Lanner

Embedded Computing Platform

Hardware Platforms for Intelligent Edge Computing

IIOT-I531 User Manual

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About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the Lanner Download Center page with a login account and password.

Icons Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

Note: This mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

Warning: This mark indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

To obtain additional documentation resources and software updates for your system, please visit the Lanner Download Center. As certain categories of documents are only available to users who are logged in, please register for a Lanner Account at http://www.lannerinc.com/ to access published documents and downloadable resources.

Technical Support

In addition to contacting your distributor or sales representative, you could submit a request to our **Lanner Technical Support** at http://www.lannerinc.com/technical-support where you can fill in a support ticket to our technical support department.

Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to contact@lannerinc.com, Thank you for your time.

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Acknowledgment

Federal Communication Commission Interference Statement

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. To protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.
- This product is intended to be supplied by an UL Listed Power Adapter rated 24 Vdc, min. 9.17A, min. 40 degree C, 5000 m.
- The PoE networks without routing to the outside of plant that installation instructions clearly states; therefore, these circuits are not considered external circuit.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Lithium Battery Caution

- There is risk of Explosion if Battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Installation only by a skilled person who knows all Installation and Device Specifications which are to be applied.
- Do not carry the handle of power supplies when moving to another place.
- Please conform to your local laws and regulations regarding safe disposal of lithium BATTERY.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.

- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation Precaution

The following should be put into consideration for rack-mount or similar mounting installations:

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installation & Operation:

- This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
  Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée

- Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
  Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

- The machine can only be used in a restricted access location and must be installed by a skilled person.
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

Warning

Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.
"Product shall be used with Class 1 laser device modules."

Avertissement

Équipement de classe I. Ce matériel doit être relié à la terre. La fiche d'alimentation doit être raccordée à une prise de terre correctement câblée. Une prise de courant mal câblée pourrait induire des tensions dangereuses sur des parties métalliques accessibles.
"Le produit doit être utilisé avec des modules de dispositifs laser de classe 1."

Electrical Safety Instructions

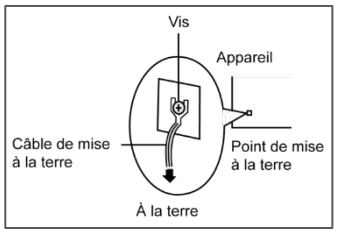
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm2 or 10 AWG.

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

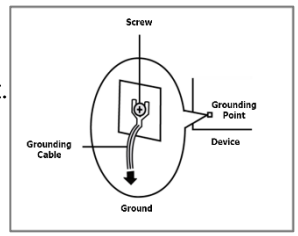
Grounding Procedure for Power Source

- Loosen the screw of the earthing point.
- Connect the grounding cable to the ground.
- The protection device for the power source must provide 30 A current.
- This protection device must be connected to the power source before power.
- The cable hould 16 AWG



Procédure de mise à la terre pour source d'alimentation

- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation doit fournir 30 A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation.
- Le câble doit 16 AWG



This equipment is for INDOOR USE ONLY

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CHAPTER 1: PRODUCT OVERVIEW

The IIoT-I531 makes available imaging-based automated decision-making capabilities that greatly benefit industries and manufacturing that require automatic visual inspection and quality control processes; such capabilities can also be relied upon for surveillance, security, guiding robotics collaboration and automating vehicle driving.

Key Features

- 11th Gen Intel® Core™ i CPU (Up to i7-1185GRE)
- 2x DDR4 3200 SO-DIMM, Max 64GB
- 4x PoE+, 2x Ethernet Ports, 4x COM Ports, 4x USB 3.0
- Intel® Iris® Xe Graphics, 2x HDMI, 4x DI & 4x DO
- 1x M.2 B-Key with Nano SIM for 5G, 1x M.2 E-Key for Wi-Fi 6, 1x mSATA

Package Content

Your package contains the following items:

- 1x IIOT-I531 IoT Edge Computer
- 2x Thermal Kit for LTE / Wi-Fi / Storage, 1x Thermal Pad for Wi-Fi
- 1x 4-Pin Terminal Block
- 1x Wall mount Kit

Ordering Information

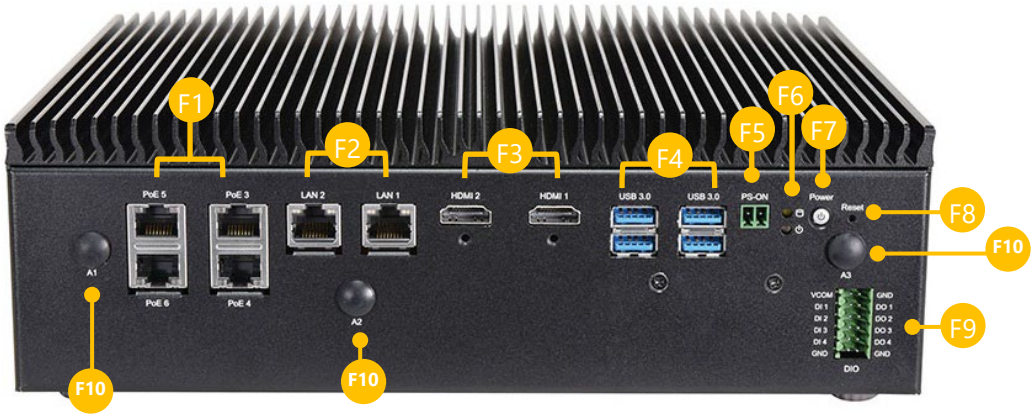
SKU No.	Description
IIOT-I531A	11th Gen Intel® Core™ i CPU (up to i7-1185GRE), 2x DDR4 3200 IBECC SO-DIMM w/ default 8GB, 4x PoE+, 2x Ethernet Ports, 4x COM ports, 4x USB 3.0, Intel® Iris Xe Graphics, 2x HDMI, 4x DI & 4x DO, 1x B-Key 3042/3050/3052 w/ Dual Nano-SIM for 5G, 1x E-Key 2230 for WiFi-6

Specifications

Processor System	CPU	11th Gen Intel® Core™ i (Up to i7-1185GRE), Codenamed TigerLake-UP3
	Frequency	PBF1.80GHz, MaxTurbo to 4.40GHz
	Core Number	4 Cores
	BIOS	AMI SPI Flash BIOS
Fanless		Yes
Memory	Technology	DDR4 3200 IBECC SO-DIMM
	Max. Capacity	Up to 64 GB
	Socket	2x 260-pin SO-DIMM
Graphic	Graphic Controller	Intel® Iris® Xe Graphics
	HDMI	2
Audio	Codec	TSI 92HD73E
	Interface	1x Line-in, 1x Line-out
Ethernet	Controller	Intel i226IT
	Speed	2.5Gbps/1Gbps/100Mbps
	Interface	6x 2.5Gbps RJ45 (4x RJ45 for PoE+, Total PoE Budget of 60W)
Storage	Type	1x mSATA; 1x SATA 2.5" SSD/HDD
I/O	Serial Port	2x RS232/422/485 (COM1, COM2) Serial Ports; 2x Isolated CAN 2.0A/B 2x5-pin Terminal Block (Optional)
	Digital I/O	4x Isolated DI, 4x Isolated DO
	USB Port	4x USB 3.0 Type A Ports
	Power-ON/Reset Button	1x Power-ON Button, 1x Reset Button
	Remote Power Switch	1x 2-Pin Remote Power Switch
	LED Indicators	Power/Storage LED Indicator
	Display Port	2x HDMI Ports with Lock
	Ethernet Port	2x 100/1000/2500Mbps RJ45 LAN Ports
	PoE Port	4x 100/1000/2500Mbps RJ45 IEEE802.3af/at PoE Ports, 2.5GigBE (+) w/ surge 2KV protection under maximum 60W power budget (Port 2-5 / PCIe 3.0) without isolation
	Audio Ports	1x Line-In; 1x Line-Out
	Power Inlet	1x 2-Pin Terminal Block for Single DC Input from 24V +/-10% w/ RVP/RCP/OVP/OCP
	Antenna	6x Antenna Holes for Wi-Fi/5G/4G LTE
Expansion Interface	PCIe	1x PCIe 3.0 x1 FHHL w PCIe x4 Connector
	M.2	1x B-Key 3042/3050/3052 w/ Dual Nano-SIM for 5G; 1x E-Key 2230 for Wi-Fi6
Watchdog Timer	Watchdog Timer	Watchdog Timer 1-255 Level Time Interval System Reset, Software Programmable
Power	Type	DC Source
	Supply Voltage	+24VDC Typically
	Connector	1x 2-Pin Terminal Block
	Power Consumption (Idle)	29.6W
	Power Consumption (Full Load)	91.6W (Without PCIE*4 LAN Card)
Environment	Operating Temperature	-40°C~70°C with LTE; -40°C~75°C without LTE
	Storage Temperature	-40°C~70°C
	Relative Humidity	5%~95% Non-condensing
	Vibration	IEC 60068-2-64, 0.5Grms, Random 5~500Hz, 30 Mins/Axis

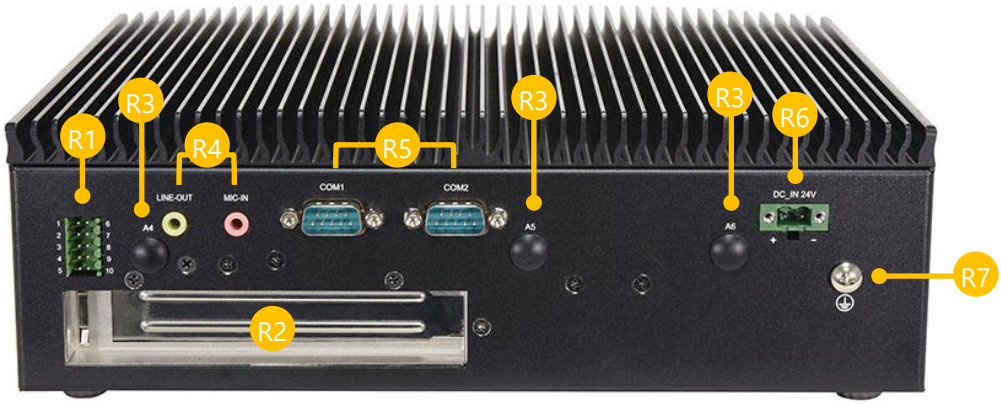
Mechanical	Dimension (WxHxD)	270 x 86 x 200mm
	Weight	TBD
	Mounting	Wall mount, VESA mount (Optional)
OS Support	Linux	Debian 11
	Windows	Win 10 IoT
Certification	EMC	FCC/CE Class A, UL

Front Panel



No.	Description	
F1	PoE Port	4x 100/1000/2500Mbps IEEE802.3af/at PoE 2.5GigBE (+) w/ surge 2KV protection under maximum 60W power budget (Port 2-5 / PCIe 3.0) without isolation
F2	Ethernet Port	2x 10/100/1000/2500Mbps RJ45 LAN Ports w/ TSN
F3	Display Port	2x HDMI Ports w/ lock
F4	USB Port	4x USB 3.0 Type A Ports
F5	Power Switch	1x 2-Pin Terminal Block Remote Power Switch
F6	LED Indicators	Storage/Power Status LED Indicators
F7	Power Button	1x ON/OFF Power Button
F8	Reset Button	1x Reset Button
F9	Multi-IO	4x Isolated DI, 4x Isolated DO
F10	Antenna	3x Antennas Holes for Wi-Fi/4G LTE/5G

Rear Panel

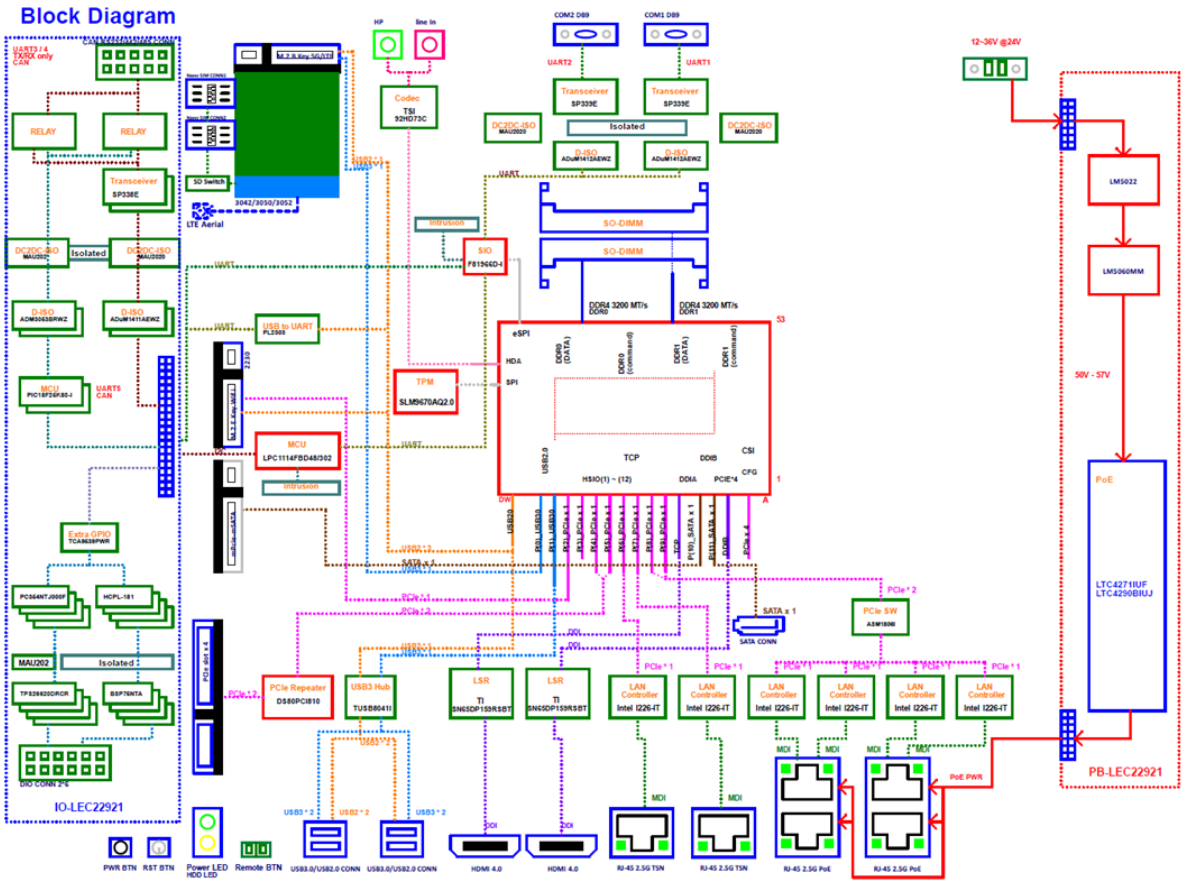


<table>
<tr><th>No.</th><th colspan="2">Description</th></tr>
<tr><td>R1</td><td>COM Port</td><td>1x 2x5-Pin Terminal block for isolated 2x RS232/422/485 COM3, COM4 Ports (Optional for 2x CAN 2.0A/B)
<table>
<tr><th>PIN</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>RS-232</td><td>GND</td><td>TXD</td><td>RXD-</td><td></td><td></td></tr>
<tr><td>RS-422</td><td>GND</td><td>RXD+</td><td>RXD-</td><td>TXD-</td><td>TXD+</td></tr>
<tr><td>RS-485</td><td>GND</td><td>RXD+</td><td>RXD-</td><td>TXD-</td><td>TXD+</td></tr>
<tr><td>RS-485</td><td>GND</td><td></td><td></td><td>RTX-</td><td>RTX+</td></tr>
<tr><td>CAN</td><td></td><td>RTX+</td><td>RTX-</td><td></td><td></td></tr>
</table>
<table>
<tr><th>PIN</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th></tr>
<tr><td>RS-232</td><td>GND</td><td>TXD</td><td>RXD-</td><td></td><td></td></tr>
<tr><td>RS-422</td><td>GND</td><td>RXD+</td><td>RXD-</td><td>TXD-</td><td>TXD+</td></tr>
<tr><td>RS-485</td><td>GND</td><td>RXD+</td><td>RXD-</td><td>TXD-</td><td>TXD+</td></tr>
<tr><td>RS-485</td><td>GND</td><td></td><td></td><td>RTX-</td><td>RTX+</td></tr>
<tr><td>CAN</td><td></td><td>RTX+</td><td>RTX-</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>R2</td><td>PCIe Slot</td><td>1x PCIe 3.0 x1 FHHL w PCIe x4 Connector (supports maximum 60W power budget)</td></tr>
<tr><td>R3</td><td>Antenna Hole</td><td>3x Antennas Holes for 4G LTE/ 5G</td></tr>
<tr><td>R4</td><td>Audio Port</td><td>1x Line-In; 1x Line-Out</td></tr>
<tr><td>R5</td><td>Serial Port</td><td>2x DB9 Male Connectors for isolated RS232/422/485 COM Ports</td></tr>
<tr><td>R6</td><td>Power Input</td><td>1x 2-Pin Terminal Block for single DC Input 24V +/- 10%, w/ RVP, RCP, OVP, OCP</td></tr>
<tr><td>R7</td><td>Ground Hole</td><td>1x Semi-shearing hole for grounding</td></tr>
</table>

