

USER'S MANUAL

AIM101 Series

Fanless Edge AI System

User's Manual



www.axiomtek.com

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December 2025, Version A2

Printed in Taiwan

Safety Precautions

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

1. The AIM101 does not come with an operating system which must be loaded first before installation of any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing any internal components. Use a wrist grounding 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 AIM101 prior to making any installation. Be sure both the system and all external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the AIM101 is properly grounded.
4. Make sure the voltage of the power source is correct before connecting it to any power outlet.
5. Turn Off system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the system.
6. Do not leave equipment in an uncontrolled environment where the storage temperature is below -40°C or above 80°C as 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 discharge any static electricity on human 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.

IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST
REPLACEE
PER UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGEES
CONFORMEMENT AUX INSTRUCTIONS
9. Warning:

Hot Surface Do Not Touch.

Restricted access locations: The equipment should only be installed in a Restricted Access Area.

Classifications

1. Degree of protection against electric shock: not classified
2. Degree of protection against ingress of water: IP40
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
4. Mode of operation: Continuous



【Note】 :All opening I/O connectors should be connected with corresponding cables, kits or covers when the system is operating with IP40 rated definition. If some of the I/O ports are not to be used or connected during operation, users must use I/O covers to plug the ports in order to meet the IP40 standard.

General Cleaning Tips

Please keep the following precautions in mind while understanding the details fully before and during any cleaning of the computer and any components within.

A piece of dry cloth is ideal to clean the device.

1. Be cautious of any tiny removable components when using a vacuum cleaner to absorb dirt on the floor.
2. Turn the system off before cleaning up the computer or any components within.
3. Avoid dropping any components inside the computer or getting circuit board damp or wet.
4. For cleaning, be cautious of all kinds of cleaning solvents or chemicals which may cause allergy to certain individuals.
5. Keep foods, drinks or cigarettes away from the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning computer and peripherals, users can also use house hold items accordingly for cleaning. Listed below are items available for cleaning computer or computer peripherals.

Pay special attention to components requiring designated products for cleaning as mentioned below.

- 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, it is recommended to use a piece of cloth.
- Water or rubbing alcohol: A piece of cloth may be somewhat moistened with water or rubbing alcohol before being rubbed on the computer. Unknown solvents may be harmful to plastic parts.
- Absorb dust, dirt, hair, cigarette and other particles outside of a computer can be one of the best methods of cleaning a computer. Over time these items may restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are applicable to reach areas in keyboard, mouse and other areas.
- Foam swabs: If possible, it is better to use lint free swabs such as foam swabs.



【Note】 : *It is strongly recommended that customer should shut down the system before starting to clean any single components.*

Please follow the steps below:

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

Scrap Computer Recycling

Please inform the nearest Axiomtek distributor as soon as possible for suitable solutions in case computers require maintenance or repair; or for recycling in case computers are out of order.

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SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the AIM101. Section 1 consists of the following sub-sections:

- General Descriptions
- System Specifications
- Dimensions
- I/O Outlets
- Packing List
- Model List
- Optional Accessory List

1.1 General Descriptions

The AIM101 is a compact, efficient industrial-grade fanless edge AI system with Intel® processor N150, featuring a PCIe Gen3 x4 M.2 slot to run AI accelerator at full performance capability. It offers 4 USB ports, dual 2.5GbE, 1 HDMI and 3 optional I/O for DIO, COM or CAN bus for peripheral connectivity and communication protocols. Suitable for computer vision inference of smart city, smart manufacturing, edge computing, factory automation applications. and more at the edge.

Features

- Powered by Intel® Quad-core processor N150 (Twin Lake)
- Optional M.2 AI accelerator cards
- Qualified Intel® ESQ for Metro AI Suite Device
- Seamless connectivity with Wi-Fi 6E, LTE and 2.5GbE combined
- Intelligent power management - USB power on/off control
- Wide power input range of 9 to 36 VDC with smart ignition control
- Ideal for edge AI object detection, image classification and video analytics applications

Reliable and Stable Design

The fanless edge AI system supports Intel® processor N-series N150 quad-core up to 3.6GHz (Twin Lake), along with high flexibility and multi-functional design that makes it the best solution for smart city, smart manufacturing, edge computing, factory automation applications.

Flexible Connectivity

The AIM101 comes with rich I/O interfaces including two USB 3.2 ports, two USB 2.0 ports, two 2.5GbE port, one HDMI, one M.2 key M slot, one M.2 key E slot, and one mPCIe expansion slot, and optional I/O for 8-CH TTL DIO, COM (RS-232/422/485) or CAN bus.

Embedded O.S. Supported

The AIM101 supports Windows® 11 IoT and Linux Ubuntu 24.04 LTS.

Various Storage Supported

In terms of storage, the AIM101 supports one M.2 Key M 2280 NVMe SSD*1, one mSATA*2 and one 2.5" SATA storage drive bay.



【Note *1】 : *Please note that AI accelerator card and NVMe SSD cannot be used simultaneously.*



【Note *2】 : *Please note that mSATA, mPCIe wireless module and CAN bus module kit cannot be used simultaneously.*

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Intel® processor N-series N150 quad-core SoC (Twin Lake)
- **Chipset**
 - SoC integration
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
 - 8GB LPDDR5 SDRAM onboard
 - *16GB (2 x 8GB) LPDDR5 SDRAM onboard, by project

1.2.2 I/O System

- **AI Accelerator**
 - Optional, M.2 Key M AI accelerator card
 - Axelera Metis M.2 module
 - DeepX DX-M1 M.2 module
 - Hailo-8 M.2 module, by project
 - MemryX MX3 M.2 module, by project
- **Display**
 - 1 x HDMI (FHD) (Resolution: 1920x1080@60Hz) (lockable kit, optional)
- **Ethernet**
 - 2 x 10/100/1000/2500 Mbps Ethernet supports Wake-on-LAN, UEFI PXE with Intel i226-V
- **USB Ports**
 - 2 x USB 3.2 Gen2 (lockable kit, optional)
 - 2 x USB 2.0 (lockable kit, optional)
- **Digital I/O and Serial Ports**
 - Up to 3 optional I/O opening, optional from below cables or module kit,
 - 2 x 8-CH TTL DIO
 - 2 x COM (RS-232/422/485)
 - 1 x Dual CAN bus 2.0A/B*¹
- **Expansion Interface**
 - 1 x M.2 Key M 2280 slot (PCIe Gen3 x4) for AI accelerator card or NVMe SSD*²
 - 1 x M.2 Key E 2230 slot (PCIe Gen3 x1+USB 2.0) for Wi-Fi 6E
 - 1 x full-size PCI Express Mini Card slot (USB 2.0 + PCIe Gen2 x1/SATA) for Wi-Fi/LTE/GPS or mSATA*¹
 - 1 x Nano SIM slot

- **Storage**
 - 1 x mSATA SSD^{*3}
 - 1 x 2.5" SATA HDD/SSD drive bay, up to 9.5mm height
 - 1 x M.2 Key M 2280 NVMe SSD^{*2}
- **Indicator**
 - 1 x Green LED as indicator for system power-on status
 - 1 x Orange LED as indicator for SSD active
- **Switch**
 - 1 x Reset button
 - 1 x Power button
 - 1 x Remote power switch connector
- **Antenna & SIM**
 - 5 x SMA type connector openings for antenna
 - 1 x Nano SIM slot
- **TPM 2.0**



【Note ^{*1}】 : *Please note that mSATA, mPCIe wireless module and CAN bus module kit cannot be used simultaneously.*



【Note ^{*2}】 : *Please note that AI accelerator card and NVMe SSD cannot be used simultaneously.*

1.2.3 System Specifications

- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels
- **Power Supply**
 - 9 to 36 VDC with smart ignition control (Typical: 12/24 VDC)
 - Inrush current: 0.37A/1.93A
 - Power rating: 12V 3.84A; 24V 1.956A
- **Operation Temperature**
 - -40°C to +70°C (-40°F to +158°F) with 0.7 m/s air flow
(with W.T.*1 AI accelerator card, DRAM and SSD)
- **Storage Temperature**
 - -40°C to +80°C (-40 °F to +176°F)
- **Humidity**
 - 10% to 95% (non-condensation)
- **Vibration (operating)**
 - IEC 60068-2-64 (with SSD: 3Grms, random, and 5 to 500 Hz)
 - MIL-STD-810H, Method 514.8, Category 20, and Figure 514.8C-2
- **Shock (operating)**
 - IEC 60068-2-27 2008 Table A.1 (with SSD: 50G, half sine, and 11 ms duration)
 - MIL-STD-810H, Method 516.8, and Procedure I (with SSD: 40G, TP sawtooth, and 11 ms duration)
- **Weight**
 - 1.10 kg (2.43 lb), without package
 - 1.86 kg (4.10 lb), with package
- **Dimension (W x D x H)**
 - 167 x 119 x 62.6 mm (6.57" x 4.69" x 2.46"), without package
 - 310 x 320 x 190 mm (12.20" x 12.60" x 7.48"), with package



【Note *1】 : *W.T.(Wide Temperature). All W.T. supported products have to be sorted by Axiomtek.*

1.2.4 Driver Contents

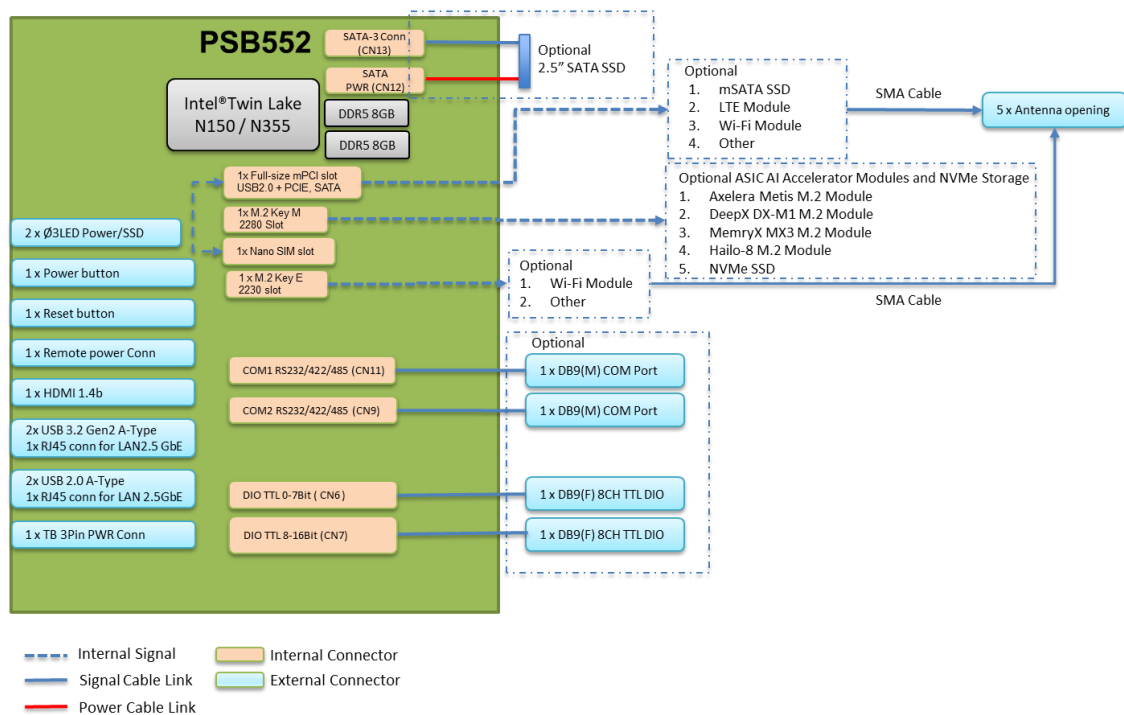
Please download the following AIM101 drivers from the Axiomtek official website.

- Intel Serial IO Driver
- Intel Ethernet I226 Driver
- Intel Chipset Driver
- Intel CSM Driver
- Intel Graphic Driver

1.2.5 Block Diagram

The following diagrams show you block diagram of the AIM101.

AIM101

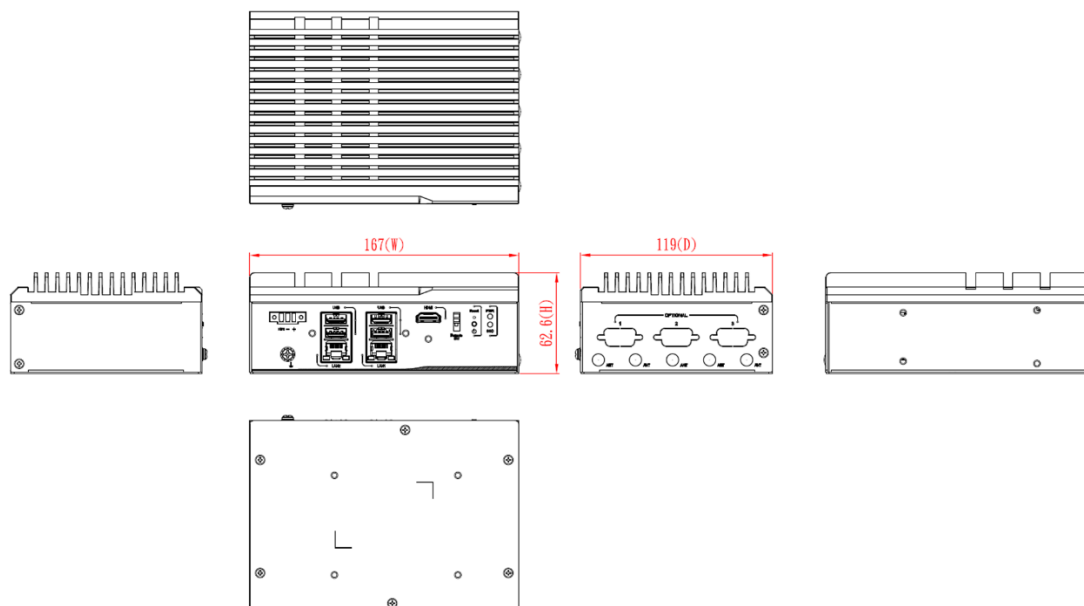


【Note】 : All specifications and images are subject to change without notice.

1.3 Dimensions

The following diagrams show dimensions and outlines of the AIM101.

1.3.1 System Dimensions

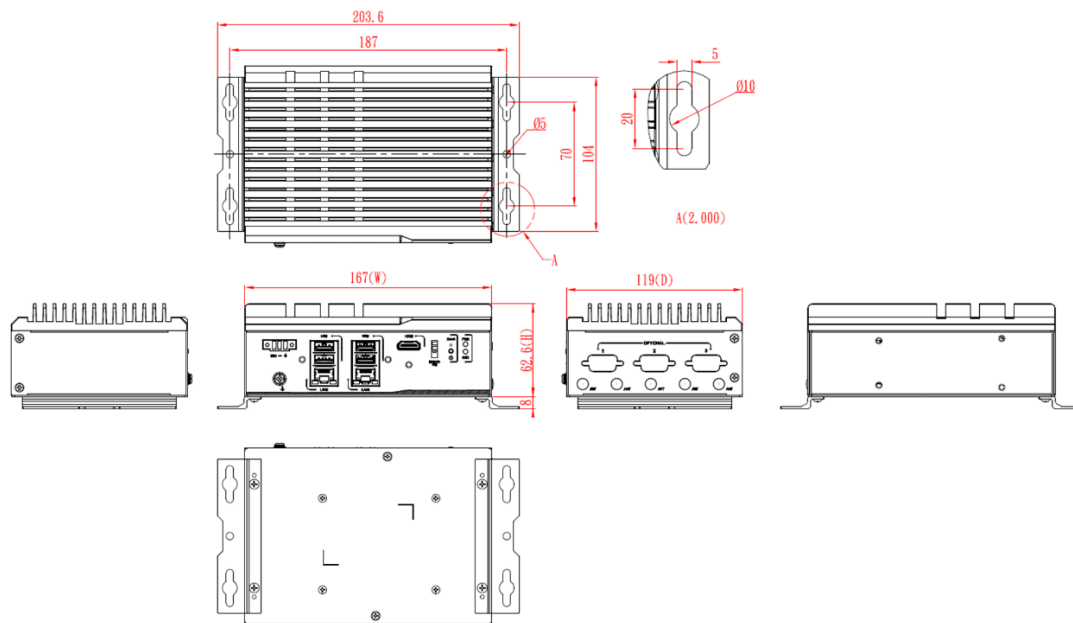


1.3.2 Wall-mount Bracket Dimensions

Please remove the original four screws from the rear cover. Users can get 4pcs truss head M3*6L screws for fixing the wall mount kit from the accessories box.

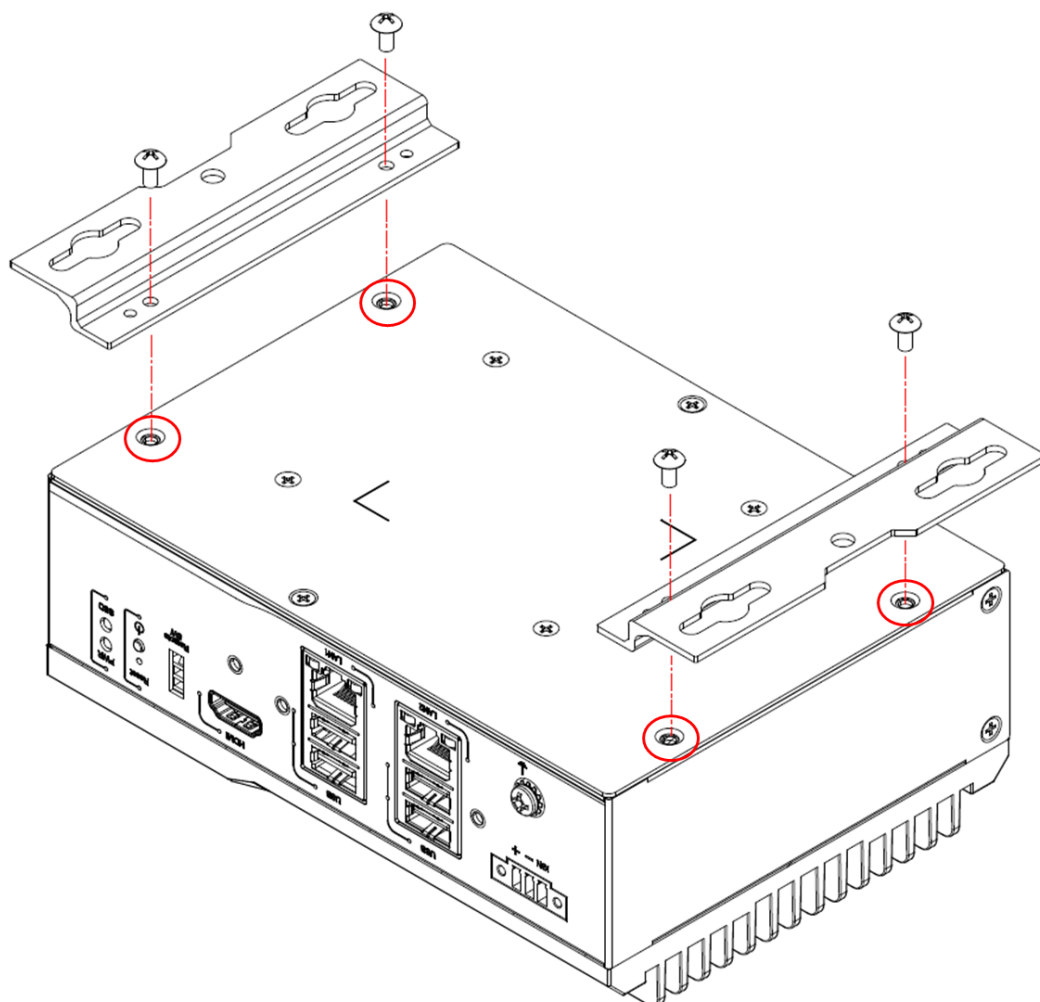


【Note】 : When users install wall mount kit, please turn the LAN ports outlet side towards the floor.



Wall-mount Bracket Assembly Drawing

Please remove the original four screws from the rear cover. Users can get 4pcs truss head M3*6L screws for fixing the wall mount kit from the accessories box.

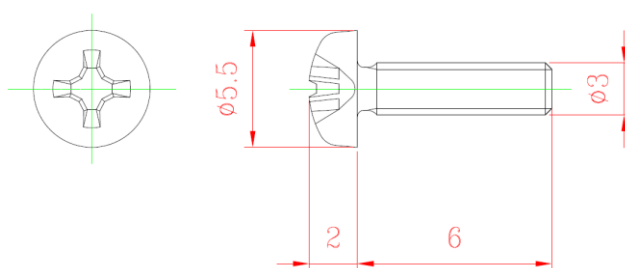


【Note】 : Please keep the original four screws from the rear cover in case they are needed after removing the system's anti-vibration kit.



