

USER'S MANUAL

eBOX100B Series

Embedded System

User's Manual



www.axiomtek.com

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Safety Precautions

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

1. The eBOX100B 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 eBOX100B 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 eBOX100B 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 screen.
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

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 eBOX100B. Section 1 consists of the following sub-sections:

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

1.1 General Descriptions

The eBOX100B is a compact, efficient industrial-grade embedded BOX PC featuring Intel® Twin Lake N150 and 8GB LPDDR5 onboard (Intel® N355/16GB RAM by request). It offers 6 USB ports, 4 DB-9 ports with RS-232/422/485, dual 2.5GbE and two independent displays for peripheral connectivity and communication protocols. Suitable for the most IoT Gateway, Factory Automation, Smart City, Retail and more.

Features

- Intel® processor N150 Quad core SoC (Twin Lake)
- 1 x 8GB LPDDR5 on board (16GB option)
- Wide operating temperature -40°C to +70°C
- Intelligent power management: Ignition and USB power on/off control
- 2 x 2.5GbE, 6 x USB, 1 x DIO and 4 x COM
- 2 x HDMI (FHD) for dual display
- M.2 Key E 2230 & Key M 2280, mini-PCIe
- Front-access I/O design

Reliable and Stable Design

The embedded system is powered by the Intel® Processor N150 "Twin Lake" SoC, featuring a quad-core architecture for efficient performance. With its compact design and rich I/O interfaces, it provides high flexibility and reliable functionality, making it an ideal solution for smart city infrastructure, AIoT, edge computing, and factory automation applications.

Flexible Connectivity

The eBOX100B is equipped with a wide range of I/O interfaces, including four RS-232/422/485 ports, two USB 3.2 ports, four USB 2.0 ports, two 2.5GbE ports, and two HDMI ports (one port support lockable). It also features an 8-channel digital I/O, one mPCIe expansion slot, and one M.2 Key E slot and one M.2 Key M slot, providing excellent connectivity and expandability for various industrial and embedded applications.

Embedded O.S. Supported

The eBOX100B supports Windows® 11 IoT and Linux.

Various Storage Supported

In terms of storage, the eBOX100B supports one NVMe storage and one 2.5" SATA storage drive bay.

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Intel® processor N150 Quad core SoC (Twin Lake), up to 3.6 GHz, 6W
 - Intel® processor N355 optional by project
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
 - 1 x 8GB LPDDR5 onboard (16GB optional by project)

1.2.2 I/O System

- **Display**
 - 2 x HDMI (FHD) (Resolution: 1920x1080@60Hz)
- **Ethernet**
 - 2 x 10/100/1000/2500 Mbps Ethernet supports Wake-on-LAN, UEFI PXE with I226-V
- **USB Ports**
 - 2 x USB 3.2 Gen2
 - 4 x USB 2.0

- **Serial Ports**
 - 4 x RS-232/422/485 (COM1-4)(with Autoflow)
Baud rate support up to 115200
- **Mini PCIe Interface**
 - 1 x full-size PCI Express Mini Card slot (USB 2.0 + PCIe + SIM signal)
 - 1 x M.2 Key E 2230 socket for Wi-Fi (USB 2.0 + PCIe x1 signal)
 - 1 x M.2 Key M 2280 socket for NVMe (PCIe x4 Gen3)
 - 1 x internal SIM slot for PCIe Mini Card slot
- **Storage**
 - 1 x M.2 2280 Key M for NVMe SSD
 - 1 x 2.5" SATA HDD/SSD drive bay, up to 15mm height
- **Indicator**
 - 1 x Green LED as indicator for PWR status
 - 1 x Orange LED as indicator for HDD active
- **Switch**
 - 1 x ATX PWR switch connector
 - 1 x Reset power switch connector
 - 1 x Remote power switch connector
- **Antenna & SIM**
 - 4 x SMA type connector openings for antenna
 - 1 x internal SIM slot
- **TPM 2.0**
 - 1 x ST33HTPH2X32AHE4

1.2.3 System Specifications

- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
 - `9-36V DC with ignition
(Typical : 12V/24VDC)
 - Inrush current : 1.5 - 13A
 - Power Rating : 9-36Vdc, 5.1-1.3A
- **Operation Temperature**
 - -40°C to +70°C (-40°F to +158°F) (with W.T. DRAM & SSD)
- **Storage Temperature**
 - -40°C ~+80°C (-40 °F ~ 176°F)
- **Humidity**
 - 10% to 90% (non-condensation)
- **Shock**
 - IEC 60068-2-27 (with SSD: 50G, half-sine, and 11 ms duration)
 - MIL-STD-810G
- **Vibration Endurance**
 - IEC 60068-2-64 (with SSD: 3Grms STD, random, 5 to 500 Hz, and 1 hr/axis)
 - MIL-STD-810G

- **Weight**

- 1.1 kg (2.4 lb) without package
- 1.5 kg (3.3 lb) with package

- **Dimension**

- 155 mm (6.1") (W) x 110 mm (4.33") (D) x 60 mm (2.36") (H)

1.2.4 Driver CD Contents

Please download the following eBOX100B drivers from the Axiomtek official website.

- **Chipset**
- **Ethernet (I226-V)**
- **Graphic**
- **Serial Port**
- **Intel® ME**

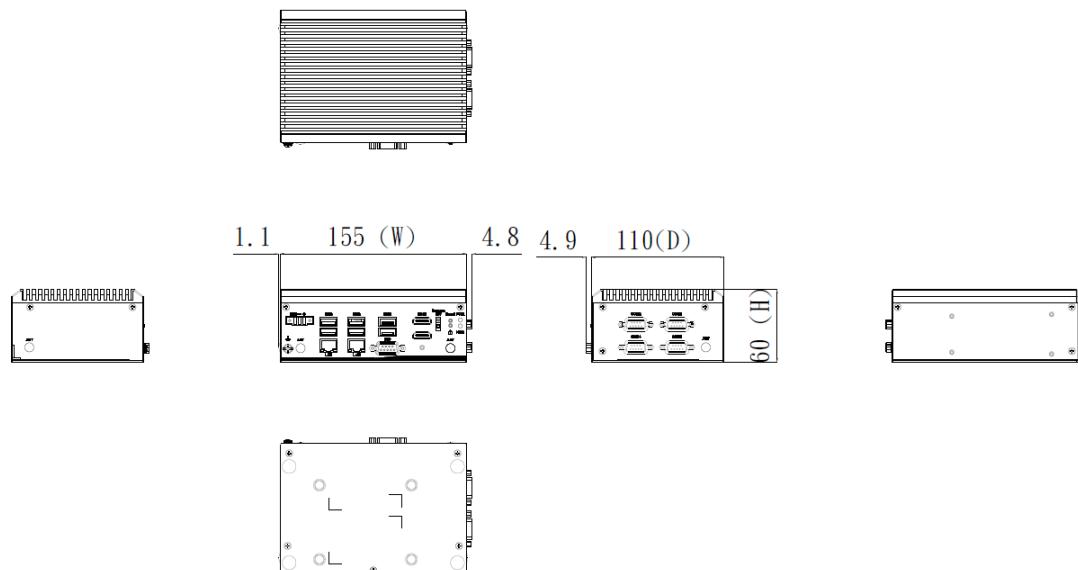


【Note】 : *All specifications and images are subject to change without notice.*

1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX100B.

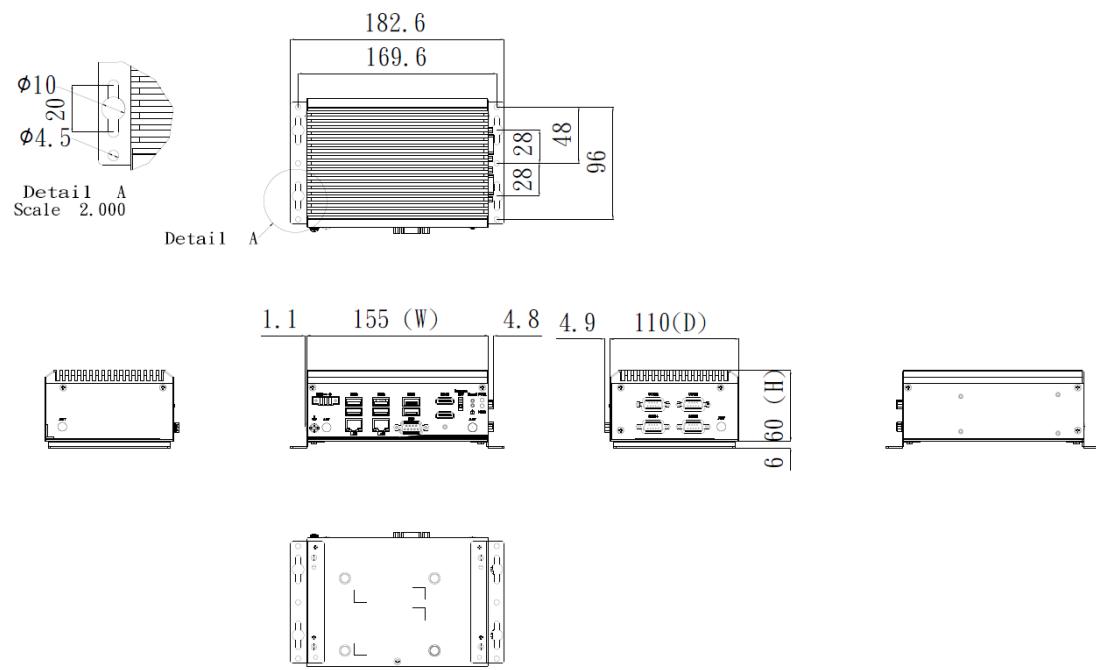
1.3.1 System Dimensions



1.3.2 Wall-mount Bracket Dimensions

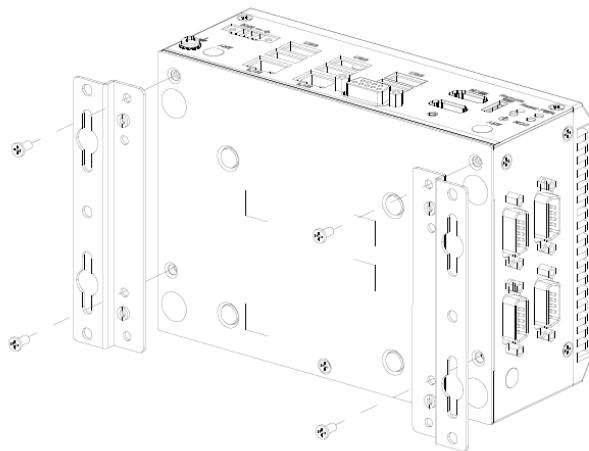
Users can get 4pcs truss head M3*6L screws for fixing the wall mount kit from the accessories box.

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

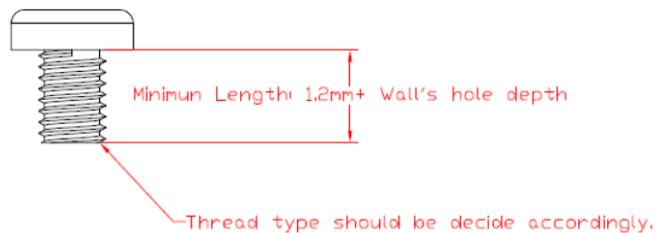
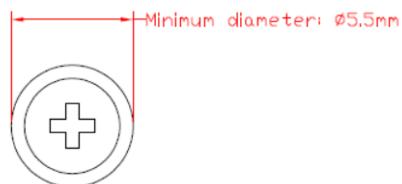


Wall-mount Bracket Assembly Drawing

Users can get 4pcs truss head M3*6L screws for fixing the wall mount kit from the accessories box.

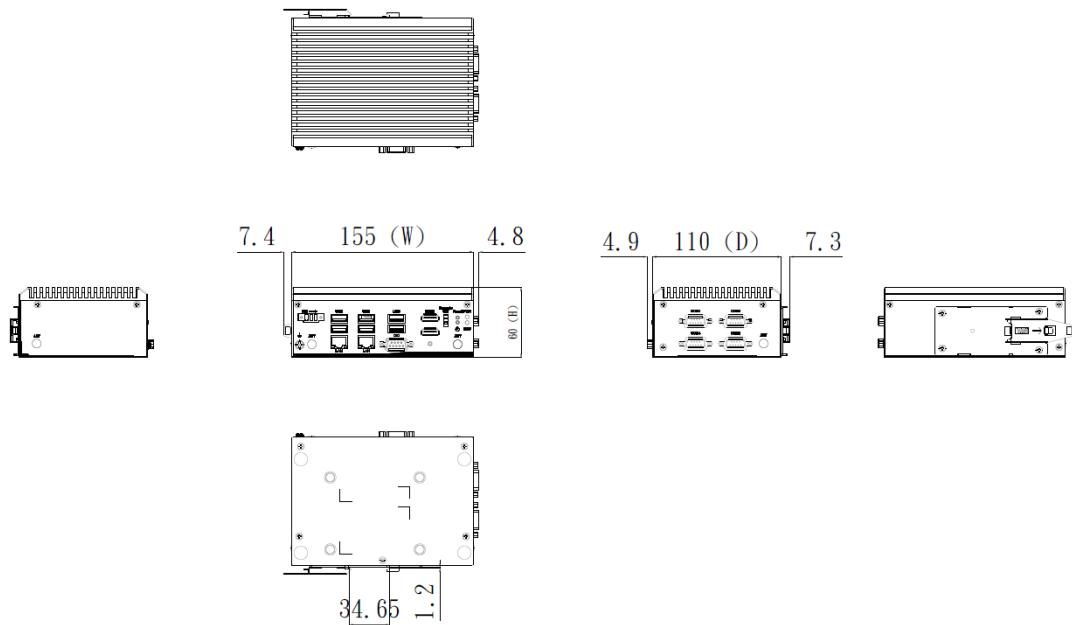


【Note】 : *If users tighten the screws in drywall, use the hollow wall anchors to ensure that unit does not pull away from the wall due to prolonged strain between the cable and power connector.*