Motherboard Information

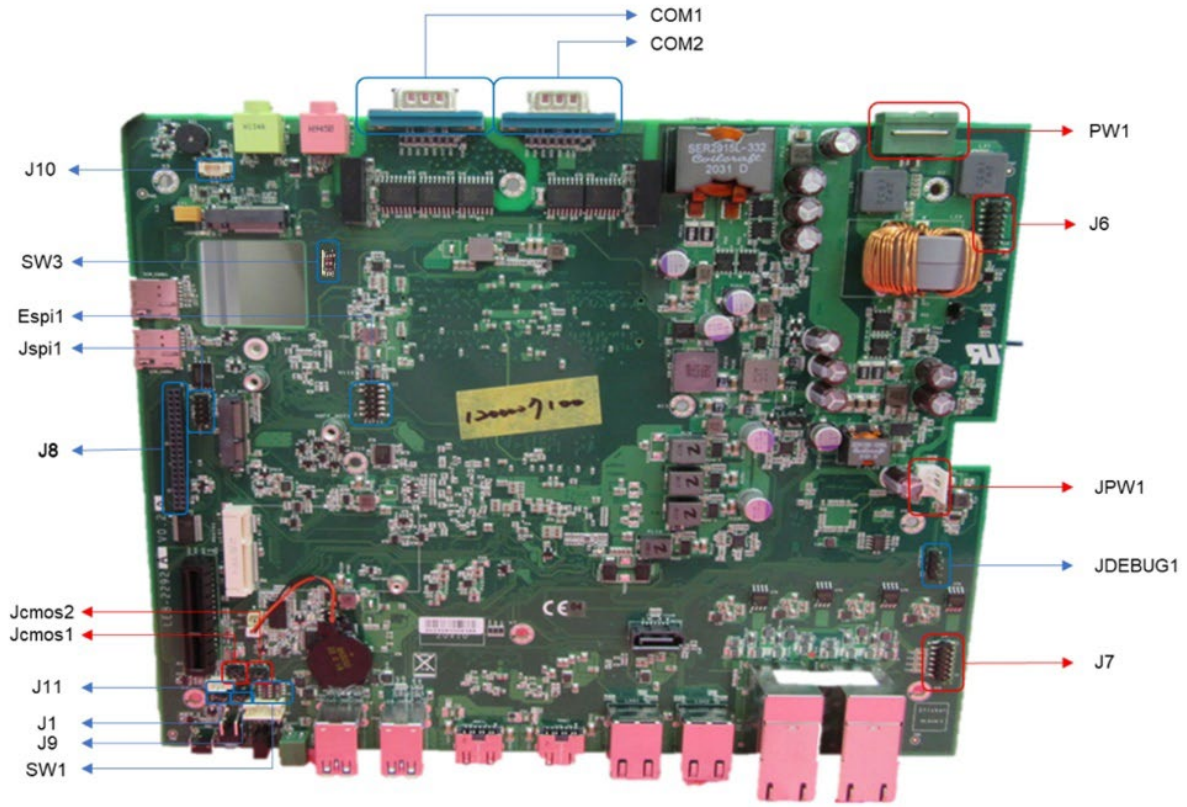
Block Diagram

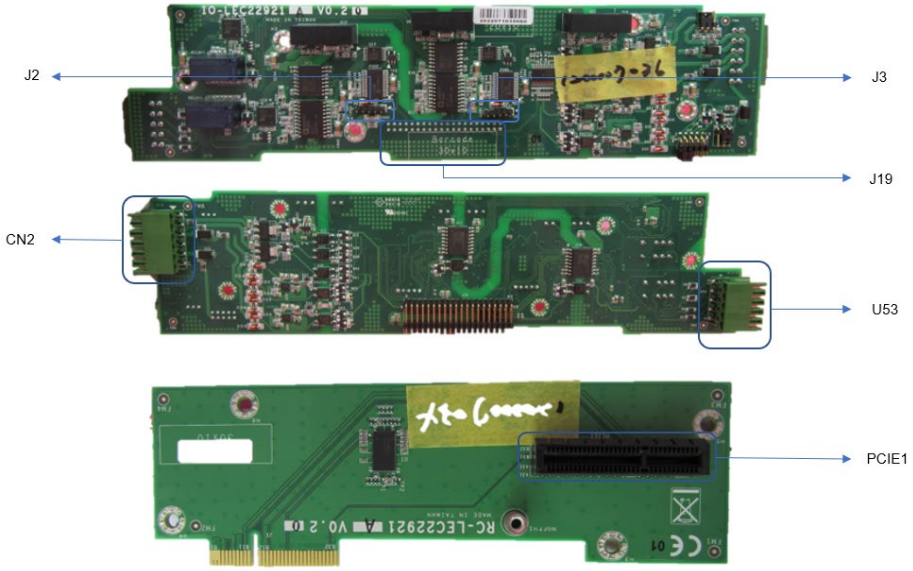
The block diagram indicates how data flows among components on the motherboard.



Internal Jumpers and Connector

The pin headers on the motherboard are often associated with important functions. With the shunt (Jumper) pushed down on the designated pins (the pin numbers are printed on the circuit board, surrounding the pin header), certain feature can be enabled or disable. When changing the jumpers, make sure your system is completely turned off.





PW1 (+24V)

Pin	Signal
1	DC_GND
2	DC_IN

JCOMS1: RTC Reset
1-2: Save CMOS (Default)
2-3: Clear CMOS

Pin	Signal
1	NC
2	RTC_RST#
3	GND

JCOMS2: SRTC Secured RTC Reset
1-2: Save ME RTC
2-3: Clear ME RTC

Pin	Signal
1	NC
2	SRTC_RST#
3	GND

J1: For Program MCU (Debug/Burn in code)
1-2: Normal Operate
2-3: Burn in code

Pin	Signal
1	+P3V3_STBY
2	PIO0_1
3	GND

SW3

Pin	Signal
1 ON 2 OFF (Default)	RM500Q, FN980, EM7455
1 OFF 2 ON	EM9191
3,4 OFF (Default)	ATX
3,4 ON	ST

SW1

Pin	Signal
1,2 ON 3,4 OFF (Default)	Sout3/Sin3
3,4 ON 1,2 OFF	NXP_RXD/ NXP_TXD

CON5

Pin	Signal
1	+P3V3_STBY
2	NXP_RXD
3	GND
4	NXP_TXD

J11

Pin	Signal
1	COPEN#
2	GND
3	NC

J10

Pin	Signal
1	INTRUSION#
2	GND
3	NC

JSPI1

Pin	Signal
1	SPI_HD1#
2	NC
3	SOC_SPI_CS0#_R
4	P3V3_SB_SPI
5	SOC_SPI_MISO_R
6	SOC_SPI_IO3_R
7	NC
8	SOC_SPI_CLK_R
9	GND
10	SOC_SPI_MOSI_R

COM1

Pin	Signal
1	COM_DCD1_#_L
2	COM_RXD1_L
3	COM_TXD1_L
4	COM_DTR1_#_L
5	GND
6	COM_DSR1_#_L

7	COM_RTS1_#_L
8	COM_CTS1_#_L
9	COM_RI1#_L

COM2

Pin	Signal
1	COM_DCD2_#_L
2	COM_RXD2_L
3	COM_TXD2_L
4	COM_DTR2_#_L
`5	GND
6	COM_DSR2_#_L
7	COM_RTS2_#_L
8	COM_CTS2_#_L
9	COM_RI2#_L

ESPI1:

Pin	Signal	Pin	Signal
1	ESPI_CLK	2	ESPI_IO1
3	ESPI_RST#	4	ESPI_IO0
5	ESPI_CS0#	6	+P3V3
7	ESPI_IO3	8	NA
9	ESPI_IO2	10	GND
11	+P3V3_STBY	12	NC

SATA_PWR1

Pin	Signal
1	+P12V
2	GND
3	GND
4	+P5V

IO Board

J2

Pin	Signal
1	ICSP_VPP1
2	+P3V3
3	GND
4	ICSP_DAT1
5	ICSP_CLK1

J3

Pin	Signal
1	ICSP_VPP2
2	+P3V3
3	GND
4	ICSP_DAT2
5	ICSP_CLK2

U53

Pin	Signal	Pin	Signal
1	GND_ISOCOM1	2	GND_ISOCOM2
3	TB2	4	TB7
5	TB3	6	TB8
7	COM1_ISO_422TXD-_485D-	8	COM2_ISO_422TXD-_485D-
9	COM1_ISO_422TXD+_485+	10	COM2_ISO_422TXD+_485D+

CN2

Pin	Signal	Pin	Signal
1	GND_ISODIO	2	GND_ISODIO
3	DO4	4	DI_4
5	DO3	6	DI_3
7	DO2	8	DI_2
9	DO1	10	DI_1
11	GND_ISODIO	12	VCOM

CHAPTER 2: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the unit, please remove all power connections to completely shut down the device and wear ESD protection gloves when handling the installation steps.

Open the Chassis

1. Power off the system and disconnect the power cord. Turn the system over. Unscrew the four (4) rubber pads securing the chassis cover.

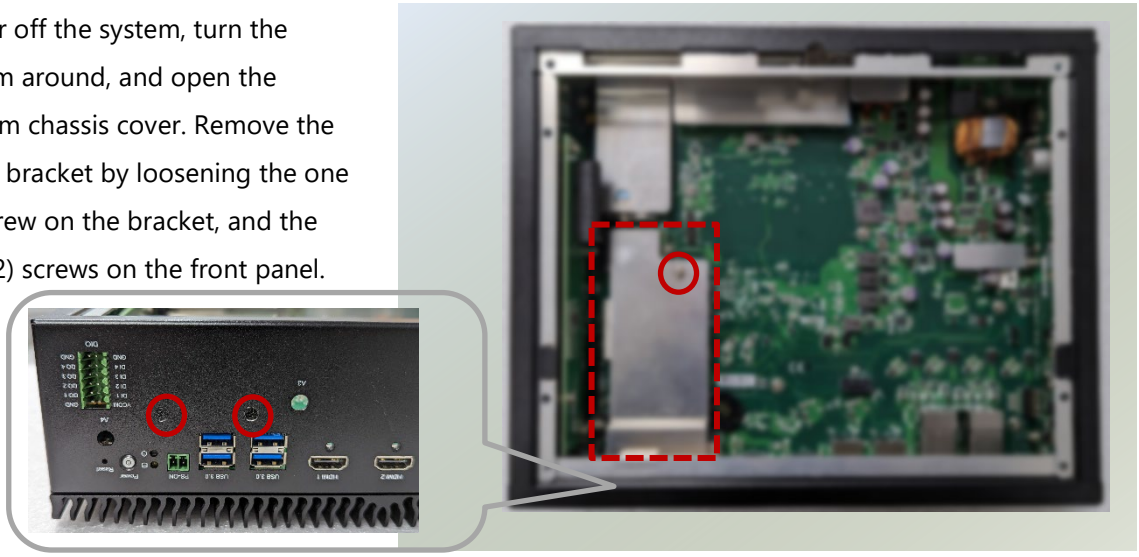
2. Then loosen the four (4) screws securing the chassis cover.

2. Lift and open the chassis cover.

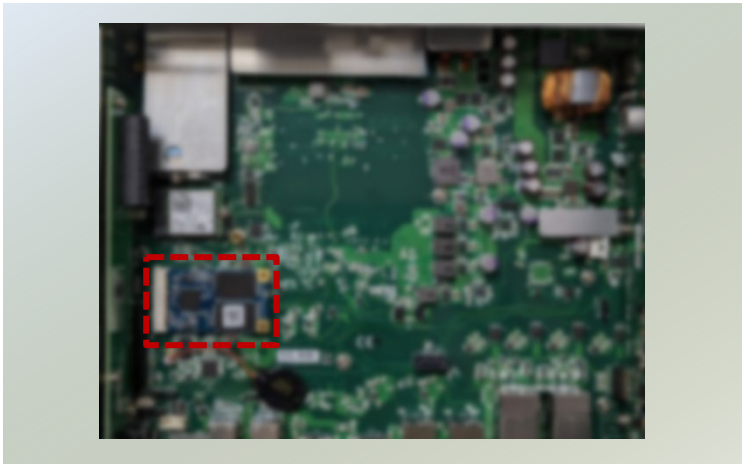
Installing mSATA Storage Card (Optional)

The system supports one mSATA storage card for additional memory storage. Please follow the steps for installation.

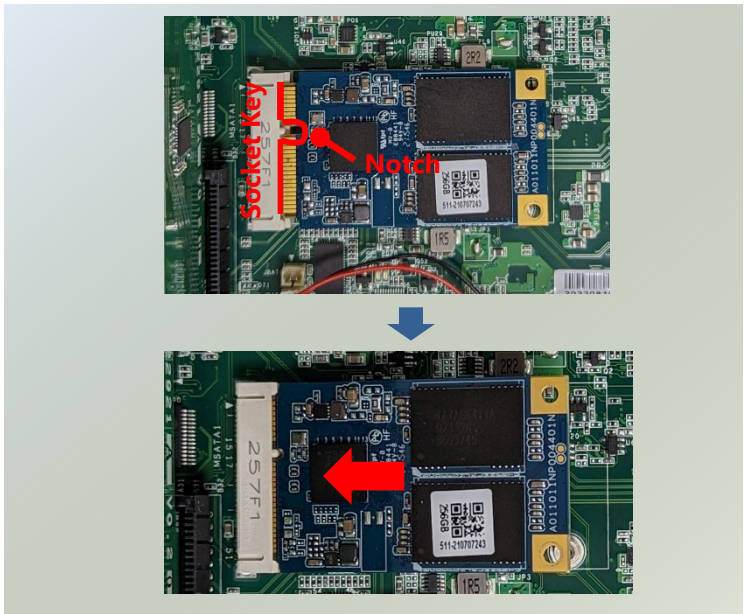
1. Power off the system, turn the system around, and open the bottom chassis cover. Remove the metal bracket by loosening the one (1) screw on the bracket, and the two (2) screws on the front panel.



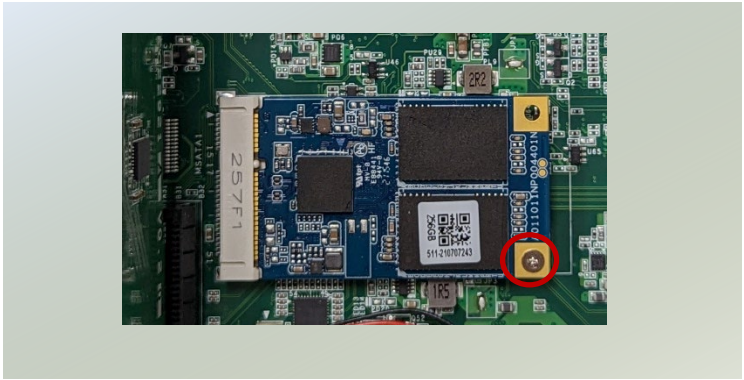
2. Locate the mSATA slot on the motherboard.



