USER'S MANUAL

ICO330

Robust Din-rail Fanless Embedded System

User's Manual

AXIOMTEK

www.axiomtek.com

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February 2024, Version A1.3

Printed in Taiwan

Safety Precautions

Before getting started, please read the following important safety precautions.

1. The ICO330 does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. 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.
3. Disconnect the power cord from the ICO330 before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the ICO330 is properly grounded.
4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -45℃ or above 85℃. It may damage the equipment.
7. Do not open the system's back 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 on your body.
   - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.
8. Caution

   Risk of explosion if battery is replaced by an incorrect type dispose of used batteries according to the instructions.
9. Warning

   Hot Surface Do NoT Touch.

   Restricted access area: The equipment should only be installed in a Restricted Access Area.
10. This product is intended to be supplied by a Listed Power Adapter or DC power source, output meets SELV, rated 12-24Vdc, minimum 2.43-1.29A, Tma = 70 degree C, and the altitude of operation = 2000m.

    If need further assistance with purchasing the power source, please contact to manufacturer for further information.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IP30
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

***Note: We strongly recommended that you should shut down the system before you start to clean any single components*.**

Please follow the steps below:

1. Close all application programs
2. Close operating software
3. Turn off power
4. Remove all device
5. Pull out power cable

Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

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Table of Contents

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SECTION 1
INTRODUCTION

This chapter contains general information and detailed specifications of the ICO330. The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets

1.1 General Description

ICO330 Din-rail fanless embedded system is suitable for communications control and for protocol converter applications in critical environments. Built for rugged work environments, ICO330 features an extra low power consumption Intel® Atom® x6212RE(1.2GHz) or x6414RE (1.5GHz) processors supporting industrial temperature range of -40℃ to +70℃. Its front accessible I/O cabling is very convenient for wiring and maintenance. ICO330 offers a HDMI output, making it particularly well-suited for data acquisition, communication control, SCADA and industrial automation. Its compact size with Din-rail mounting allows for easy installation into control cabinet. Pre-installed (optional) with Linux, Windows® 10/11 IoT, ICO330 provides programmers with a friendly environment for developing application software at a lower cost.

ICO330 is robust industrial-grade hardware design, besides, supporting the mSATA, SATA SSD, which makes it especially suitable for field control & monitoring system solution for following markets:

Utility Industries (Water; Energy; Chemical Plant; Mining…)

Public Transportation Industries (Traffic/ Highway Control; Train/Bus Control…)

Homeland Security (Weather Monitoring/Alarm System…)

- **Checklist (Slim Mode)**

✓ICO330 System Unit x 1
✓DDR thermal pad x1
✓M.2 Key B thermal pad x1
✓Screws for Mini Card M2*5L x2
✓Screws for SSD/HDD M3*4L x4
✓Screws for M.2 KeyB M3*3L x1
✓Screws for HDMI BKT M3*5L x1
✓Power 3 pin terminal block x 1
✓Din-rail Kit x1Set
✓COM 2x5pin termninal block x2
✓SATA+Power SSD cable x1
✓HDMI BKT x1
✓Cable Tie and Holding Kit for HDMI x1
✓Thermal sheet block for DDR x1
✓Thermal sheet block for M.2 KeyB x1

- **Checklist (Full Mode)**

✓ICO330 System Unit x 1
✓DDR thermal pad x1
✓M.2 Key B thermal pad x1
✓Screws for Mini Card M2*5L x2
✓Screws for SSD/HDD M3*4L x4
✓Screws for M.2 KeyB M3*3L x1
✓Screws for HDMI BKT M3*5L x1
✓Power 3 pin terminal block x 1
✓Din-rail Kit x1Set
✓DIO 2x6pin termninal block x2
✓COM 2x5pin termninal block x6
✓SATA+Power SSD cable x1
✓HDMI BKT x1
✓Cable Tie and Holding Kit for HDMI x1
✓Thermal sheet block for DDR x1
✓Thermal sheet block for M.2 KeyB x1

Note: Please contact your local vendors if any damaged or missing items.

- **Features (Slim Mode)**
  - Fanless design
  - Wide temperature operation of -40^{0}C - +70^{0}C
  - 3 2.5Gb Ethernets with Magnetic Isolated Protection
  - 2 isolation 2KV COM Ports support RS-232/422/485 with terminal block type connector (2 w/ fully pins)
  - 3 Mini Card (1x M.2 key B w/ USB+SIM, 1 x Full-size mini card w/ USB+SIM, 1 x Half-size mini card w/ USB/PCIe/mSATA)
  - Support one 2.5" SSD SATA drive bay, mSATA (half-size) and eMMC (8Gb by default)
  - Wide range 9–36V DC-in with terminal block
  - Din-rail mounting
  - Wall mounting (optional)
  - Passed CE with FCC testing.

- **Features (Full Mode)**
  - Fanless design
  - Wide temperature operation of -40^{0}C - +70^{0}C
  - 3 2.5Gb Ethernets with Magnetic Isolated Protection
  - 6 isolation 2KV COM Ports support RS-232/422/485 with terminal block type connector (2 w/ fully pins, 4 w/ 4-wire type)
  - 3 Mini Card (1x M.2 key B w/ USB+SIM, 1 x Full-size mini card w/ USB+SIM, 1 x Half-size mini card w/ USB/PCIe/mSATA)
  - Support one 2.5" SSD SATA drive bay, mSATA (half-size) and eMMC (8Gb by default)
  - Wide range 9–36V DC-in with terminal block
  - 1 isolation 2KV 8-bit DO with terminal block type connector
  - 1 isolation 2KV 8-bit DI with terminal block type connector
  - Din-rail mounting
  - Wall mounting (optional)
  - Passed CE with FCC testing

- **Embedded O.S. Supported**
  - ICO330 not only supports Windows®10/11, but also supports embedded OS, such as Windows® 10/11 IoT and Linux package support. For storage device, ICO330 supports one SATA SSD, one mSATA, one 8GB eMMC.

1.2 System Specifications

1.2.1 CPU

- Onboard Intel® Atom® x6212RE (1.2GHz) or x6414RE (1.5GHz)

1.2.2 BIOS

- AMI (American Megatrends Inc.) UEFI (Unified Extensible Firmware Interface) BIOS.

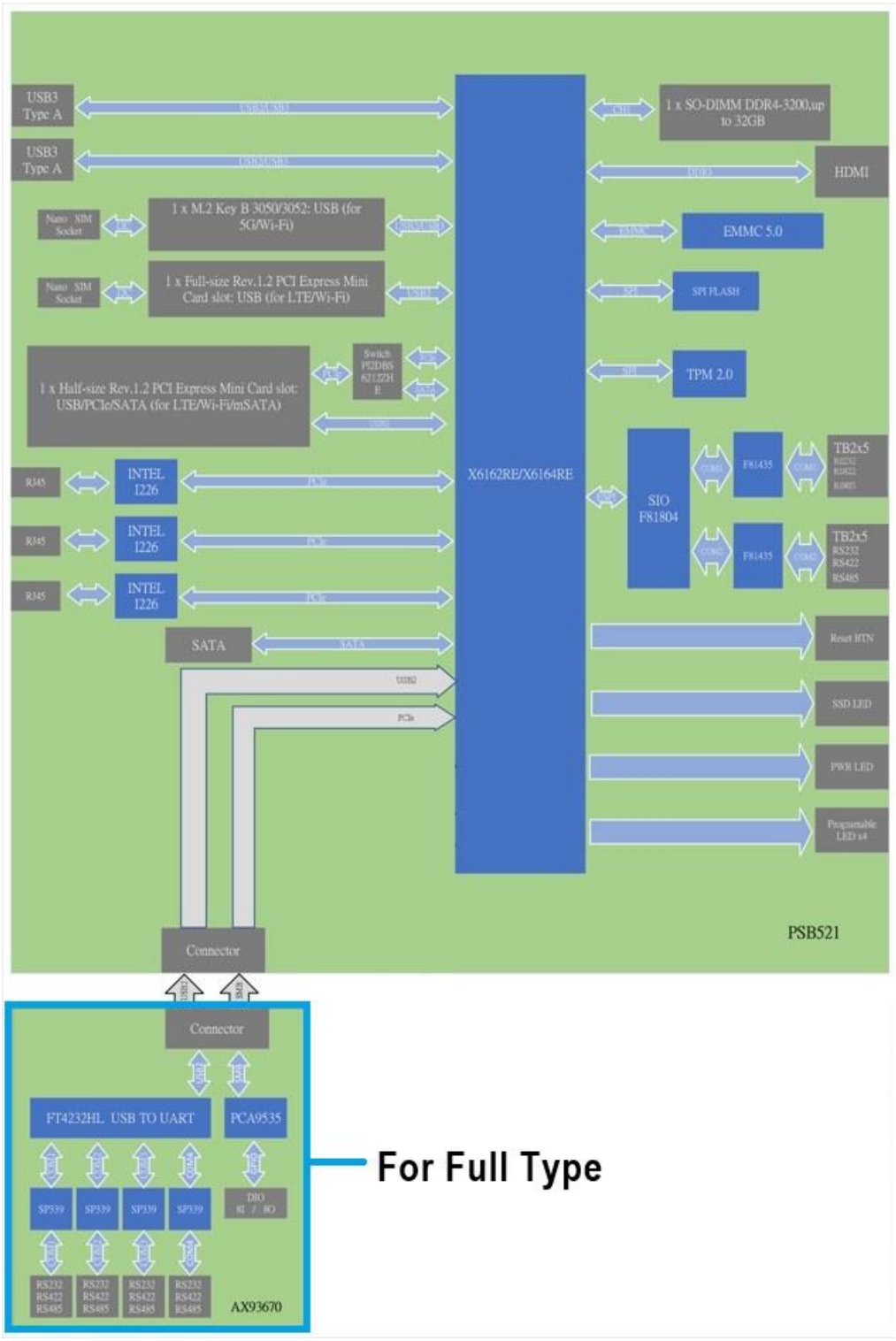
1.2.3 System Memory

- One DDR4-3200 260-pin SO-DIMM slot.
- Supports 3200 MHz up to 32GB.

1.2.4 Display

- 1 x HDMI (up to 1920 x 1080 @60Hz)

1.2.5 System Block diagram



1.2.6 Ethernet Ports

- LAN Chip: Intel Ethernet Controller I226-IT.
- LAN1~3 support 100/1000/2500 Base-T with 1.5KV magnetic isolated protection.

1.2.7 Storages

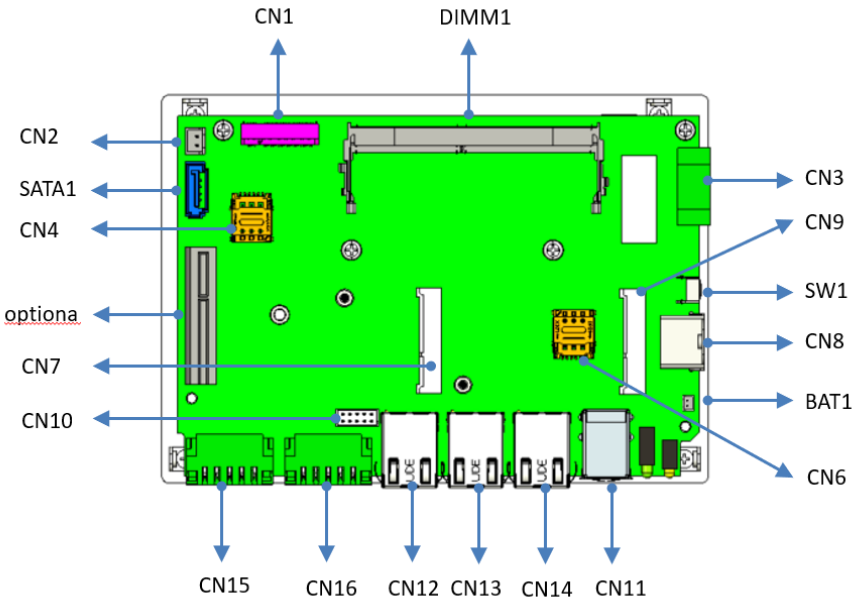
- 1 x 2.5" SATA drive bay.
- 1 x mSATA.
- 1 x 8GB eMMC

1.2.8 Extension

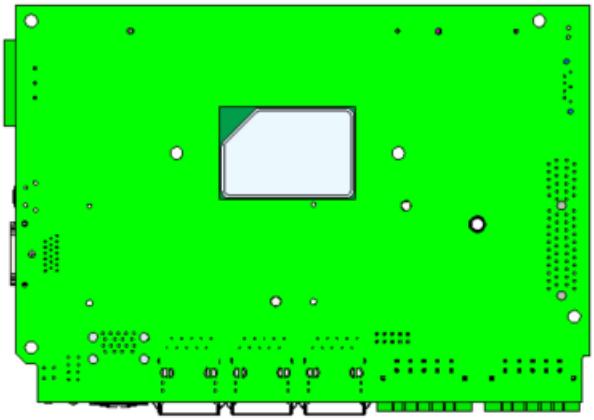
- 1 x full size mini card slot supports module with USB Interface.
- 1 x half size mini card slot supports module with USB and PCIe Interface and SATA Interface for mSATA.
- 1 x M.2 Key B 3050/3052 with USB Interface.
- 2 x SIM Card Socket (one for full size mini card; one for M.2 Key B).
- 5 x Antenna holes.

1.2.9 Placement

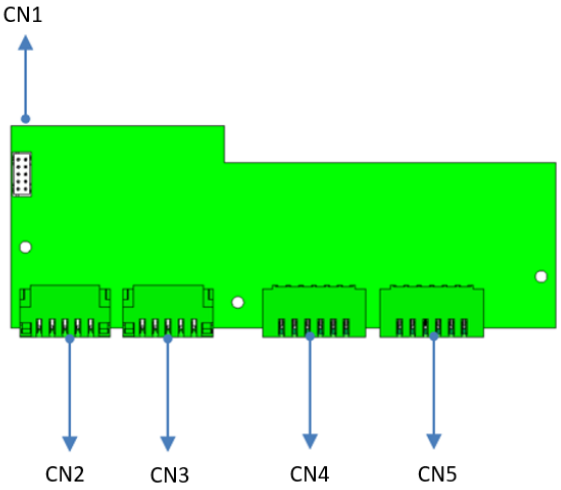
PSB521 TOP View



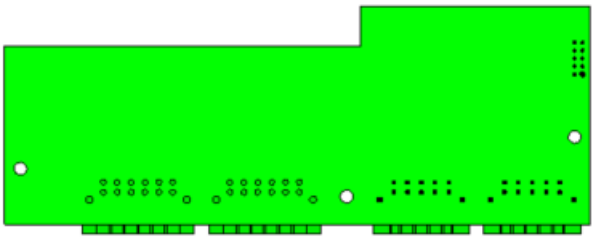
PSB521 Buttom View



AX93670 TOP View



AX93670 Buttom View



1.2.10 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.

PSB521

Connectors	Label
3 pin terminal block for Power Input	CN3
COM Port with RS232 / RS422 /RS485	CN15/CN16
Battery Connector	BAT1
DDR4 SODIMM Socket	DIMM1
HDMI output Connector	CN8
USB3.1 *2 Connector	CN11
LAN connector	CN12/CN13/CN14
M.2 B-key 3052/3042 (USB3.1 / PCIe interface)	CN1
Nano SIM card slot	CN4/CN6
Mini Card Solt1(USB2.0 interface)	CN9
Mini Card Solt2(USB2.0 / PCIe / mSATA interface)	CN7
IO Connector	CN10
SATA+Power	CN2/SATA1
Tact switch for clear CMOS	SW2
Tact switch for Reset	SW1

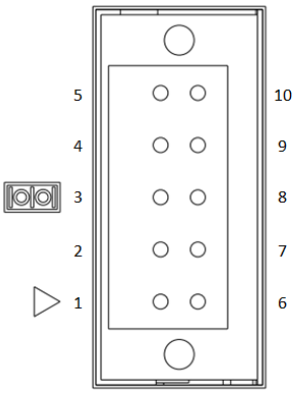
AX93670(Full Mode)

Connectors	Label
IO Connector	CN1
COM Port with RS232 / RS422 /RS485	CN2/CN3
Digital I Connector	CN5
Digital O Connector	CN4

1.2.11 COM

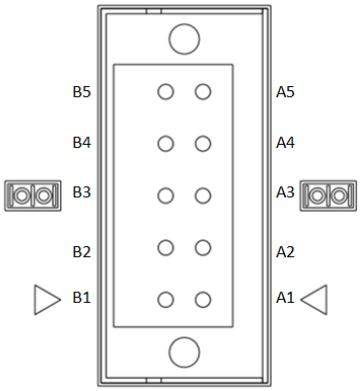
- 6 ports terminal block support RS-232/422/485 which can be selected by BIOS with isolation 2KV protection.
- Supports Auto Flow Control in RS485 mode.
- Serial Port Pin Define:

COM1~2



Pin	RS232	RS422	RS485
1	GND	GND	GND
2	RTS	RX-	N.C
3	TX	RX+	N.C
4	CTS	TX-	D-
5	RX	TX+	D+
6	DTR	N.C	N.C
7	DSR	N.C	N.C
8	DCD	N.C	N.C
9		N.C	N.C
10	N.C	N.C	N.C

COM3~6

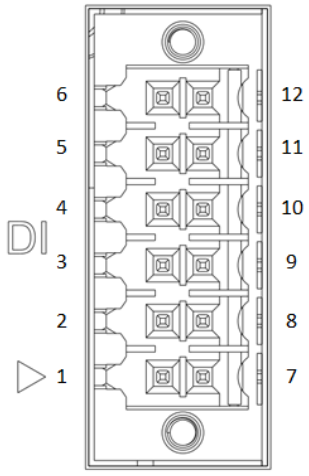


Pin	RS232	RS422	RS485
A1	GND	GND	GND
A2	RTS	RX-	N.C
A3	TX	RX+	N.C
A4	CTS	TX-	D-
A5	RX	TX+	D+
B1	GND	GND	GND
B2	RTS	RX-	N.C
B3	TX	RX+	N.C
B4	CTS	TX-	D-
B5	RX	TX+	D+

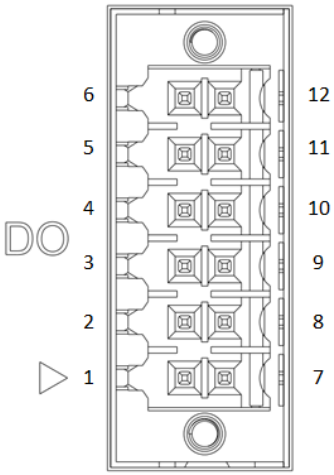
1.2.12 Digital I/O Connector and Pin Definition

- 8bit DI and 8bit DO with 2KV optical isolation (only for fully type)

Digital Input	
Input Channels	8 source type
Input Voltage	0 to 30VDC Input
Digital Input Levels for Dry Contacts	Logic level 0: Close to GND. Logic level 1: Open
Digital Input Levels for Wet Contacts	Logic level 0: +10V to +24V (DI To XIN_COM-). Logic level 1: +3V max.
• When external device inputs **HIGH** pulse, DI will be mapping to **logic level 0 (LOW)**. It needs to do inversing in software to get **HIGH** status.	
Digital Output	
Output Channels	8 sink type
Output Current	Max. 200 mA per channel, current sink type
External voltage	10 to 30VDC, open collector to 30V



Pin	DI
1	External PWR
2	DI 8
3	DI 9
4	DI 10
5	DI 11
6	DIO_GND
7	External PWR
8	DI 12
9	DI 13
10	DI 14
11	DI 15
12	DIO_GND



Pin	DO
1	COM+
2	DO 0
3	DO 1
4	DO 2
5	DO 3
6	COM-
7	COM+
8	DO 4
9	DO 5
10	DO 6
11	DO 7

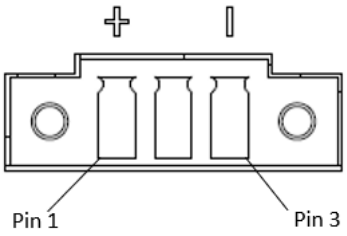
12	COM-

- When the external device inputs a high-level pulse, DI will correspond to logic low-level. If the controller reads the same logic as the external state, it needs to be inverted in software to get the high state.

1.2.13 Power

- Wide-range 12 - 24V DC power input with terminal block.

