
ARTS-7550

IP69K Waterproof Fanless Computer with
Intel® Amston Lake CPU

User Manual

Version 1.0



Revision History

Version	Release Time	Description
1.0	July, 2026	Initial release

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Copyright Notice

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Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this document may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Declaration of Conformity

CE

The CE symbol on the computer indicates that it is in compliance with the directives of the European Union (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH –Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

Important Safety Instructions

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
10. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user manual.
 - e. The equipment has been dropped or damaged.
 - f. The equipment has obvious signs of breakage.
11. Keep this User Manual for later reference.

Product Heat



The computer generates heat during operation. Contact the computer's chassis with your body could cause discomfort or even a skin burn.

Warning

The Box PC and its components contain very delicately Integrated Circuits (IC). To protect the Box PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Box PC from the power source when you want to work on the inside.
2. Use a grounded wrist strap when handling computer components.
3. Place components on a grounded antistatic pad or on the bag that came with the Box PC, whenever components are separated from the system.

Replacing Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash can. It must be disposed of in accordance with local regulations concerning special waste.

Technical Support

If you have any technical difficulties, please consult the user manual first at:

<http://www.arbor-technology.com>

Please do not hesitate to e-mail our customer service when you still cannot find out the answer.

E-mail: info@arbor.com.tw

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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Chapter 1

Introduction

1.1. The Computer

- IP69K-rated dustproof and waterproof
- Intel® Amston Lake x7433RE processor
- Rugged -40°C to 70°C fanless operation
- 2 x 2.5GbE LAN ports via M12 X-coded
- 2 x isolated CAN FD, 1 x isolated RS-232, and 1 x isolated RS-232 (optional)/422/485 via one combo M12 A-coded connector
- 1 x M.2 B-Key w /1 x nano SIM card slot for Wi-Fi/BT/4G/5G/GPS
- 1 x HDMI waterproof connector
- 8V to 35V DC input with built-in ignition power control
- E-Mark compliant & MIL-STD-810H Shock/ Vibration certified
- Support dTPM2.0 & Windows® 11



1.2. About this Manual

This manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about the description herein, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

1.3. Specifications

System	
CPU	Intel® Amston Lake x7433RE processor (Quad-Core SoC, 3.4GHz, TDP 9W)
Memory	1 x DDR5 SO-DIMM socket, support 4800MHz up to 16GB
Graphics	Integrated Intel® UHD Graphics
LAN Chipset	2 x Intel® i226-IT 2.5GbE controller
TPM	Support dTPM 2.0
I/O Ports	
Serial Port / CAN Bus	2 x isolated CAN FD, 1 x isolated RS-232, and 1 x isolated RS-232 (optional)/422/485 ports via one combo M12 A-coded connector
USB Port	2 x USB 2.0 ports via one M12 A-coded connector
LAN	2 x 2.5GbE LAN ports via two M12 X-coded connectors
Display	1 x HDMI waterproof connector, resolution up to 3840x2160@60Hz
Expansion Bus	1 x M.2 B-Key 2242/3042/3052 (PCIe Gen3 x1 + USB3.0 + USB2.0), w/ 1 x nano SIM card slot for 4G/5G/GPS module <i>*Outside accessible SIM slot</i>
Sensors	Onboard G-Sensor / Gyroscope combining accelerometer (G-Sensor) and Gyroscope
Storage	
Type	1 x M.2 M-key 2280 (SATA3 + PCIe Gen3 x2) for storage
Power Requirement	
Power Input	8V to 35V DC input with ignition power control via one M12 L-coded connector
Environmental	
Operating Temperature	-40°C ~ 70°C (-40°F ~ 158°F)
Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
Operating Humidity	10% ~ 90%, non-condensing
Vibration	MIL-STD-810H, Method 514.8, Category 4
Shock	MIL-STD-810H, Method 516.8, Procedure I
Mechanical	
Button	1 x Waterproof power button with LED
SIM Slot	1 x Outside accessible SIM card slot (waterproof)
Antenna	4 x Antenna Holes
Mounting	Wall-mount (standard accessories)
Weight	1.2 kg

Introduction

Dimensions (W x H x D)	106 x 78 x 159 mm (4.17" x 3.07" x 6.26")
Waterproof	IP69K Waterproof
Qualification	
Certification	CE/FCC Class A, E-Mark compliant
OS Support	
Operating System	Windows® 10 / Windows® 11 / Linux Ubuntu 22.04

1.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:



IP69K Waterproof Fanless Computer:
ARTS-7550



Accessory Box that contains the following items:

- 1 x Information Card
- 1 x Wall Mounting Bracket Kit
- 1 x Thermal-Pad for RAM
- Screws for SSD/Wall Mount

1.5. Ordering Information

1.5.1. Standard Accessories

WMK-7550

Wall Mounting Bracket Kit for ARTS-7550 Series



1.5.2. Optional Accessories

The following items are normally optional, but some vendors may include them as a standard package, or some vendors may not carry all the items.

PAC-60W8A-MW-ES	12V/5A, 60W AC/DC Adapter, -30~+70°C, w/ EU & USA Power Cord	
CBL-M12L5-PWR-200CM	Power Cable, M12 5P(L-coded) TO 3P OPEN, Length: 200CM	
CBL-M12-7550	ARTS-7550 M12 cable kit, including: 2 x CBL-M12X8M-RJ45-50CM 1 x CBL-M12A8M-2U2TA-50CM 1 x CBL-M12A17M-3DB9-50CM	
WiFi-MT1440	MediaTek MT7921AUN M.2 B-Key Wi-Fi 6E+BT Module Kit (w/ 2 x 25cm RF Cable)	
ANT-P15	IP67 2.4G/5G/6G WIRELESS ANTENNA KIT W/ CABLE FOR WiFi-MT1440	

CBL-M12-7550 (Cable Kit Details)

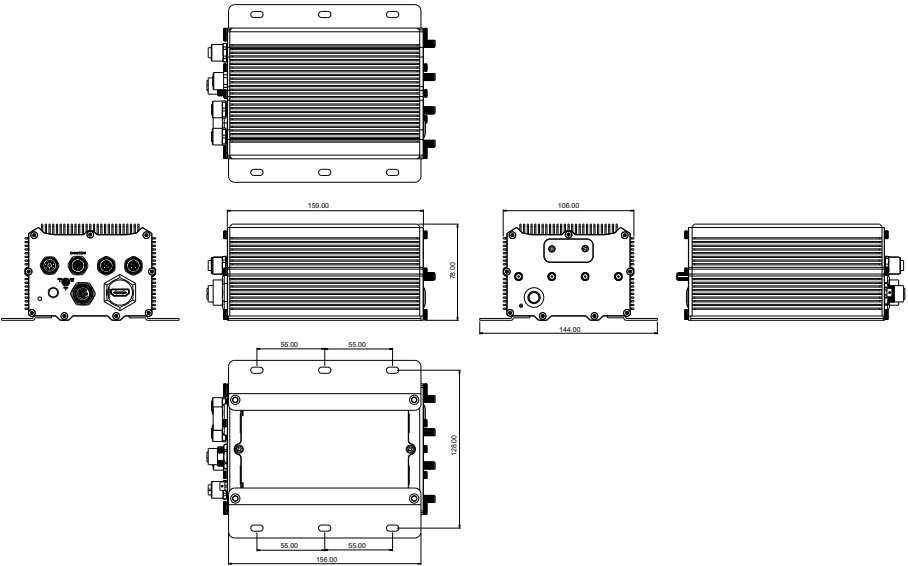
CBL-M12X8M-RJ45-50CM	M12(8-pole-X-coded) to RJ45, CAT6, Length : 50CM	
CBL-M12A8M-2U2TA-50CM	M12 (8-pole-A-coded) to 2x USB 2.0 type A (female), Length: 50CM	
CBL-M12A17M-3DB9-50CM	M12 (17-pole-A-coded) to 3x DB9 for COM1/ COM2/CAN FD 1&2 (Male), Length: 50CM	

Chapter 2

Getting Started

2.1. Dimensions

The following illustration shows the dimensions of the computer, with the measurements in width, depth, and height called out. (Unit: mm)



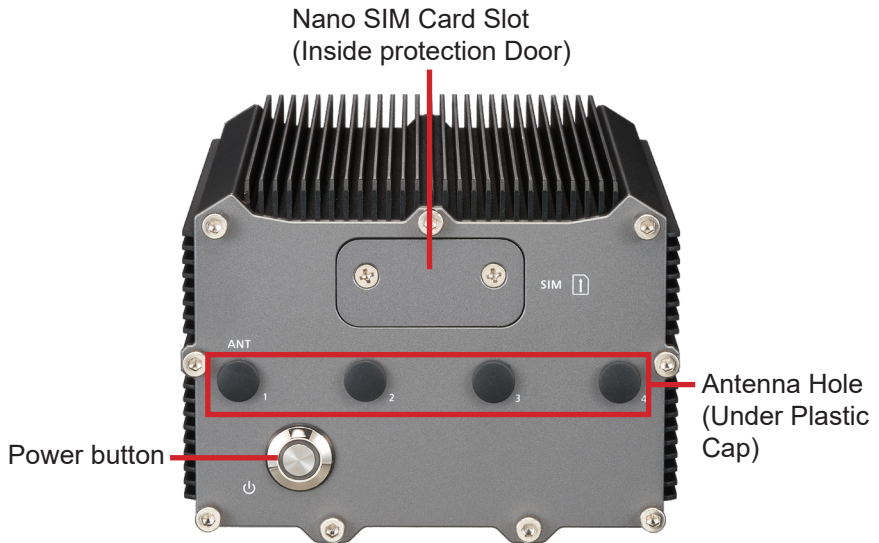
2.2. Take A Tour

Front View



No.	Connector	Description
①	M12 DC-in with ignition power control	M12 L-coded 8V to 35V DC input with built-in ignition power control
②	M12 X-coded Rthernet	2.5 GbE Ethernet via Intel I226 controller
③	M12 A-coded CAN/COM	2 x isolated CAN FD, and 1 x isolated RS-232, and 1 x isolated 422/485
④	M12 A-coded USB2.0	The USB 2.0 ports offer up to 480MB/s bandwidth and are backward compatible with USB1.1/1.0
⑤	HDMI	HDMI waterproof connector, resolution up to 3840 x 2160 (4K) @ 60Hz
⑥	Exhaust Valve	To exhaust the air through this unit when it is needed

Rear View



2.3. Driver Installation Notes

To install the drivers, please visit our website at www.arbor-technology.com and download the driver pack from the **Software Download**.