1.3.3 Din-Rail (Vertical type) Bracket Dimensions

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

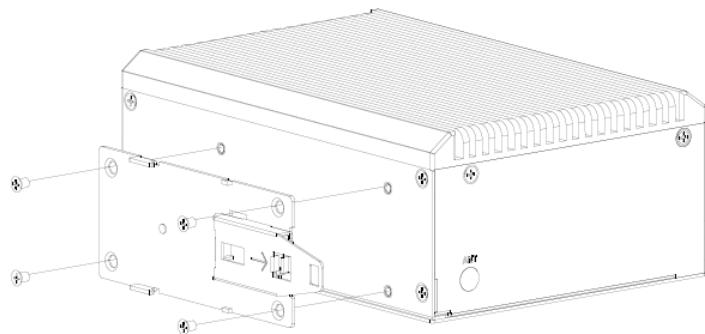


Din-Rail Bracket (Vertical type) Assembly Drawing

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

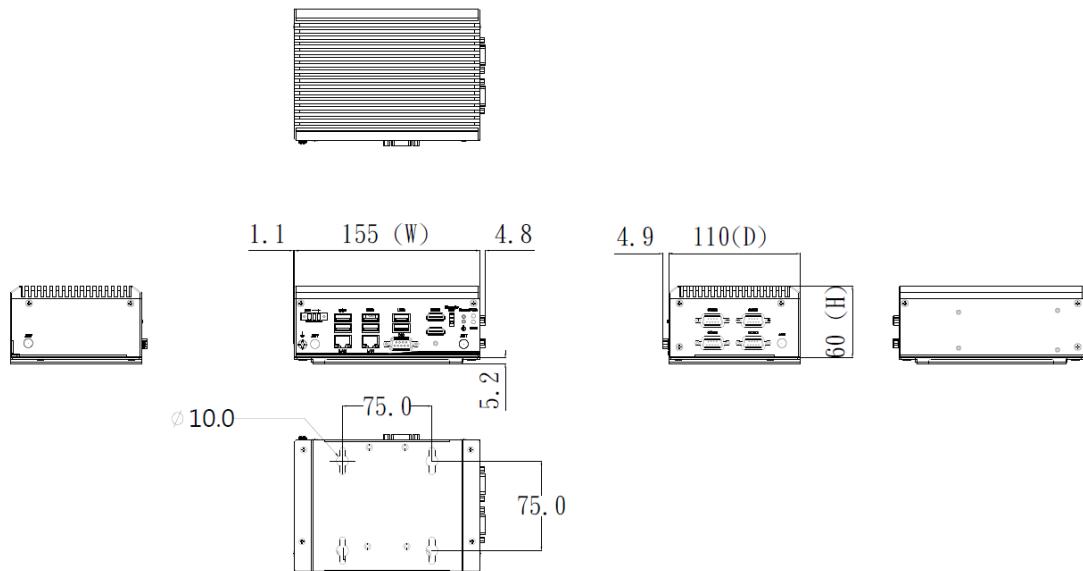


【Note】 : COM port IO connector facing up .



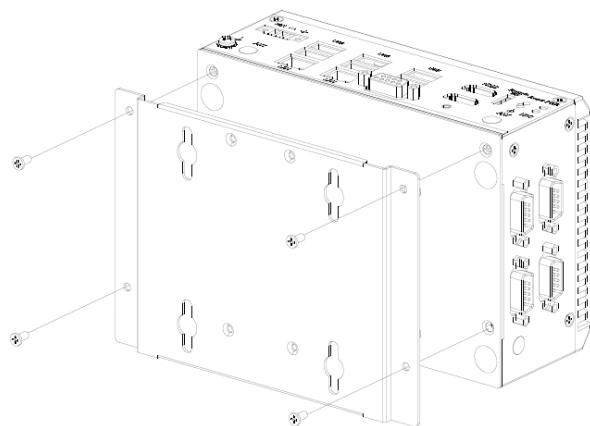
1.3.4 VESA Mount Bracket Dimensions

Users can get 4pcs truss head M3*6L screws for fixing the Vesa mount kit from the accessory box.



VESA Mount Bracket Assembly Drawing

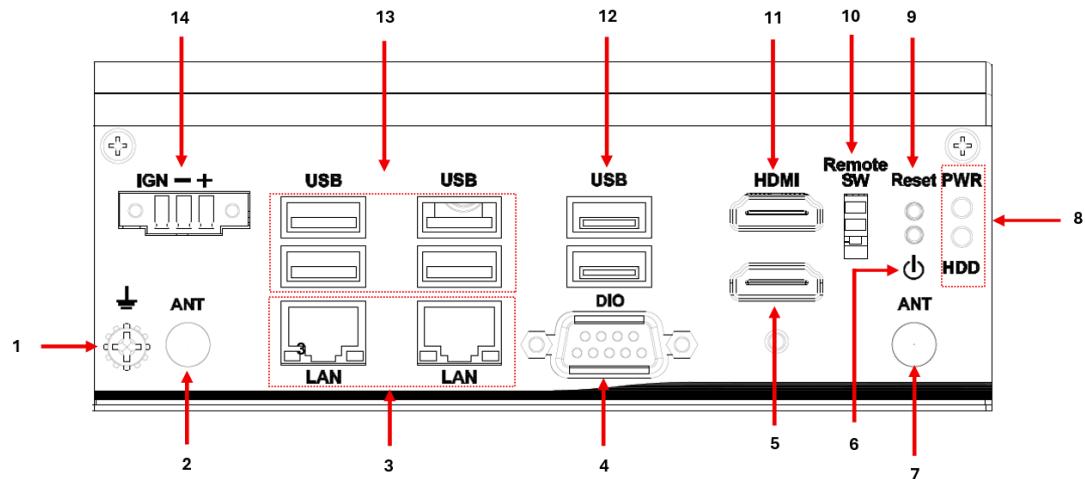
Users can get 4pcs truss head M3*4L screws for fixing the Vesa mount kit from the accessory box.



1.4 I/O Outlets

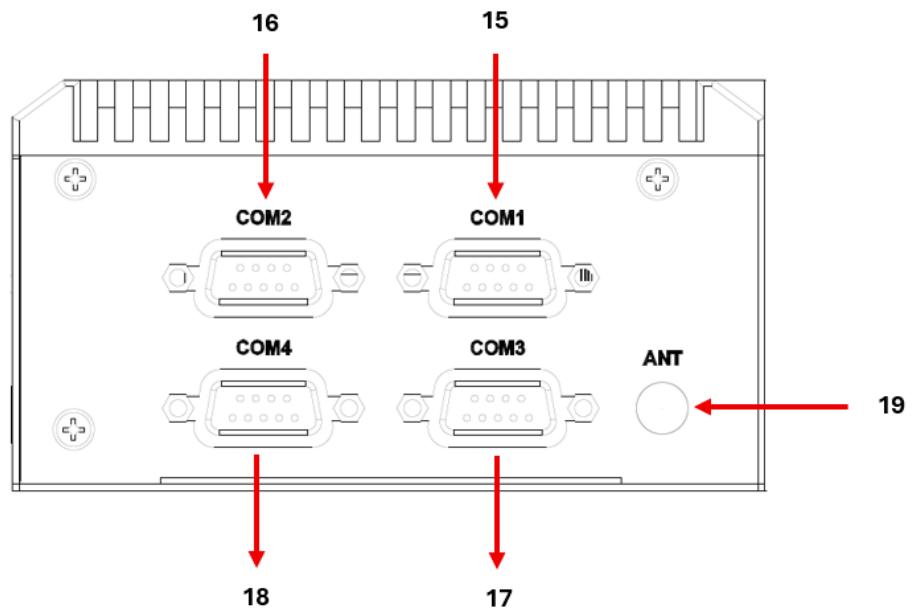
The following figures show I/O outlets on the eBOX100B.

Front View

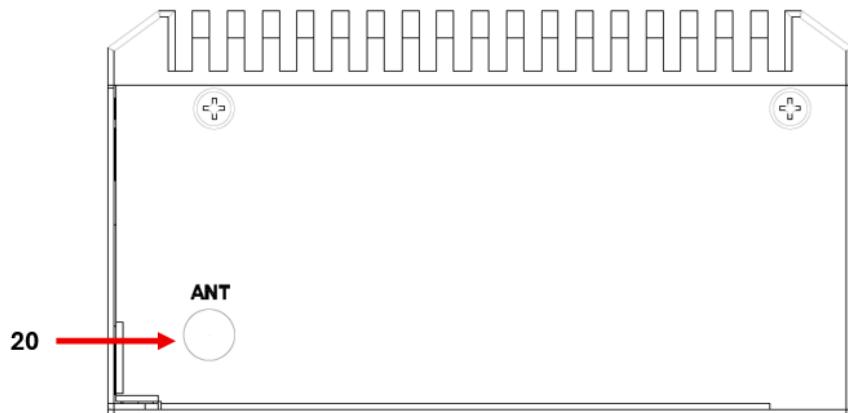


| | | | |
|---|----------------------------|----|--|
| 1 | 1 x Grounding | 8 | LEDs (PWR, HDD) |
| 2 | 1 x Antenna opening | 9 | 1 x Reset switch connector |
| 3 | 2 x 2.5GbE (I226-V) | 10 | 1 x Remote switch connector |
| 4 | 1 x 8-CH Digital IO | 11 | 1 x HDMI |
| 5 | 1 x HDMI (lockable) | 12 | 2 x USB 3.2 Gen2 |
| 6 | 1 x Power Switch connector | 13 | 4 x USB 2.0 |
| 7 | 1 x Antenna opening | 14 | 1 x 9-36VDC power input (Phoenix type) |

Top View



Bottom View



| | | | |
|----|---------------------------|----|---------------------------|
| 15 | 1 x RS-232/422-485 (COM1) | 16 | 1 x RS-232/422-485 (COM2) |
| 17 | 1 x RS-232/422-485 (COM3) | 18 | 1 x RS-232/422-485 (COM4) |
| 19 | 1 x Antenna opening | 20 | 1 x Antenna opening |

1.5 Packing List

The eBOX100B comes with the following bundle package:

- **eBOX100B System Unit x 1**
- **3-pin Terminal Block connector x 1**
- **Remote Switch Cable x 1**
- **Foot Pad x 4**
- **M.2 thermal pad x 2**
- **M.2 thermal bracket x 1**
- **Lockable cable for HDMI x 1**
- **SATA cable for 2.5" storage x 1**

1.6 Model List

| | |
|------------------|---|
| eBOX100B-N150-2E | Fanless embedded system with Intel® processor N150 (Twin Lake) , 2 LAN, 2 HDMI, 4 COM, 6 USB, DIO and 9 to 36 VDC |
|------------------|---|

Please contact Axiomtek's distributors immediately in case any abovementioned items are missing.

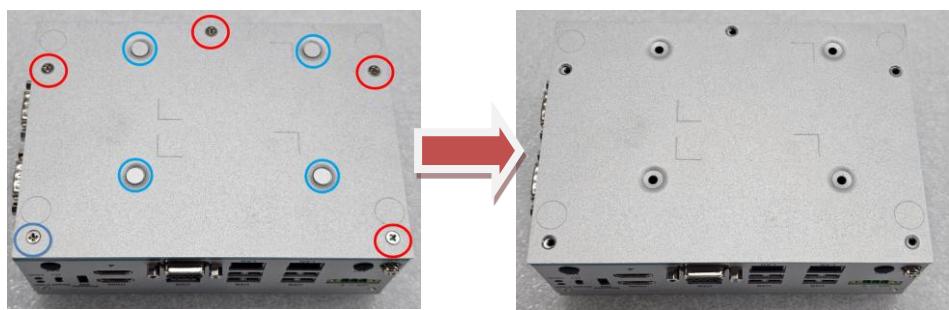
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SECTION 2 HARDWARE INSTALLATION

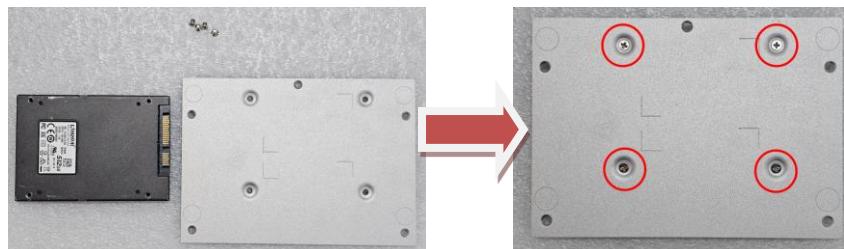
The eBOX100B is convenient for various hardware configurations, such as DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive), PCI Express Mini card, M.2 module. Section 2 contains guidelines for hardware installation.

2.1 Installation of 2.5" SATA Device

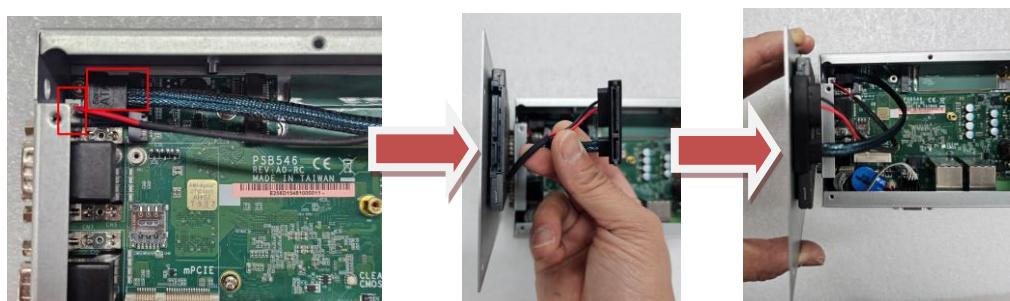
Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom side of the system, and then loosen five screws and four HDD mylar.



Step 3 Assemble SSD/HDD with the bottom cover with 4 screws.



Step 4 Connect the power and SATA cables to the corresponding connectors on the mainboard. And connect the other end of the SATA cable to the storage device. Make sure all cables are properly and securely connected.

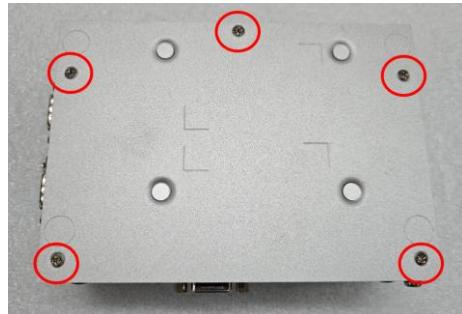


Step 5 Put the bottom cover back and fasten all the screws.