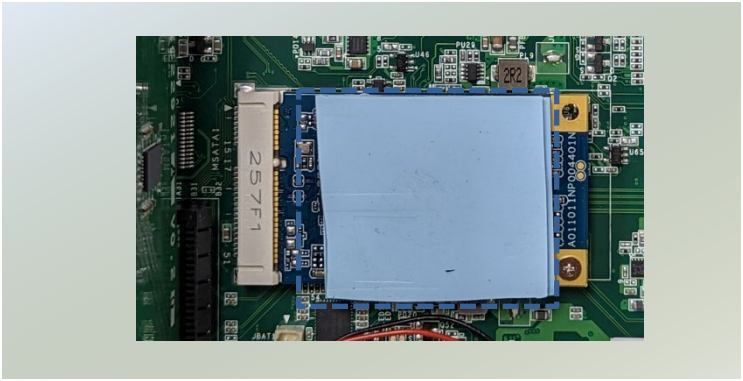
3. Align the notch of the mSATA module with the socket key in the pin slot.
4. Insert the mSATA module pins at 30 degrees into the socket until it is fully seated.



5. Push down on the module card and secure it with a screw.



6. Next, thermal pad placement. Remove the protective film on the Thermal Pad (included in accessory pack) and gently place on the mSATA module.

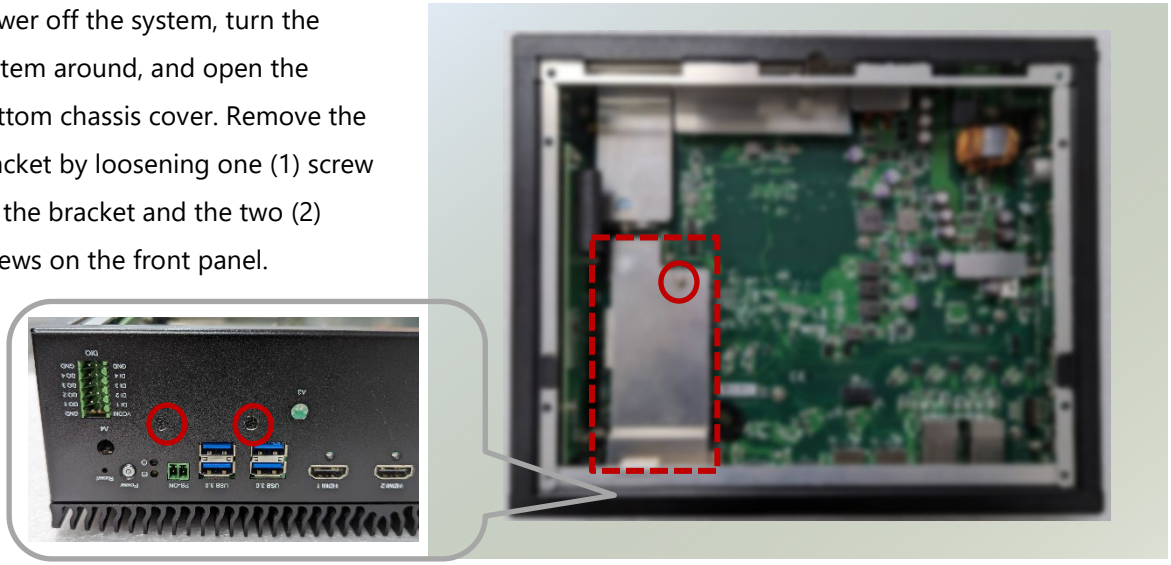


7. If a Wi-Fi module will not be inserted, make sure to place the metal bracket back on top and secure with three (3) screws.

Installing Wi-Fi Module (Optional)

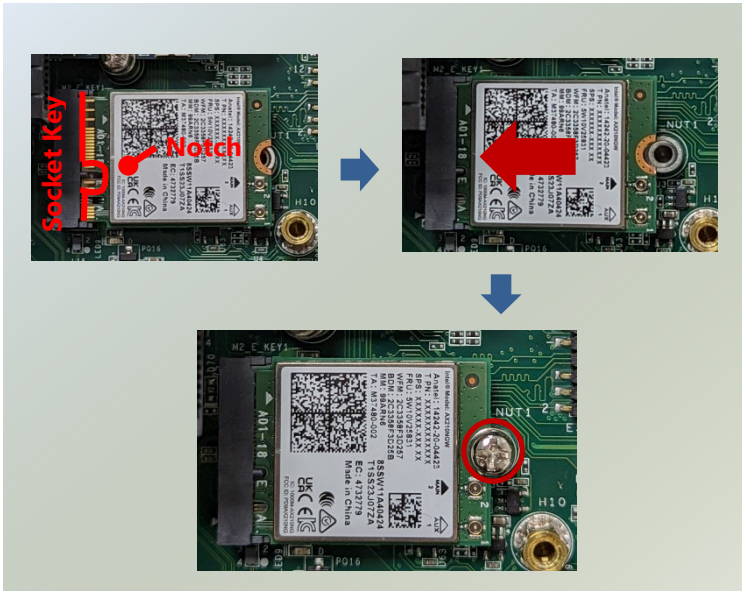
The system supports one M.2 E-key slot for a Wi-Fi module card, an optional accessory. Wi-Fi module requires two antennas. Please follow the steps to install the Wi-Fi module.

1. Power off the system, turn the system around, and open the bottom chassis cover. Remove the bracket by loosening one (1) screw on the bracket and the two (2) screws on the front panel.



2. Locate the M.2 E-Key slot on the motherboard.

3. Align the notch of the Wi-Fi module with the socket key in the pin slot.
4. Insert the Wi-Fi module pins at 30 degrees into the socket until it is fully seated.
5. Push down on the module card and secure it with a screw.



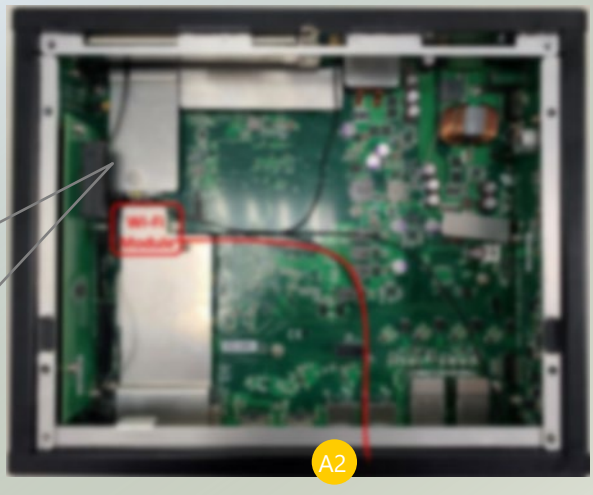
6. Next, thermal pad placement. Remove the protective film on the Thermal Pad (included in accessory pack) and gently place on the Wi-Fi module.

7. Make sure to place the metal bracket back on top and secure with three (3) screws, after installing the RF antenna cables.

Installing Wi-Fi Antennas

Front Panel

1. Locate the two (2) antenna hole placement (A1, A2). Locate the two (2) IPEX connectors on the Wi-Fi module.



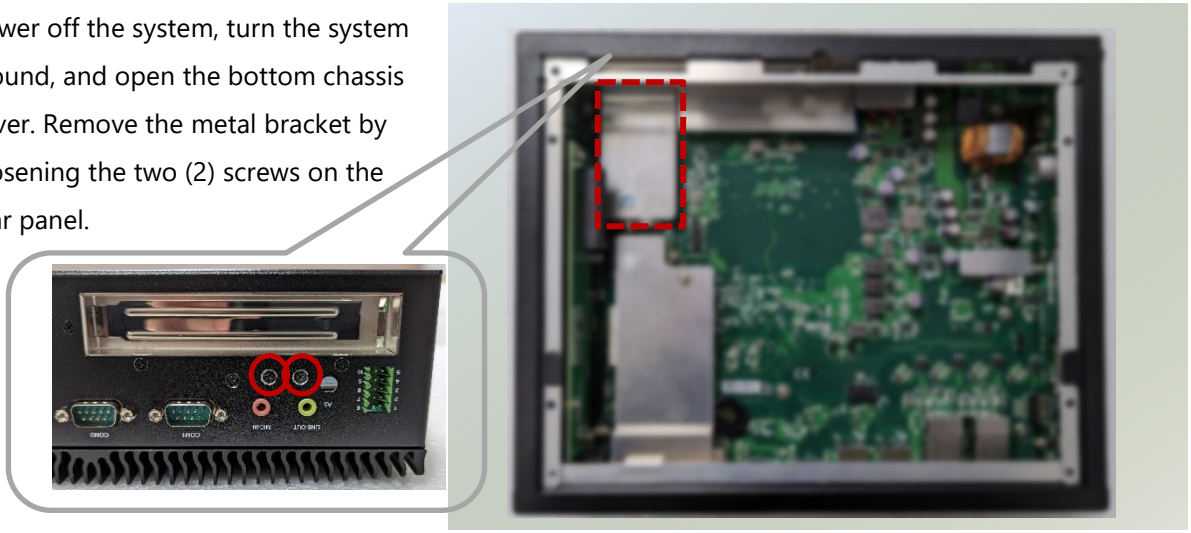
2. Connect RF cables to the IPEX connectors on the Wi-Fi module and screw the other end of the cables in the antenna holes.

3. Then, screw the two (2) antennas on the front panel of the system.

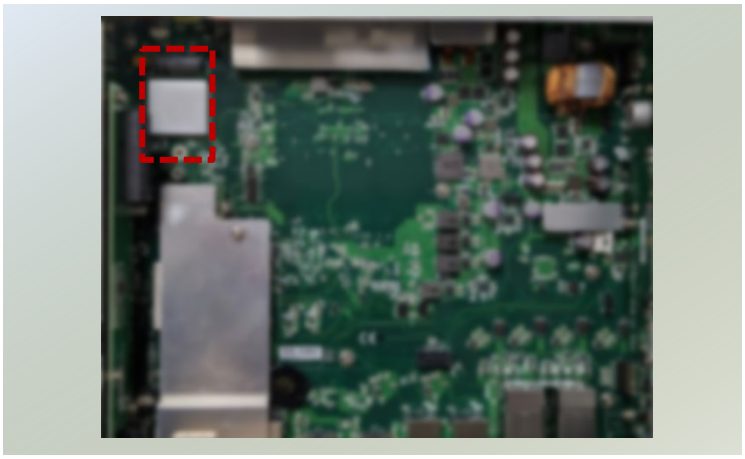
Installing 5G Module (Optional)

The motherboard provides one M.2 B-Key slot for a 4G LTE/ 5G module card, an optional additional accessory. 5G module will require four antennas. Please follow the installation procedures for the 5G module.

1. Power off the system, turn the system around, and open the bottom chassis cover. Remove the metal bracket by loosening the two (2) screws on the rear panel.

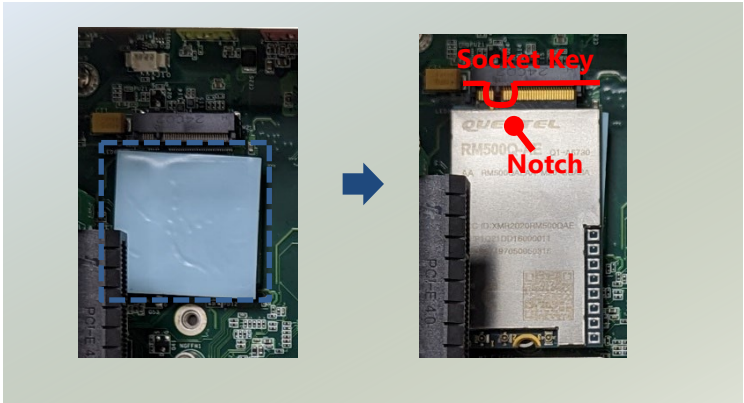


2. Locate the M.2 B-Key slot on the motherboard.



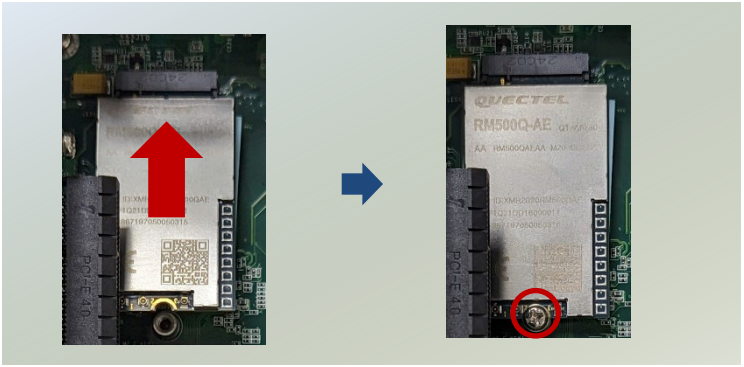
3. Next, thermal pad placement. Remove the protective film on the thermal pad (included in accessory pack) and gently place on the motherboard. The thermal pad needs to be underneath the module card.

4. Align the notch of the 5G module with the socket key in the pin slot.



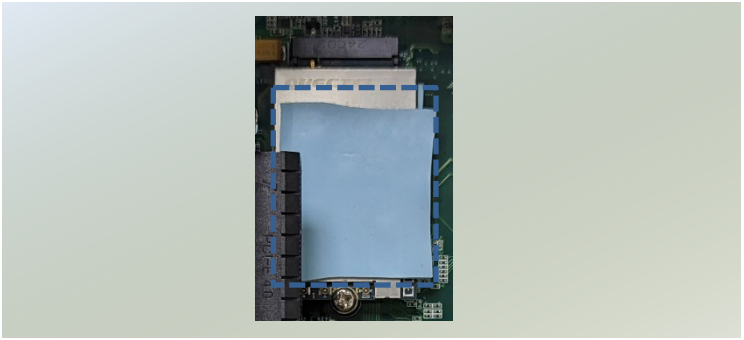
5. Insert the 5G module card pins at 30 degrees into the socket until it is fully seated.

6. Push down on the module card and secure it with a screw.



7. Then, place another thermal pad on the module card.

8. Make sure to place the metal bracket back on top of the module and secure with two (2) screws, after installing the RF antenna cables.

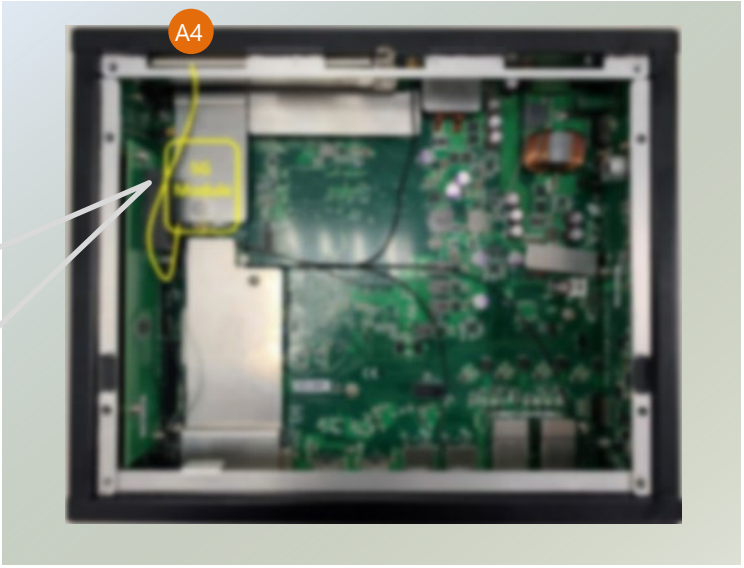


Installing 5G Antennas

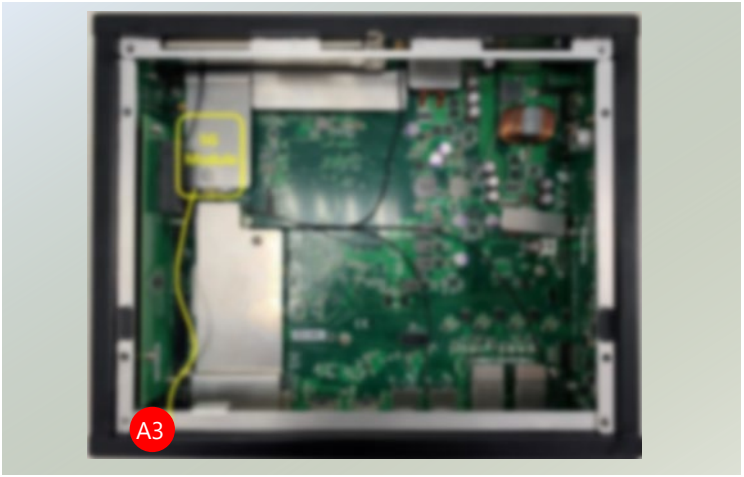
Front Panel

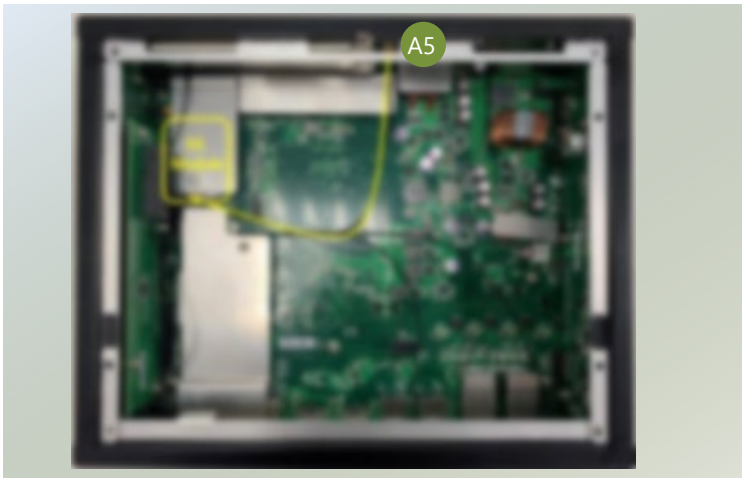
Rear Panel

1. Locate the four (4) antenna hole placement (A3, A4, A5, A6). Locate the four (4) IPEX connectors on the 5G module card.