Chapter 3

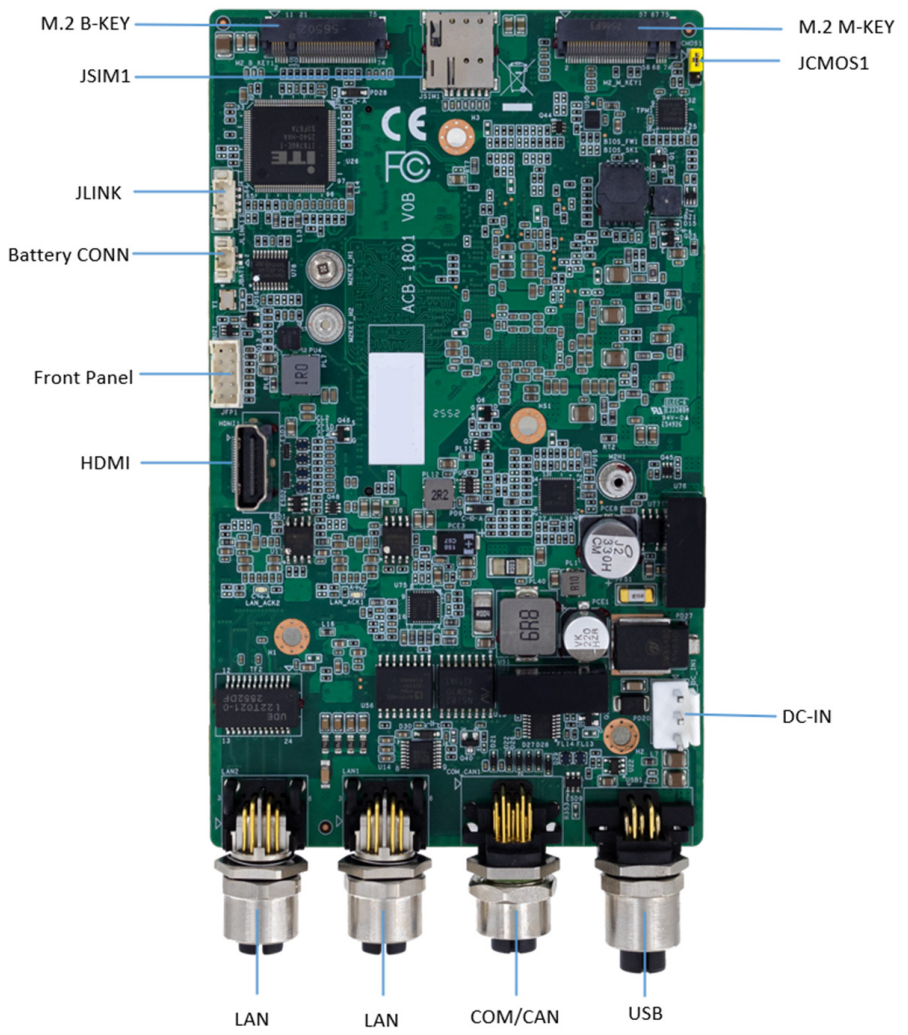
System Configuration

3.1. Board Layout

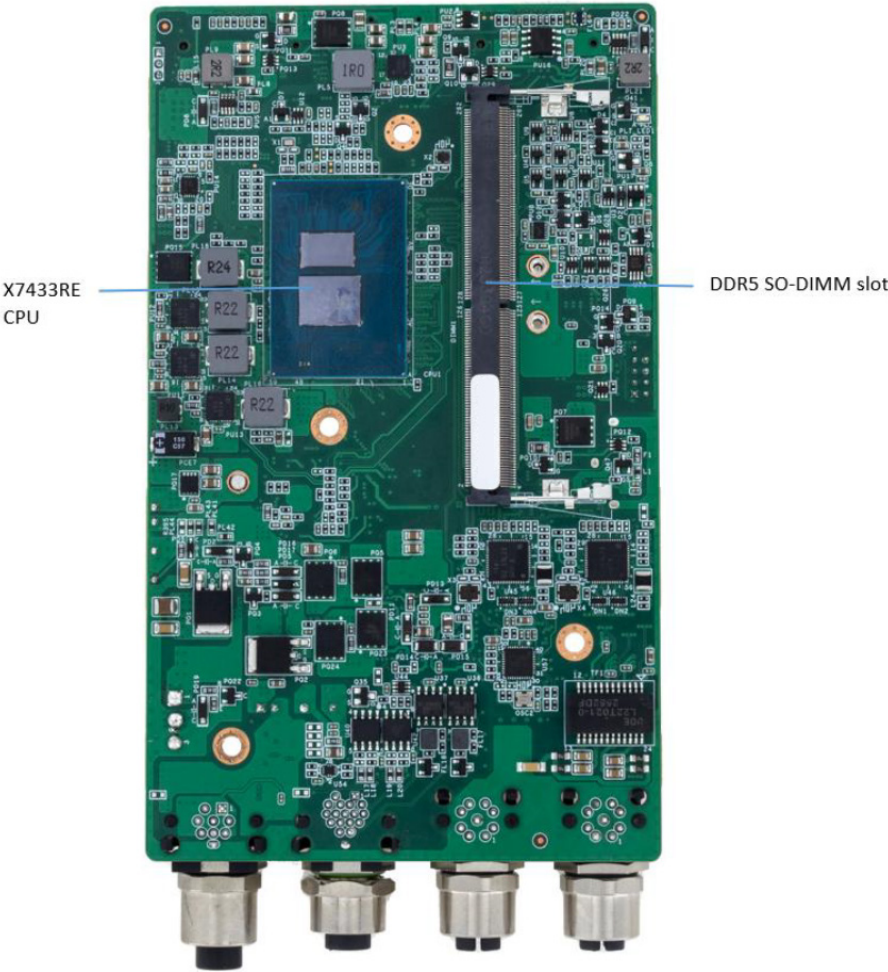
The engine of the computer is constructed by a main board. Following in this section you will be guided through the main board of the computer.

3.1.1. Main Board

Board Top



Board Bottom



3.2. Jumpers and Connectors

The Main board comes with some connectors to join devices and some jumpers to alter the computer's hardware configuration. The following in this chapter will explicate these components.

3.2.1. Jumpers

JCMOS1

Function: Clear CMOS Settings

Jumper Type: Onboard 1x3-pin header



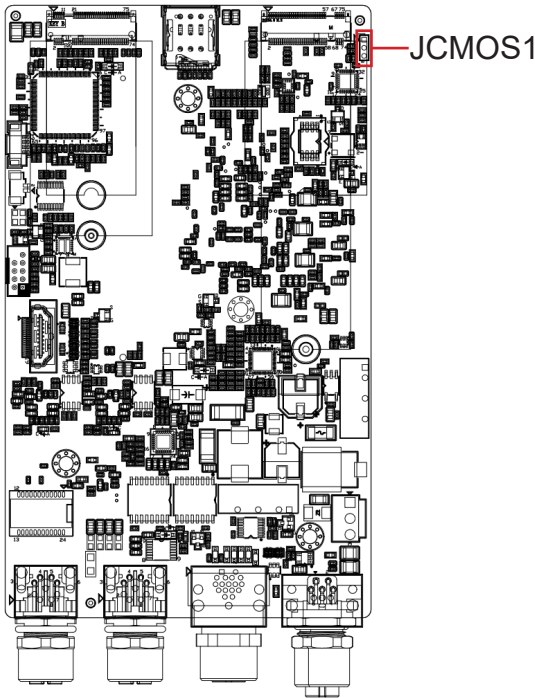
Setting: Short pin 1 and pin 2 for Normal.
(Default)



Short pin 2 and pin 3 for clear CMOS.



Board Top

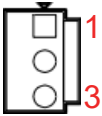


3.2.2. Connectors

DC-IN

Function: DC Input Connector

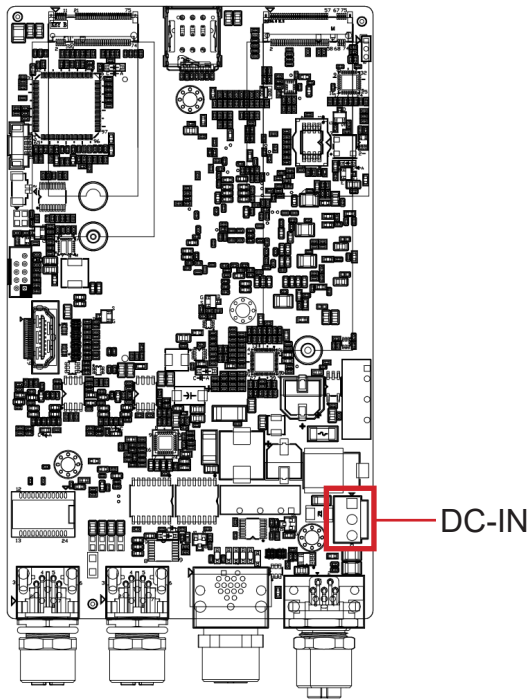
Connector Type: Onboard 3-pin connector



Setting:

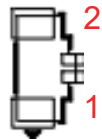
Pin	Description
1	DC-IN
2	GND_F
3	P_+IGNITION

Board Top



Battery CONN

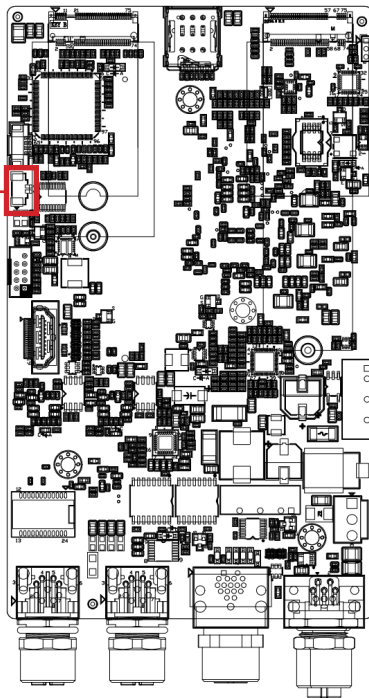
Function: Battery connector
Connector Type:



Setting:

Pin	Description
1	GND
2	VBAT_J

Battery CONN



Front Panel

Function: Front Panel setting

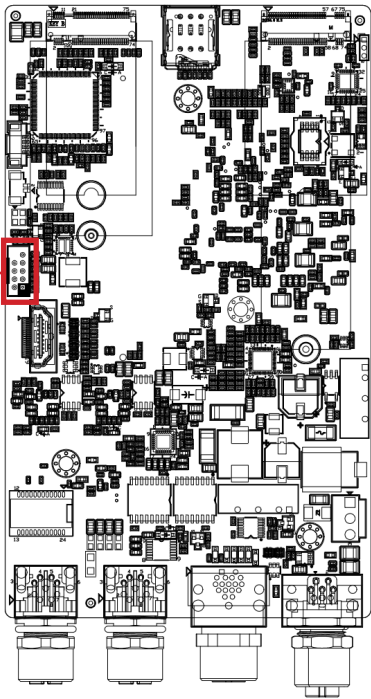
Connector Type:



Setting:

Pin	Description	Pin	Description
1	NC	2	P5VSB
3	NC	4	PWRLED#
5	NC	6	PWRBTN_N
7	NC	8	GND
9	NC		

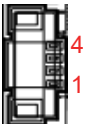
Front Panel



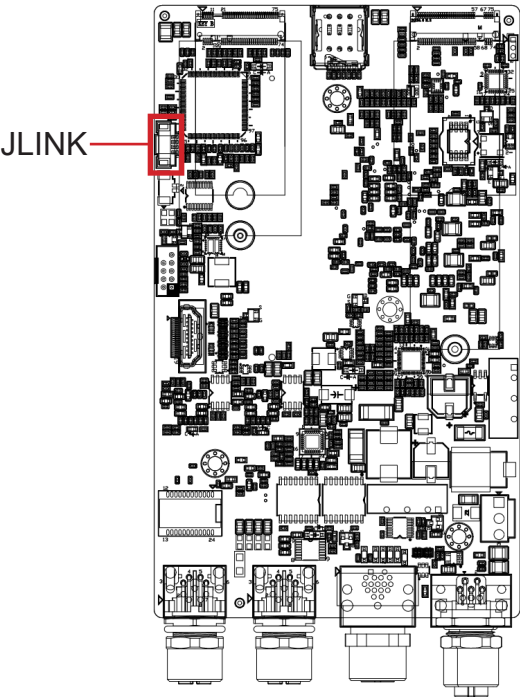
JLINK

Function: MCU Burning Port

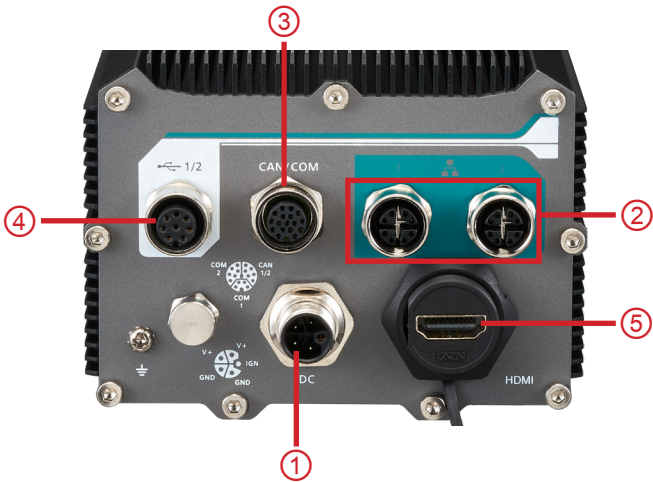
Connector Type:



Setting:	Pin	Description	Pin	Description
	1	P3V3_A	2	GND
	3	MCU_SWCLK	4	MCU_SWDIO

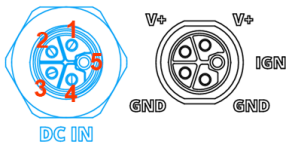


3.2.3. Front Panel Connectors



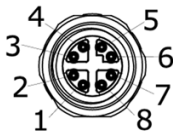
① DC-IN

Pin	Description
1	V+
2	V+
3	V-
4	V-
5	Ignition



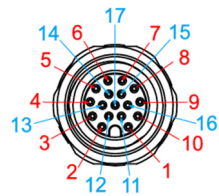
② LAN

Pin	Description	Pin	Description
1	LAN P3	5	LAN P0
2	LAN N3	6	LAN N0
3	LAN N2	7	LAN P1
4	LAN P2	8	LAN N1



③ CAN/COM

	Pin	Description
COM1_RS232	1	COM1_SOUT
	2	COM1_SIN
	11	GND
	12	GND
COM2_RS422/485	3	COM2_TXD485N_C
	4	COM2_TXD485P_C
	5	COM2_RXD422N_C
	6	COM2_RXD422P_C
	13	GND
	14	GND
CAN1/2	7	CAN1H_C
	8	CAN1L_C
	9	CAN2H_C
	10	CAN2L_C
	15	GND
	16	GND
	17	NC



④ USB 2.0

Pin	Description	Pin	Description
1	D1+	5	GND
2	D1-	6	VCC_USB
3	VCC_USB	7	D2-
4	GND	8	D2+



⑤ HDMI

This pin assignments conform to the industry standard.



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Chapter 4

Installation and Maintenance

4.1. Disassembling and Assembling the Computer

4.1.1. Disassembling the Computer

To use onboard jumpers/connectors or to install/remove internal components, you will need to open the computer to access the inside of the computer. Follow through the guide below to disassemble the computer.