Pin	Signal
1	VIN +
2	N/A
3	VIN -

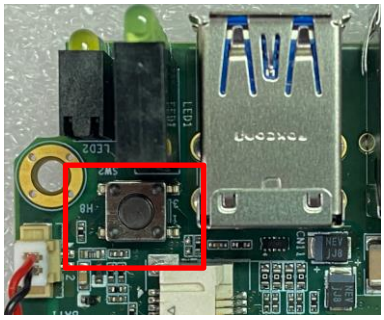


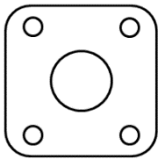
1.2.14 WatchDog Timer (WDT)

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

1.2.15 Restore BIOS Optimal Defaults (Clear CMOS)

- Press the tact switch (10 seconds) can restore BIOS optimal defaults.





1.2.16 System LED

- There are showed the LED's indicators and functional descriptions.

LED Name	Description	Color
ACT	Indicate the storge status and it's flashing when storge access.	Green
PWR	Indicate the Power status. When the DC input is acceptable, the LED will ON.	Yellow
Programable LED	A sample code will be provided that allows users to define their own function(LED P1~P4).	Green

1.2.17 Operation Temperature

- -40^{0}C ~ +70^{0}C

1.2.18 Storage Temperature

- -40^{0}C ~ +85^{0}C

1.2.19 Humidity

- 10% ~ 95% (non-condensation)

1.2.20 Weight

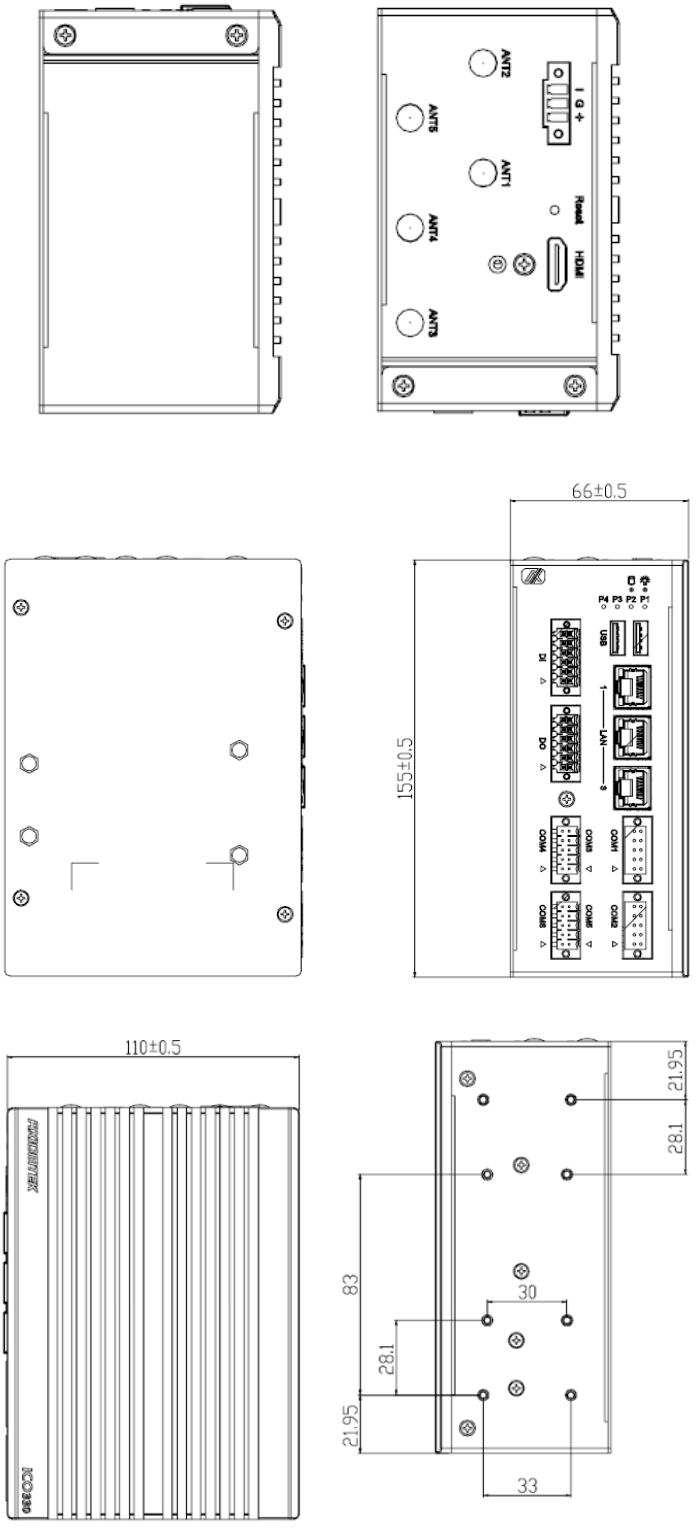
- Slim Mode: 0.9 kg
- **Full Mode**: 1.1 kg

1.2.21 Dimensions (W x D x H)

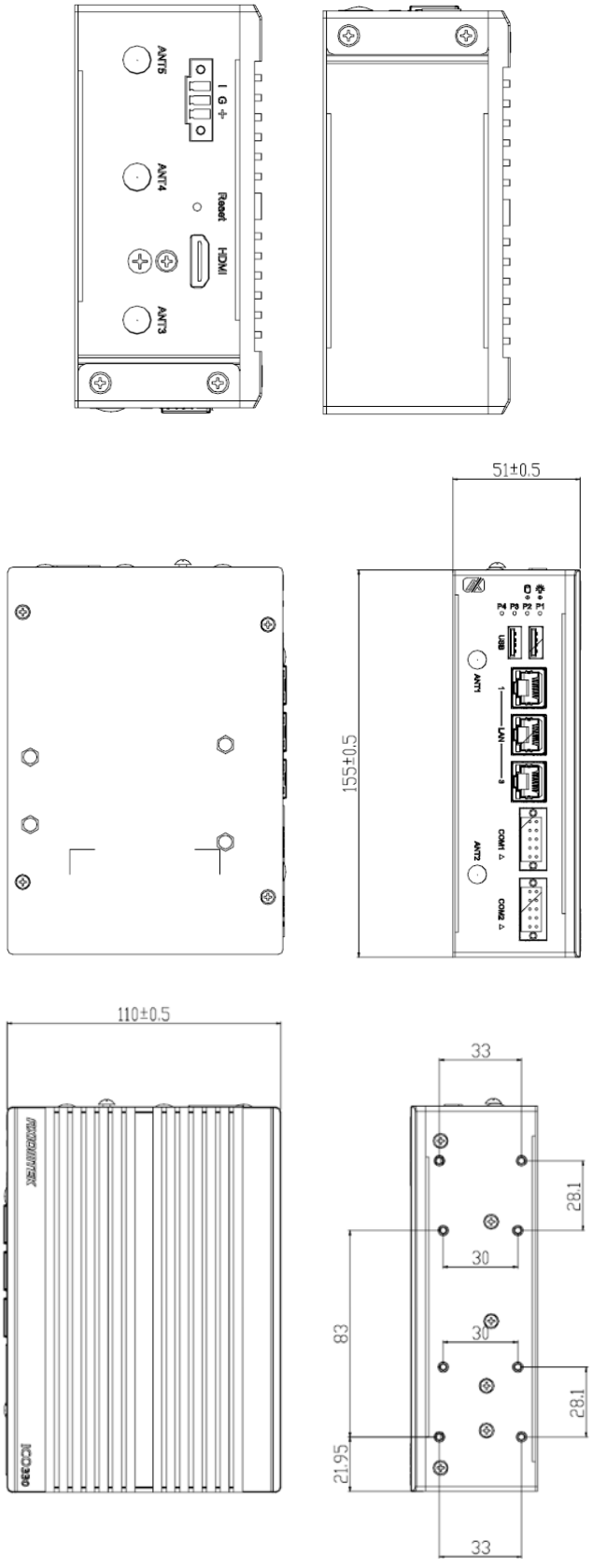
- Slim Mode: 51 x 110 x 155 mm (2.17" x 4.33" x 6.1")
- **Full Mode**: 66 x 110 x 155 mm (2.48" x 4.33" x 6.1")

1.3 Dimensions

The following diagrams show you dimensions and outlines of the ICO330.



Full Mode


ANT5
I G +
ANT4
Reset
HDMI
ANT3
51±0.5
155±0.5
P4 P3 P2 P1
USB
ANT1
LAN1
COM1
ANT2
COM2
110±0.5
33
28.1
30
83
30
28.1
21.95
33

Slim Mode

1.4 I/O Outlets

The following figures show you I/O outlets on front view and top view of the ICO330.

SECTION 2
HARDWARE INSTALLATION

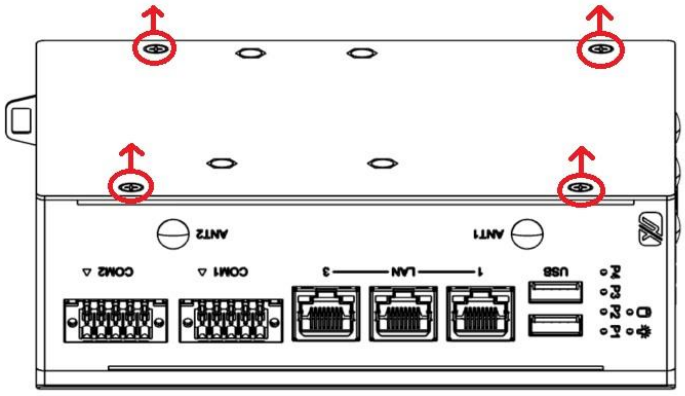
The ICO330 is convenient for your various hardware configurations, such as Memory Module and Hard Disk Drive. The chapter 2 will show you how to install the hardware. It includes:

2.1 Installing the Memory Module

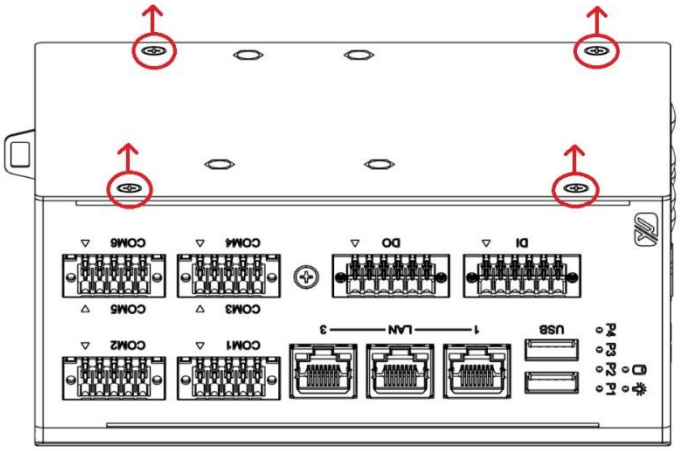
Step 1 Turn off the system.

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

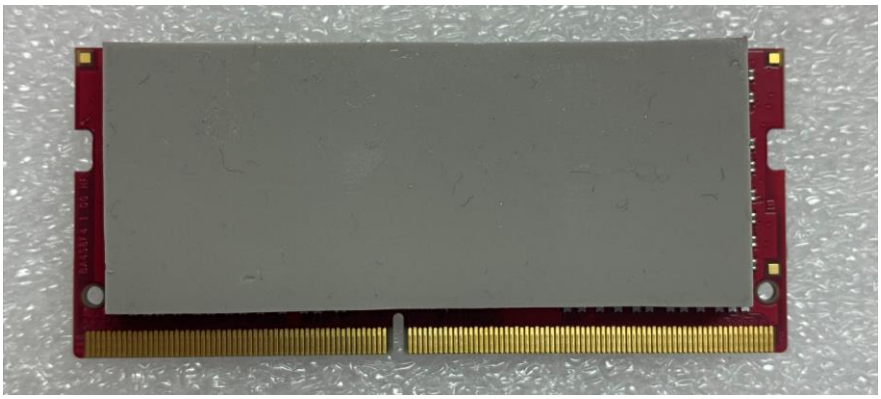
Slim Mode



Full Mode

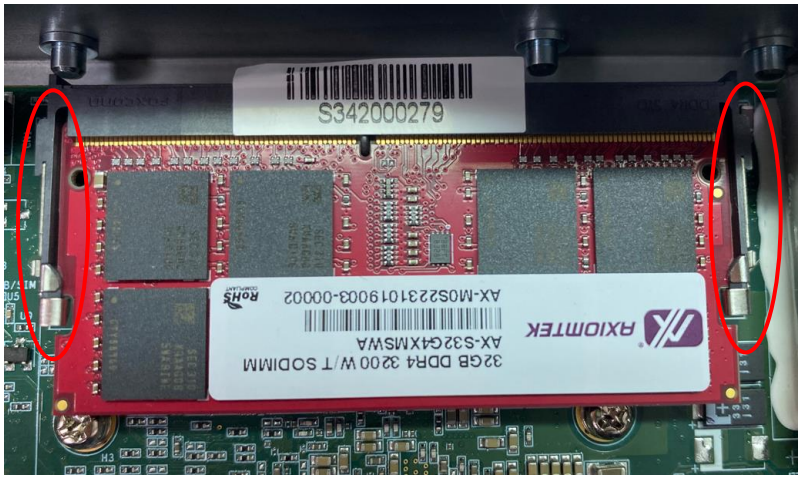


Step 3 Put the thermal pad on the memory module to improve cooling effect.



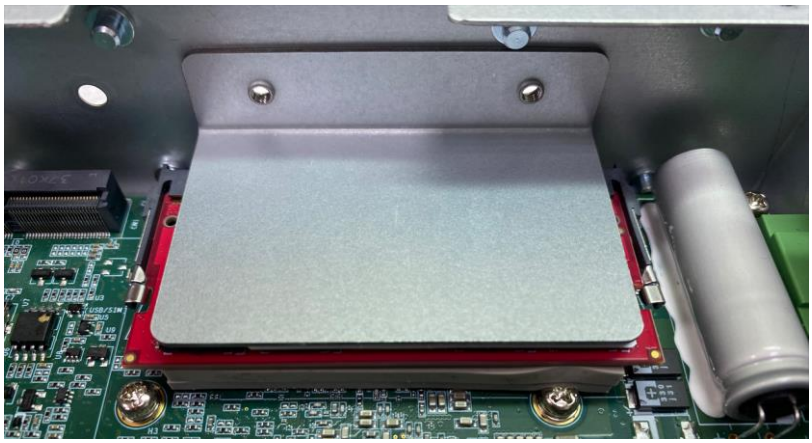
Step 4 Use two fingers to hold the memory module and insert the gold figure into the slot and push the module down.

Step 5 The memory module is locked by two latches on the sides. We strongly recommend using "LDC737" silicone on the two sides of the memory for good ability of vibration.

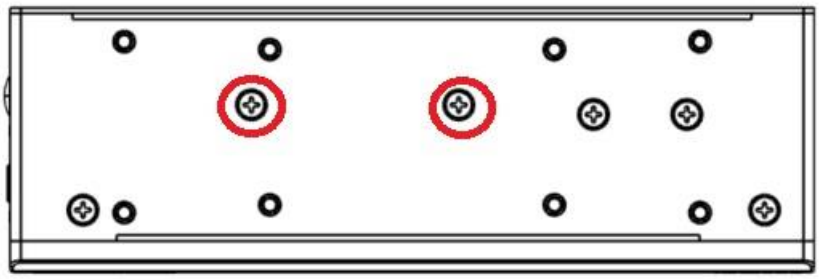


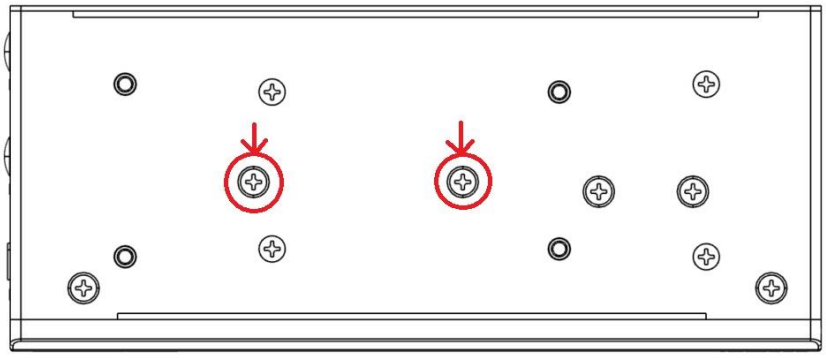
Step 6 Stick thermal pad onto DDR

Step 7 Install DDR bracket



Step 8 The bracket screws it tight.
Slim Mode





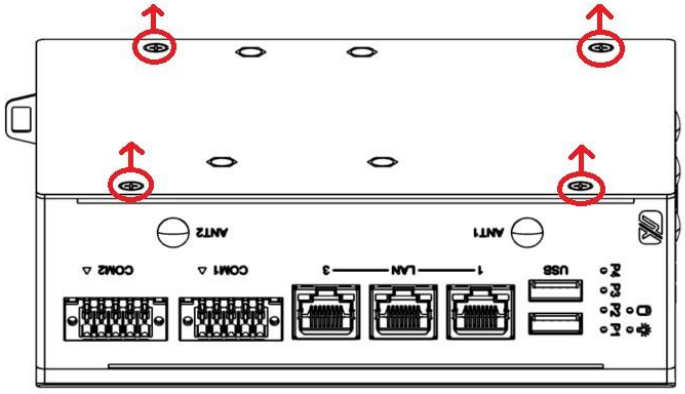
Step 9 Put the cover back to the system and fasten screws tight close the chassis.

2.2 Installing the mSATA PCIe USB module

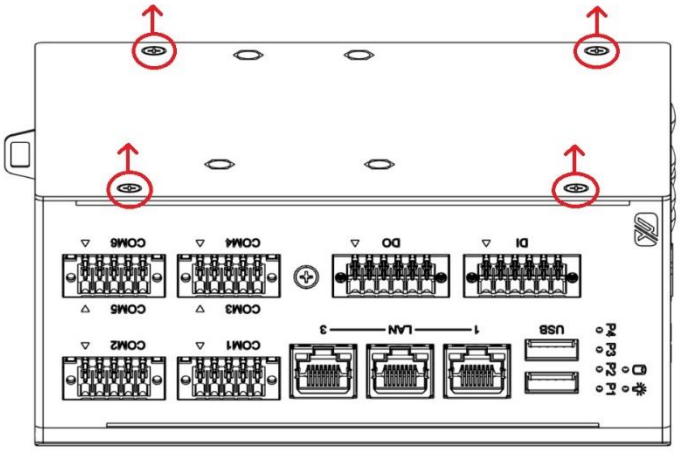
Step 1 Turn off the system.

