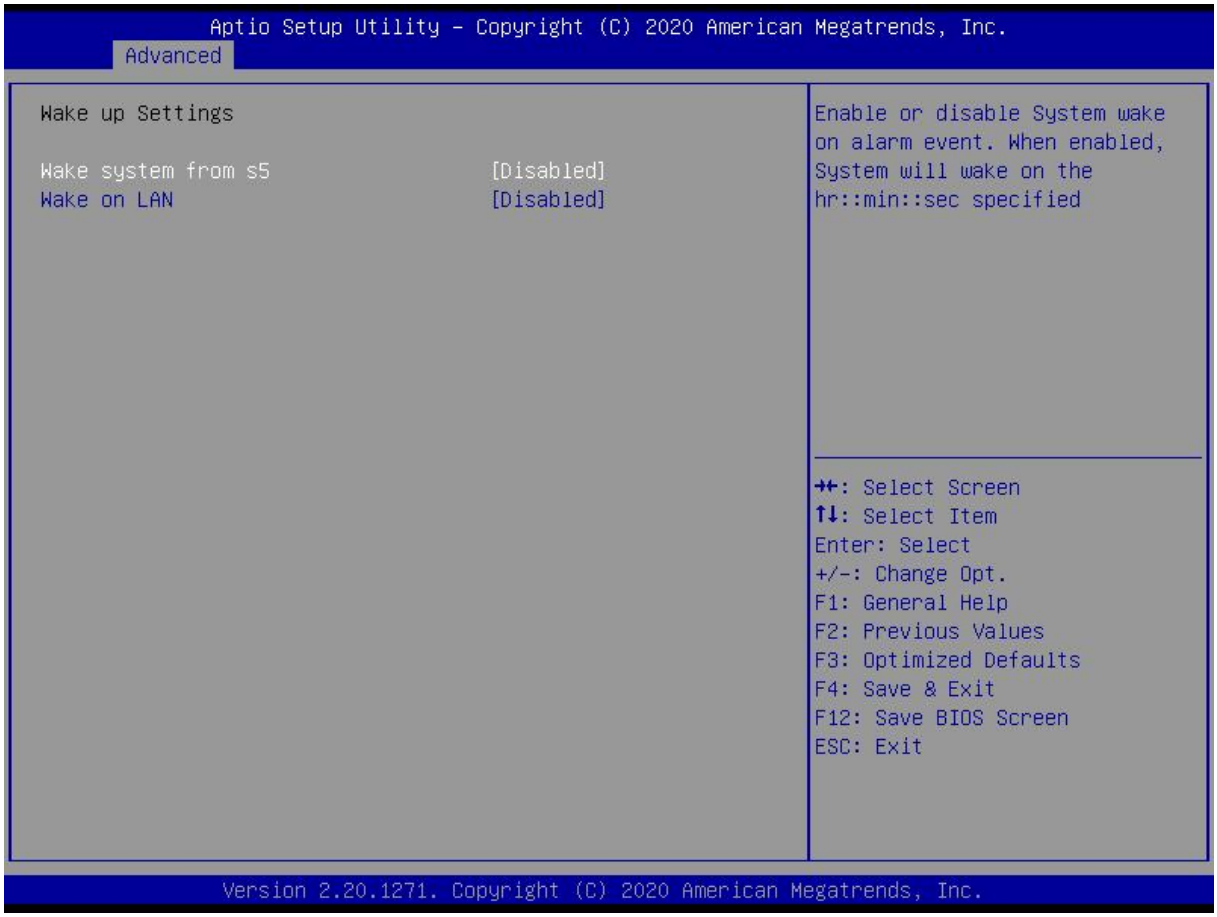
Picture 3.4-7 BIOS-AC Power Loss

Project	Content	Describe
Power on after power fail	Power off / Power on / Last status	Indicates the power-on status of the motherboard after reconnecting the power supply. - Power off：Regardless of the state of the last power outage, if the motherboard suddenly powers up after a power outage, the motherboard will not power on; - Power on ：Regardless of the state

		of the last power outage, if the motherboard suddenly powers up after a power outage, the motherboard will automatically power on and start up; - Last State ： Sudden power supply after power outage on the motherboard, restoring the state before power outage
ME State	Enabled / Disabled	Do not change this item.
ME Unconfig on RTC Clear	Enabled / Disabled	Do not change this item.
Soft-off by PWR-BTTN	Delay 4 sec / Instant-off	- The method of turning off the computer when clicking "Turn Off Computer" or running the shutdown command in the system. The default is Instant off mode. - Delay 4 sec：Delay shutdown by 4 seconds; - Instant-off：Shut down immediately.

1.1.3.6 Wake up settings

This interface sets the wake-up mode of the system in sleep mode.



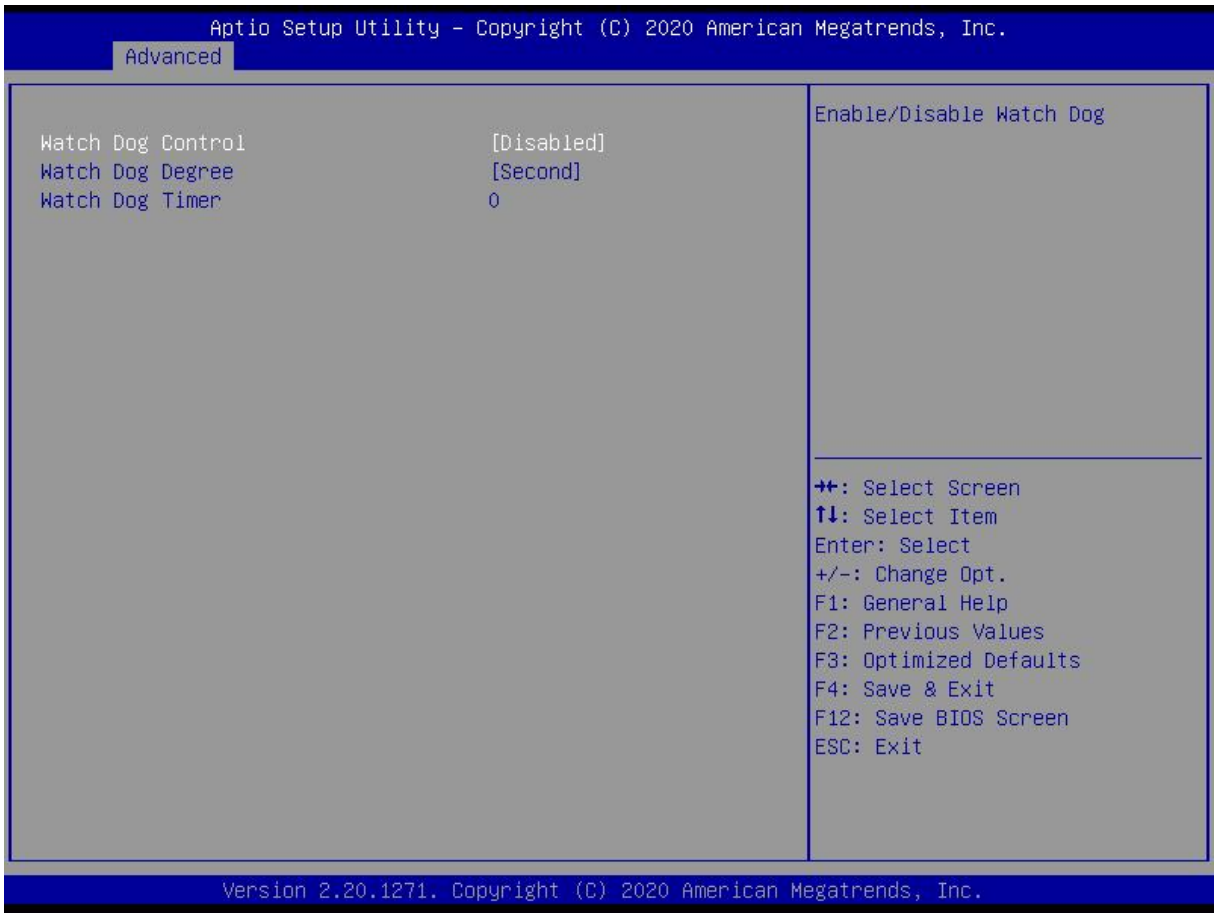
Picture 3.4-8 BIOS-Wake up Settings

- **Wake up Settings:**

Project	Content	Describe
Wake system form s5	Enabled / Disabled	Do not change this item.
Wake on LAN	Enabled / Disabled	Do not change this item.

1.1.3.7 Watch Dog Configuration

In this interface, you can turn on the system's watchdog timer and set its parameters.