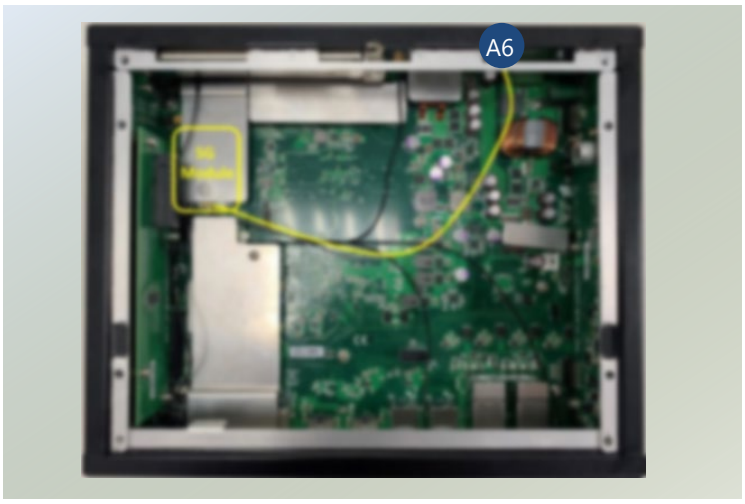


2. Connect the RF cables to the IPEX connectors on the 5G module and screw the other end of the cables in the antenna holes.





3. Then, screw on the four (4) antennas on the front and rear panel of the system.

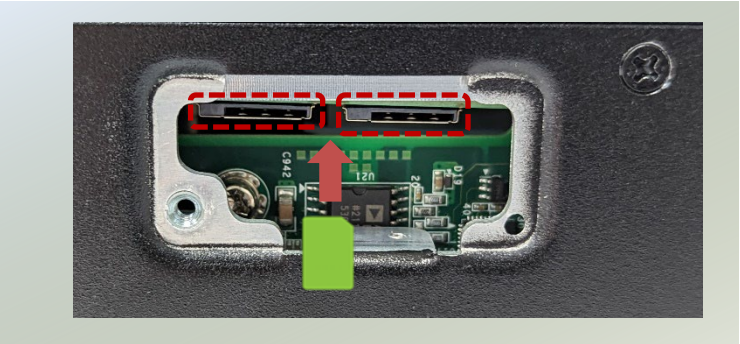


Installing SIM Cards

The SIM slot on the side panel supports dual Nano SIM cards. The SIM socket supports the push-push mechanism, allowing inserting and ejecting the SIM card to be as easy as one push.

1. Locate the SIM card cover on the side panel.
2. Loosen the twist-screw and remove the slot cover.

3. Two Nano-SIM cards can be placed on the top layer. Insert and push the nano-SIM cards, gold contacts facing upwards, all the way until they click into place.



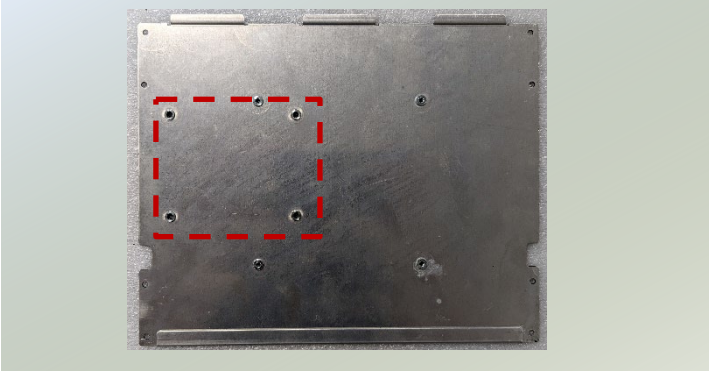
4. To remove the nano-SIM card, use your fingertips to push it once, to have the card automatically ejected.
5. Place the door back and tighten the twist-screw.

Installing Disk Drive (Optional)

The system supports one 2.5" HDD/SSD drive for additional data storage. Please follow the steps for installation.

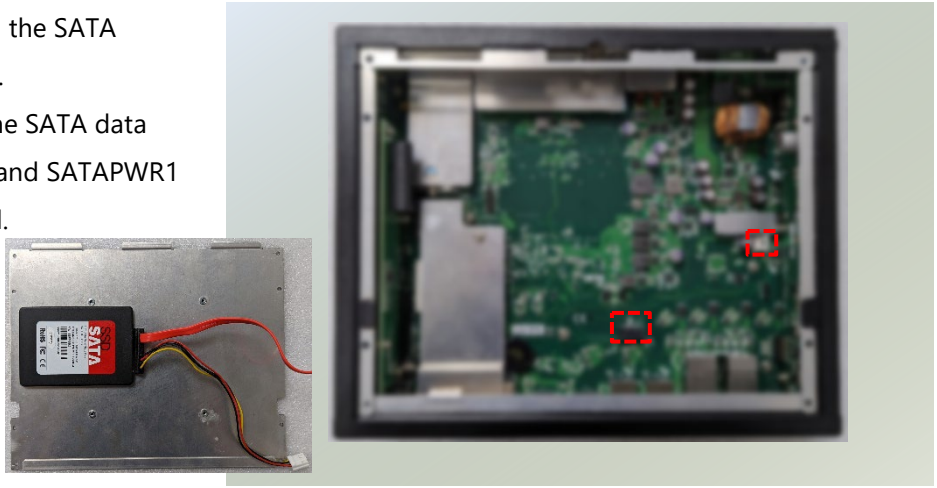
1. The HDD/SSD Kit includes:
   - 1x 2.5" SSD
   - 1x SATA Cables

2. Power off the system and open the bottom chassis cover. Locate the 2.5" SATA HDD/SSD drive placement on underside of the chassis cover.



3. Place the 2.5" HDD/SSD on the chassis cover and secure with two (2) screws on each side.

4. Insert the SATA cables to the SATA contact on the HDD/SSD.
5. Insert the other end of the SATA data cable to the SATA1 port and SATAPWR1 port on the motherboard.

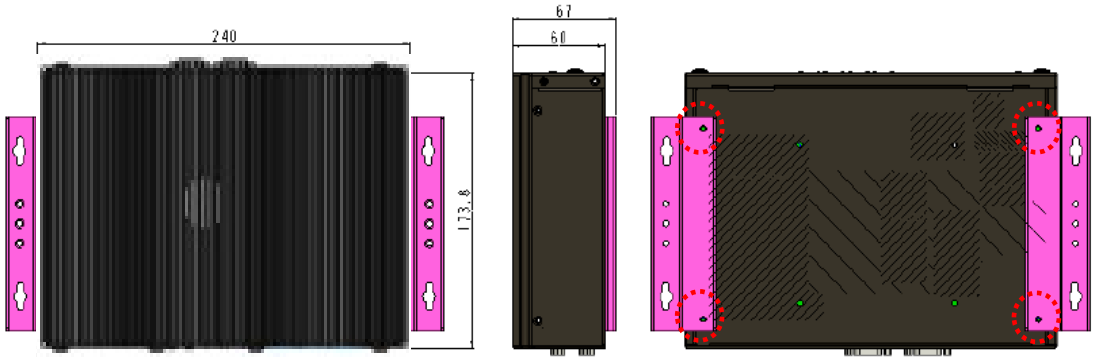


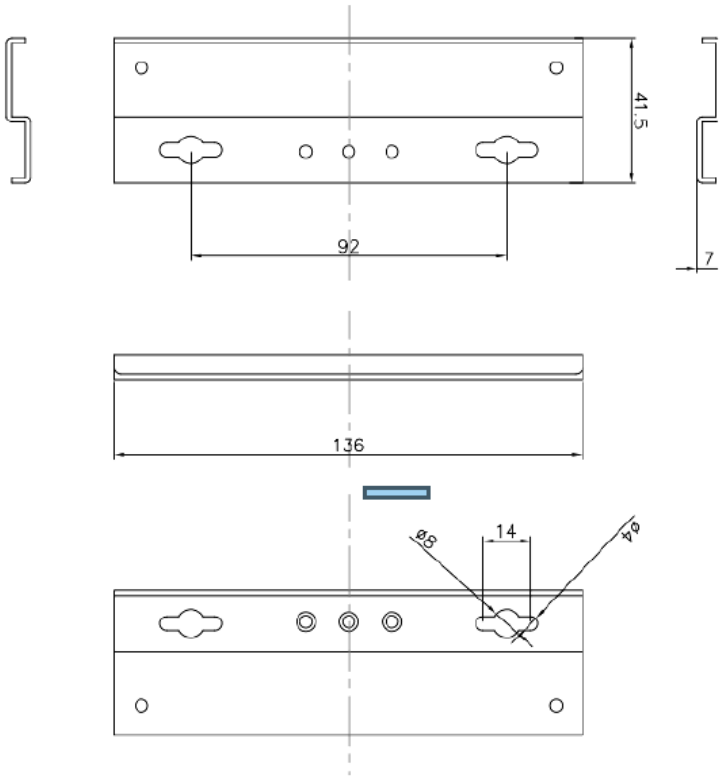
Wall Mounting

The system can be mounted on a flat surfaced wall. Please take the following into considerations when mounting the system onto the wall.

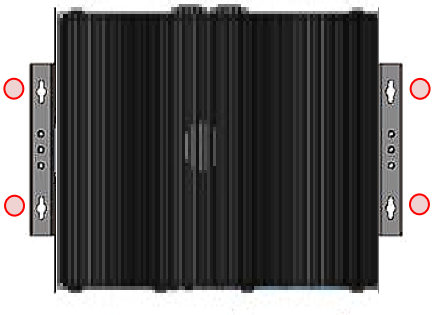
Note: All pictures shown are for illustration purposes only, actual product may vary due to specific model or enhancement.

1. Fix the wall mount brackets onto the system bottom by securing them with four (4) provided screws.

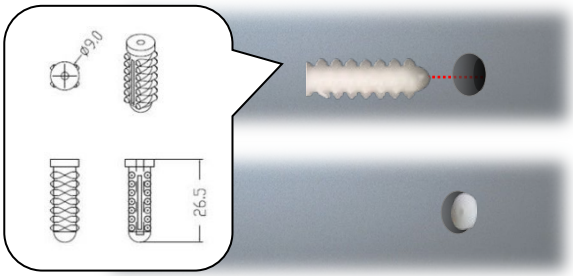




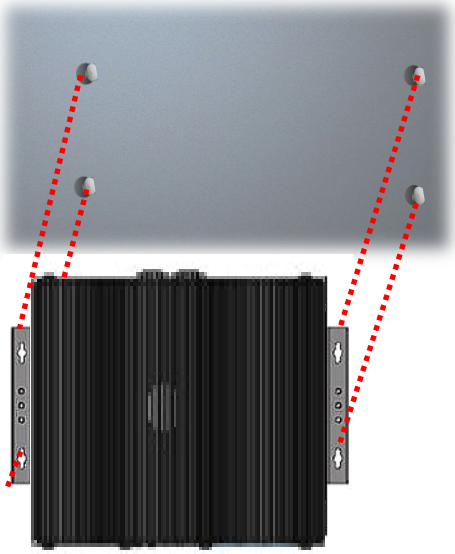
2. On the wall, measure the exact place where you want to hang the system, and drill four holes that match the four mounting holes on both brackets.



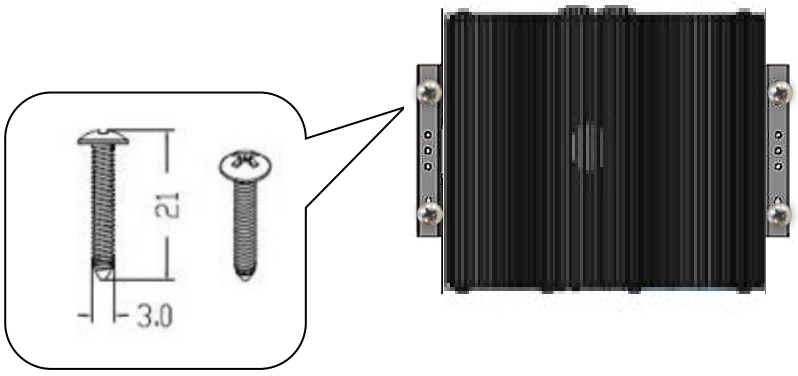
3. Insert **four** anchoring bolts into the holes.



4. Align the four mounting holes on the system's brackets with the four anchoring bolts you just installed on the wall.



5. Drive **four** long screws into the anchoring bolts to secure the system.



CHAPTER 3: SOFTWARE SETUP

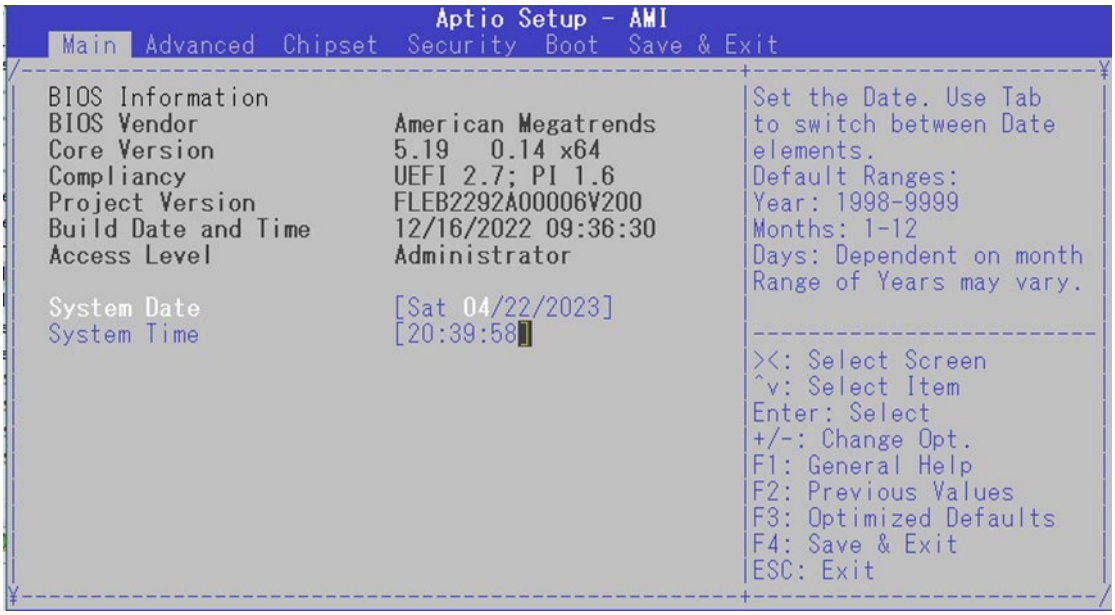
BIOS Setup

The system has AMI BIOS built-in, with a SETUP utility that allows users to configure required settings or to activate certain system features. Pressing the **<Tab>** or **<Del>** key immediately allows you to enter the Setup utility.

