USER'S MANUAL

iNA200 Series

Din Rail Network Appliance

User's Manual

AXIOMTEK

www.axiomtek.com

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Safety Approvals

- CE Marking
- FCC Class A

FCC Compliance

This equipment has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.
Shielded interface cables must be used in order to comply with emission limits.

Safety Precautions

Before getting started, read the following important cautions.

1. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
2. Disconnect the power cords from the **iNA200** before making any installation. Be sure both the system and the external devices are turned OFF. A sudden surge of power could ruin sensitive components. Make sure the **iNA200** is properly grounded.
3. Do not open the system's top cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

    - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity in your body.
    - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

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Section 1
Introduction

This chapter contains general information and detailed specifications of the iNA200 Series Network Appliance Server. It contains the following sections:

- **General Description**
- **Features**
- **Specifications**
- **Dimensions and Outlines**
- **I/O Outlets**

1.1 General Description

The iNA200 is a din rail network security hardware platform for VPN, firewall and other network security applications, which bases on the Intel® Elkhart Lake processor. This platform supports one DDR4-3200 SO-DIMM slot with maximum of up to 32GB memory. In the meantime, the platform also can support two gigabit Ethernet ports, two 2.5GbE and two 1G SFP LAN ports which can provide the best throughput. For storage, it also provides one 2.5" SSD drive slot. This platform can be easily enabled through application programs to make a user-friendly appliance for customers, and provide the highest ever performance of encryption and decryption.

1.2 Features

iNA200 series supports Intel® Elkhart Lake processor, has a compact size high compatibility, and low power for network security field application.

- **Intel® Elkhart Lake Processor**
- **Supports up to 32 GB DDR4-3200 SO-DIMM system memory**
- **Supports two 10/100/1000 Mbps Ethernet ports with LAN Bypass**
- **Supports two 2.5GbE LAN ports with LAN Bypass**
- **Supports two 1G SFP ports**
- **Supports one full-size mini-PCIe slot for Wireless/3G/LTE and mSATA**
- **Supports one M.2 key B slot for 5G module**
- **Supports Windows 10 and Linux operating systems**

1.3 Specifications

Model	iNA200
SBCs	NAB200 / MIO306 / EIO105
Form Factor	Din Rail
Chassis Material	Steel
Chipset	SoC integrated
Processor/Cache	Intel® Atom® x6212RE/x6414RE 1.2GHz/1.5GHz 2C/4C 6W/9W
BIOS	AMI 128Mbits Flash ROM
System Memory	1 x DDR4-3200MHz SO-DIMM (Non ECC) up to 32GB
Super I/O	Fintek F81804
Processor Graphic	Intel® UHD Graphics for 10th Gen Intel® Processors
Storage	1 x Onboard 8GB eMMC (Optional) 1 x SATA 3.0 connector for 2.5" HDD/SSD
System I/O	1 x HDMI 2 x USB 3.1 1 x COM port (RS-232/422/485) with DB9 type 1 x COM port (RS-485) with 3 pin terminal block 1 x Tact switch for Reset 4 x Antenna hole 1 x Power input connector 4 x Copper LAN 2 x Fiber LAN 1 x Console port (RJ-45)
Expansion slot	1 x M.2 key B 3042/3052 slot (PCIe + USB interface) with Nano SIM Socket 1 x Full-size PCIe Mini Card slot (USB + SATA interface) with Nano SIM Socket
Power	Two power paths input with terminal block, DC Input has OVP, UVP & Reverse protection 12-24VDC(UVP:9V, OVP:36V)
System Dimensions	150 mm (H) x 66 mm (W) x 127 mm (D)
Weight (Net/ Gross)	1.3 KG/ 1.8KG
Form Factor	DIN-rail Wall-mount (Optional)
Other	4 x hole for Wireless/LTE/5G module
Certifications	CE/FCC Class A

OS	Linux kernel 5.15.0-41 ;Windows 10
Environmental	Operating temperature: -40°C ~ 70°C Storage temperature: -40°C ~ 85°C 10% ~ 90% non-condensing

NOTE: All specifications and images are subject to change without notice.

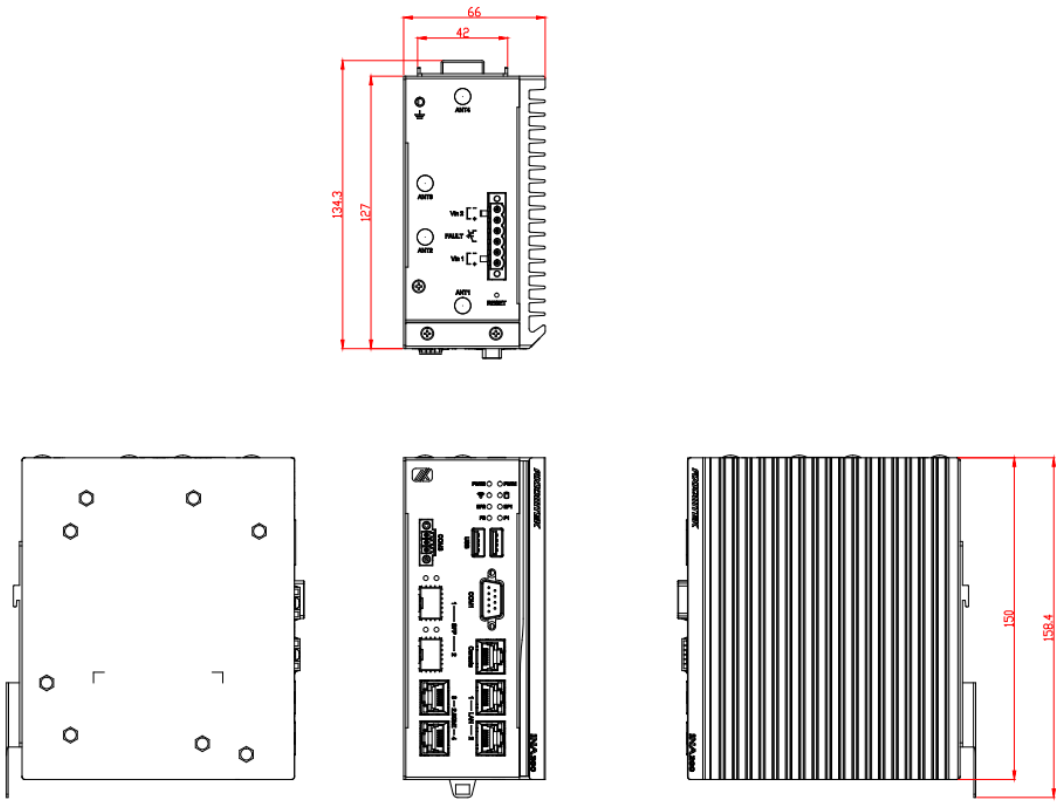
★ ***Windows or Linux boot, please refer to the Section 4.6 Boot Type***

1.4 Dimensions and Outlines

The following diagram shows you dimensions and outlines of the iNA200 Series.

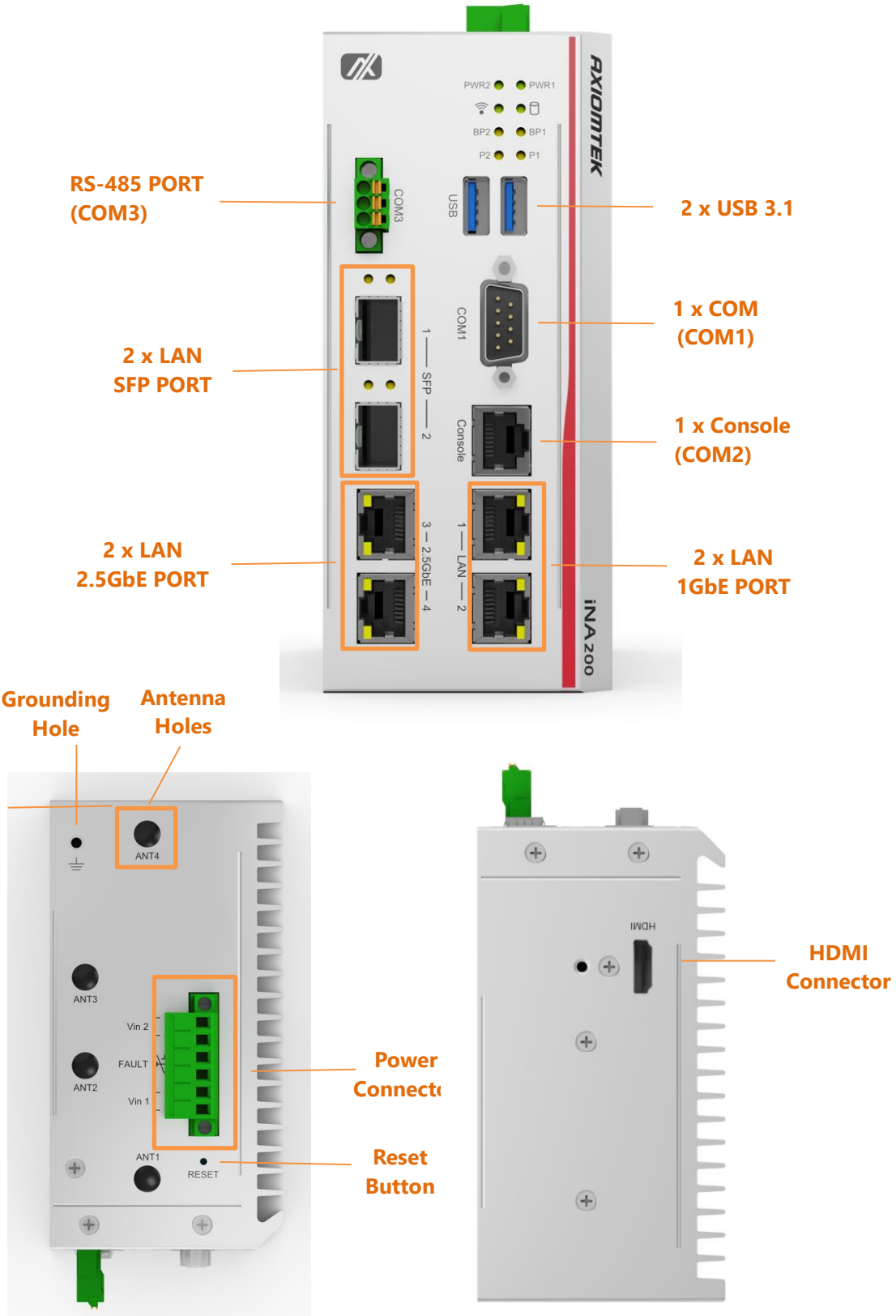
1.4.1 Din-Rail Bracket Dimensions

Users can get 4pcs M3*6L screws for fixing the din-rail kit from the accessory box.



1.5 I/O Outlets

Locate front and rear panel I/O outlets on the iNA200 Series server to connect serial and Ethernet interface devices.



- **Power LED**
  The LED will maintain a solid green color when the server is powered on to perform diagnostic tests and check for proper operation.

- **HDD LED**
  The LED flashes when transmitting or receiving any signals.

- **Programmable LED**
  A sample code will be provided that allows users to define their own function.

NOTE: If you need sample codes, please contact our FAE directly, and the codes are for reference purposes only.

- **LAN Bypass LED**
  While running the LAN Bypass function, the LED always lights up.

- **Reset**
  It is for reset the system to reboot your computer instead of turning off the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

NOTE: If you need sample codes, please contact our FAE directly, and they are for reference purposes only.

- **Active LED (Single color) for LAN port #1, port#2**

  1. The orange LED is on when the LAN port connection is working.
  2. The LED flashes when transmitting or receiving any signals to or from the appliance.
  3. The LED is dark when the system is off.

- **Speed LED for LAN port #1, port#2**

  1. The double-color LED light indicates 10/100/1000Mbps transfer rate.
  2. When the LED light maintains a solid amber color, it indicates 1000Mbps transfer rate at this moment.
  3. When the LED maintains a solid greencolor , it indicates 100Mbps transfer rate at this moment
  4. If the LED is dark and Link/Active LED is light on or flashing, it indicates 10Mbps transfer rate.
  5. When Speed LED and Link/Active LED are both dark no networking devices are connected.

Transfer Rate	LED Light Color
10Mbps	Dark
100Mbps	Green
1000Mbps	Amber

- **Active LED (Single color) for LAN port #3, port#4**

  1. The orange LED is on when the LAN port connection is working.
  2. The LED flashes when transmitting or receiving any signals to or from the system.
  3. The LED is dark when the system is off.

- **Link LED for LAN port #3, port#4** The double-color LED light indicates 10/100/1000Mbps transfer rate.

- When the LED light maintains a solid amber color, it indicates 1000Mbps transfer rate at this moment.

- When the LED maintains a solid green color, it indicates 100Mbps transfer rate at this moment

- If the LED is dark and Link/Active LED is light on or flashing, it indicates 10Mbps transfer rate.

- When Speed LED and Link/Active LED are both dark no networking devices are connected.

Transfer Rate	LED Light Color
10/100Mbps	Dark
1000bps	Green
2.5Gbps	Amber

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Section 2
Interfaces and Connectors

The iNA200 Series are convenient for your various hardware configurations. This chapter will help you get familiar with the hardware.

2.1 Check List

The package bundled with your iNA200 Series should contain the following items:

- **1 x The iNA200 Series network appliance hardware platform**
- **1 x Din-rail Kit**
- **1 x 3pin Power terminal block**
- **1 x 6pin Power terminal block**
- **1 x M.2 hand lock nut**
- **1 x M.2 screw**
- **1 x Mini screw**
- **4 x Antenna pad**
- **1 x DDR thermal pad**
- **1 x Cable tie for SSD bracket fixed use**
- **1 x Cable Fixed Seat for SSD bracket fixed use**
- **1 x Cable tie for HDMI Cable bracket fixed use**
- **1 x HDMI Cable bracket**
- **3 x M3*4L Cross recessed countersunk flat head screws for SSD bracket**
- **1 x M3*4L Cross recessed countersunk flat head screws for HDMI Cable bracket**
- **1 x M3*6L Pan head screw with Wave Washer for ground terminal**
- **1 x SSD SATA cable**
- **2 x MPO Fiber Optic Dust Cover Caps**

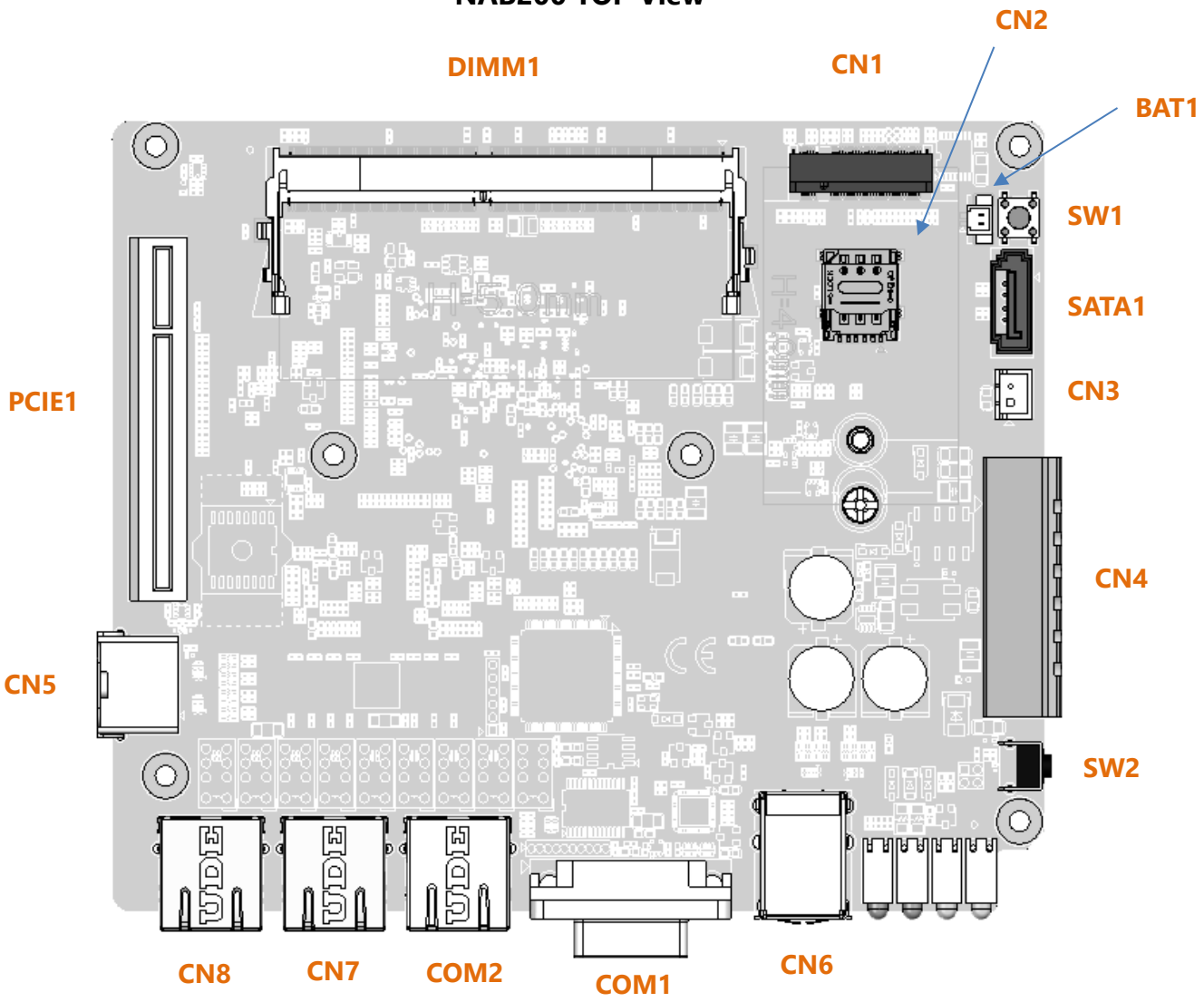
Optional

- **1 x DB9F- RJ45 1.8M Console cable**
- **1 x DDR thermal bracket**
- **1 x Thermal PAD FSL-BSNA For DDR bracket**