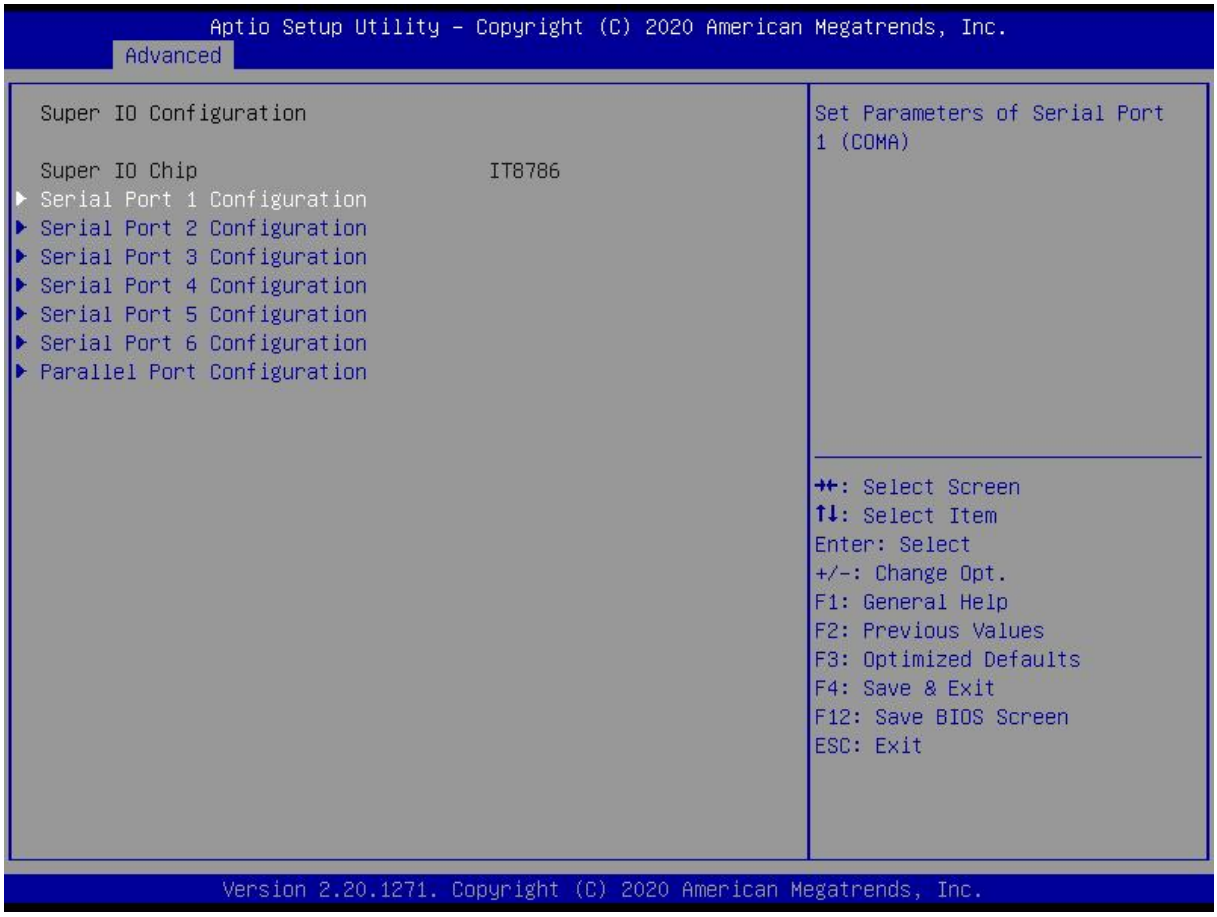


Picture 3.4-9 BIOS-Watch Dog Settings

Project	Content	Describe
Watch Dog Control	Enabled / Disabled	The watchdog timer function is turned on and off.
Watch Dog Degree	Second / Minute	The set value unit of the watchdog timer.
Watch Dog Timer	0-255	Watchdog timer timeout setting. When the timer is turned on, the software needs to periodically feed the dog (reset the timer). When the timer time exceeds the set value, the system will be reset and restarted.

1.1.3.8 Super IO Configuration

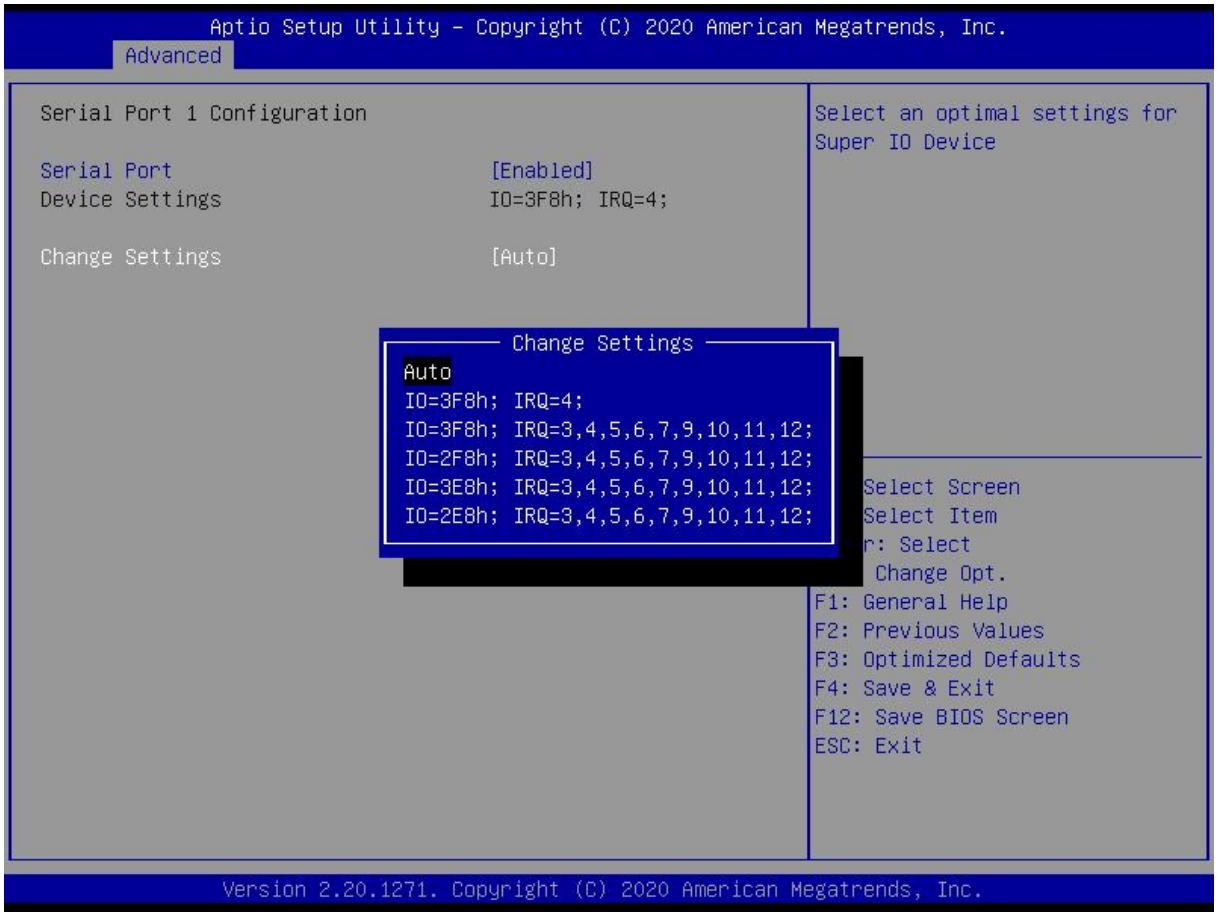
In this interface, the main configuration is for Super IO, which includes the configuration of Serial Port x and Parallel Port.



Picture 3.4-1 0 BIOS-Super IO Configuration

1.1.3.8.1 Serial Port x Configuration

In this sub interface, it is mainly used to set the interrupt and IO address of the serial port. The settings include Auto, IO, and interrupt address.



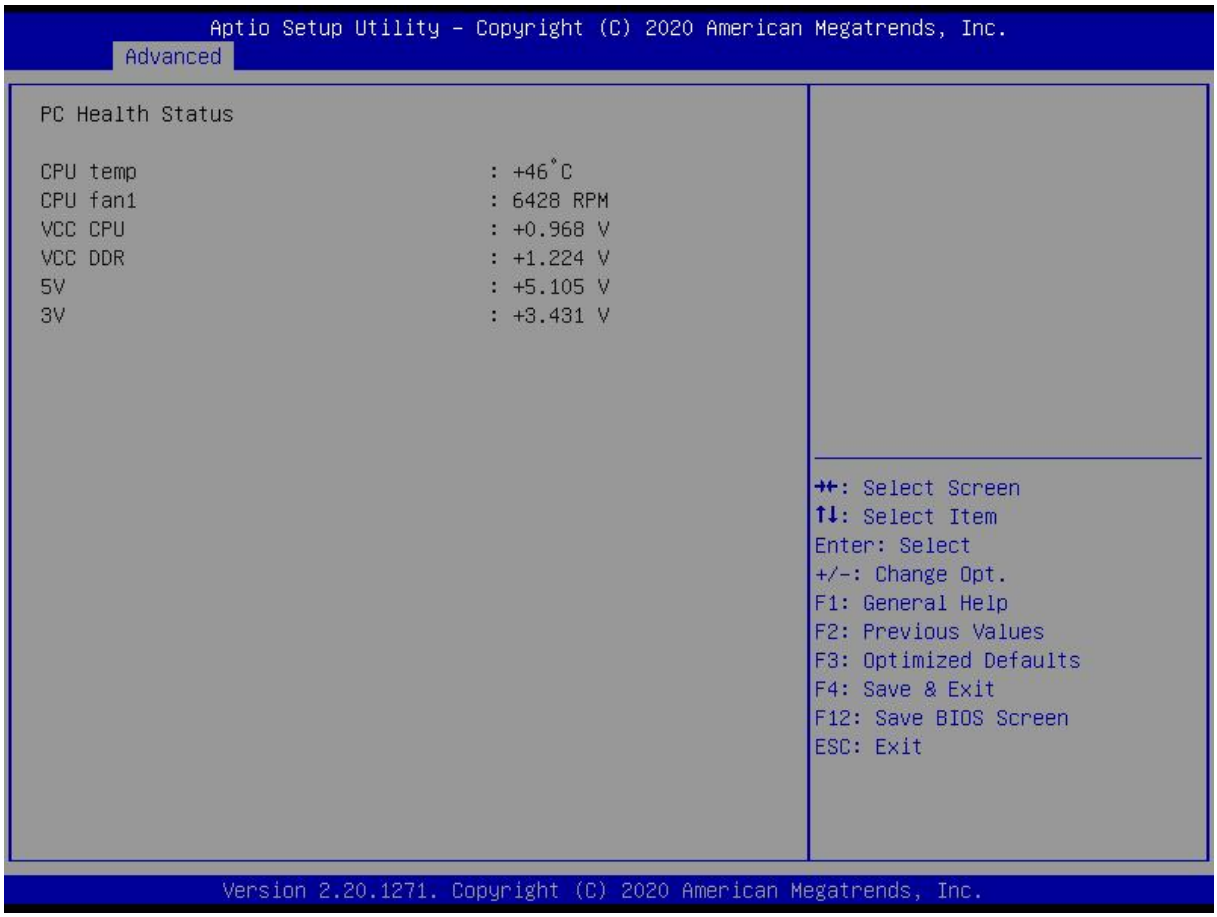
Picture 3.4-1 1 BIOS-Serial Port Configuration

- **Serial Port x Configuration:**

Project	Content	Describe
Serial Port	Enabled / Disabled	Enabling and disabling the serial interface
Device Settings	IO=3F8h; IRQ=4	IO address and interrupt priority of the serial port
Change Settings	Change Settings Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Setting the address and interrupt priority of the serial port. The default is Auto.