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

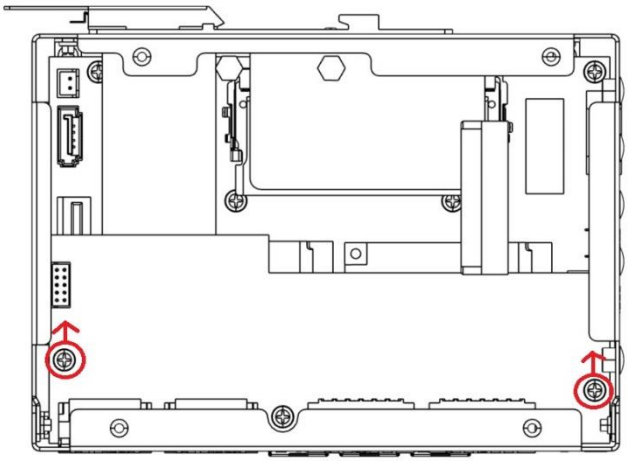
Slim Mode



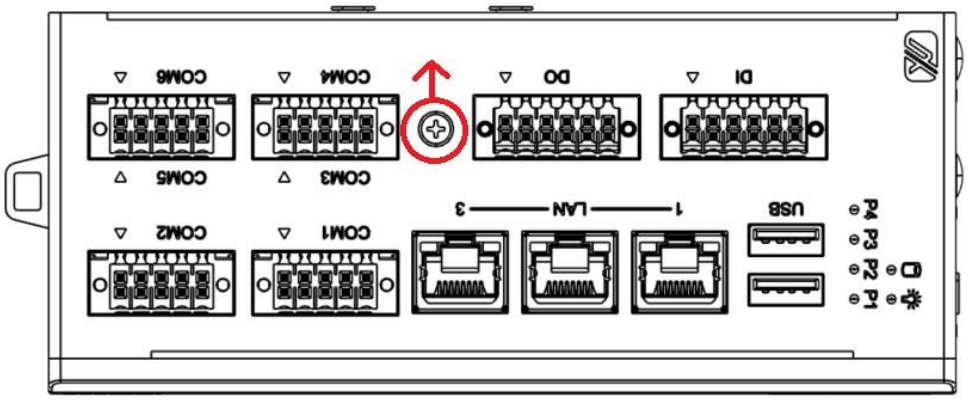
Full Mode - step1



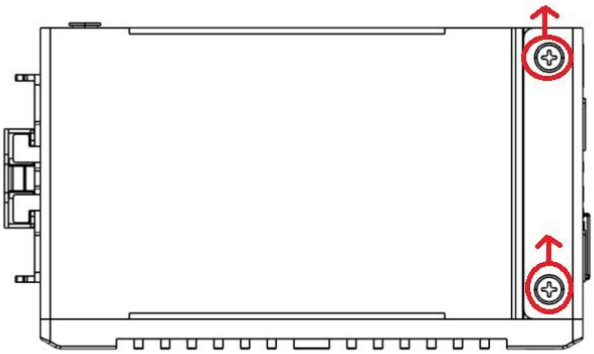
Full Mode - Step2



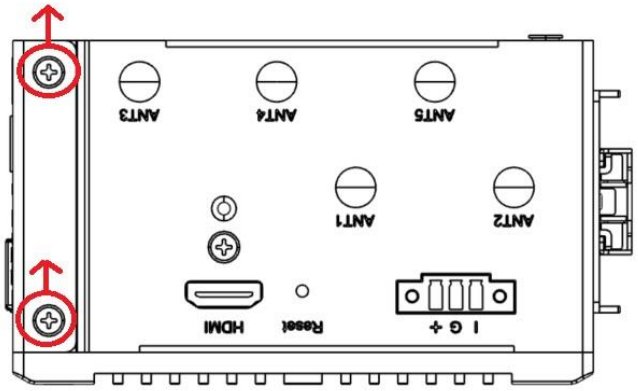
Full Mode - Step3



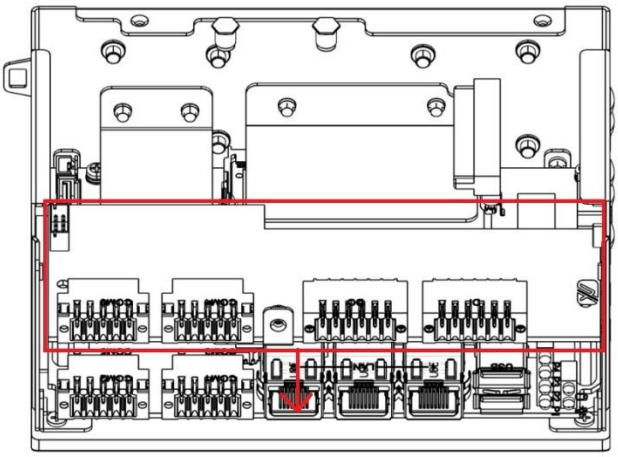
Full Mode - Step4



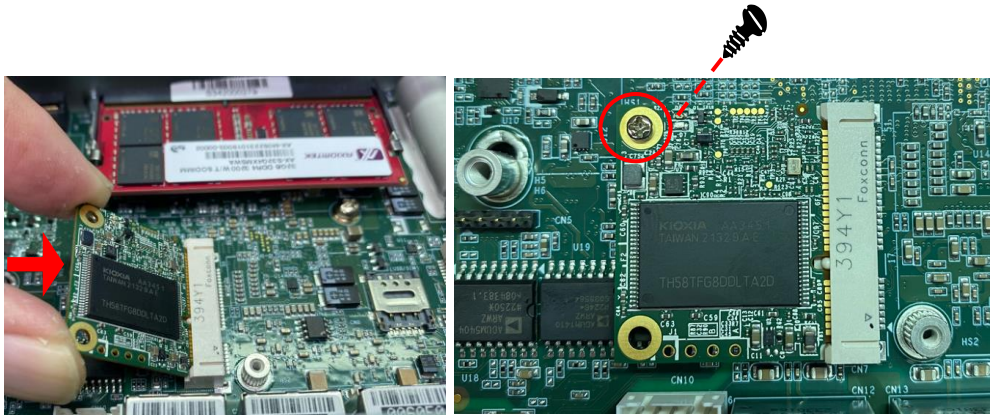
Full Mode - Step5



Full Mode - Step6



Step 3 Insert the mSATA into the slot which marking with "mSATA / USB / PCIe " and fasten screws.



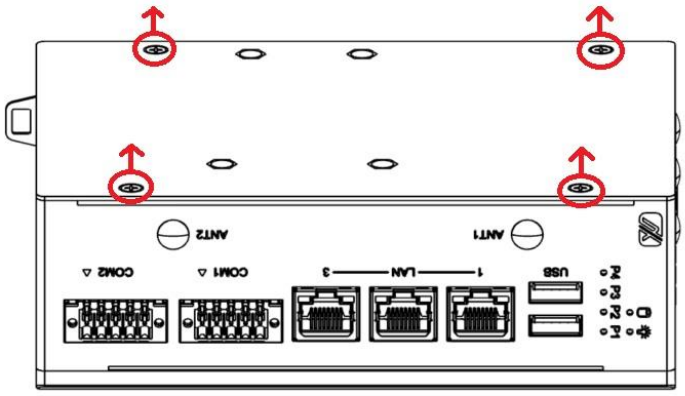
Step 4 Put the cover back to the system and fasten screws tight close the chassis.

2.3 Installing Wireless Module(3G/LTE)

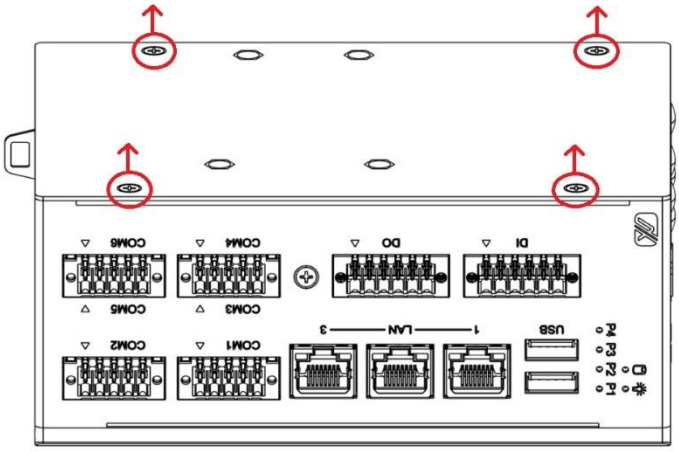
Step 1 Turn off the system.

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

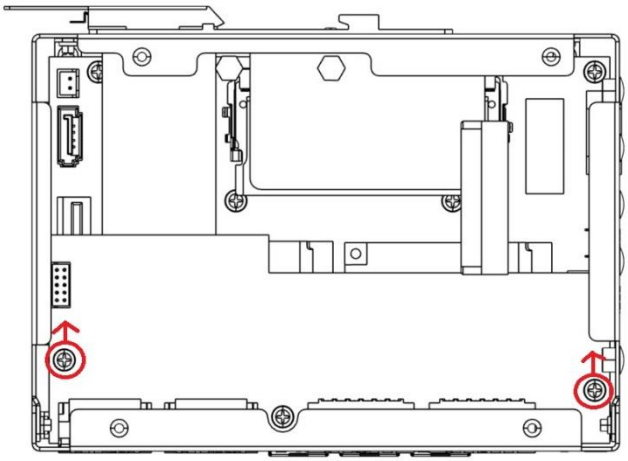
Slim Mode



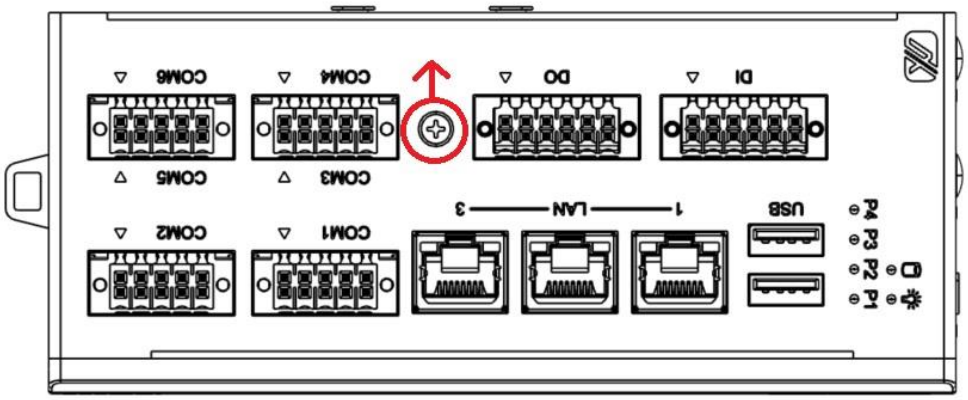
Full Mode - step1



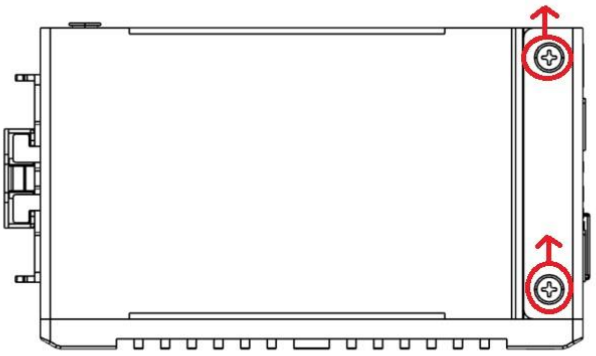
Full Mode - Step2



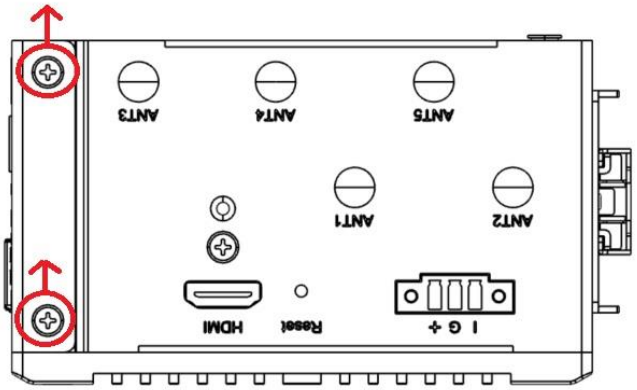
Full Mode - Step3



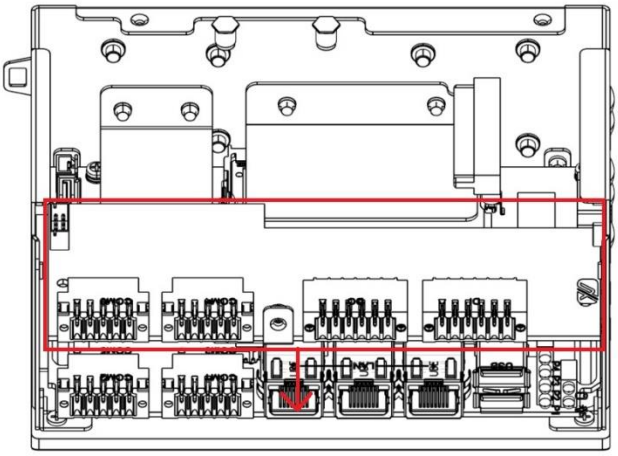
Full Mode - Step4



Full Mode - Step5



Full Mode - Step6



Step 3 Following(Figure 3-1) push the SIM slot back to unlock SIM slot, inserting the SIM card and put it back(Figure 3-2), and lock the SIM slot(Figure 3-3).

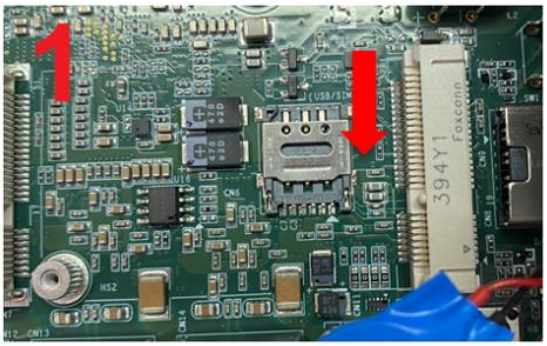


Figure 3-1

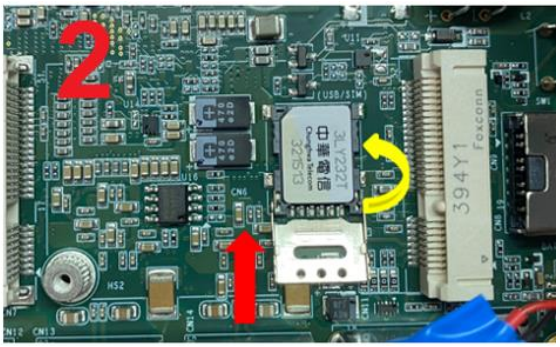


Figure 3-2

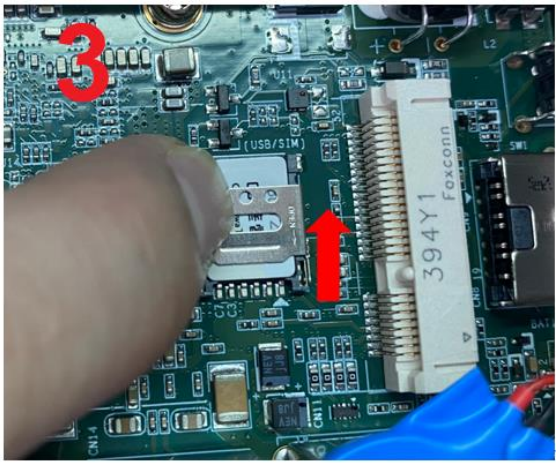
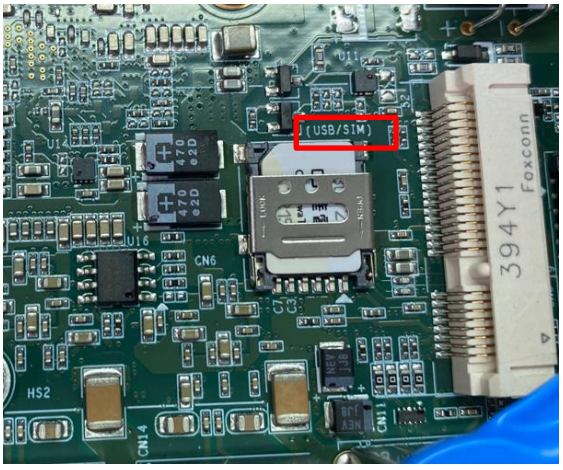


Figure 3-3

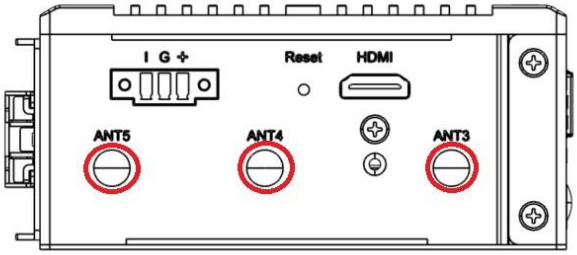
Step4. Insert the wireless module into the slot which marking with "USB ".



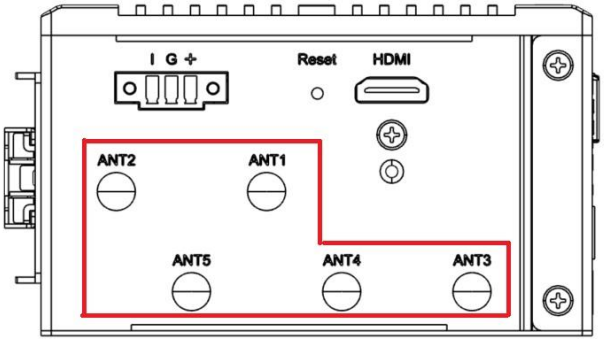
Step 5 Insert the 4G/LTE module and screws it tight.

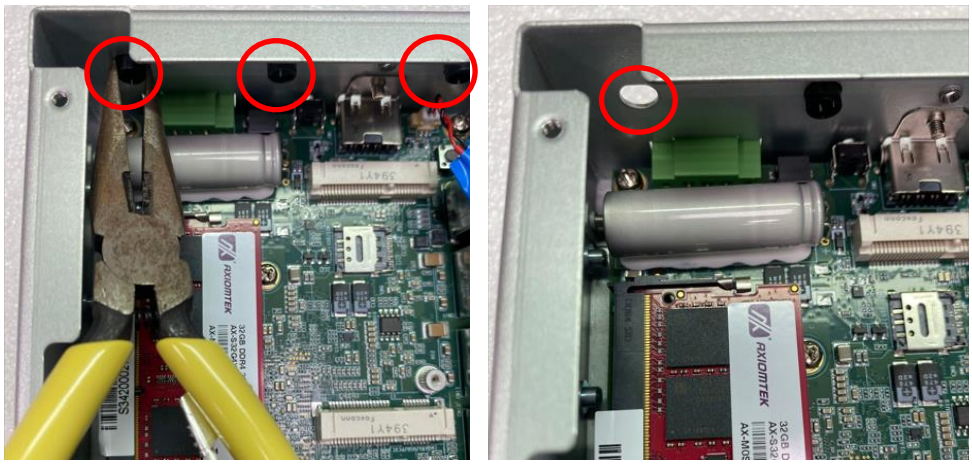
Step 6 Removing the plug cover from the chassis.

Slim Mode



Full Mode





Step 7 Connect the RF cable to the connector of 4G/LTE module which "MAIN".

Step 8 Taking out the parts from the 4G/LTE kit package (Figure 8-1) and make the RF cable through the antenna hole (Figure 8-2). Finally, screw it tight(Figure 8-3).

Figure 8-1

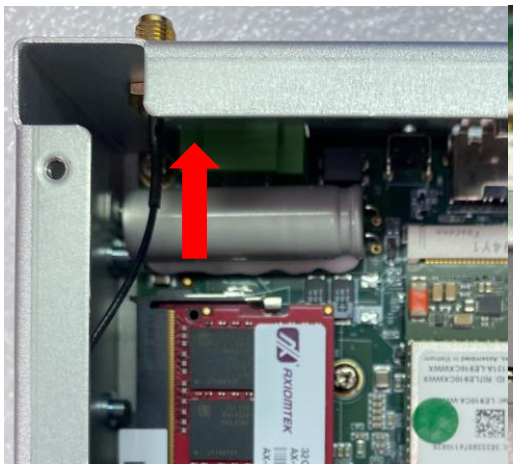


Figure 8-2

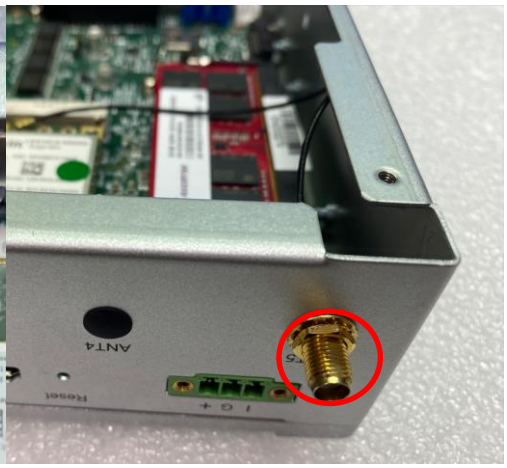


Figure 8-3

Step 9 Screwing the RF antenna tight.

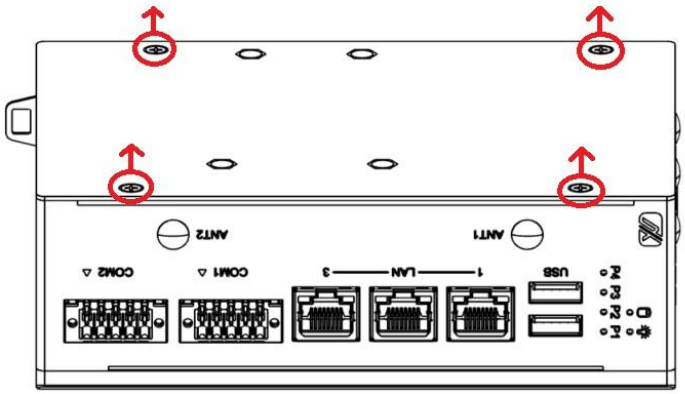
Step 10 Put the cover back to the system and fasten screws tight close the chassis.

2.4 Installing Wireless Module(5G/LTE)

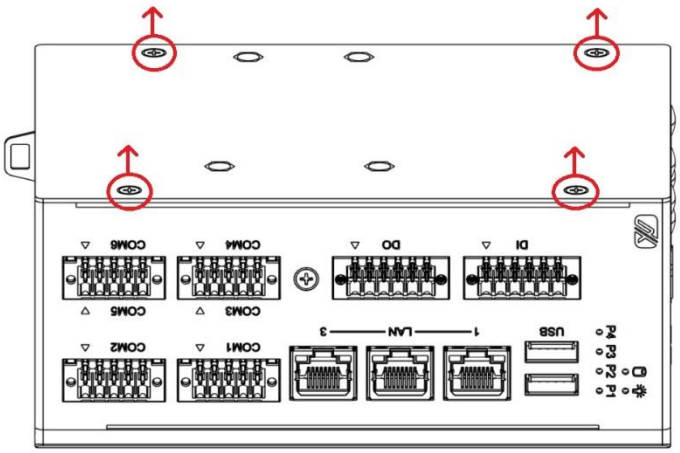
Step 1 Turn off the system.