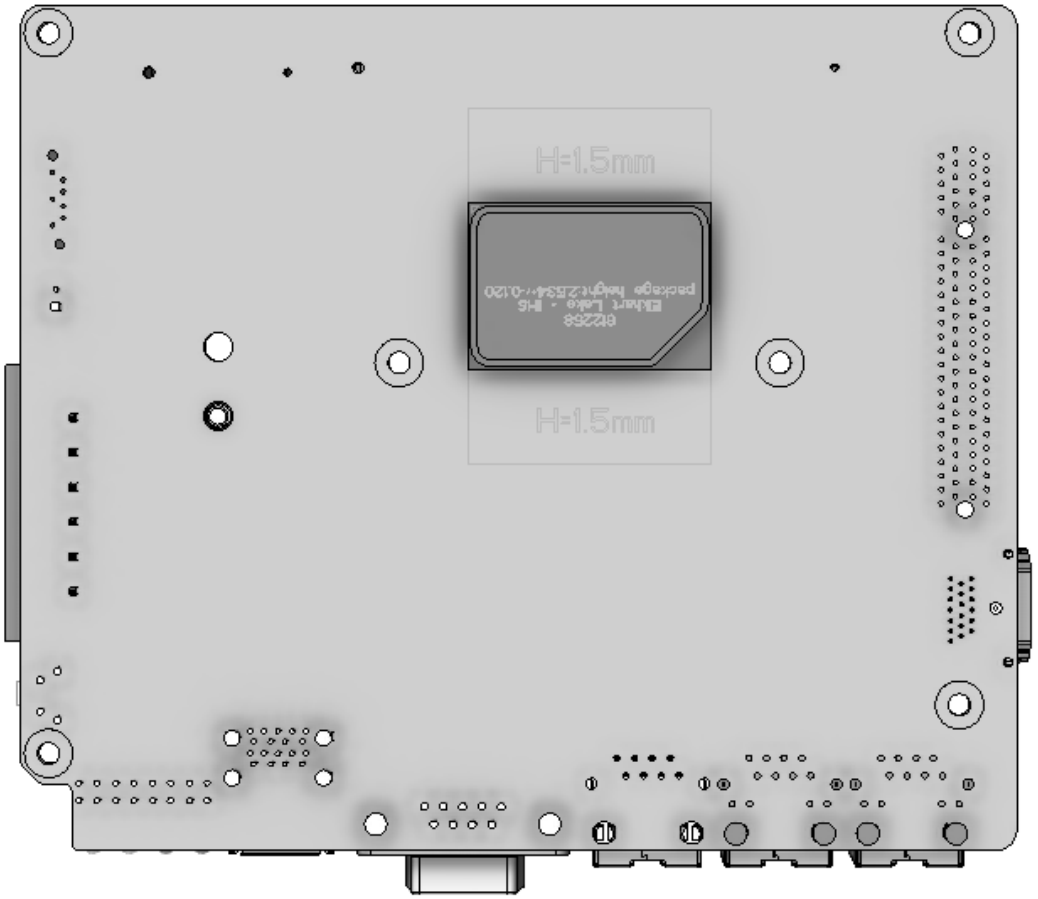
If you cannot find this package or any items are missing, please contact Axiomtek distributors immediately. If you order any optional components, the package might contain those additional hardware or documents accordingly.

2.2 Board Layout

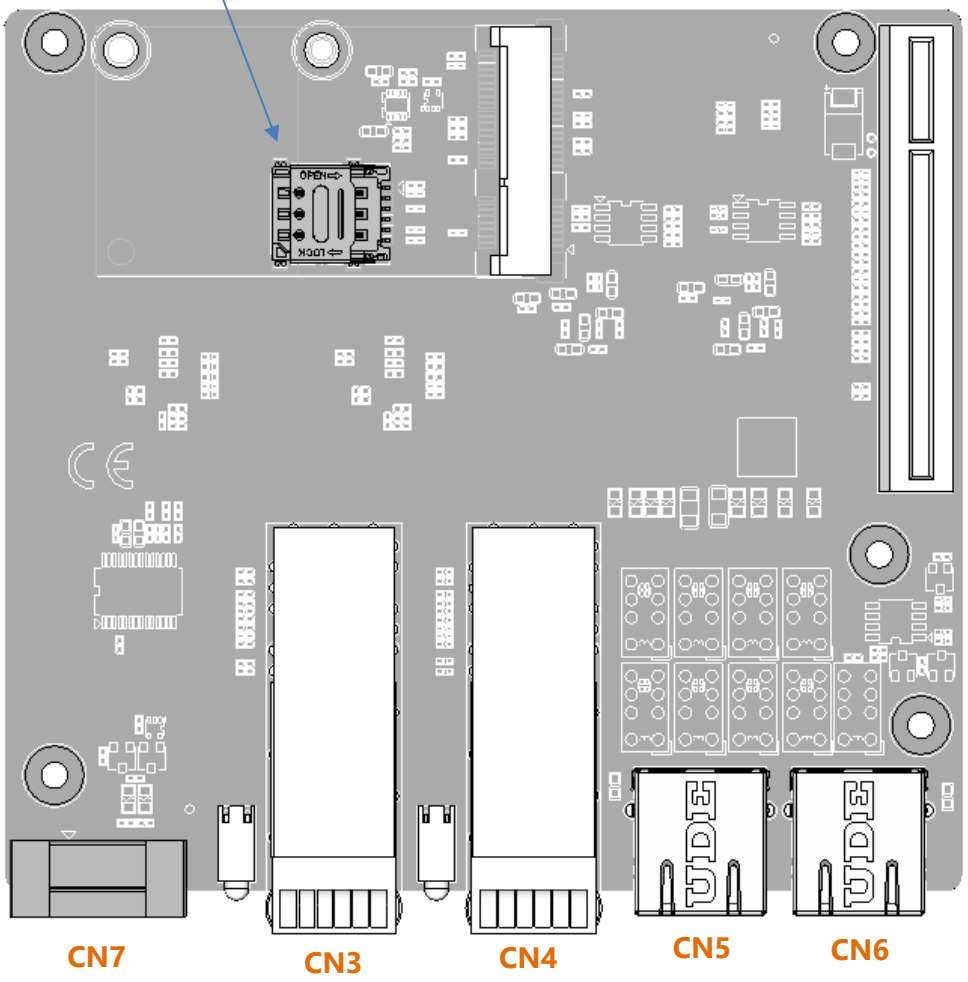
NAB200 TOP View



NAB200 Bottom View



MIO306 TOP View



2.3 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

NAB200

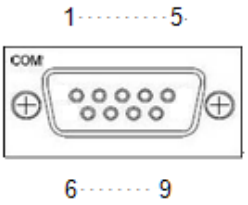
Connectors	Label
6 pin terminal block for Power Input	CN4
Serial Port1 with RS232 box header	COM1
Console/Serial Port 2 with RJ45 Connector	COM2
Battery Connector	BAT1
DDR4 SODIMM Socket	DIMM1
HDMI output Connector	CN5
USB3.1 *2 Connector	CN6
LAN connector	CN7 CN8
M.2 B-key 3052/3042 (USB3.1 / PCIe interface)	CN1
Nano SIM card slot	CN2
Board-to-Board Connector	PCIE1
Tact switch for clear CMOS	SW1
Tact switch for Reset	SW2

MIO306

Connectors	Label
1 GbE SFP	CN3 CN4
2.5GbE RJ-45 with LAN Bypass	CN5 CN6
3 pin terminal block for RS-485	CM7
Full size Mini Card (USB2.0 / mSATA interface)	CN1
Nano SIM card slot	CN2

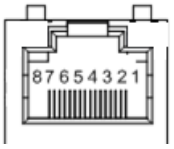
2.3.1 Serial Port1 (COM1)

Pin	RS-232	RS-422	RS-485
1	DCD1	TX-	Data-
2	RX1	TX+	Data+
3	TX1	RX+	-
4	DTR1	RX-	-
5	GND	GND	GND
6	DSR1	-	-
7	RTS1	-	-
8	CTS1	-	-
9	RI1	-	-



2.3.2 Console Port (COM2)

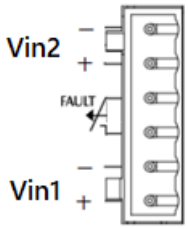
Pin	Signal	Pin	Signal
1	RTS	5	GND
2	DTR	6	RXD
3	TXD	7	DSR
4	GND	8	CTS



2.3.3 Power

- Power Input
  DC Terminal block : Wide-range 12 - 24V. OVP and Reverse protection.

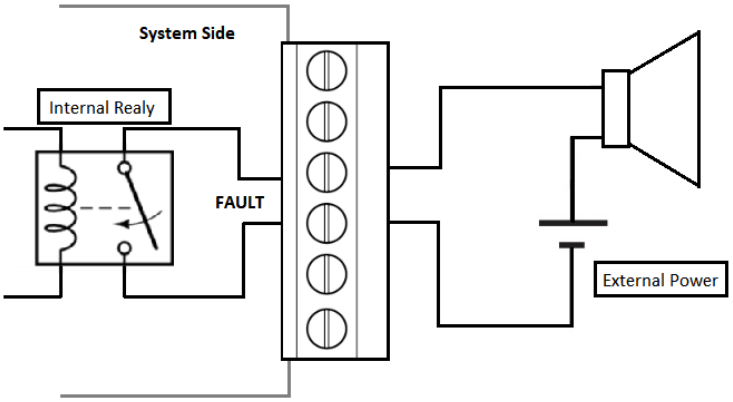
Pin	Signal
1	Vin2 -
2	Vin2 +
3	ALARM -
4	ALARM +
5	Vin1 -
6	Vin1 +



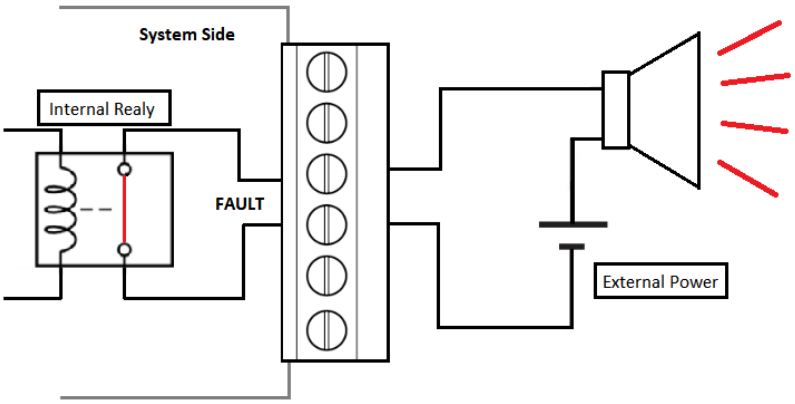
➢ Relay output

Below is a very simple application for remote notice use relay and lamp.

a) Normal



b) Warning

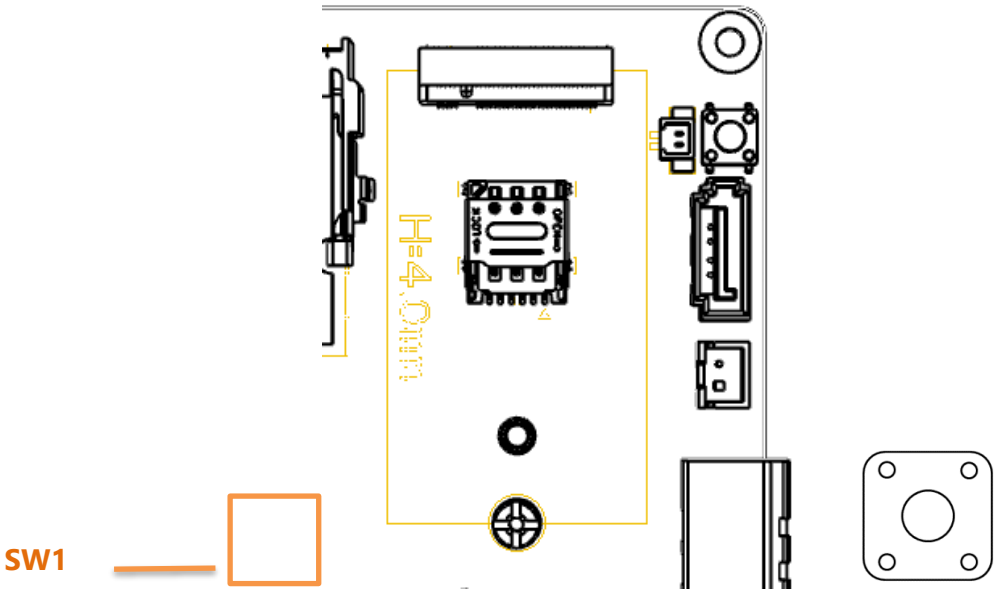


2.4 WatchDog Timer (WDT)

- 1~255 seconds or minutes; up to 255 levels.

2.5 Restore BIOS Optimal Defaults (SW1)

- Press the tact switch (SW 1) can restore BIOS optimal defaults.



2.6 System LED

- The list shows the LED's indicators and functional descriptions.

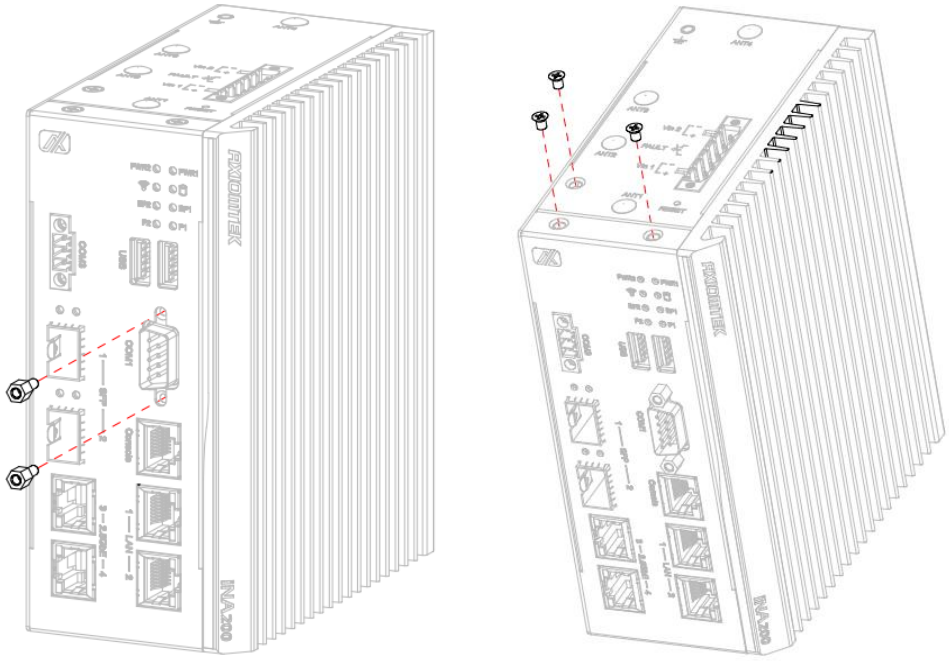
LED Name	Description	Color
ACT	Indicates the storge status and it's flashing when storge is accessed.	Green
PWR	Indicates the Power status. When the DC input is acceptable, the LED will be ON.	Green
Wireless	Indicates the Wireless status. When ANT accessed data the LED will flash.	Green
LAN Bypass	When the Lan Bypass function is enabled, the LED will be ON.	Orange
USER defined LED	The user sets the LED action by the software	Orange

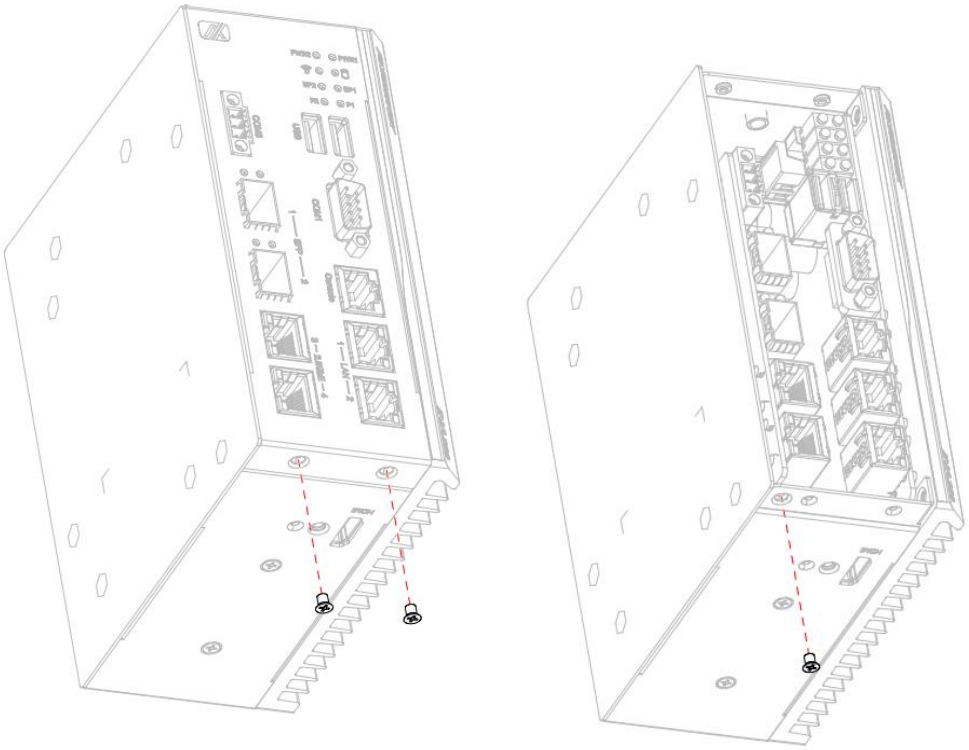
Section 3
Hardwarew Installation

The INA200 is convenient for your various hardware configurations, such as Memory Module and Hard Disk Drive. The Section 3 will show you how to install the hardware. It includes:

3.1 Installing the Memory Module

Step 1 Turn off the system.
Step 2 Loosen all screws of the cover and remove the cover from the system.