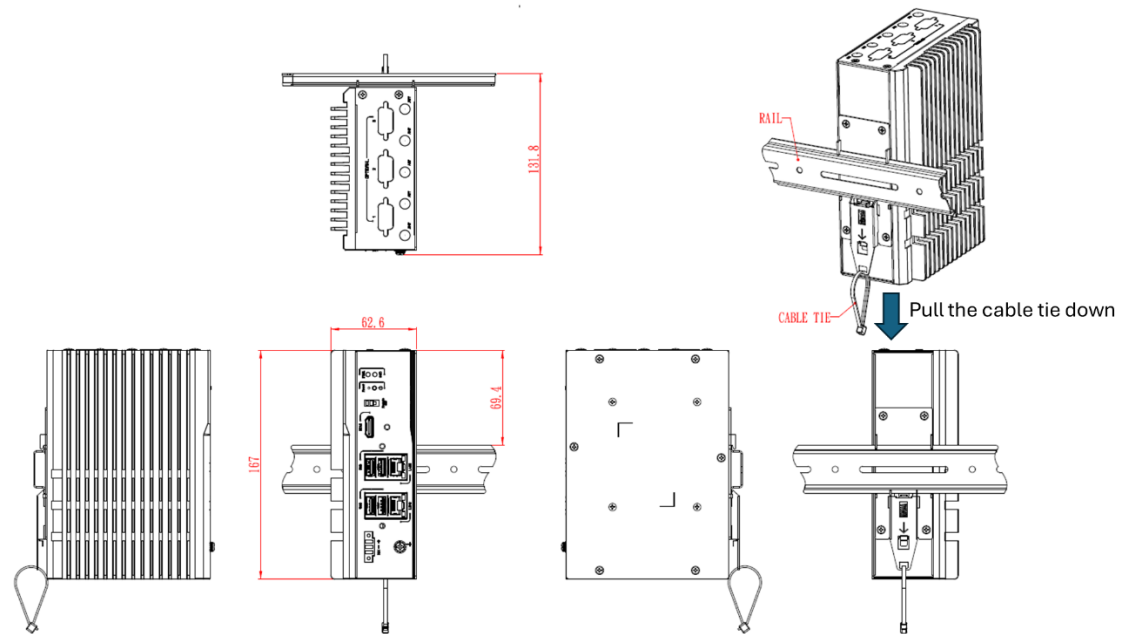
【Note】 : If users tighten the screws in drywall, use the hollow wall anchors to ensure that unit does not pull away from the wall due to prolonged strain between the cable and power connector.

PAN HEAD SCREW: M3L6



1.3.3 Din-Rail (Vertical type) Bracket Dimensions

Users can get 4pcs countersunk M3*4L screws for fixing the Din rail mount kit from the accessory box. To remove the system from the rail, please pull the cable tie down on the Din rail mount kit.

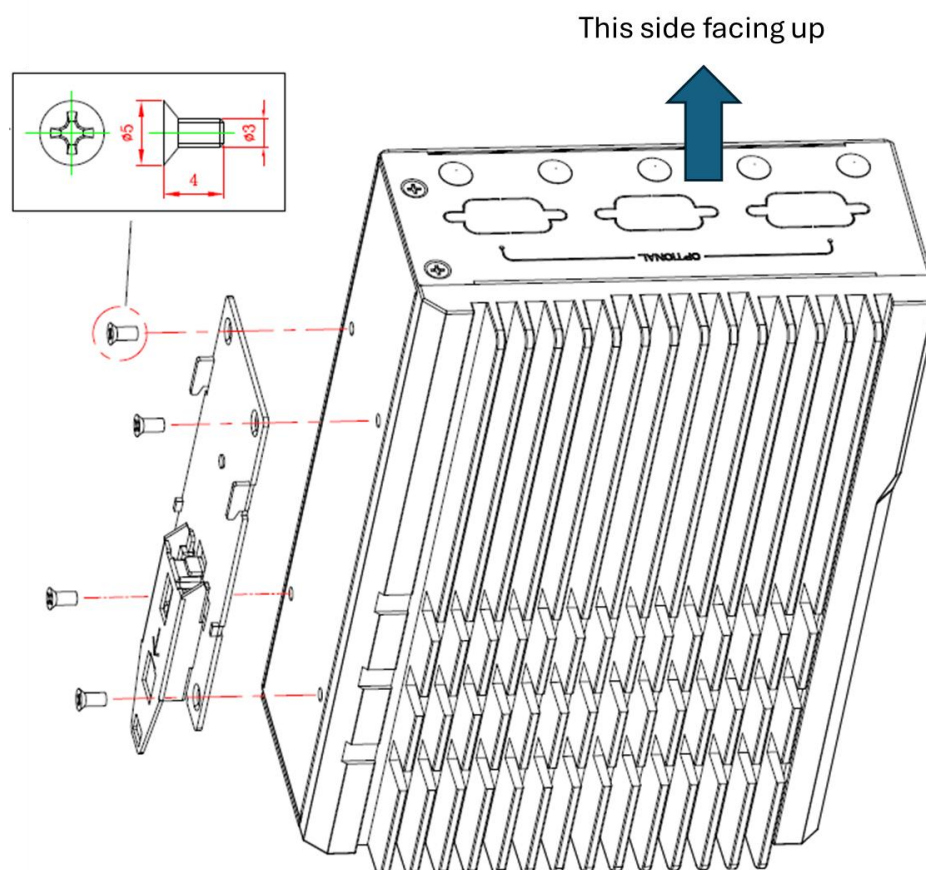


Din-Rail Bracket (Vertical type) Assembly Drawing

Users can get 4pcs countersunk M3*4L screws for fixing the Din rail mount kit from the accessory box.



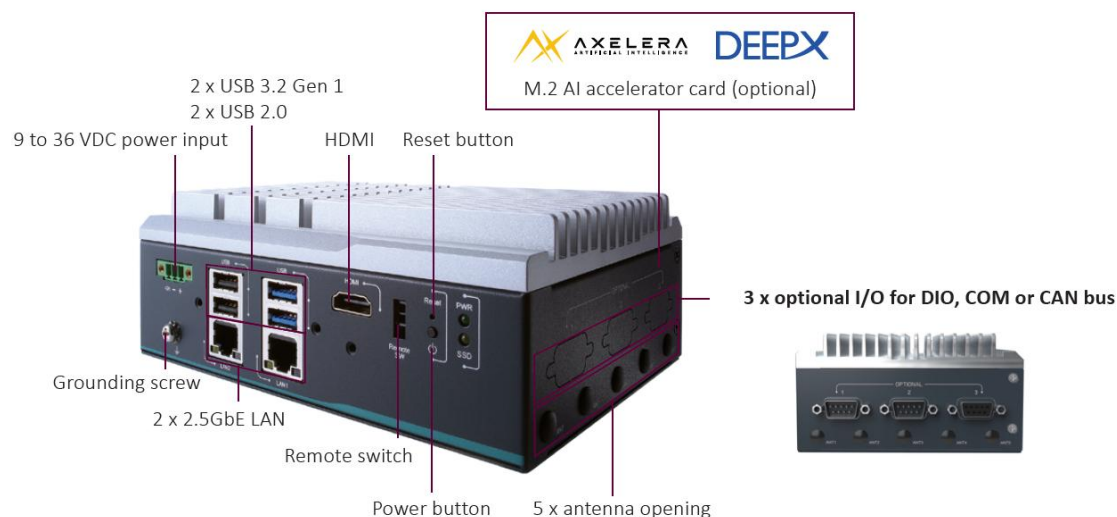
【Note】 : Optional IO & Antenna side facing up.



1.4 I/O Outlets

The following figures show I/O outlets on the AIM101.

Front and Side View



1.5 Packing List

The AIM101 comes with the following bundle package:

- 1 x AIM101 System Unit
- 1 x 3 Pin terminal block connector for power
- 1 x Screws pack
 - 2 x M3*3L screws (used for M.2 Key M 2280 slot/ M.2 Key E 2230 slot)
 - 1 x M2*3L screw (used for full-size PCI Express Mini Card slot)



【Note】 : Regarding the latest product manual, please download them from Axiomtek official website.

1.6 Model List

AIM101-N150-8R (P/N: E27Y101101)	Fanless edge AI system with Intel® processor N150, on-board 8GB LPDDR5, 2 2.5GbE LAN, 4 USB, and 1 HDMI, featuring a PCIe Gen 3 x4 M.2 slot
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【Note】 : If you cannot find this package or any items are missing, please contact Axiomtek distributors immediately.

1.7 Optional Accessories

1.7.1 Optional Accessory List

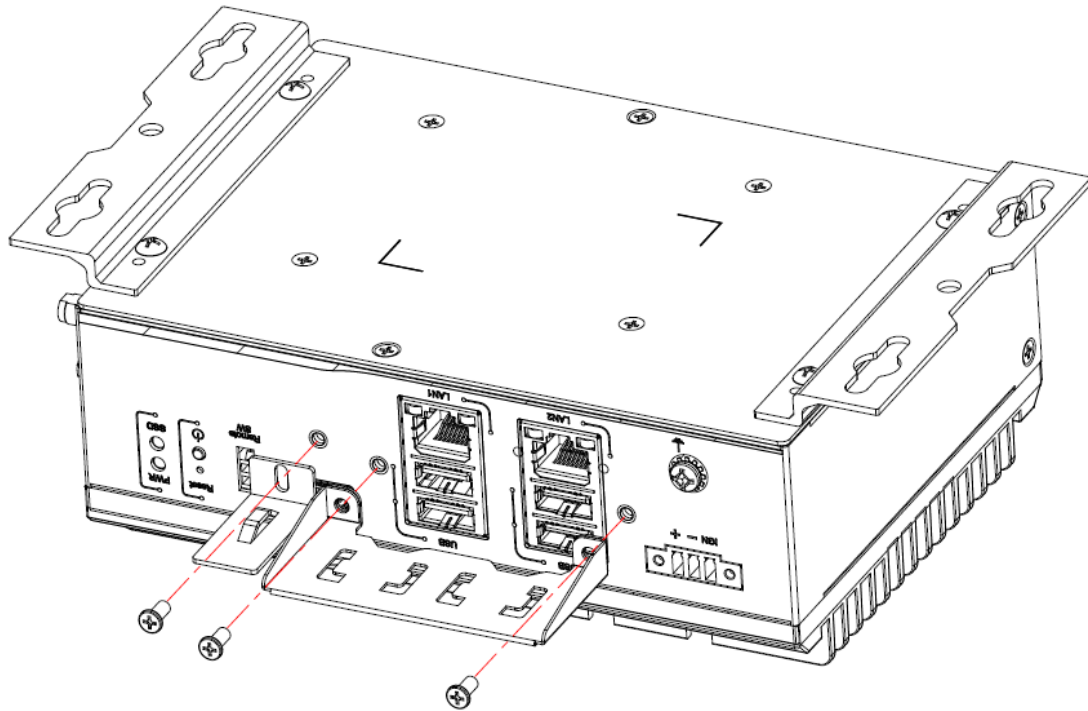
Part Number	Description
ACC155-AXK-M101	Axelera Metis M.2 module & thermal kit
ACC155-DXK-M101	DeepX DX-M1 M.2 module & thermal kit
Storage	<p>M.2 NVMe SSD, mSATA SSD, 2.5" SATA SSD/HDD (128GB or above)</p> <p>*Please order SSD thermal kit or 2.5" SATA cable kit separately.</p> <p>*Please note that mSATA, mPCIe wireless module and CAN bus module kit cannot be used simultaneously.</p> <p>*Please note that AI accelerator card and NVMe SSD cannot be used simultaneously.</p>
ACC155-WM-M101 (P/N: E29R155100)	Wall mount kit
ACC155-DR-M101 (P/N: E29R155101)	Din-rail kit
594K6220210E	Remote Power Switch Cable
509000005500	12V 60W Power Adapter (2 wire type)
Optional I/O	DIO cable, COM cable, CAN bus module kit
Power Cord	
Wi-Fi module	
LTE module	



【Note】 : The optional accessory list may be subject to change without notice.

1.7.2 Front I/O Cable Lockable Kit (Optional)

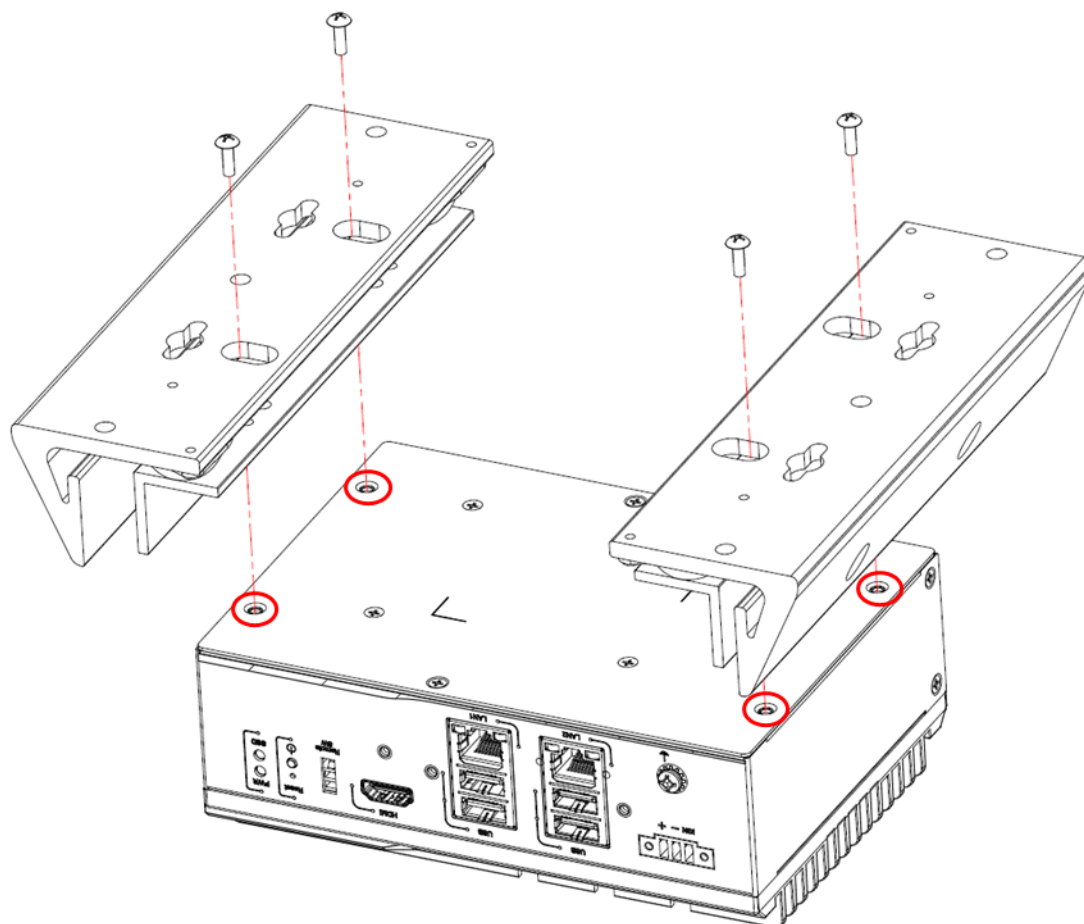
Users can use 3pcs countersunk M3*6L screws for fixing the front I/O cable lockable kit to the system.



【Note】 : This is an optional accessory, please contact Axiomtek distributors if users would like to order it.

1.7.3 System Anti-Vibration Kit (Optional)

Please remove the original four screws from the rear cover. Users can use 4 truss head M3*8L screws to secure the anti-vibration kit to the system.



【Note】 : Please keep the original four screws from the rear cover in case they are needed after removing the system's anti-vibration kit.



【Note】 : This is an optional accessory, please contact Axiomtek distributors if users would like to order it.

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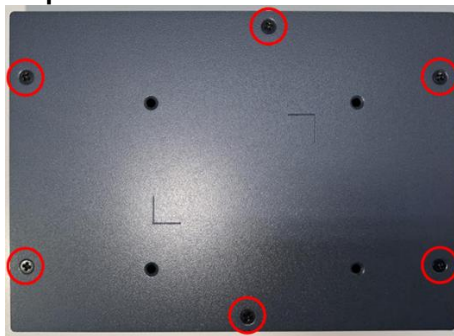
SECTION 2 HARDWARE INSTALLATION

The AIM101 is convenient for various hardware configurations, such as HDD (Hard Disk Drive), SSD (Solid State Drive), PCI Express Mini card, M.2 Module. Section 2 contains guidelines for hardware installation.

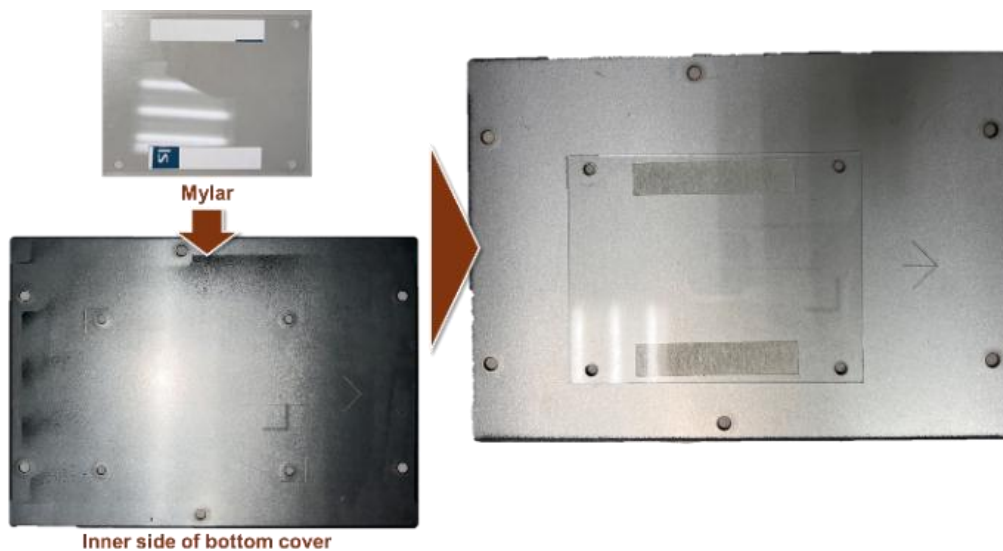
2.1 Installation of 2.5" SATA Device

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down and loosen six screws on the bottom.



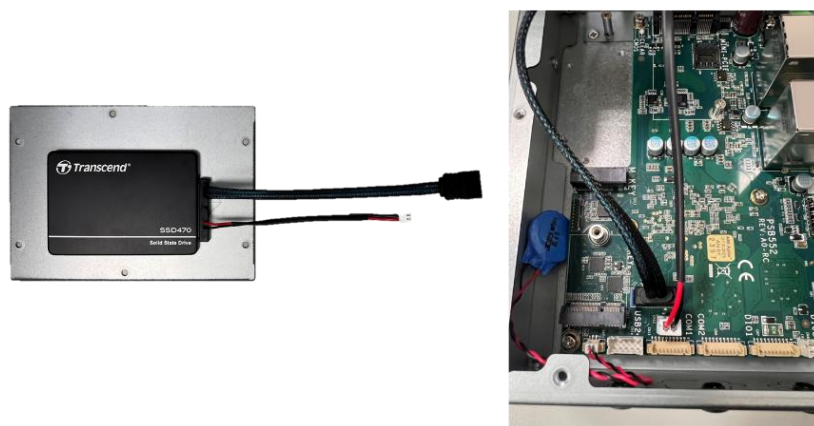
Step 3 Flip the bottom cover to the inner side, then attach the mylar to the inner surface of the bottom cover.



Step 4 Assemble the 2.5" SATA device with the bottom cover using 4 screws. Ensure that the SATA interface is aligned with the arrow mark on the bottom cover.



Step 5 Connect the power and SATA cables directly between 2.5" SATA device and the mainboard, ensuring that connectors are fully seated.



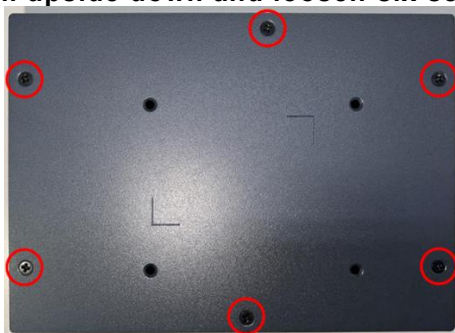
Step 6 Place the bottom cover back and secure it with six screws.