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

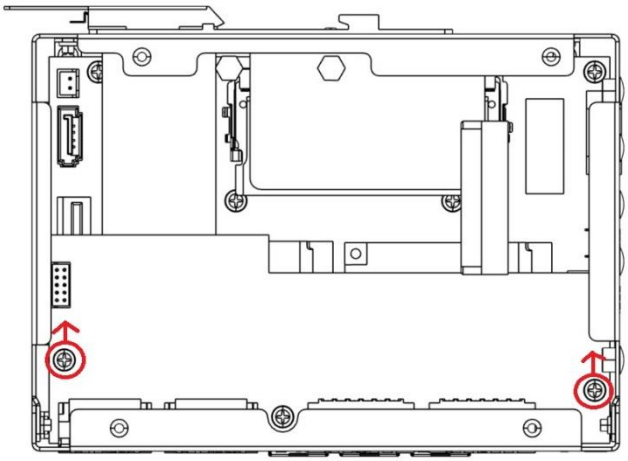
Slim Mode



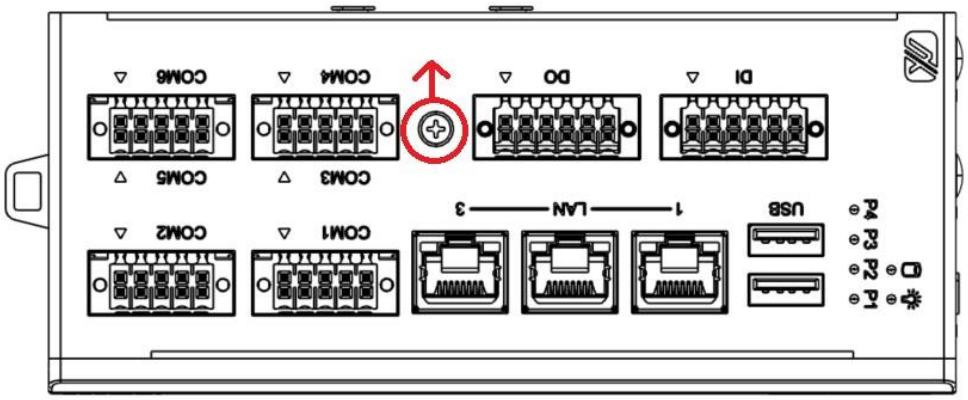
Full Mode - Step1



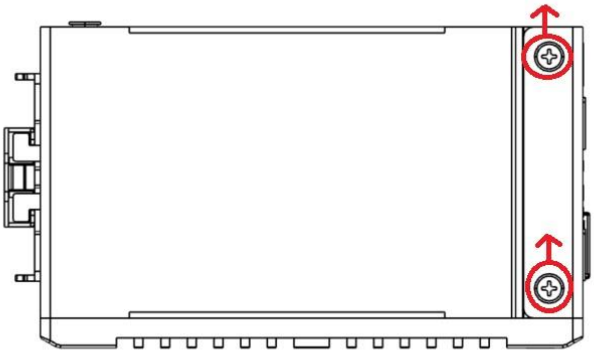
Full Mode - Step2



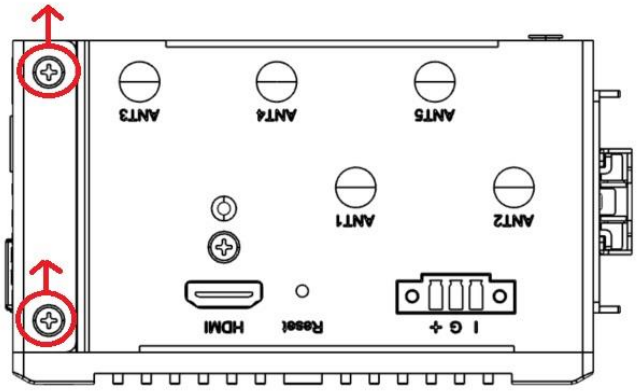
Full Mode - Step3



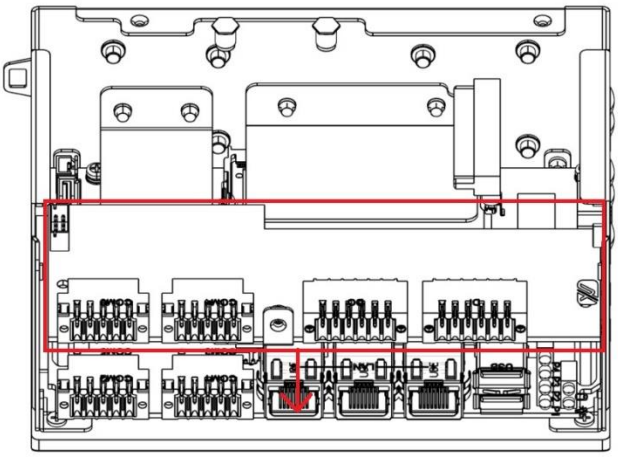
Full Mode - Step4



Full Mode - Step5



Full Mode - Step6



Step 3 Following(Figure 3-1) push the SIM slot back to unlock SIM slot, inserting the SIM card and put it back(Figure 3-2), and lock the SIM slot(Figure 3-3).

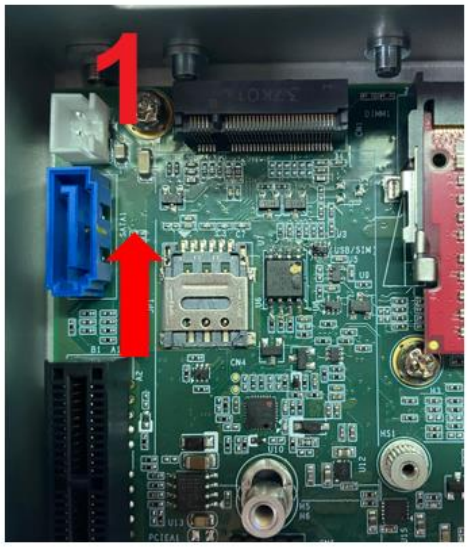


Figure 3-1

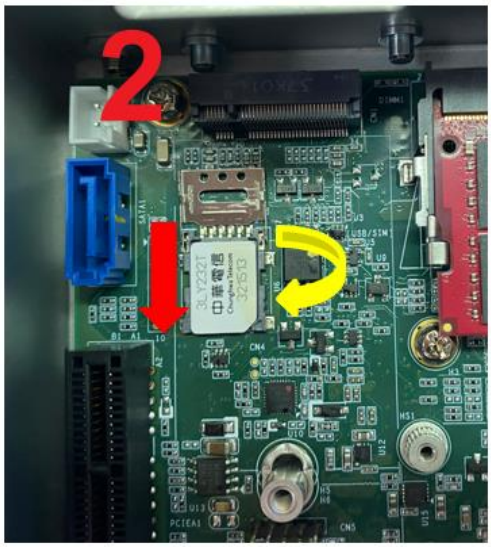


Figure 3-2

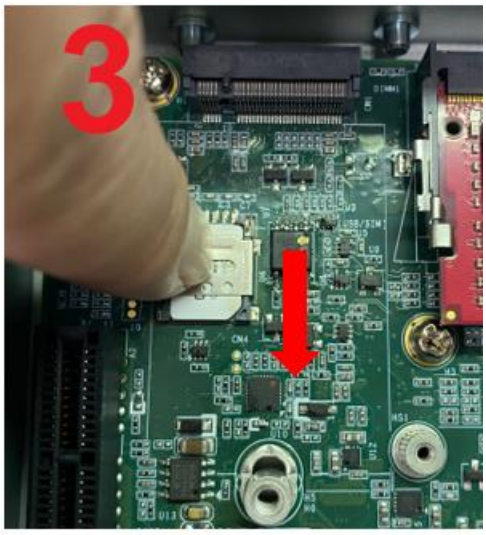
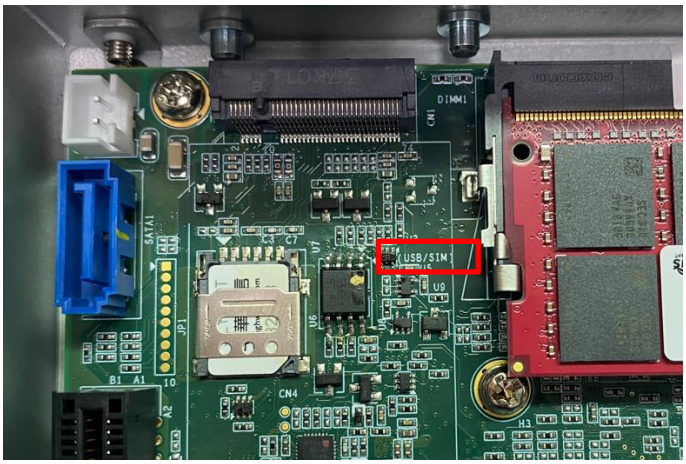
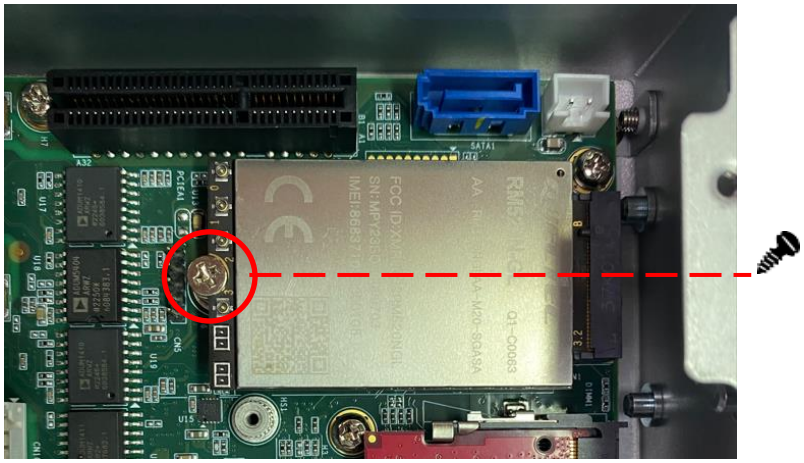


Figure 3-3

Step4. Insert the wireless module into the slot which marking with "USB ".

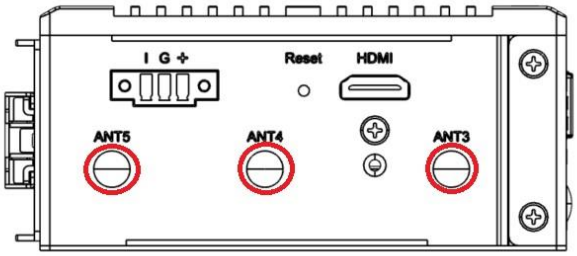


Step 5 Insert the 5G/LTE module and screws it tight.

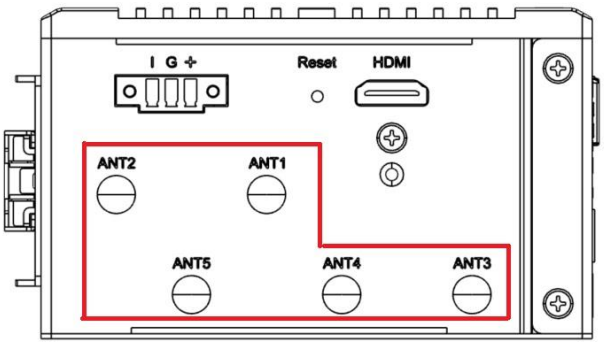


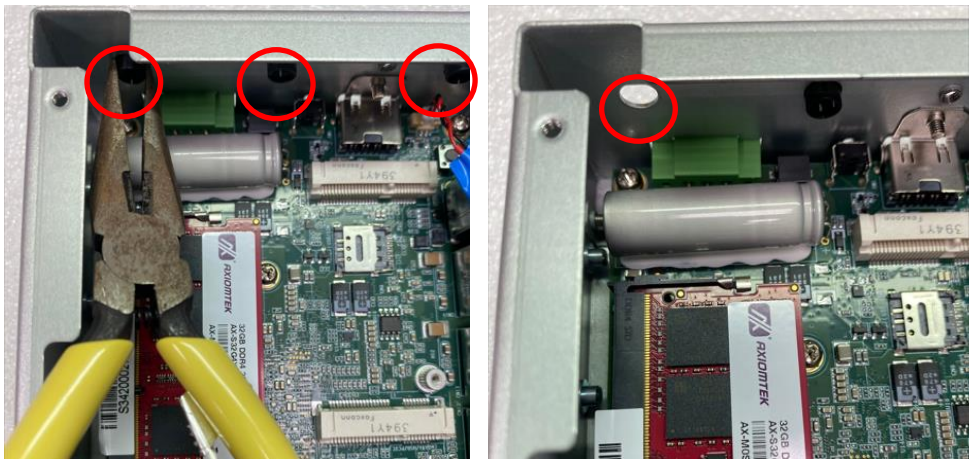
Step 6 Removing the plug cover from the chassis.

Slim Mode



Full Mode



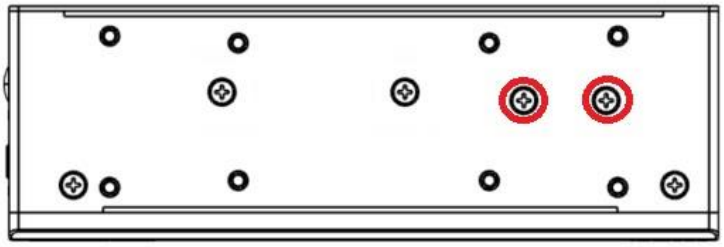


Step 7 Connect the RF cable to the connector of 5G/LTE module which "MAIN".

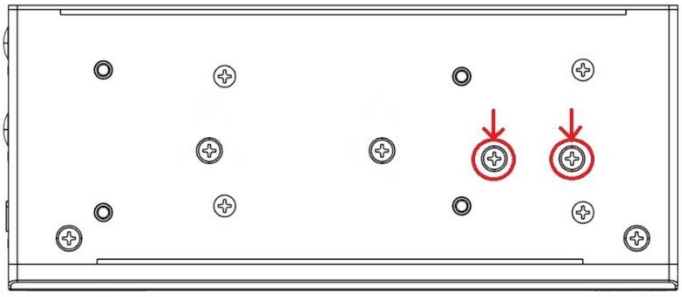
Step 8 Stick thermal pad onto 5G/LTE

Step 9 Install 5G/LTE bracket

Step 10 The bracket screws it tight.
Slim Mode



Full Mode



Step 11 Taking out the parts from the 4G/LTE kit package (Figure 8-1) and make the RF cable through the antenna hole (Figure 8-2). Finally, screw it tight(Figure 8-3).

Figure 8-1

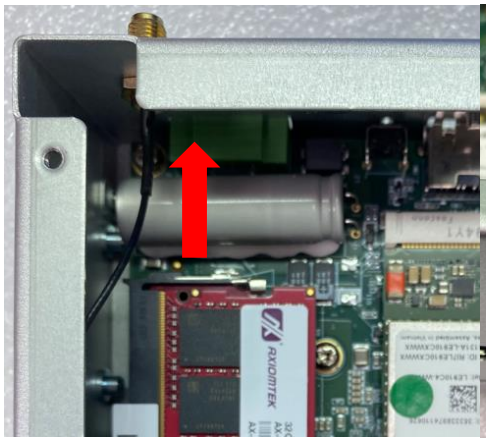


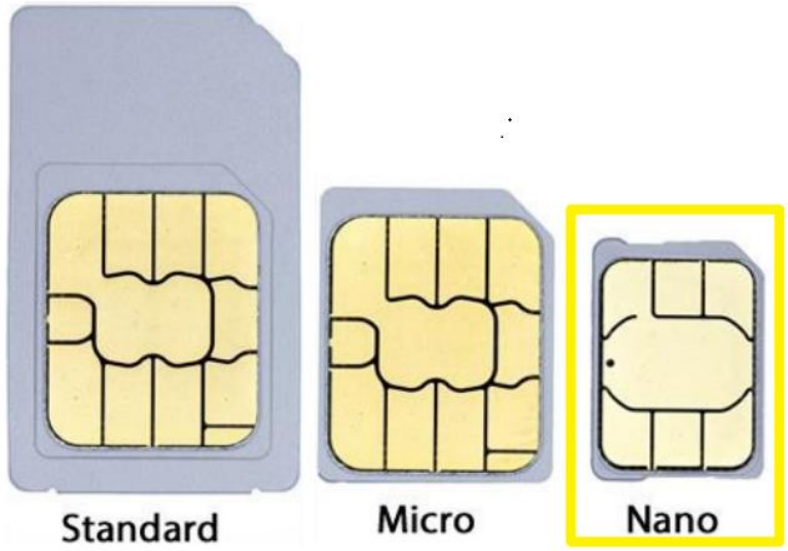
Figure 8-2

Figure 8-3

Step 12 Screwing the RF antenna tight.

Step 13 Put the cover back to the system and fasten screws tight close the chassis.

Note: SIM Card only can use the standard size as the following pictures.

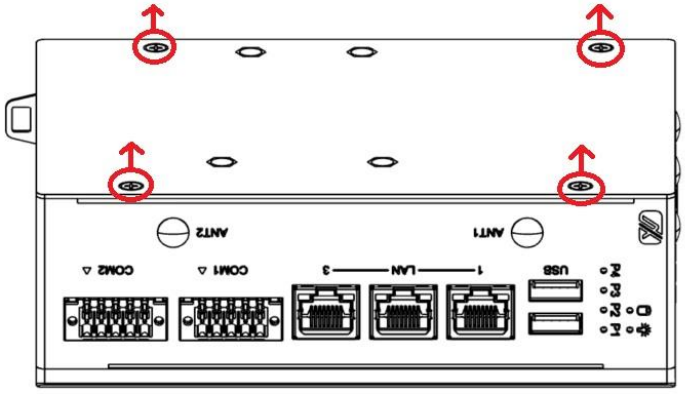


2.5 Installing the Hard Disk Drive

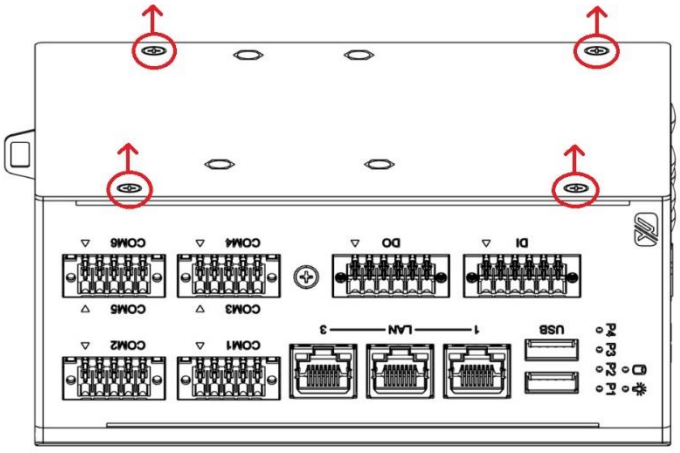
Step 1 Turn off the system.