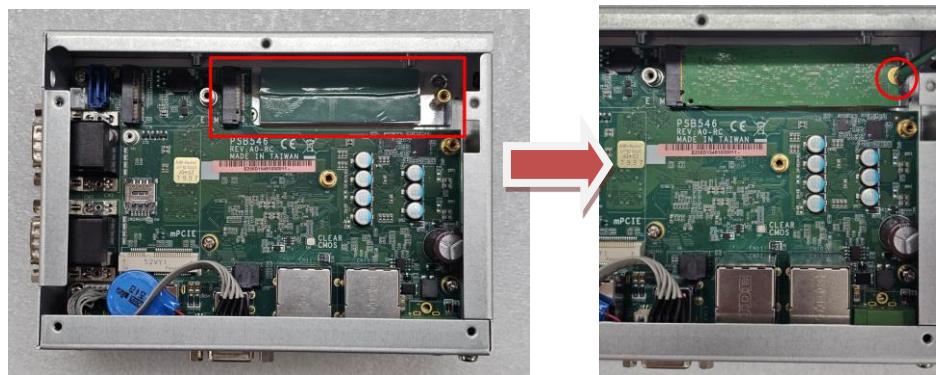
2.2 Installation of M.2 Key M NVMe storage(CN2)

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

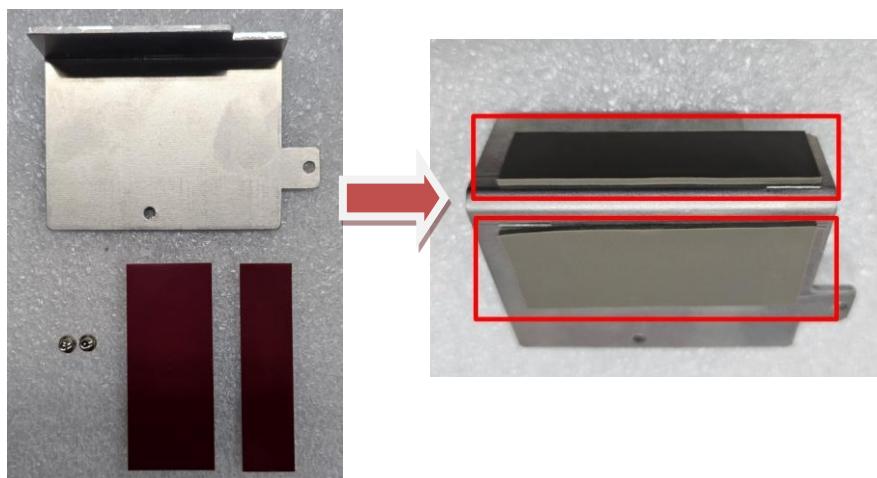
Step 2 Turn the system upside down to locate screws at the bottom side of the system and then loosen five screws.



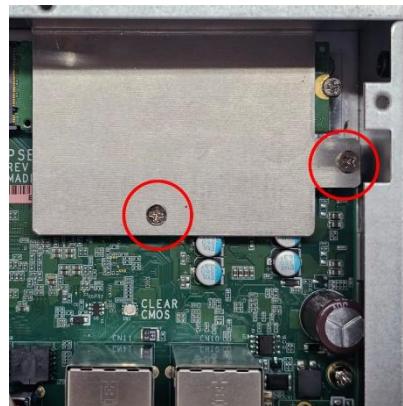
Step 3 Located the M.2 KEY M as red marked, insert the M.2 key M NVMe SSD and tighten the screw.



Step 4 Stick the two thermal pads onto the engraved lines on the M.2 thermal bracket.



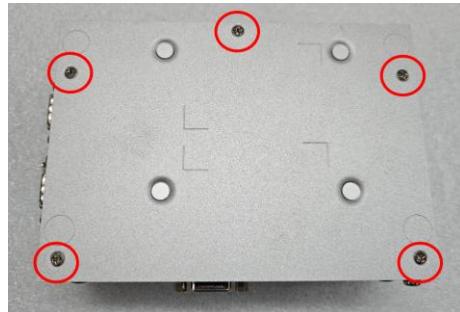
Step 5 Finally, fasten the M.2 thermal bracket with 2 screws to the module to complete the installation.



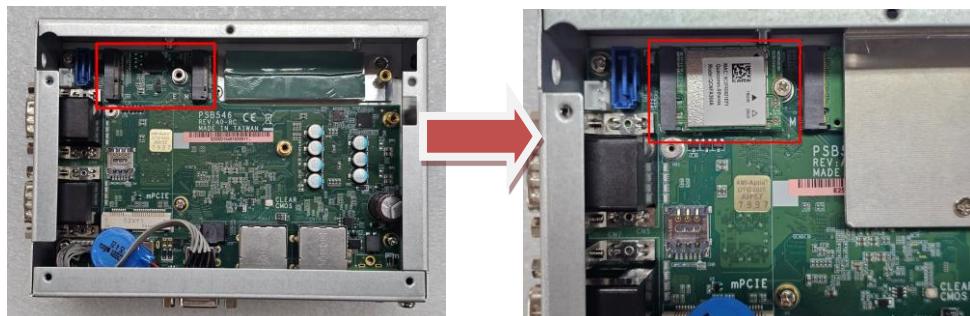
Step 6 Put the bottom cover back and fasten all the screws.

2.3 Installation of M.2 KEY E Module (CN3)

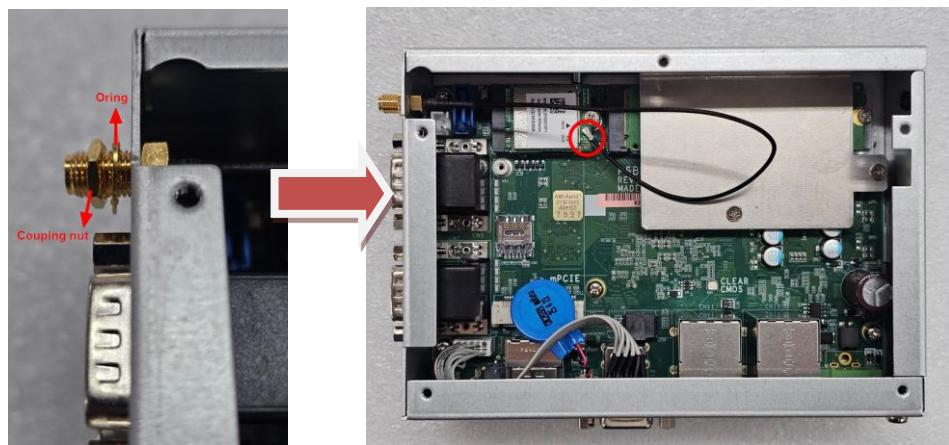
Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom side of the system and then loosen five screws.



Step 3 Located the M.2 KEY E as red marked, insert the M.2 key E mini card module and tighten the screw.



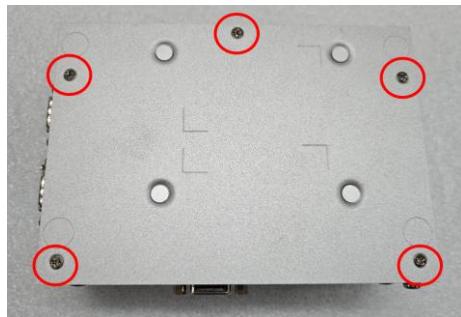
Step 4 Attach the IPEX-to-SMA cables to any two-antenna opening on the chassis first, then connect the other ends of the cables to the connectors on the wireless module.



Step 5 Reinstall and secure the bottom cover, then connect the antennas to complete the assembly.

2.4 Installation of Mini PCIe Module (Full-size)(CN8)

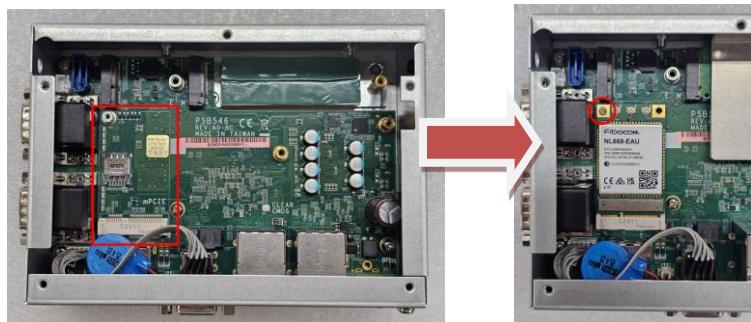
Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom side of the system and then loosen five screws.



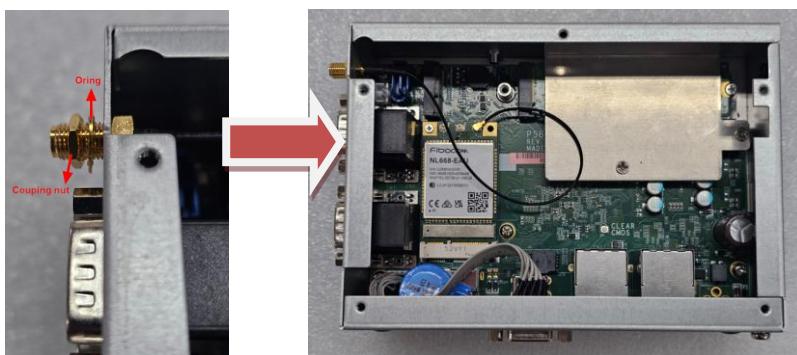
Step 3 Locate the min card slot and insert a mini PCIe module into the sockets and then tighten the screw.



【Note】 : Please use an extended bracket when using a half-size Mini card



Step 4 Attach the IPEX-to-SMA cables to any two-antenna opening on the chassis first, then connect the other ends of the cables to the connectors on the mini card module.



Step 5 Reinstall and secure the bottom cover, then connect the antennas to complete the assembly.

*Note: If use LTE module, please Insert the corresponding SIM card into SIM socket (CN6) before you install the mini-PCIe module.

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SECTION 3

PUSHBUTTON & CONNECTOR SETTINGS

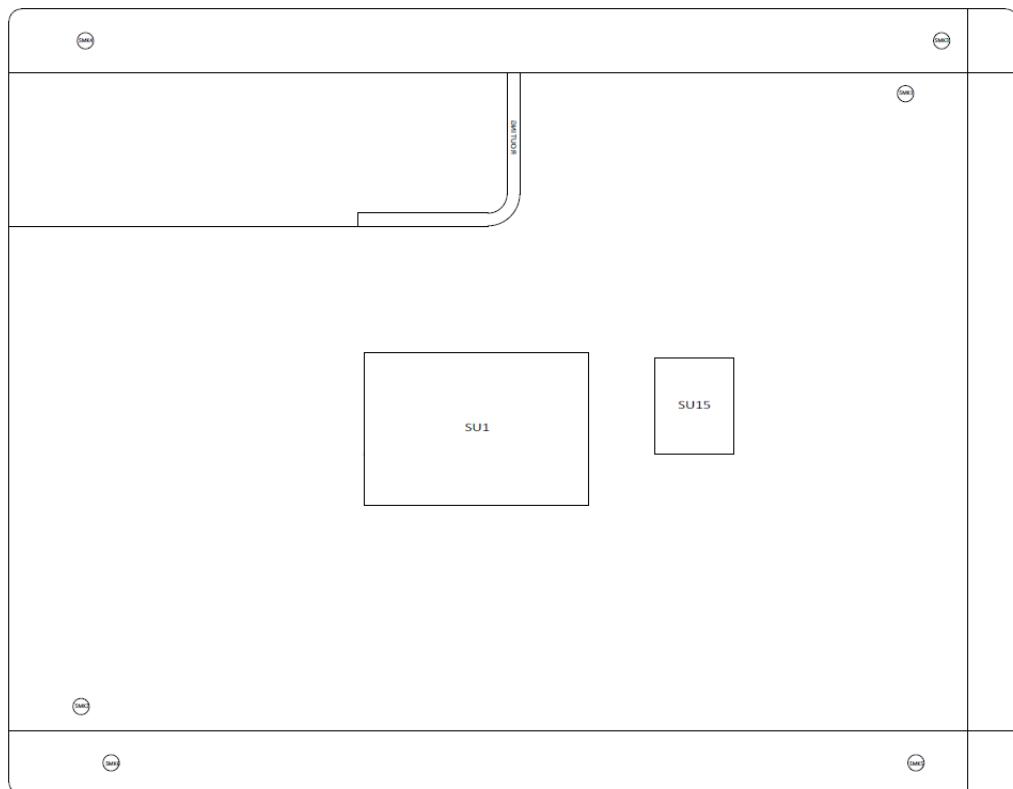
Proper jumper settings configure the eBOX100B to meet various application needs. -Hereby all jumpers' settings along with their default settings are listed for devices onboard.

3.1 Locations of Pushbutton & Connectors

PSB546 Top View



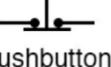
PSB546 Bottom View



【Note】 : *It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs. Any modifications without instructions might cause system failure.*

3.2 Summary of Pushbutton Settings

Proper jumper settings configure the eBOX100B to meet various application purposes. A table of all jumpers and their default settings is listed below.

| Pushbutton | Descriptions | Settings |
|--|---|---|
| SW1  SW1 | Use this switch SW3 for clear CMOS (button you press and hold the button for at least 10 seconds) |  Pushbutton <i>normally open</i> (default) |
| | |  Pushbutton <i>normally closed</i> (clear CMOS) |

3.3 Connectors

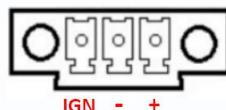
Please refer to the connector table to get their pin assignments.

| External Connectors | Sections |
|---|----------|
| DC-in Phoenix Power Connector (CN14) | 3.3.1 |
| HDMI Connector (CN12) | 3.3.2 |
| Serial Port Connector (CN5, CN7) | 3.3.3 |
| USB 3.2 Connector (CN13) | 3.3.4 |
| Ethernet Connector / USB 2.0 (CN10, CN11) | 3.3.5 |
| ATX Power Button / Reset Switch (SW3) | 3.3.6 |
| Remote Power Switch Connector (SW2) | 3.3.7 |
| Digital IO (CN9) | 3.3.8 |
| Internal Connectors | Sections |
| SATA Power Connector (CN4) | 3.3.9 |
| SATA Connector (CN1) | 3.3.10 |
| SIM Slot (CN6) | 3.3.11 |
| Full-Size Express Mini Card slot (CN8) | 3.3.12 |
| M.2 2230 Key E (CN3) | 3.3.13 |
| M.2 2280 Key M (CN2) | 3.3.14 |

3.3.1 DC-in Phoenix Power Connector (CN14)

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

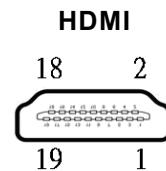
| Pins | Signals |
|------|---------|
| 1 | + |
| 2 | - |
| 3 | IGN |



3.3.2 HDMI Connector (CN12)

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.