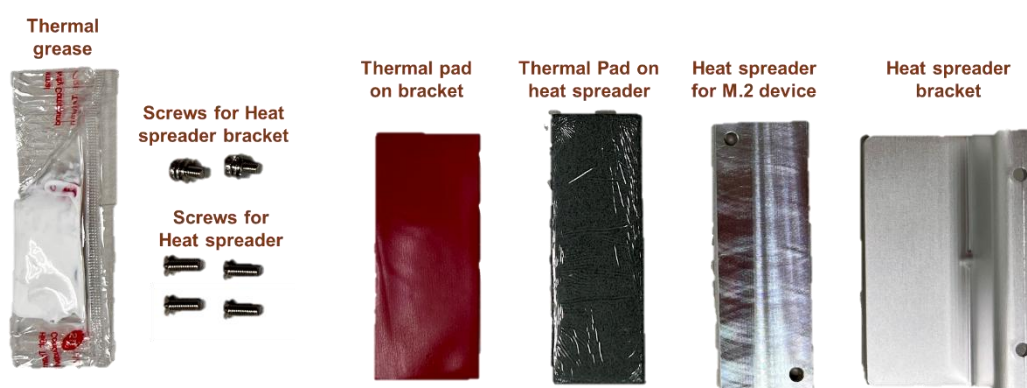
2.2 Installation of M.2 Module (CN16) for NVMe/AI Accelerator Card

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down and loosen six screws on the bottom.



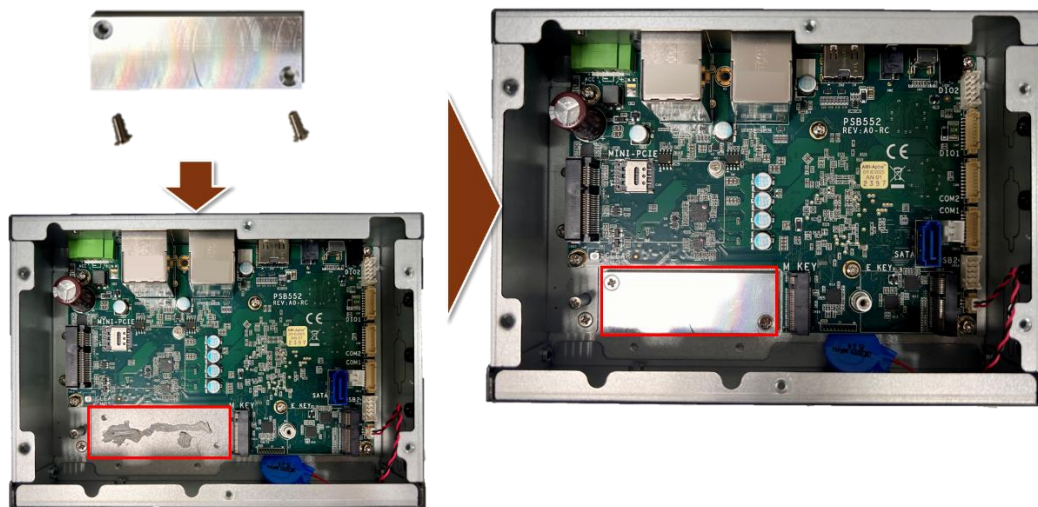
Step 3 Prepare the thermal grease, screws, thermal pads, heat spreader, and the bracket.



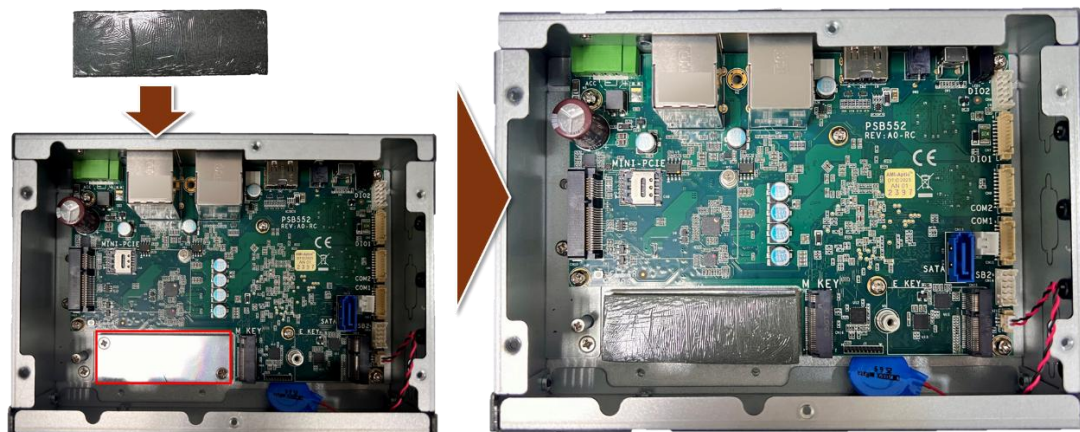
Step 4 Apply thermal paste evenly on the metal surface at the designated M.2 M-key device installation area.



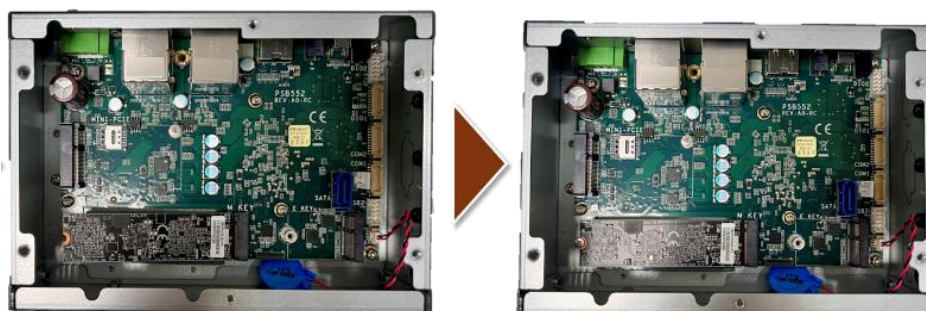
Step 5 Place the M.2 heat spreader onto the thermal grease and secure it with screws.



Step 6 Peel off the mylar from the bottom side of the thermal pad, then attach the thermal pad to the heat spreader.



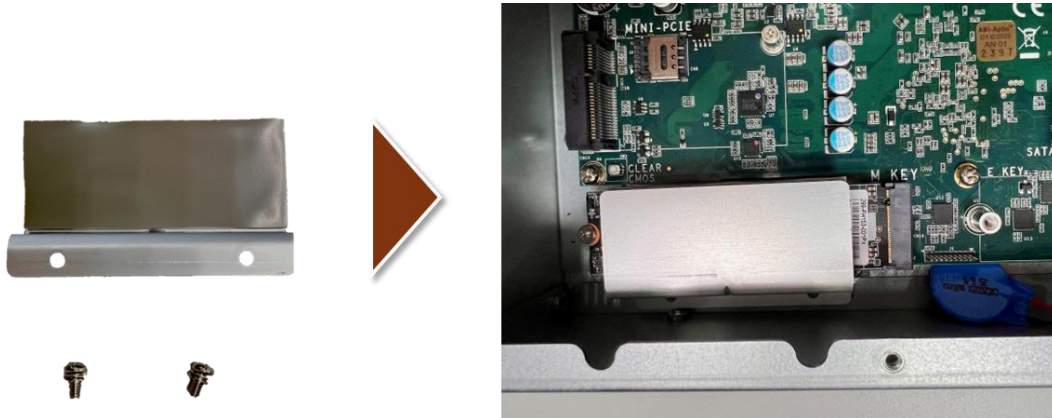
Step 7 Insert the M.2 2280 device into the slot, then secure the device to the standoff using the M3*3L screw from the screw pack of system accessories.



Step 8 Attach the bracket thermal pad to the bracket, then remove the red protective film on top.



Step 9 Secure the bracket with two screws and ensure that the thermal pad is firmly attached to the M.2 2280 device.

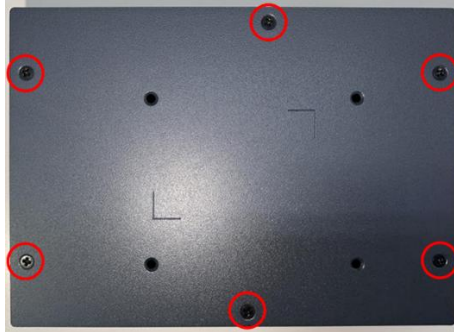


Step 10 Place the bottom cover back and secure it with six screws.

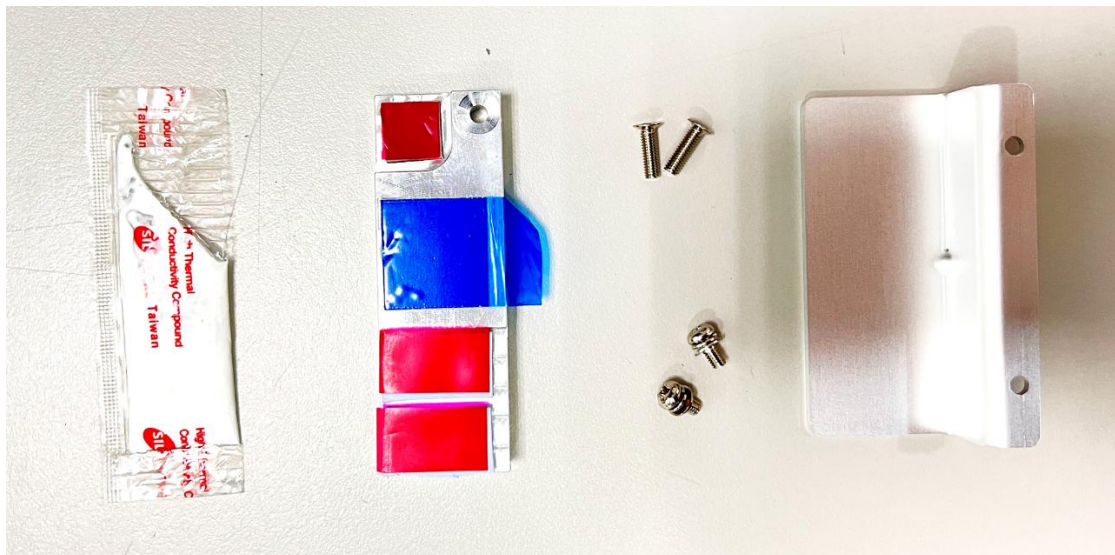
2.3 Installation of M.2 Module (CN16) for Axelera AI Accelerator Card

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down and loosen six screws on the bottom.



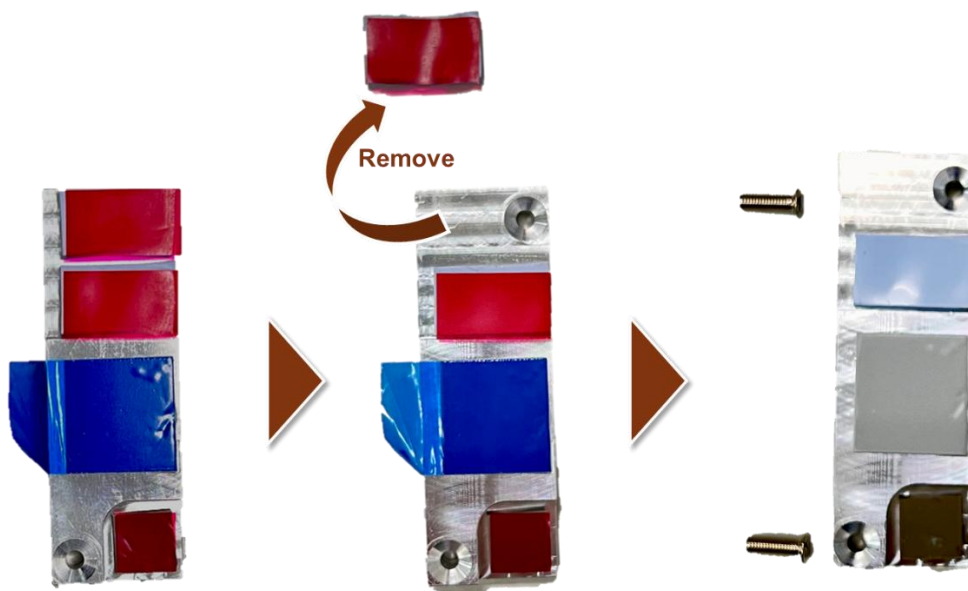
Step 3 Prepare the thermal grease, screws, thermal pads, heat spreader, and the bracket.



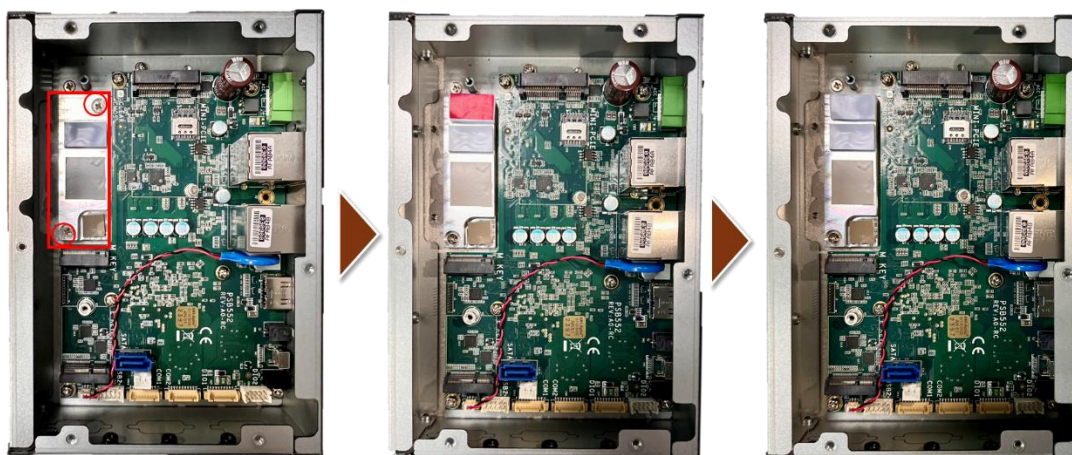
Step 4 Apply thermal paste evenly on the metal surface at the designated M.2 M-key device installation area.



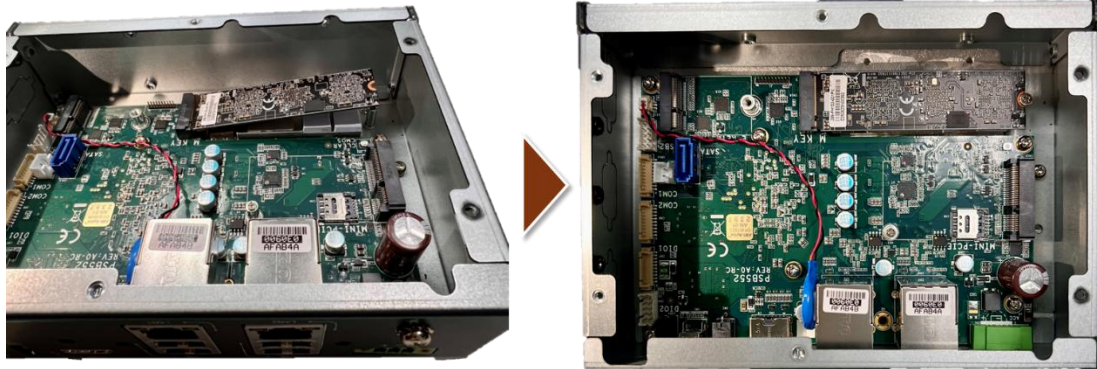
Step 5 Remove the rectangular thermal pad covering the screw holes on the edge of the heat spreader to expose the holes. Then peel off the red and blue protective films from the thermal pads.



Step 6 Place the M.2 heat spreader onto the thermal grease and secure it with screws. Place the removed thermal pad back to its original position, then peel off the red protective film.



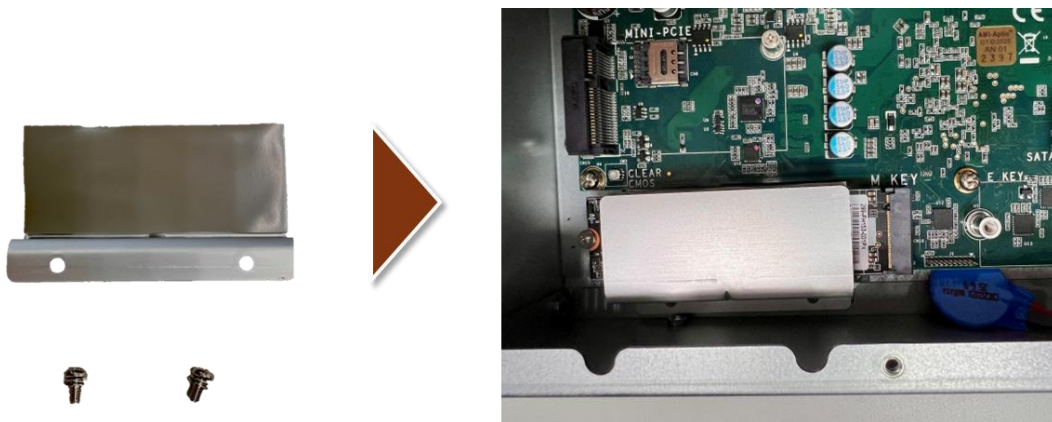
Step 7 Insert the M.2 Axelera accelerator module into the slot, then secure the accelerator module to the standoff using the M3*3L screw from the screw pack of system accessories.



Step 8 Attach the bracket thermal pad to the bracket, then remove the red protective film on top.



Step 9 Secure the bracket with two screws and ensure that the thermal pad is firmly attached to the accelerator module.

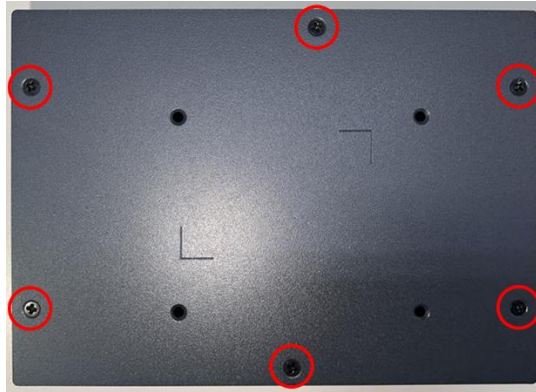


Step 10 Place the bottom cover back and secure it with six screws.

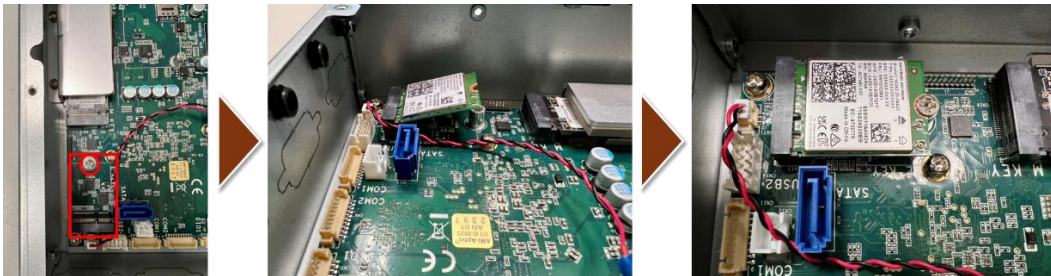
2.4 Installation of M.2 KEY E Module (CN15)

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the bottom side of the system and then loosen six screws.



Step 3 Located the M.2 KEY E as red marked, insert the M.2 KEY E device and secure with the M3*3L screw from the screw pack of system accessories.

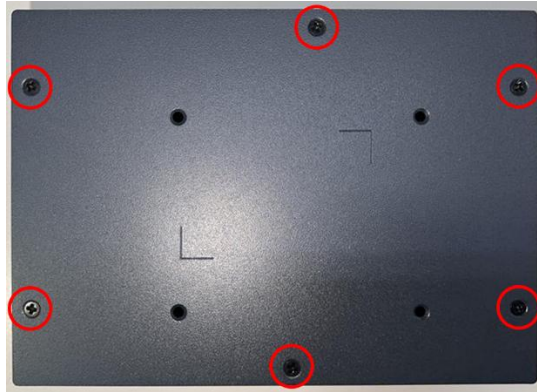


Step 4 Place the bottom cover back and secure it with six screws.

2.5 Installation of Mini PCIe Module (Full-size)(CN10)

Step 1 Turn off the system and unplug the power cord.