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

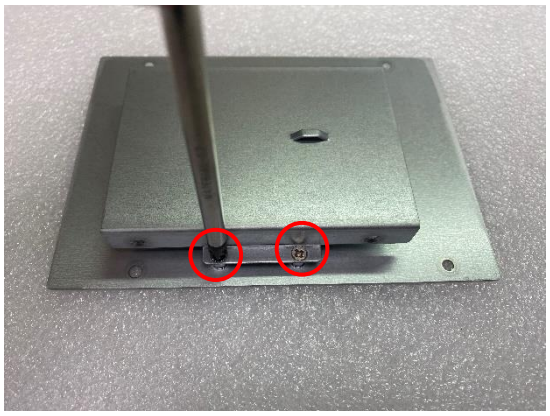
Slim Mode



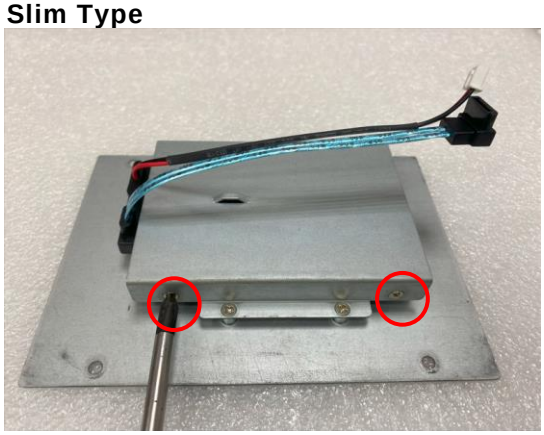
Full Mode



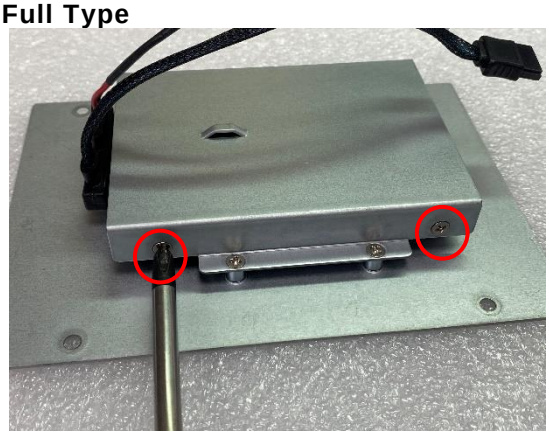
Step 3 **Loosen 4pcs screws of the cover, and put the SSD into the SSD bracket and fix the SSD by 4pcs of screws in the accessory bag.**



Slim Type

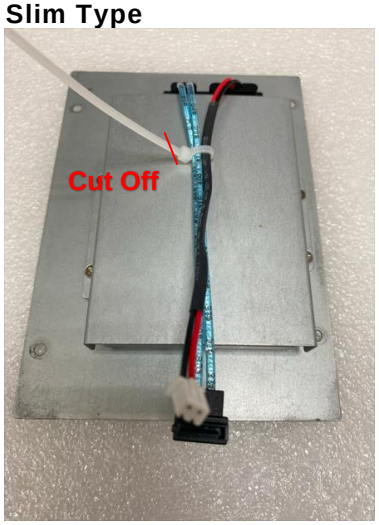


Full Type

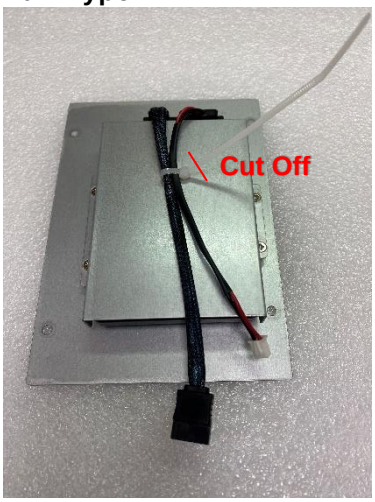


Step 4 **Put the SSD bracket on the cover and use 4pcs screws to fix tightly. Taes the SSD SATA+Power SSD cable and Cable Tie out from the accessory bag and connect SATA+Power SSD cable to SSD then use Cable Tie to fix it on the SSD bracket, cut off the lengthy Cable Tie.**

Slim Type

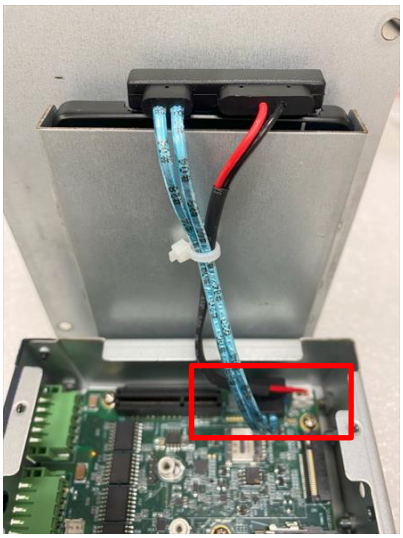


Full Type

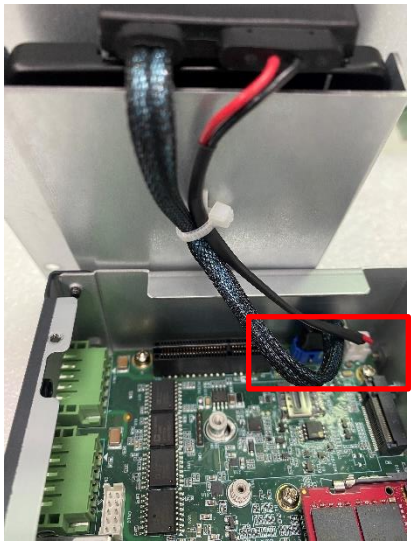


Step 5 Connect SATA+Power SSD cable to the board connector, SATA side first then power side second.

Slim Type



Full Type

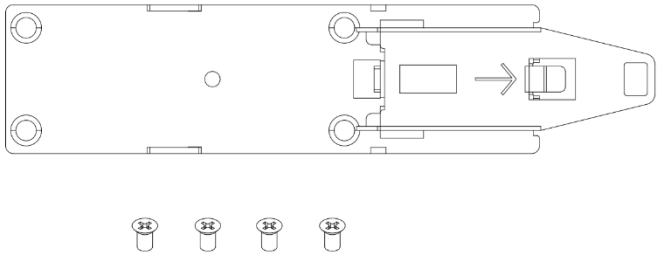


Step 6 Put the cover back to the system and fasten screws tight close the chassis.

2.6 Installing Din-rail Mounting (Screw: M3 x 6 4pcs)

The ICO330 provides Din-rail Mount for 2 methods that customers can install as below:

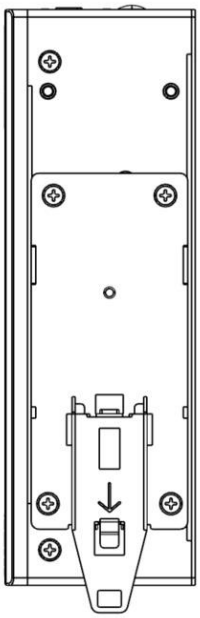
Step 1 Prepare Din-rail Mount assembling components (screws and bracket) ready.



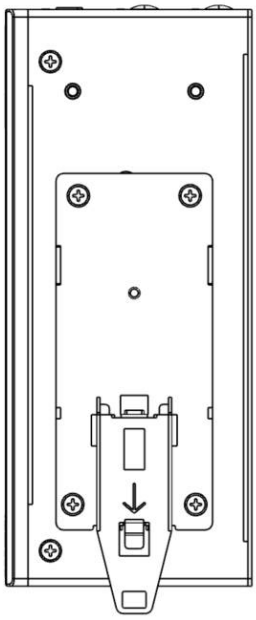
Step 2 Assembly the bracket to the system and fasten screws tight.

Method 1:

Slim Mode



Full Mode



SECTION 3
AMI UEFI BIOS 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-backed-up to save the Setup information whenever the power is turned off.

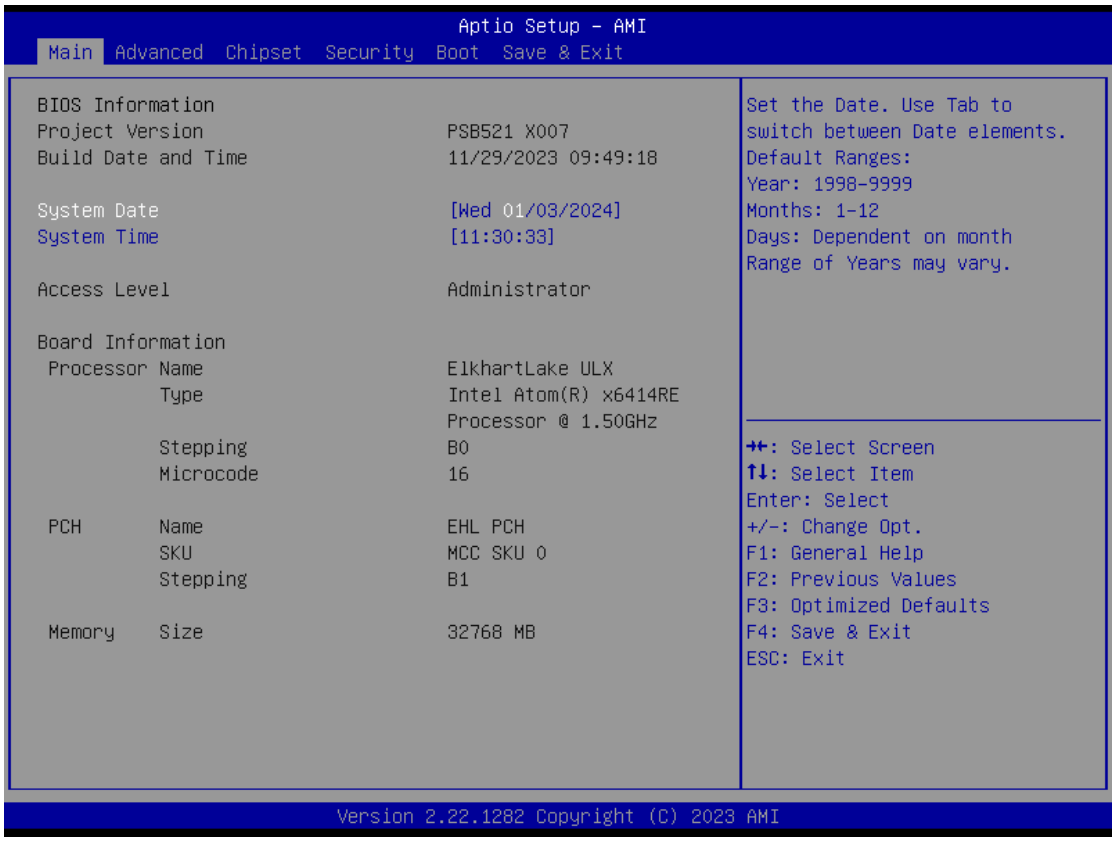
3.1 Entering Setup

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the <Del> key immediately.
2. 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.

3.2 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 then press <Enter> to accept or enter its sub-menu.

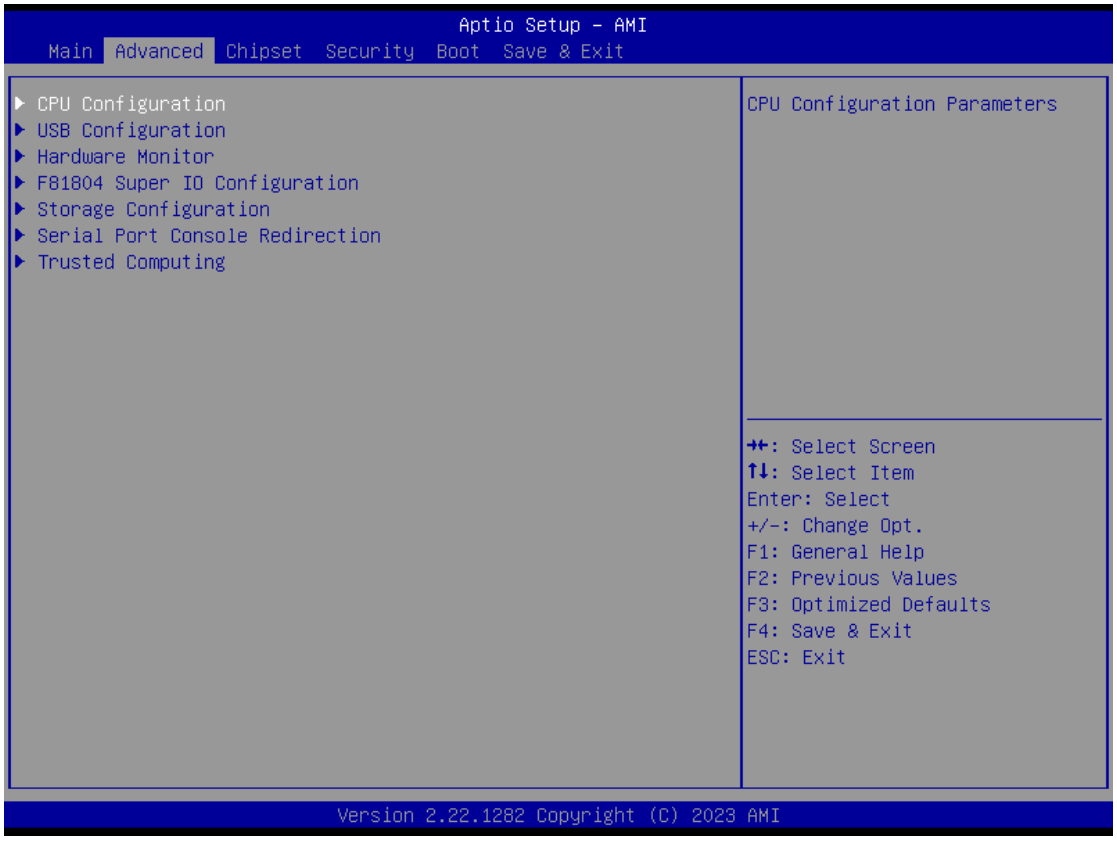


System Date
The date format is <day> <month> <date> <year>.

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

3.3 Advanced Features

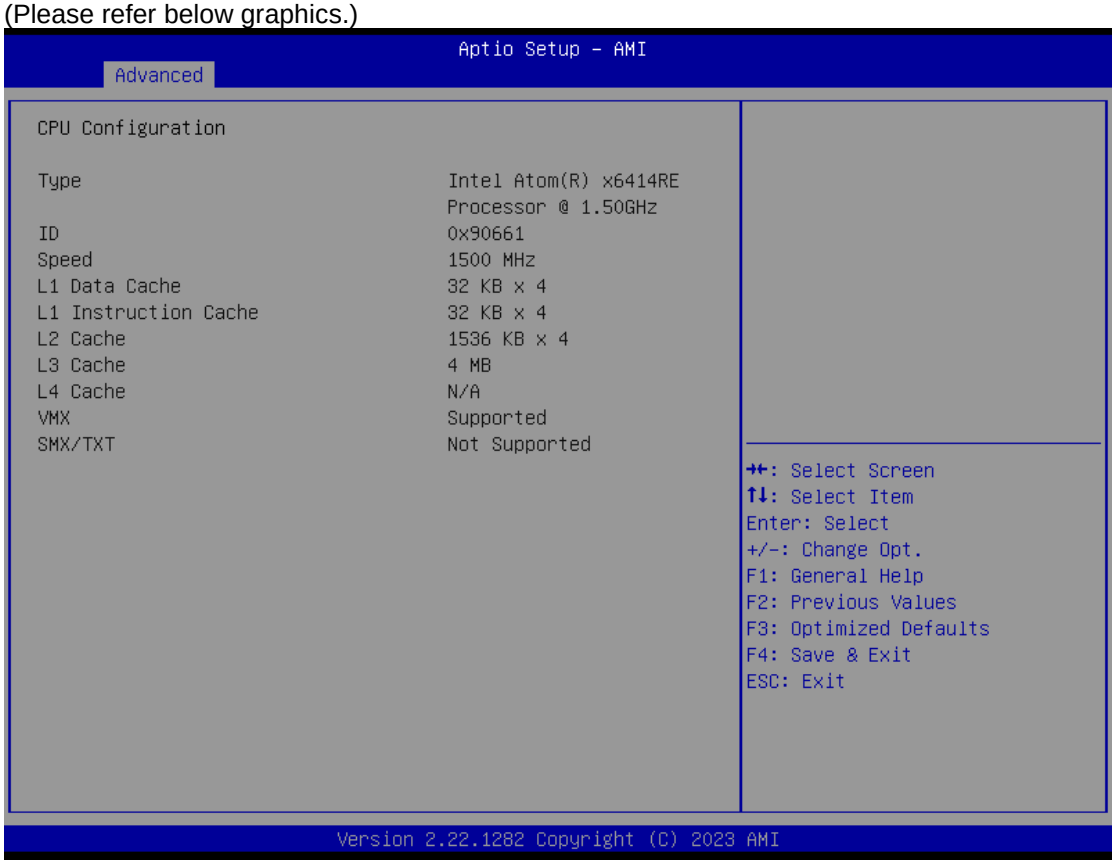
This Advanced section allows users to configure and improve your system, to set up some system features according to your preference. You can select any of the items in the left frame of the screen to go to the sub menus:



- **CPU Configuration**

Scroll to this item and press <Enter> to view the CPU Configuration informations.

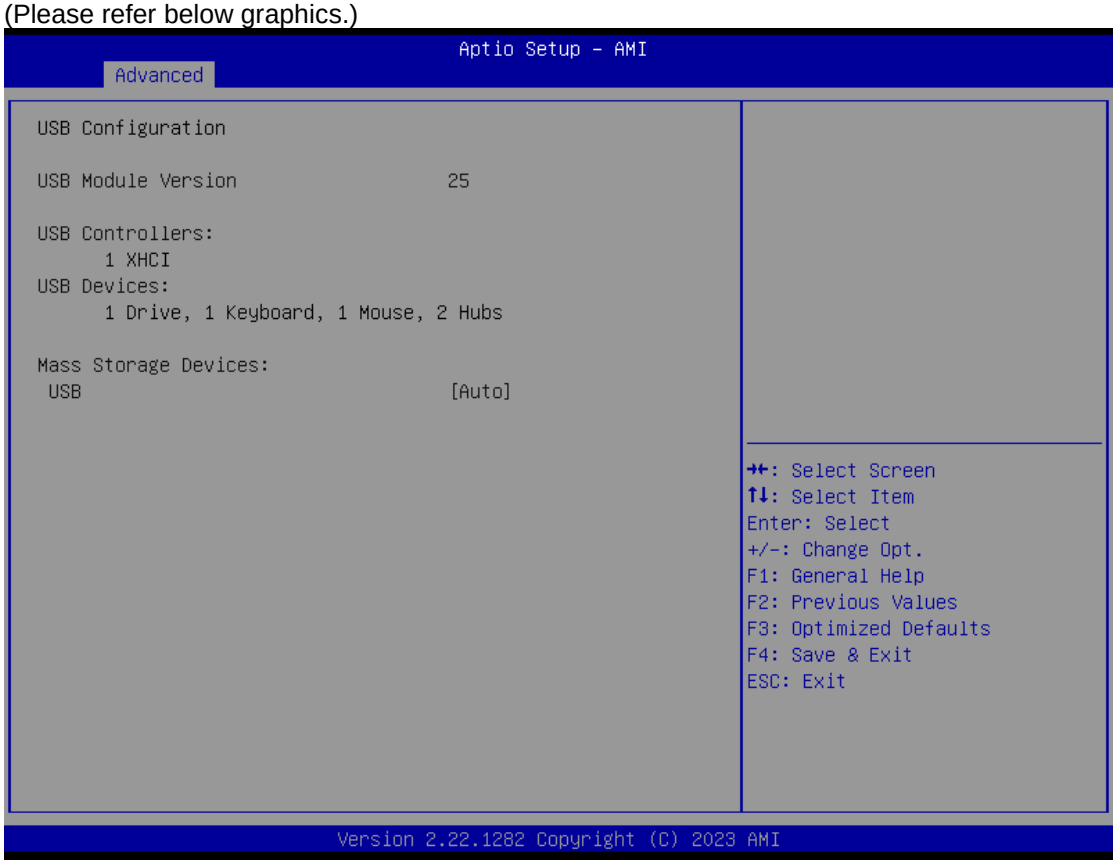
(Please refer below graphics.)



- **USB Configuration**

Scroll to this item and press <Enter> to view the SATA Configuration informations.