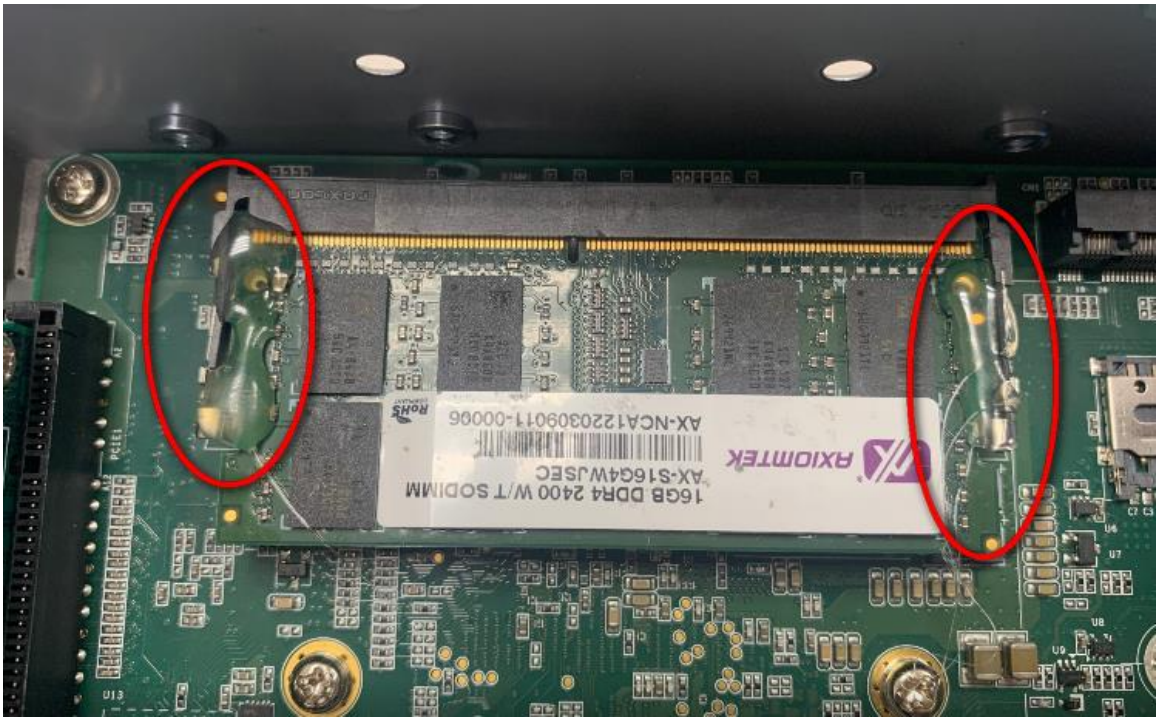


Step 3 Remove the cover from the system.

Step 4 Put the thermal pad on memory module can enhance cooling effect.

Step 5 Use two fingers to hold the memory module, and insert the gold figure into the slot and push the module down.

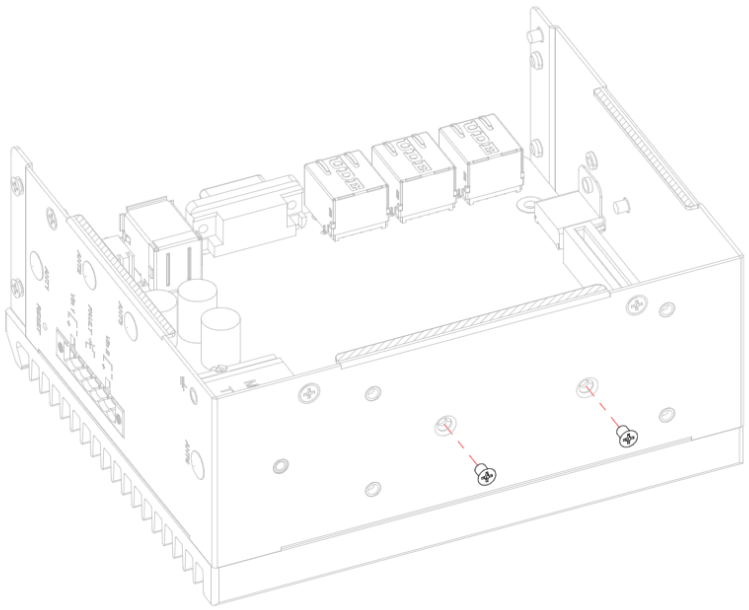
Step 6 **The memory module is locked by two latches on the sides. But we still strongly recommend using "LDC737" silicone on the two sides of the memory for anti-vibration.**



Step 7 **Stick thermal pad onto DDR (option)**

Step 8 Install DDR bracket (option)

Step 9 Put the screw of Bracket (option)



Step 10 Put the cover back to the system, and tighten screws tight to close the chassis.

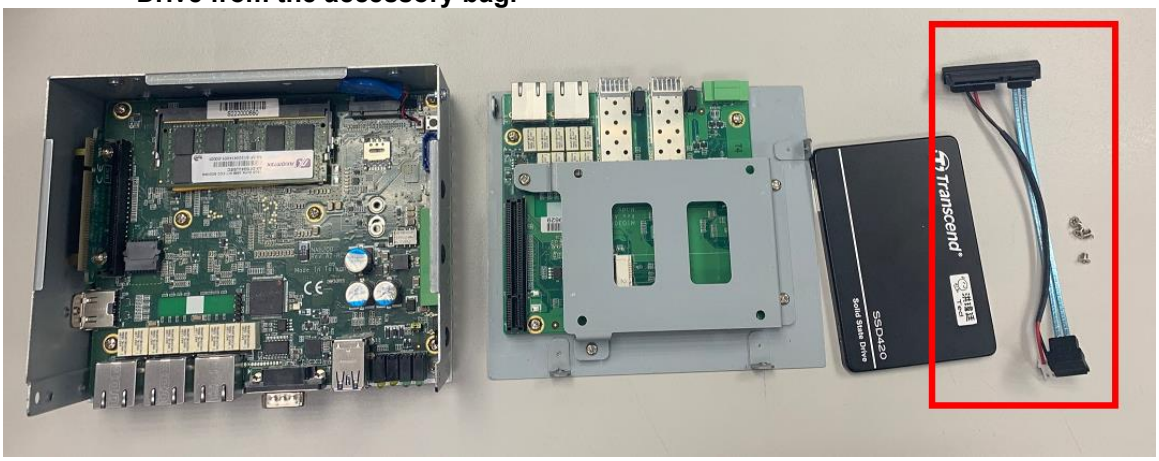
3.2 Installing the SATA HDD

Step 1 Turn off the system.

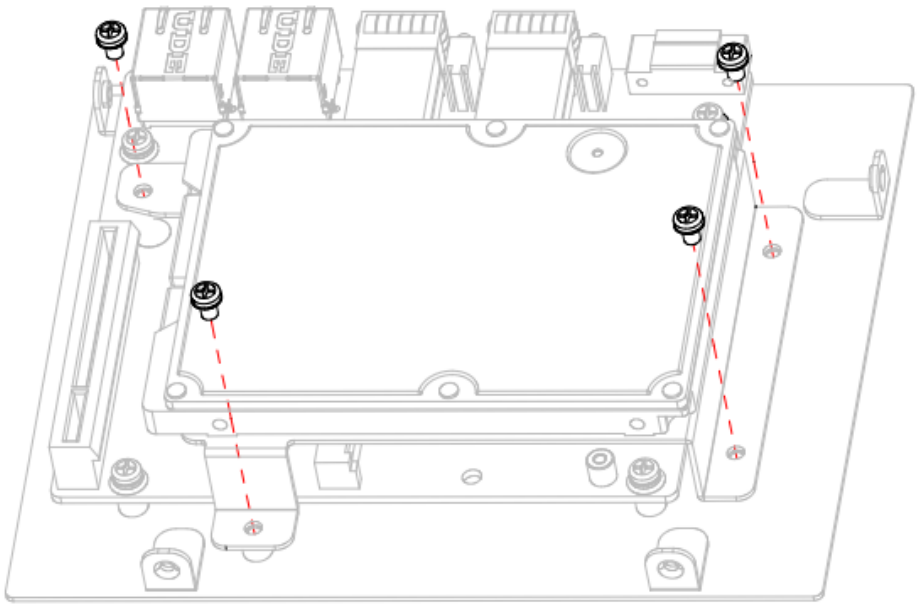
Step 2 Loosen all screws of the cover and remove the cover from the system.

Please refer to Section 3.1

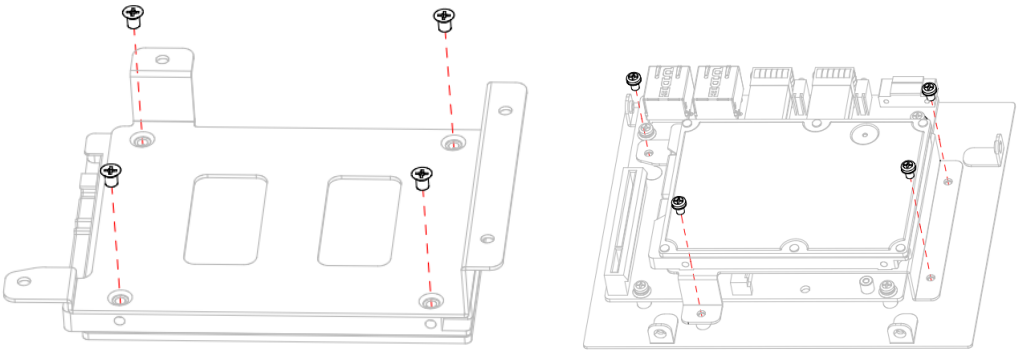
Step 3 Take out the SATA+Power HDD cable & 4pcs of screws for fixing the Hard Disk Drive from the accessory bag.



Step 4 Loosen screws of the HDD Bracket

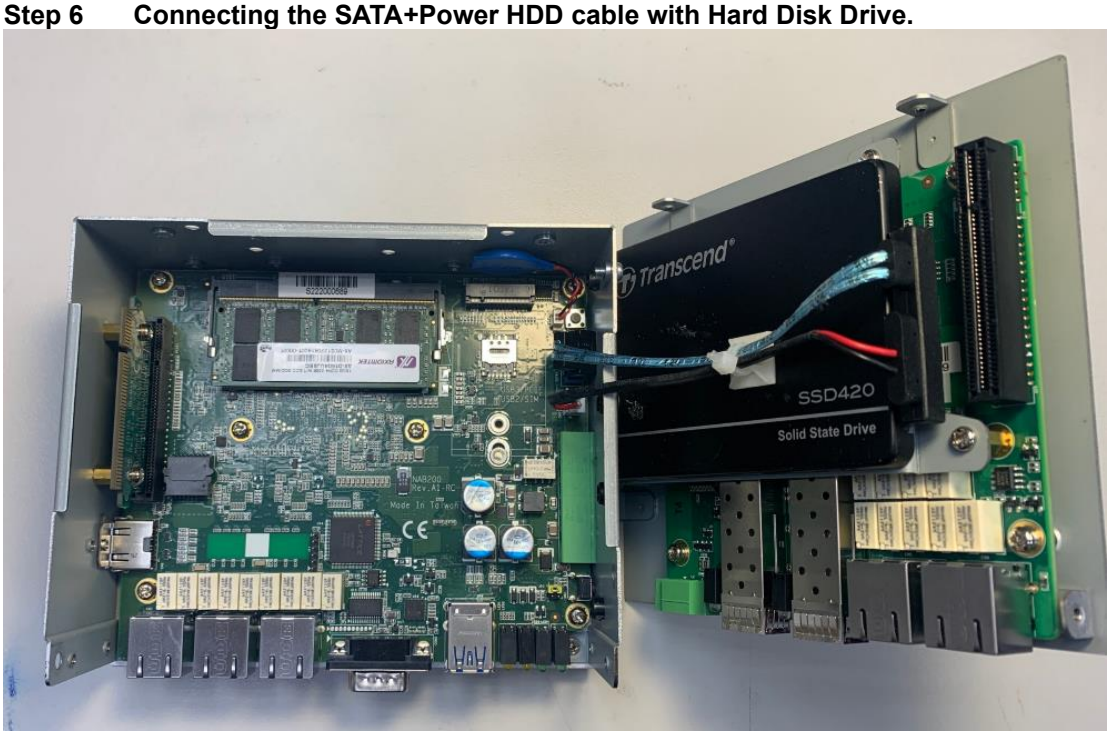


Step 5 Insert the Hard Disk Drive into the bracket and use these screws to fix it tightly.



NOTE: The front of Hard Disk Drive must be upward when insert the Hard Disk Drive into the bracket.

Step 6 Connecting the SATA+Power HDD cable with Hard Disk Drive.



Step 7 Put the cover back to the system, and tighten screws to close the chassis.

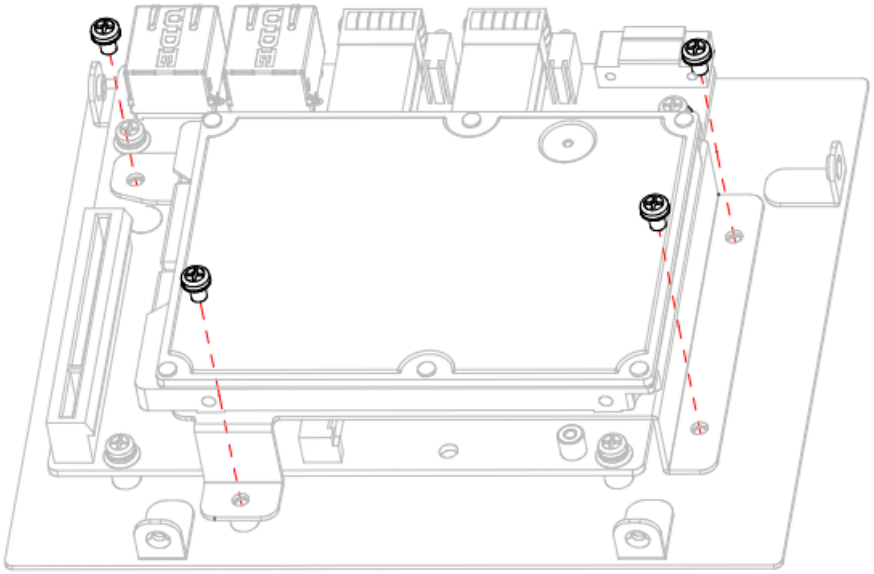
3.3 Installing Mini-Card Module

Step 1 Turn off the system.

Step 2 Loosen all screws of the cover and remove the cover from the system.