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced], [Chipset], [Security], [Boot], and [Save & Exit]
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	to adjust values for the selected setup item/option
F1	to display General Help screen
F2	to retrieve previous values, such as the parameters configured the last time you had entered BIOS.
F3	to load optimized default values
F4	to save configurations and exit BIOS
<Esc>	to exit the current screen

Main Page

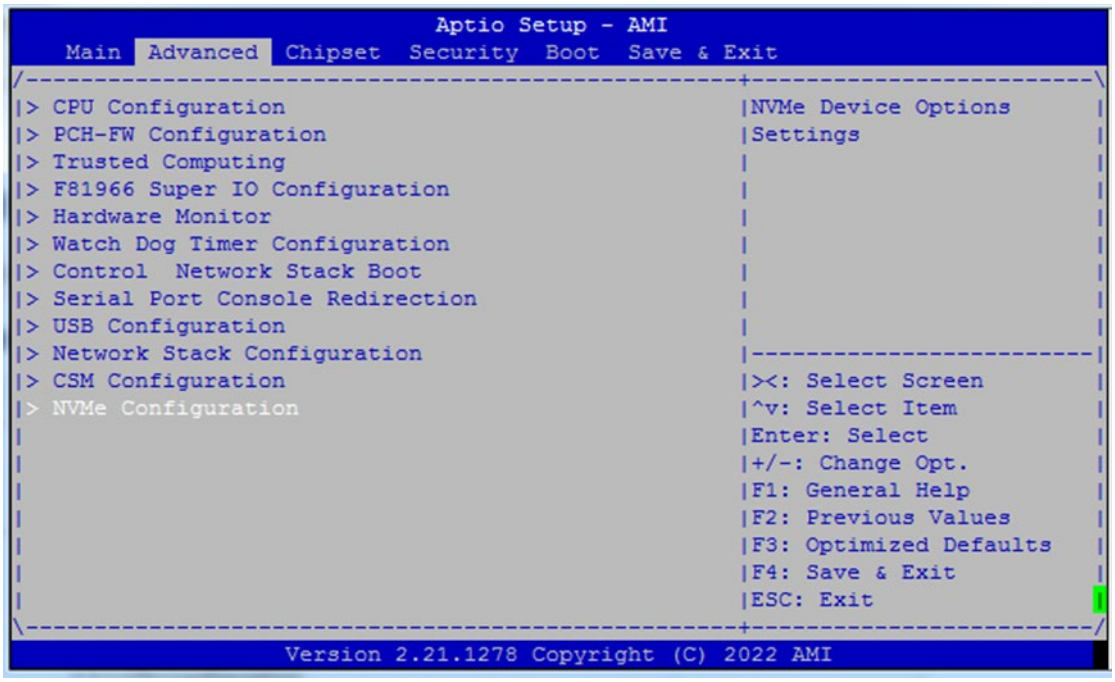
Setup main page contains BIOS information and project version information.



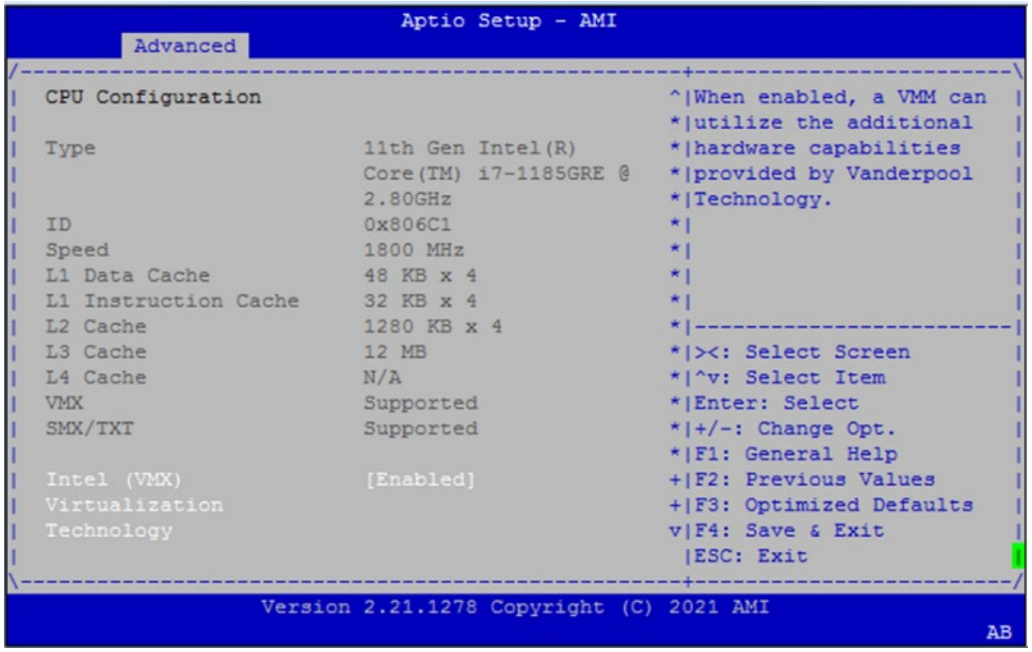
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **<Tab>** to switch between Date elements. Default Range of Year: 2005-2099 Default Range of Month: 1-12 Days: dependent on Month.
System Time	To set the Date, use **<Tab>** to switch between Date elements.

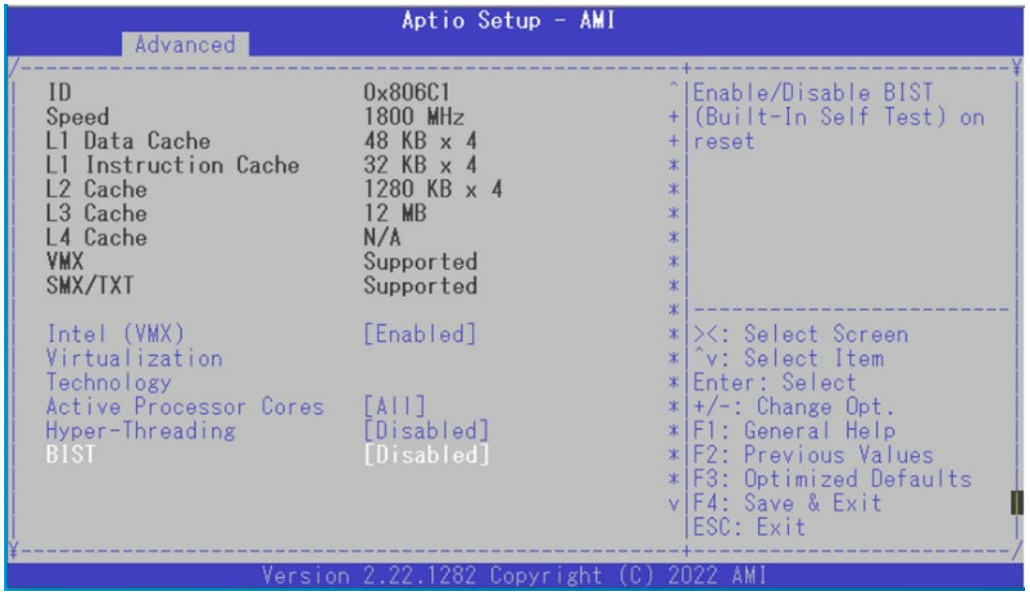
Advanced Page

Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



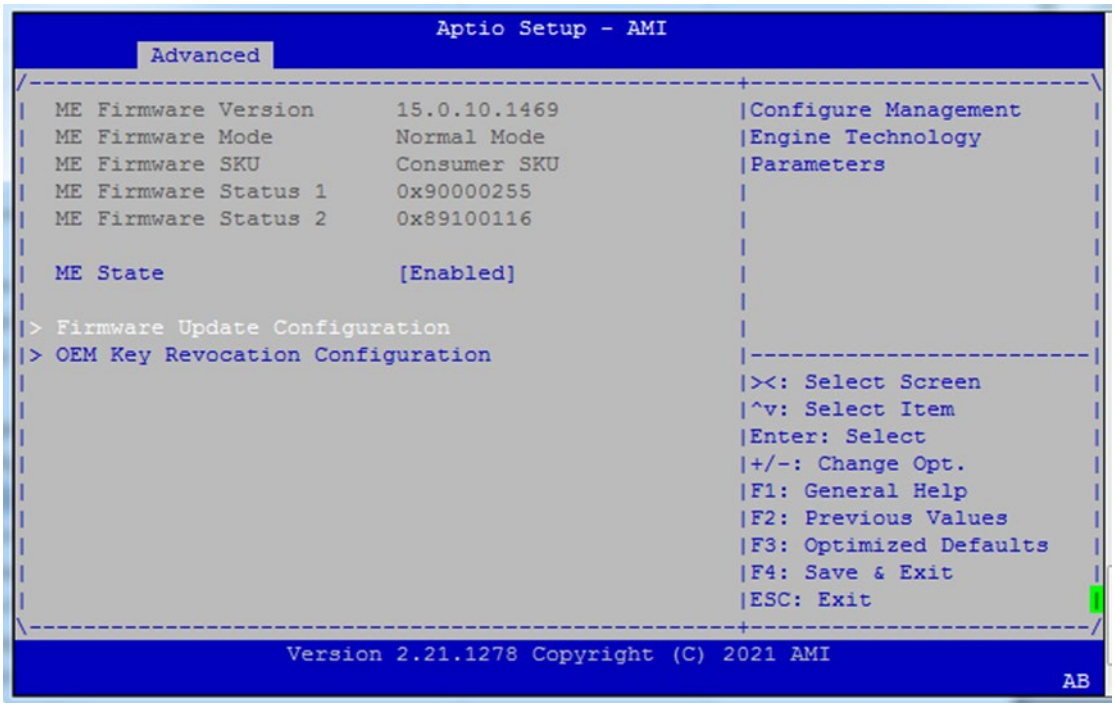
CPU Configuration





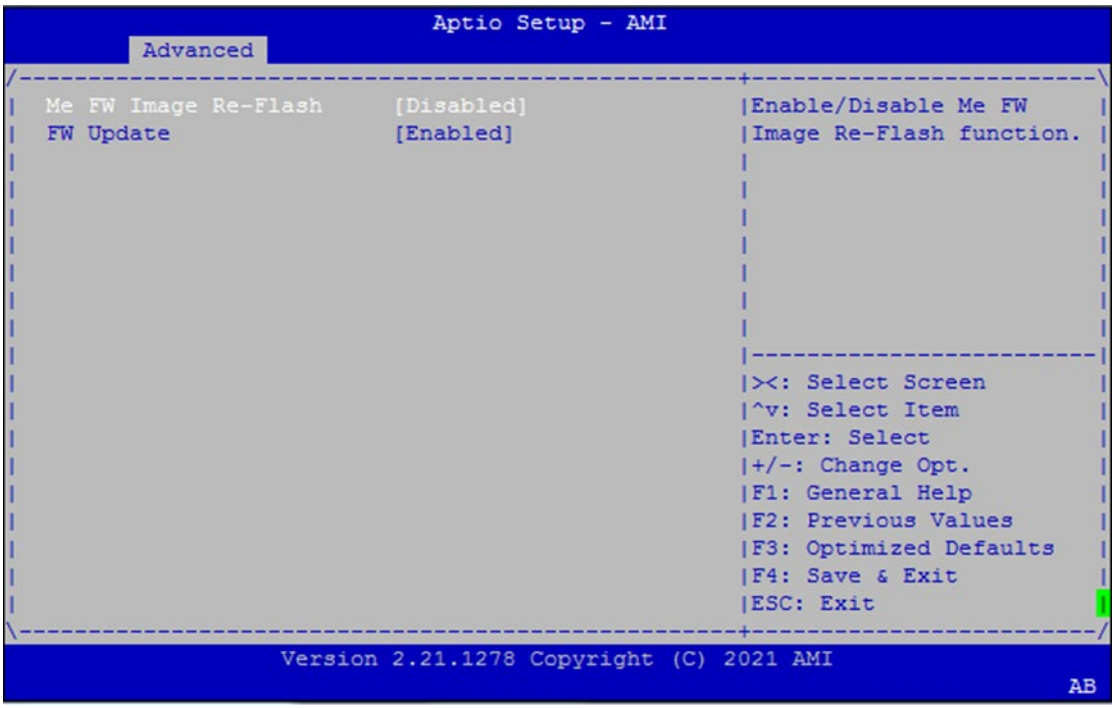
Feature	Options	Description
Intel (VMX) Virtualization Technology	Enabled Disabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All 1 2 3	Number of cores to enable in each processor package.
Hyper-Threading	Enabled Disabled	Enable or Disable Hyper-Threading Technology.
BIST	Enabled Disabled	Enable/Disable BIST (Built-In Self-Test) on reset

PCH-FW Configuration



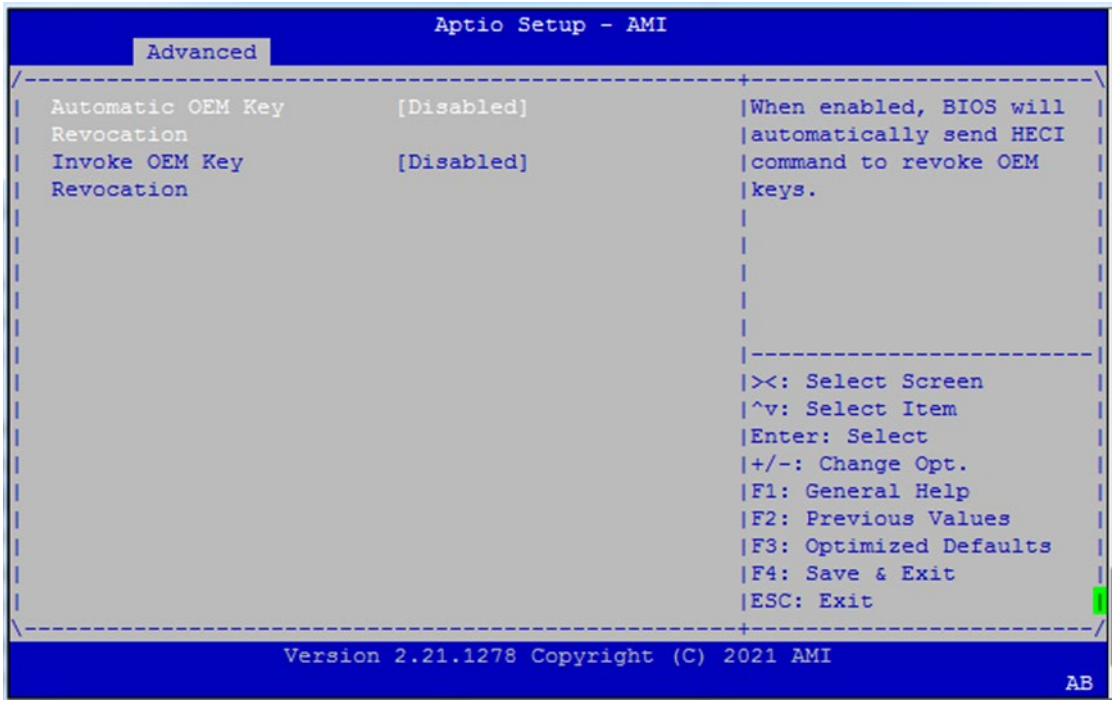
Feature	Options	Description
ME State	Enabled Disabled	Configure Management Engine Technology Parameters

Firmware Update Configuration



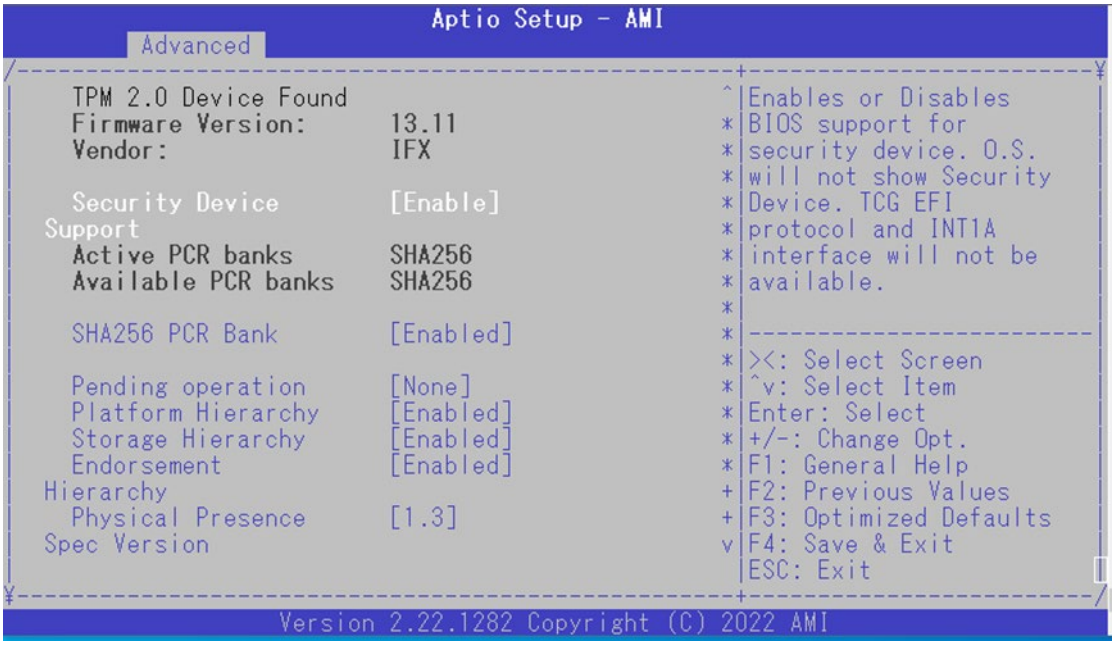
Feature	Options	Description
Me FW Image Re-Flash	Enabled Disabled	Enable/Disable ME FW Image Re-Flash function.
FW Update	Enabled Disabled	Enable/Disable ME FW Update function.