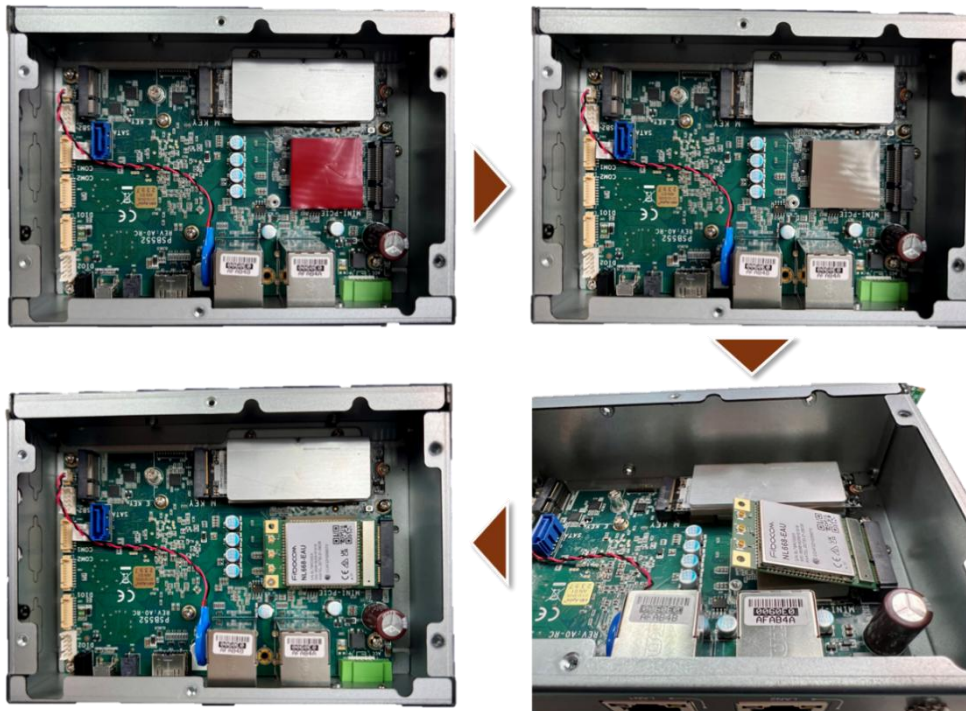
Step 2 Turn the system upside down to locate screws at the bottom side of the system, and then loosen six screws.



Step 3 Prepare the mPCIe bracket, standoff, screws, and thermal pad.



Step 4 Attach the thermal pad to the mPCIe area, remove the red film, insert the mPCIe device, and secure it with the M2*3L screw from the screw pack of system accessories, and to ensure firm contact.



Step 5 Remove the yellow film from the thermal pad on the mPCIe bracket.



Step 6 Install the standoffs next to the mPCIe slot, then mount the bracket and secure it with two screws, ensuring the thermal pad contacts the mPCIe device firmly.

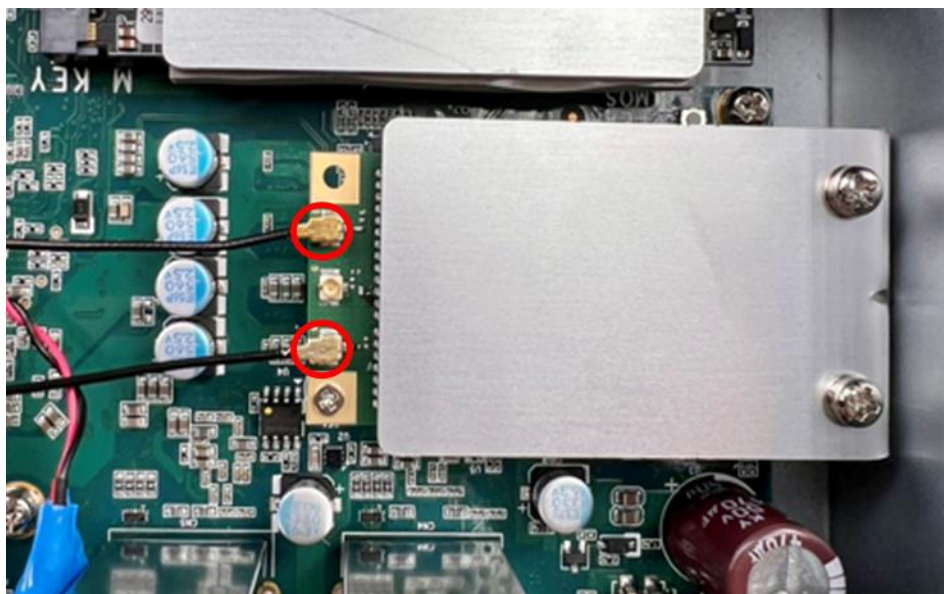


Step 7 Place the bottom cover back and secure it with six screws.

2.6 Installing of LTE or Wi-Fi Antenna Cable

Step 1 Install the mPCIe LTE module or M.2 2230 Key E Wi-Fi module, securing it with a screw and connecting it using IPEX-SMA cables. For more details, please refer to sections 2.4 to 2.5.

▼ mPCIe LTE module



▼ M.2 2230 Key E Wi-Fi module





【Note】 : The LTE and Wi-Fi modules come with a different type of SMA cable, one is IPEX, and another one is IPEX4. Please do not mix them up to avoid mismatch.

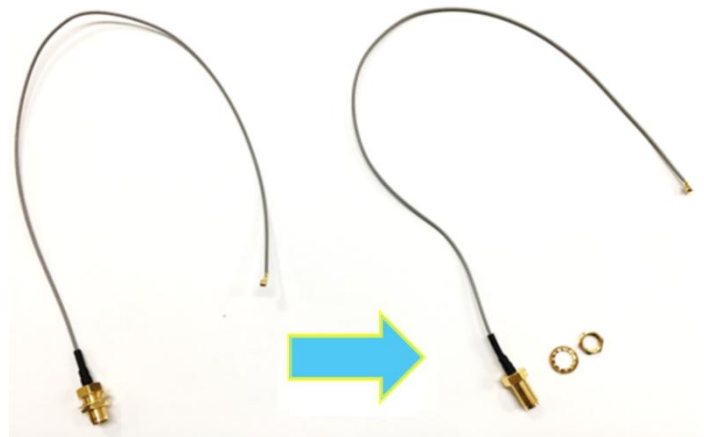
LTE: IPEX



Wi-Fi: IPEX4

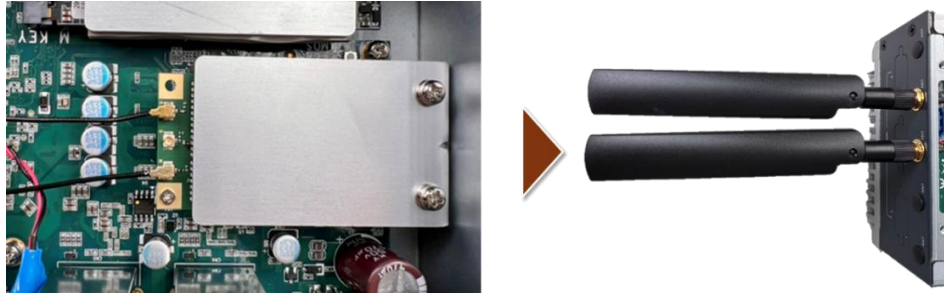


Step 2 Before installing the antenna cable onto the chassis, kindly remove the hex nut and washer.

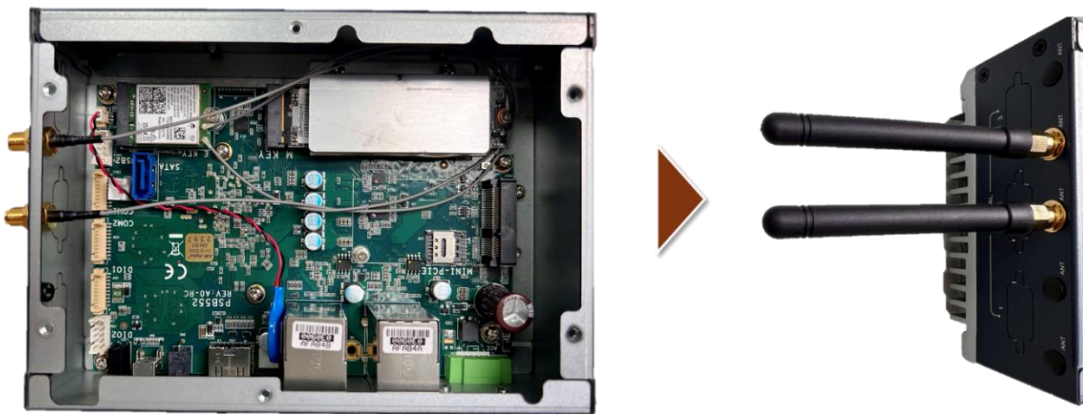


Step 3 Remove the antenna cover from the system. Insert the SMA connector of the IPEX-SMA cable through the hole, then secure it with the washer and hex nut. Finally, attach the antenna to the SMA connector.

▼ LTE antenna installation



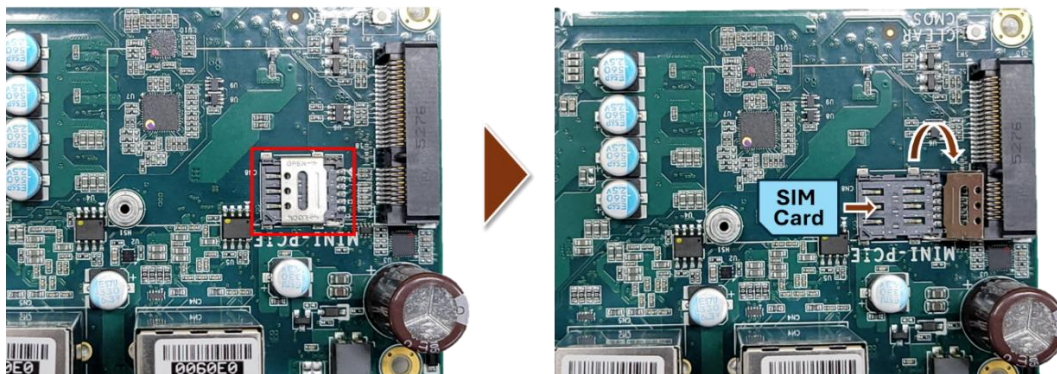
▼ Wi-Fi antenna installation



Step 4 Put the bottom cover and tighten all screws back onto the system.



【Note】 :If using an LTE module, insert the corresponding SIM card into the SIM socket before installing the LTE module. Slide and lift SIM card holder. Place the SIM card into the SIM tray so that it is properly. Secure the SIM card by sliding the holder.

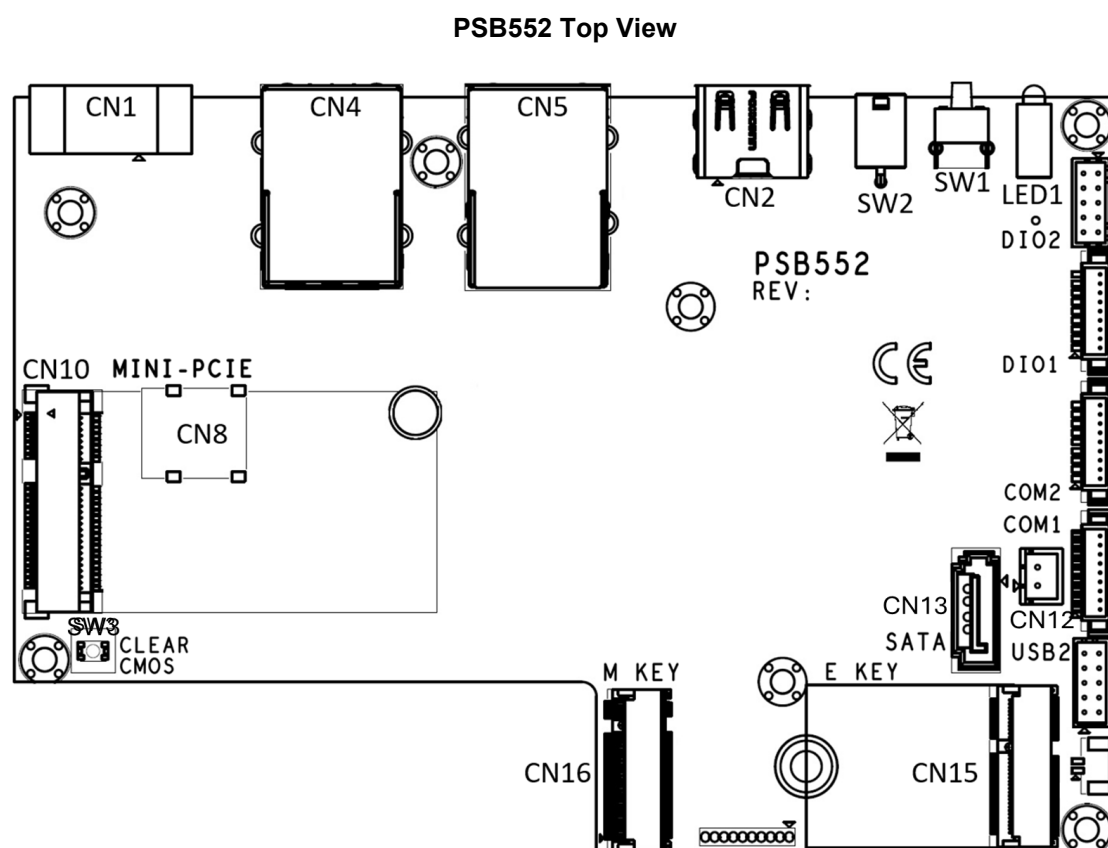


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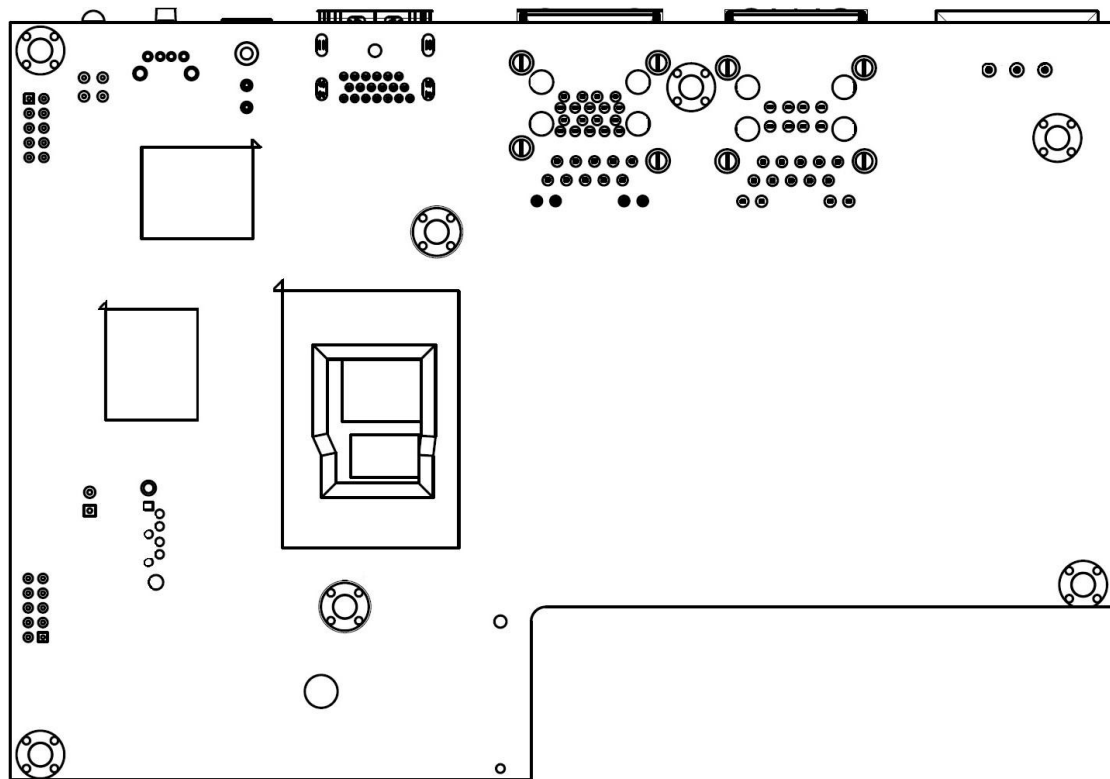
SECTION 3 CONNECTORS & PIN DEFINITIONS

This chapter contains connector information and detailed pin definitions of the AIM101.

3.1 Locations of Connectors



PSB552 Bottom View



3.2 Connectors

Please refer to the connector table to get their pin assignments.

Connectors / Buttons / Switches	PCB Location	Section
DC Phoenix Power In Connector	CN1	3.2.1
HDMI Connector	CN2	3.2.2
USB2.0 Type A x2 + RJ45	CN4	3.2.3
USB3.2 Type A x2 + RJ45	CN5	3.2.4
Nano SIM Card Slot	CN8	3.2.5
PCI-Express Mini Card slot	CN10	3.2.6
SATA Power Connector	CN12	3.2.7
SATA Connector	CN13	3.2.8
M.2 2230 Key E slot	CN15	3.2.9
M.2 2280 Key M (PCIe Gen3 x4) slot	CN16	3.2.10
Power Button & Reset Button	SW1	3.2.11
Remote Power Switch Connector	SW2	3.2.12
Restore BIOS Optimal Defaults Switch (Clear CMOS)	SW3	3.2.13
Power and Storage LED Indicator	LED1	3.2.14
CMOS Battery Interface	BAT1	3.2.15
Serial Port Connector (Optional)	COM1/COM2 (CN9/CN11)	3.2.16
Digital I/O Connector (Optional) (Female)	DIO1/DIO2 (CN7/CN6)	3.2.17

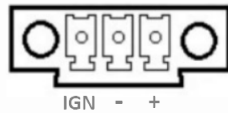


【Note】 : *The AIM101 reserves three optional I/O ports on the right side. Please note that a maximum of three optional I/O ports can be selected simultaneously. If you have any requirements regarding optional I/O, please contact Axiomtek sales.*

3.2.1 DC-in Phoenix Power Connector (CN1)

The system supports 9-36V Phoenix DC-in connector for system power input.

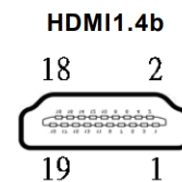
Pins	Signals
1	DC+
2	DC-
3	IGN



3.2.2 HDMI Connector (CN2)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

Pins	Signals	Pins	Signals
1	HDMI OUT_DATA2+	11	GND
2	GND	12	HDMI OUT Clock-
3	HDMI OUT_DATA2-	13	N.C.
4	HDMI OUT_DATA1+	14	N.C.
5	GND	15	HDMI OUT_SCL
6	HDMI OUT_DATA1-	16	HDMI OUT_SDA
7	HDMI OUT_DATA0+	17	GND
8	GND	18	+5V
9	HDMI OUT_DATA0-	19	HDMI_HTPLG
10	HDMI OUT Clock+		



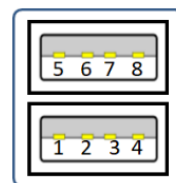
3.2.3 USB 2.0 Connector (CN4)

The system has two port compliant with USB 2.0 (480 Mbps), and ideally for installing USB peripherals such as scanner, camera, and USB devices, etc.

And the system has two 2.5GbE RJ-45 connectors which are designed by Intel i226-V.

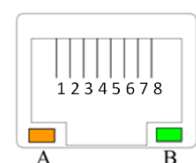
USB2.0 Pin assignment

Pin	Signal USB2.0 HUB Port 1	Pin	Signal USB2.0 HUB Port 2
1	VCC	5	VCC
2	D0-	6	D1-
3	D0+	7	D1+
4	GND	8	GND



2.5 GbE Pin assignment

Pins	2500/1000 Base-T	Description
L1	BI_DA+	Bidirectional or Transmit Data+
L2	BI_DA-	Bidirectional or Transmit Data-
L3	BI_DB+	Bidirectional or Receive Data+
L4	BI_DC+	Bidirectional or Not Connected
L5	BI_DC-	Bidirectional or Not Connected
L6	BI_DB-	Bidirectional or Receive Data-
L7	BI_DD+	Bidirectional or Not Connected
L8	BI_DD-	Bidirectional or Not Connected
A	Active Link LED (Yellow) Off: No link Blinking: Data activity detected	
B	Speed LED 2500: Green 1000: Orange 100/10: OFF	



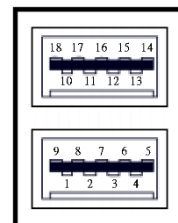
3.2.4 USB 3.2 & Ethernet Connector (CN5)

The system has two port compliant with USB 3.2 gen2 (10GB/s), and ideally for installing USB peripherals such as scanner, camera, and USB devices, etc.

And the system has two 2.5GbE RJ-45 connectors which are designed by Intel i226-V.