1.1.3.9 Hardware Monitor

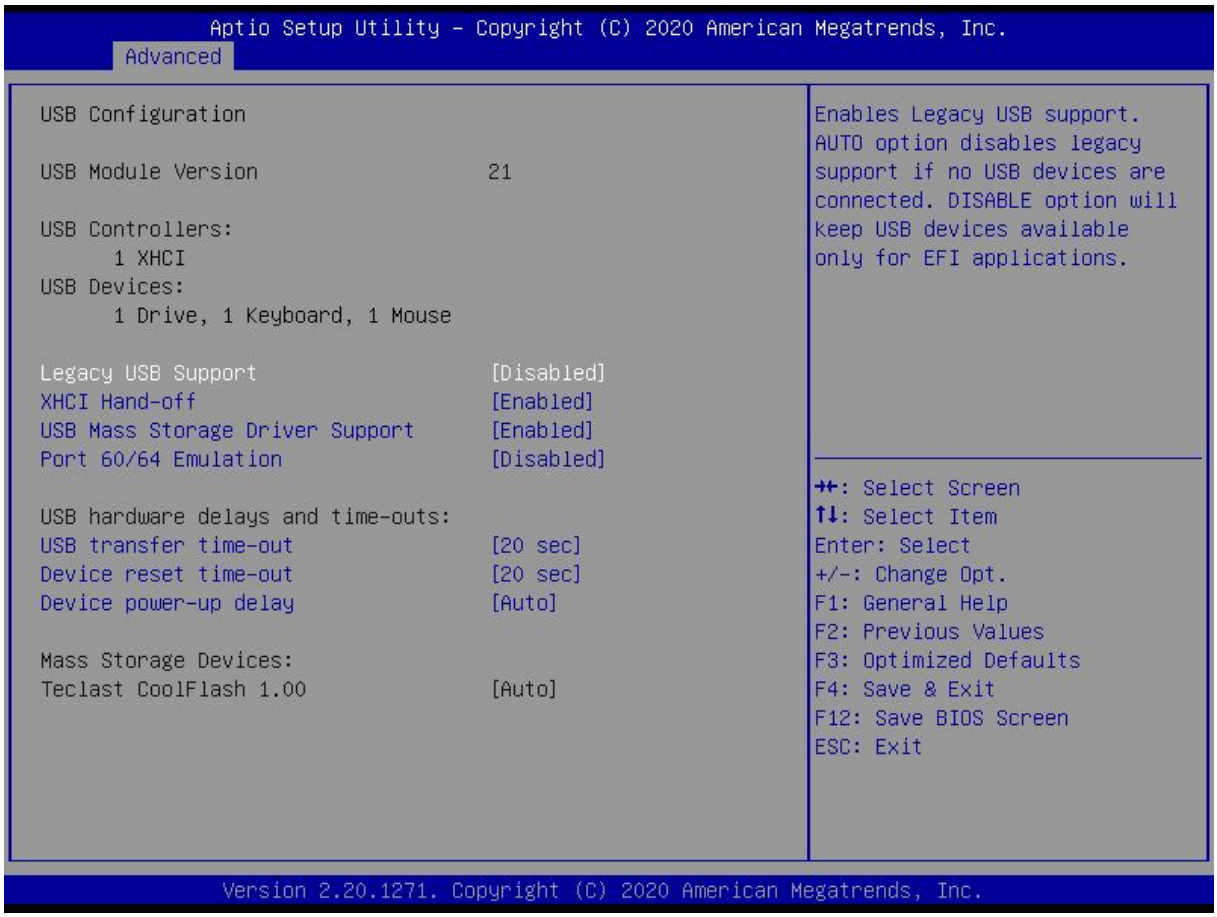
This interface is mainly used for hardware detection of the system.



Picture 3.4-1 2 BIOS-Hardware Monitor

1.1.3.10 USB Configuration

In this interface, the main configuration is for the USB controller interface.



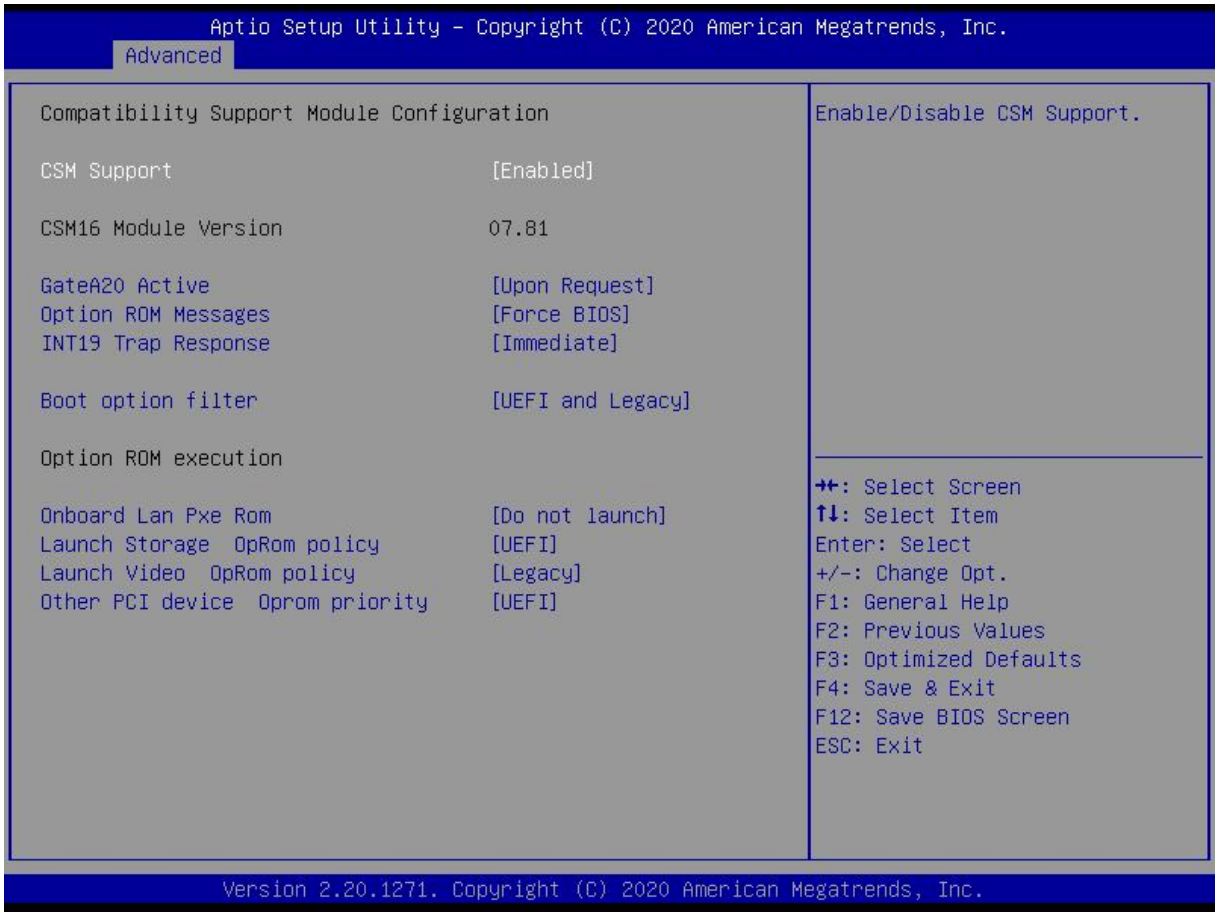
Picture 3.4-1 3 BIOS-USB Configuration

- **USB Configuration:**

Project	Content	Describe
Legacy USB Support	Enabled / Disabled / Auto	Configure whether USB keyboards and similar devices can be used with older operating systems (such as MS-DOS).
XHCI Hand-off	Disabled / Enabled	Do not change this setting.
USB Mass Storage Driver Support	Disabled / Enabled	Configure support for USB storage devices in BIOS
Port 60/64 Emulation	Disabled / Enabled	IIO60/64 software analog switch. Do not change this item.
USB transfer time-out	1sec/5sec/10sec/20sec	USB transfer timeout value setting
Device reset time-out	10sec/20sec/30sec/40sec	USB command timeout setting
Device power-up delay	Auto / Manual	USB startup delay setting

1.1.3.11 CSM Configuration

This interface is specifically designed for compatibility with devices that can only work in Legacy mode and operating systems that do not support or cannot fully support UEFI. CSM enables support for UEFI startup and non UEFI startup. If you need to start a traditional MBR device, you need to turn on CSM. If CSM is turned off, it will become pure UEFI startup and fully support secure startup. SecureBoot (Secure Boot) is only applicable to operating systems that use UEFI to boot.