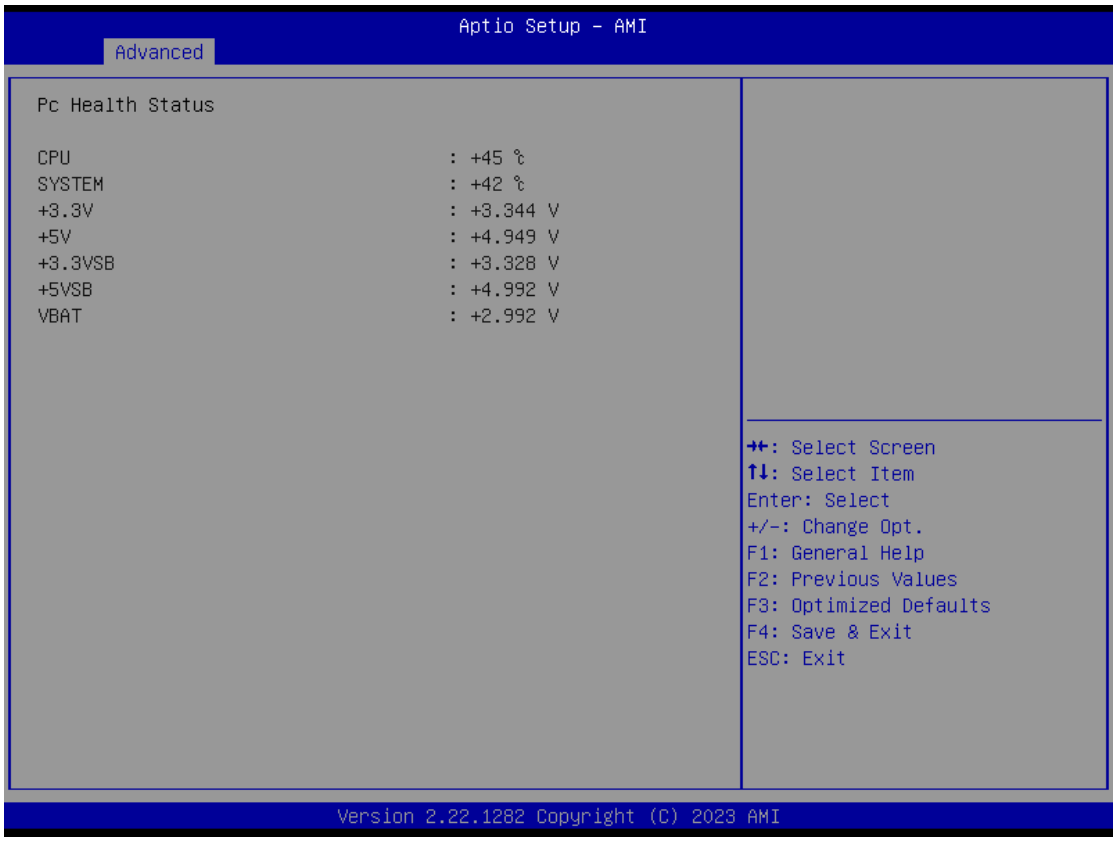
(Please refer below graphics.)



- **Hardware Monitor**

Scroll to this item and press <Enter> to view the monitor hardware status.

(Please refer below graphics.)



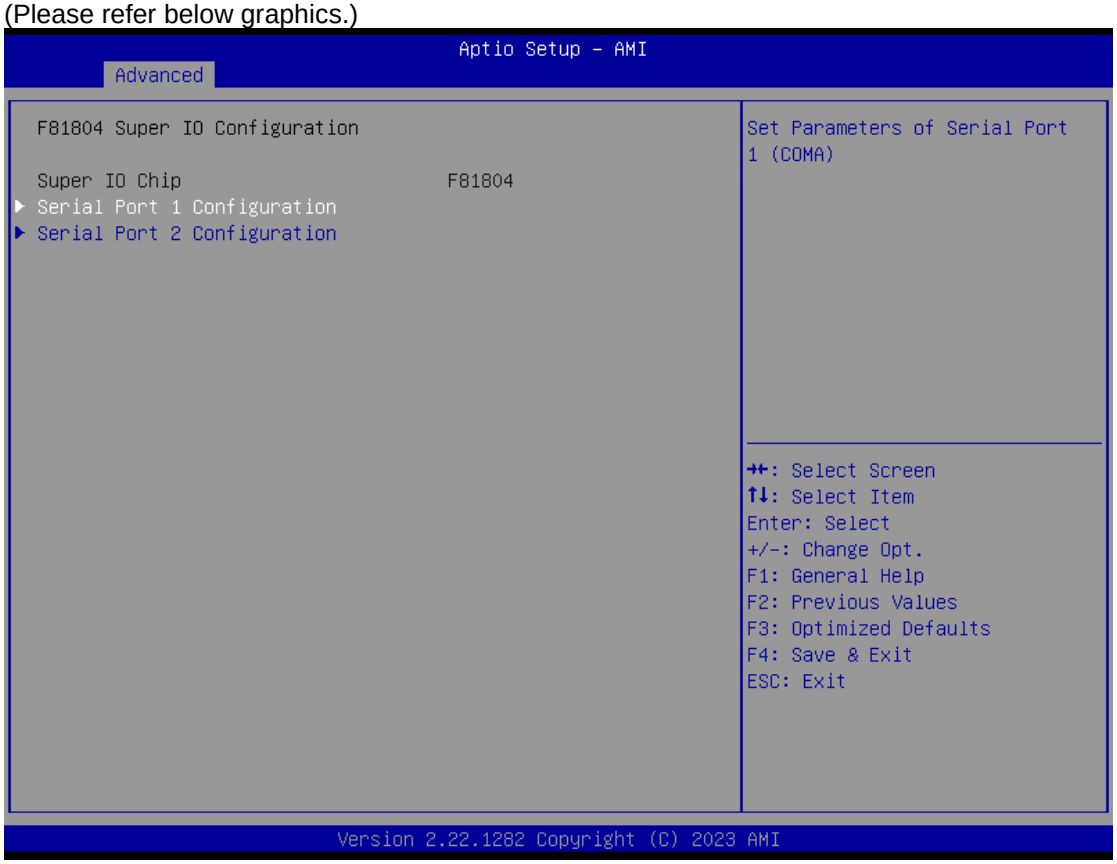
- **F81804 Super IO Configuration**

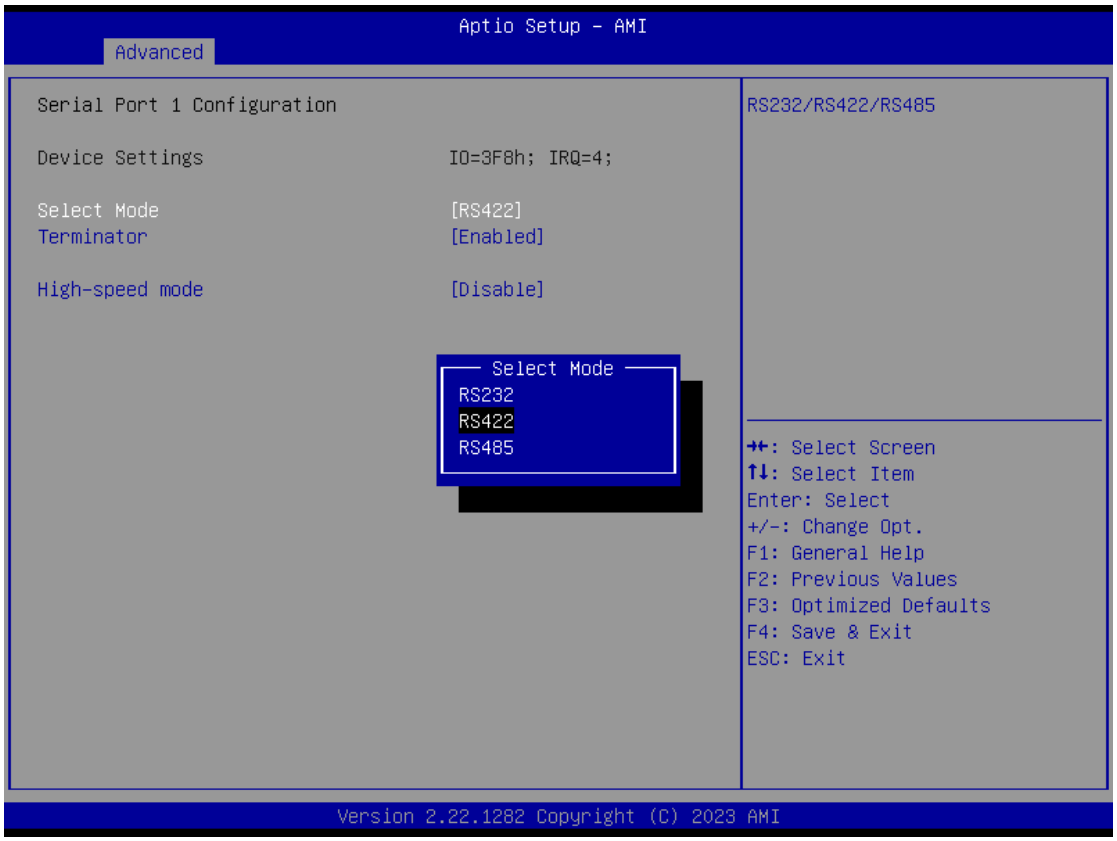
The default setting for all Serial Ports are RS232.

You can change the setting by selecting the value you want in each COM Port Type.

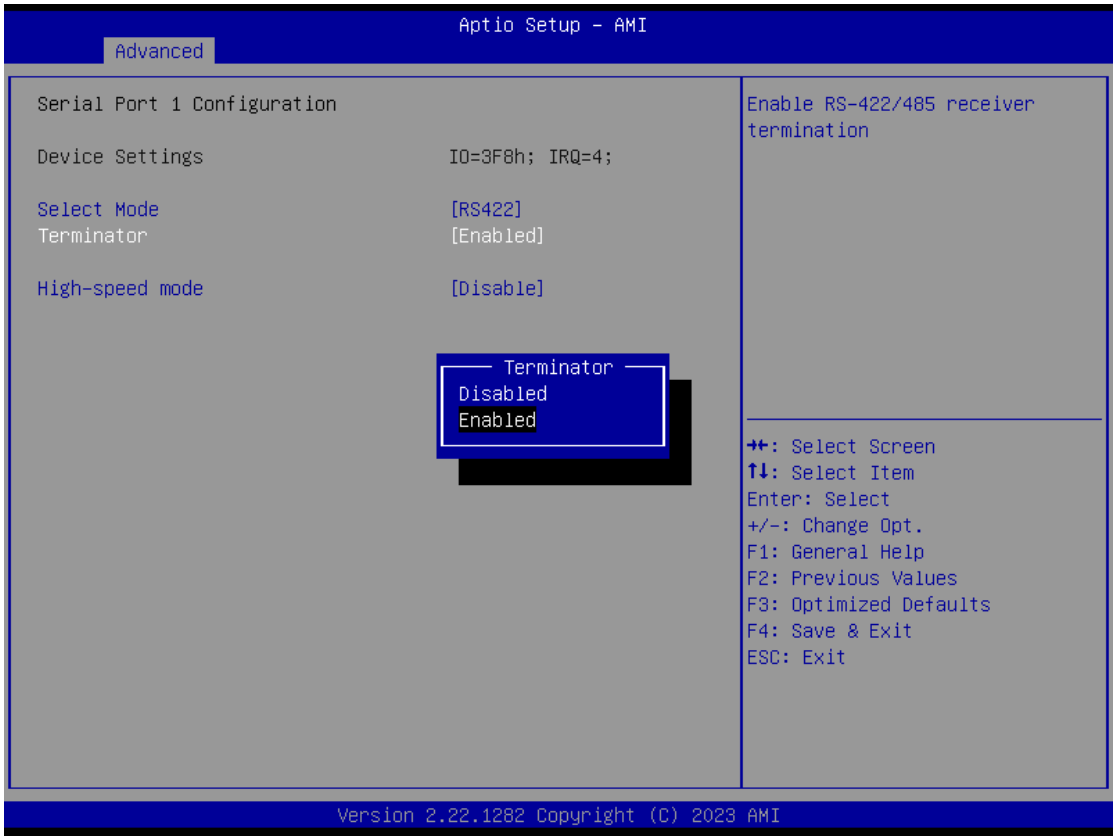
Supports RS422 & RS485 mode.

(Please refer below graphics.)

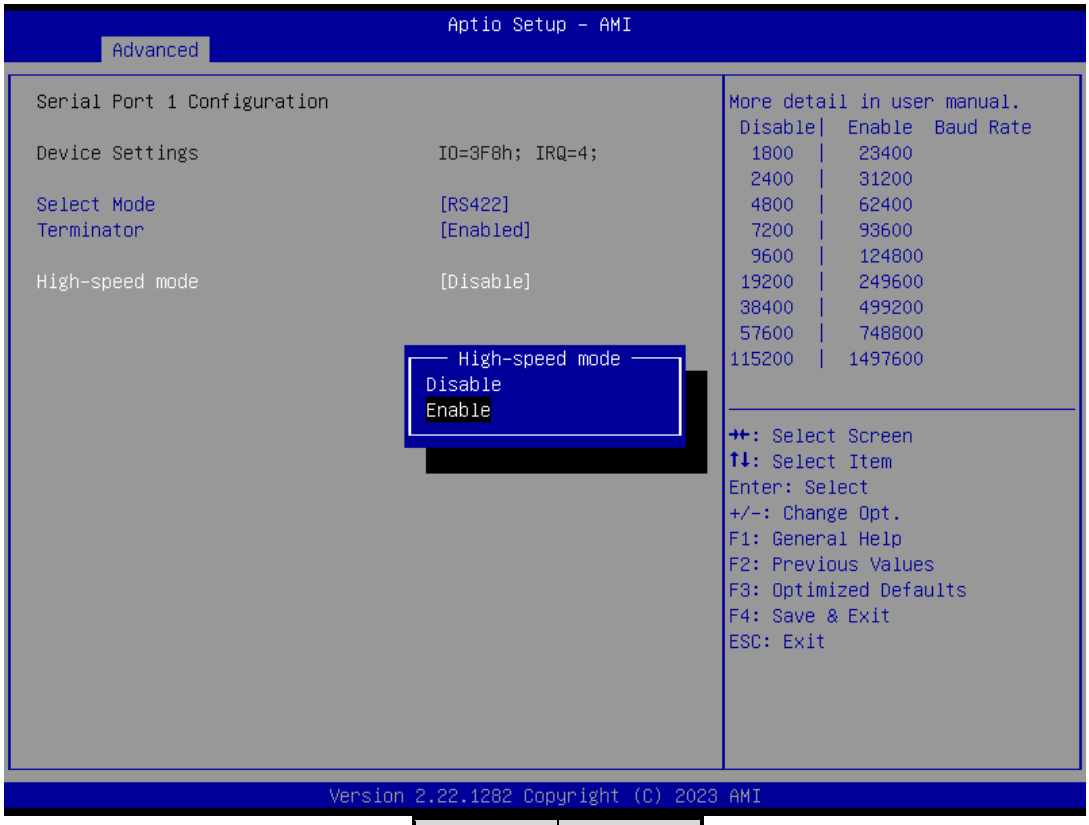




You can enable COM port RS-422/485 receiver termination in RS422/485 mode.



You can enable COM port High-speed mode to support higher speed com port buard rate in RS422/485 mode.

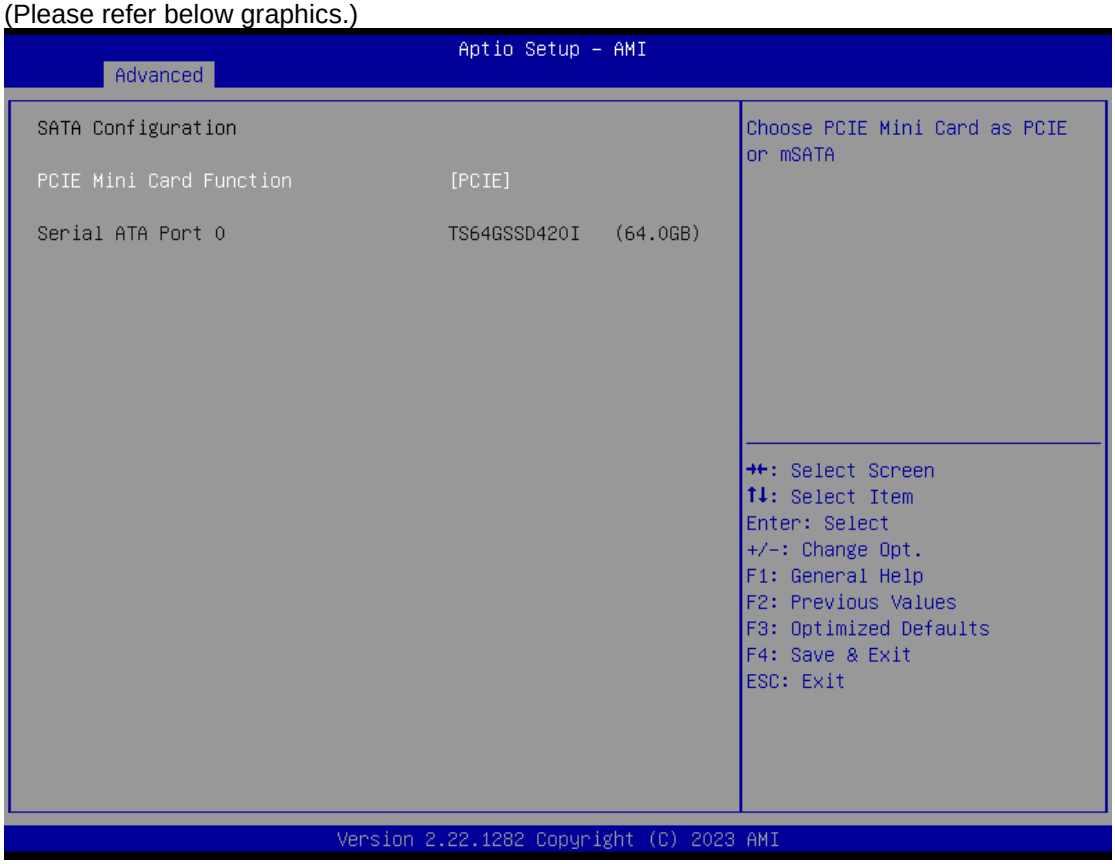


Disable	Enable
50	650
75	975
110	1430
134.5	1478.5
150	1950
300	3900
600	7800
1200	15600
1800	23400
2000	26000
2400	31200
3600	46800
4800	62400
7200	93600
9600	124800
19200	249600
38400	499200
57600	748800
115200	1497600

- **Storage Configuration**

Scroll to this item and press <Enter> to view the Storage Configuration information.

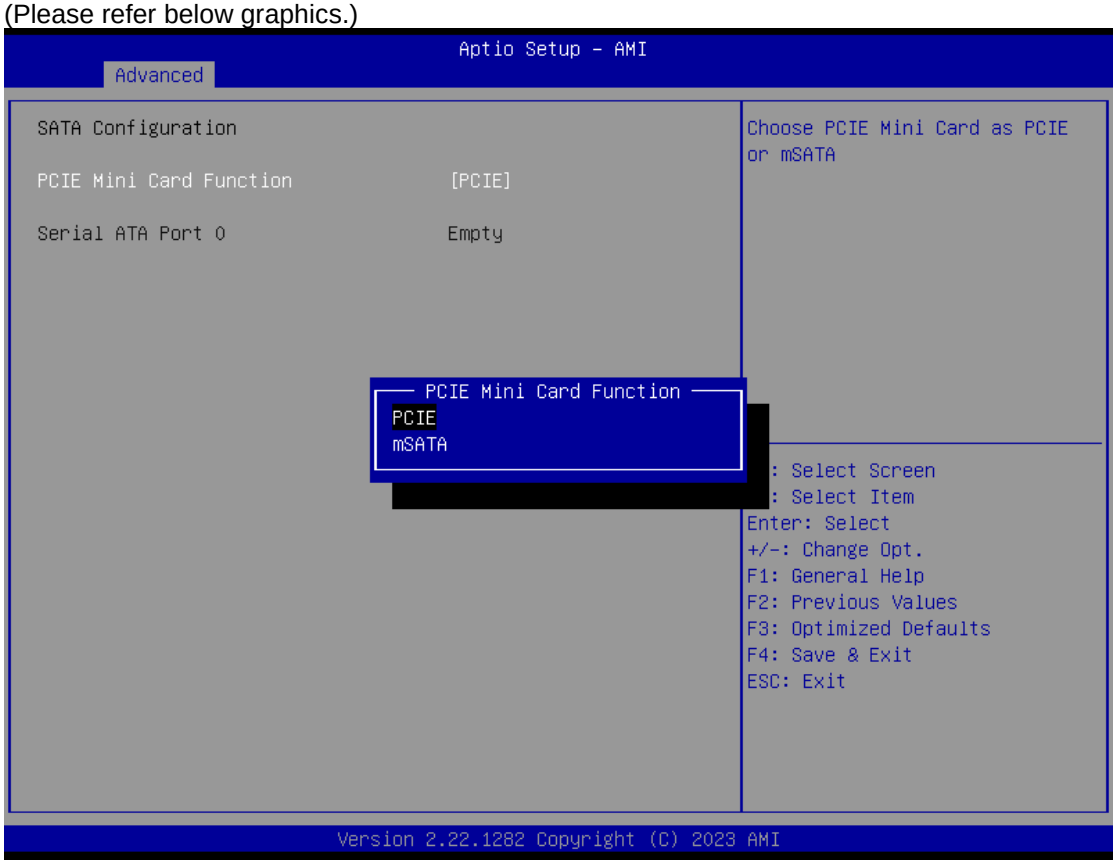
(Please refer below graphics.)