USB3.2 Pin assignment

Pin	Signal USB3.0 Port 2	Pin	Signal USB3.0 Port 3
1	VCC	10	VCC
2	D2-	11	D3-
3	D2+	12	D3+
4	GND	13	GND
5	SSRX2-	14	SSRX3-
6	SSRX2+	15	SSRX3+
7	GND	16	GND
8	SSTX2-	17	SSTX3-
9	SSTX2+	18	SSTX3+



2.5 GbE Pin assignment

Pins	2500/1000 Base-T	Description
L1	BI_DA+	Bidirectional or Transmit Data+
L2	BI_DA-	Bidirectional or Transmit Data-
L3	BI_DB+	Bidirectional or Receive Data+
L4	BI_DC+	Bidirectional or Not Connected
L5	BI_DC-	Bidirectional or Not Connected
L6	BI_DB-	Bidirectional or Receive Data-
L7	BI_DD+	Bidirectional or Not Connected
L8	BI_DD-	Bidirectional or Not Connected
A	Active Link LED (Yellow) Off: No link Blinking: Data activity detected	
B	Speed LED 2500: Green 1000: Orange 100/10: OFF	



3.2.5 Nano SIM Card Slot (CN8)

The AIM101 has one SIM slot: CN8 on bottom side that support mPCIe slot (for CN10). It is mainly used in wireless network applications.

Pins	Signals
C1	PWR
C2	RST
C3	CLK
C4	NC
C5	GND
C6	VPP
C7	I/O



3.2.6 Full-Size PCI Express Mini Card Slot (CN10)

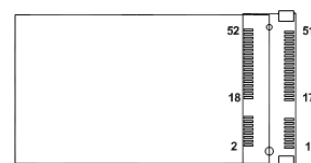
The AIM101 supports one full-size PCI-Express Mini Card slot.

CN10 is applying for PCI-Express complies with PCI-Express Mini Card Spec. V1.2. Users can install mPCIe wireless module (LTE/ Wi-Fi 5) or mSATA SSD into this slot.



【Note】 : Please note that mSATA SSD and mPCIe wireless module cannot be used simultaneously.

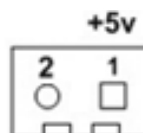
Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ# 8 No use	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_REST
15	GND	16	UIM_VPP
17	NC	18	GND
19	NC	20	W_DISABLE#100k PU
21	GND	22	PERST#
23	PE_RXN3/	24	+3.3VSB
25	PE_RXP3/	26	GND
27	GND	28	+1.5V
29	GND	30	NC
31	PE_TXN3/	32	NC
33	PE_TXP3/	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	SATAXPCE	52	+3.3VSB



3.2.7 SATA Power Connector (CN12)

Based on CN12 to offer the SATA power for SATA 2.5" HDD/SSD.

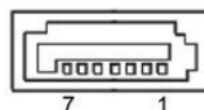
Pins	Signals
1	+5V level
2	GND



3.2.8 SATA Connector (CN13)

The Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interfaces. It is computer bus interfaces for connecting to devices such as hard disk drives. This board has one SATA 3.0 ports with 6Gb/s performance.

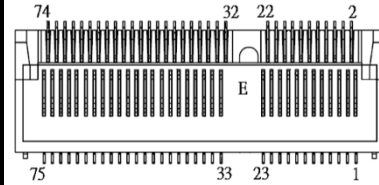
Pins	Signals
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



3.2.9 M.2 2230 Key E slot (CN15)

The M.2 2230 Key E can be used for Wi-Fi 6E/ Wi-Fi 5 Module.

Pins	Signals	Pins	Signals
1	GND	2	+3.3V_SBY
3	USB_D+	4	+3.3V_SBY
5	USB_D-	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	GND
19	GND	20	NC
21	NC	22	NC
23	NC	24	Key E
25	Key E	26	
27		28	
29		30	
31		32	NC
33	GND	34	NC
35	PCIE_TX_+	36	NC
37	PCIE_TX_-	38	NC
39	GND	40	NC
41	PCIE_RX_+	42	NC
43	PCIE_RX_-	44	NC
45	GND	46	NC
47	CLK_PCIE_+	48	NC
49	CLK_PCIE_-	50	NC
51	GND	52	PERST# (+3.3V Level)
53	CLKREQ0#	54	W_DISABLE 100k PU
55	NC	56	W_DISABLE 100k PU
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	GND	64	GND
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+3.3V_SBY
73	NC	74	+3.3V_SBY
75	GND		

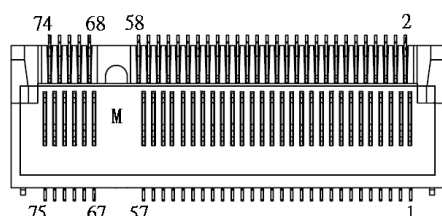


3.2.10 M.2 2280 Key M (PCIe Gen3 x4) slot (CN16)

The M.2 2280 Key M slot with PCIe Gen3 4-lane interface, it can be used for AI accelerator card or NVM Express SSD for storage.



【Note】 : Please note that AI accelerator card and NVMe SSD cannot be used simultaneously.



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V	3	GND	4	+3.3V
5	PERn3	6	NC	7	PERp3	8	NC
9	GND	10	LED_1#	11	PETn3	12	+3.3V
13	PETp3	14	+3.3V	15	GND	16	+3.3V
17	PERn2	18	+3.3V	19	PERp2	20	NC
21	GND	22	NC	23	PETn2	24	NC
25	PETp2	26	NC	27	GND	28	NC
29	PERn1	30	NC	31	PERp1	32	NC
33	GND	34	NC	35	PETn1	36	NC
37	PETp1	38	NC	39	GND	40	NC
41	PERn0	42	NC	43	PERp0	44	NC
45	GND	46	NC	47	PETn0	48	NC
49	PETp0	50	PERST#	51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#	55	REFCLKp	56	NC
57	GND	58	NC	59	CONNECTOR Key M	60	CONNECTOR Key M
61	CONNECTOR Key M	62	CONNECTOR Key M	63	CONNECTOR Key M	64	CONNECTOR Key M
65	CONNECTOR Key M	66	CONNECTOR Key M	67	NC	68	NC
69	NC	70	+3.3V	71	GND	72	+3.3V
73	GND	74	+3.3V	75	GND		

3.2.11 Power switch /Reset switch connector (SW1)

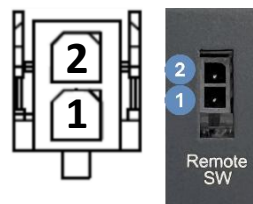
	Functions	Descriptions
1	Reset switch	Reset system
2	Power switch	Turn on/off system



3.2.12 Remote Power Switch Connector (SW2)



One 2-pin connector output for remote power on/off switch.

Functions	Descriptions
Short (1-2)	Turn on/off system
Open	Keep system status



3.2.13 Restore BIOS Optimal Defaults Switch (SW3) (Clear CMOS)

Pressing the tact switch will restore the BIOS to its optimal defaults. Use this switch (SW3) to clear the CMOS; please press and hold the button for at least 10 seconds to complete the CMOS clear process.

Functions	Descriptions
Default	
Clear CMOS (Button pressed)	



3.2.14 Power and Storage LED Indicators (LED1)

The Yellow LED is linked to Solid-state Drive (SSD) activity signal. LED flashes every time SSD is accessed. The power LED (Green) lights up and will remain steady while the system is powered on.

LED Color	Function
Green	Power ON /OFF
Yellow	M.2 SSD Activity



3.2.15 CMOS Battery Connector (BAT1)

This connector is for CMOS battery interface.

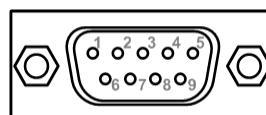
Pin	Signal
1	+VBAT
2	GND



3.2.16 Serial Port Connector (Optional) (COM1/COM2)

The system can support up to two Serial Port (RS232/422/485) through the optional cables connected to CN9/CN11. Please refer to Chapter 4 for the details of BIOS settings.

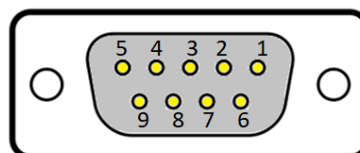
Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	N/C
4	DTR	RX-	N/C
5	GND	GND	GND
6	DSR	N/C	N/C
7	RTS	N/C	N/C
8	CTS	N/C	N/C
9	RI	N/C	N/C



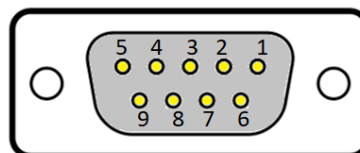
3.2.17 Digital I/O Connector (Optional) (Female) (DIO1/DIO2)

The system can support up to two 8-Channel TTL (Transistor-Transistor Logic) digital I/O connectors through the optional cables connected to CN7/CN6; which can be managed through software programming.

Pin	Signal	Pin	Signal
1	DIO1	2	DIO2
3	DIO3	4	DIO4
5	DIO5	6	DIO6
7	DIO7	8	DIO8
9	GND		



Pin	Signal	Pin	Signal
1	DIO9	2	DIO10
3	DIO11	4	DIO12
5	DIO13	6	DIO14
7	DIO15	8	DIO16
9	GND		



【Note】 : The AIM101 reserves three optional I/O ports on the right side. Please note that a maximum of three optional I/O ports can be selected simultaneously. If you have any requirements regarding optional I/O, please contact Axiomtek's distributors or sales.

SECTION 4

BIOS SETUP UTILITY

This section provides users with detailed descriptions in terms of how to set up basic system configurations through the BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After pressing the key, the main BIOS setup menu displays. Users can access other setup screens, such as the Advanced and Chipset menus, from the main BIOS setup menu.

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

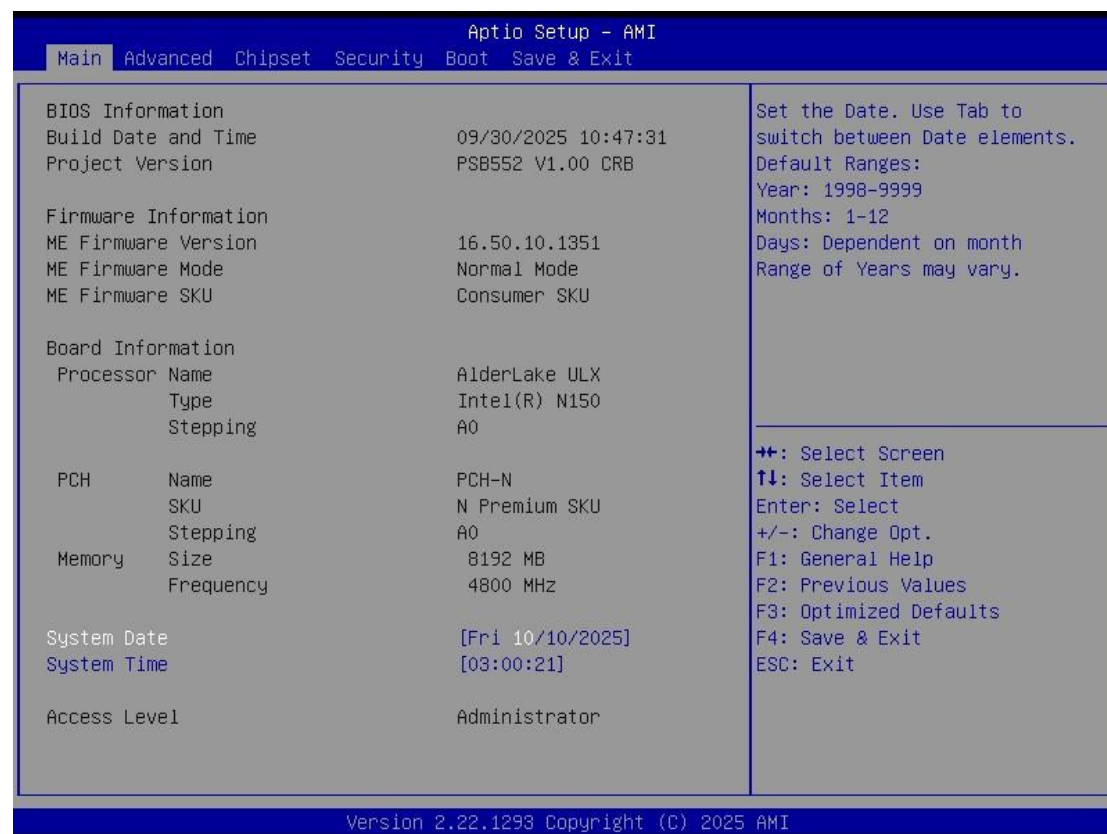


【Note】 : Some of the navigation keys differ from one screen to another.

Hot Keys	Descriptions
→← Left/Right	The Left and Right <Arrow> keys allow users to select a setup screen.
↑ ↓ Up/Down	The Up and Down <Arrow> keys allow users to select a setup screen or sub-screen.
+ - Plus/Minus	The Plus and Minus <Arrow> keys allow users to change the field value of a particular setup item.
Tab	The <Tab> key allows users to select setup fields.
F1	The <F1> key allows users to display the General Help screen.
F2	The <F2> key allows users to Load Previous Values.
F3	The <F3> key allows users to Load Optimized Defaults.
F4	The <F4> key allows users to save any changes they made and exit the Setup. Press the <F4> key to save any changes.
Esc	The <Esc> key allows users to discard any changes they made and exit the Setup. Press the <Esc> key to exit the setup without saving any changes.
Enter	The <Enter> key allows users to display or change the setup option listed for a particular setup item. The <Enter> key can also allow users to display the setup sub- screens.

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.



BIOS Information

Display the auto-detected BIOS information.

System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Access Level

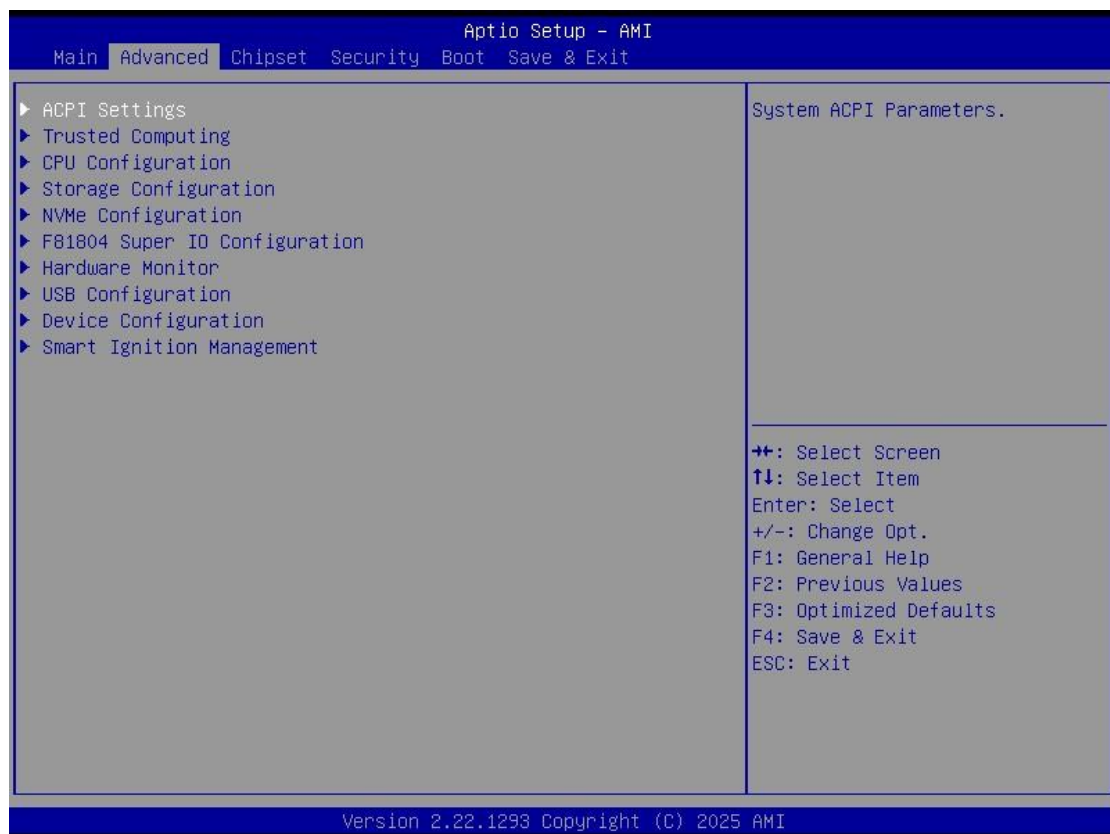
Display the access level of current user.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

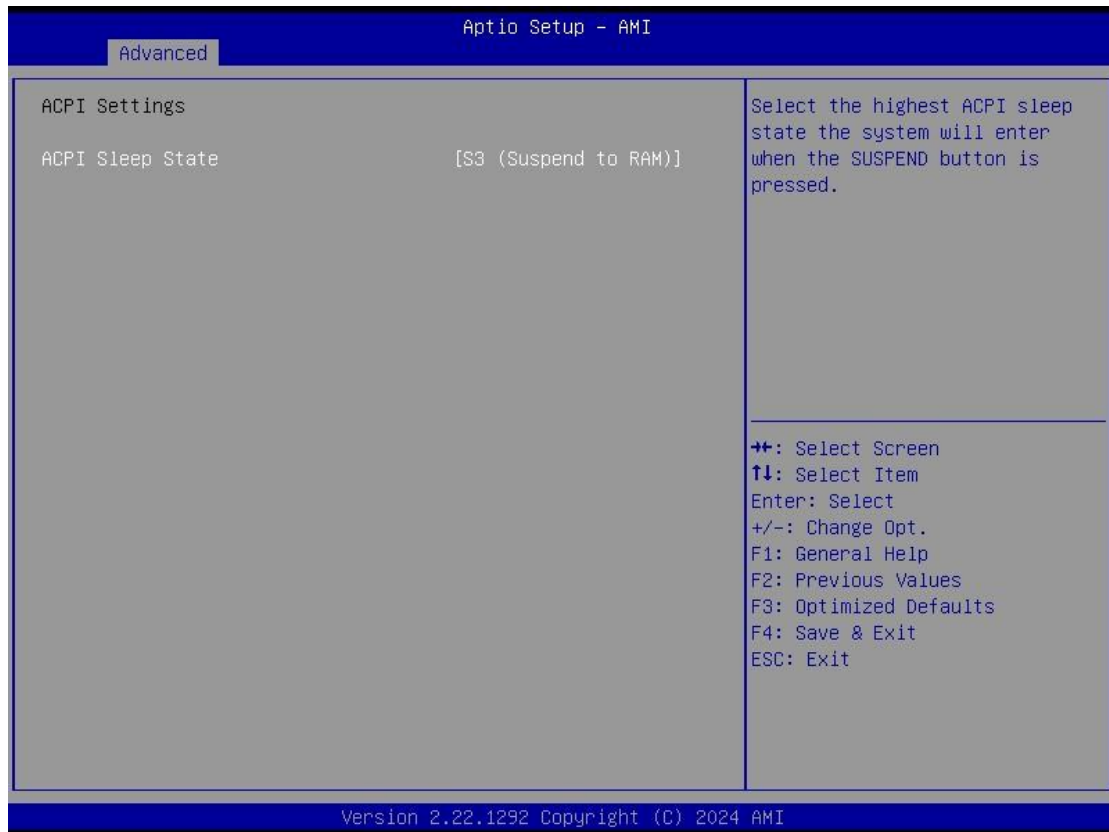
- ▶ ACPI Settings
- ▶ Trusted Computing
- ▶ CPU Configuration
- ▶ Storage Configuration
- ▶ NVMe Configuration
- ▶ F81804 Super IO Configuration
- ▶ Hardware Monitor
- ▶ USB Configuration
- ▶ Device Configuration
- ▶ Smart Ignition Management

For items marked with “▶”, please press <Enter> for more options.



ACPI Settings

Use this screen to select options for the ACPI configuration and change the value of the selected option. A description of the selected item appears on the right side of the screen.



ACPI Sleep State

When the sleep button is pressed, the system will be in the ACPI sleep state.

The default is S3 (Suspend to RAM).

Trusted Computing

If users install a security device, such as TPM, users will see the following information for the TPM device and status.