1. Position the computer with the bottom side facing up and remove screws securing the chassis as shown below.



2. Then lift the bottom chassis away from the assemble.
3. You are ready to access the components on the main board and make required configurations and connections.



4.1.2. Assembling the Computer

After completing the required hardware installation and jumpers settings, assemble the computer by performing the proceeding steps in reverse order.

4.2. Installing Hardware

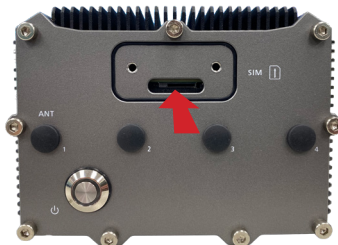
4.2.1. Install/uninstall Nano SIM card

This computer supports Nano SIM card for mobile networking. Follow through the guide below to install a SIM card to this computer

1. Remove the screws on the SIM card slot door.



2. Insert Nano SIM card (Push-insert) into the SIM card slot with correct direction.



SIM card insert direction

To uninstall the SIM card:

Push the central position of SIM card, and pull out SIM card.

4.2.2. Install WiFi-MT1440 Module

To use Wi-Fi/Bluetooth, hardware-wise the computer needs a Wi-Fi/Bluetooth module installed.

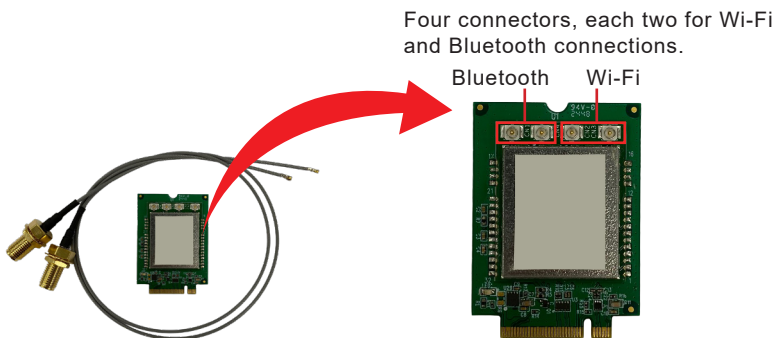
1. Remove the computer's bottom cover, the inside of the computer comes to view.



2. Locate the **M.2 B-Key** socket for a Wi-Fi/Bluetooth module.



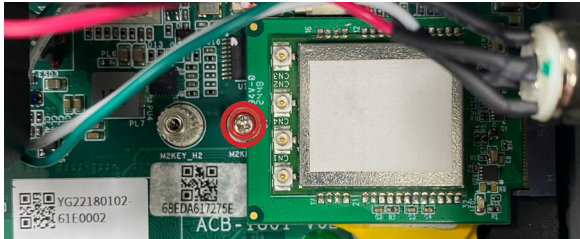
3. Prepare the WiFi-MT1440 module kit, the module is a M.2 B-Key form factor with four U.FL connectors.



4. Plug the Wi-Fi module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the wireless module should meet the break of the connector.

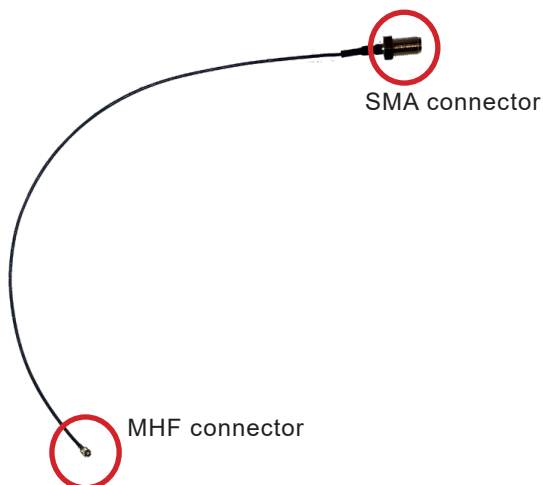


5. Press down the module and fix the module in place using one screw.

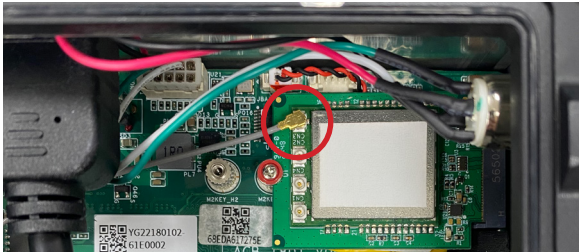


6. Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.

Warning: Please use waterproof cable. (Ex. Optional Antenna: ANT-P15)

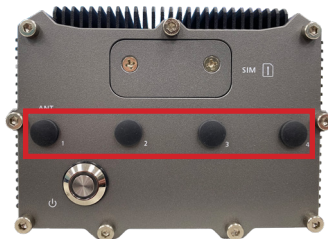


7. Connect the RF antenna's MHF connector to the Wi-Fi module's connector.

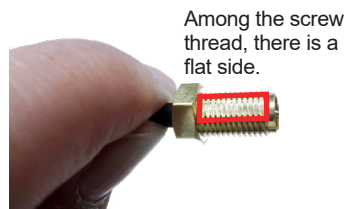
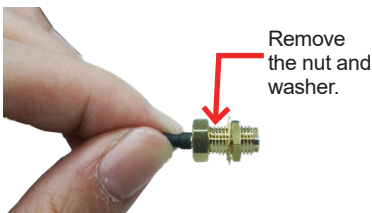


Connect the RF antenna's MHF connector to the Wi-Fi module's Wi-Fi/Bluetooth connector.

8. Remove one plastic plug from the computer's front panel to make an antenna hole. Keep the plastic plug for any possible restoration in the future.



9. From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flattened side.



10. Pull the SMA connector through the above mentioned antenna hole. Note to meet the aforesaid flattened side with the antenna hole's flat side.

Arrange the flat side of the SMA connector to meet the flat side of the antenna hole.



11. Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.



Mount the washer and the nut to the SMA connector. Tighten the nut.

12. Have an external antenna. Screw and tightly fasten the antenna to the SMA connector.



13. Assemble the computer's bottom cover.

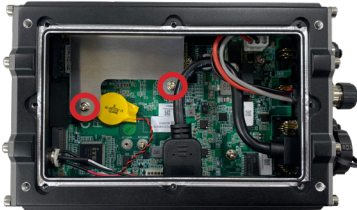
4.2.3. Install Memory Module

The computer has one DDR5 SO-DIMM socket, support up to 16GB maximum system memory. To install a memory module:

1. Remove the computer's bottom cover, the inside of the computer comes to view.



2. Remove 2 screws from the M.2 SSD L-shape plate, and then remove L-shape plate.



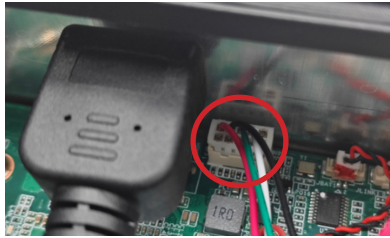
3. Remove 2 Hex Socket standoff using 5mm Hex tool.



4. Remove 2 screws from PCB board.



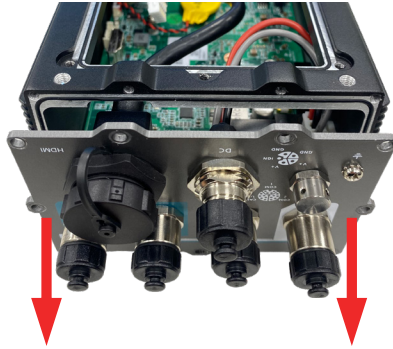
5. Remove power button connector (Front Panel) from PCB.



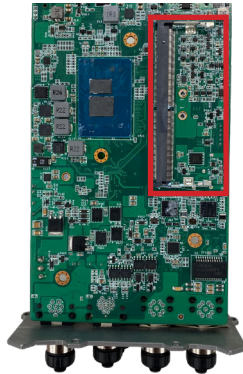
6. Remove the M3 Hexagon screw from Front panel side. (Please use hex key to remove screws)



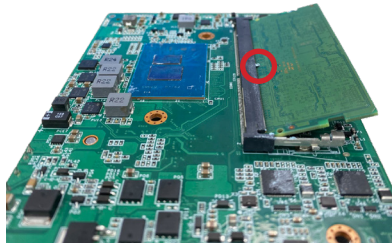
7. Carefully pull the PCB board upwards and outwards to avoid component collisions.



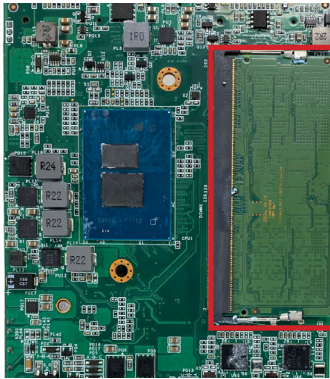
8. Please place the PCB upside down on a flat surface. And locate the memory slot.



9. Align the notch on the memory module with the key in the module slot.



- Slide the module into place. Once the memory module is fully inserted into the slot, press down on the top edge of the device to latch it into place.



- Restore the PCB board into the box pc and assemble the computer's front panel, L-shape plate, power button connector and bottom cover with the reverse steps described above to secure it back in place.

Note: When restore PCB board into the box pc, carefully insert the PCB board upwards and inwards to avoid component collisions.

4.2.4. Install M.2 Storage Module

This computer has a M.2 M-Key 2280 socket for SSD storage, use a 22 x 80 form factor SSD for installation.

1. Remove the computer's bottom cover, the inside of the computer comes to view.



2. Remove 2 screws from the M.2 SSD L-shape plate, and then remove L-shape plate.



3. Locate M.2 M-Key 2280 socket.



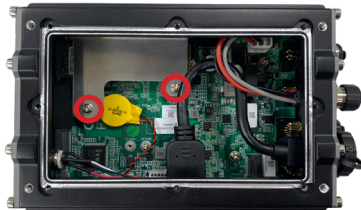
4. Insert the M.2 module into the socket by aligning the notch on the module with the small slot on the M.2 socket.



5. Fasten the screw into the standoff.



6. Restore the L-shape plate and fasten two screws. (The thermal pad can be pasted on the L-shape contact side)

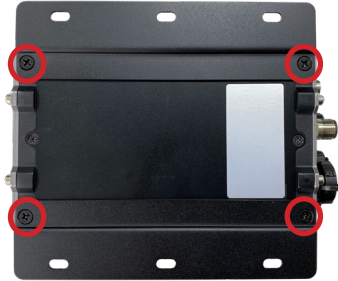


7. Assemble the computer's bottom cover.

4.3. Mount the Computer

Follow through the guide below to mount the computer to a wall.

1. Tighten the wall mounting bracket on the bottom cover as shown below:



2. Find the cutouts as marked in the illustration below, mount the computer to a wall by the said cutouts.



4.4. Wire DC-IN Power Source

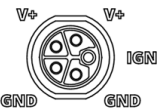
Warning

Only trained and qualified personnel are allowed to install or replace this equipment.

Connecting the computer to a DC-input power source.



Pin	Description
1	V+
2	V+
3	V-
4	V-
5	Ignition



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Chapter 5

BIOS

BIOS

The BIOS Setup utility for the computer is featured by American Megatrends Inc to configure the system settings stored in the system’s BIOS ROM. The BIOS is activated once the computer powers on. When the computer is off, the battery on the main board supplies power to BIOS RAM.

To enter the BIOS Setup utility, keep hitting the “Delete” key upon powering on the computer.



The BIOS featured menus are:

Menu	Description
Main	See 5.1. Main on page 42
Advanced	See 5.2. Advanced on page 43
Chipset	See 5.3. Chipset on page 59
Security	See 5.4. Security on page 70
Boot	See 5.5. Boot on page 72
Save & Exit	See 5.6. Save & Exit on page 73

Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and configure the utility.