Please refer to Section 3.1

Step 3 Loosen screws of the HDD Bracket



Step 4 **Following the steps from Figure 3-1; push the SIM slot backward to unlock SIM slot. Insert the SIM card and put it back (Figure 3-2), and lock the SIM slot (Figure 3-3).**

Figure 3-1

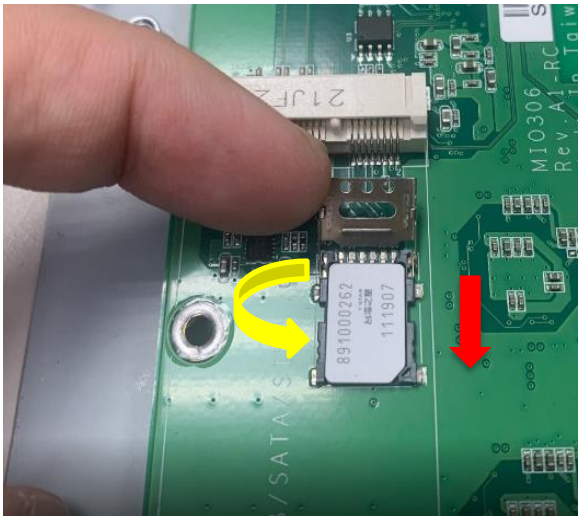


Figure 3-2

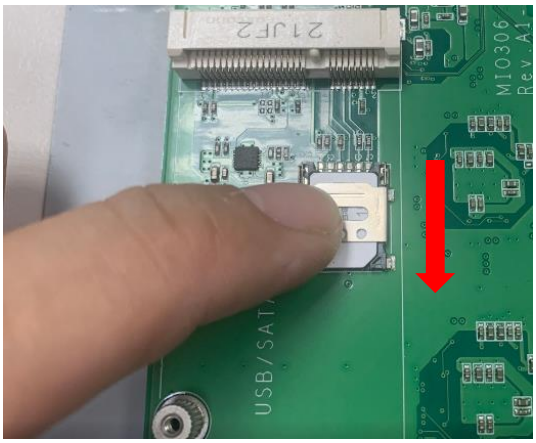
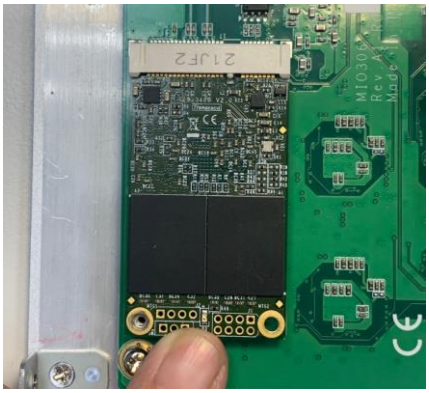
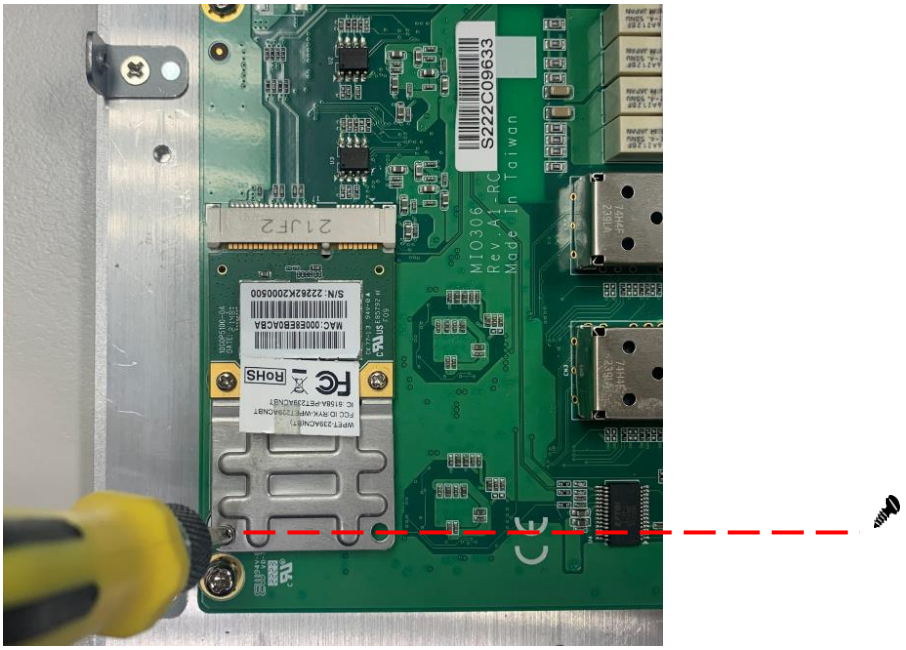


Figure 3-3

Step 5 **Insert the wireless/mSATA module into the Mini-Card slot.**

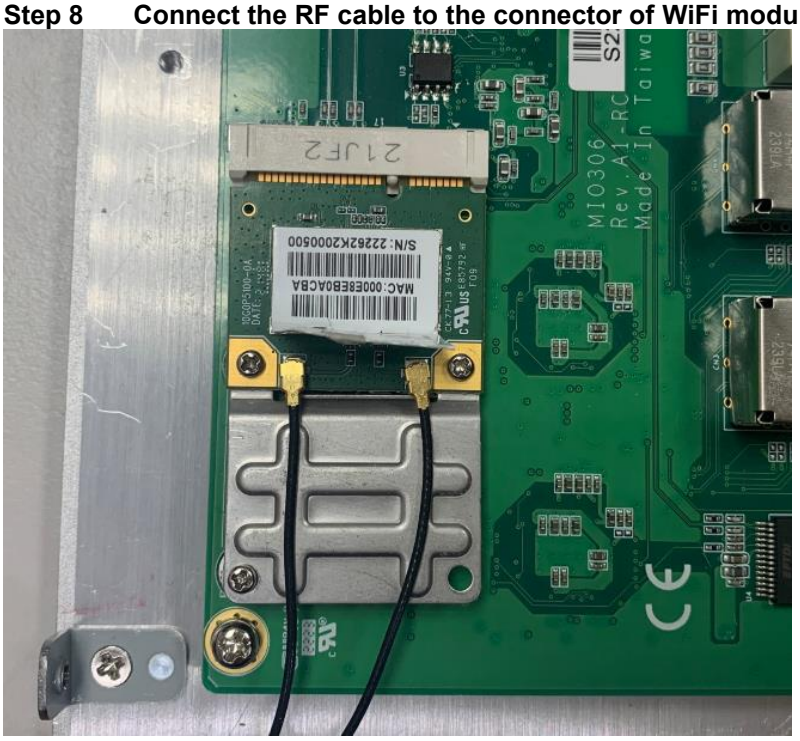


Step 6 Insert the 3G module and tighten the screws.

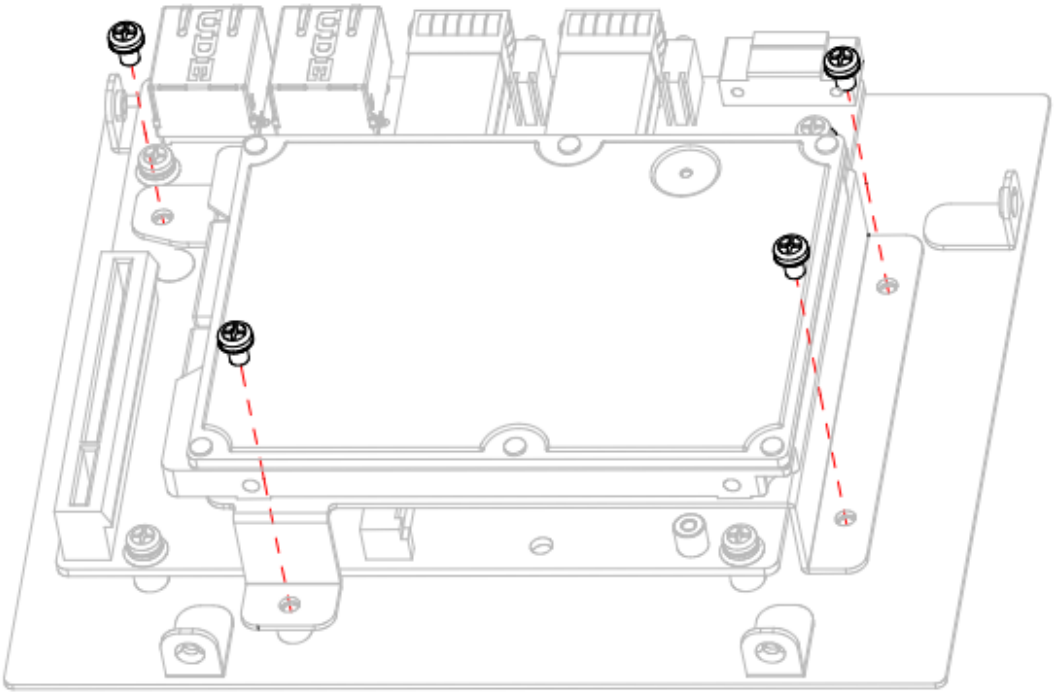


Step 7 Remove the plug cover from the chassis.

Step 8 Connect the RF cable to the connector of WiFi module



Step 9 Loosen screws of the HDD Bracket



Step 10 **Take out the parts from the 3G/4G kit package (Figure 3-4) and put the RF cable through the antenna hole (Figure 3-5). Finally, tighten the screws. (Figure 3-6).**

Figure 3-4

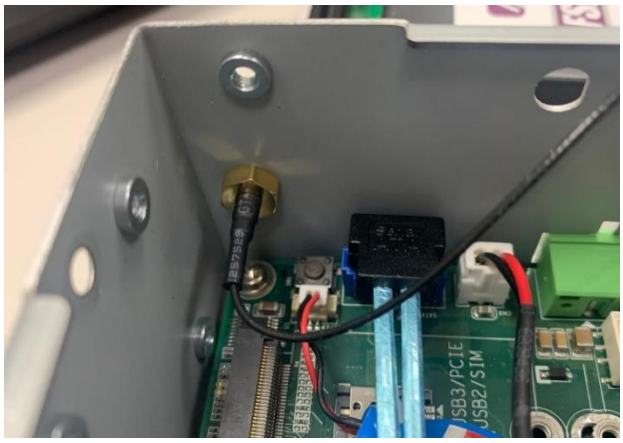


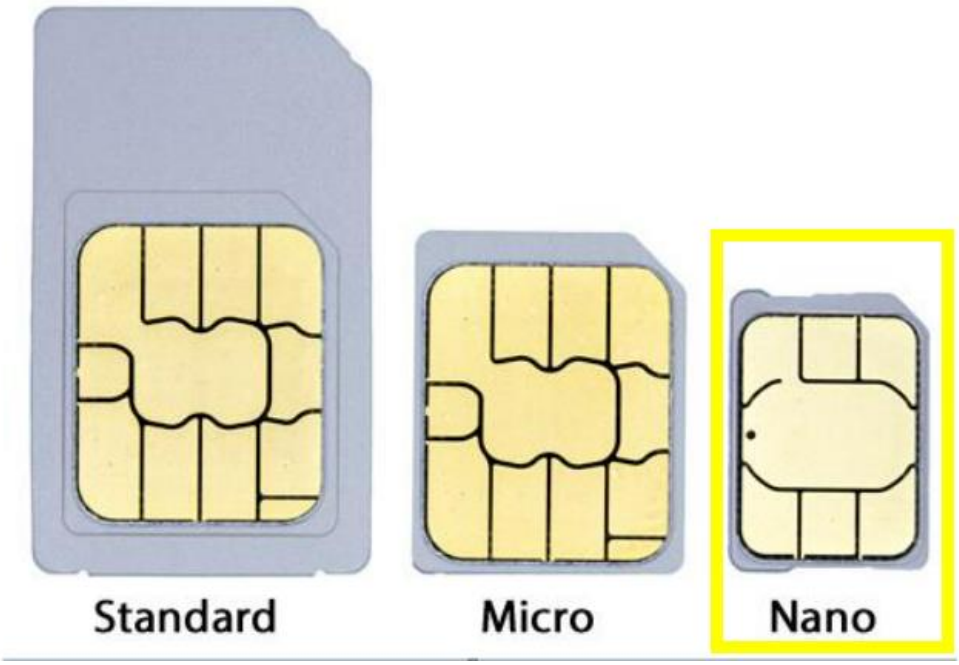
Figure 3-5

Figure 3-6

Step 11 **Screw the RF antenna tight.**

Step 12 Put the cover back to the system, and tighten the screws and close the chassis.

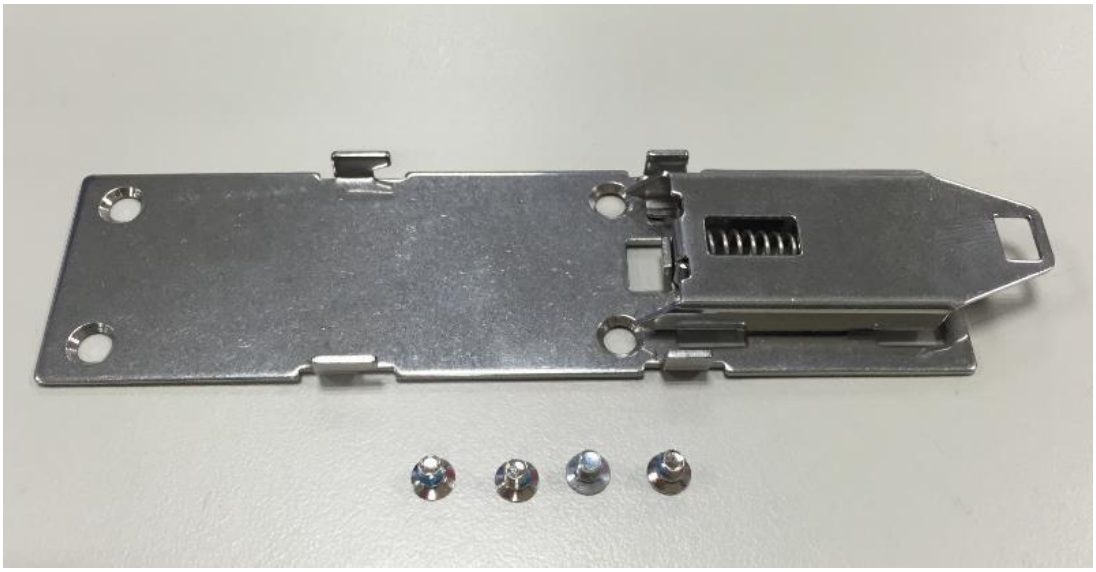
NOTE: Only the Nano SIM card as the following picture can be inserted into the slot .



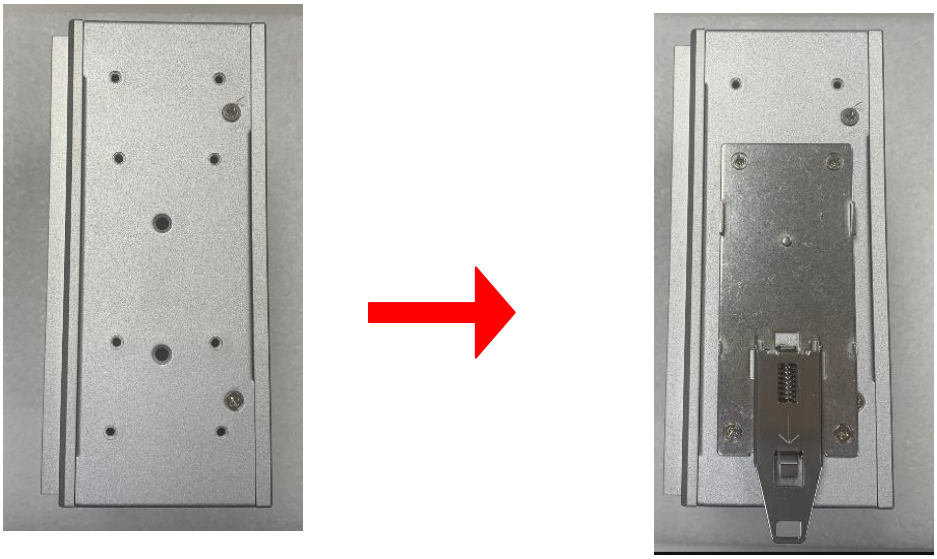
3.4 Installing Din-rail Mounting

The iNA200 provides Din-rail Mount as below:

Step 1 Prepare Din-rail Mount assembling components (screws and bracket) ready.



Step 2 Assemble the bracket to the system and tighten the screws .



Section 4
AMI BIOS Setup Utility

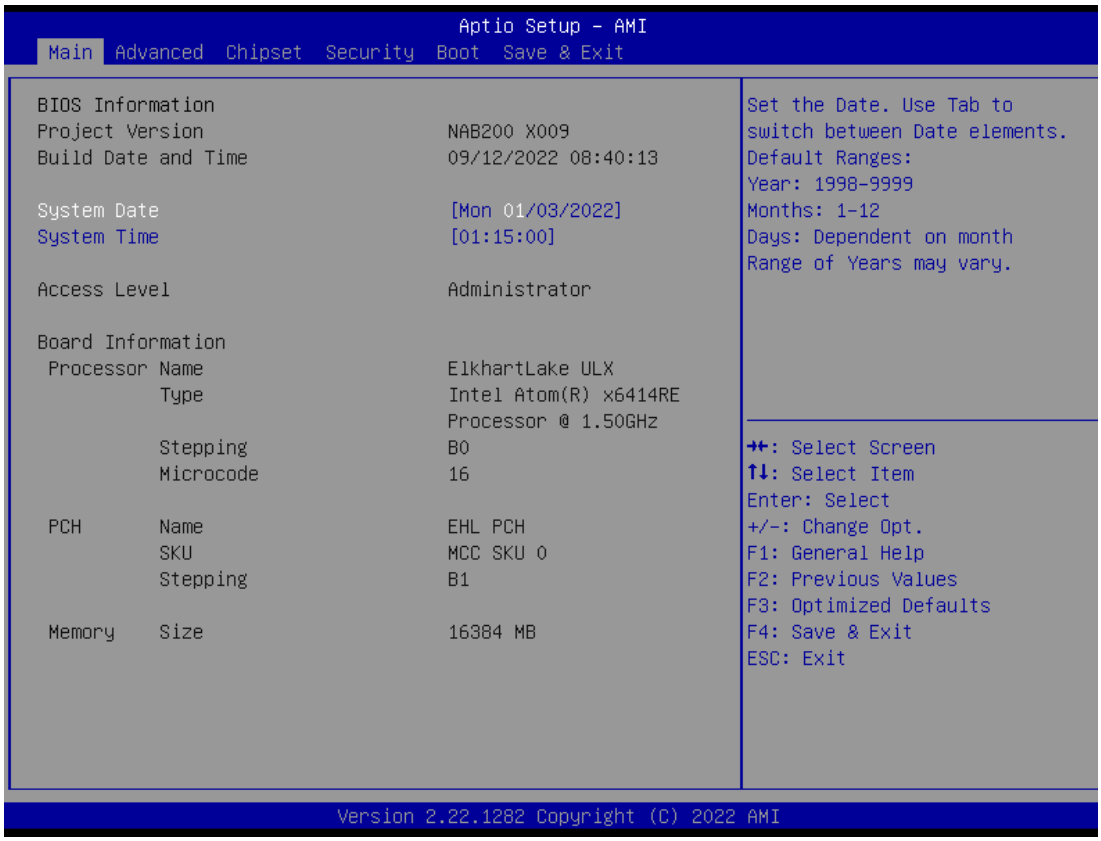
The AMI UEFI BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a flash backup to save the Setup information whenever the power is turned off.

4.1 Entering Setup

To enter the setup screens and follow the steps below:
Turn on the computer and press the <Del> key immediately.
After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

4.2 The Main Menu

Once you enter the AMI BIOS Aptio Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use Select Screen Keys (or Move Keys) to select the Setup Page you intend to configure and then press <Enter> to accept or to enter its sub-menu.