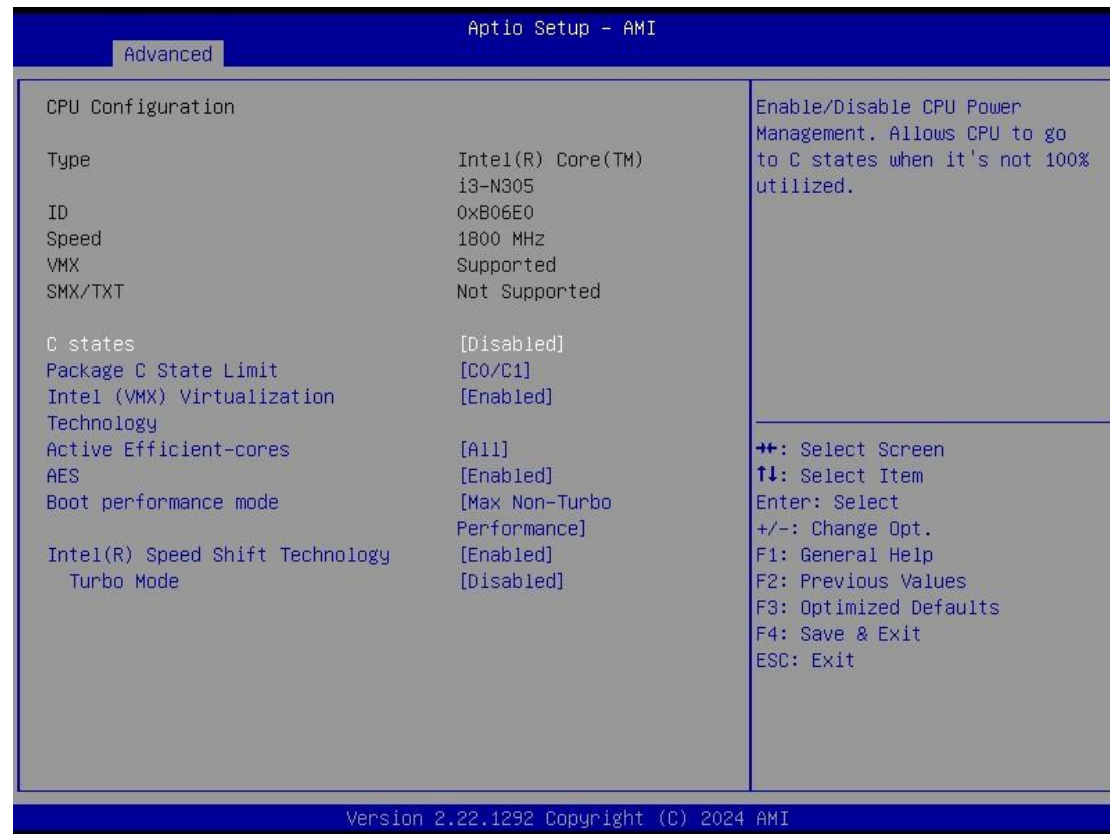


Security Device Support

Enable or disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

This screen shows the CPU version and its detailed information.



C states

Use this item to enable or disable CPU Power Management. When set as [Enabled], it allows CPU to go to C states when it's not 100% utilized.

C states Set the default value to: [Disabled].

The optional settings: [Enabled].

Package C states Limit

Use this item to maximum package C State Limit setting.

CPU default: leaves to factory default value. Auto: initializes to deepest available package C State Limit.

Package C State Limit Set the default value to: [Auto].

The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [CPU Default]; [Auto].

Intel (VMX) Virtualization Technology

Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a single computer system to work as several virtual systems.

Active Efficient-Cores

Enter the sub-menu of Efficient the E-core Information.

AES

Enable or Disable AES (Advanced Encryption Standard).

Boot performance mode

Use this item to select the performance state that the BIOS will set starting from reset vector.

Boot Performance Mode Set the default value to: [Turbo Performance].

The optional settings: [Min Non-Turbo Performance]; [Max Non-Turbo Performance]; [Turbo Performance].

Intel (R) Speed Shift Technology

To speed up CPU frequency transition time from basic frequency to maximum frequency.

Enabled : Enables Intel(R) Speed Shift Technology (Default setting)

Disabled : Disables Intel(R) Speed Shift Technology

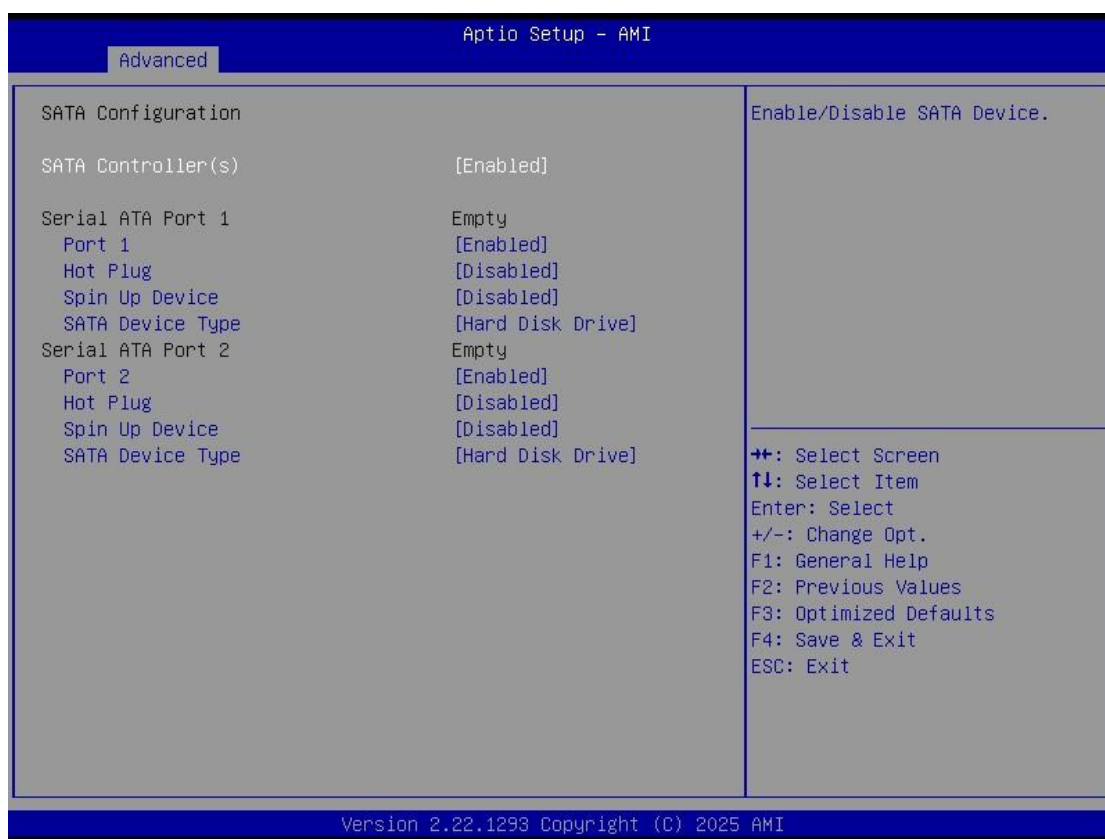
Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too).

Storage Configuration

This screen allows users to select options for SATA Configuration, and change the value of the selected option.





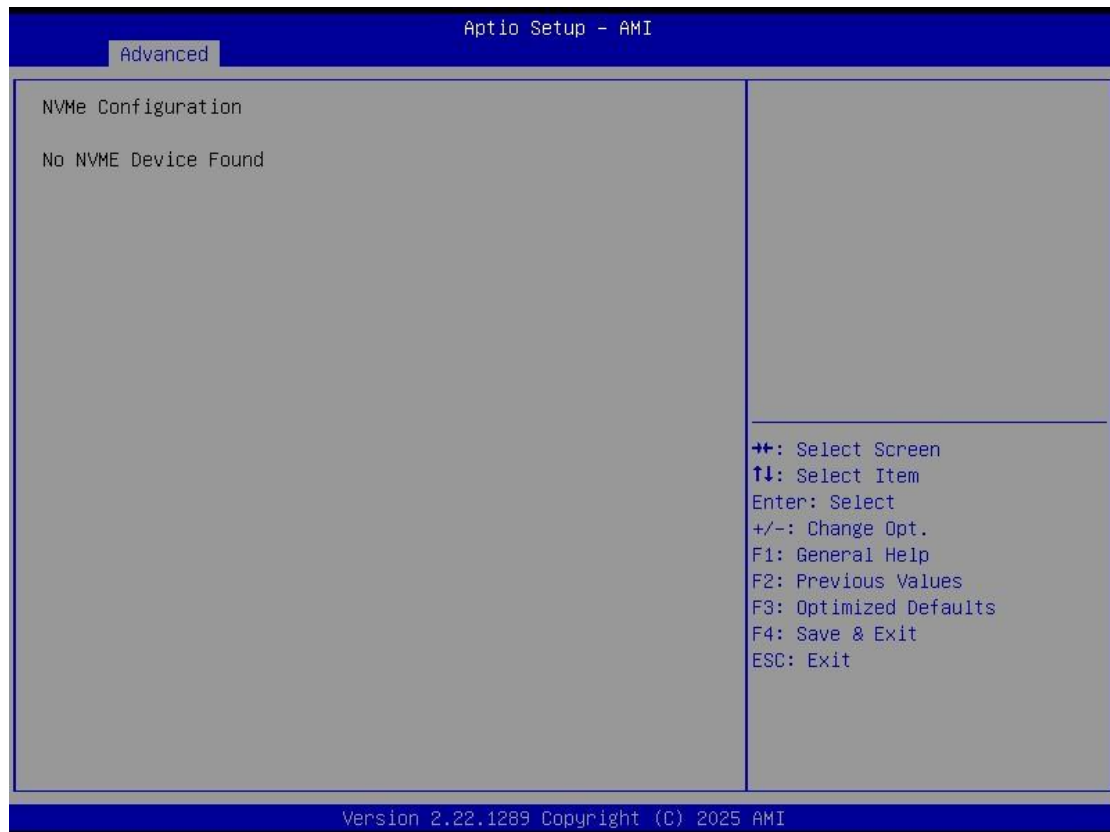
SATA Controller

Highlight this item to enable or disable SATA Controller.

NVMe Configuration

This screen allows users to select options for NVMe Configuration, and change the value of the selected option.

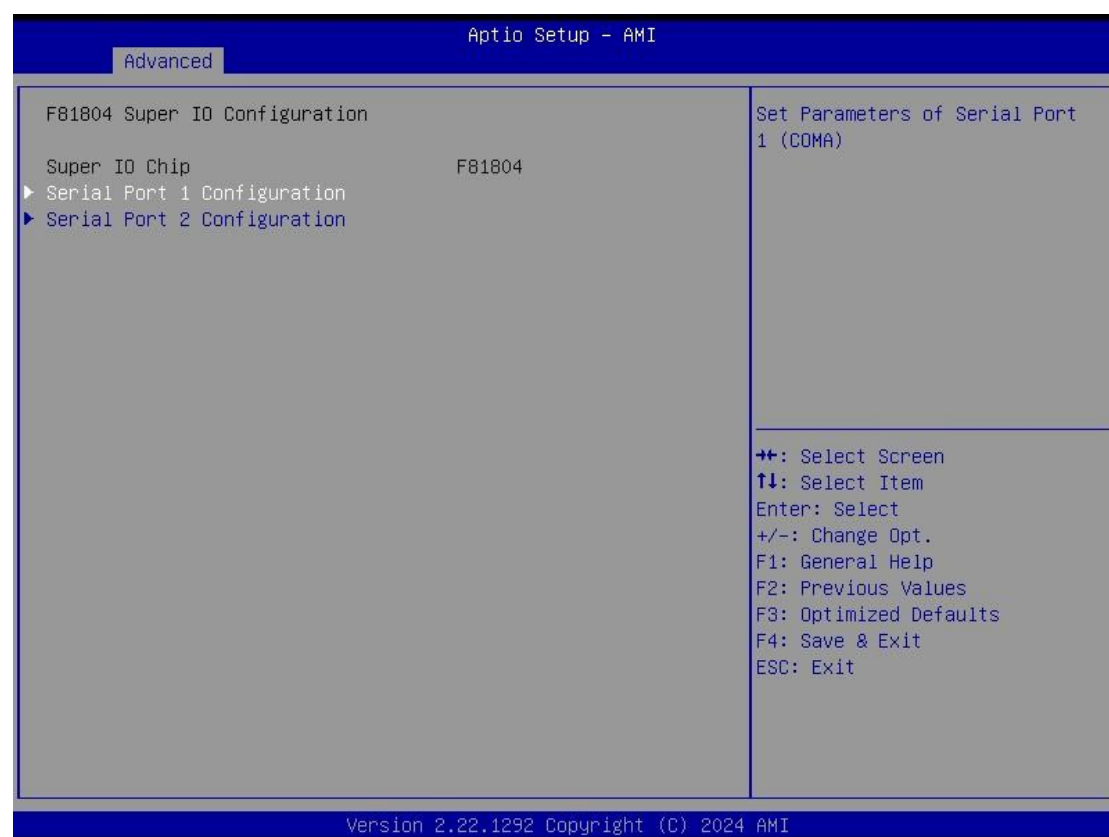
This screen shows NVMe device information.



F81804 Super IO Configurations

Use this screen to select options for the F81804 Super IO Configurations and change the value of the selected option. A description of the selected item appears on the right side of the screen.

For items marked with “▶”, please press <Enter> for more options

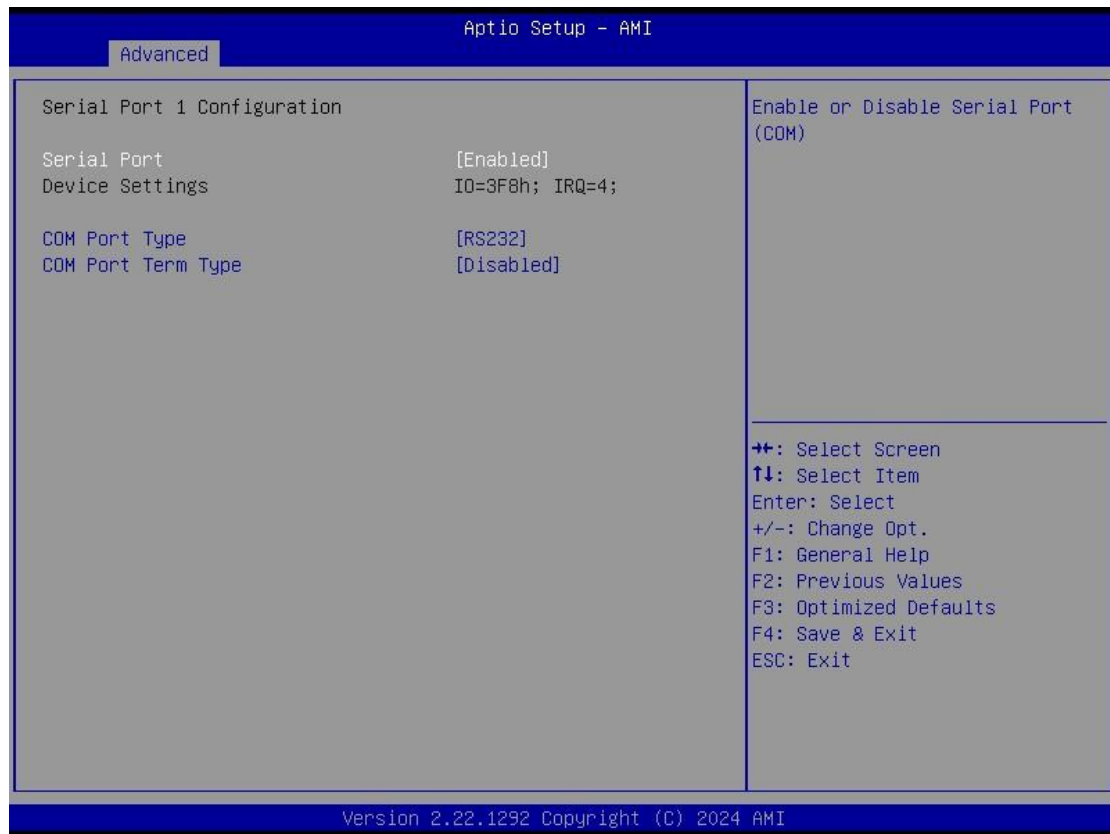


Serial Port 1/ Serial Port 2 (COM1/ COM2) Configurations

Use these items to set parameters related to serial ports COM1 (RS232/422/485)/ COM2 (RS232/422/485)

Serial Port 1

Use this to set parameters of COM 1 (RS232/422/485). The default is RS232.



Serial Port

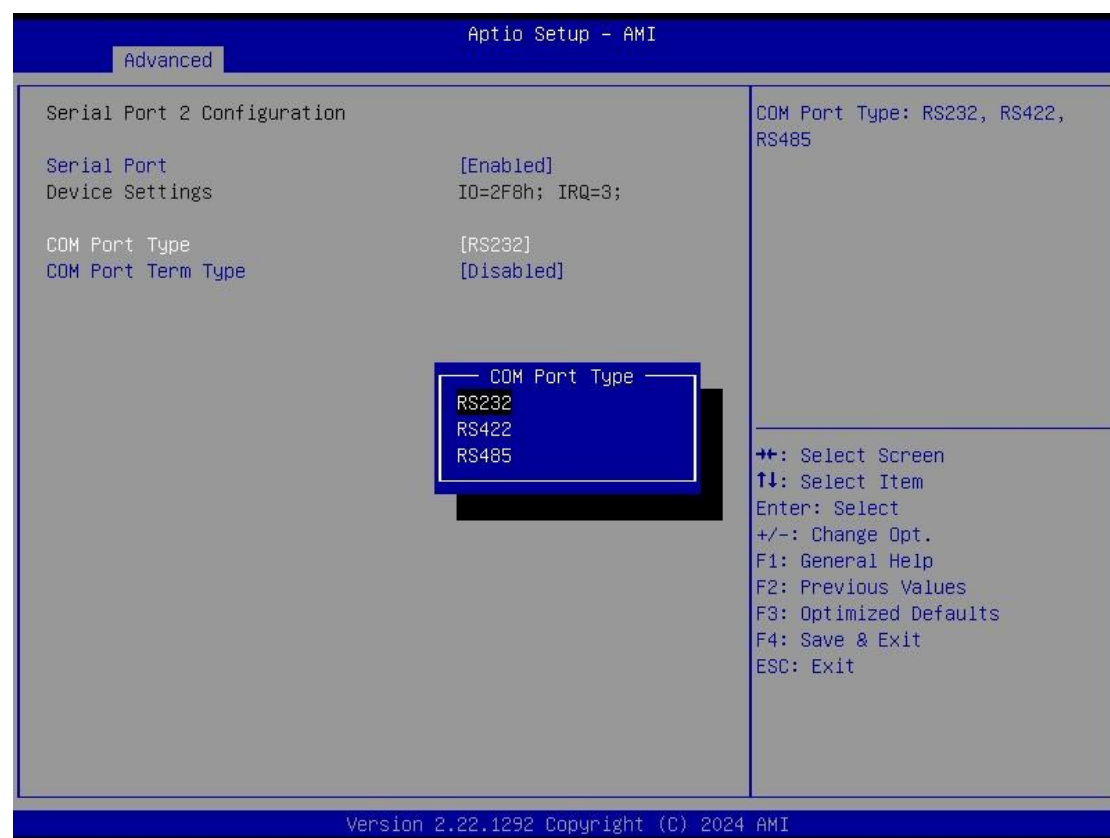
Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

COM Port Type

Use this item to set RS232/422/485 communication mode.

Serial Port 2

Use this to set parameters of COM 2 (RS232/422/485). The default is RS232.