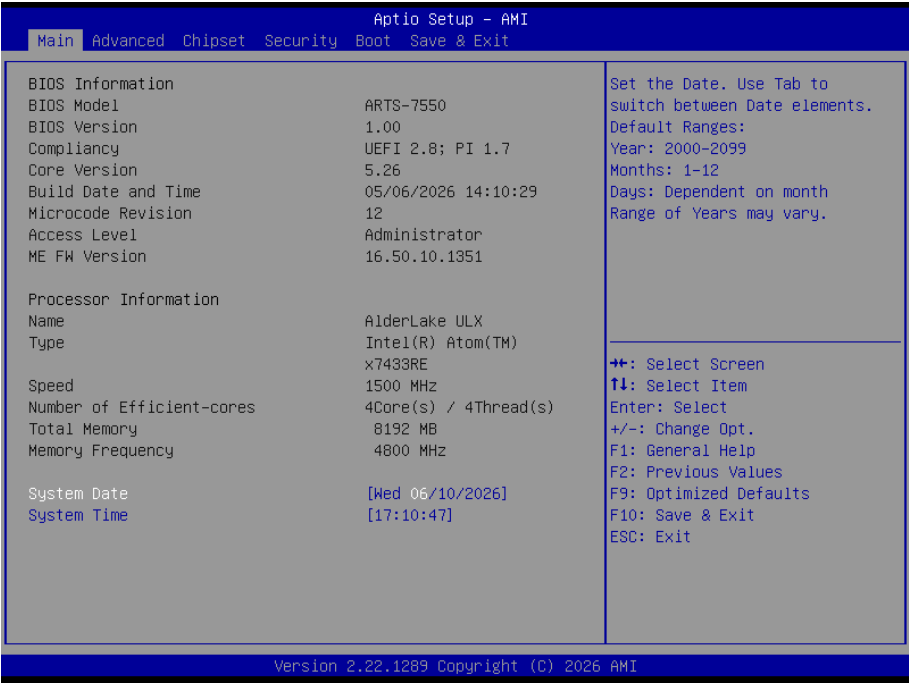
Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
Enter	Selects an highlighted item/field.
Esc	▶ On the top menus: Use Esc to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select OK or Cancel to exit discarding changes.) ▶ On the submenus: Use Esc to quit current screen and return to the top menu.
Page Up / +	Increases current value to the next higher value or switches between available options.
Page Down / -	Decreases current value to the next lower value or switches between available options.
F1	Opens the Help of the BIOS Setup utility.
F2	Previous values.
F9	Load Optimized Defaults (The screen then prompts a message asking you to select Yes or No to restore to default.)
F10	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select Yes or No to exit saving changes.)

Note:

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have onscreen.

5.1. Main

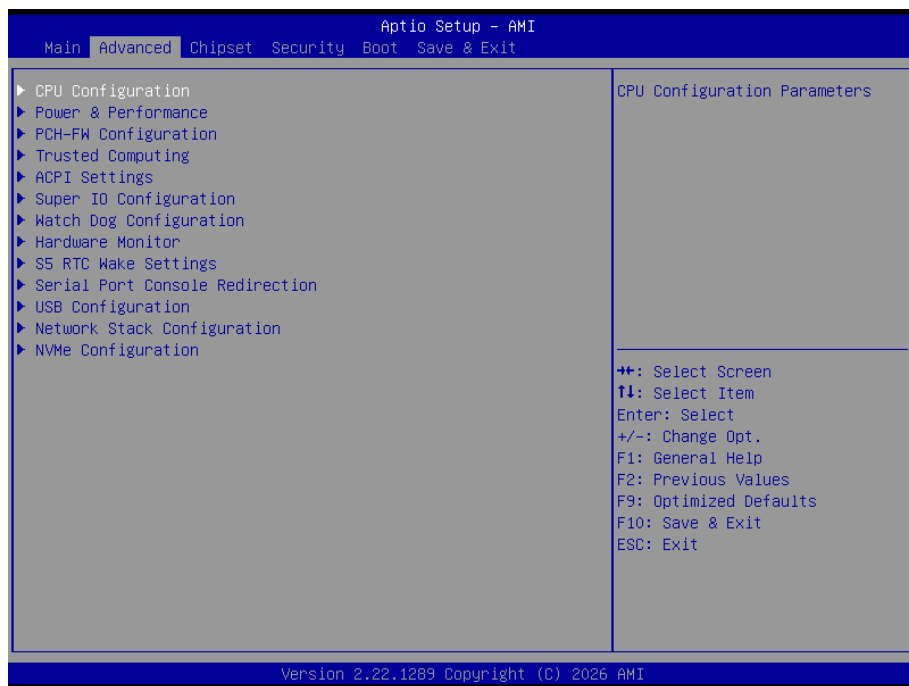
The **Main** menu features the settings of **System Date** and **System Time** and displays some BIOS and system information.



The feature settings are:

Setting	Description
System Date	Set the system date. Use Tab to switch between Date elements. Note that the 'Day' automatically changes when you set the date. ► The date format is: Day: Sun to Sat Month: 1 to 12 Date: 1 to 31 Year: 2000 to 2099
System Time	Set the system time. Use Tab to switch between Time elements. ► The time format is: Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59

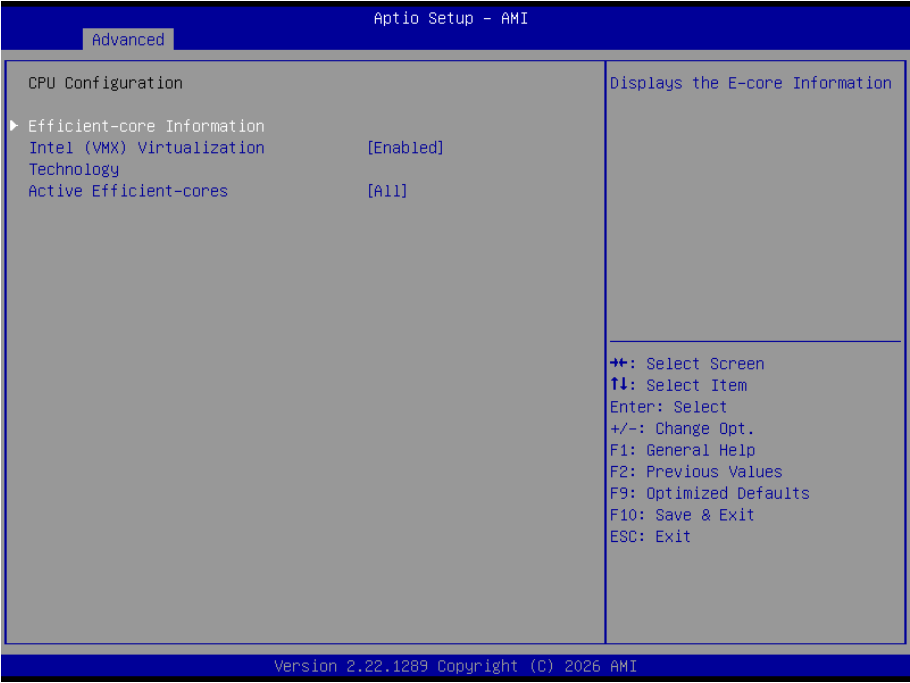
5.2. Advanced



The feature settings and submenus are:

Setting	Description
CPU Configuration	See 5.2.1. CPU Configuration on page 44.
Power & Performance	See 5.2.2. Power & Performance on page 45.
PCH-FW Configuration	See 5.2.3. PCH-FW Configuration on page 46.
Trusted Computing	See 5.2.4. Trusted Computing on page 47.
ACPI Settings	See 5.2.5. ACPI Settings on page 48.
Super IO Configuration	See 5.2.6. Super IO Configuration on page 49.
Watch Dog Configuration	See 5.2.7. Watch Dog Configuration on page 51.
Hardware Monitor	See 5.2.8. Hardware Monitor on page 52.
S5 RTC Wake Settings	See 5.2.9. S5 RTC Wake Settings on page 53.
Serial Port Console Redirection	See 5.2.10. Serial Port Console Redirection on page 54.
USB Configuration	See 5.2.11. USB Configuration on page 55.
Network Stack Configuration	See 5.2.12. Network Stack Configuration on page 57.
NVMe Configuration	See 5.2.13. NVMe Configuration on page 58.

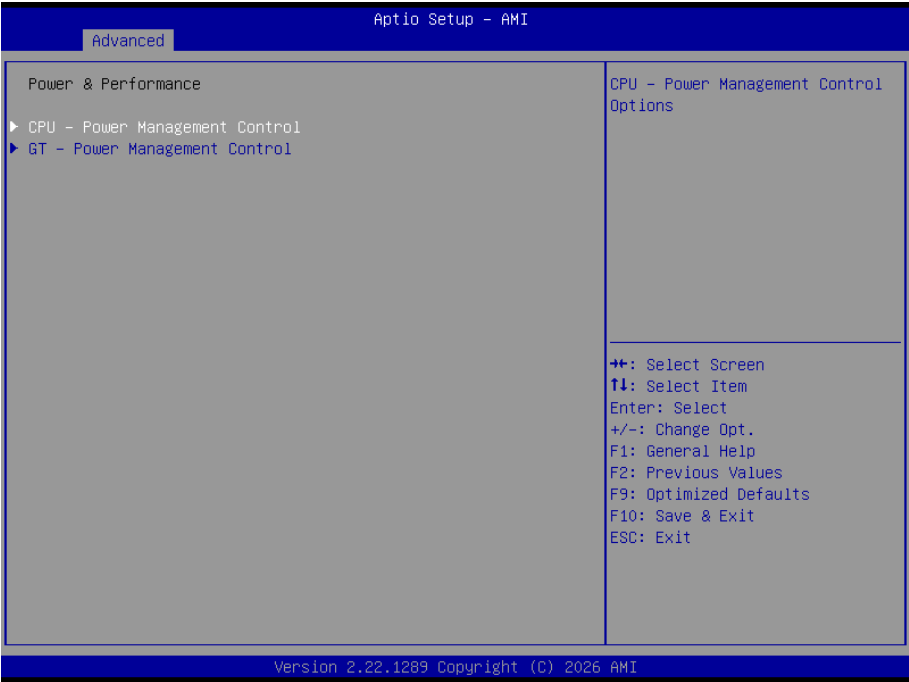
5.2.1. CPU Configuration



The feature settings are:

Setting	Description
Efficient-core Information	Displays the E-core Information.
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. ► Options: Enabled (default) or Disabled
Active Efficient-cores	Number of E-cores to enable in each processor package. ► Options: All (default), 0 , 1 , 2 , 3

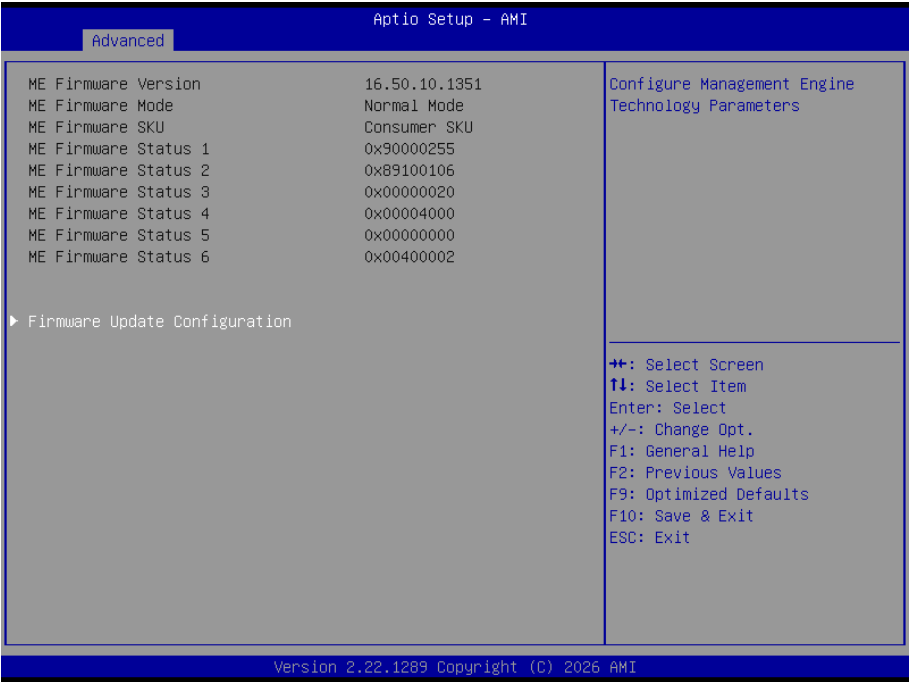
5.2.2. Power & Performance



The feature settings are:

Setting	Description
CPU - Power Management Control	CPU - Power Management Control Options Boot performance mode: - Options: Boot performance mode: Max Battery, Max Non-Turbo Performance, Turbo Performance (Default) Intel(R) SpeedStep(tm): - Options: Disabled, Enabled (Default) Turbo Mode: - Options: Disabled (Default), Enabled C States: - Options: Disabled (Default), Enabled
GT - Power Management Control	RC6(Render Standby): Check to enable render standby - Options: Disabled / Enabled (Default) Maximum GT frequency: Maximum GT frequency limited by the user. - Options: Default Max Frequency(Default), 100Mhz~1200Mhz Disable Turbo GT Frequency: Enabled/Disabled GT Frequency. - Options: Disabled (Default) / Enabled

5.2.3. PCH-FW Configuration



The feature settings are:

Setting	Description
Firmware Update Configuration	Me FW Image Re-Flash: Enable/Disable Me FW Image Re-Flash function. ► Options: Enabled or Disabled (default)
	FW Update: Enable/Disable Me FW Update function. ► Options: Enabled (default) or Disabled

5.2.4. Trusted Computing

Aptio Setup - AMI		
Advanced		
TPM 2.0 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	16.13	
Vendor:	IFX	
Security Device Support	[Enabled]	⬆⬆: Select Screen ⬆⬆: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Active PCR banks	SHA256	
Available PCR banks	SHA256,SHA384	
SHA256 PCR Bank	[Enabled]	
SHA384 PCR Bank	[Disabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
Physical Presence Spec Version	[1.3]	
TPM 2.0 InterfaceType	[TIS]	
Device Select	[Auto]	