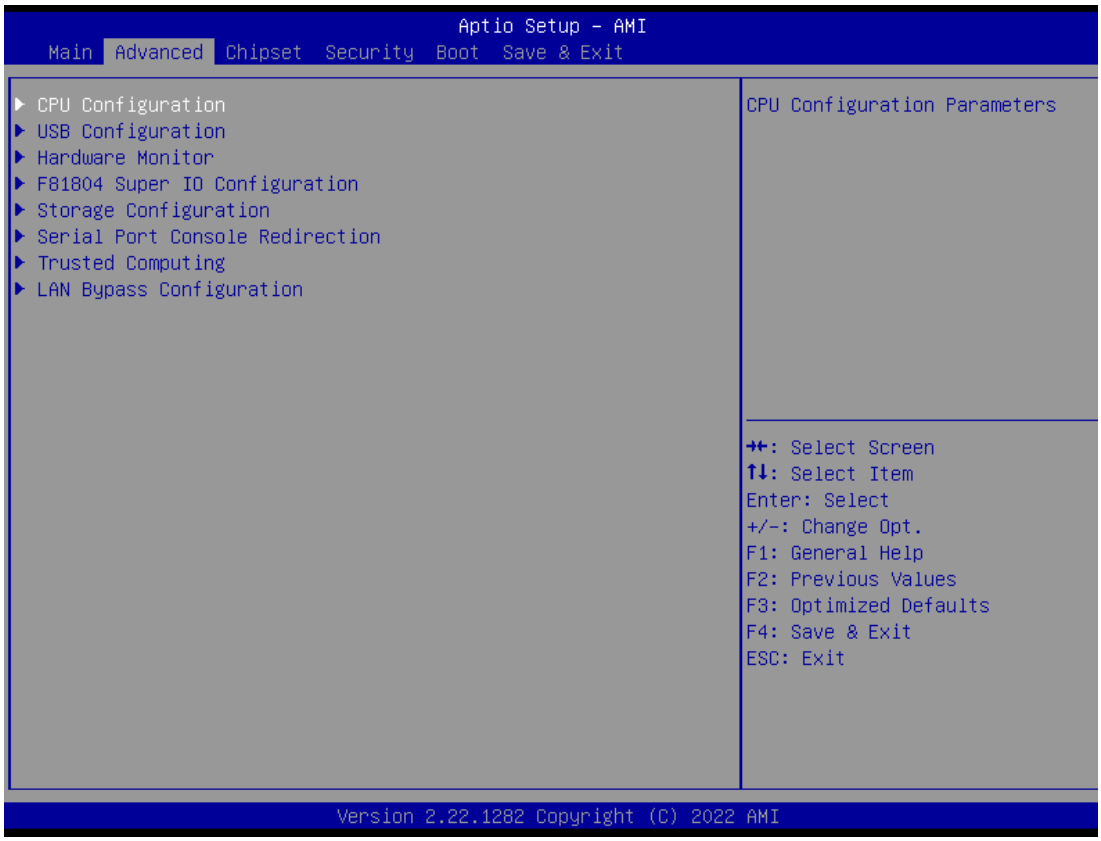
System Date
The date format is <day> <month> <date> <year>.

System Time
This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

4.3 Advanced Features

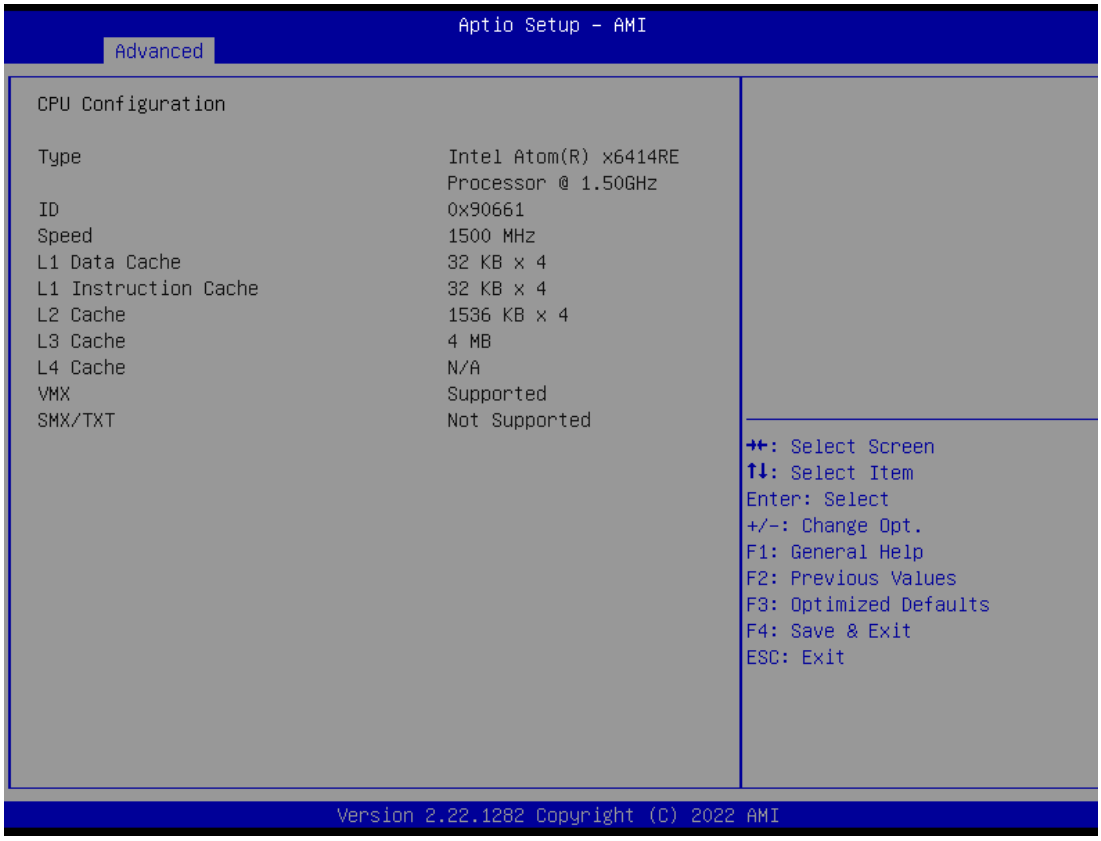
This Advanced menu allows users to configure and improve your system, or to set up some system features according to your preference. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ CPU Configuration
- ▶ USB Configuration
- ▶ Hardware Monitor
- ▶ SATA Configuration
- ▶ F81804 Super IO Configuration
- ▶ Storge Configuration
- ▶ Serial Port Console Redirection
- ▶ Trusted Computing
- ▶ LAN Bypass Configuration



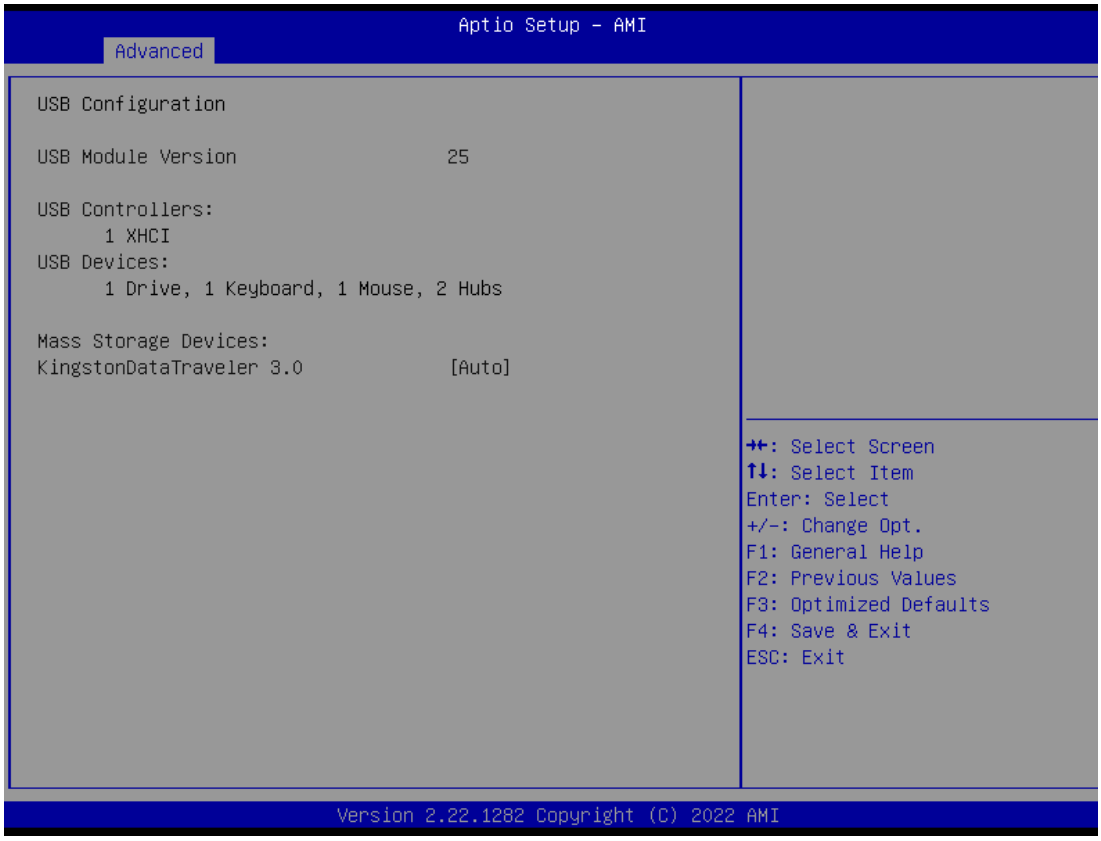
- **CPU Configuration**

Scroll to this item and press <Enter> to view the CPU Configuration information.
(Please refer to the graphics below .)



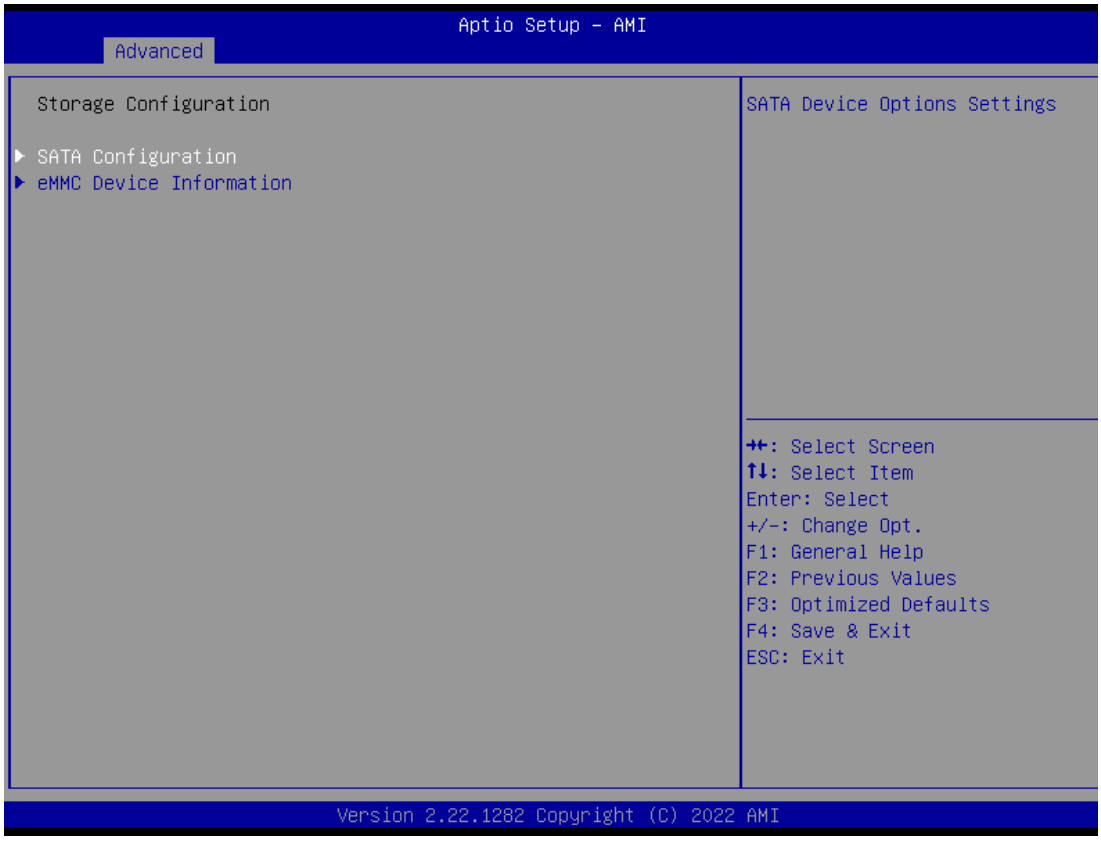
- **USB Configuration**

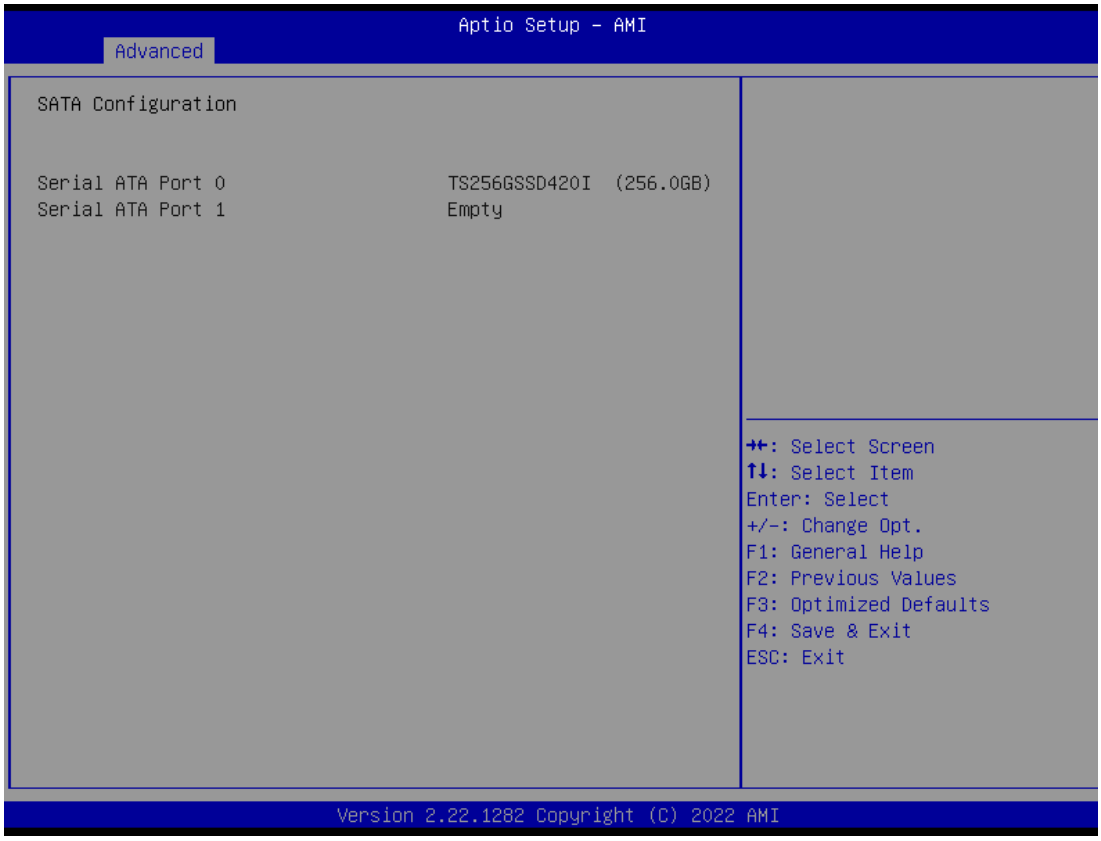
Scroll to this item and press <Enter> to view the USB Configuration information.
(Please refer to the graphics below)

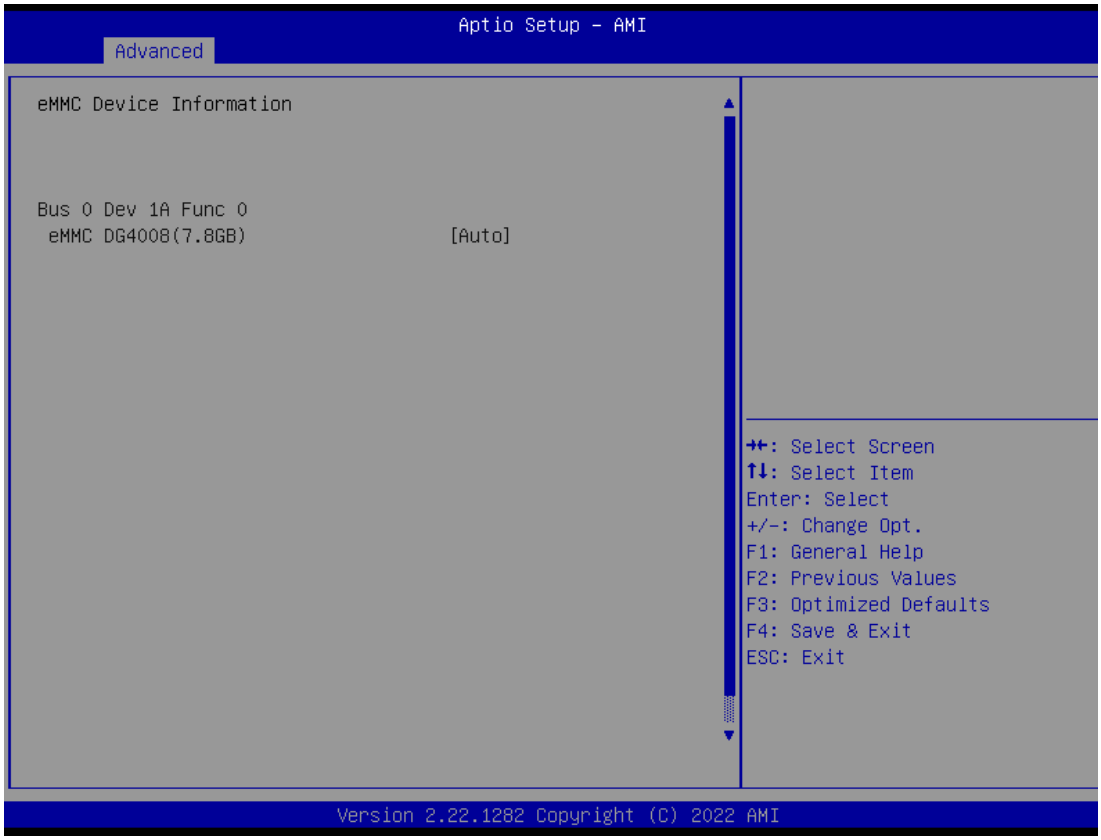


- **Storage Configuration**

Scroll to this item and press <Enter> to view the eMMC and SATA Configuration information. (Please refer to the graphics below .)