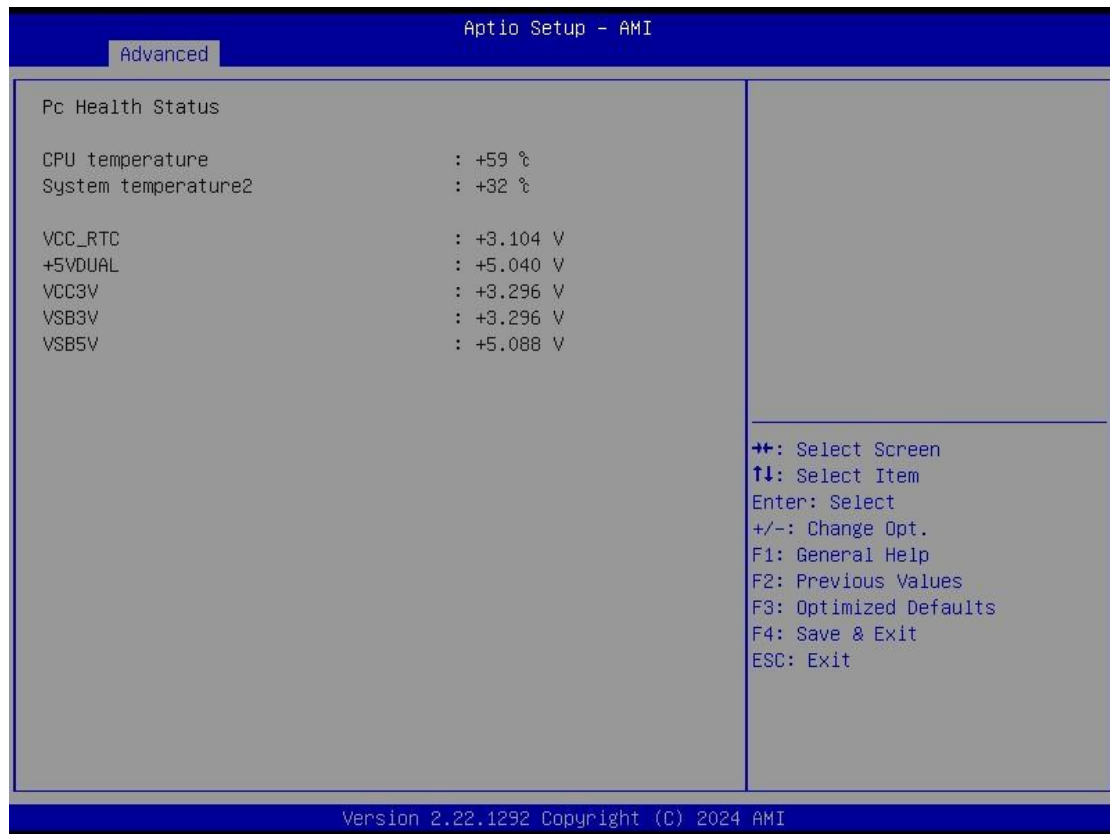


Serial port

Enable or disable serial port 2. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

Hardware Monitor

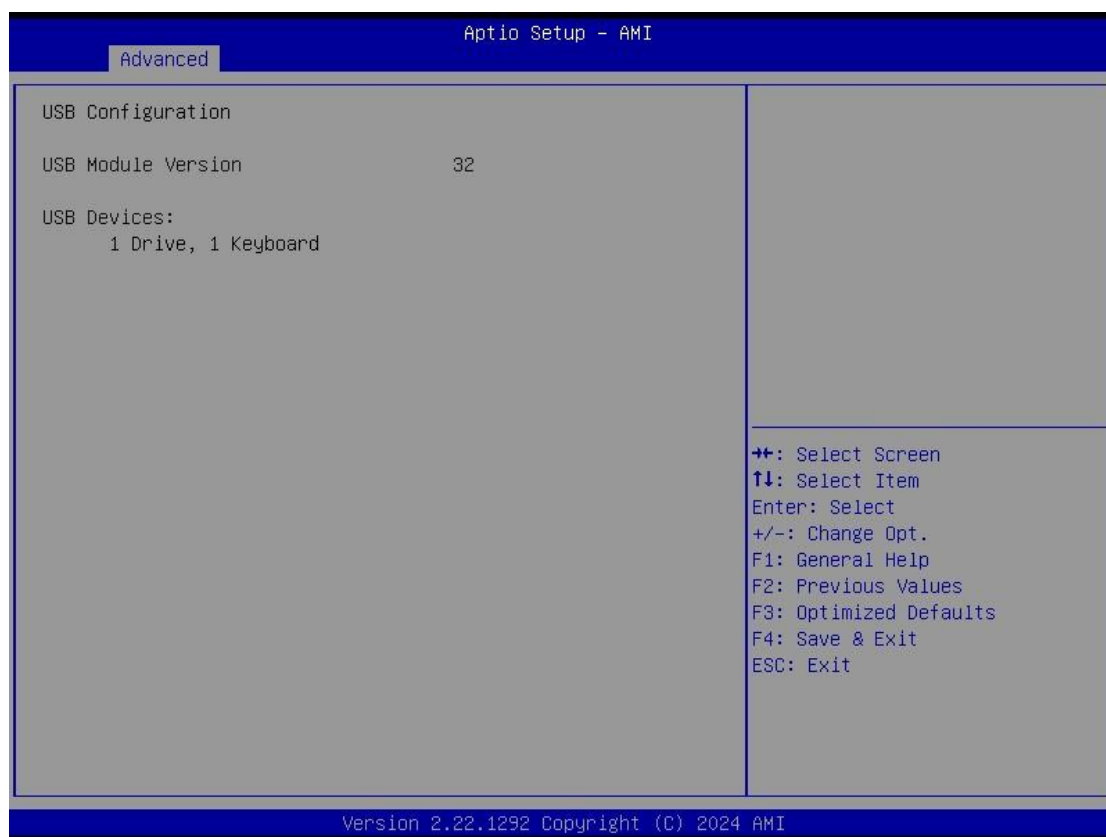
This screen monitors hardware health status.



This screen displays the temperature of system and CPU as well as system voltages (VCC_RTC, +5VDUAL, VSB3V, VCC3V and VSB5V).

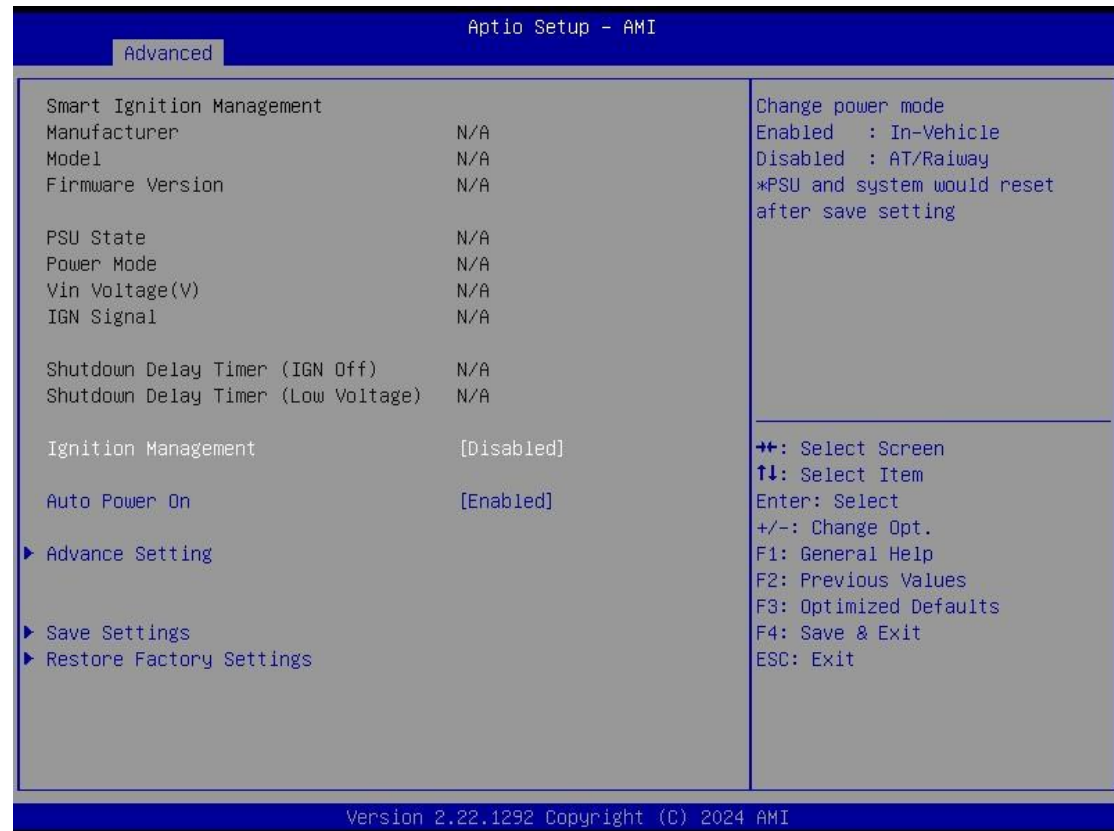
USB Configurations

Display all detected USB devices.



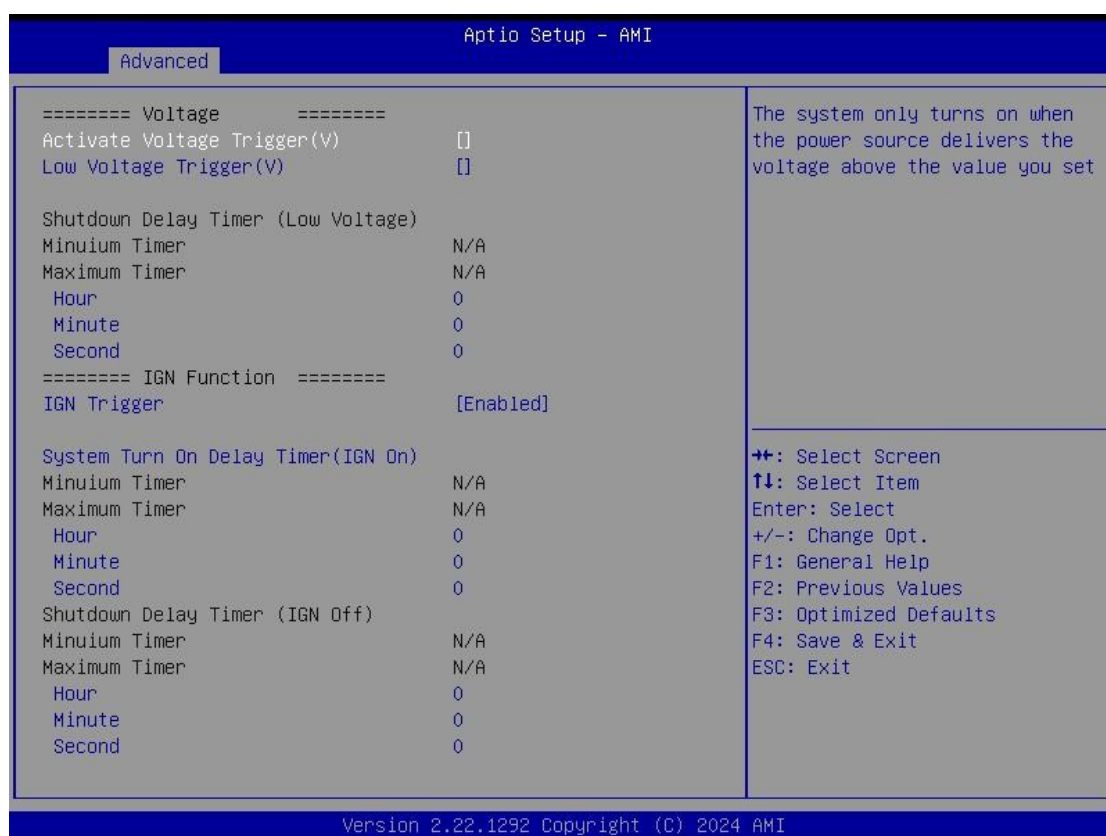
Smart Ignition Management

Press Enter to access the sub-menu. Calculated based on the 24-hour military-time clock.



BIOS menu item	Description
Ignition Management	<p>Enabled</p> <p>Switch to ACC mode</p> <p>*Note: IGN signal will only be triggered when DCIN Terminal Block 4-Pin IGN relates to VCC.</p> <p>Disabled</p> <p>Switch to AT mode</p> <p>*Note: System will be reset after Ignition Management setting has been changed and saved.</p>

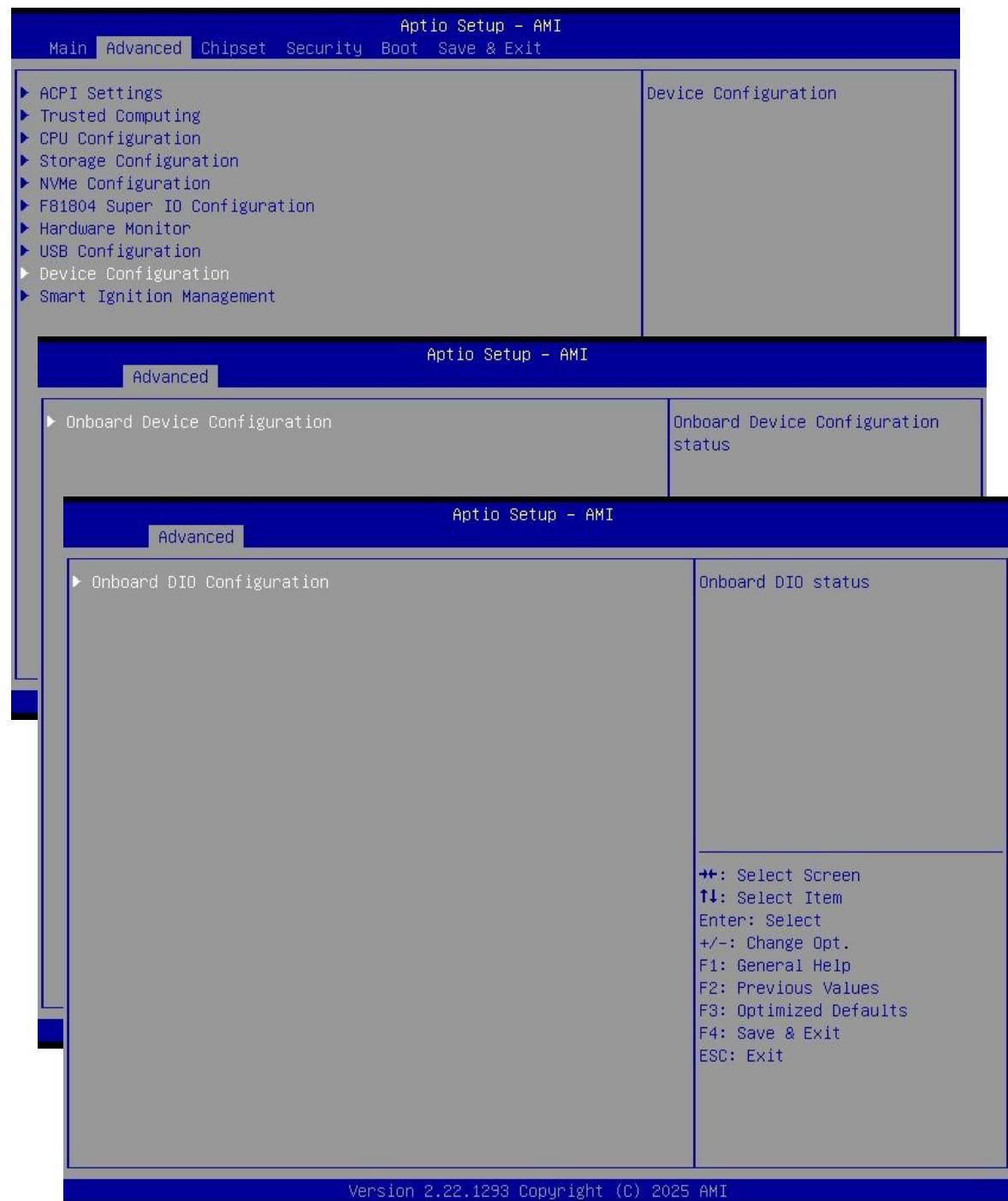
BIOS menu item	Description
Auto Power On	<p>Enabled</p> <p>System will turn on automatically under following conditions:</p> <ul style="list-style-type: none"> - Manually disconnects and reconnects system power - Power interruption: Resumes power after power failure <p>Disabled</p> <p>System will not turn on automatically when power is connected or when power resumes from a power failure</p>
Advance Setting	Set system on/off timing and voltage threshold levels
Save Settings	Save the current settings
Restore Factory Settings	Restores factory defaults to remove any incorrect or corrupt settings that might have prevented the system from properly powering on/off.

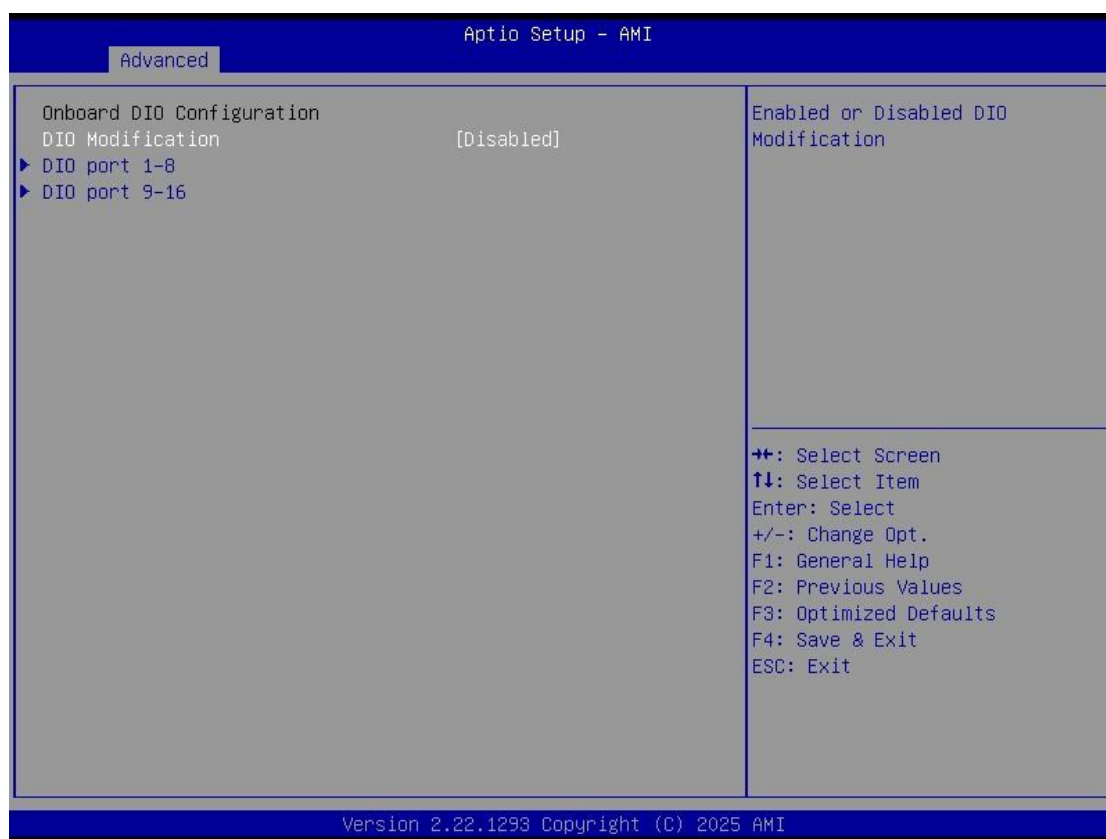


Onboard DIO Configuration

To change the DIO parameters, users should first enter the Advanced Menu, select Device Configuration, and select Onboard Device Configuration, followed by Onboard DIO Configuration. A description of selected item appears on the right side of the screen.

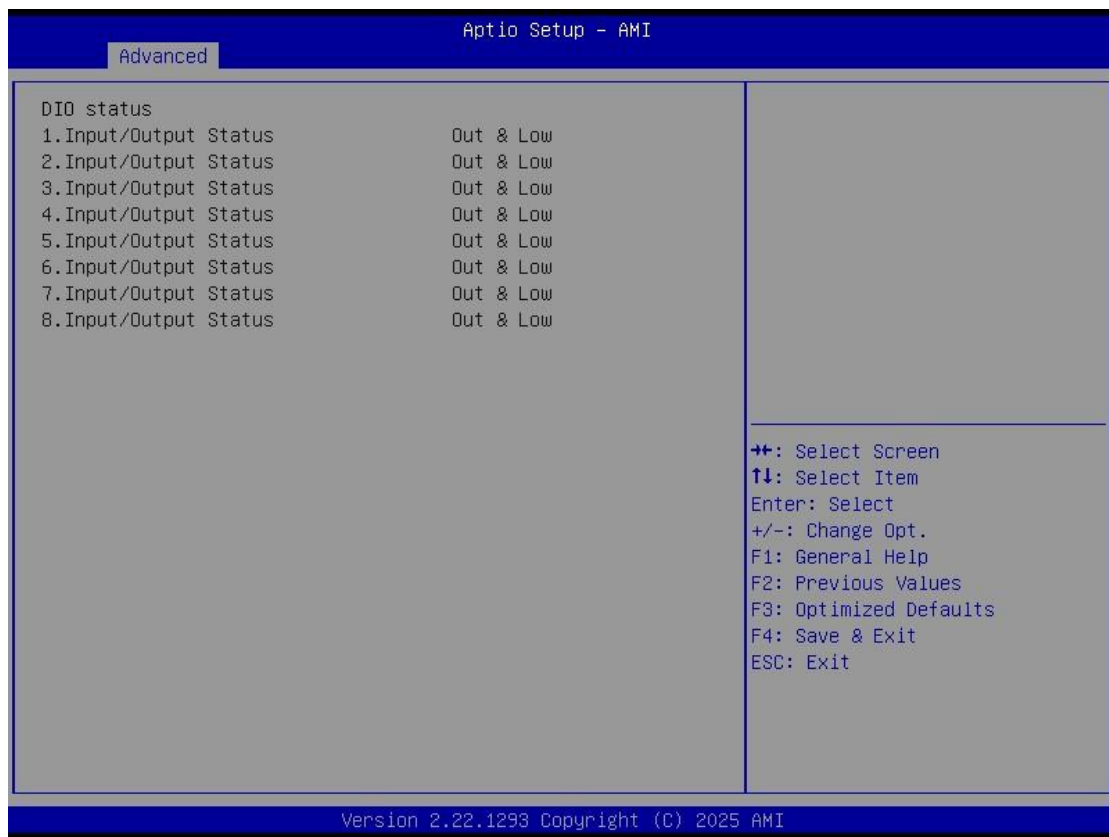
Note that digital I/O (DIO) port 1-16 are available only if optional DIO cables are connected inside the AIM101. For more details, see 3.2.17 section.





DIO Modification

Enabled or disabled digital I/O modification. The default is Disabled. Once it is enabled, you can load manufacture default and access to the DIO port 1-8 or DIO port 9-16 sub screen to set output or input.