- **PCIe/mSATA Mini Card Configuration**

Scroll to this item and press <Enter> to view the SATA Configuration information and choose PCIE Mini Card as PCIE or mSATA.

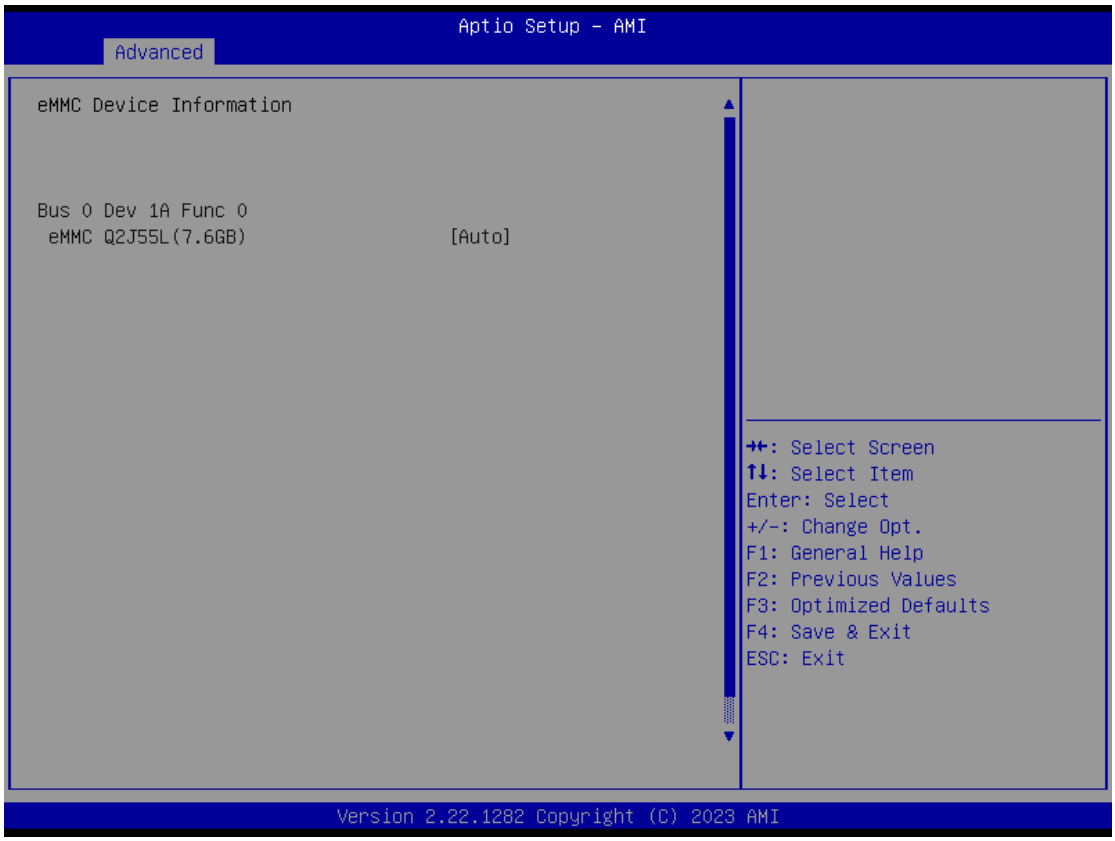
(Please refer below graphics.)



- **eMMC Device Information**

Scroll to this item and press <Enter> to view the EMMC Device information.

(Please refer below graphics.)

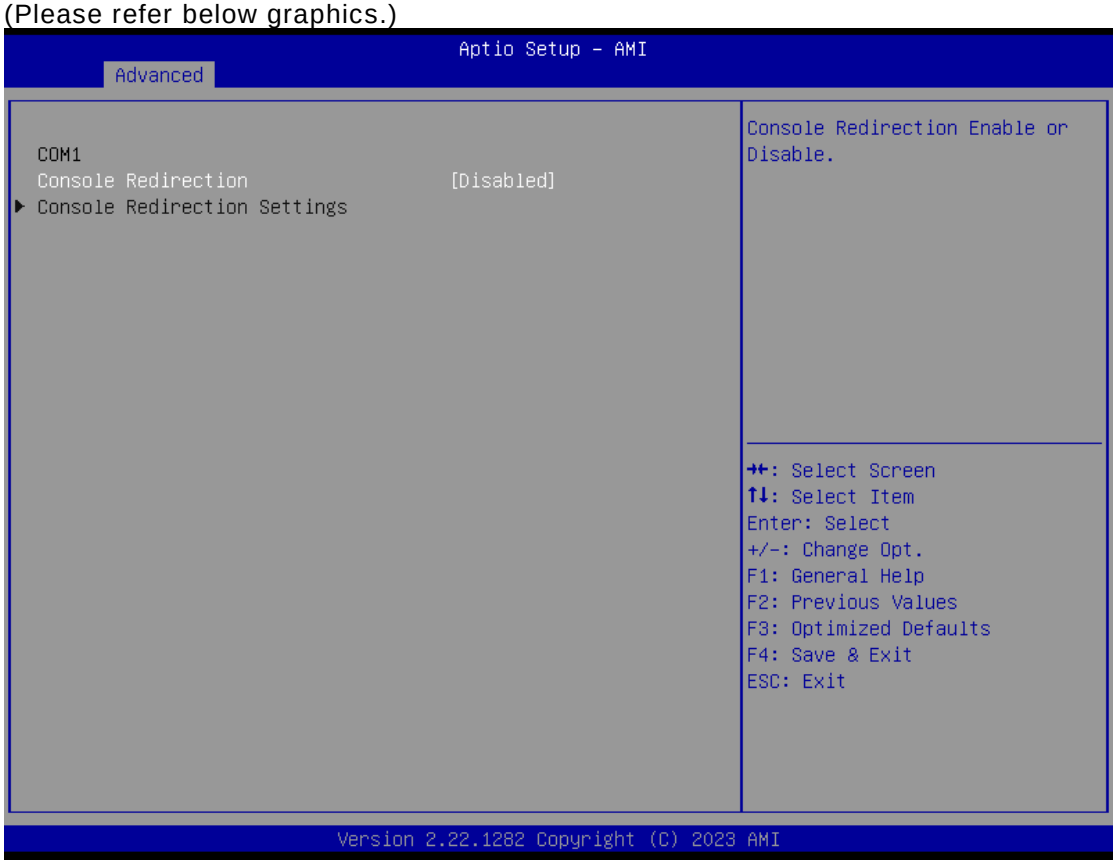


- **Serial Port Console Redirection**

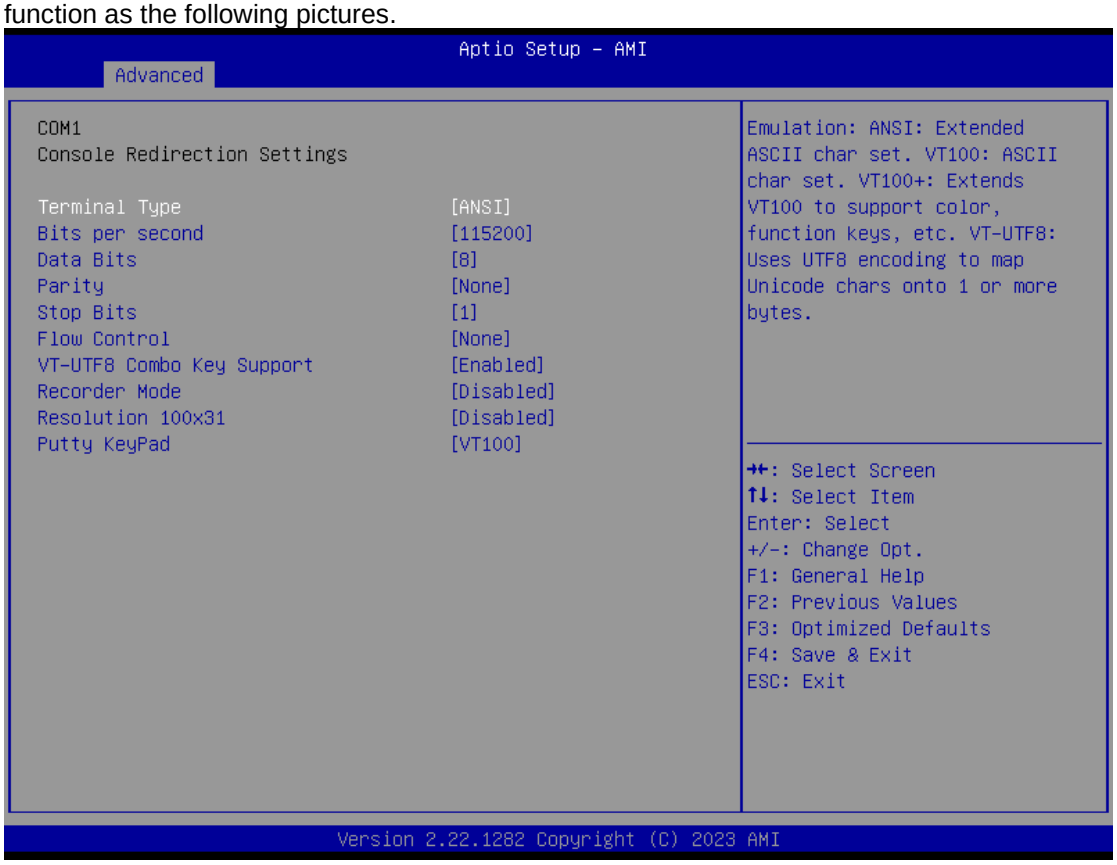
Only COM1 has the console redirection function.

The default setting for the console redirection function is [Disabled]

(Please refer below graphics.)



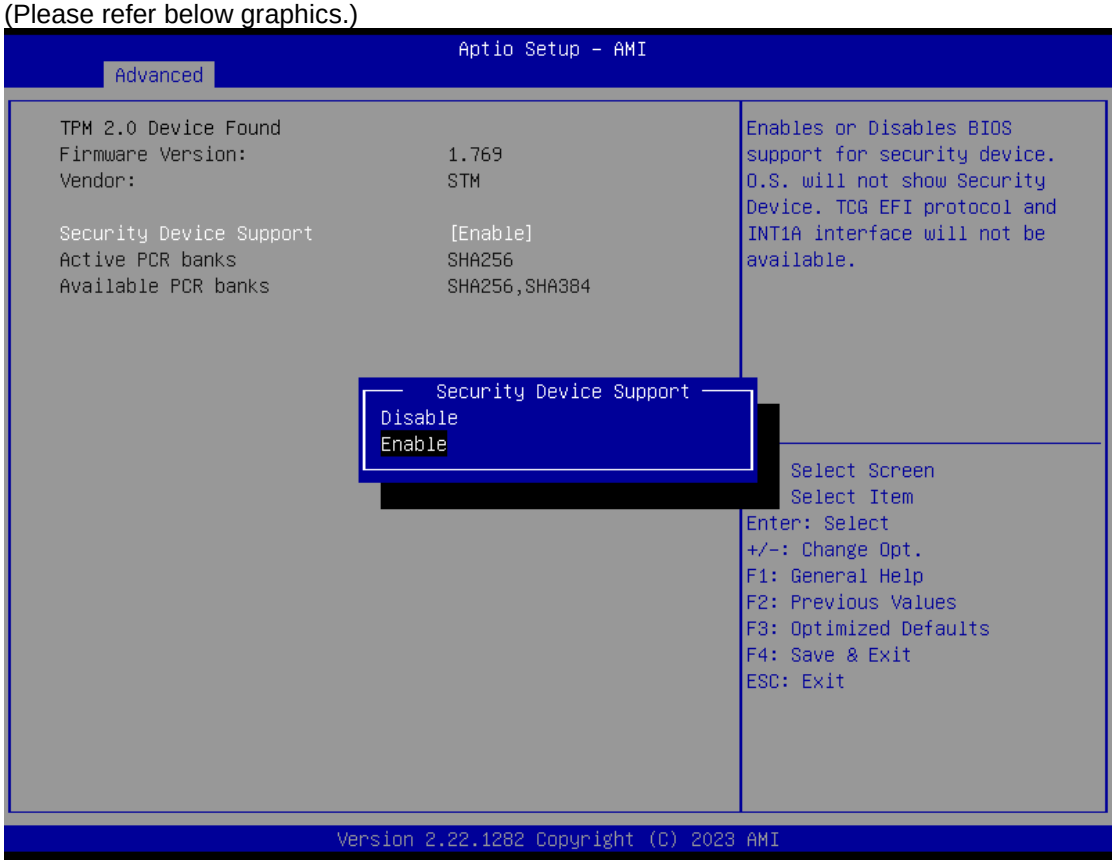
And you can further change the setting by selecting or setting the value you want in each function as the following pictures.



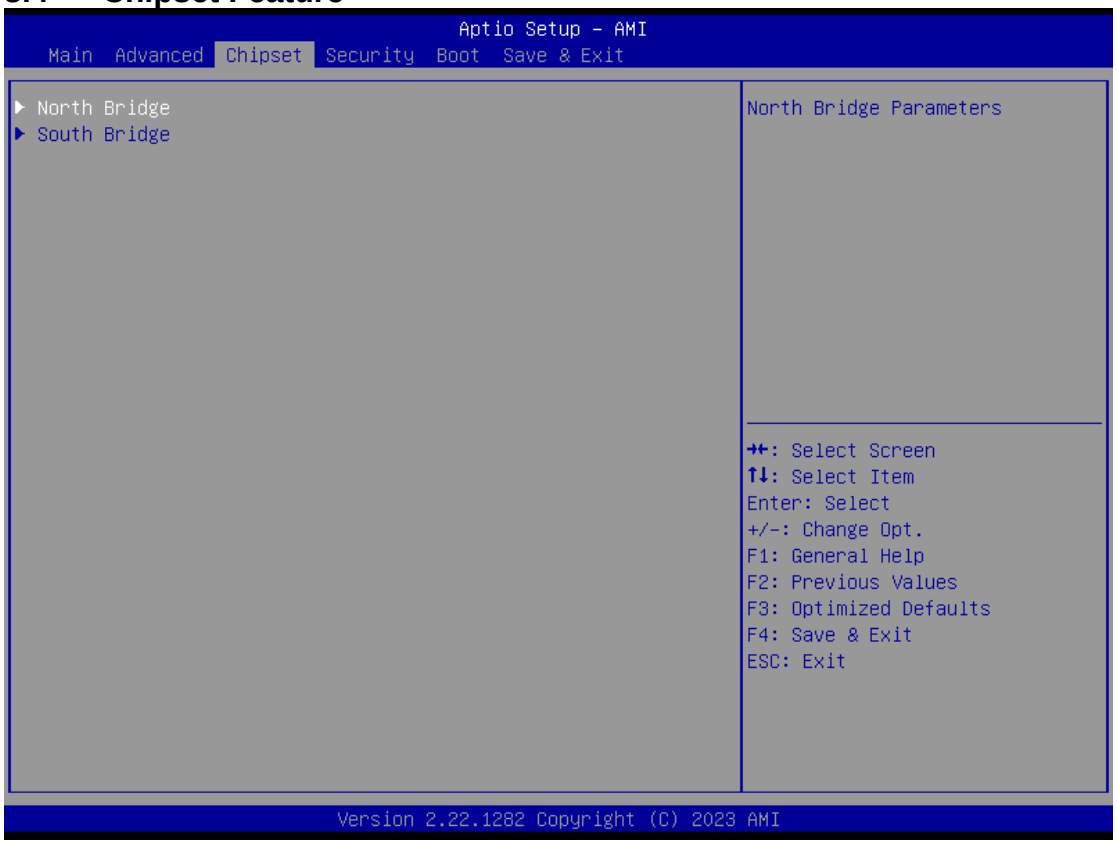
- **Trusted Computing**

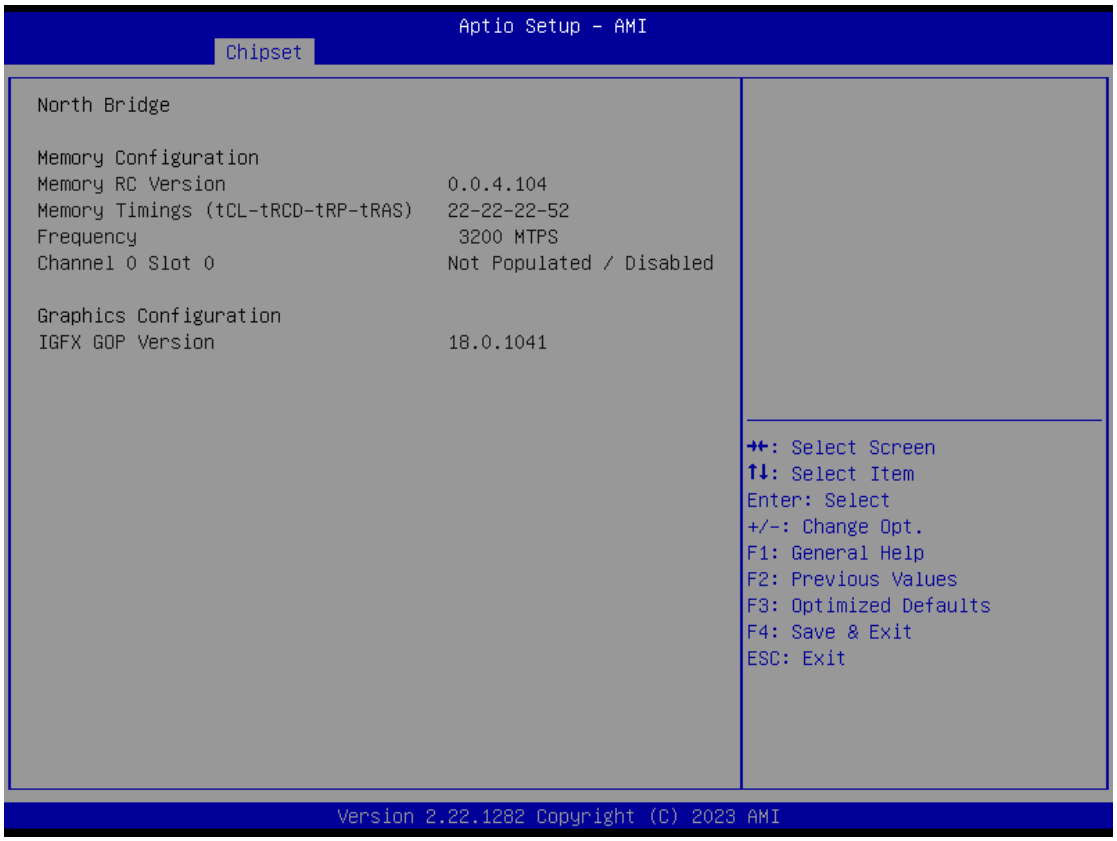
Scroll to this item and press <Enter> to view the Trusted Computing information and default set Security Device Support [Enable].

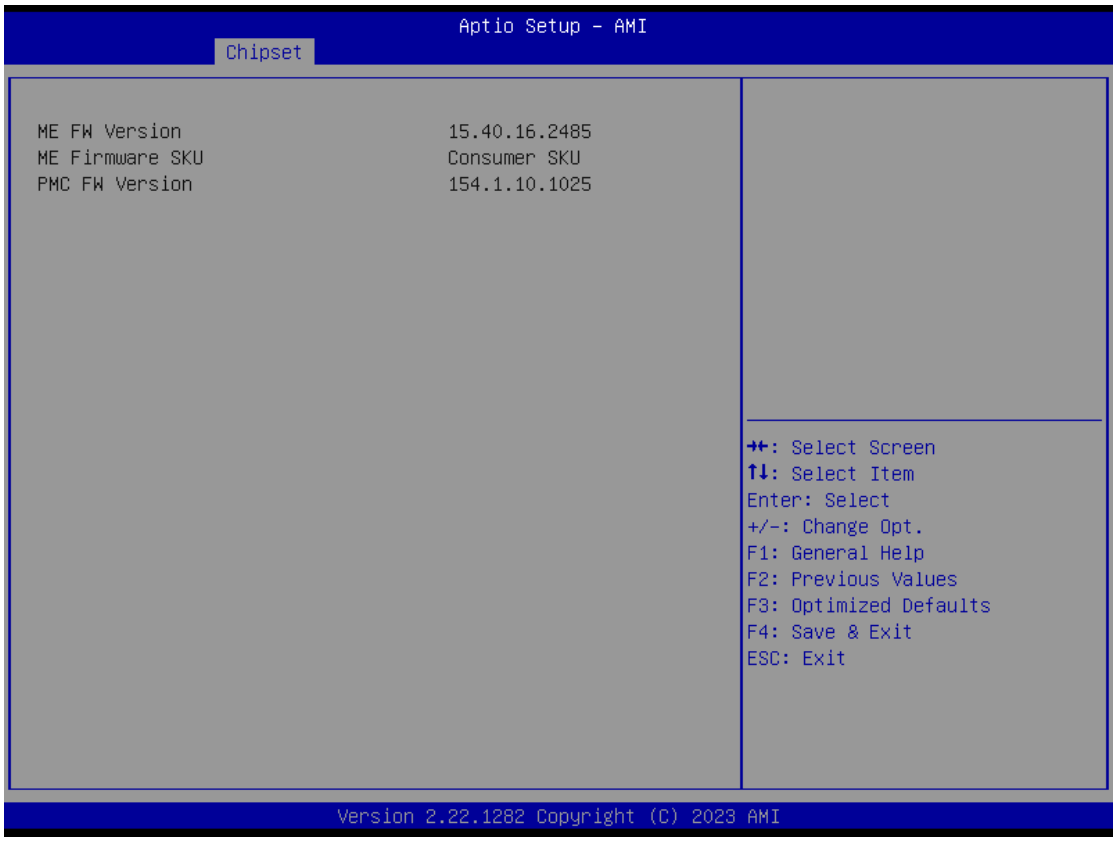
(Please refer below graphics.)