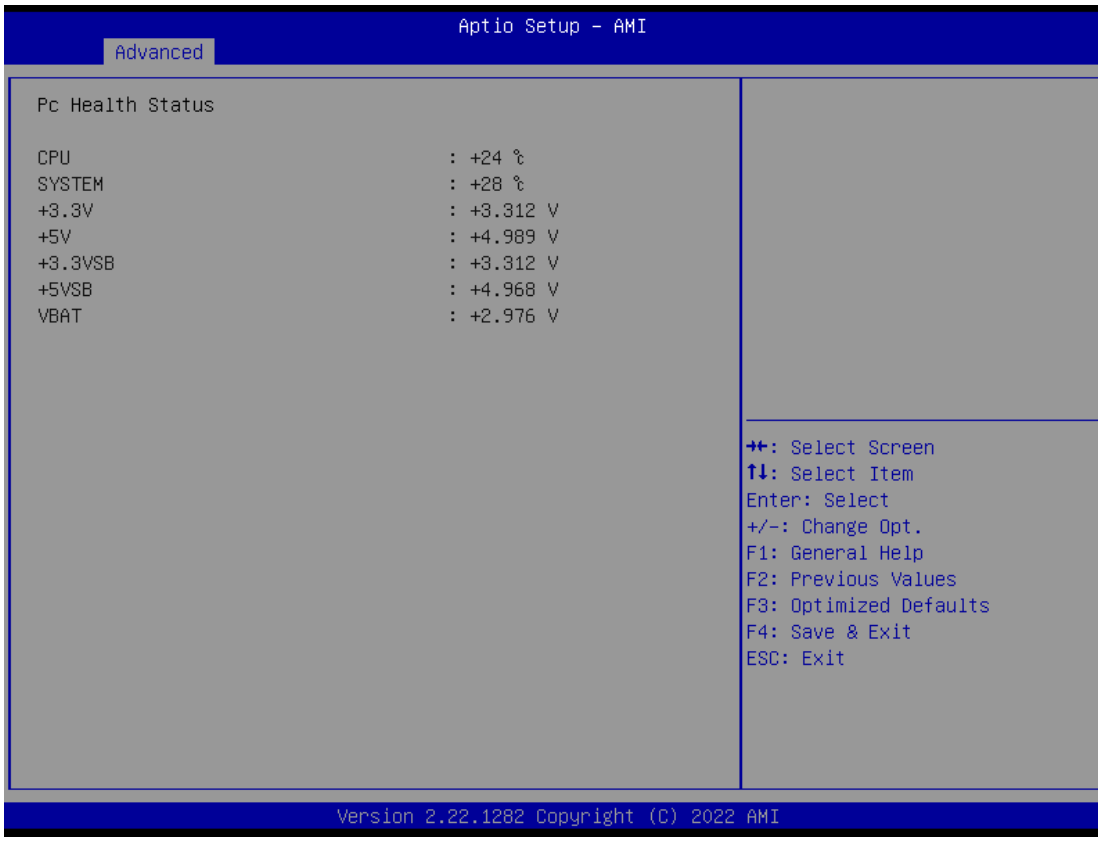



Aptio Setup – AMI
Advanced
SATA Configuration
Serial ATA Port 0 TS256GSSD420I (256.0GB)
Serial ATA Port 1 Empty
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2022 AMI


Aptio Setup – AMI
Advanced
eMMC Device Information
Bus 0 Dev 1A Func 0
eMMC DG4008(7.8GB) [Auto]
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2022 AMI

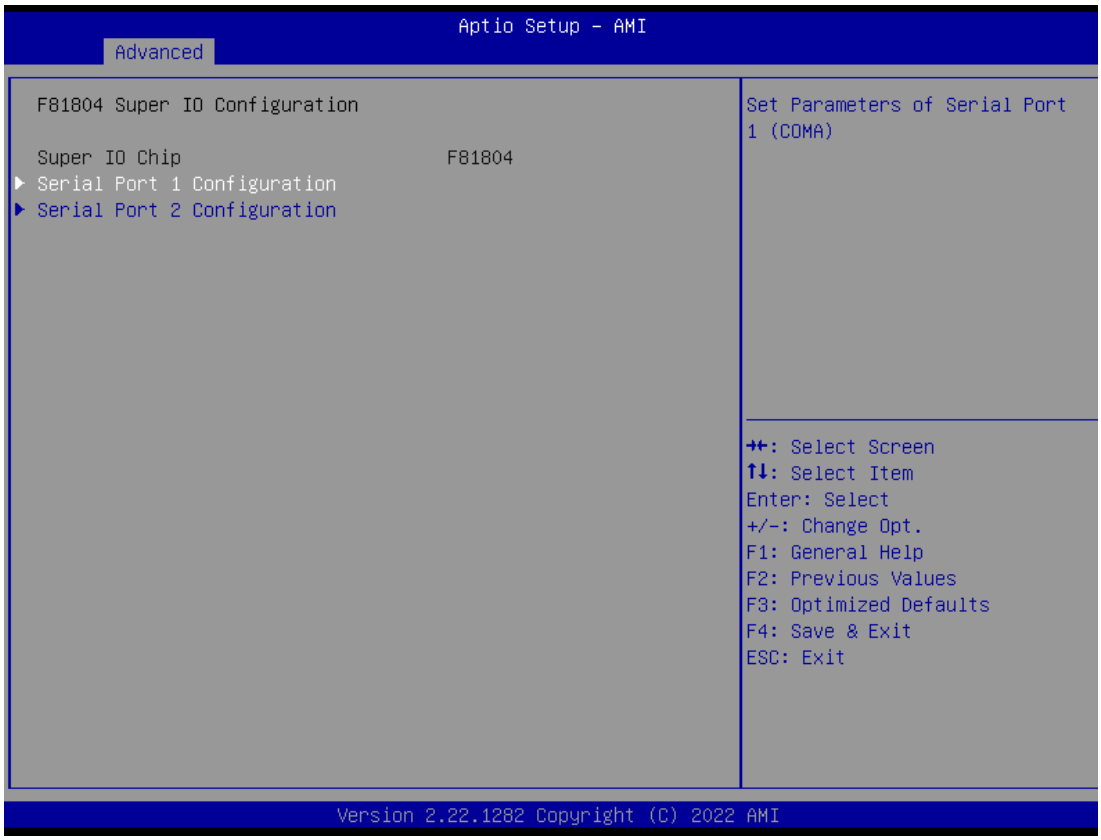
- **H/W Monitor**

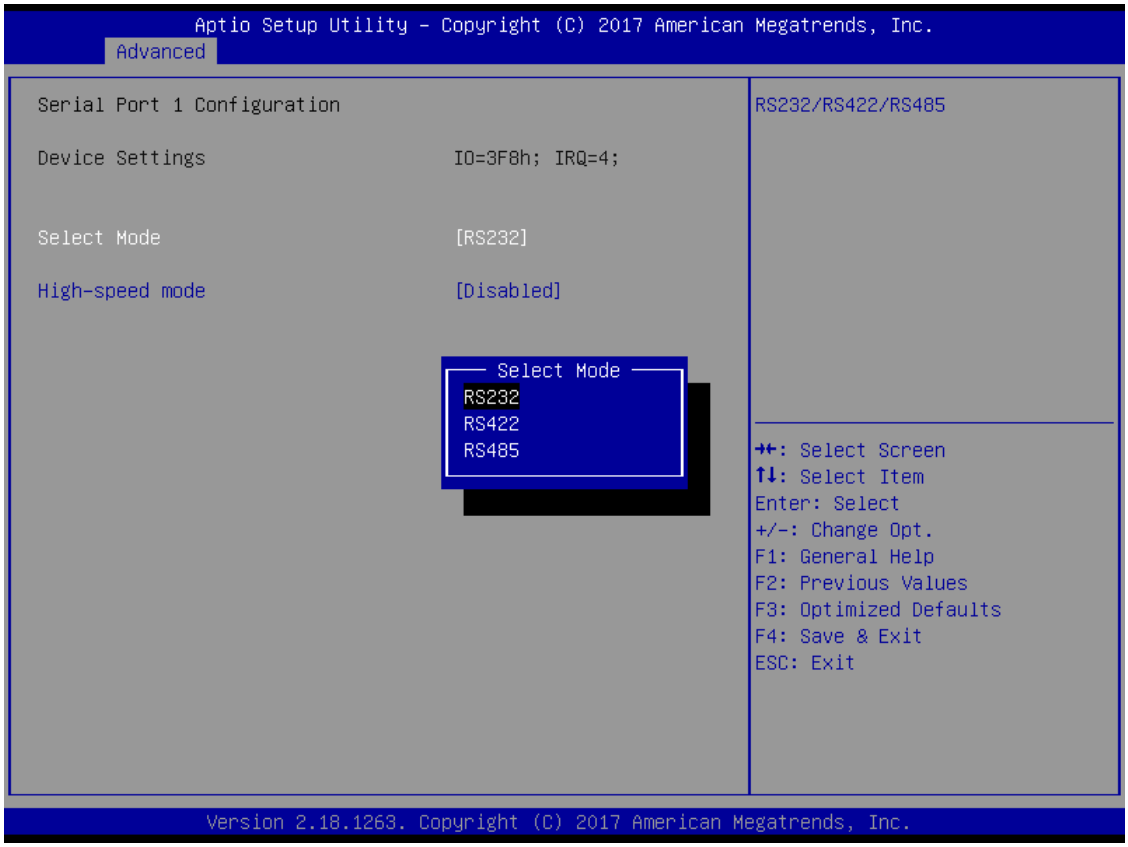
Scroll to this item and press <Enter> to view the hardware status items under monitoring. (Please refer to the graphics below .)

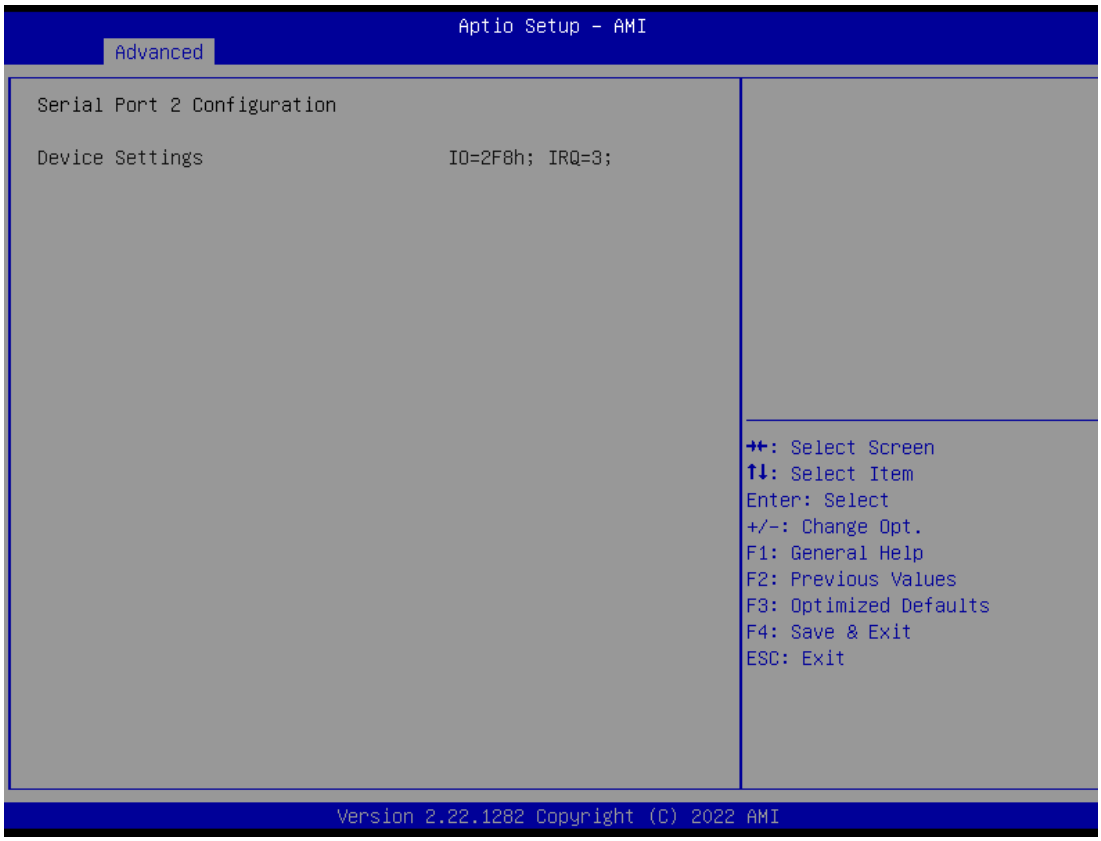


- **F81804 Super IO Configuration**

The default setting for all serial ports is RS-232.
You can change the setting by selecting the value you want in each COM port type.
The system supports RS-422 and RS-485 modes as well as high-speed mode.
You can enable High-speed mode, which can be selected in the BIOS menu.
COM port speed supports up to 1.5 Mbps.
(Please refer to the graphics below .)

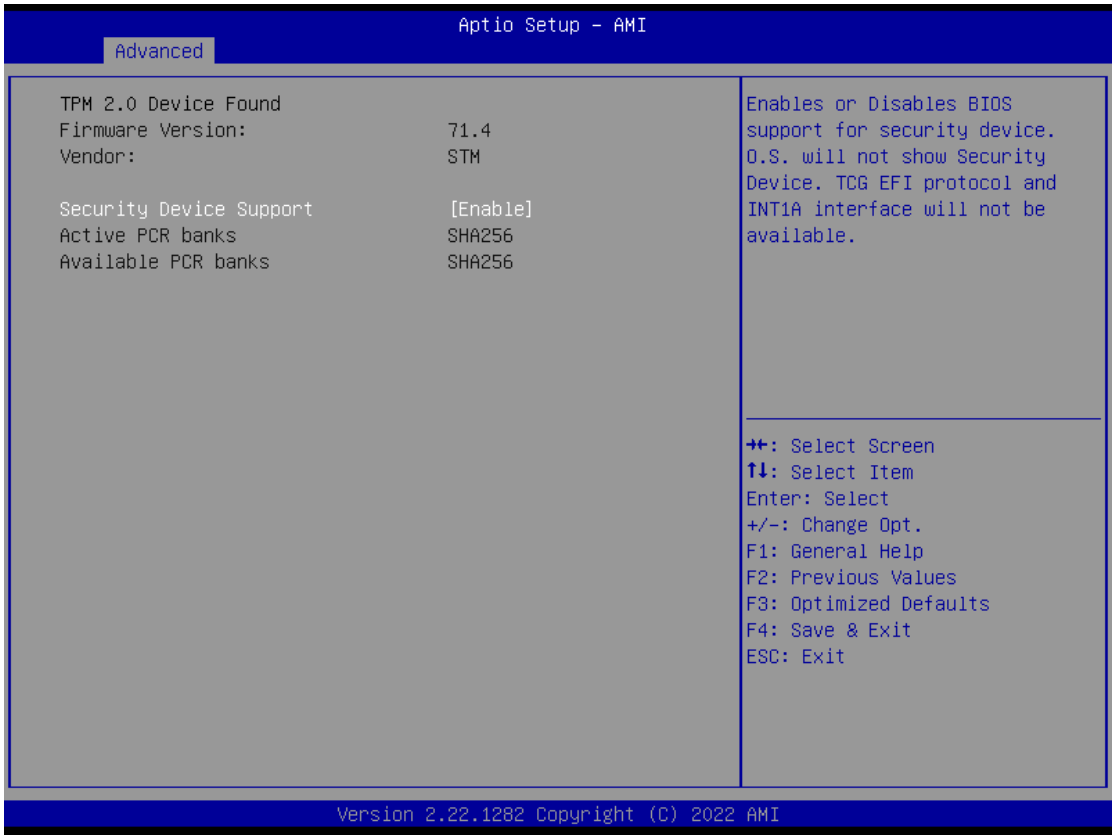



Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced
Serial Port 1 Configuration
Device Settings
IO=3F8h; IRQ=4;
Select Mode
[RS232]
High-speed mode
[Disabled]
Select Mode
RS232
RS422
RS485
RS232/RS422/RS485
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.