Picture 3.4-1 4 BIOS-CSM Configuration

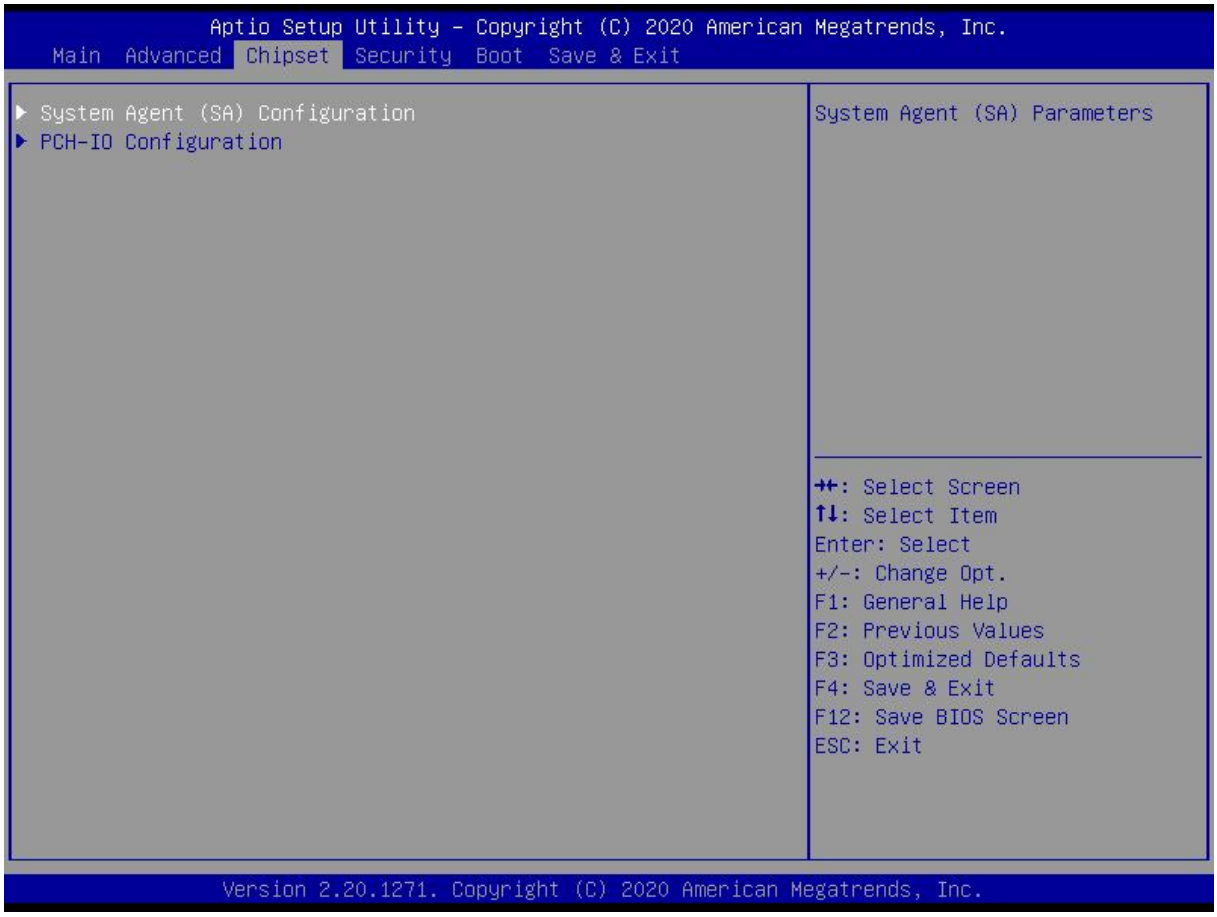
■ **CSM Configuration:**

Project	Content	Describe
CSM Support	Enabled / Disabled	Enable compatible module support function. Please do not change this item!
GateA20 Active	Upon Request / Always	Upon Request: GA20 can be disabled using BIOS services Always: do not allow disabling GA20, this option is useful when any RT code is executed above 1MB

Option ROM Messages	Force BIOS / Keep Current	Set display mode for Option ROM
INT19 Trap Response	Immediate / Postponed	BIOS reaction on INT19 trapping by Option ROM Immediated: execute the trap right always; Postponed: execute the trap during legacy boot.
Boot option filter	UEFI and Legacy / Legacy only / UEFI only	This option controls Legacy/UEFI ROMs priority
Onboard Lan Pxe Rom	Do not launch / UEFI / Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Launch Storage OpRom policy	Do not launch / UEFI / Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Launch Video OpRom policy	Do not launch / UEFI / Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device Oprom priority	Do not launch / UEFI / Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

1.1.4 Chipset

In this interface, it is mainly used to display information about the chipset or set specific functions of the chipset.



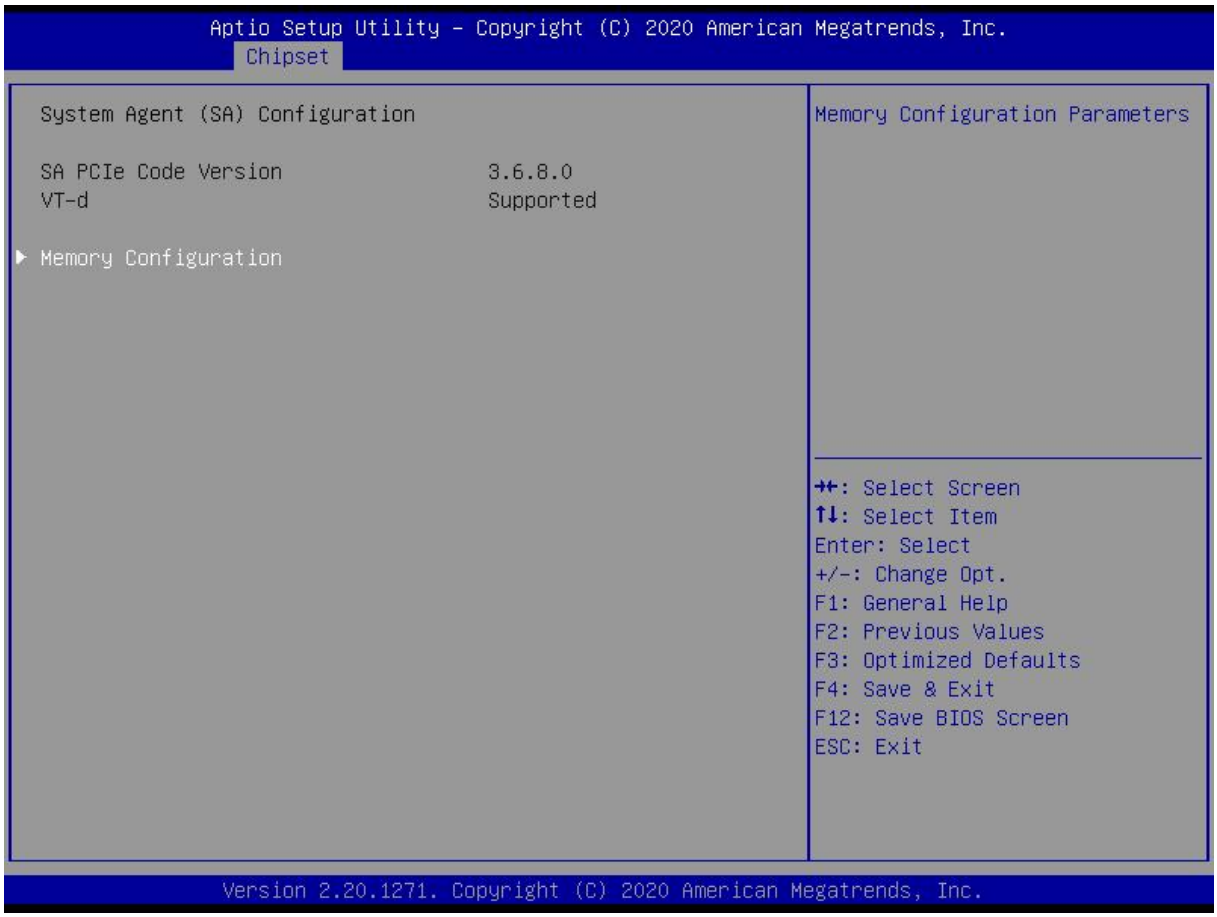
Picture 3.4-1 5 BIOS-Chipset

In this interface, the following functional items are mainly viewed or set:

- System Agent(SA) Configuration
  - Auxiliary information of the system
- PCH-IO Configuration
  - Configure device interfaces such as PCI Express, LAN, USB, and HD Audio.