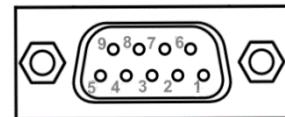
| Pins | Signals | Pins | Signals |
|------|-----------------|------|-----------------|
| 1 | HDMI OUT_DATA2+ | 11 | GND |
| 2 | GND | 12 | HDMI OUT Clock- |
| 3 | HDMI OUT_DATA2- | 13 | N.C. |
| 4 | HDMI OUT_DATA1+ | 14 | N.C. |
| 5 | GND | 15 | HDMI OUT_SCL |
| 6 | HDMI OUT_DATA1- | 16 | HDMI OUT_SDA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



3.3.3 Serial Port Connector (CN5, CN7)

The system has four RS232/422/485 serial ports. Please refer to Chapter 4 for the details of BIOS setting.

| Pins | RS-232 | RS-422 | RS-485 |
|------|--------------------------|--------|--------|
| 1 | DCD, Data Carrier Detect | TX- | Data- |
| 2 | RXD, Receive Data | TX+ | Data+ |
| 3 | TXD, Transmit Data | RX+ | No use |
| 4 | DTR, Data Terminal Ready | RX- | No use |
| 5 | GND, Ground | No use | No use |
| 6 | DSR, Data Set Ready | No use | No use |
| 7 | RTS, Request To Send | No use | No use |
| 8 | CTS, Clear To Send | No use | No use |
| 9 | RI, Ring Indicator | No use | No use |

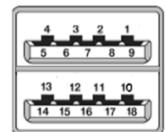


3.3.4 USB 3.2 Connector (CN13)

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

USB 3.2 Gen2

| Pins | Signal USB Port 0 | Pins | Signal USB Port 1 |
|------|-----------------------------------|------|-----------------------------------|
| 1 | USB_VCC (+5V level standby power) | 10 | USB_VCC (+5V level standby power) |
| 2 | USB_Data- | 11 | USB_Data- |
| 3 | USB_Data+ | 12 | USB_Data+ |
| 4 | GND | 13 | GND |
| 5 | SSRX- | 14 | SSRX- |
| 6 | SSRX+ | 15 | SSRX+ |
| 7 | GND | 16 | GND |
| 8 | SSTX- | 17 | SSTX- |
| 9 | SSTX+ | 18 | SSTX+ |



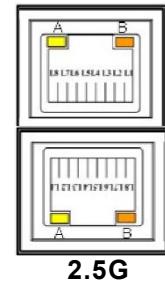
3.3.5 Ethernet Connector (CN10,CN11)

The eBOX100B has two LAN ports that are all 2.5GbE and designed by Intel I226-V and two USB 2.0 ports connectors.

Pin assignment

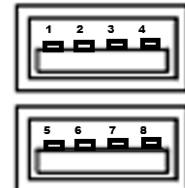
LAN port

| 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 | |



USB 2.0

| Pins | Signal USB Port 0 | Pins | Signal USB Port 1 |
|------|-----------------------------------|------|-----------------------------------|
| 1 | USB_VCC (+5V level standby power) | 5 | USB_VCC (+5V level standby power) |
| 2 | USB_Data- | 6 | USB_Data- |
| 3 | USB_Data+ | 7 | USB_Data+ |
| 4 | GND | 8 | GND |



3.3.6 Power switch /Reset switch connector (SW3)

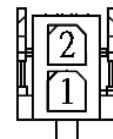
| | Functions | Descriptions |
|---|--------------|--------------------|
| 1 | Power switch | Turn on/off system |
| 2 | Reset switch | Reset system |



3.3.7 Remote Power Switch Connector (SW2)

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

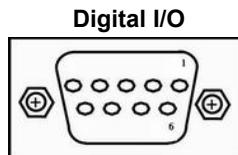
| Functions | Descriptions |
|-------------|--------------------|
| Short (1-2) | Turn on/off system |
| Open | Keep system status |



3.3.8 8-CH Digital IO (CN9)

eBOX630B supports one 8-CH output connector (DIO1~8), default: 4IN & 4OUT. Each bit can be set to function as input or output by software programming, and users can set up via BIOS setting.

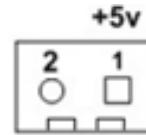
| Pins | Description |
|------|-------------|
| 1 | DIO1 |
| 2 | DIO2 |
| 3 | DIO3 |
| 4 | DIO4 |
| 5 | DIO5 |
| 6 | DIO6 |
| 7 | DIO7 |
| 8 | DIO8 |
| 9 | GND |



3.3.9 SATA Power Connector (CN4)

Based on CN4 to offer the SATA power for SATA 2.5" HDD/SSD.

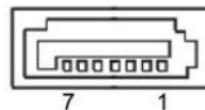
| Pins | Signals |
|------|-----------|
| 1 | +5V level |
| 2 | GND |



3.3.10 SATA Connector (CN1)

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.

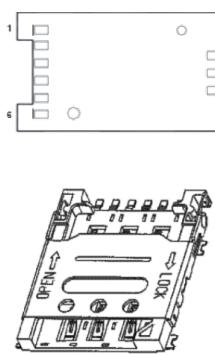
| Pins | Signals |
|------|----------|
| 1 | GND |
| 2 | SATA_TX+ |
| 3 | SATA_TX- |
| 4 | GND |
| 5 | SATA_RX- |
| 6 | SATA_RX+ |
| 7 | GND |



3.3.11 Nano SIM Card Slot (CN6)

The eBOX100B has one SIM slot: CN6 on top side that support mini PCIe slot (for CN8). It is mainly used in wireless network applications.

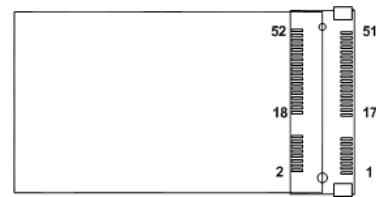
| Pins | Signals |
|------|---------|
| 1 | DATA |
| 2 | CLK |
| 3 | VPP |
| 4 | RESET |
| 5 | GND |
| 6 | PWR |



3.3.12 Full-Size PCI Express Mini Card Slot (CN8)

The eBOX100B supports one full-size PCI-Express Mini Card slot. CN8 is applying for PCI-Express comply with PCI-Express Mini Card Spec. V1.2. Users can install WLAN/WWAN cards into this slot.

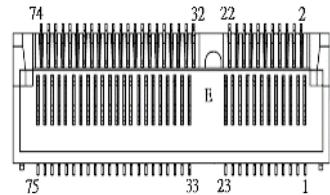
| Pin | Signals | Pin | Signals |
|-----|-------------------|-----|-----------|
| 1 | WAKE# | 2 | +3.3VSB |
| 3 | NC | 4 | GND |
| 5 | NC | 6 | +1.5V |
| 7 | CLKREQ# | 8 | NC |
| 9 | GND | 10 | NC |
| 11 | REFCLK- | 12 | NC |
| 13 | REFCLK+ | 14 | NC |
| 15 | GND | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | NC | 20 | W_DISABLE |
| 21 | GND | 22 | PERST# |
| 23 | PE_RXN3/mSATA_RXP | 24 | +3.3VSB |
| 25 | PE_RXP3/mSATA_RXN | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMB_CLK |
| 31 | PE_TXN3/mSATA_TXN | 32 | SMB_DATA |
| 33 | PE_TXP3/mSATA_TXP | 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 | NC | 52 | +3.3VSB |



3.3.13 M.2 2230 Key E slot (CN3)

The system comes with one M.2 Key E socket (PCIe & USB2.0)

| 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 | GND | 14 | NC |
| 15 | NC | 16 | NC |
| 17 | NC | 18 | GND |
| 19 | GND | 20 | UART_BT_WAKE- |
| 21 | NC | 22 | CNVI_BRI_RSP |
| 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 | SUSCLK (+3.3V Level) |
| 51 | GND | 52 | PERST# (+3.3V Level) |
| 53 | CLKREQ0# | 54 | BT_RF_KILL |
| 55 | PEWAKE0# | 56 | WIFI_RF_KILL |
| 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 | | |

3.3.14 M.2 2280 Key M slot (CN2)

The system comes with one M.2 Key M socket (PCIe x4 GEN3).

| Pins | Signals | Pins | Signals | Pins | Signals | Pins | Signals |
|------|--------------------|------|--------------------|------|--------------------|------|--------------------|
| 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 | | |

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.

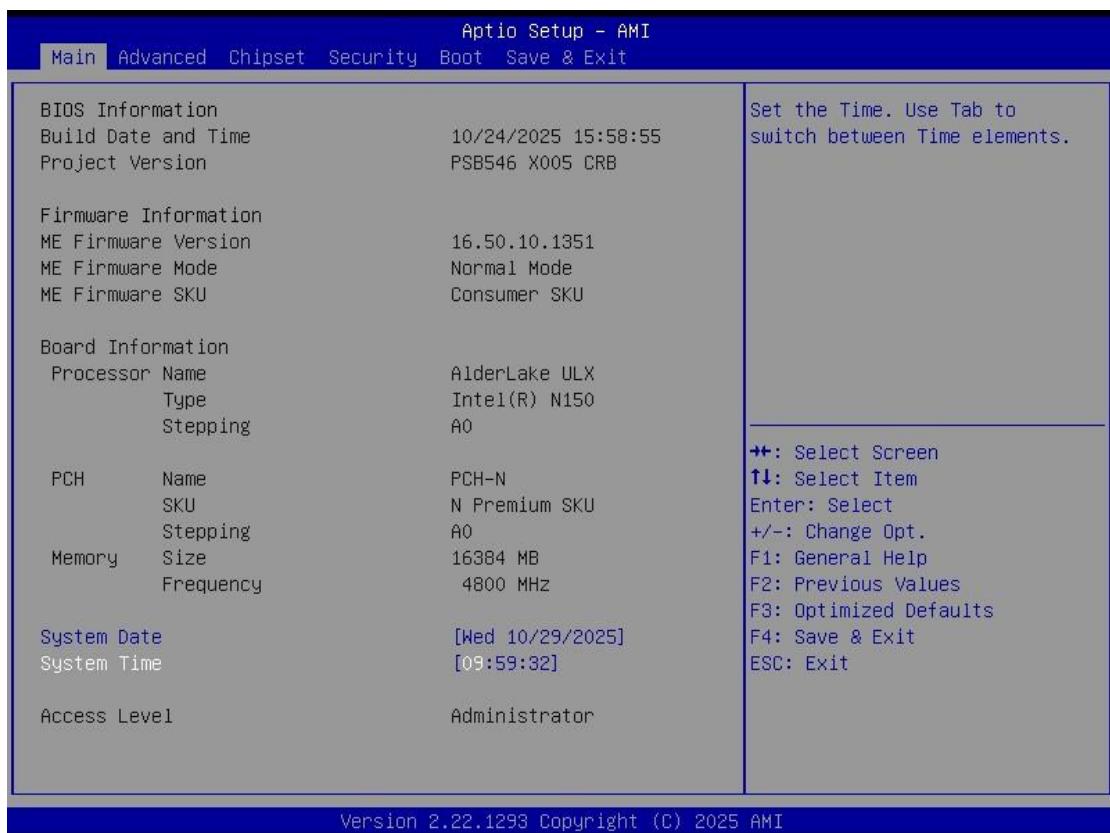


【Note】 : Some of the navigation keys differ from one screen to another.

| 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:

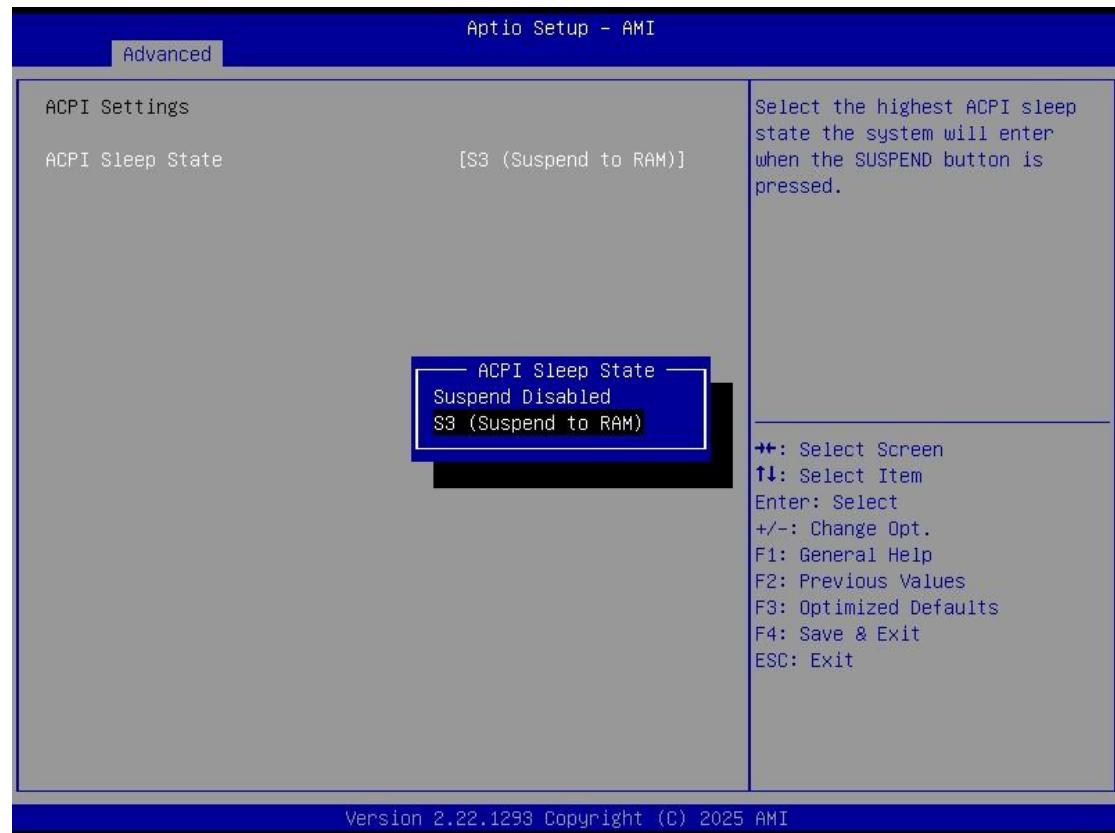
- ▶ ACPI Settings
- ▶ Trusted Computing
- ▶ CPU Configurations
- ▶ Storage Configuration
- ▶ NVMe Configuration
- ▶ F81966 Super IO Configuration
- ▶ Hardware monitor
- ▶ USB Configuration
- ▶ Device Configuration
- ▶ Smart Ignition Management

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.