Aptio Setup – AMI
Advanced
Serial Port 2 Configuration
Device Settings
IO=2F8h; IRQ=3;
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2022 AMI

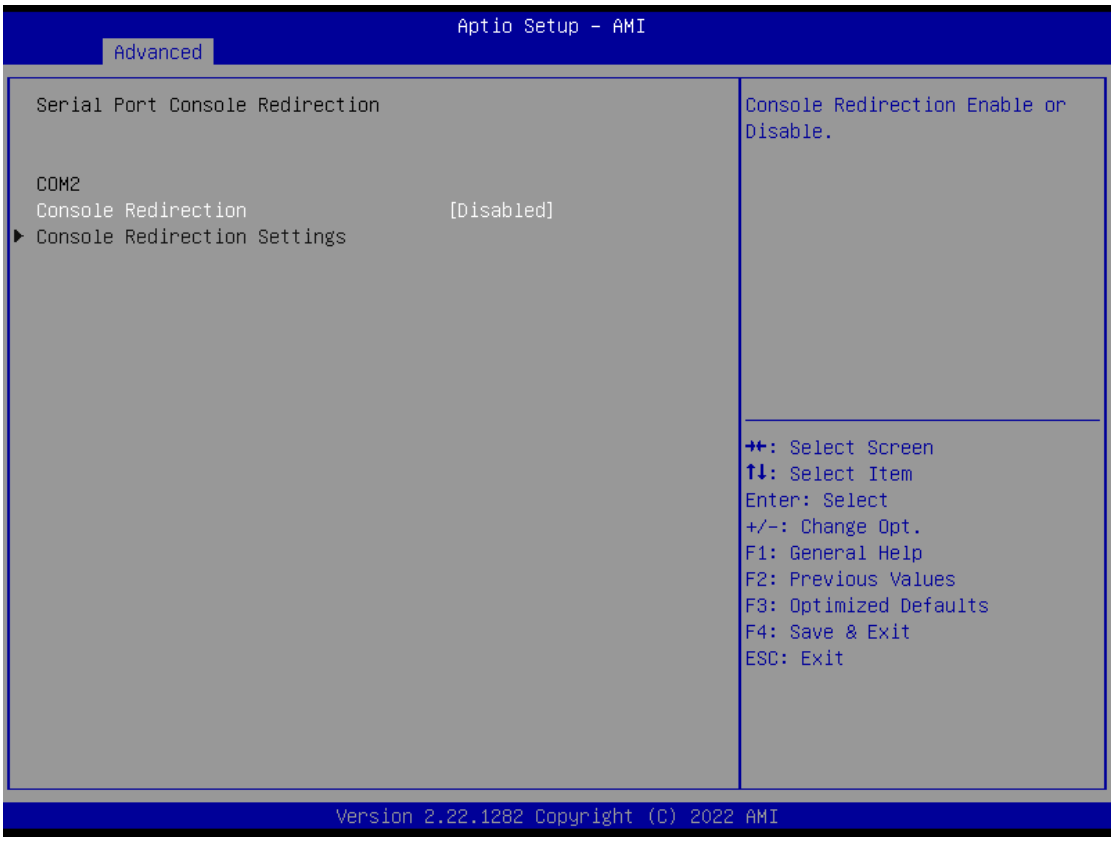
- **Trust Computing**

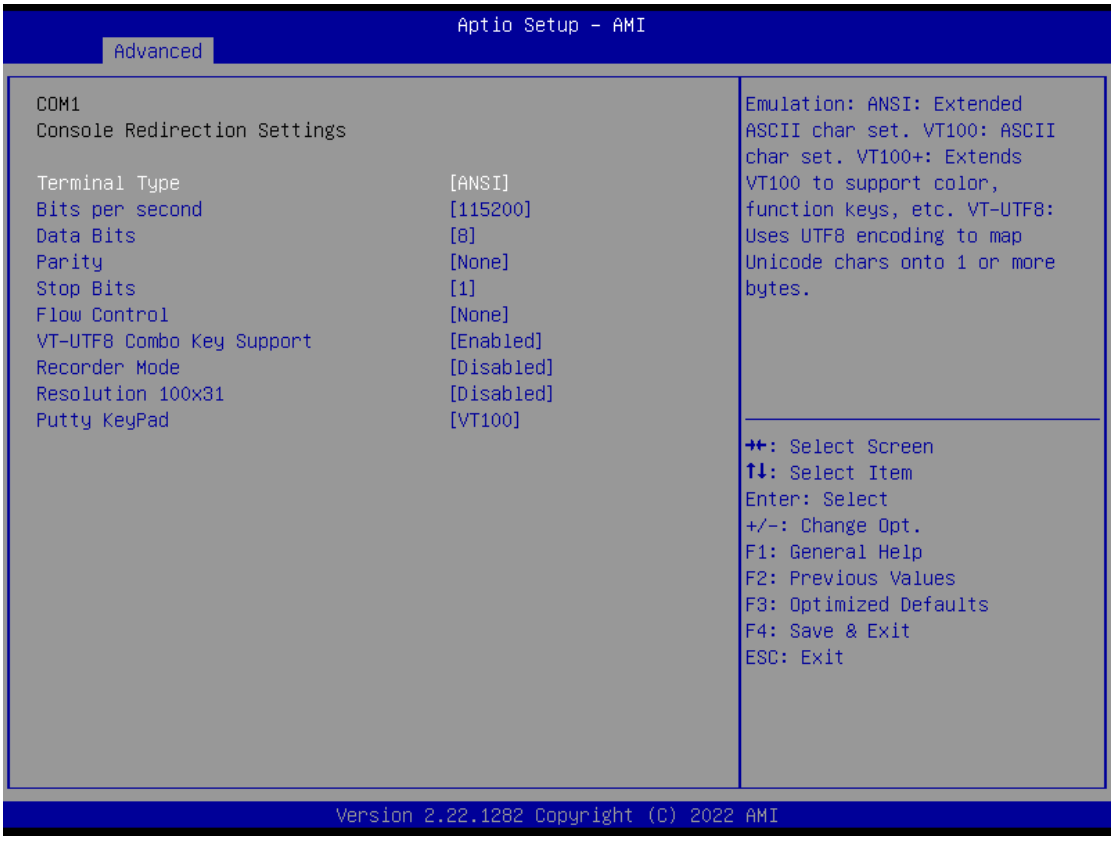
This sub-menu will allow users to enable/disable Trusted Platform Module (TPM) and to configure the TPM State. Select Trusted Computing and press <Enter> to access the sub-menu. Select the Security Device Support item to enable the TPM device.



- **Serial Port Configuration**

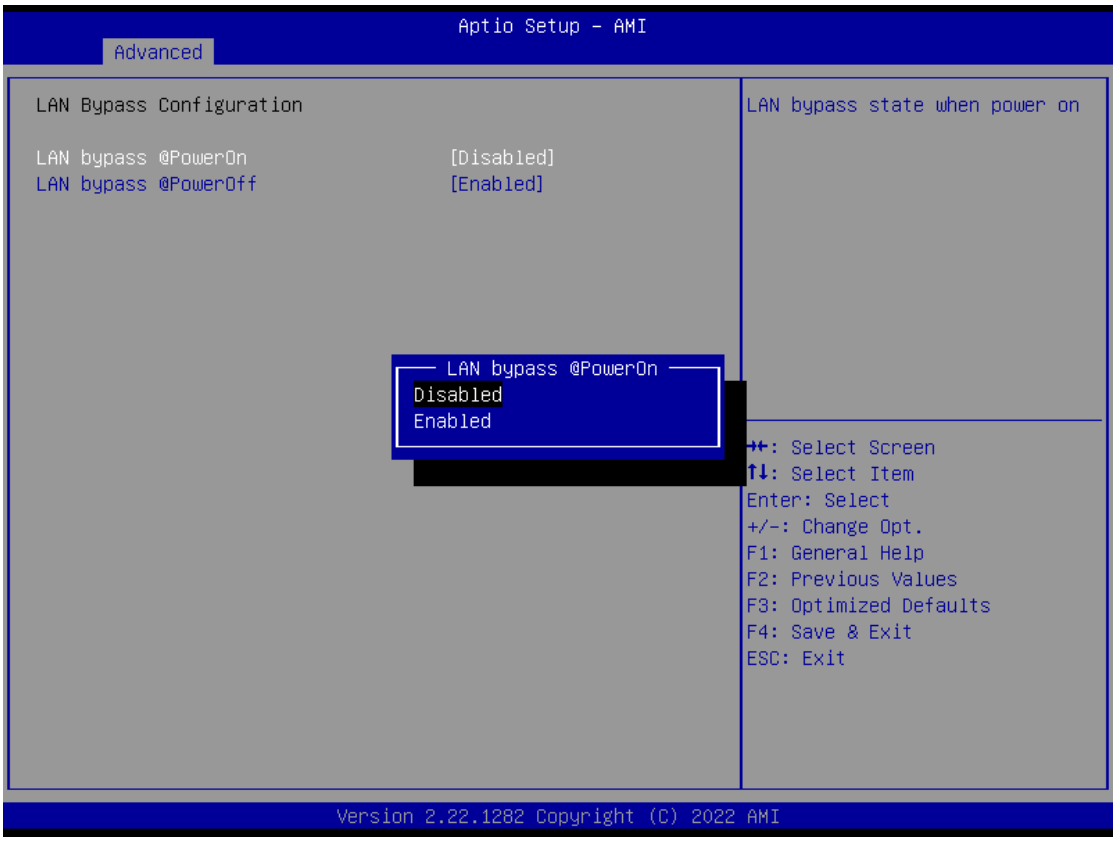
The DIO Modification default setting is "disable".
If the setting is changed to "enable", you can load manufacture default and program DIO setting.
(Please refer to the graphics below .)





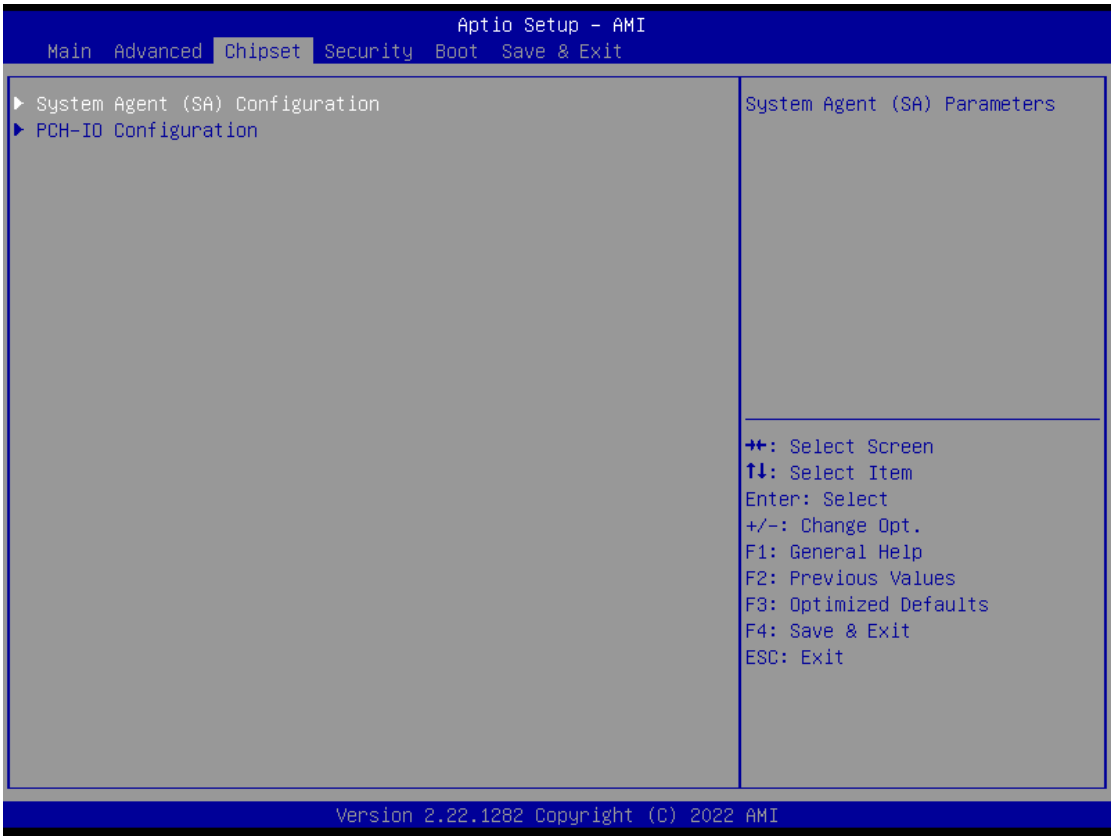
- **LAN Bypass Configuration**

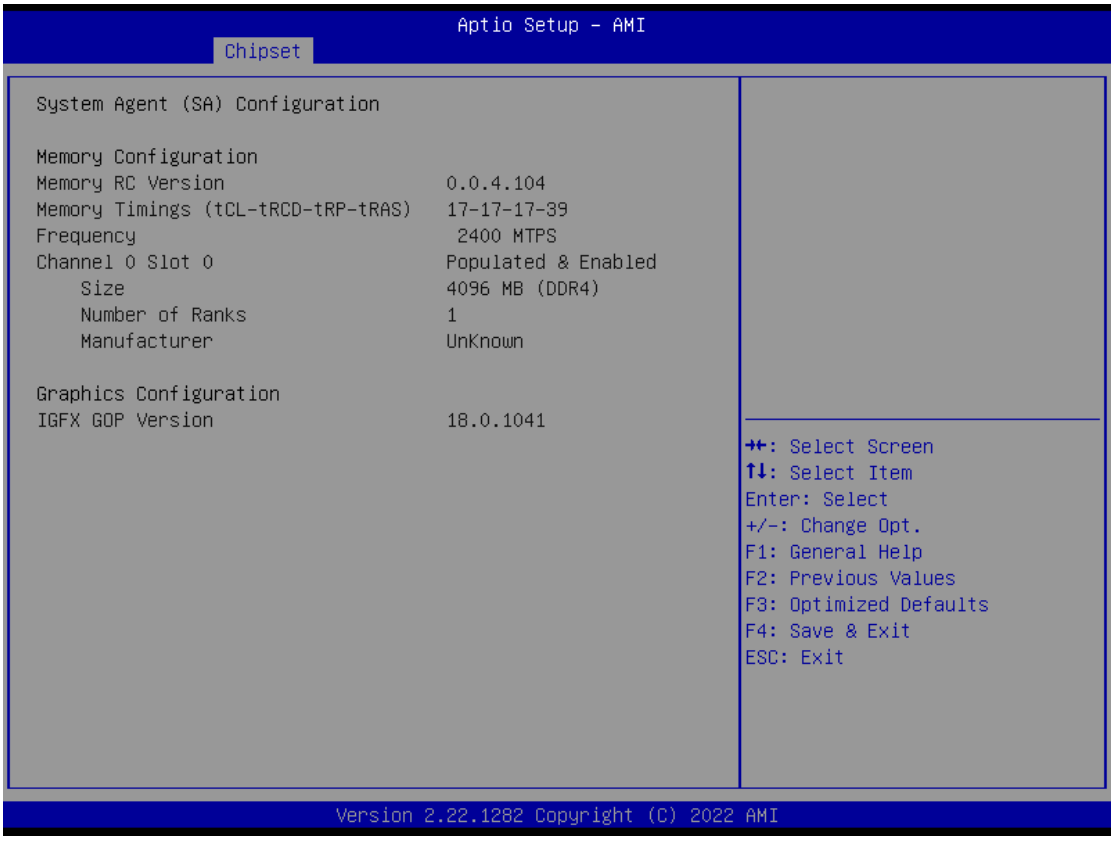
Enable/Disable LAN bypass function

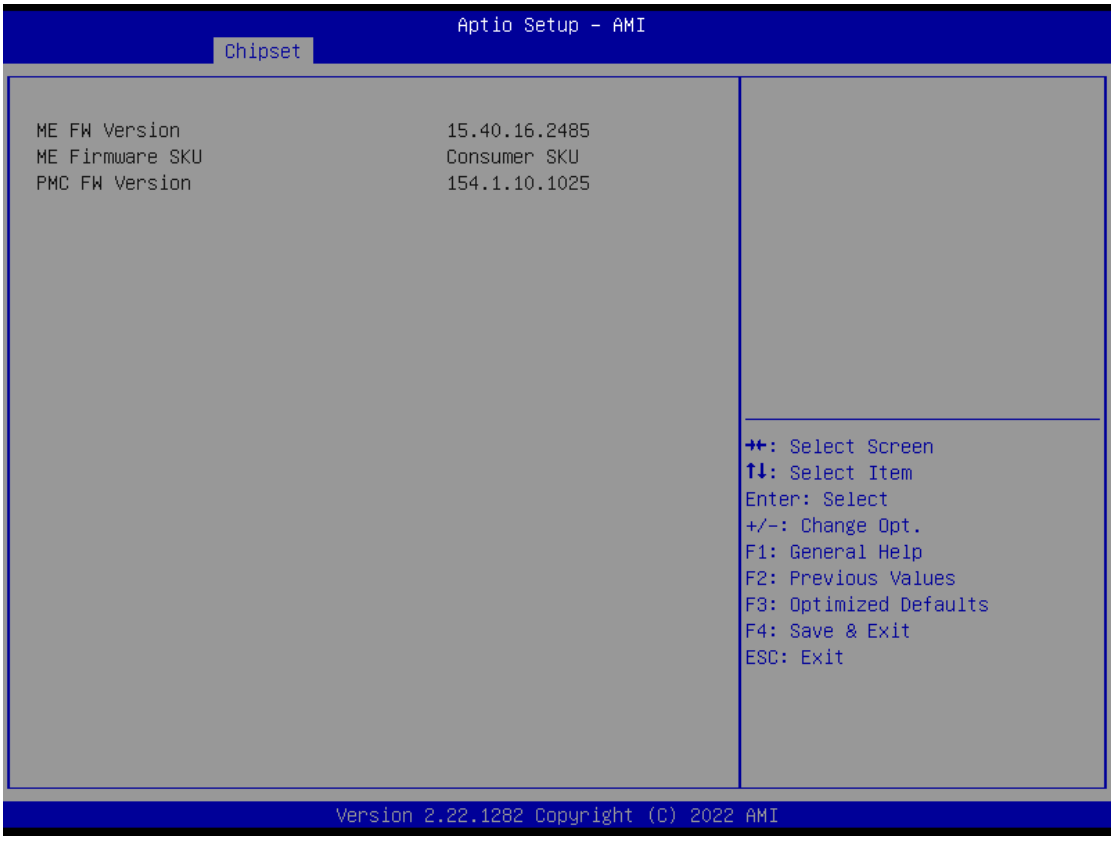


4.4 Chipset Feature

This section contains fully optimized chipset features in the system.