DIO port 1-8/ DIO port 9-16

Select this option to open DIO status sub screen to set output or input for each port.

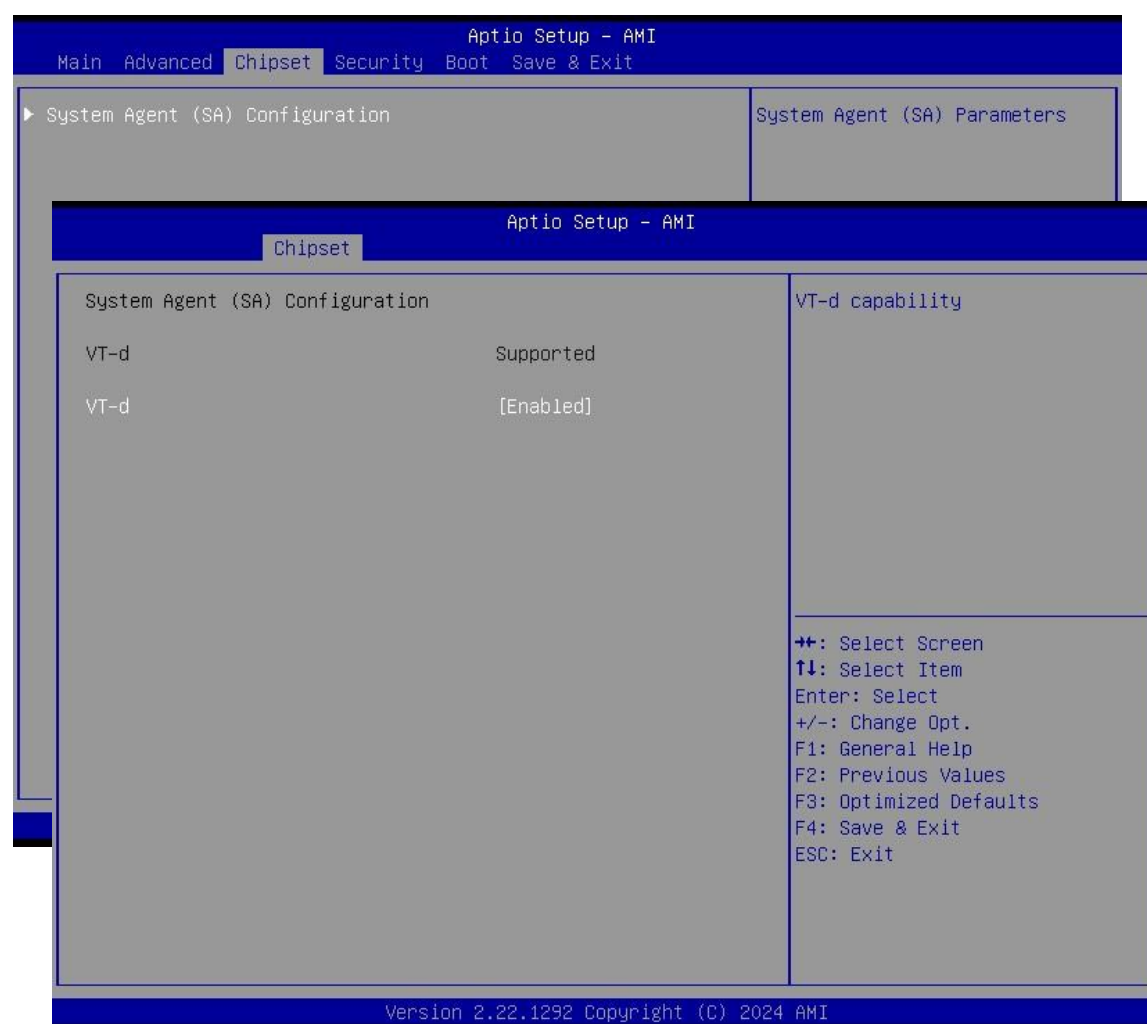
4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus.

System Agent (SA) Configuration

This screen allows users to configure System Agent (SA) parameters.

For items marked with "►", please press <Enter> for more options.

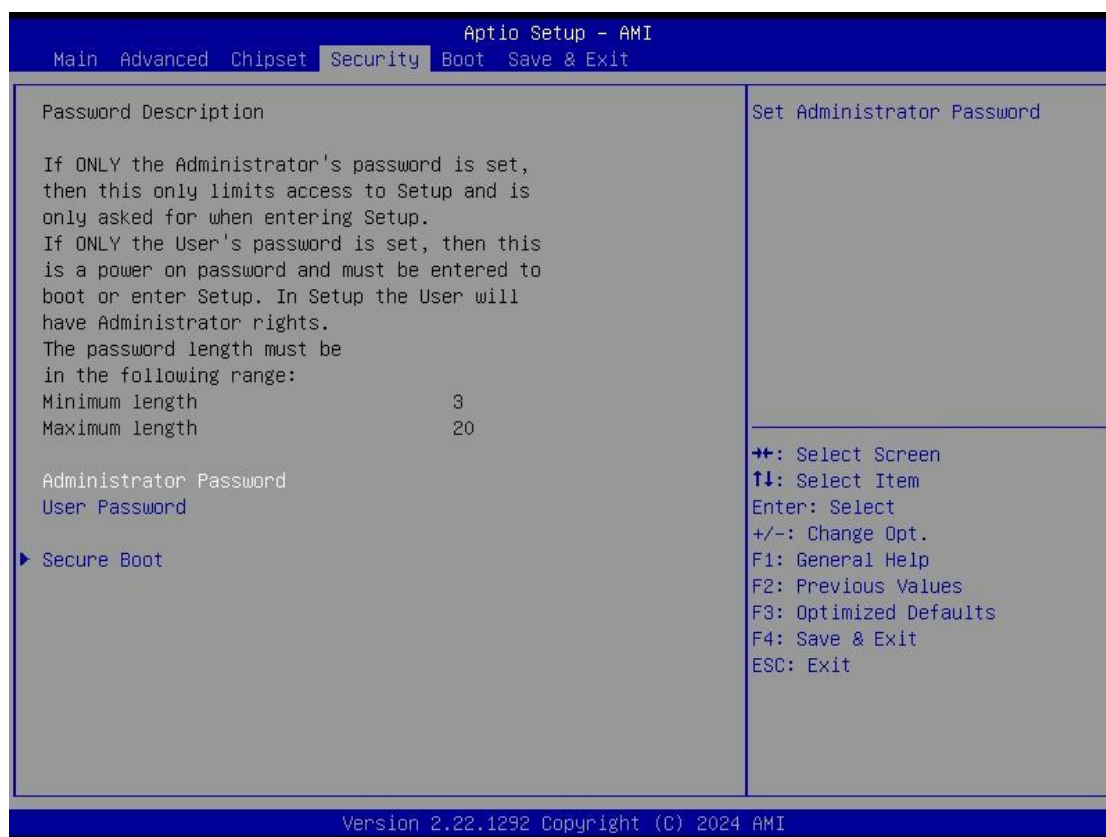


VT-d

Check to enable VT-d function on MCH.

4.6 Security Menu

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



Administrator Password

This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

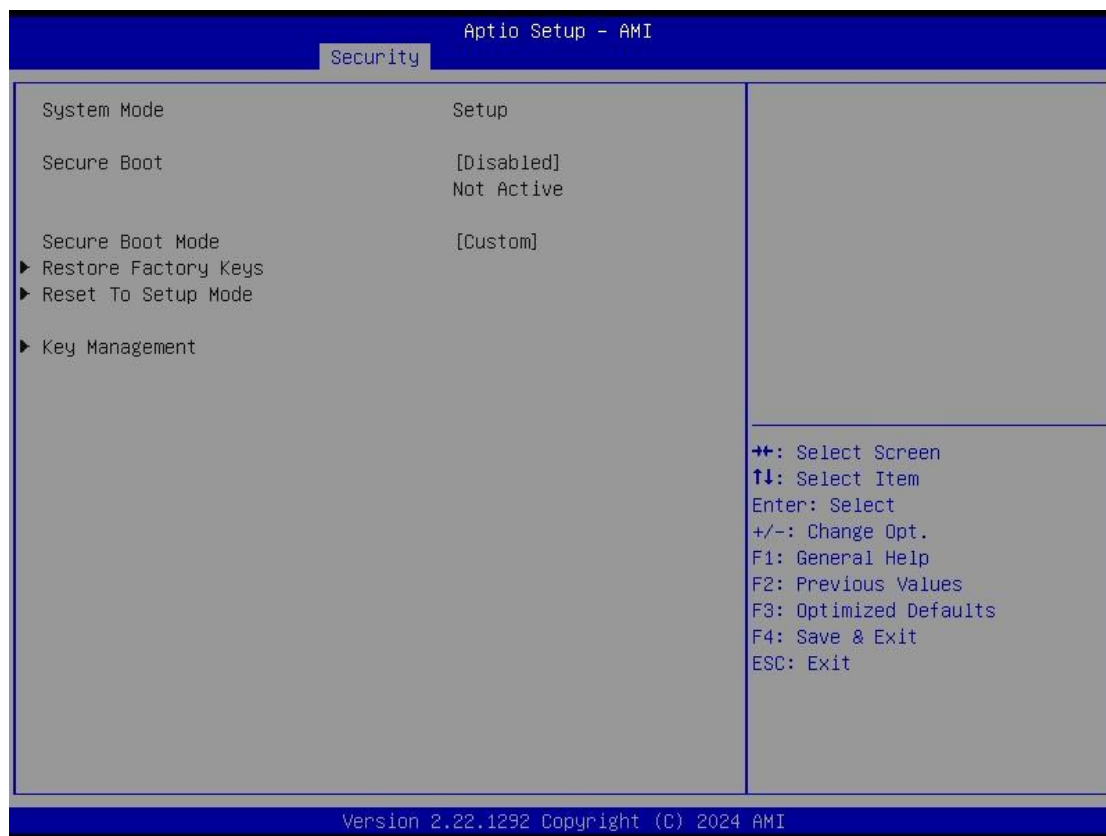
This item indicates whether a user password has been set (installed or uninstalled).

Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled or Disabled.

Secure Boot

Use this item to enable or disable support for Secure Boot.



Secure Boot Mode

Secure Boot mode options: Standard or Custom.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

Reset to Setup Mode

Delete all Secure Boot key databases from NVRAM.

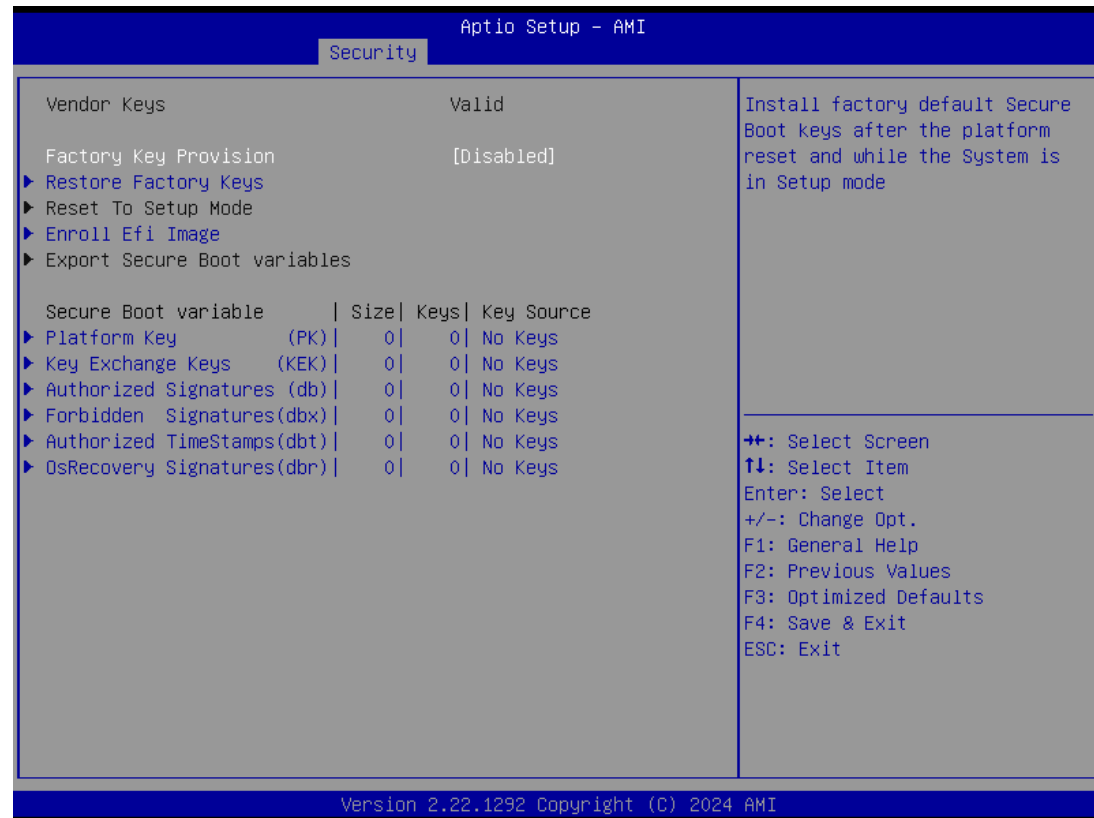
Key Management

Secure Boot feature is Active if Secure Boot is Enabled or Disabled.

Key management

Enables expert users to modify Secure boot policy variables without full authentication

Press <Enter> to configure the advanced items.



Factory Key Provision

Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode.

Enabled: Enables Factory Key Provision. (Default setting)

Disabled: Disables Factory Key Provision.

Restore Factory Keys

To restore factory settings.

Reset To Setup Mode

Delete all Secure boot key databases from NVRAM.

Enroll Efi Image

Allow the image to run in Secure Boot mode.

Export Secure Boot variables

Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

Platform Key (PK).

Key Exchange Keys (KEK)

Authorized Signatures (db)

Forbidden Signatures (dbx)

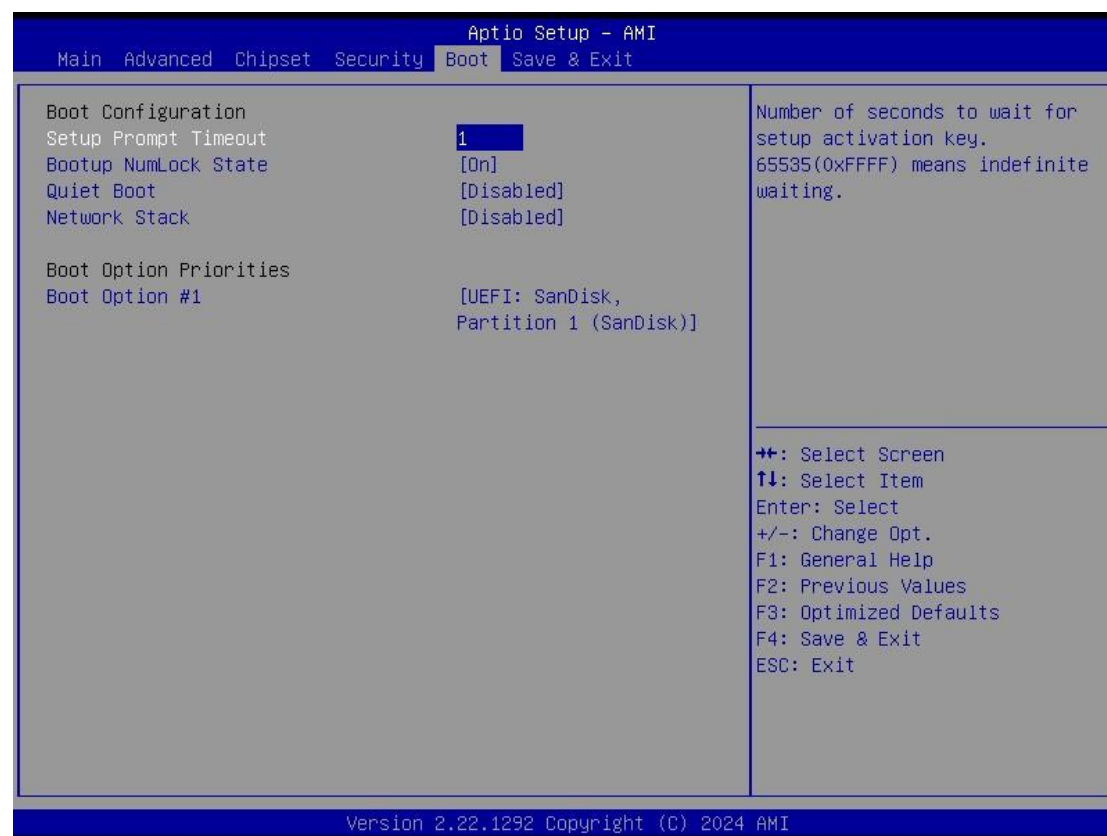
Authorized TimeStamps (dbt)

OsRecovery Signatures (dbr)

These items allow you to enroll factory defaults or load Certificates from a file.

4.7 Boot Menu

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



Setup Prompt Timeout

Use this item to set up number of seconds to wait for setup activation key where 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.

Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

Network Stack

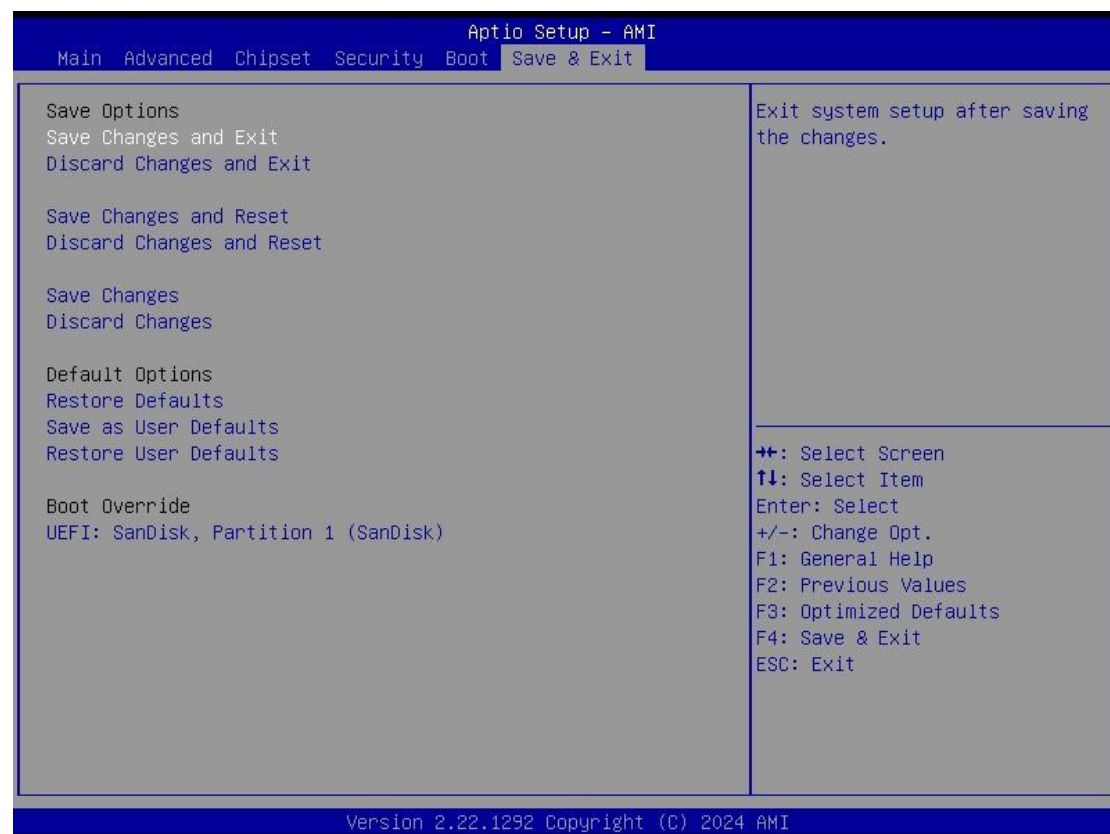
Enable/Disable UEFI Network Stack. Default setting is Enabled.

Boot Option Priorities

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.8 Save & Exit Menu

The Save & Exit menu allows users to load system configurations with optimal or fail-safe default values.



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 configurations 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

Having completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations 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

Having completed 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 configurations. 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.

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SECTION 5

GET STARTED WITH AI ACCELERATOR MODULE

This section provides users with detailed instructions on setting up basic system configurations and the environment for AI accelerator applications.

System Requirements

Please ensure that you have installed the operating system Ubuntu 24.04.3 or later on the AIM101 before starting the AI accelerator environment setup.

Environment Setup for AI Accelerator

Please visit the link below for detailed instructions:

[AIM101/AI-accelerator at main · Axiomtek-AIM-SW/AIM101](#)