1.1.4.1 System Agent Configuration

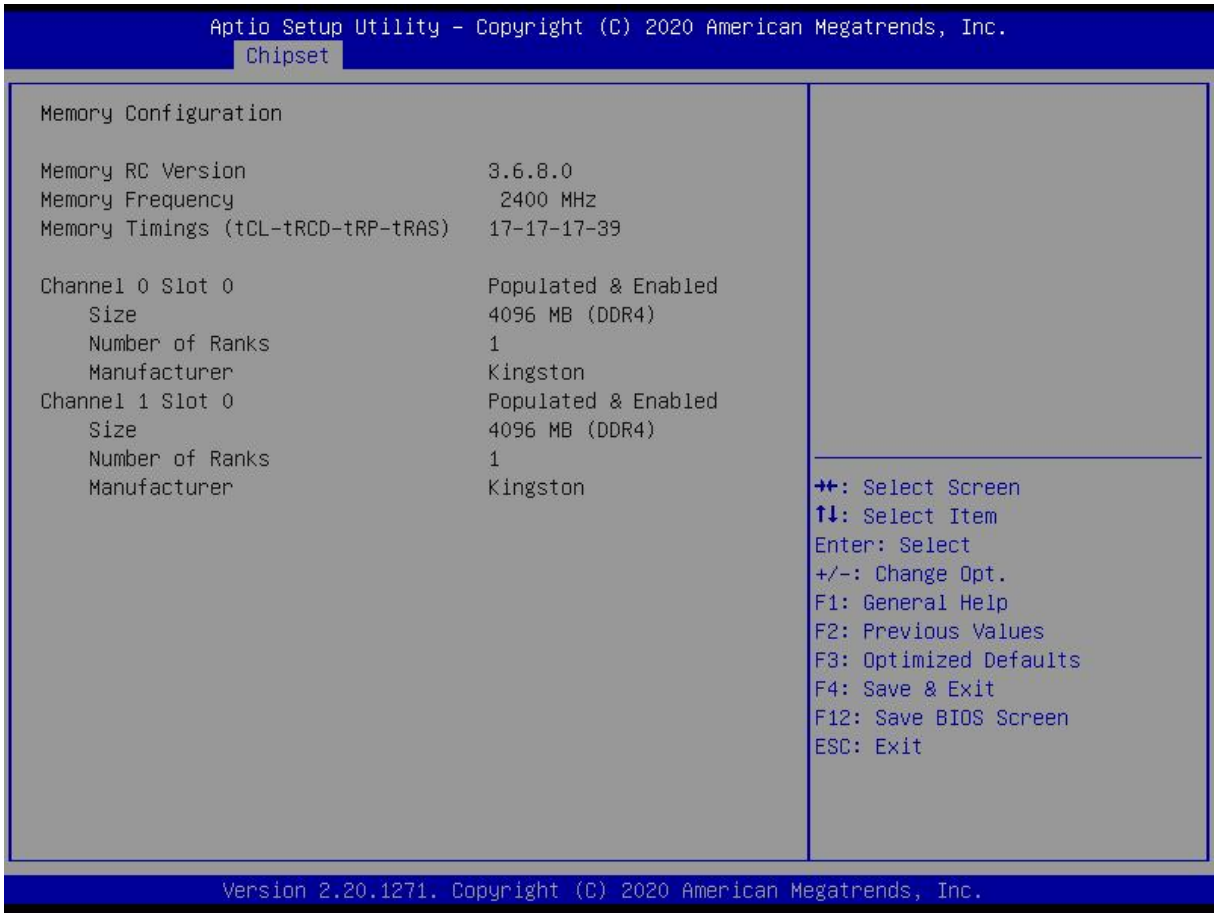
Display the current auxiliary configuration items.



Picture 3.4-1 6 BIOS-System Agent Configuration

1.1.4.1.1 Memory Configuration

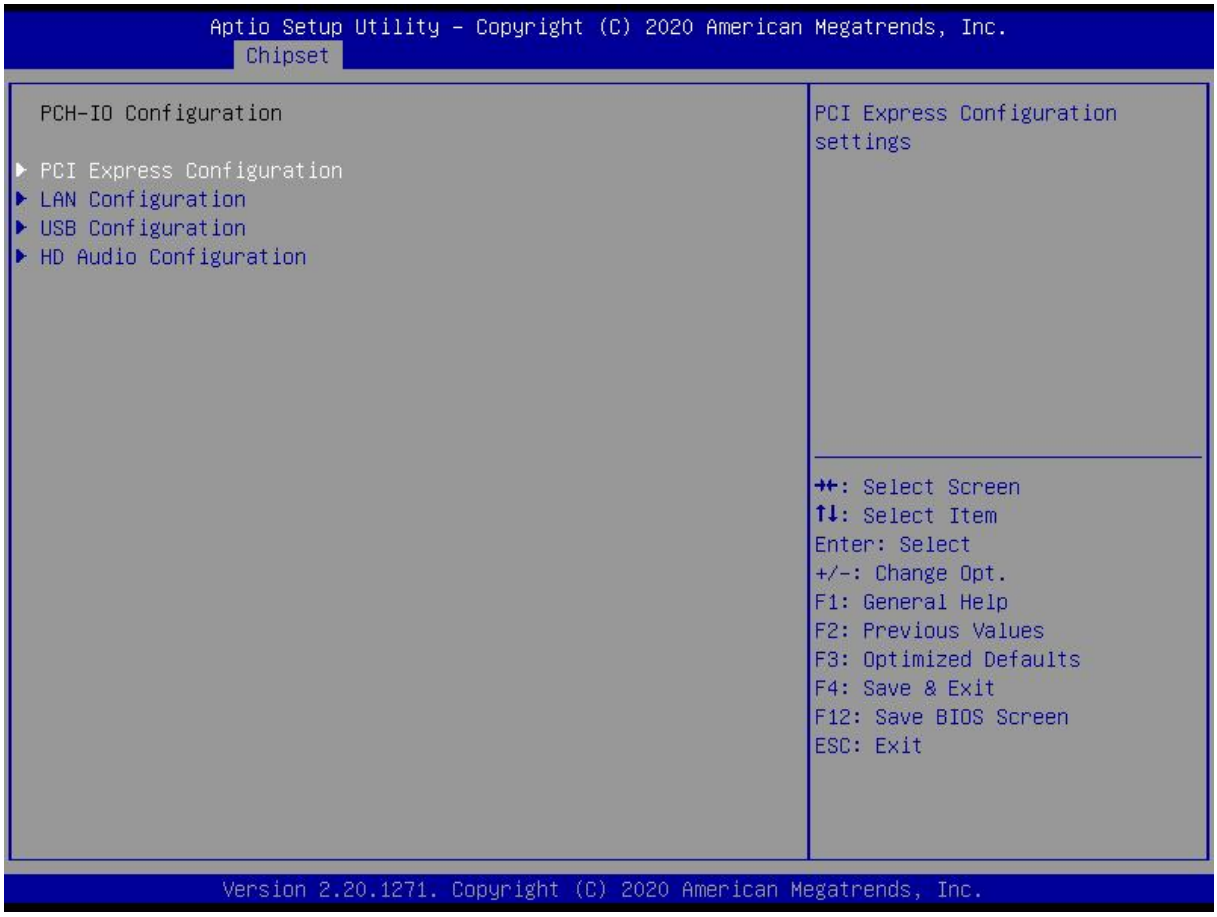
Display the current memory channel configuration information.



Picture 3.4-1 7 BIOS-Memory Configuration

1.1.4.2 PCH-IO Configuration

This interface is mainly used to configure device interfaces such as onboard PCI Express, LAN, USB, and HD Audio.



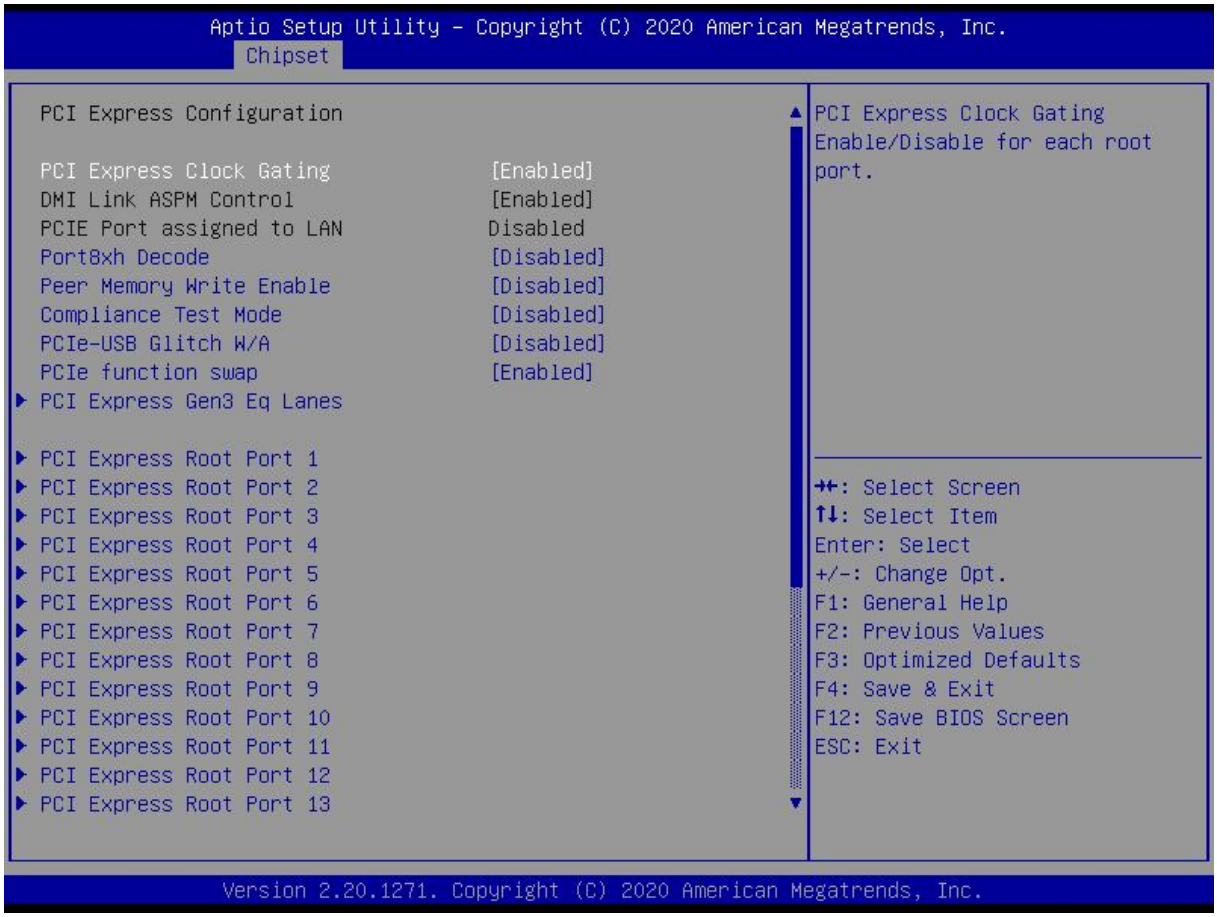
Picture 3.4-1 8 BIOS-PCH-IO Configuration

It mainly includes the following submenus:

- PCI Express Configuration
  - PCI Expressto configure.
- LAN Configuration
  - Configuration of onboard network ports.
- USB Configuration
  - Configuration of onboard USB.
- HD Audio Configuration
  - Settings for onboard sound card.