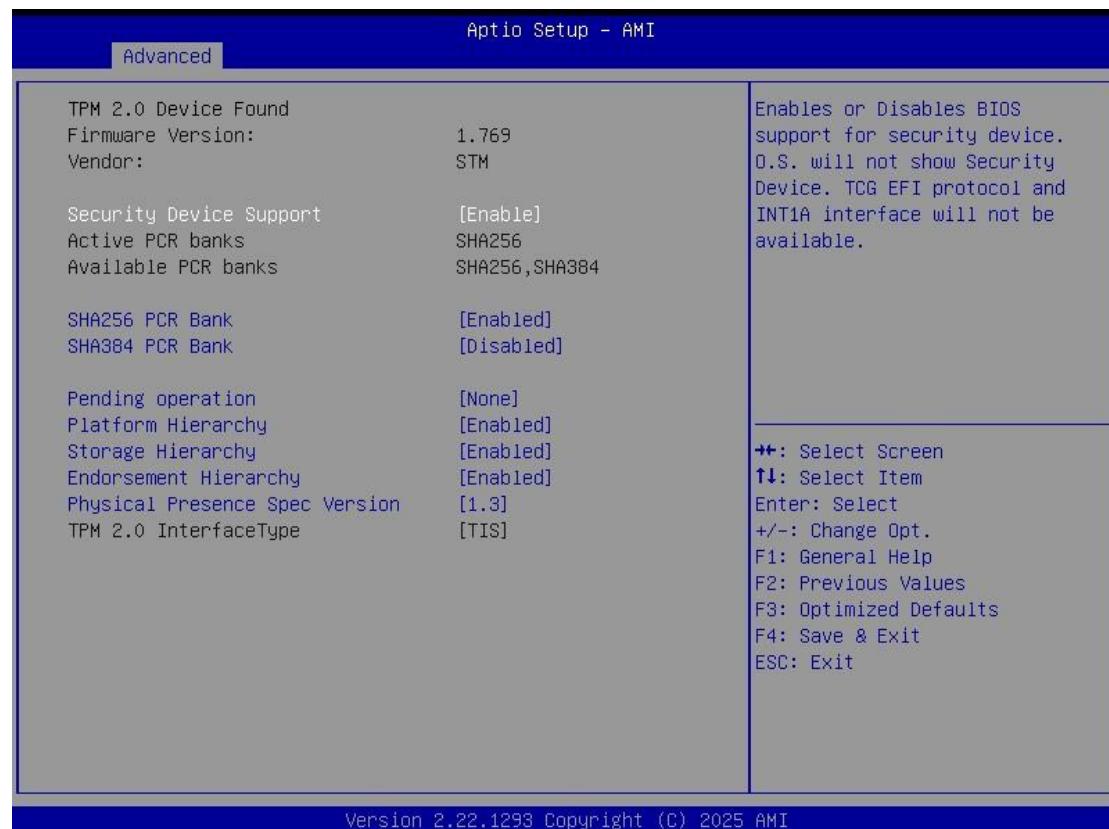
ACPI Sleep State

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

The default is S3 (Suspend to RAM).

Trust Computing

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

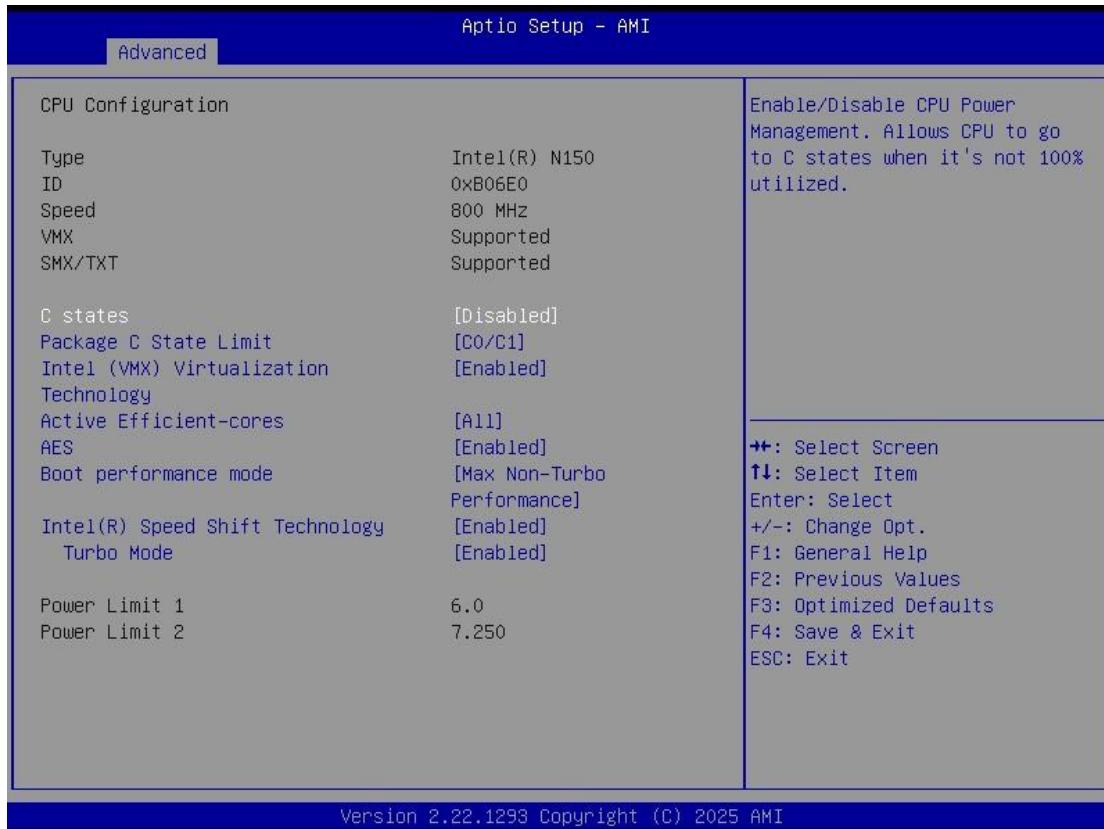


Security Device Support

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

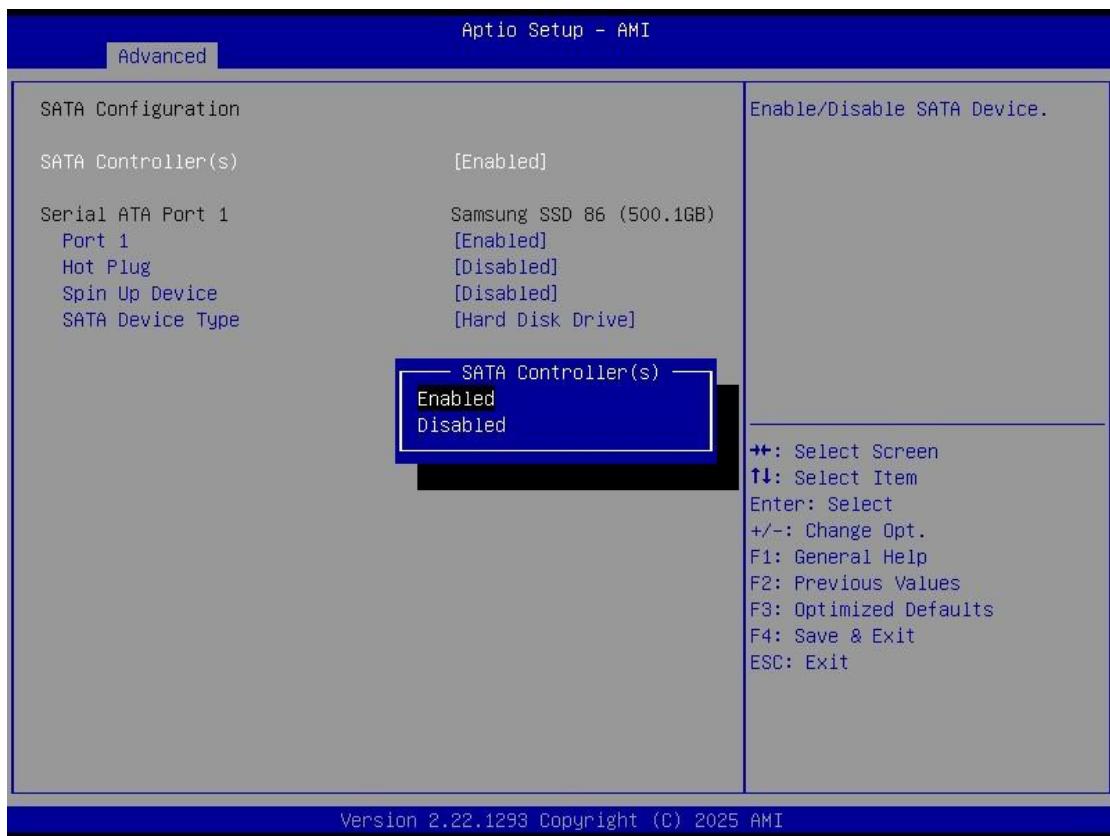
Enable/Disable processor Turbo Mode (requires EMTTM enabled too).

When Turbo Mode is enabled, the system's operating temperature can only reach 50°C.

Storage Configuration

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



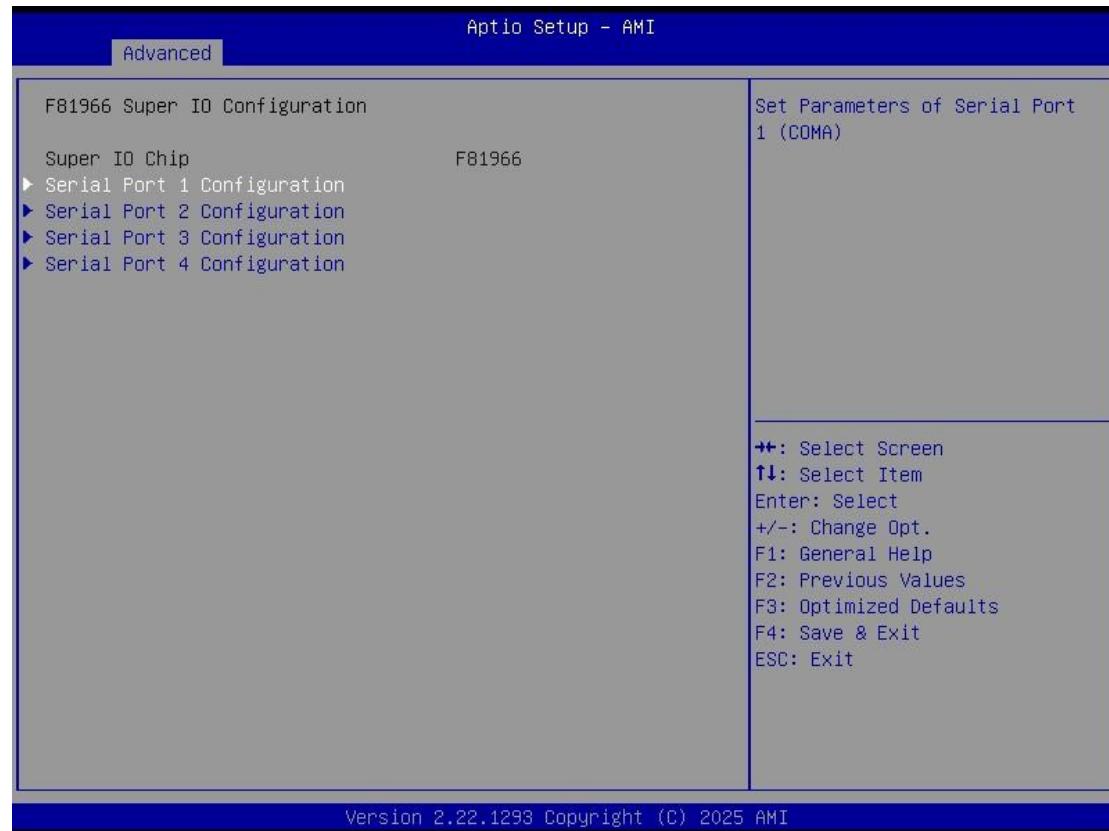


SATA Controller

Highlight this item to enable or disable SATA Controller.

F81966 Super IO Configurations

Use this screen to select options for the F81966 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

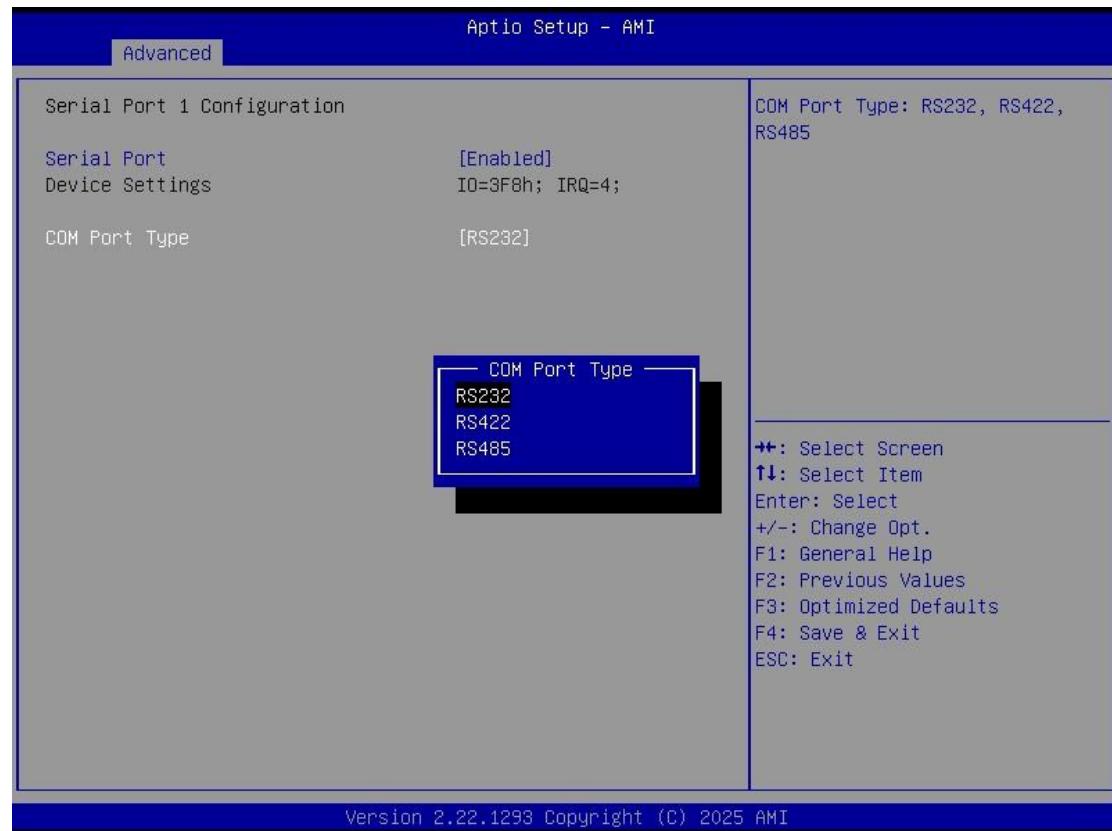


Serial Port 1~4 (COM1~4) Configurations

Use these items to set parameters related to serial ports COM1-4 (RS232/422/485)