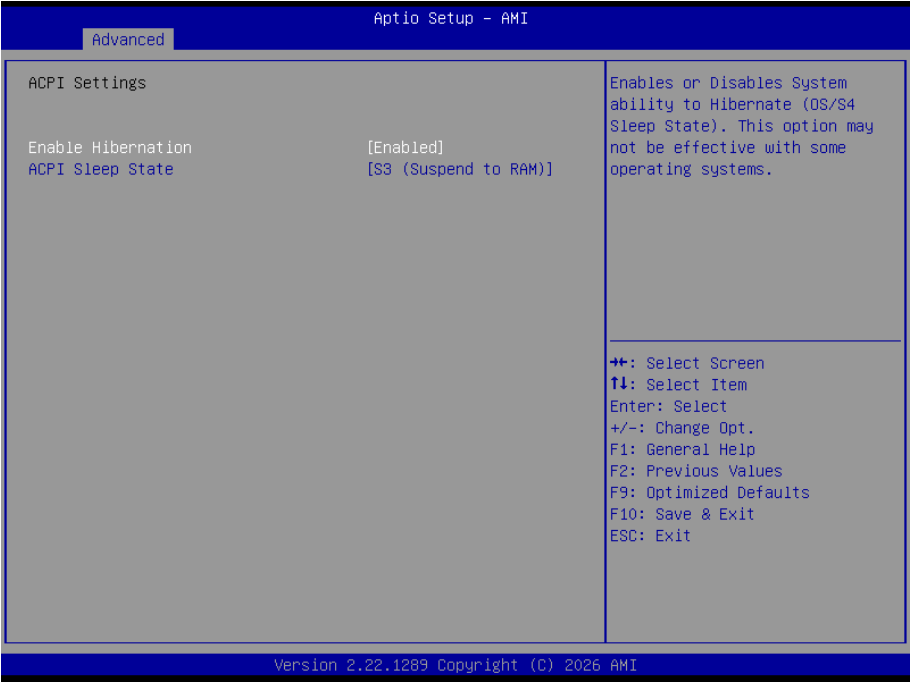
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The feature settings are:

Setting	Description
Security Device Support	Enables or disables BIOS support for security device. OS will not show Security Device. ► Options: Enabled (Default) / Disabled
SHA256 PCR Bank	Enables or disables SHA256 PCR Bank. ► Options: Enabled (Default) / Disabled
SHA384 PCR Bank	Enables or disables SHA384 PCR Bank. ► Options: Enabled / Disabled (Default)
Pending operation	Schedule an operation for the security device. ► Options: None (Default) / TPM Clear
Platform Hierarchy	Enables or disables Platform Hierarchy. ► Options: Enabled (Default) / Disabled
Storage Hierarchy	Enables or disables Storage Hierarchy. ► Options: Enabled (Default) / Disabled
Endorsement Hierarchy	Enables or disables Endorsement Hierarchy. ► Options: Enabled (Default) / Disabled
Physical Presence Spec Version	This item select to tell O.S. to support PPI Spec Version 1.2 or 1.3. ► Options: 1.3 (Default) / 1.2

Device Select	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both TPM 2.0 devices and TPM 1.2 devices. ► Options: Auto (Default) / TPM 1.2 / TPM 2.0
---------------	---

5.2.5. ACPI Settings



The feature settings are:

Setting	Description
Enable Hibernation	Enables (default) or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. ► Options: Suspend Disabled , S1 (CPU Stop Clock) and S3 (Suspend to RAM) (Default)

5.2.6. Super IO Configuration

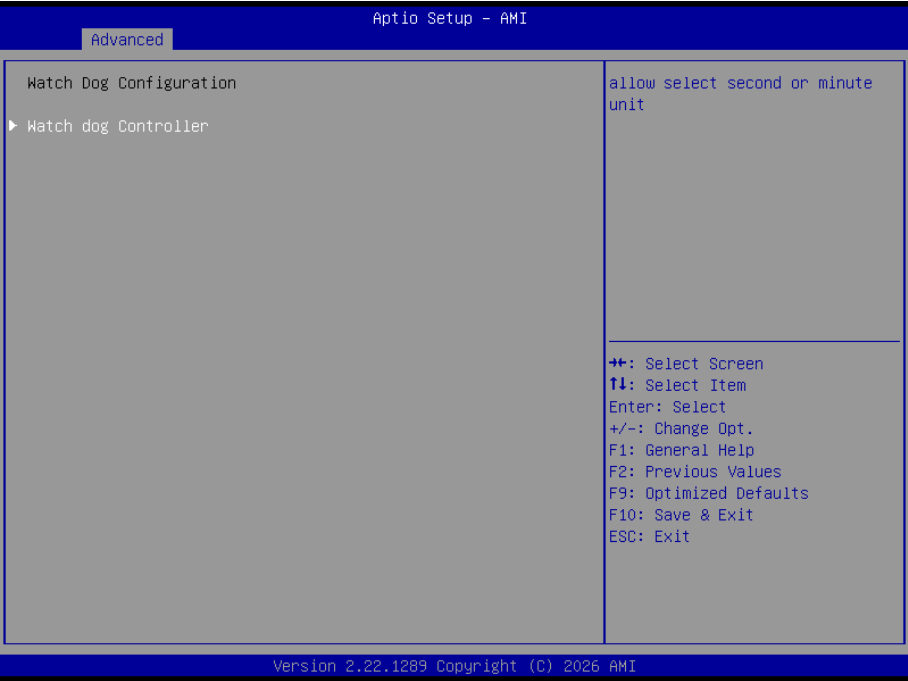


The feature settings are:

Setting	Description
Serial Port 1 Configuration	To configure each COM port settings. Serial Port: Enable or Disable Serial Port (COM) ► Options: Enabled (default), Disabled Change Settings: Select an optimal settings for Super IO Device ► Options: Auto (default), IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; RS485 Autoflow Control: Select Function Mode ► Options: Enabled, Disabled (default)

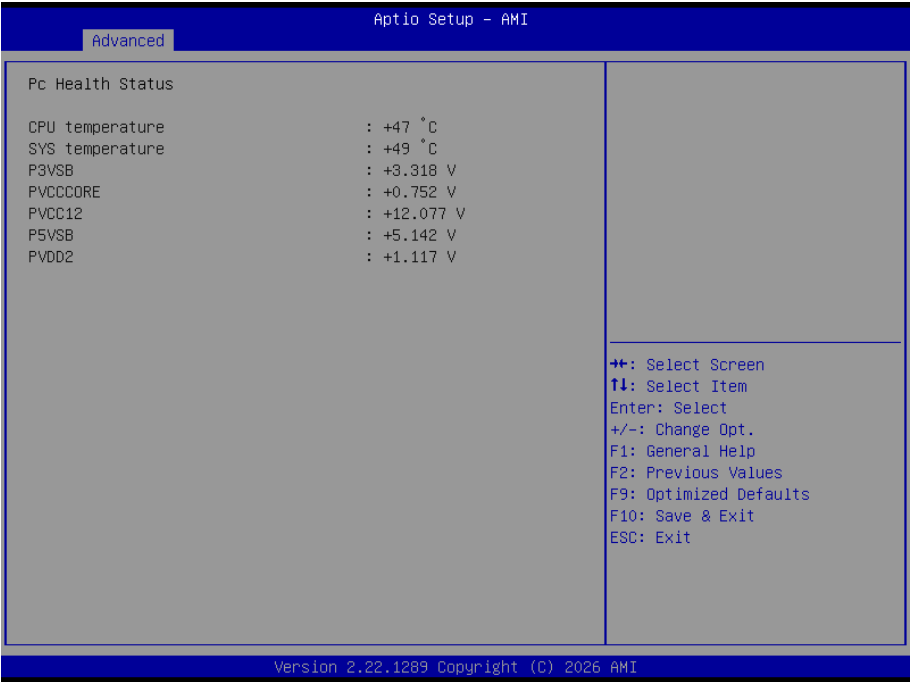
Serial Port 2 Configuration	To configure each COM port settings. Serial Port: Enable or Disable Serial Port (COM) ► Options: Enabled (default), Disabled Change Settings: Select an optimal settings for Super IO Device ► Options: Auto (default), IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12; COM2 Config: Select COM2 Mode ► Options: RS485 mode (default), RS422 mode 120R SEL: 120R Selection ► Options: Enabled, Disabled (default)
-----------------------------	---

5.2.7. Watch Dog Configuration



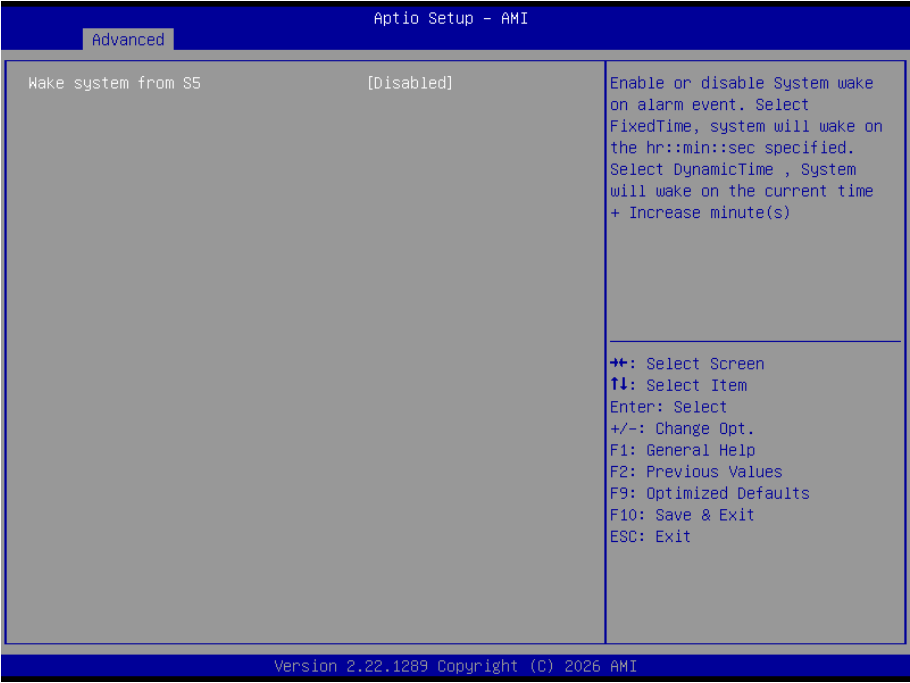
Setting	Description
Watch dog Controller	Allow select second or minute unit. WDT Timeout Mode: WDT Timeout Mode Select Minute or Second ► Options: Disabled (default), Minute , Second

5.2.8. Hardware Monitor



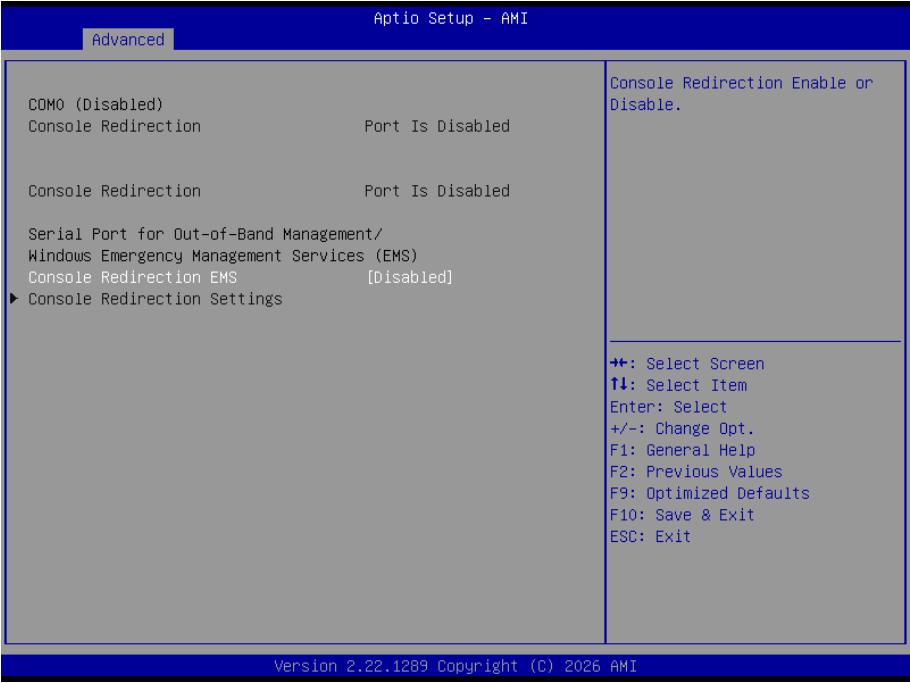
To view the Hardware Health Status of this computer.

5.2.9. S5 RTC Wake Settings



Setting	Description
Wake system from S5	Enable or Disable (default) system wake on alarm event. ► Options available are: Disabled (default): Fixed Time: System will wake on the hr::min::sec specified. DynamicTime: If selected, you need to set Wake up minute increase from 1 - 5. System will wake on the current time + increase minute(s).