1.1.4.2.1 PCI Express Configuration

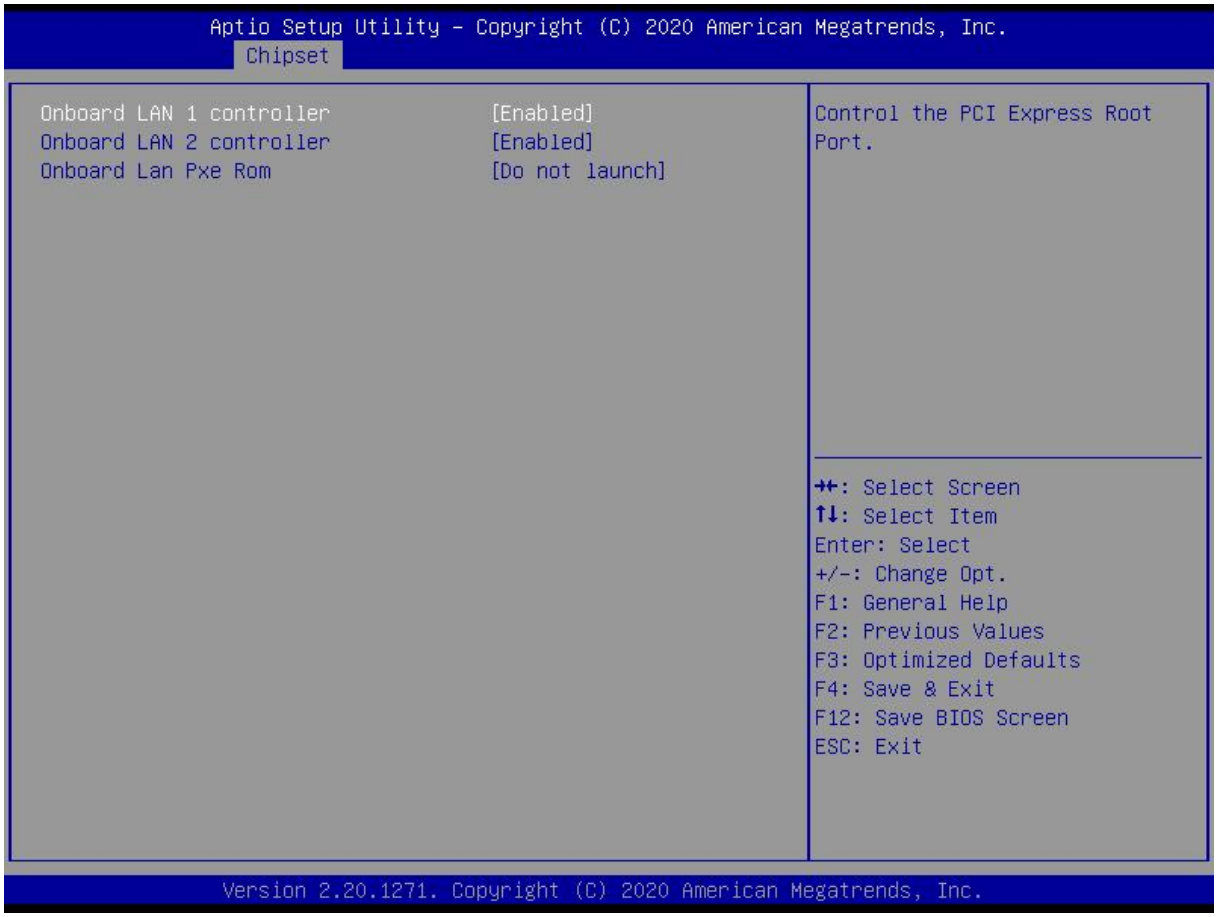
This interface mainly configures the onboard PCIExpress bus. Do not change the settings in this interface!



Picture 3.4-1 9 BIOS-PCI Express Configuration

1.1.4.2.2 LAN Configuration

This interface mainly configures the onboard network card.

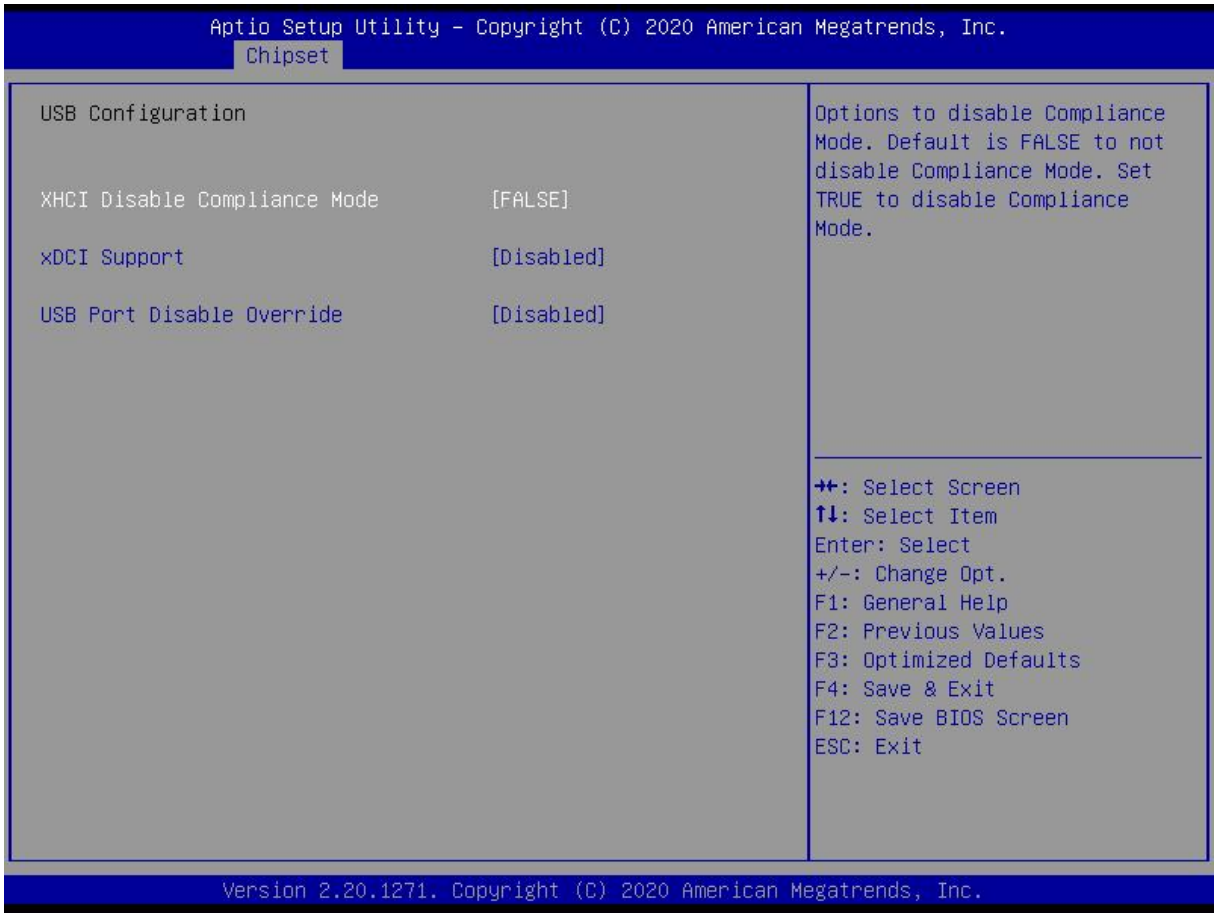


Picture 3.4-2 0 BIOS-LAN Configuration

Project	Content	Describe
Onboard LAN 1 controller	Enabled / Disabled	Enable or disable onboard network card 1
Onboard LAN 2 controller	Enabled / Disabled	Enable or disable onboard network card 2
Onboard Lan Pxe Rom	Do not launch / UEFI / Legacy	Do not change this setting!

1.1.4.2.3 USB Configuration

This interface mainly includes the configuration and settings of the onboard USB bus.