Serial Port 1

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



Serial Port

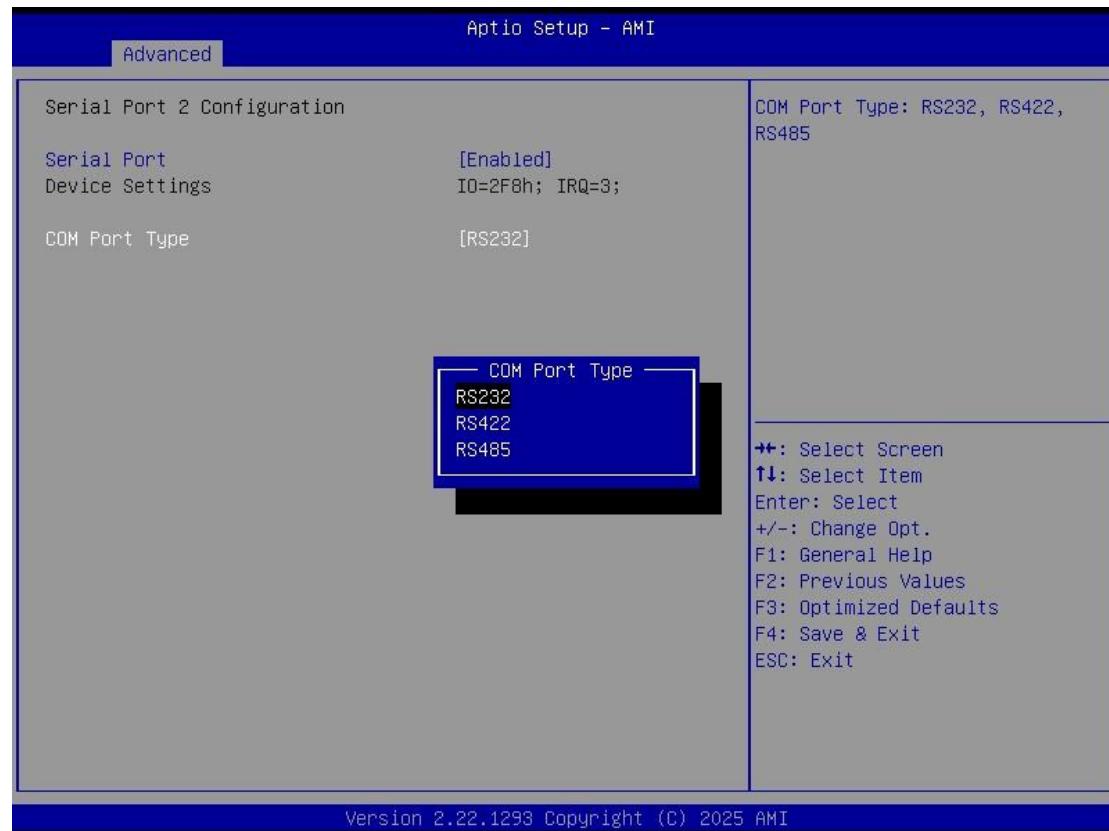
Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

COM Port Type

Use this item to set RS-232/422/485 communication mode. Default is RS232.

Serial Port 2

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



Serial port

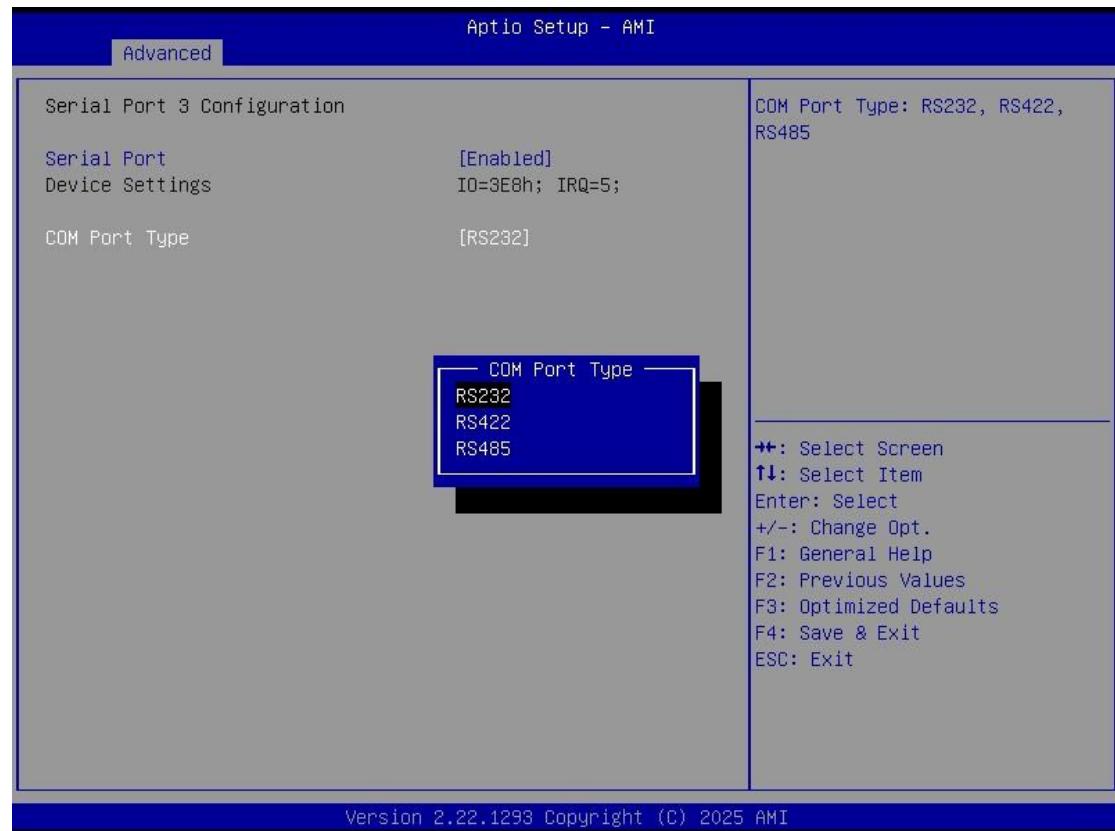
Enable or disable serial port 2. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

COM Port Type

Use this item to set RS-232/422/485 communication mode. Default is RS232.

Serial Port 3

Use this to set parameters of COM 3 (RS232/422/485).



Serial port

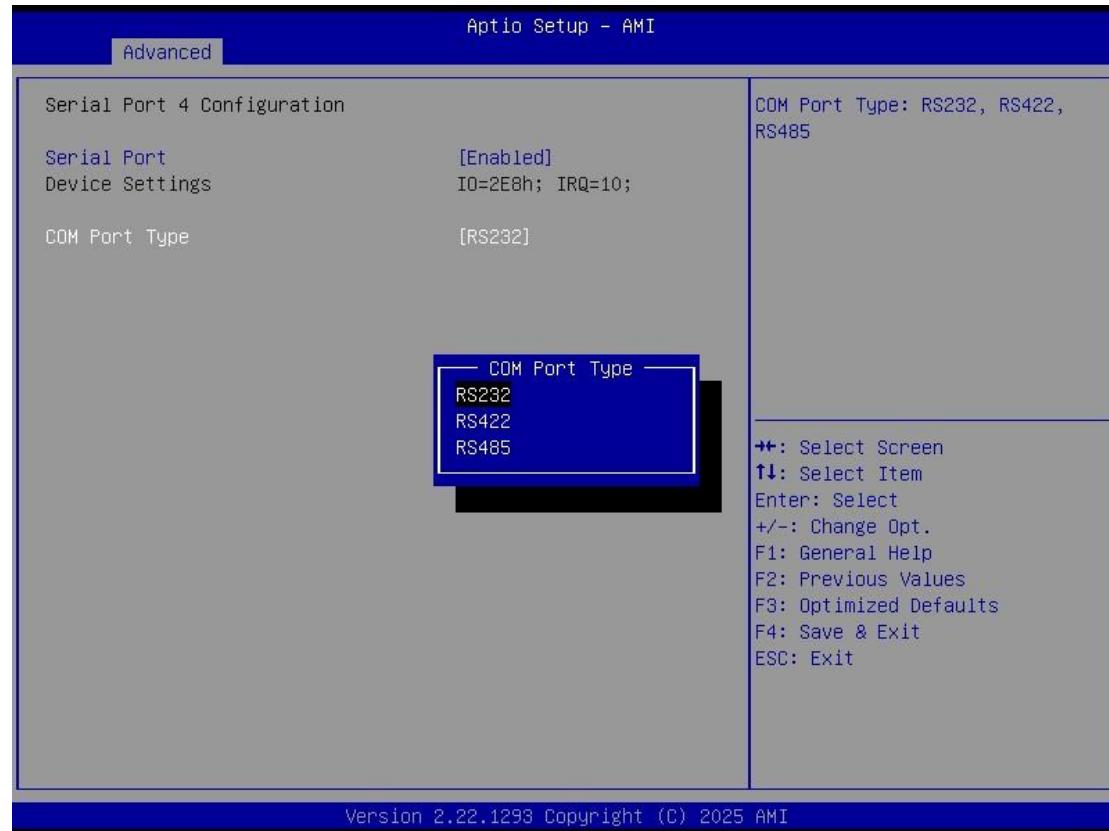
Enable or disable serial port 3. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

COM Port Type

Use this item to set RS-232/422/485 communication mode. Default is RS232.

Serial Port 4

Use this to set parameters of COM 4 (RS232/422/485).



Serial port

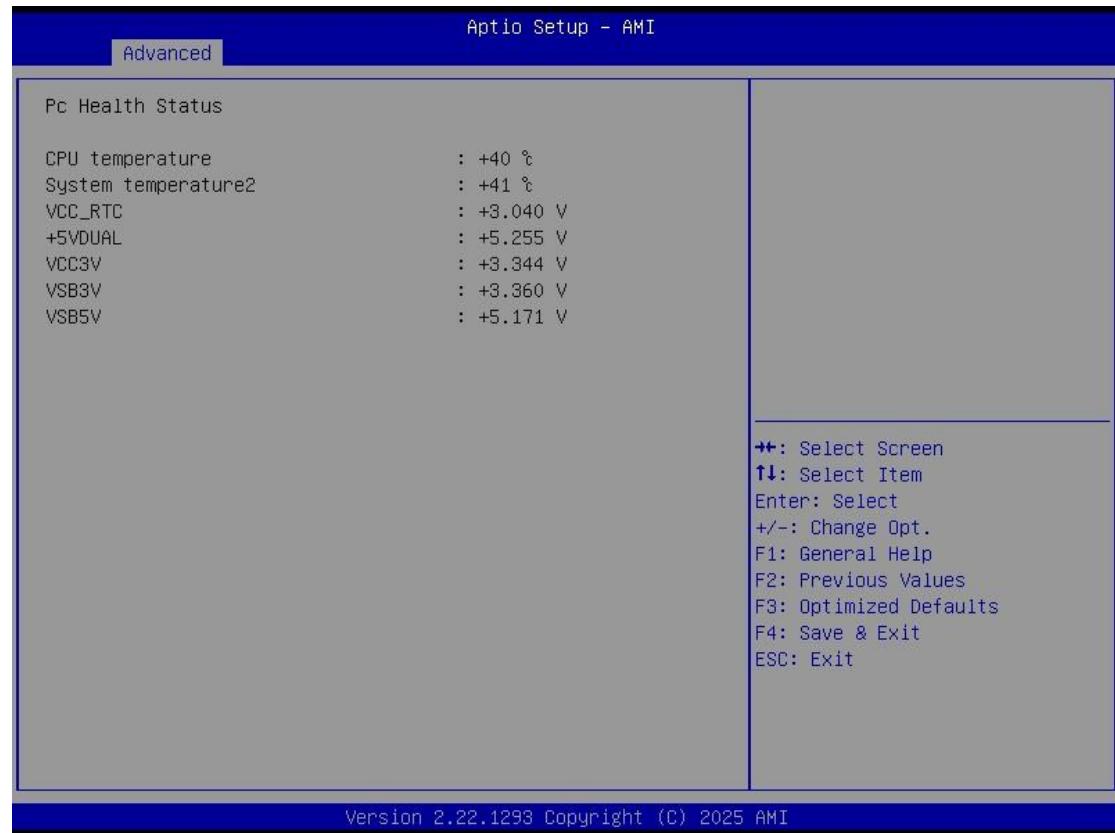
Enable or disable serial port 2. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

COM Port Type

Use this item to set RS-232/422/485 communication mode. Default is RS232.

Hardware Monitor

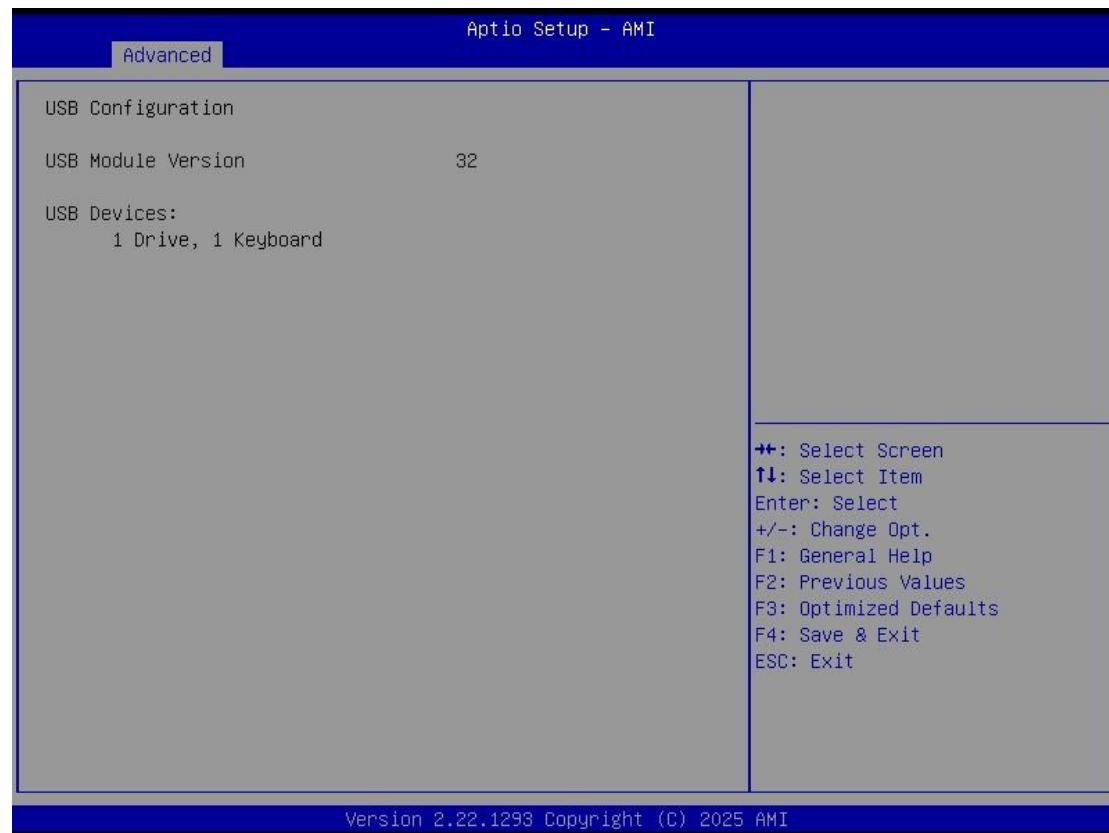
This screen monitors hardware health status.