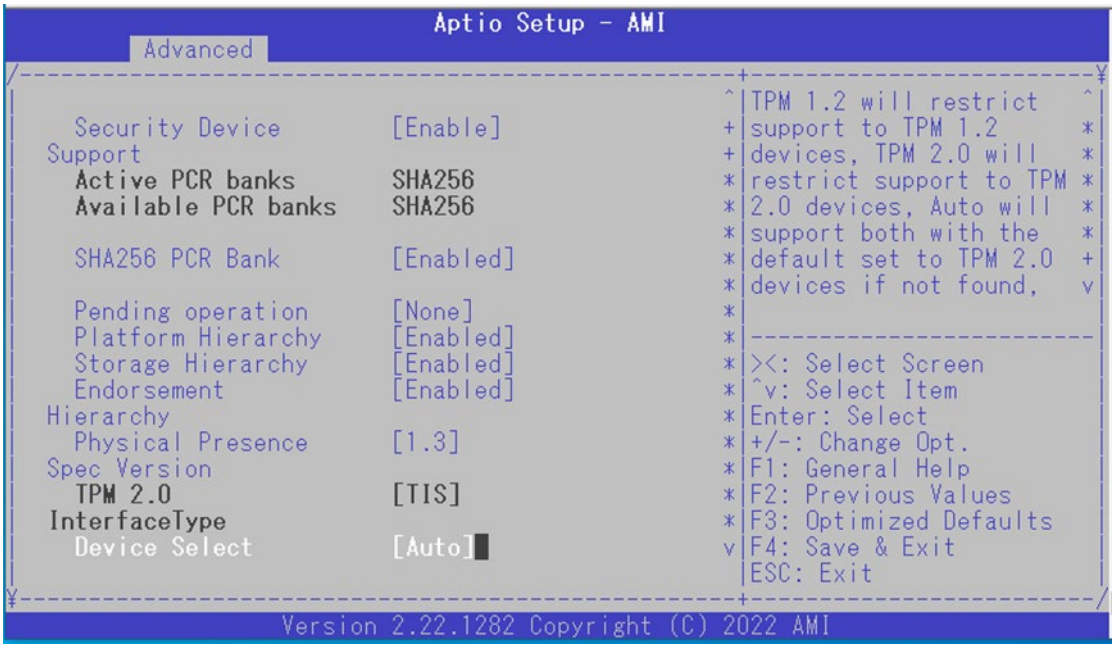
OEM Key Revocation Configuration



Feature	Options	Description
Automatic OEM Key Revocation	Enabled Disabled	When enabled, BIOS will automatically send HECI command to revoke OEM keys.
Invoke OEM Key Revocation	Enabled Disabled	When enabled, BIOS will automatically send HECI command to revoke OEM keys.

Trusted Computing

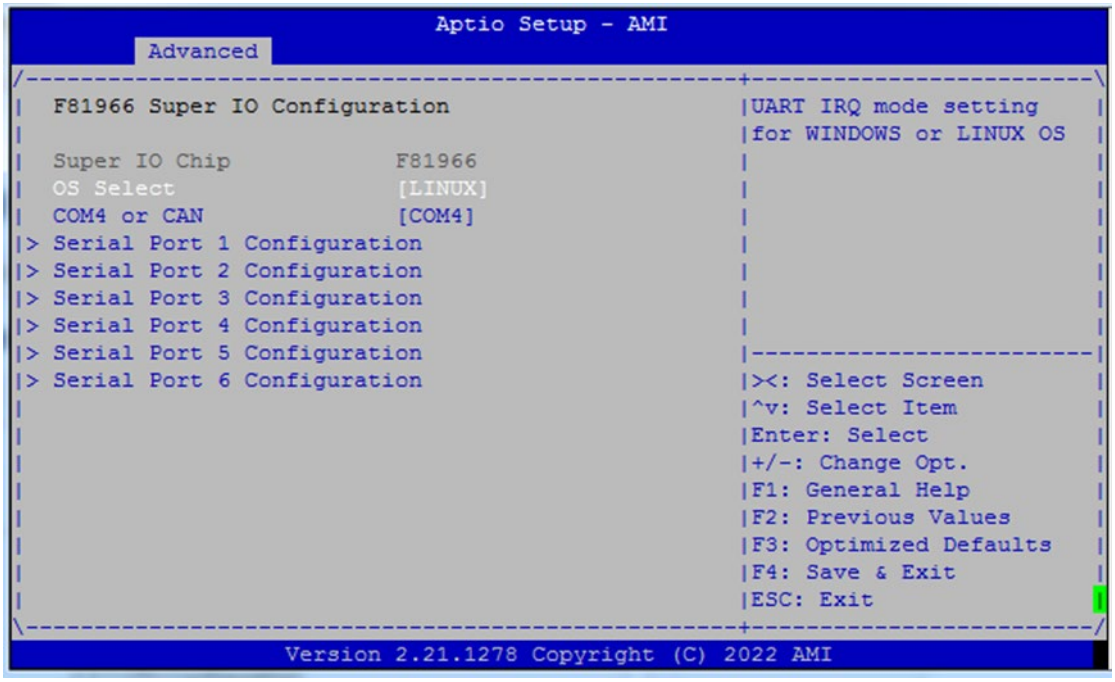




Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or Disables SHA-1 PCR Bank.
SHA256 PCR Bank	Enabled Disabled	Enables or Disables SHA256 PCR Bank.

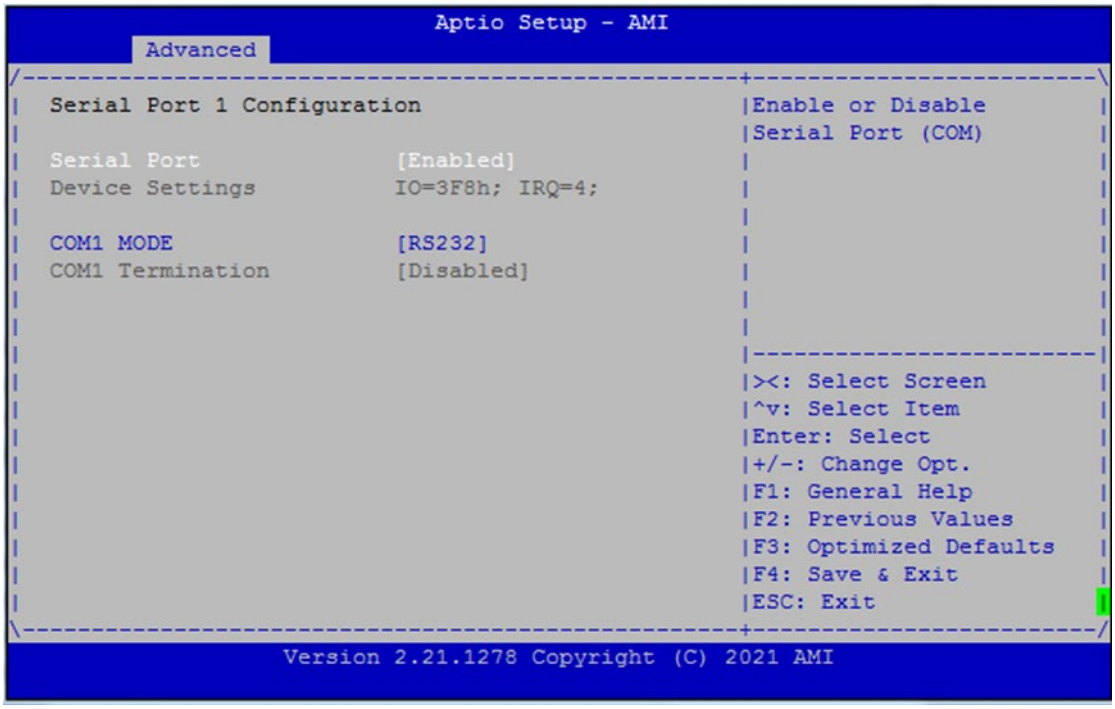
SHA384 PCR Bank	Enabled Disabled	Enables or Disables SHA384 PCR Bank.
SM3_256 PCR Bank	Enabled Disabled	Enables or Disables SM3_256 PCR Bank.
Pending Operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	Enabled Disabled	Enables or disables Platform Hierarchy.
Storage Hierarchy	Enabled Disabled	Enables or disables Storage Hierarchy.
Endorsement Hierarchy	Enabled Disabled	Enables or disables Endorsement Hierarchy.
TPM2.0 UEFI Spec Version	TCG_1_2 TCG_2	Select the TCG2 Spec Version, **TCG_1_2**: The Compatible mode for Win8/Win10 **TCG_2**: Supports new TCG2 protocol and event format for Win10 or later.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE: Some HCK tests might not support 1.3.
Device Select	TPM 1.2 TPM 2.0 Auto	**TPM 1.2** will restrict support to TPM 1.2 devices; while **TPM 2.0** will restrict support to TPM 2.0 devices; **Auto** will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

F81966 Super IO Configuration



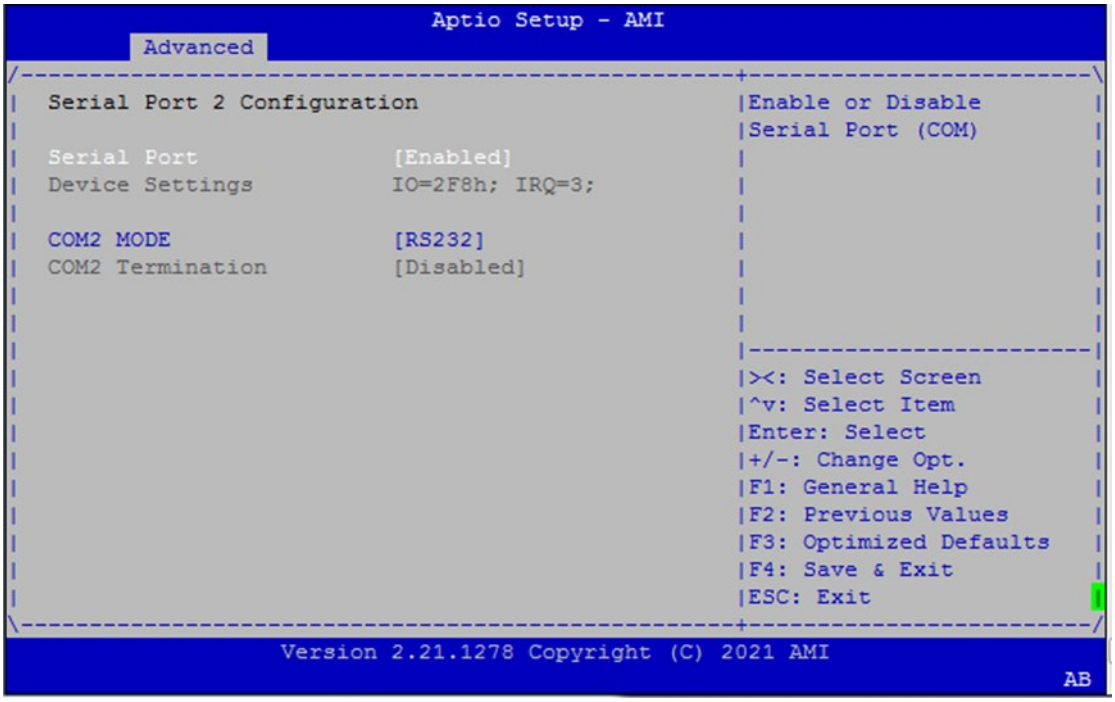
Feature	Options	Description
OS Select	WINDOWS LINUX	UART IRQ mode setting for WINDOWS or LINUX OS
COM4 or CAN	CAN COM4	COM4 or CAN

Serial Port 1 Configuration



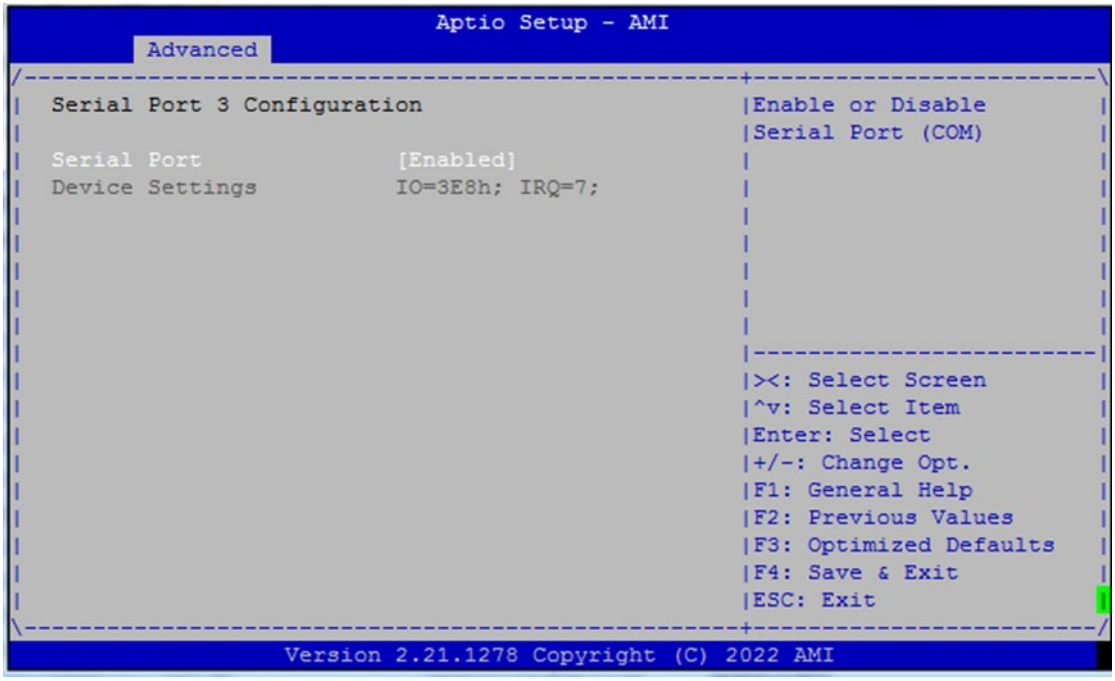
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4
COM1 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM1 Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Serial Port 2 Configuration