3.4 Chipset Feature




Aptio Setup – AMI
Chipset
North Bridge
Memory Configuration
Memory RC Version 0.0.4.104
Memory Timings (tCL-tRCD-tRP-tRAS) 22-22-22-52
Frequency 3200 MTPS
Channel 0 Slot 0 Not Populated / Disabled
Graphics Configuration
IGFX GOP Version 18.0.1041
→←: 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) 2023 AMI


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) 2023 AMI

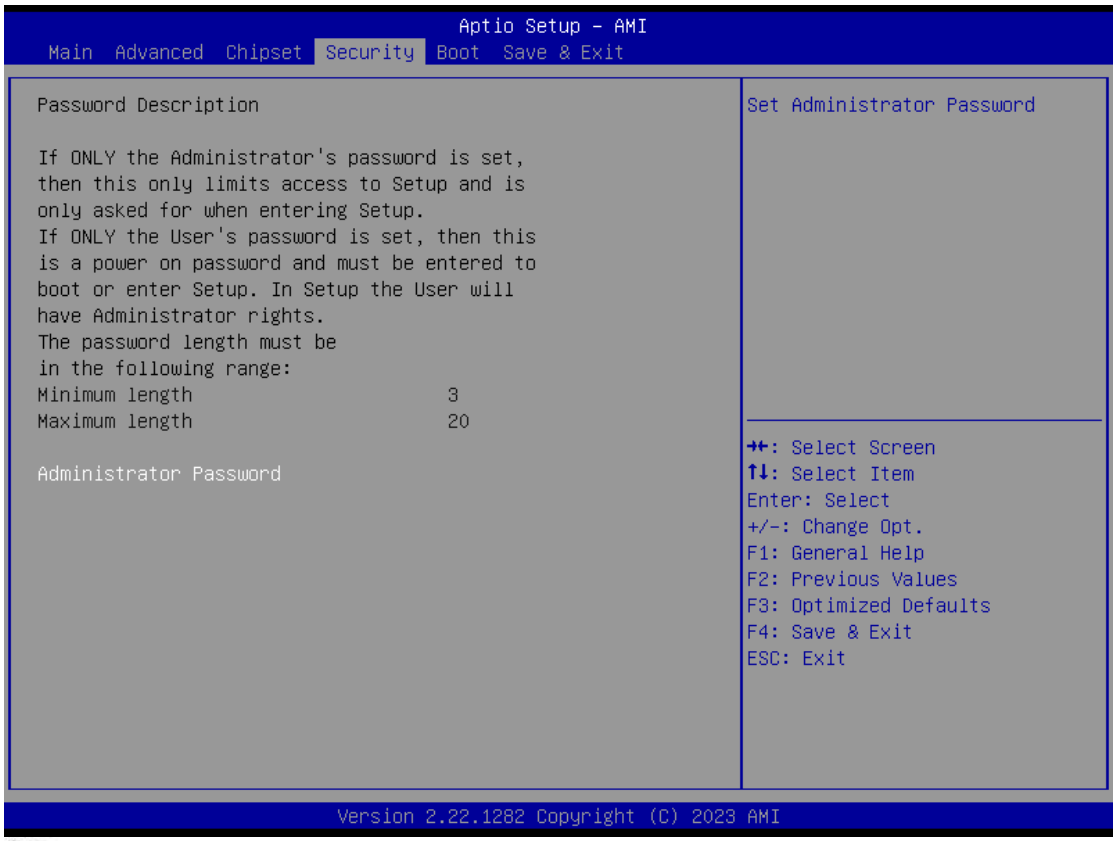
3.5 Security

The default setting for Administrator Password is "Not setting passwords".

The Security menu allows users to change the security settings for the system.

You can set the password for Administrator Password.

(Please refer below graphics.)

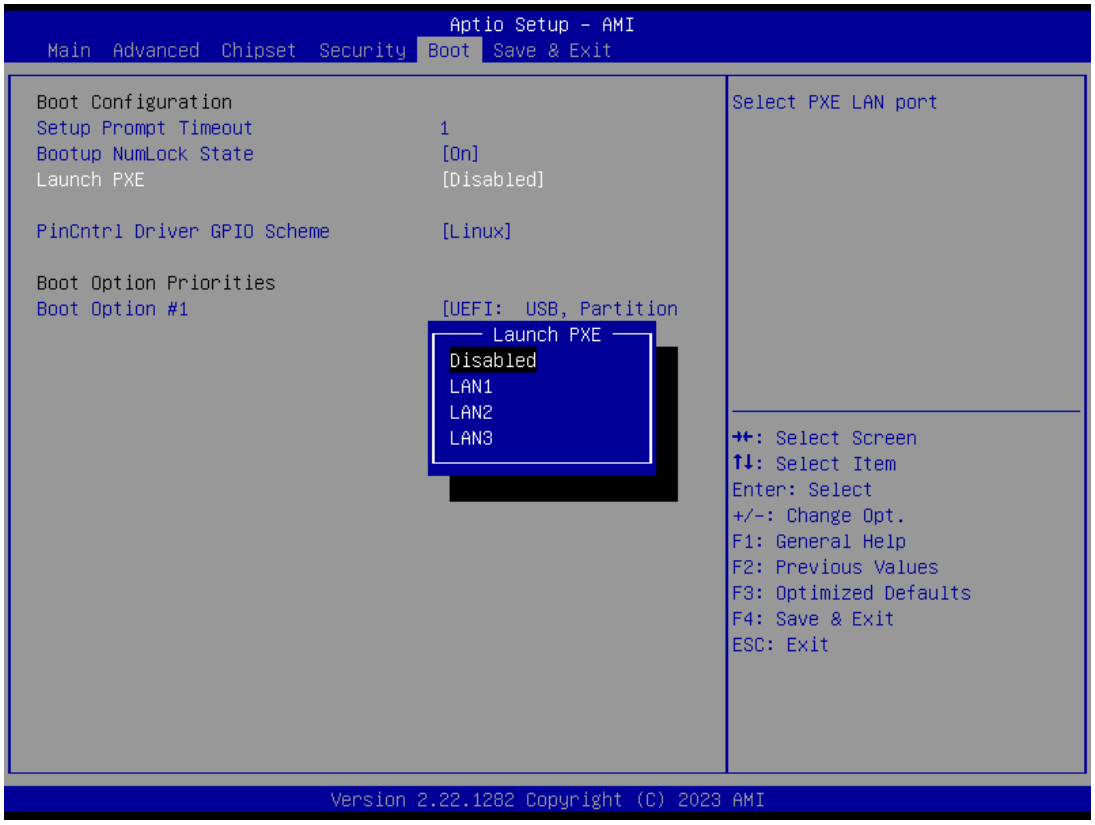


Note: The BIOS default has no password, when user created the password, please remember the password number, if users forget password the RMA is the only solution.

3.6 Boot Type

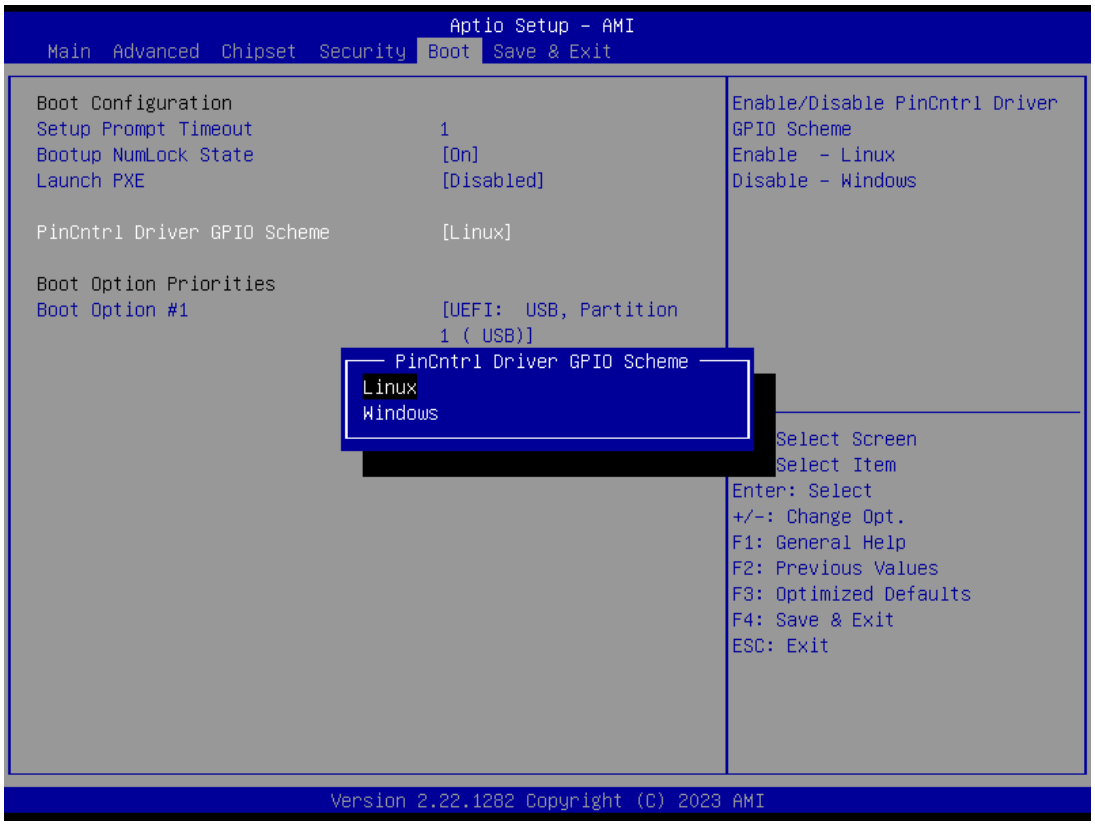
The default setting boot from onboard Launch PxE is [Disabled]

(Please refer below graphics.)



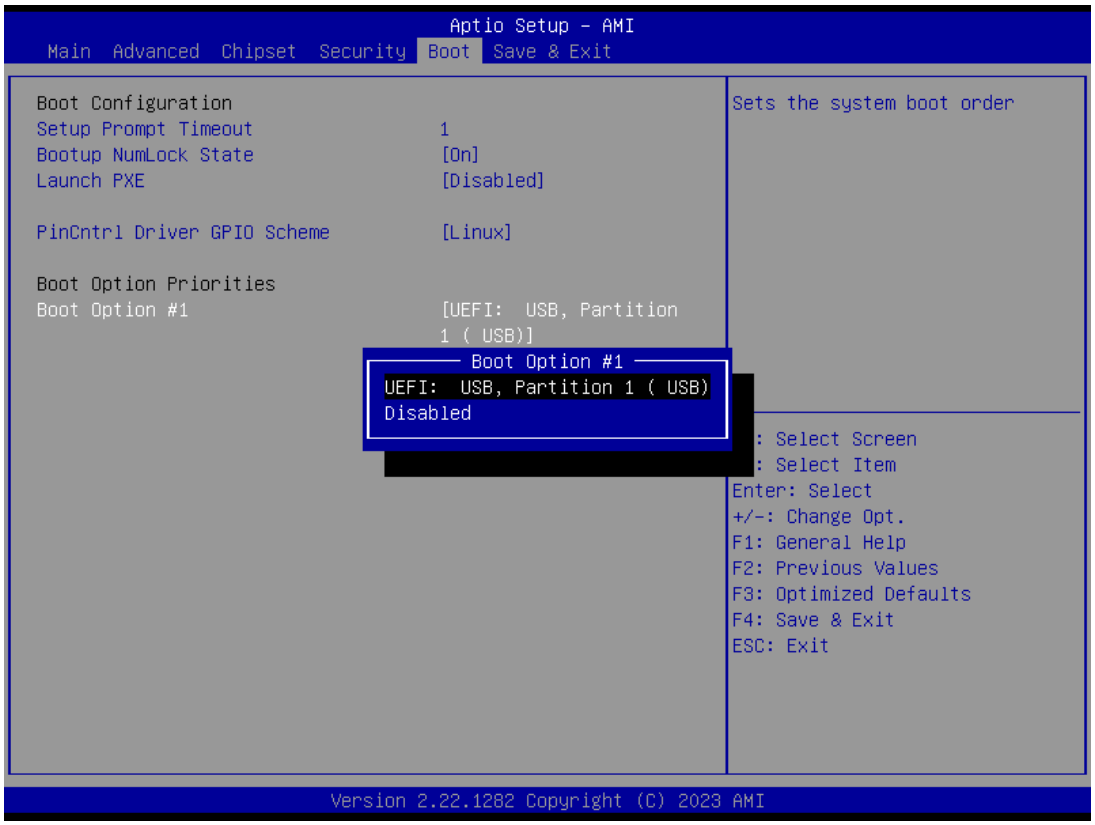
The setting boot from PinCntrl Driver GPIO Scheme is the item can let user choose which operating system want to boot.

(Please refer below graphics.)



The Boot Option Priorities can select by Boot Option #1, #2…, If user is using a USB Device.

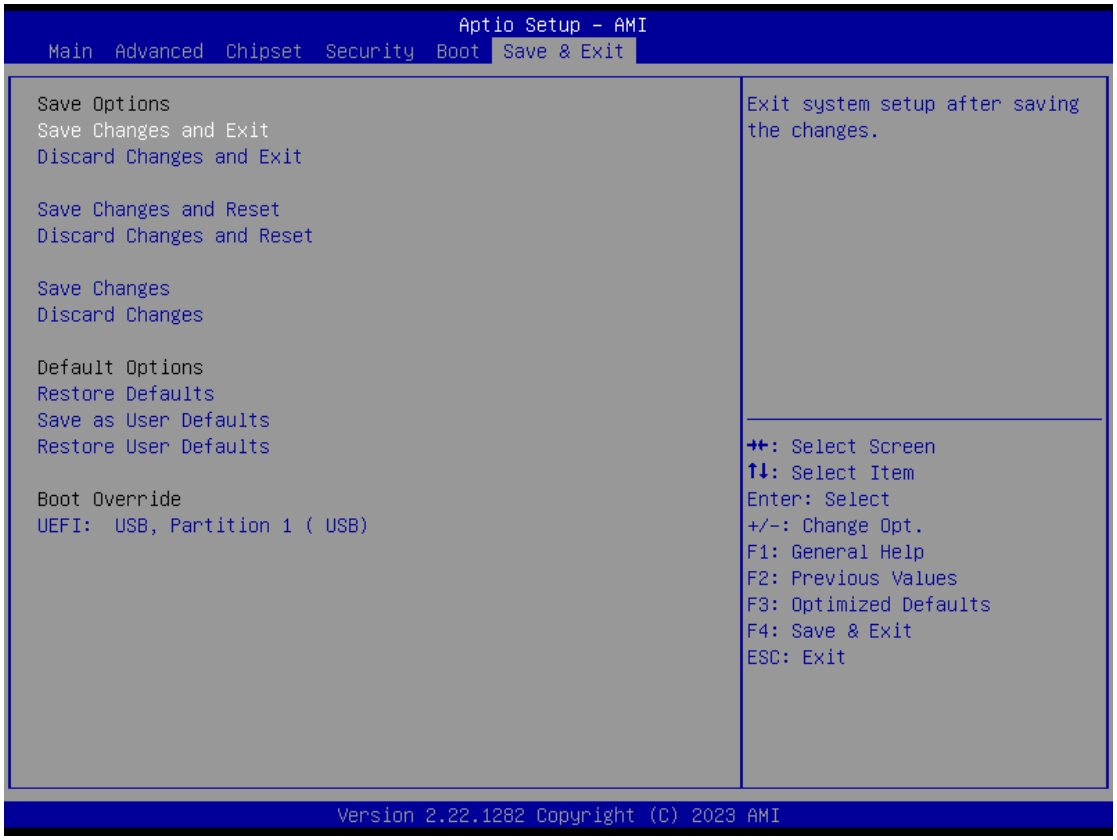
(Please refer below graphics.)


Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit
Boot Configuration
Setup Prompt Timeout 1
Bootup NumLock State [On]
Launch PXE [Disabled]
PinCntrl Driver GPIO Scheme [Linux]
Boot Option Priorities
Boot Option #1 [UEFI: USB, Partition 1 (USB)]
Boot Option #1
UEFI: USB, Partition 1 (USB)
Disabled
Sets the system boot order
: 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) 2023 AMI

3.7 Save & Exit

This section allows you to determine whether or not to accept your modifications.

(Please refer below graphics.)



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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.

```
#include <stdio.h>
#include <stdlib.h>

#include <sys/io.h>

#define SIO_INDEX 0x2E
#define SIO_DATA  0x2F

#define SIO_ENTRY_KEY  0x87
#define SIO_EXIT_KEY   0xAA

#define SIO_LD_WDT  0x07

#define SIO_REG_LDN         0x07
#define SIO_REG_ACTIVATE    0x30
#define SIO_REG_IOBASE_HIGH  0x60
#define SIO_REG_IOBASE_LOW   0x61

#define WDT_IOBASE_HIGH 0x0A
#define WDT_IOBASE_LOW 0x10
#define WDT_IOBASE 0x0A10
#define WDT_CONFIG 0x05
#define WDT_TIME   0x06
```

```
int main()
{
  unsigned char Count = 10; // 10 Seconds
  unsigned char DataBuffer; // Operate Io Data

  //Get  Io Port Read/Write Permission
  iopl(3);

  //Enter SIO Config
  outb_p ( SIO_ENTRY_KEY, SIO_INDEX);
  outb_p ( SIO_ENTRY_KEY, SIO_INDEX);


  // Set WDT IOBASE
  // Select Logical Device = 07 (WDT)
  outb_p ( SIO_REG_LDN , SIO_INDEX);
  outb_p ( SIO_LD_WDT  , SIO_DATA);

  // set IOBase
  outb_p ( SIO_REG_IOBASE_HIGH , SIO_INDEX);
  outb_p ( WDT_IOBASE_HIGH ,     SIO_DATA);

  outb_p ( SIO_REG_IOBASE_LOW , SIO_INDEX);
  outb_p ( WDT_IOBASE_LOW ,     SIO_DATA);

  // Activate Wdt IO Decode
  outb_p ( SIO_REG_ACTIVATE , SIO_INDEX);
  outb_p ( 1                , SIO_DATA);

  //Exit SIO Config
  outb_p ( SIO_EXIT_KEY, SIO_INDEX);


  // Clear And Set Wdt Status
  /*
```

```
 Wdt Config Reg Bit Definition
 7 : Reserved
 6 : WDT time out Status (Write 1 Clear)
 5 : Watch dog counting Enable
 4 : Set Output mode (0 Level,1 Edge)
 3 : Time Unit (0 : 1sec , 1: 60Sec)
 2 : Output Polarity (0 : low active , 1 : High active)
 1-0 : (output pulse width of Wdtrst# ,
       00 1ms  , 01 25ms ,
      10 125ms ,11 :5sec)
*/
 outb_p ( 0x40  ,  WDT_IOBASE + WDT_CONFIG);

 //Set WatchDog Count Time
 outb_p ( Count ,  WDT_IOBASE + WDT_TIME);

 //Start WatchDog Count
 outb_p ( 0x20  ,  WDT_IOBASE + WDT_CONFIG);

 //Print Remain Time
 while(1)
 {
   DataBuffer = inb_p ( WDT_IOBASE + WDT_TIME );
   printf(" reset in %d sec\n",DataBuffer);
 }
 return 0;
}
```