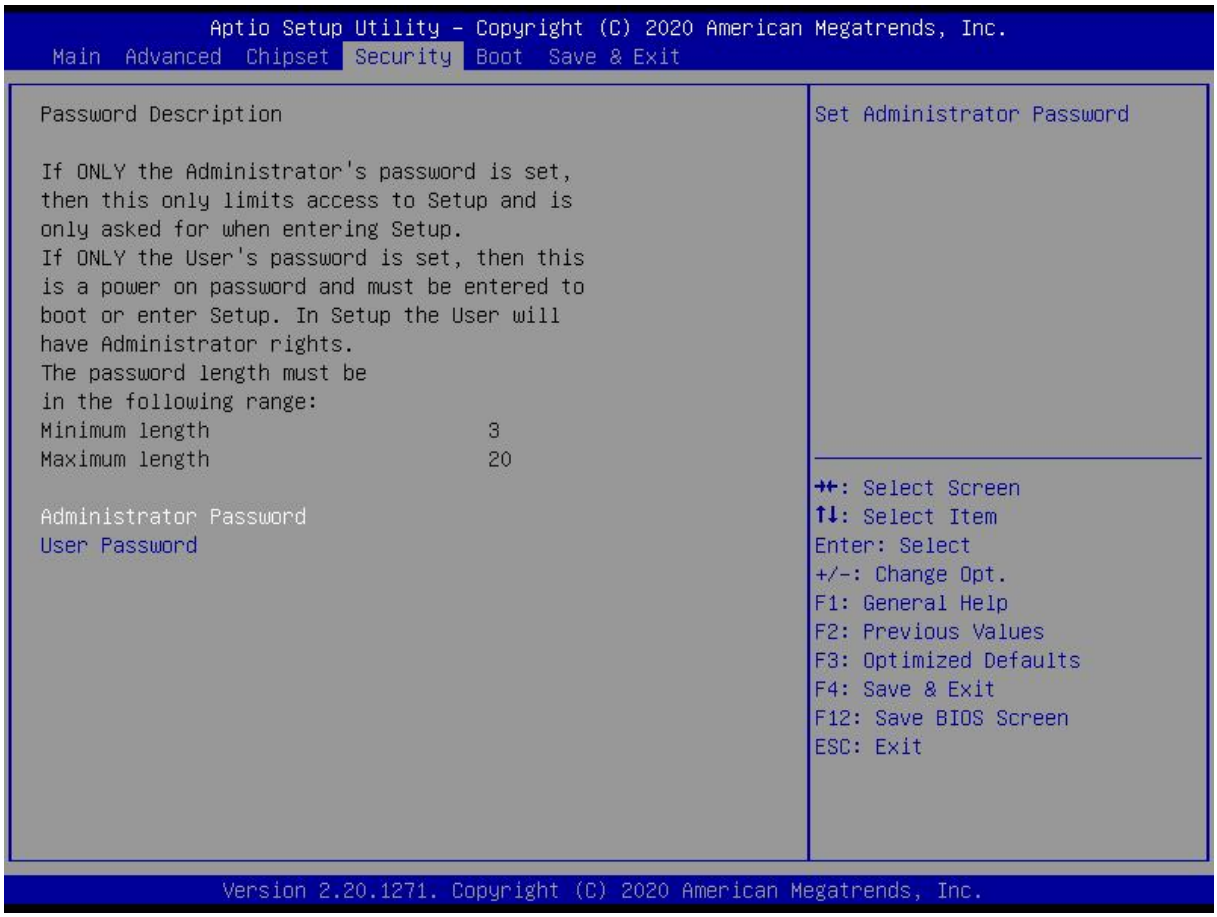


Picture 3.4-2 1 BIOS-USB Configuration

Project	Content	Describe
XHCI Disable Compliance Mode	[FALSE] / TRUE	Turn off XHCI compatibility mode, please do not change it!
xDCI Support	Enabled / [Disabled]	Do not change this setting!
USB Port Disable Override	Enabled / [Disabled]	Do not change this setting!

1.1.5 Security

This interface is mainly used for key settings related to system security protection.



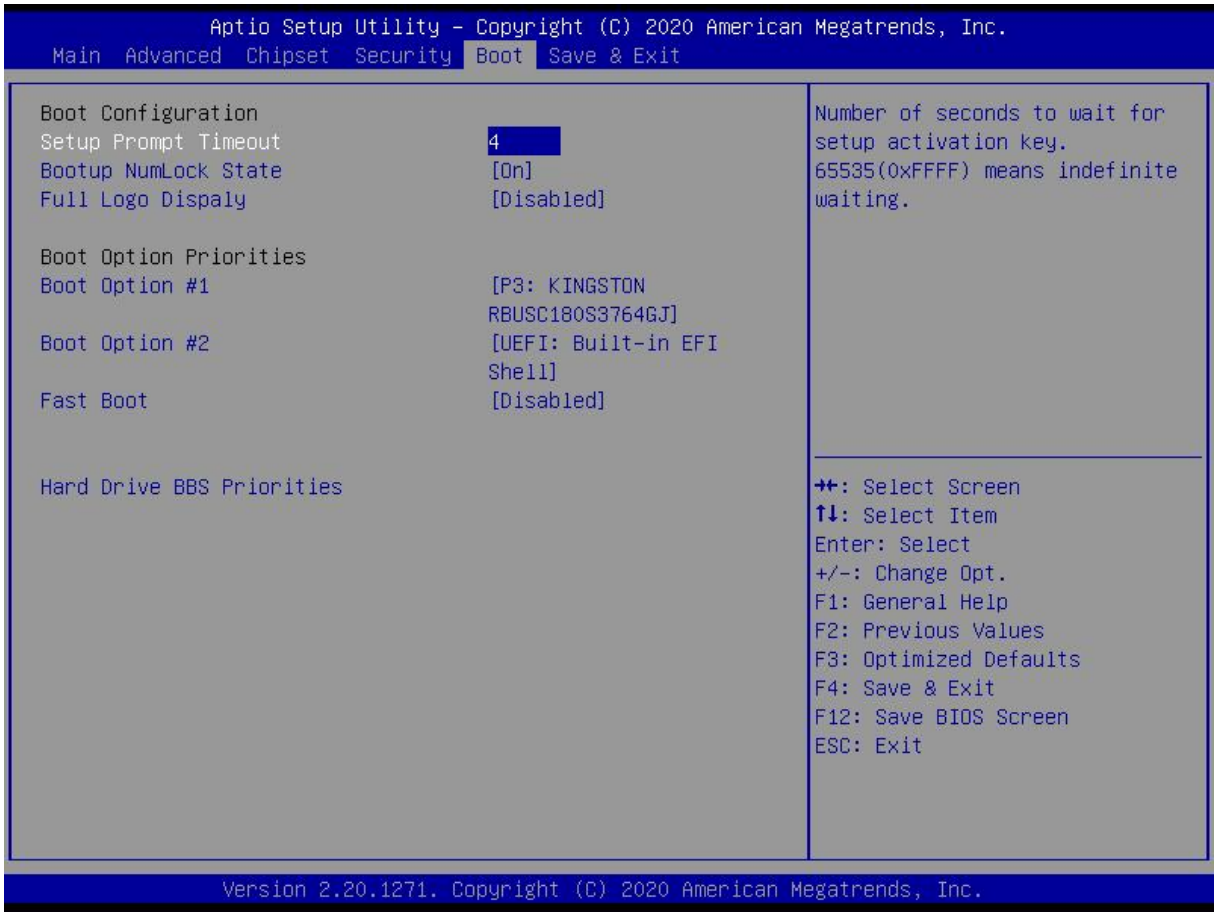
Picture 3.4-2 2 BIOS-Security

- Administrator Password
  - Set the administrator password.
- User Password
  - Set the user password.

: Once the password is set, it is necessary to remember the password, otherwise it may result in inability to access the system due to lack of permission! Additional maintenance costs may arise.

1.1.6 Boot

This interface is mainly used to set parameters related to BIOS system startup and device loading sequence.



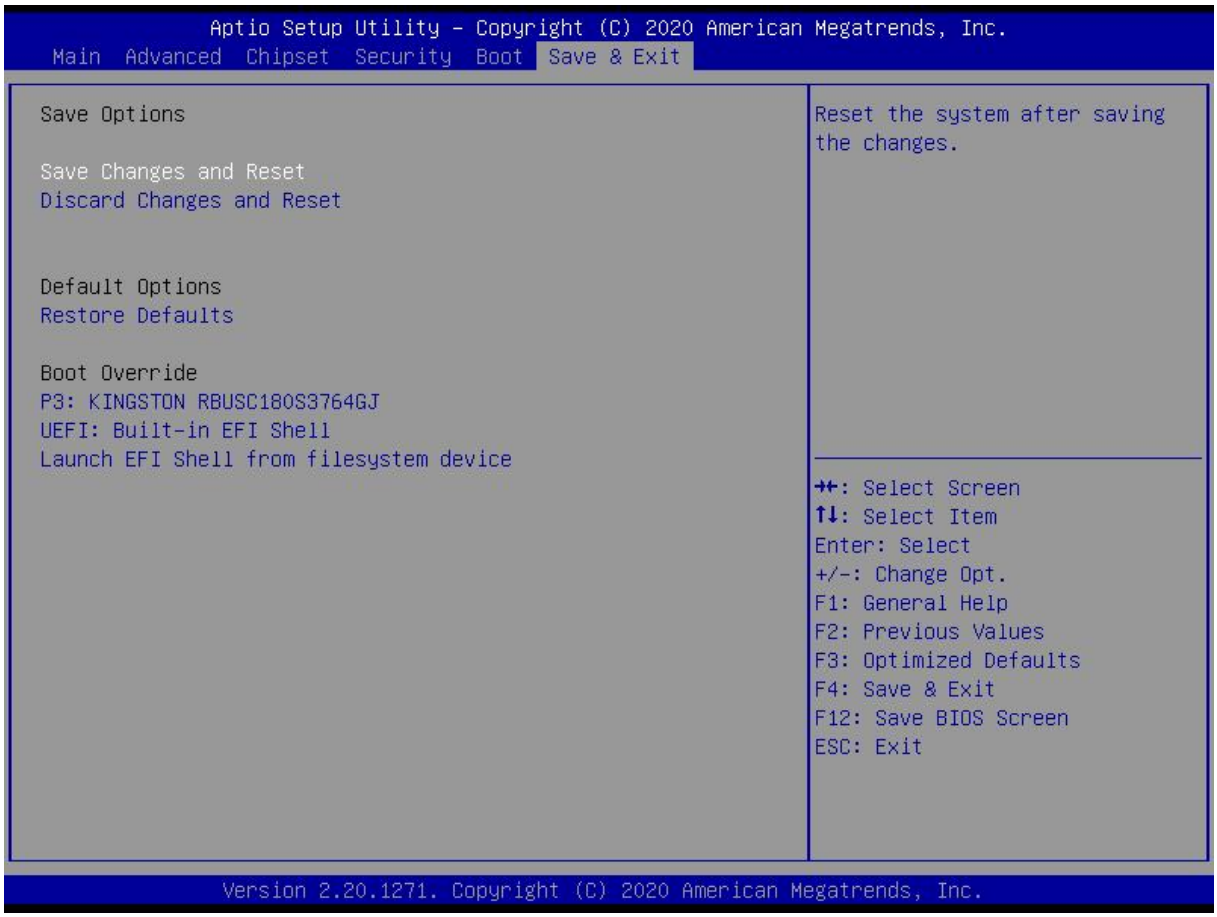
Picture 3.4-2 3 BIOS-Boot

- **Boot Configuration:**

Project	Content	Describe
Setup Prompt Timeout	4	Waiting time for BIOS setting button appears. (in seconds)
Bootup NumLock State	On / Off	The state of the numeric keypad at system startup.
Full Logo Display	Enabled / Disabled	Do not change this setting!
Boot Option #1	XXXXXXXX	System First Boot Device
Boot Option #2	XXXXXXXX	System second boot device
Fastw Boot	Enabled / Disabled	Do not change this setting!
Hard Drive BBS Priorities	-	Set the loading order for system boot storage media.