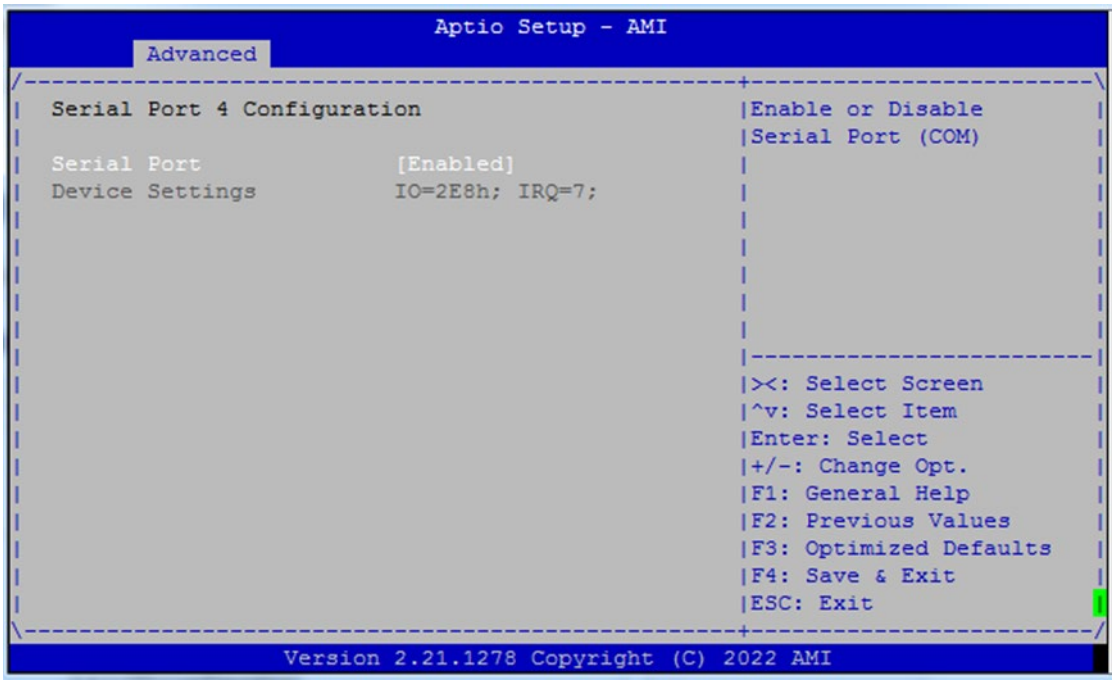
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=2F8h; IRQ = 3
COM2 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM2 Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Serial Port 3 Configuration



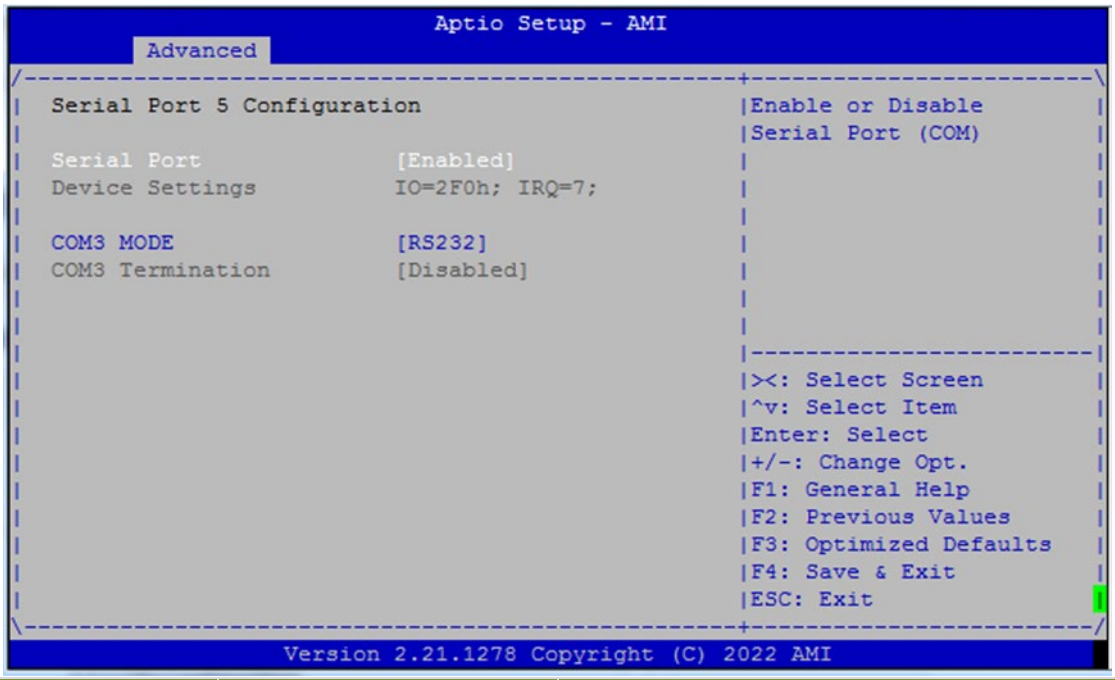
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=3E8h; IRQ = 7

Serial Port 4 Configuration



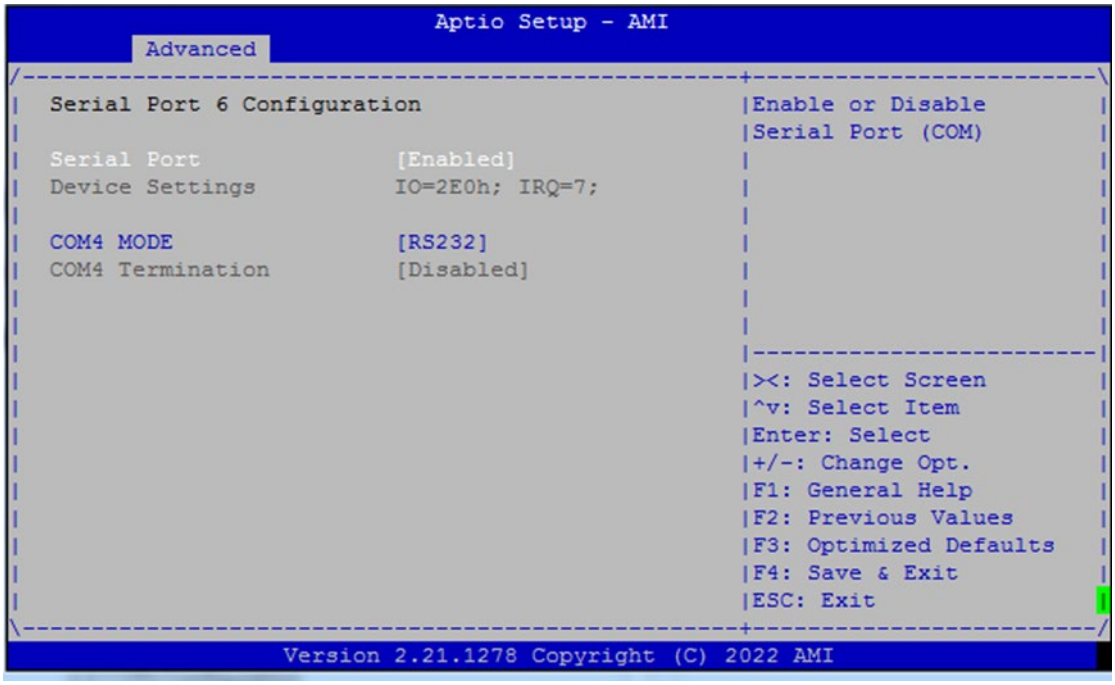
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=3E8h; IRQ = 7

Serial Port 5 Configuration



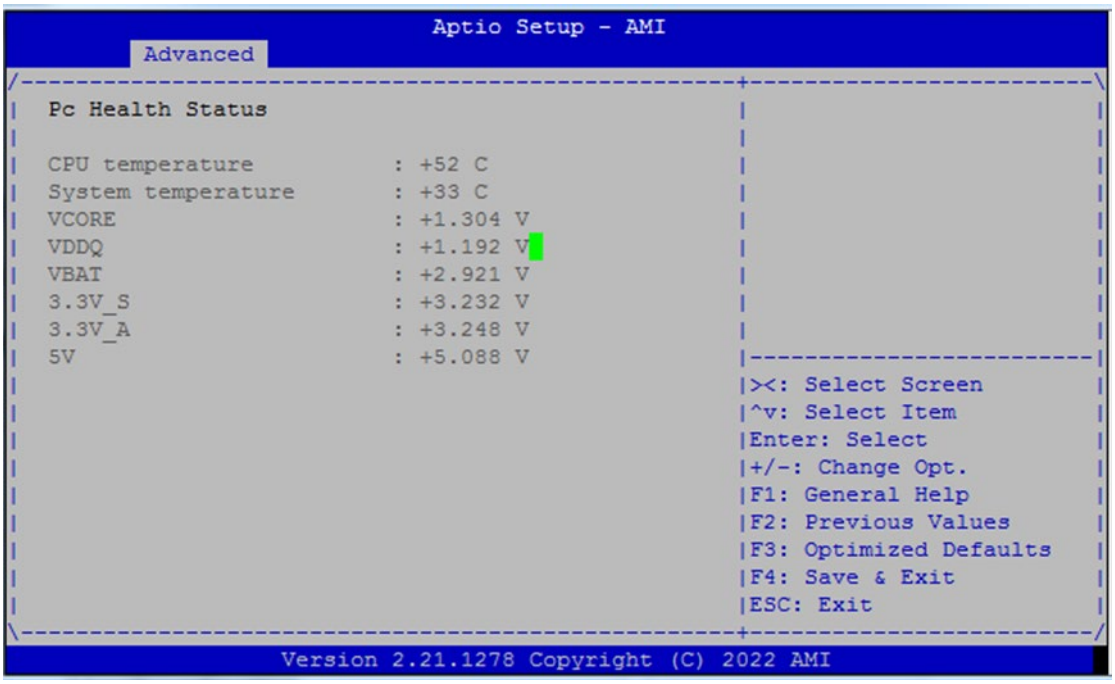
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=2F0h; IRQ = 3
COM3 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM3Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Serial Port 5 Configuration



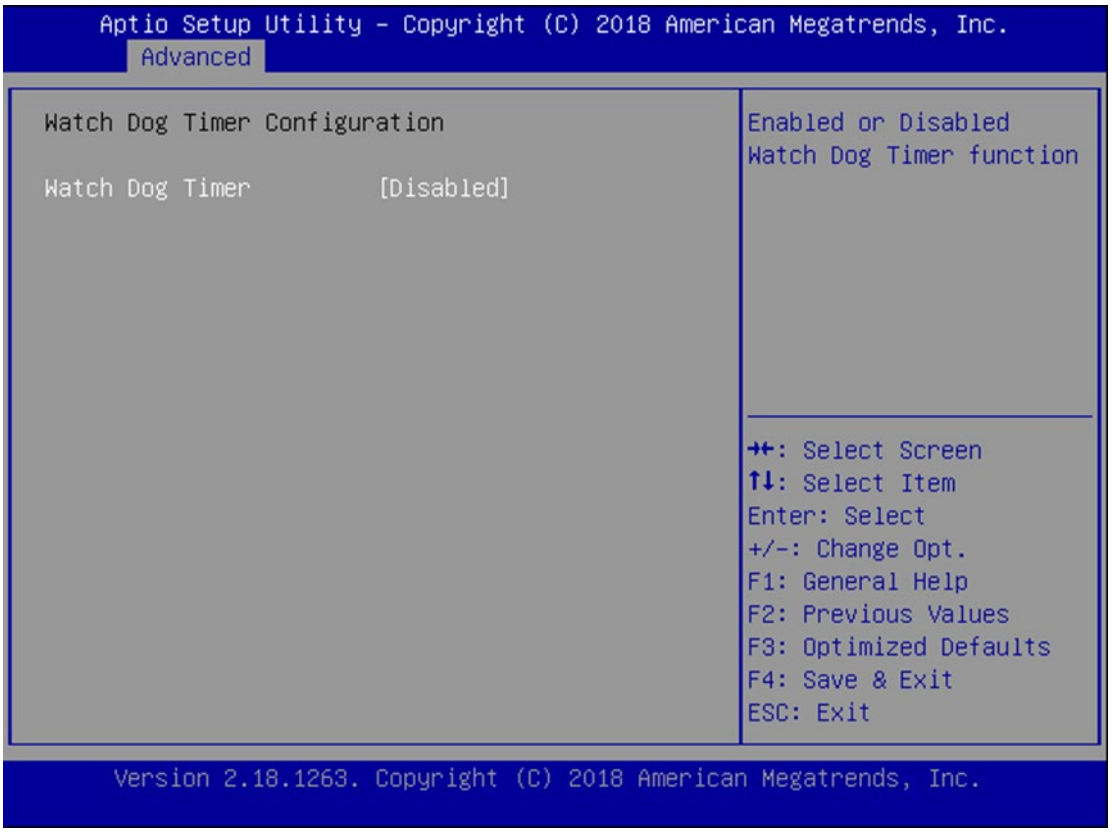
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
Device Settings	NA	IO=2E0h; IRQ = 3
COM4 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM4 Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Hardware Monitor



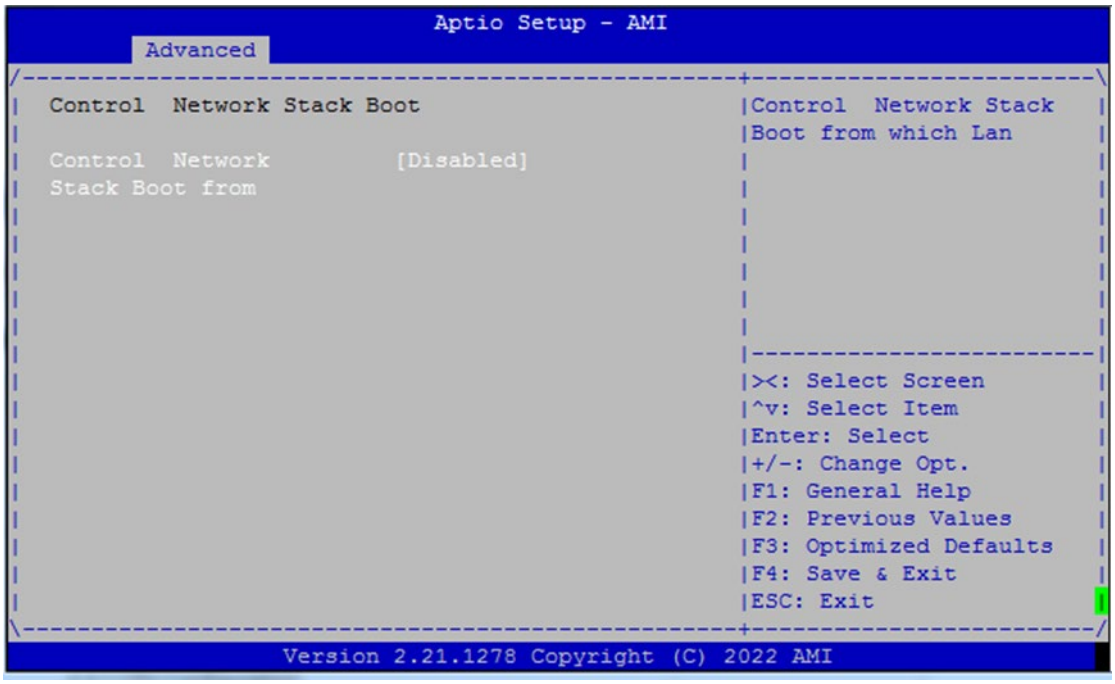
Feature	Description
CPU temperature	This value reports the CPU temperature.
System temperature	This value reports the System temperature.
VCORE	This value reports the CPU VCORE.
VDDQ	This value reports the DDR4 _VDDQ.
VBAT	This value reports the VBAT Input voltage.
3.3V_S	This value reports the 3.3V_S Input voltage.
3.3V_A	This value reports the 3.3V_A Input voltage.
5V	This value reports the 5V Input voltage.