5.2.10. Serial Port Console Redirection



Setting	Description
Console Redirection EMS	Enable or Disable Console Redirection EMS. ► Options: Disabled (default), Enabled When set as Enabled, user can make further settings in the following Console Redirection Settings.
Console Redirection Settings	Out-of-Band Mgmt Port: Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port. ► Options: COM0 (Disabled) (default) Terminal Type EMS: Select preferred terminal type for out-of-band management. ► Options: VT100/VT100Plus/VT-UTF8 (default)/ANSI Bits per second EMS: Select serial port transmission speed. ► Options: 9600/19200/57600/115200 (default) Flow Control EMS: Flow control can prevent data loss from buffer overflow. ► Options: None (default), Hardware RTS/CTS, Software Xon/Xoff

5.2.11. USB Configuration

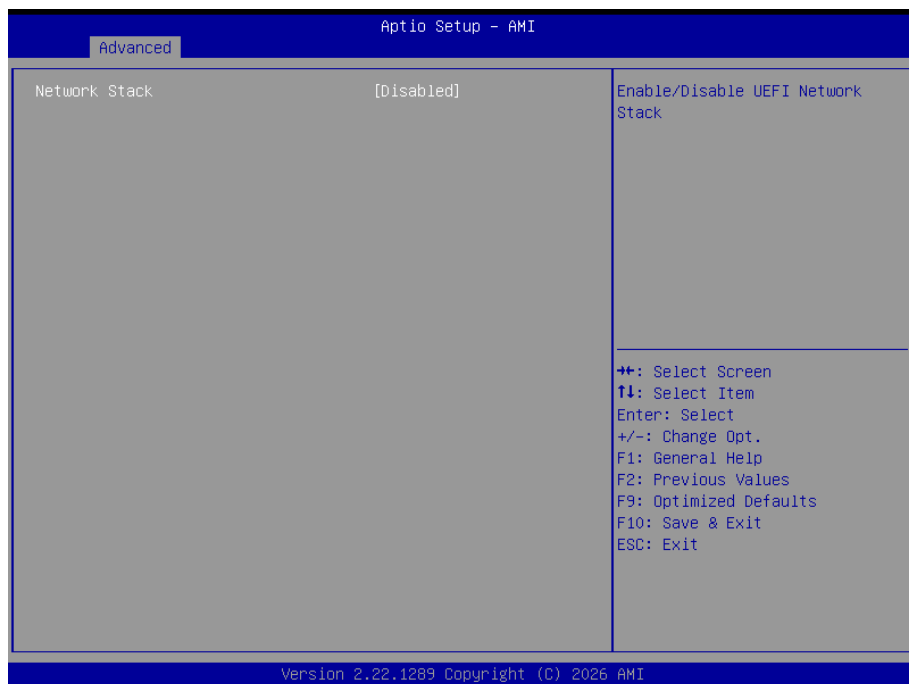
Aptio Setup - AMI	
Advanced	
USB Configuration	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
USB Module Version	32
USB Controllers:	
1 XHCI	
USB Devices:	
1 Drive, 1 Keyboard	
Legacy USB Support	[Enabled]
XHCI Hand-off	[Enabled]
USB Mass Storage Driver Support	[Enabled]
USB hardware delays and time-outs:	
USB transfer time-out	[20 sec]
Device reset time-out	[20 sec]
Device power-up delay	[Auto]
Mass Storage Devices:	
SMI USB DISK 1100	[Auto]
++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit	
Version 2.22.1289 Copyright (C) 2026 AMI	

The feature settings are:

Setting	Description
Legacy USB Support	Enables/disables legacy USB support. ► Options available are Enabled (default), Disabled and Auto . ► Select Auto to disable legacy support if no USB devices are connected. ► Select Disabled to keep USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSeS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. ► The optional settings are: Enabled (default) / Disabled
USB Mass Storage Driver Support	Enables/disables USB Mass Storage Driver Support. ► The optional settings are: Enabled (default) / Disabled

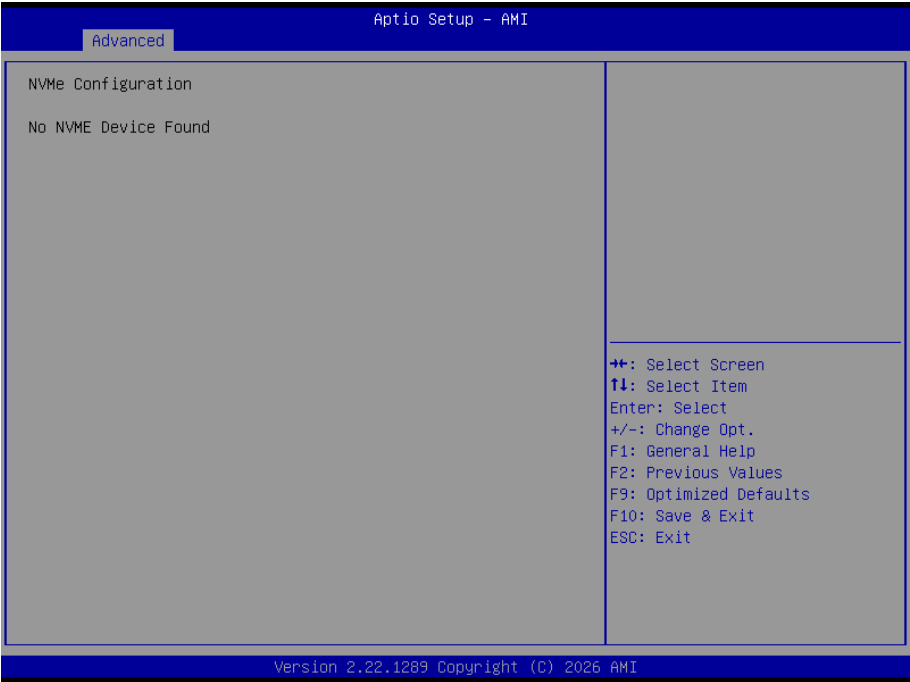
USB transfer time-out	Use this item to set the time-out value for control, bulk, and interrupt transfers. ► Options: 1 sec, 5 sec, 10 sec, 20 sec (default)
Device reset time-out	Use this item to set USB mass storage device start unit command time-out. ► Options: 10 sec, 20 sec (default), 30 sec, 40 sec
Device power-up delay	Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. ► Options available are: Auto: Default Manual: Select Manual you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.
SMI USB DISK 1100	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type. ► Options: Auto, Floppy, Forced FDD, Hard Disk and CD-ROM

5.2.12. Network Stack Configuration



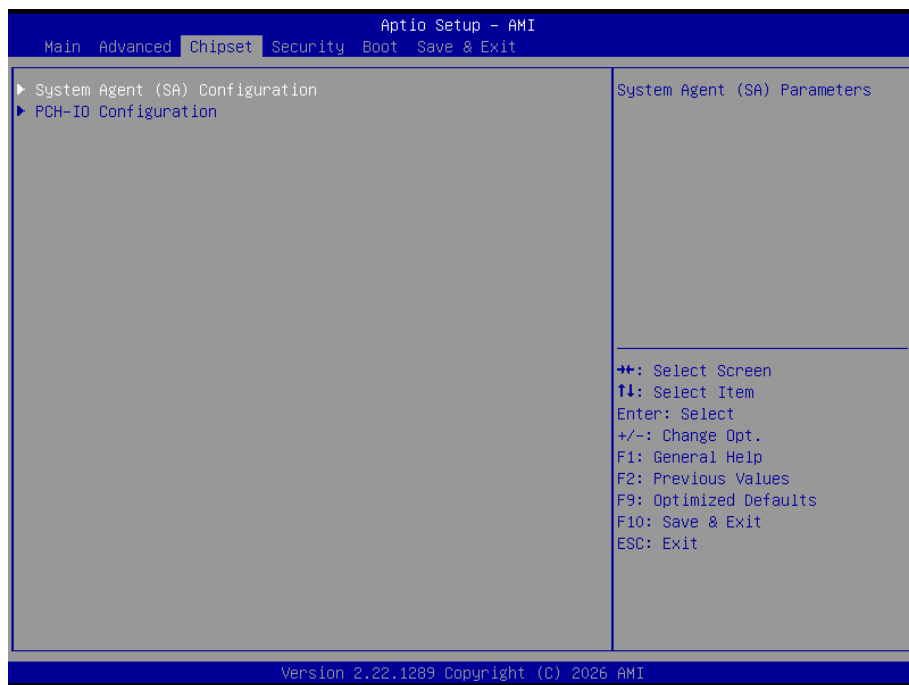
Setting	Description
Network Stack	Enable or Disable (default) UEFI network stack

5.2.13. NVMe Configuration



Access this submenu to view the NVMe controller and driver information.

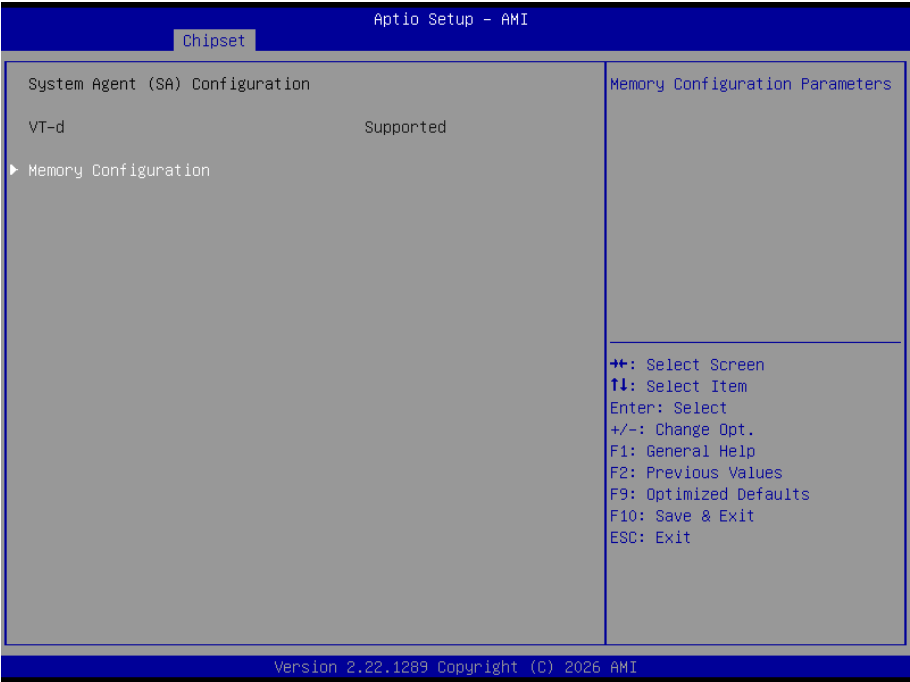
5.3. Chipset



The feature settings are:

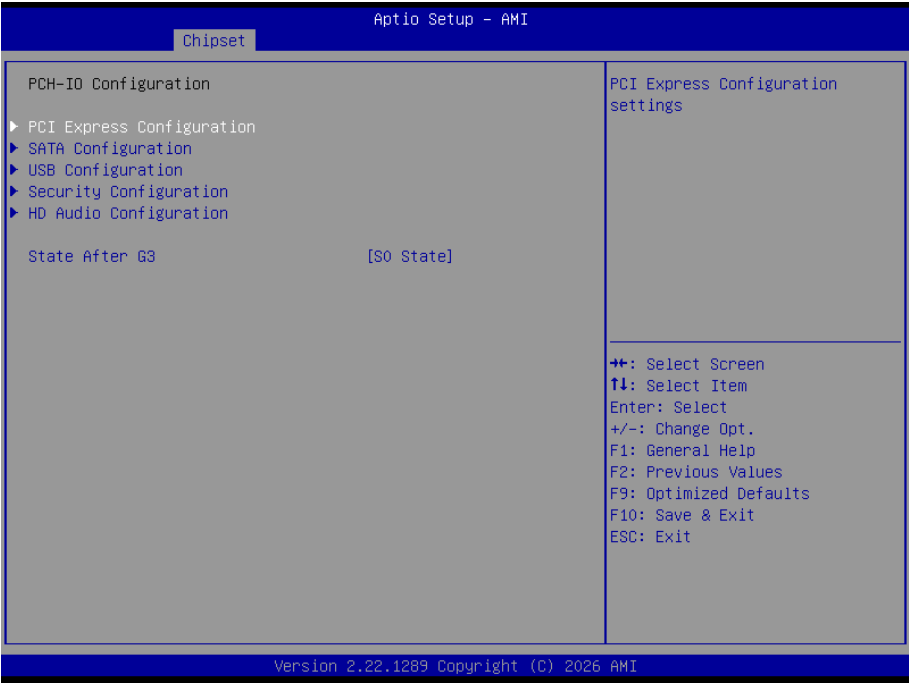
Setting	Description
System Agent (SA) Configuration	See 5.3.1. System Agent (SA) Configuration on page 60
PCH-IO Configuration	See 5.3.2. PCH-IO Configuration on page 61