1.1.7 Save & Exit

This menu is used to save settings or load default configuration parameters, exit BIOS settings, etc.



Picture 3.4-2 4 BIOS-Save&Exit

- Save Changes and Reset
  - Save the settings and restart the system.
- Discard Changes and Reset
  - Discard setting changes and restart the system.
- Restore Defaults
  - Load default settings parameters.
- Boot Override
  - When it is necessary to temporarily load and start the system through another connected system storage medium, the corresponding system storage medium can be selected here. But it will not affect the system startup sequence set in the Boot menu. When the system restarts, it will load the system boot according to the system disk boot sequence set in the Boot menu

Chapter 4 System Installation

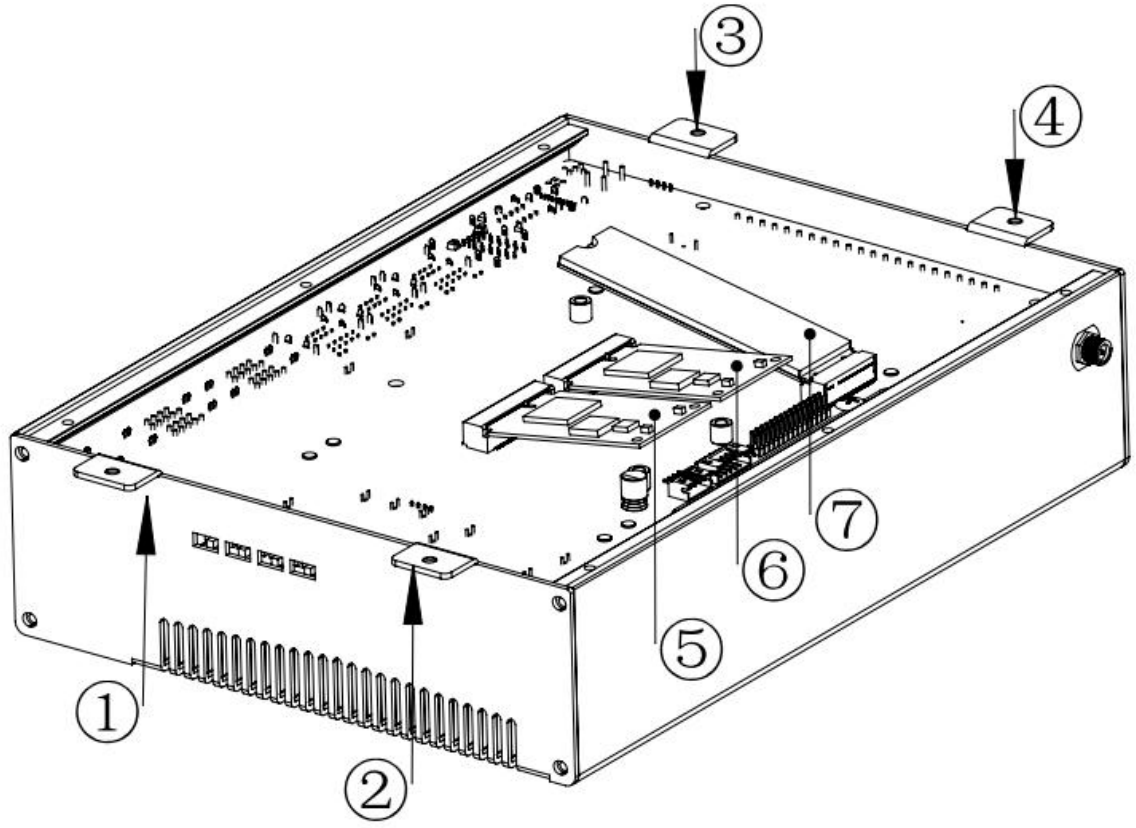
This chapter mainly introduces the hardware installation and related driver software installation of the system.

1.2 Hardware Install

This section introduces the installation and uninstallation of hardware.

1.2.1 Installation of SSD and WiFi modules

- Remove the screws 1/2/3/4 from the back of the host, and open the rear housing to leak out the motherboard
- Reserved miniPCIE expansion slot (6), with a SIM card slot below the expansion slot (6), which can be used to install functional modules such as 4G, WiFi, Bluetooth, SIM card, etc
- SSD hard disk interface (5), M.2 (NVME) interface (7)
- After installing the equipment, reinstall the screws 1/2/3/4



Picture 4.1-1 Expansion card installation

:
1. Do not operate with power, disconnect the power supply before disassembly.
2. Pay attention to static discharge.

1.3 Driver Installation

1. Go to the official website of www.nodka.com to download the corresponding driver

2. Select the corresponding machine model and click Find, download the corresponding driver, and install the driver software according to the installation wizard.

Chapter 5 List of Optional Accessories

1.4 List of optional accessories

Name	Package	Describe
CPU	LGA1151	6500T/7500T/6700T/7700T ... ...
Memory	DDR4 2400	1 x 4G,1 x 8G,1 x 16G 2 x 4G,2 x 8G,2 x 16G
Hard disk	mSATA	64G,128G,256G ... ...
Expansion Card	miniPCIe	4G WIFI ... ...

Chapter 6 Safety Prevention And Maintenance

 : The preventive measures outlined in this chapter should be strictly followed. Failure to follow such preventive measures may result in serious damage to the machine.

1.5 Safety Precautions

Please follow the safety precautions outlined in this section below.

1.5.1 General safety precautions

Please ensure that the following safety precautions are always followed.

- Always follow the electrostatic prevention measures outlined below when turning on the machine.
- Once it is necessary to install, move, or modify the machine, ensure that the power is turned off and the power cord is disconnected.
- It is prohibited to apply voltage levels that exceed the specified voltage range. Otherwise, it may cause a fire or electric shock.
- When the machine is in operation, electric shock may occur once the chassis of the machine is opened.
- Do not drop or insert any object into the ventilation opening of the machine.
- Once a large amount of dust, water, or liquid enters the machine, the power should be immediately turned off, the power cord should be unplugged, and the machine supplier should be contacted.
- The following activities are prohibited:
  - Do not drop the machine onto hard ground.
  - It is prohibited to strike the machine or apply excessive force to it.
  - It is prohibited to use the machine in places where the ambient temperature exceeds the rated temperature.

1.5.2 Antistatic precautions

 : Failure to take ESD preventive measures during machine installation may result in permanent damage to the machine and serious injury to the user. Electrostatic discharge (ESD) can cause serious damage to machine electrical components. Dry climates are more prone to ESD generation. Therefore, once the machine is opened and any electrical components need to be handled, the following anti-static precautions must be strictly followed:

- Wearing an anti-static wrist strap: Wearing a simple anti-static wrist strap helps to avoid ESD damage to any electrical components.
- Self grounding: Before handling any electrical components, touch any grounded conductive material. During the handling of electrical components, any conductive substances that are grounded should be frequently touched.
- Use anti-static pads: When configuring electrical components or engaging in related work, they should be placed on the anti-static pad. This can reduce the likelihood of ESD damage occurring.

- Only touching the edges of electrical components: When handling electrical components, it is advisable to hold them by grasping the edges.

1.5.3 Product disposal method

: If the wrong type of battery is replaced, there may be an explosion risk, and only certified engineers can replace the onboard battery. Dispose of waste batteries in accordance with relevant instructions and local laws and regulations.

Outside the EU - If you need to dispose of waste electrical and electronic products outside the EU, please contact your local regulatory authority to ensure the correct disposal method is taken. Within the EU:

EU-wide legislation implemented by member states requires that waste electrical and electronic equipment (WEEE) be disposed of separately from general household waste, with the exception of products marked with a left-hand symbol. This includes monitors and electrical components such as cords or power cables. To dispose of your product, follow the guidelines provided by your local authorities or ask the store where you purchased the product. The marking on electrical and electronic products is only applicable within the current EU member states. Please follow the relevant national guidelines for the disposal of electrical and electronic products.

1.6 Maintenance and cleaning precautions

Please follow the following guidelines to maintain or clean the machine.

1.6.1 Maintenance and cleaning

Before cleaning any parts or components of the machine, please read the following details first.

It is prohibited to directly spray or spray liquid onto any other components.

- Internal cleaning is not required. Avoid liquid entering the interior.
- Be careful to avoid damaging small, detachable components inside.
- Please turn off the power before cleaning.
- It is prohibited to drop any object or allow any liquid to enter the equipment through the opening.
- When cleaning, be careful of any allergic reactions that the human body may have to solvents or chemicals.
- Avoid eating, drinking, and smoking near the work area.
- Regularly clean the dust around the fan and its surroundings.

1.6.2 Cleaning Tools

Only specially designed specialized products can be used to clean certain components. In such cases, the cleaning prompt will clearly indicate such products. The following is a list of items that can be used for cleaning.

- Cloth - Although tissue or tissue paper can be used, it is recommended to use a soft, clean cloth.
- Water or external alcohol - A cloth dipped in water or external alcohol should be used.
- Using solvents - It is recommended not to use solvents as they may cause damage to plastic components.
- Vacuum cleaner - Using a vacuum cleaner specifically designed for computers is the best cleaning method. Dust and dirt may restrict airflow, leading to corrosion of the circuit.
- Cotton swab - A cotton swab dipped in external alcohol or water is an excellent tool for wiping areas of equipment that are difficult to touch.
- Foam tags – if possible, it is better to use foam tags and other non rough tags for cleaning

Chapter 7 FAQ

1.7 Technical Support and Services

Please visit the official website of www.nodka.com to download the documents and related driver software, or directly contact your local distributor to provide support and services.