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

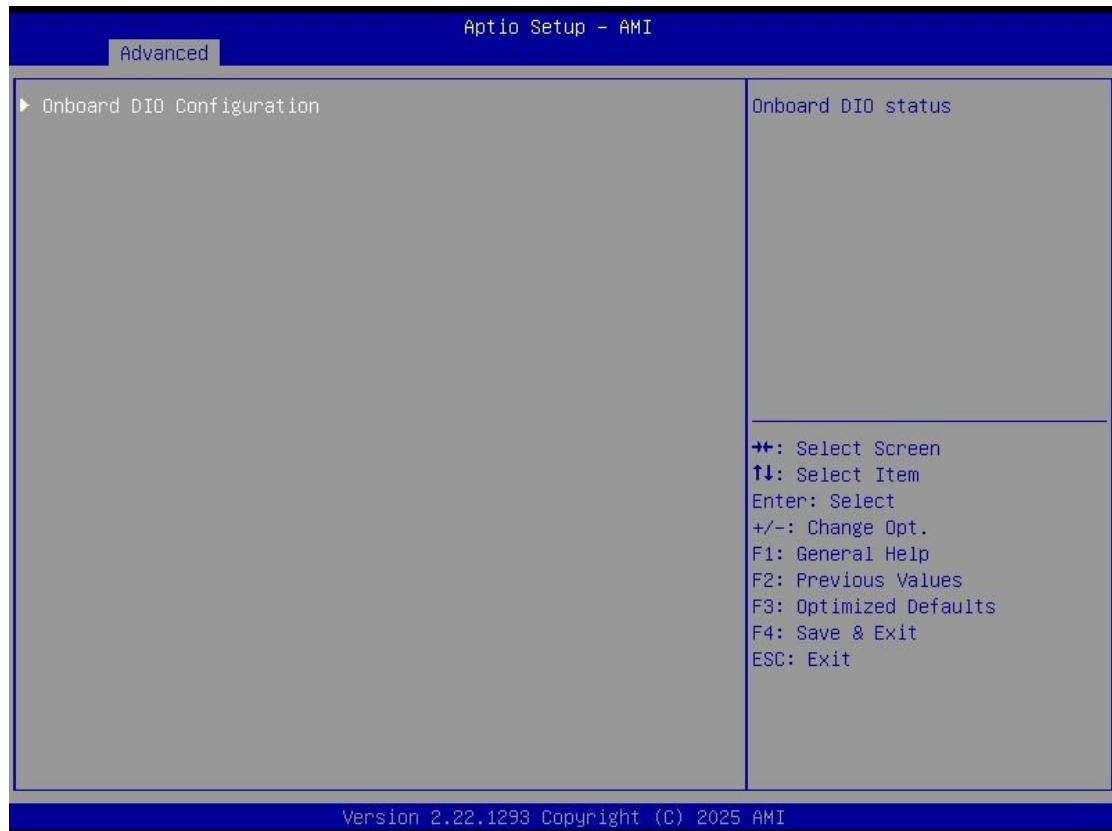
USB Configurations

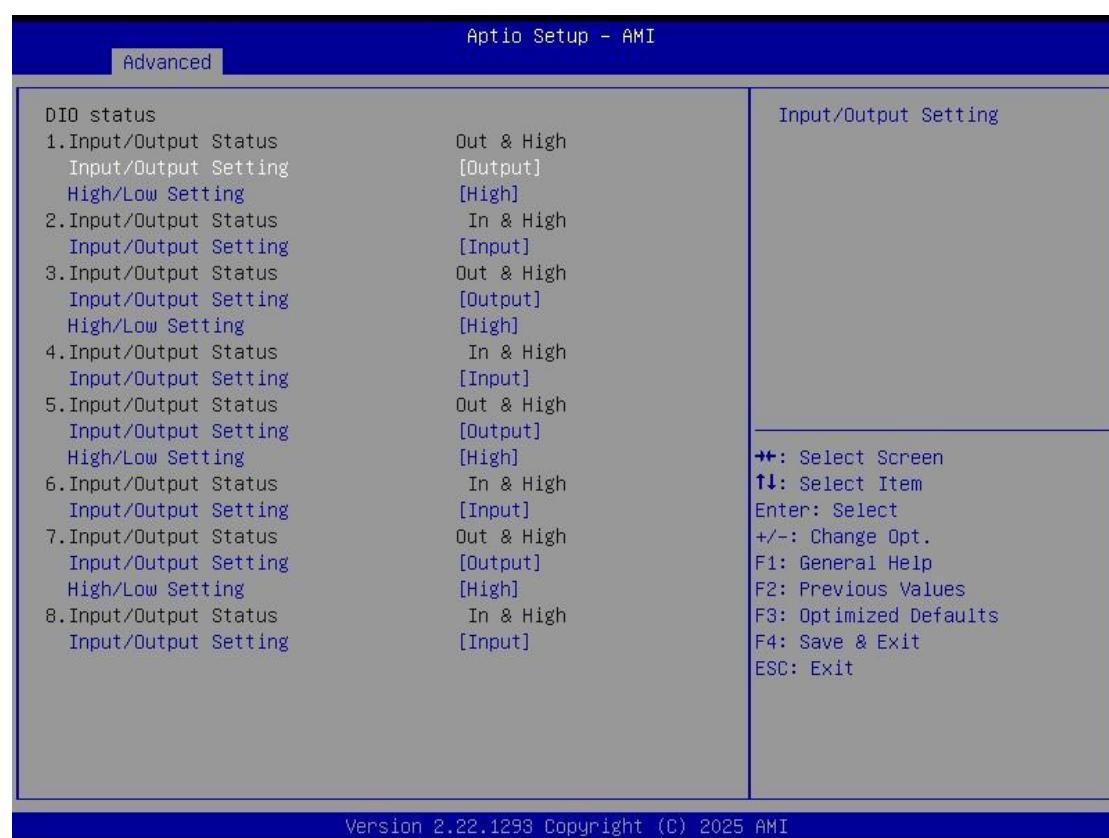
Display all detected USB devices.



Device Configurations

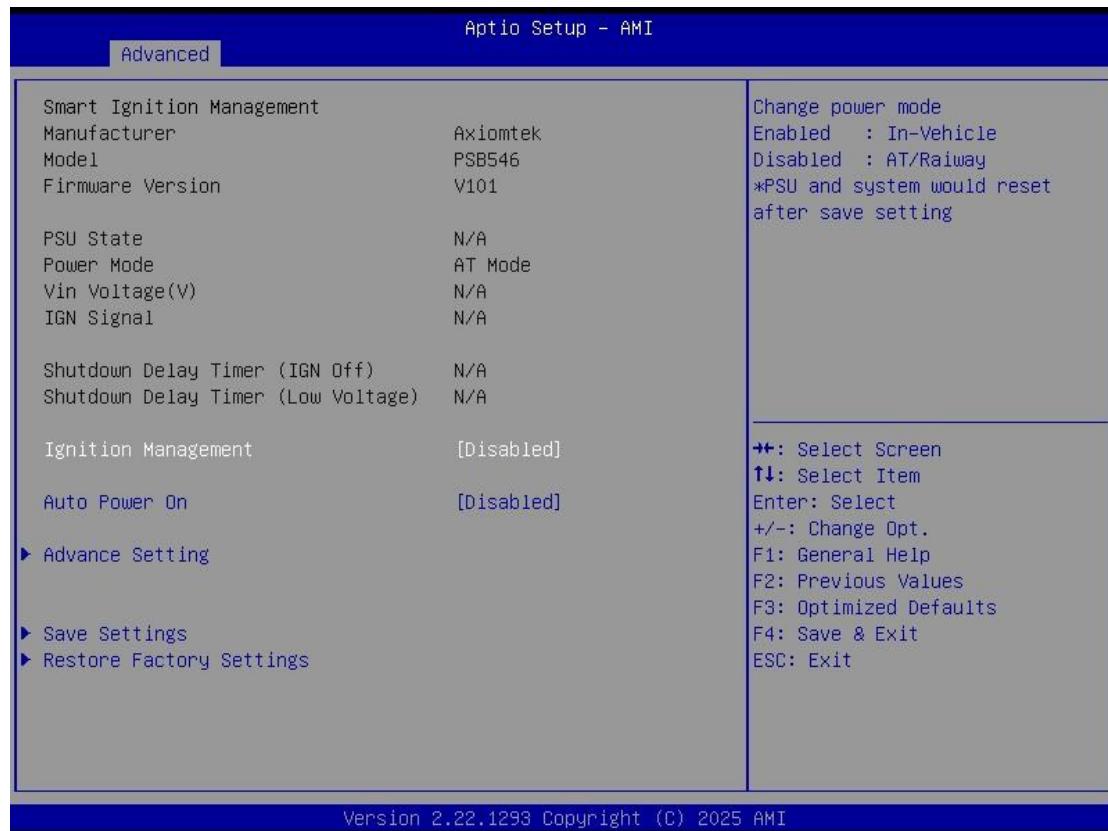
Users can use this screen to configure Device configurations.





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 3-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> |
| 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. |



B4

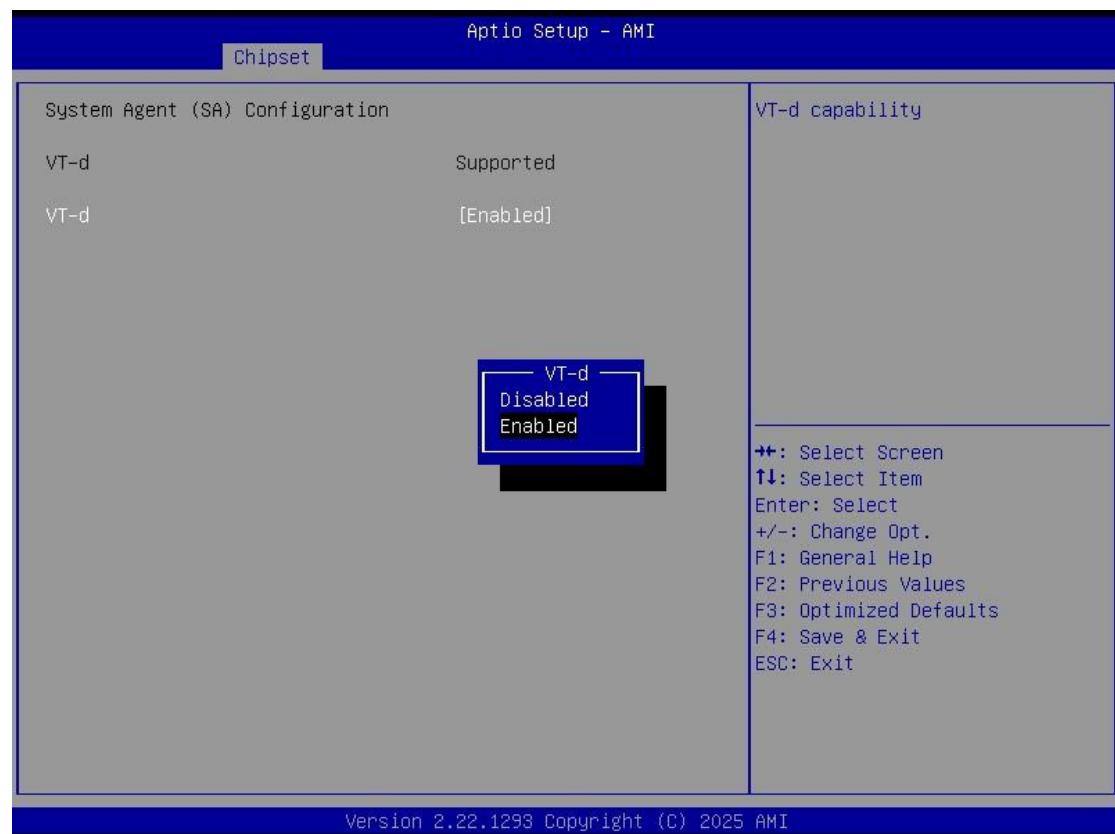
| BIOS menu item | Description |
|------------------------------------|---|
| Activate Voltage Trigger | The system only turns on when the voltage delivered by the power source is higher than the value you set here. |
| Low Voltage Trigger | The system will begin countdown stage once voltage drops below the value you set here. If the power source voltage does not come back above the value of [Activate Voltage Trigger] within the time you set for [Shutdown Delay Time (Low Voltage)], the system will shut down and remain off. |
| Shutdown Delay Timer (Low Voltage) | The counter will be activated once power source voltage drops below the value defined in [Low Voltage Trigger]. The system will be forced to turn off once timer completes countdown. |
| IGN Trigger | Enable [System Turn On Delay] and [Shutdown Delay] will be triggered by IGN. Disable IGN signal will not affect any power management. |

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:

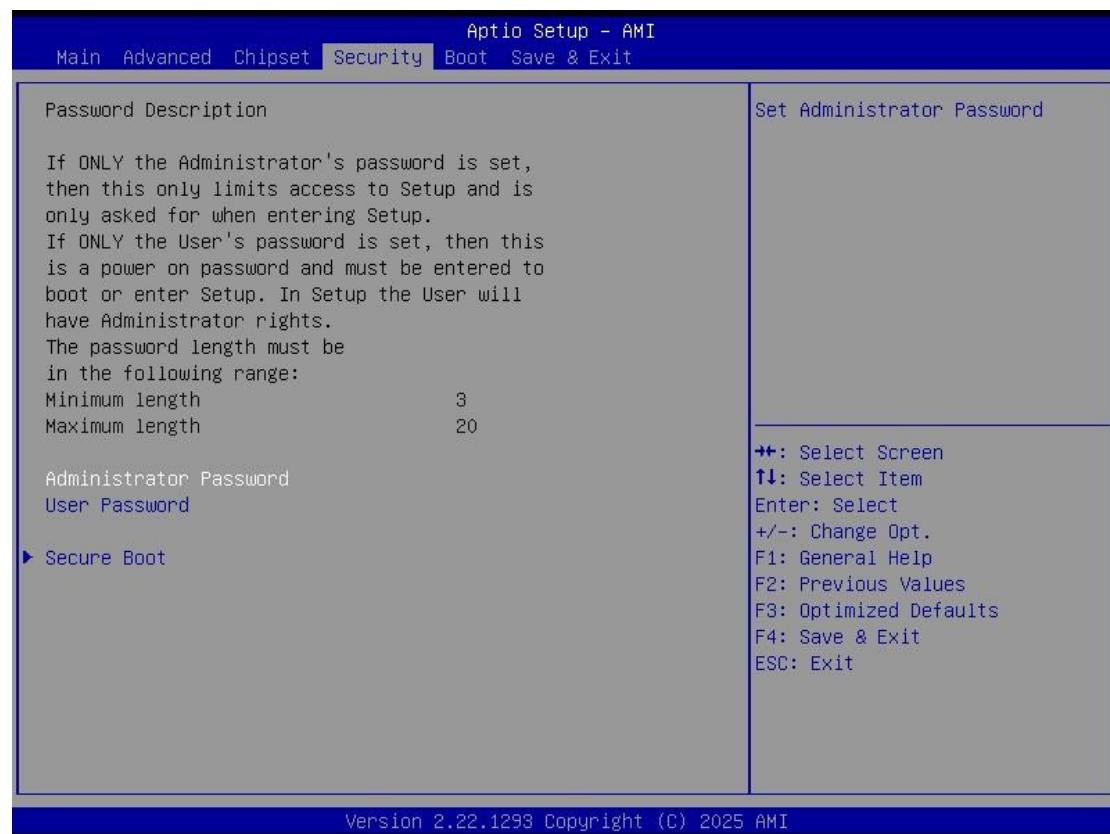
- ▶ System Agent (SA) Configurations

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



VT-d
VT-d capability

Security Menu



Administrator Password

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

User Password

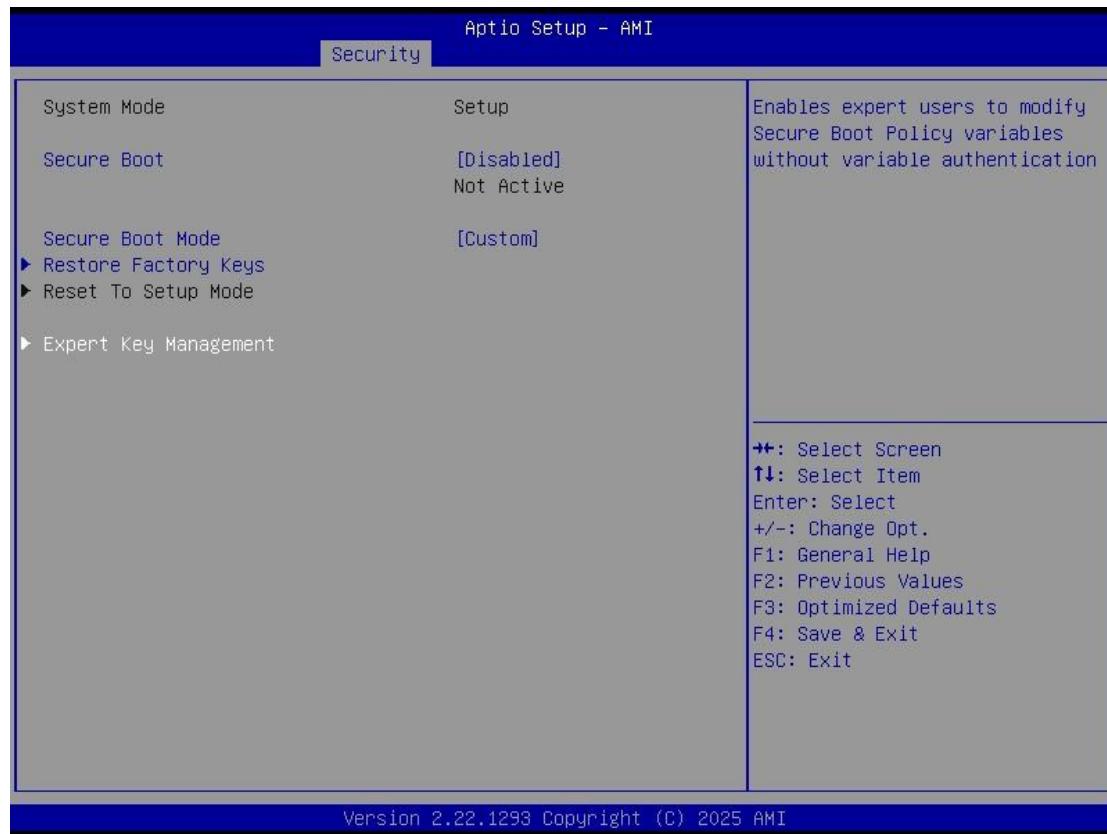
This item indicates whether a user password has been set (installed or uninstalled).

Secure Boot

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

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.

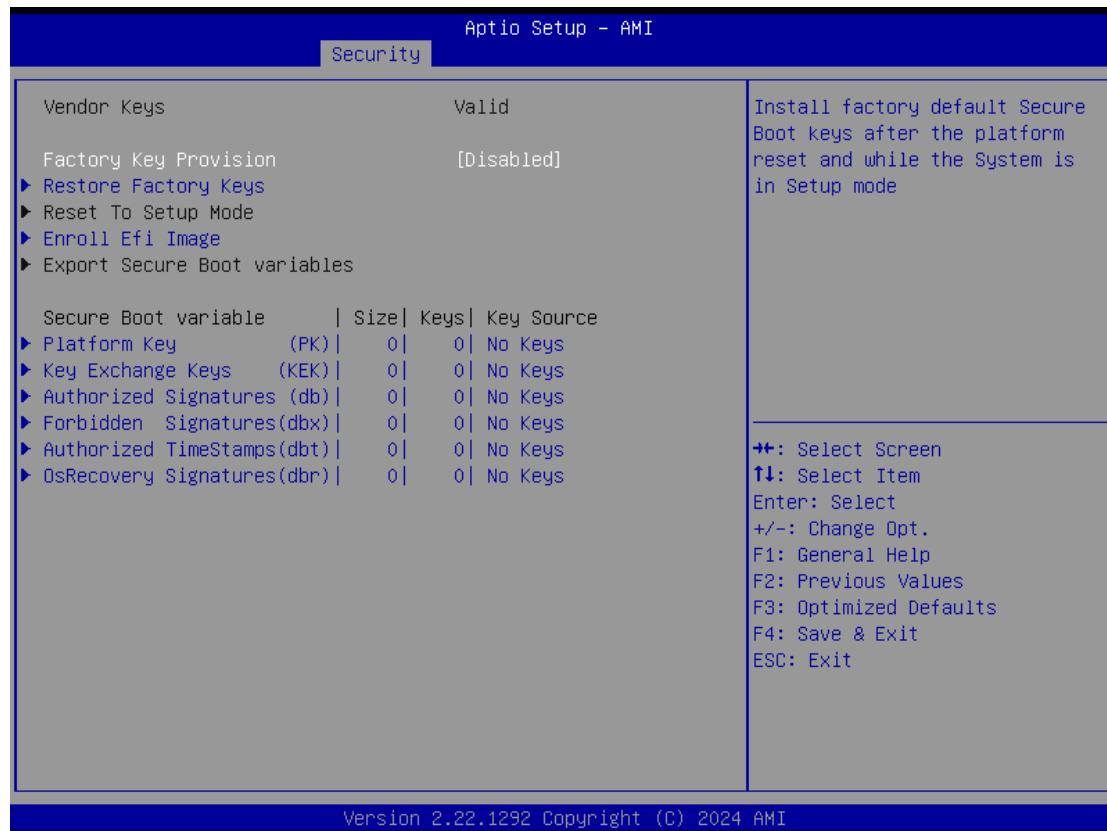
Expert Key Management

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

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)

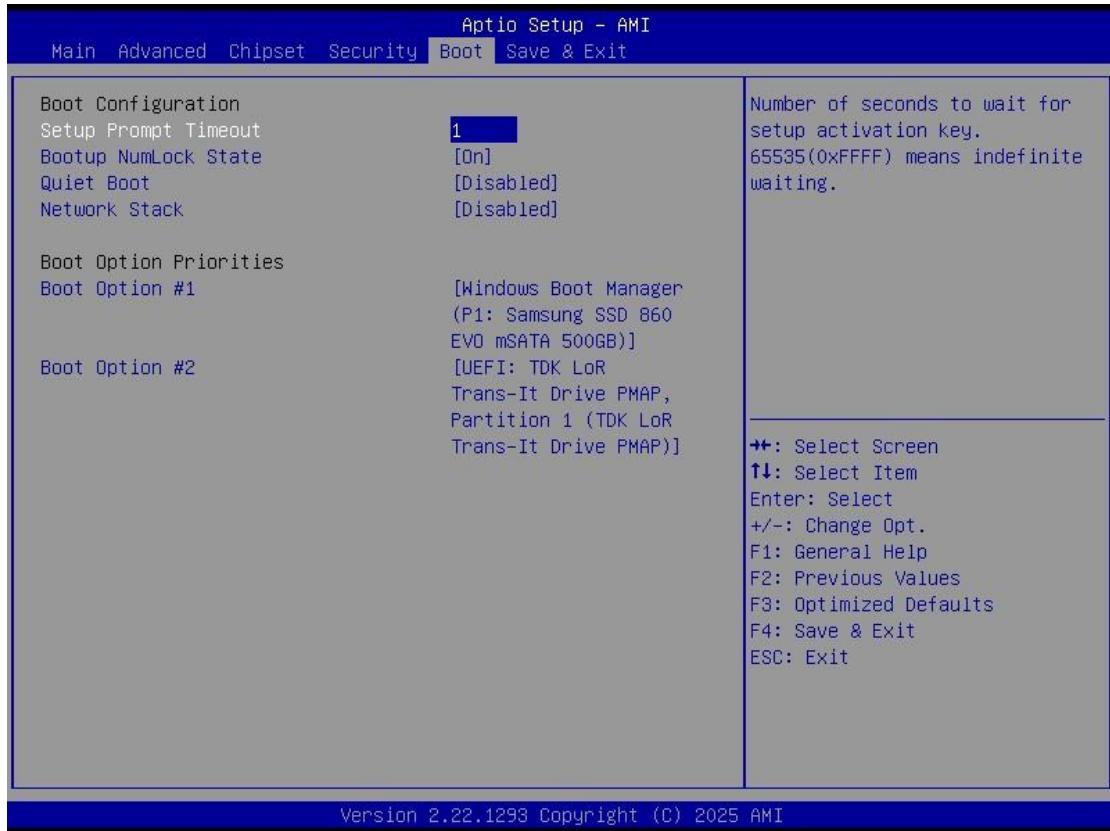
Authorized TimeStamps (dbt)

OsRecovery Signatures (dbr)

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

4.6 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

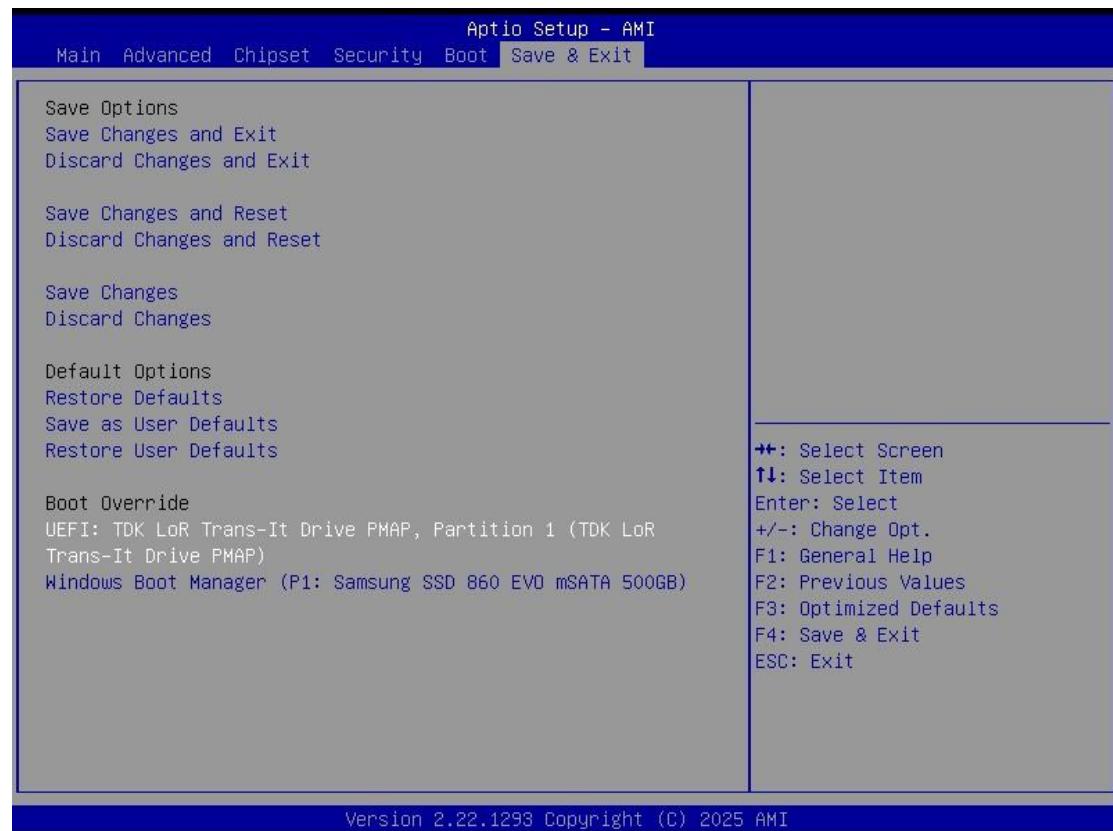
Enable/Disable UEFI Network Stack. Default setting is Enabled

Boot Option Priorities

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

4.7 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.