5.3.1. System Agent (SA) Configuration



Setting	Description
Memory Configuration	Access this submenu to view the memory configuration

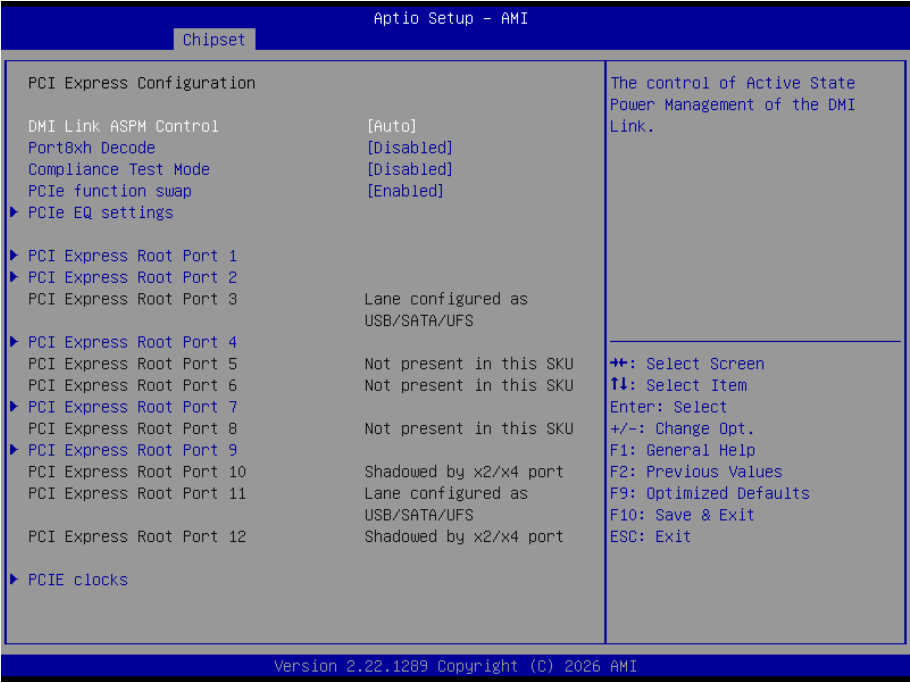
5.3.2. PCH-IO Configuration



The feature settings are:

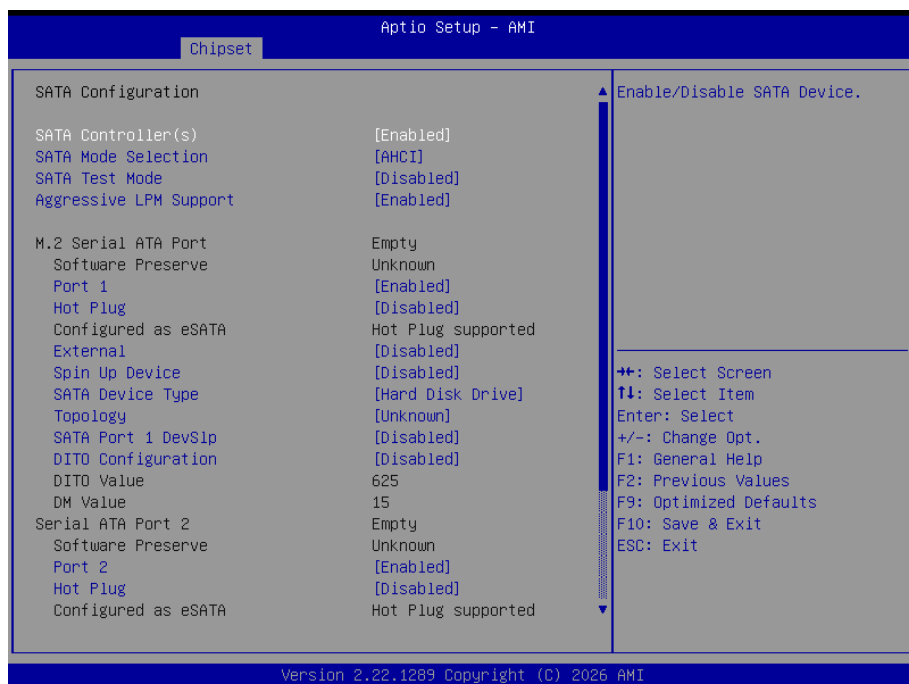
Setting	Description
PCI Express Configuration	See 5.3.2.1. PCI Express Configuration on page 62
SATA Configuration	See 5.3.2.2. SATA Configuration on page 63
USB Configuration	See 5.3.2.3. USB Configuration on page 65
Secutiry Configuration	See 5.3.2.4. Security Configuration on page 67
HD Audio Configuration	See 5.3.2.5. HD Audio Configuration on page 68
State After G3	Specify what state to go to when power is re-applied after a power failure(G3 state). ► Options: S0 State (default), S5 State

5.3.2.1. PCI Express Configuration



Setting	Description
DMI Link ASPM Control	The control of Active State Power Management of the DMI Link. ► Options: Disabled, L0s, L1, L0sL1, Auto
Port8xh Decode	PCI Express Port8xh Decode Enable/Disable. ► Options: Enabled, Disabled
Compliance Test Mode	Enable when using Compliance Load Board. ► Options: Enabled, Disabled
PCIe function swap	When Disabled, prevents PCIe rootport function swap. ► Options: Enabled, Disabled
PCIe EQ settings	Access this submenu to view and select options for controlling PCIe EQ process.
PCI Express Root Port 1, 2, 4, 7, 9	Access this submenu to view and select options for control the PCI Express Root Port.
PCIe clocks	Access this submenu to config PCIe clocks setting.

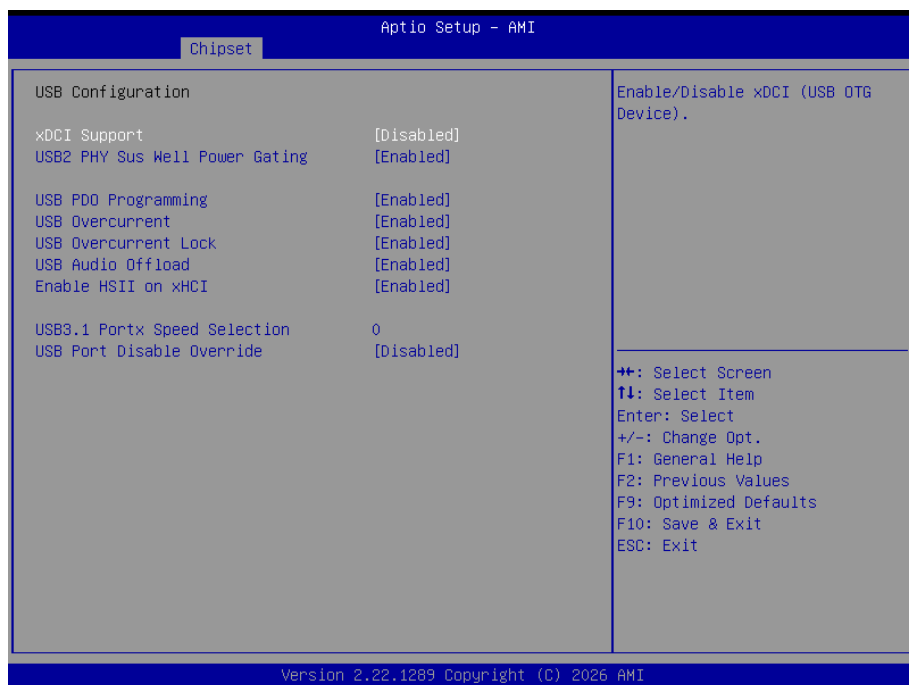
5.3.2.2. SATA Configuration



Setting	Description
SATA Controller(s)	Enables (default) / disables SATA device.
SATA Mode Selection	Determines how SATA controller(s) operate. ► Options: AHCI
SATA Test Mode	Test Mode Enable/Disable (Loop Back). ► Options: Enabled, Disabled
Aggressive LPM Support	Enable PCH to aggressively enter link power state. ► Options: Enabled, Disabled
Port 1/2	Enables (default) / disables SATA port.
Hot Plug	Designates this port as Hot Pluggable. ► Options: Enabled, Disabled
External	Marks this port as external. ► Options: Enabled, Disabled

Spin Up Device	If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot. ► Options: Enabled, Disabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive. ► Options: Hard Disk Drive, Solid State Drive
Topology	Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2. ► Options: Unknown, ISATA, Direct Connect, Flex, M2
SATA Port 1/2 DevSlp	Enable/Disable SATA Port1/2. DevSlp. For DevSlp to work, both hard drive and SATA port need to support DevSlp function, otherwise an unexpected behavior might happen. Please check board design before enabling it. ► Options: Enabled, Disabled
DITO Configuration	Enable/Disable DITO Configuration. ► Options: Enabled, Disabled

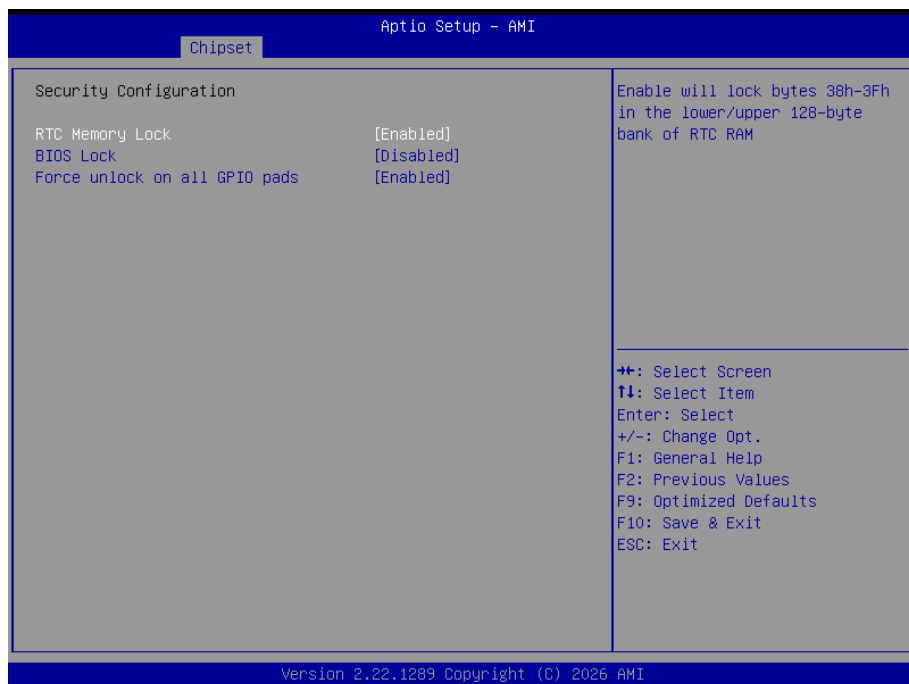
5.3.2.3. USB Configuration



Setting	Description
xHCI Support	Enable/Disable xHCI (USB OTG Device). ► Options: Enabled, Disabled
USB2 PHY Sus Well Power Gating	Select "Enabled" to enable SUS Well PG for USB2 PHY. This option has no effect on PCH-H. ► Options: Enabled, Disabled
USB PD0 Programming	Select "Enabled" if Port Disable Override functionality is used. ► Options: Enabled, Disabled
USB Overcurrent	Select "Disabled" for pin-based debug. If pin-based debug is enabled but USB overcurrent is not disable, USB DbC does not work. ► Options: Enabled, Disabled
USB Overcurrent Lock	Select "Enabled" if Overcurrent functionality is used. Enabling this will make xHCI controller consume the Overcurrent mapping data. ► Options: Enabled, Disabled
USB Audio Offload	Enable/Disable USB Audio offload functionality. ► Options: Enabled, Disabled