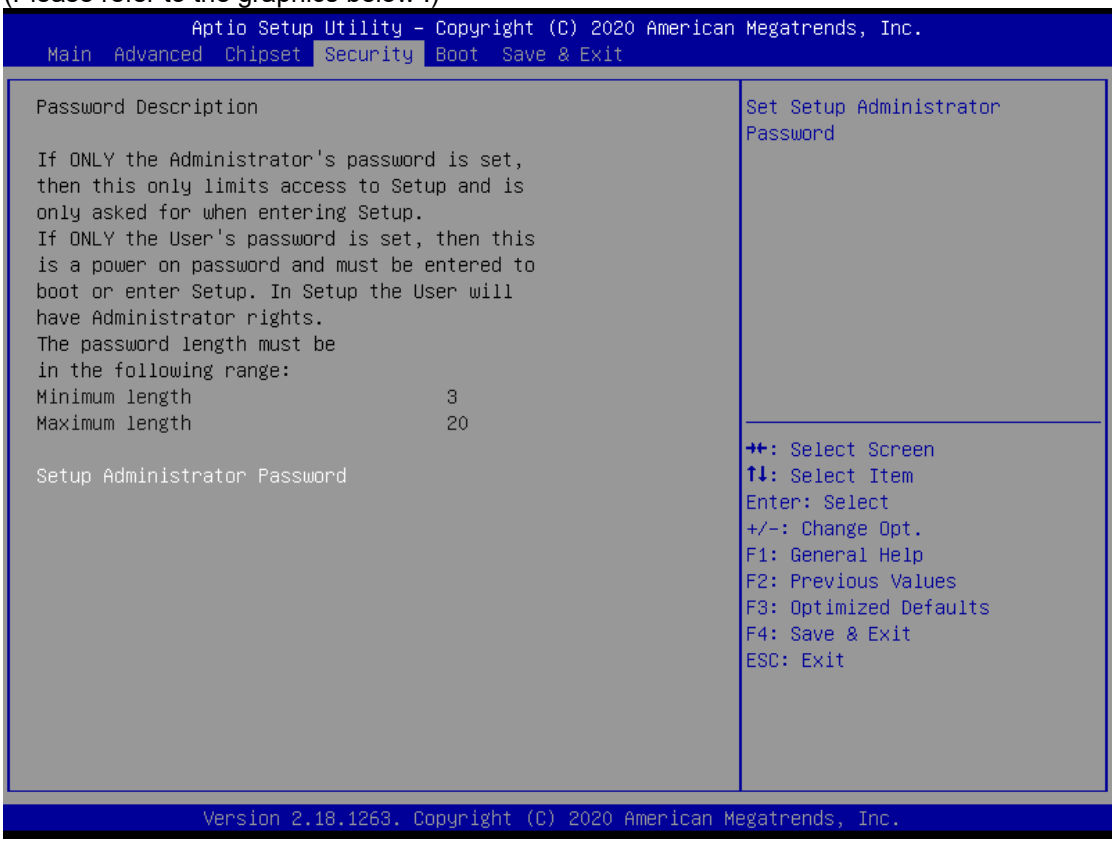


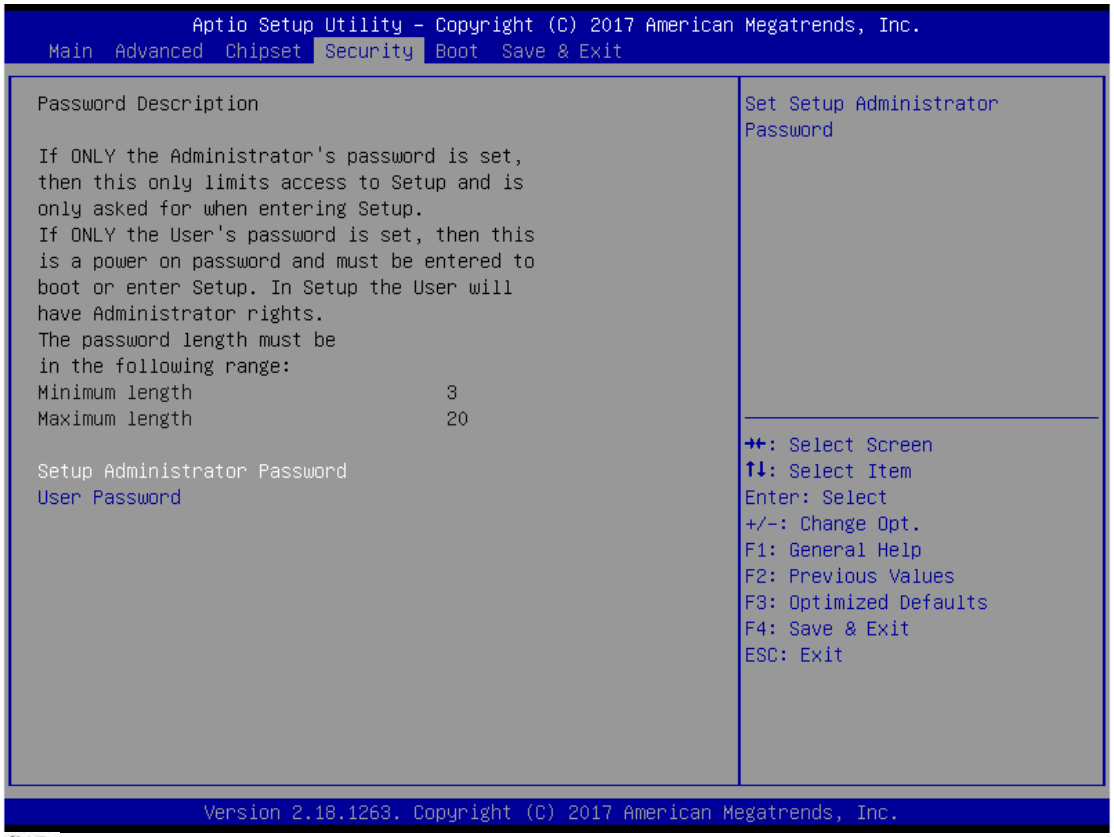



Aptio Setup – AMI
Chipset
ME FW Version
15.40.16.2485
ME Firmware SKU
Consumer SKU
PMC FW Version
154.1.10.1025
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2022 AMI

4.5 Security

The Security menu allows users to enhance system security by setting an administrator password and a user password. No password has been set in the default setting.
(Please refer to the graphics below .)

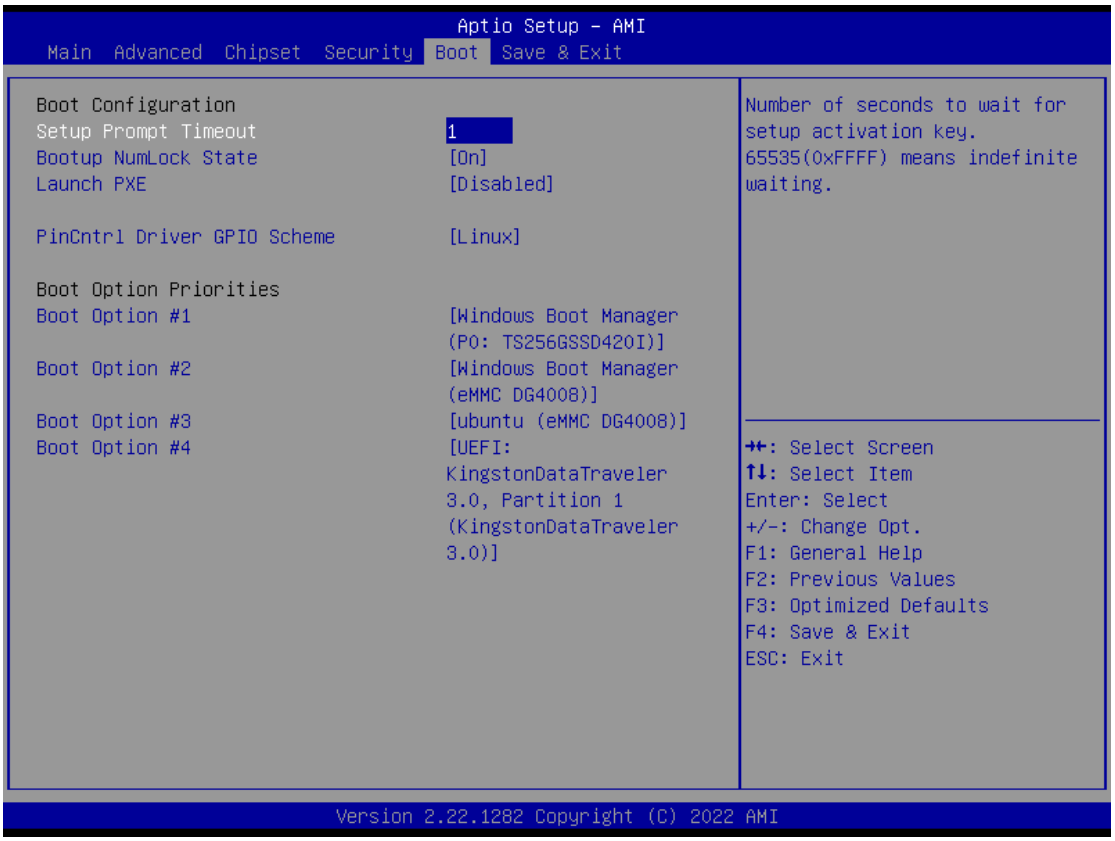




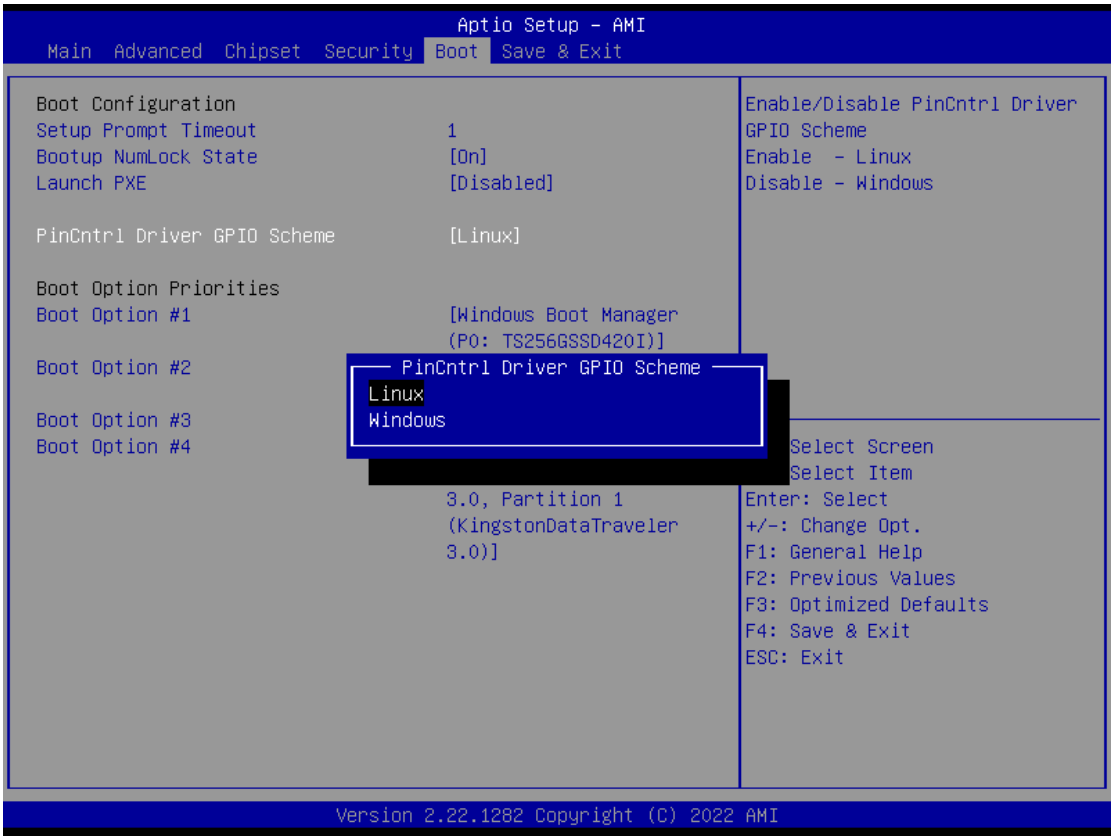
NOTE: The BIOS default has no password. The user must remember the password after creating one. If the user forgets the password RMA is the only solution.

4.6 Boot Type

The Boot menu allows users to change boot options of the system



PinCtrl Driver GPIO Scheme item for choosing for linux or windows

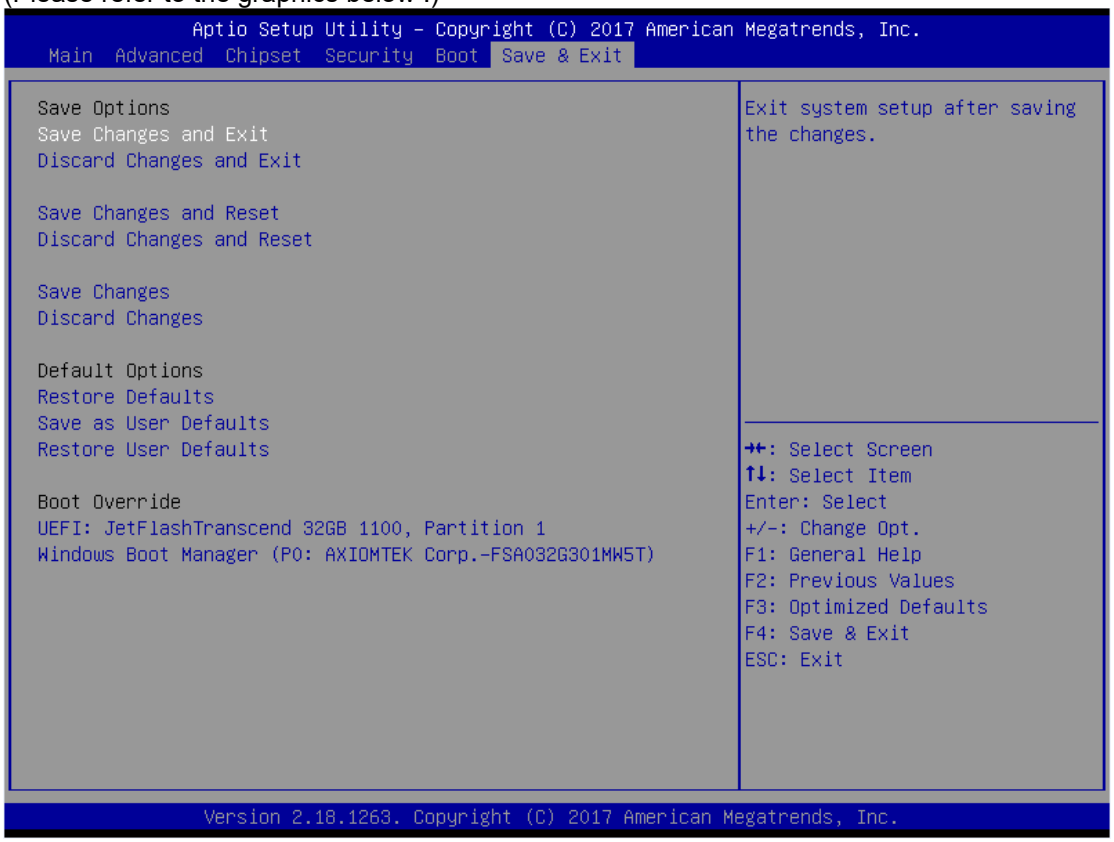


The Boot Option Priorities can be set by selecting Boot Option #1, #2…
(Please refer to the graphics below .)

.

4.7 Save & Exit

The Save & Exit menu allows users to determine whether or not to accept their modifications to the system configuration, or to keep default values for optimal fail-safe performance.
(Please refer to the graphics below .)



BIOS menu item	Description
Save Changes and Exit	When users have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.
Discard Changes and Exit	Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.
Save Changes and Reset	After completing the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations will take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.
Discard Changes and Reset	Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.
Save Changes	After completing the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

Discard Changes	Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
Restore Defaults	It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.
Save as User Defaults	Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
Restore User Defaults	It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
Boot Override	Select a drive to immediately boot that device regardless of the current boot order.

Appendix A
Watchdog Timer

About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

How to Use Watchdog Timer

The following example enables configuration using debug tool.

Enable WDT

Enable configuration:

O 2E 87 ; Un-lock super

I/O O 2E 87

Select logic device:

O 2E 07

O 2F 07

WDT device enable:

O 2E 30

O 2F 01

Activate WDT:

O 2E F0

O 2F 80

Set base timer:

O 2E F6

O 2F M ; **M** = time value

00h~FFh: Time-out disable~ Time-out occurs after 255 seconds when **N**=71h.

Set Second or Minute :

O 2E F5
O 2F N ; **N**=71h or 79h

N=71h, the time base is set to second.

N=79h, the time base is set to minute.