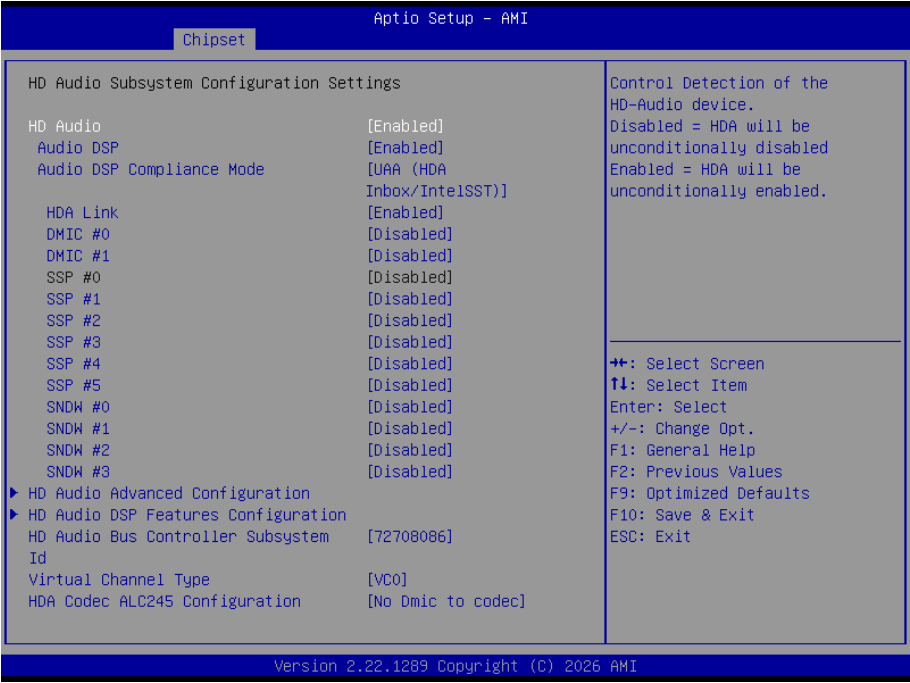
Enable HSII on xHCI	Enable/Disable HSII feature. It may lead to increased power consumption. ► Options: Enabled, Disabled
USB3.1 Portx Speed Selection	Port Selection value in decimal for Gen1; Default - Gen2; Bit 0 corresponds to Port 0 and so on.
USB Port Disable Override	Selectively Enable/Disable the corresponding USB port from reporting ► Options: Enabled, Disabled

5.3.2.4. Security Configuration



Setting	Description
RTC Memory Lock	Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM. ► Options: Enabled, Disabled
BIOS Lock	Enabled/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash. ► Options: Enabled, Disabled
Force unlock on all GPIO pads	If Enabled BIOS will force all GPIO pads to be in unlocked state. ► Options: Enabled, Disabled

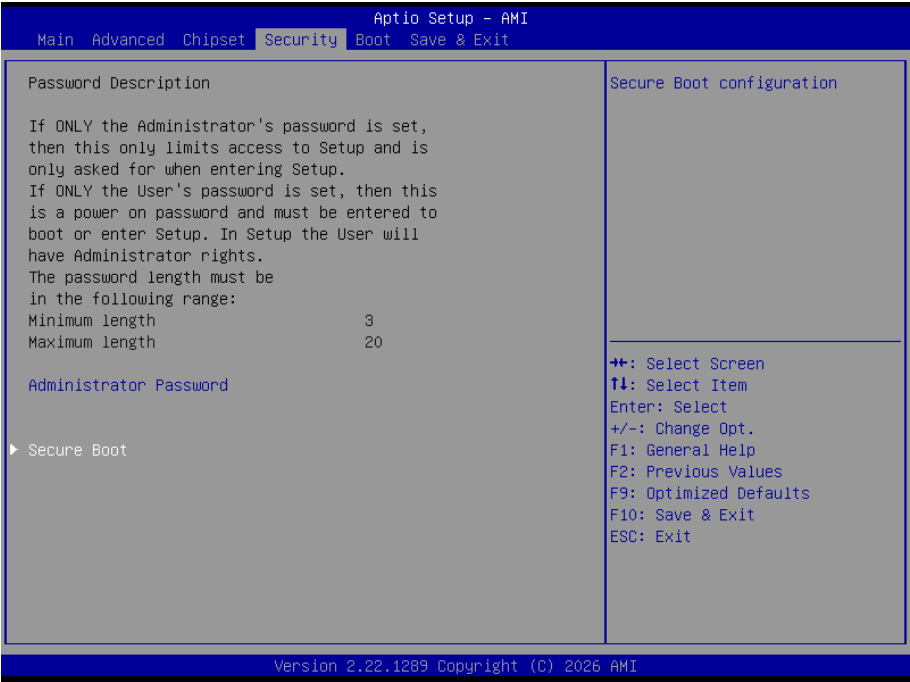
5.3.2.5. HD Audio Configuration



Setting	Description
HD Audio	Control Detection of the HD-Audio device. Disabled: HDA will be unconditionally disabled. Enabled: HDA will be unconditionally enabled. ► Options: Enabled, Disabled
Audio DSP	Enable/Disable Audio DSP. ► Options: Enabled, Disabled
Audio DSP Compliance Mode	Specifies DSP enabled system compliance: Non-UAA (IntelSST driver support only - CC_040100) UAA (HD Audio Inbox or IntelSST driver support - CC_040380) ► Options: Non-UAA (IntelSST), UAA (HDA Inbox/IntelSST)

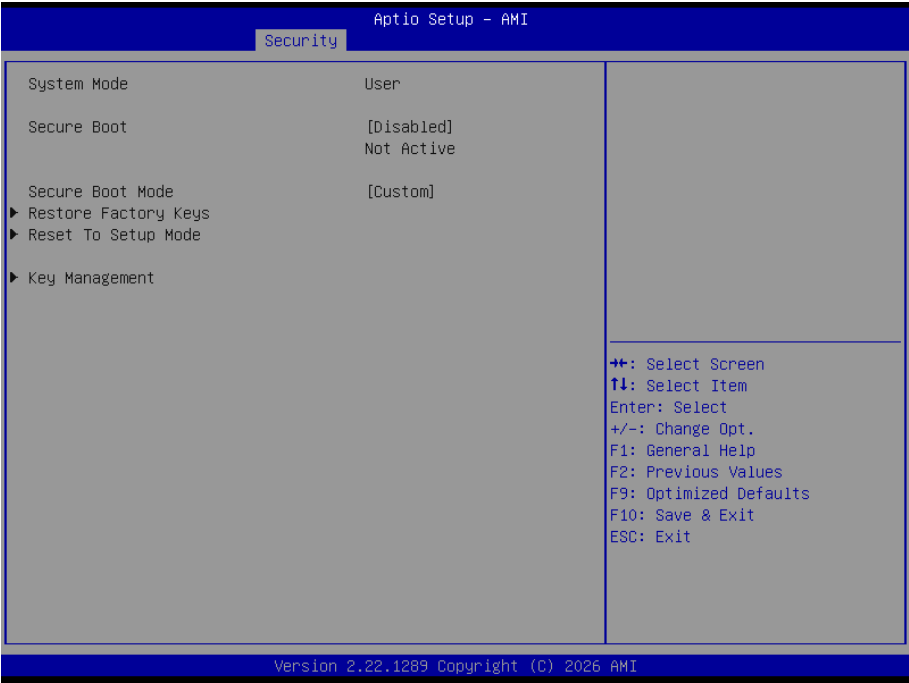
HDA Link/DMIC #0/1/SSP #0~5/SNDW #0~3	HDA Link settings. Muxed interfaces: 1. HDA/SSP0 2. HDA [SDI1]/SSP1 3. DMIC0/SNDW4 4. DMIC1/SNDW3 CNL only: 5. HDA/SNDW1 6. SSP1/SNDW2 ► Options: Enabled, Disabled
HD Audio Advanced Configuration	Access this submenu to view and config HD Audio Advanced options.
HD Audio DSP Features Configuration	Access this submenu to view and config HD Audio Subsystem Features options.
HD Audio Bus Controller Subsystem Id	Selects HD Audio Bus Controller Subsystem Id.
Virtual Channel Type	Enable/Disable HD Audio to use VC0/VC1. ► Options: VC0 (default), VC1
HDA Codec ALC245 Configuration	Option for configuring DMIC connection to ALC245. ► Options: No Dmic to codec (default), 4 Dmic to codec, 2 Dmic to codec

5.4. Security



Setting	Description
Administrator Password	To set up an administrator password: 1. Select Administrator Password. 2. An Create New Password dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Hit [Enter] key to submit.
Secure Boot	See 5.4.1. Secure Boot on page 71

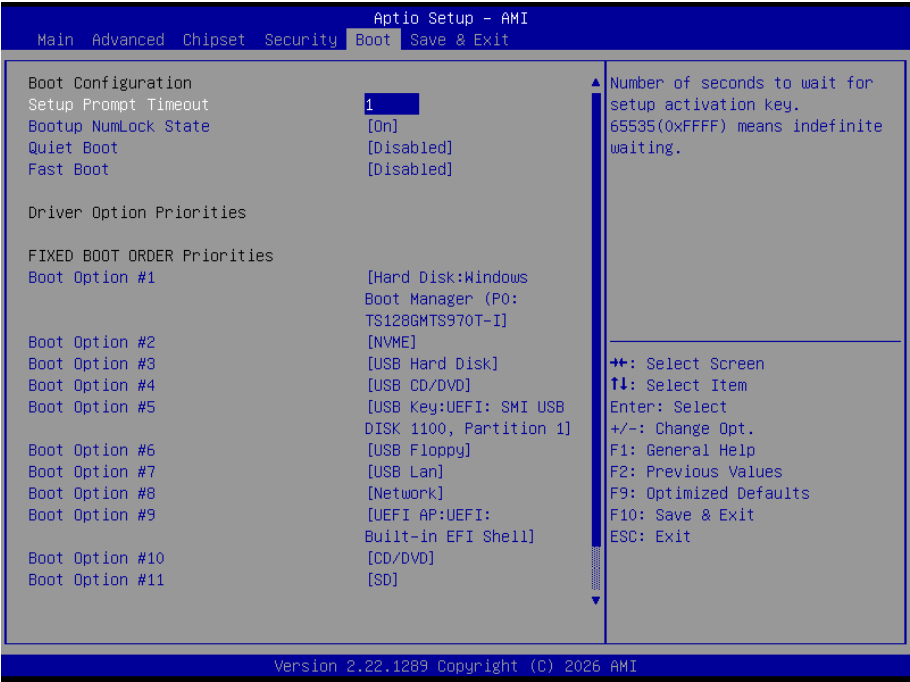
5.4.1. Secure Boot



The feature settings are:

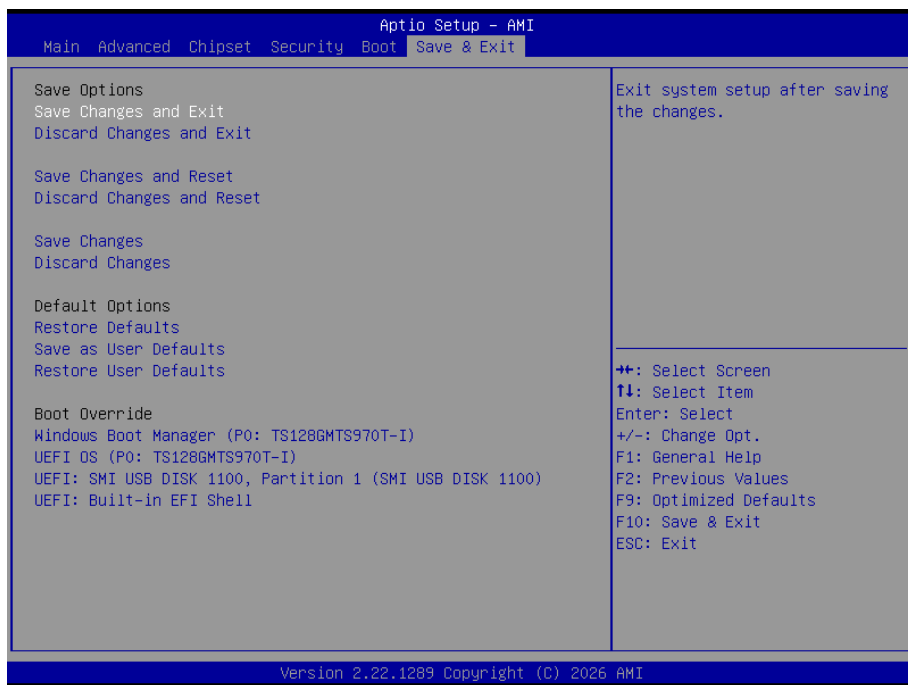
Setting	Description
Secure Boot	Enable/Disable (default) secure boot.
Secure Boot Mode	Allow users to set the secure boot selector. ► Options: Standard (default) / Custom mode.
Restore Factory Keys	Force system to restore default secure boot key database.
Reset to Setup Mode	Delete all secure boot key databases.
Key Management	Allow users to modify secure variables and set key management page.

5.5. Boot



Setting	Description
Setup Prompt Timeout	Set how long to wait for the prompt to show for entering BIOS Setup. ► The default setting is 1 (sec). ► Set it to 65535 to wait indefinitely.
Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. ► Options available are On (default) and Off .
Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. ► Select Disabled to display the normal POST message, which is the default.
Fast Boot	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. ► Options: Enabled , Disabled
Boot Option Priority	Set the system boot priorities.

5.6. Save & Exit



Setting	Description
Save Changes and Exit	Exit system setup after saving the changes.
Discard Changes and Exit	Exit system setup without saving any changes.
Save Changes and Reset	Reset system after saving the changes.
Discard Changes and Reset	Reset system setup without saving any changes.
Save Changes	Save Changes done so far to any of the setup options.
Discard Changes	Discard Changes done so far to any of the setup options.
Restore Defaults	Restore/Load Default values for all the setup options.
Save as User Defaults	Save the changes done so far as User Defaults.
Restore User Defaults	Restore the User Defaults to all the setup options.
Boot Override	Boot Override presents a list in context with the boot devices in the system.