Watch Dog Timer Configuration



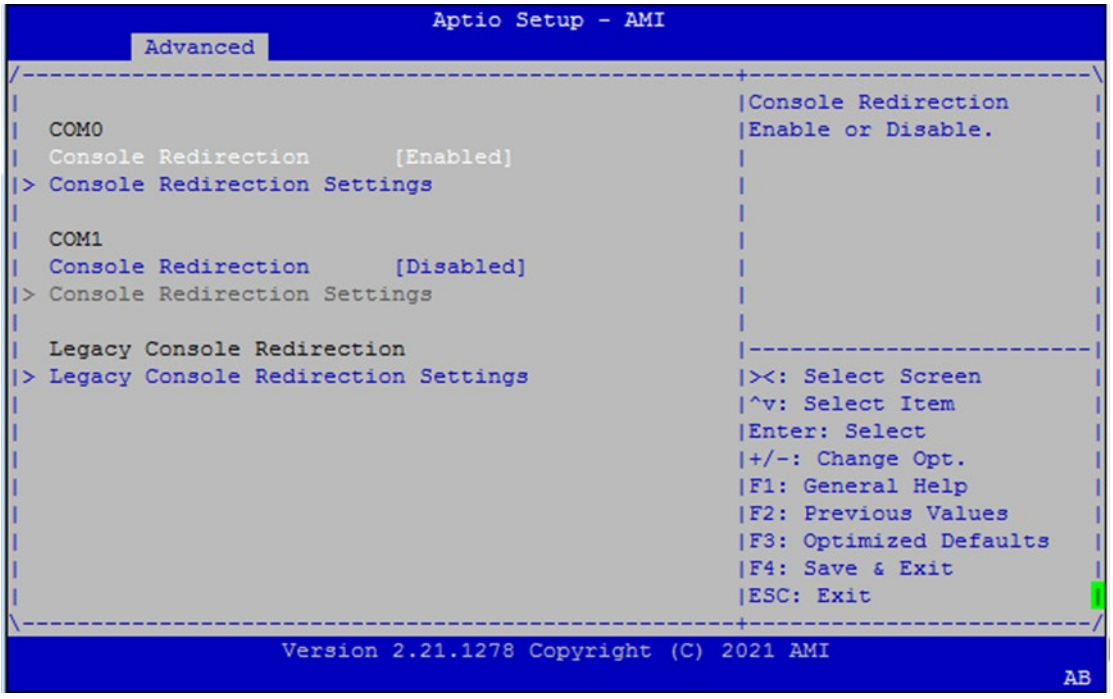
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enable or Disable Watch Dog function

Control Network Stack Boot



Feature	Options	Description
Control Network Stack Boot from	Disabled LAN1 LAN2 LAN3 LAN4	Control Network Stack Boot from which Lan

Serial Port Console Redirection

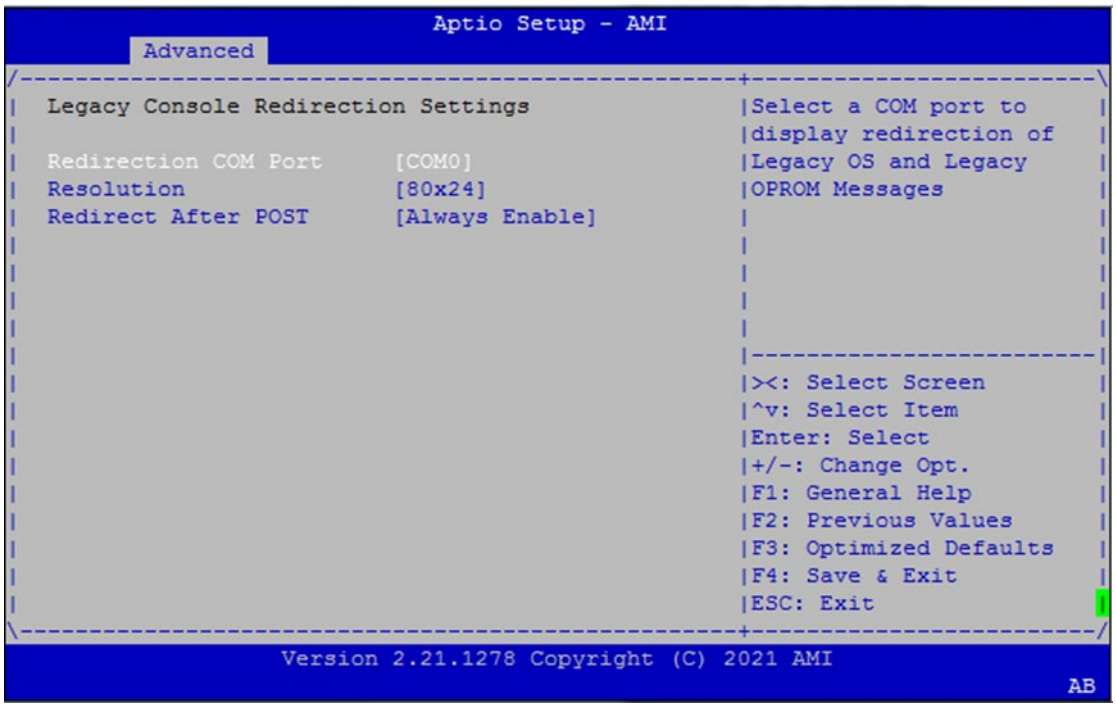


Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection
COM1 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

Console Redirection Settings

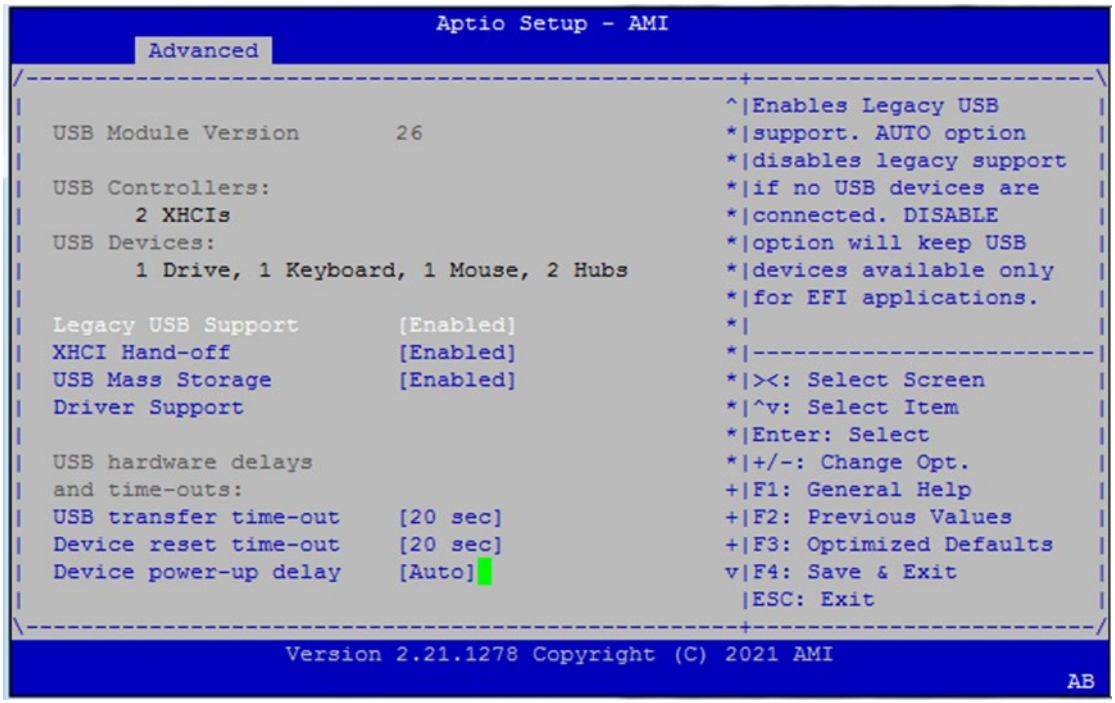
Feature	Options	Description
Terminal Type	VT100 VT100Plus T-UTF8 ANSI	ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Stop bits indicate the end of a serial data packet.
Flow Control	None Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution.
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

Legacy Console Redirection Setting



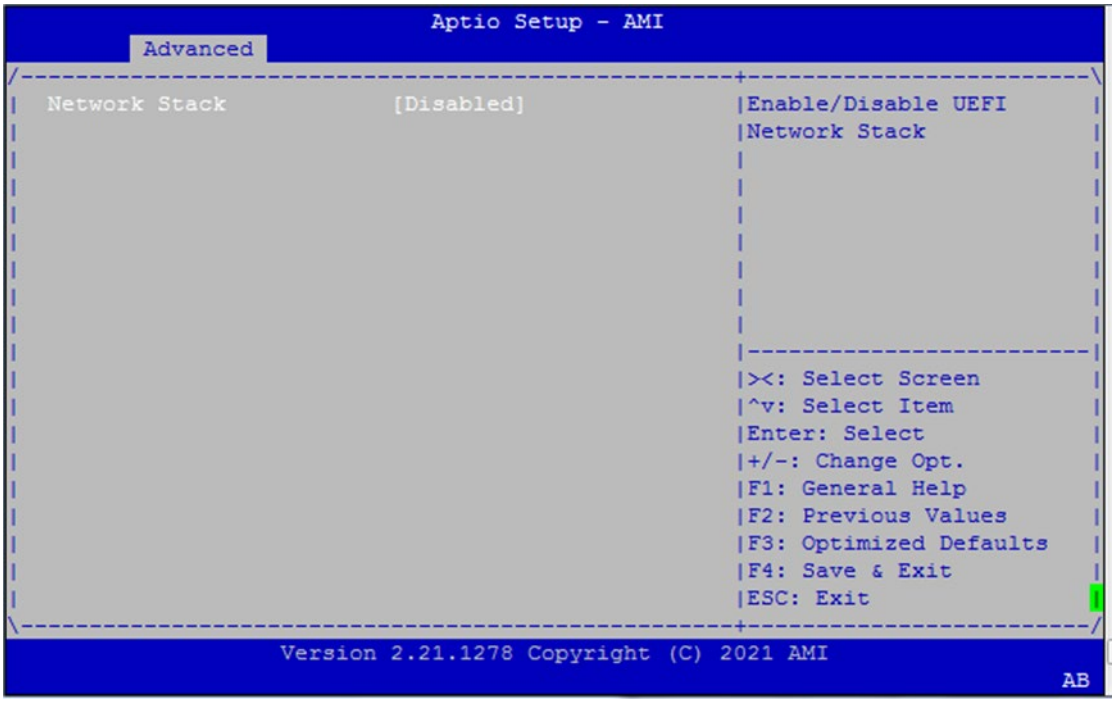
Feature	Options	Description
Redirection COM Port	COM0 COM1	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After POST	Always Enable BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

USB Configuration



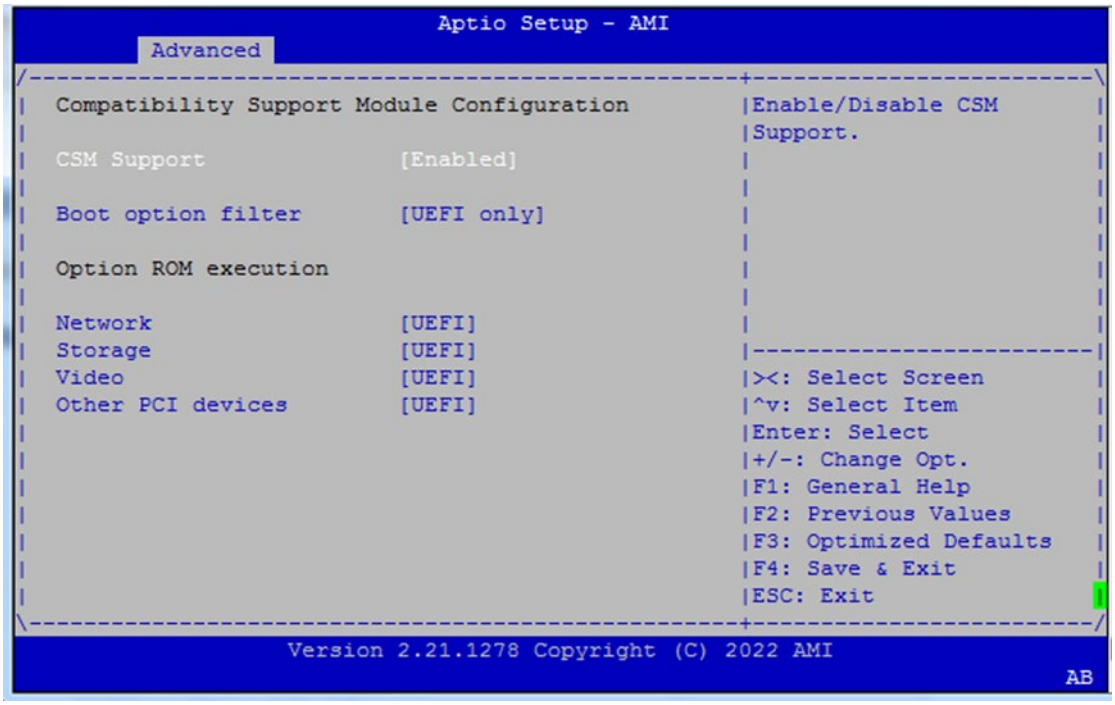
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out
Device power-up delay	Auto Manual	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.

Network Stack Configuration



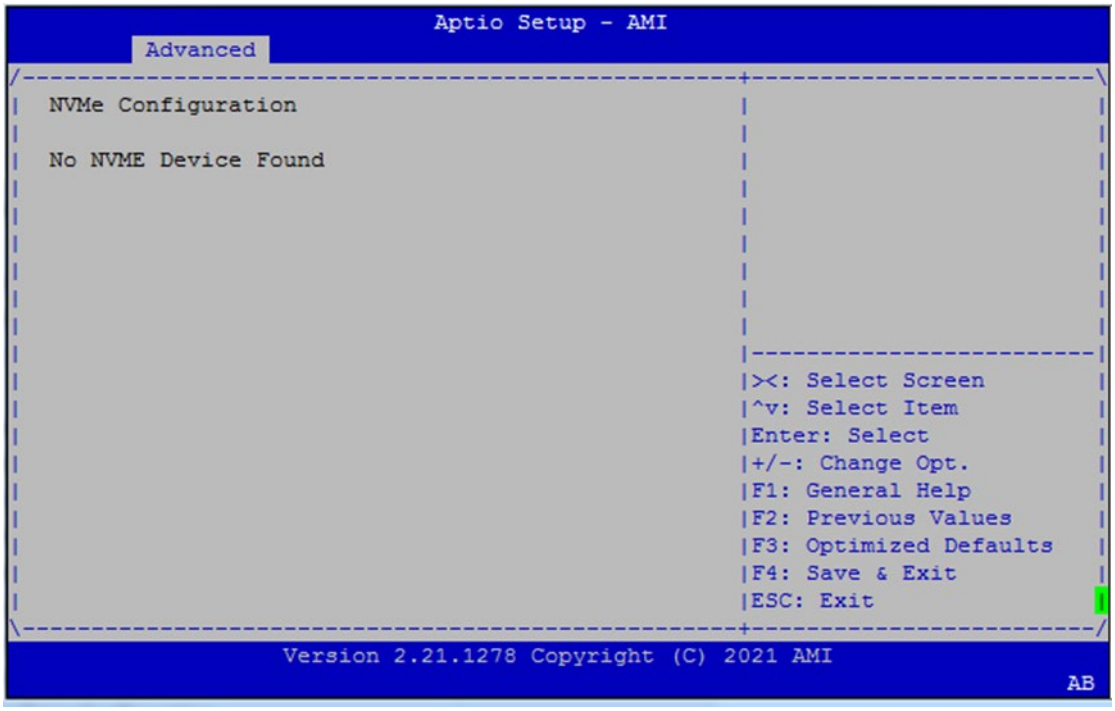
Feature	Options	Description
Network Stack	Disabled Enable	Enable/Disable UEFI Network Stack
IPv4 PXE Support	Disabled Enable	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP Support	Disabled Enable	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	Disabled Enable	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
IPv6 HTTP Support	Disabled Enable	Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

CSM Configuration



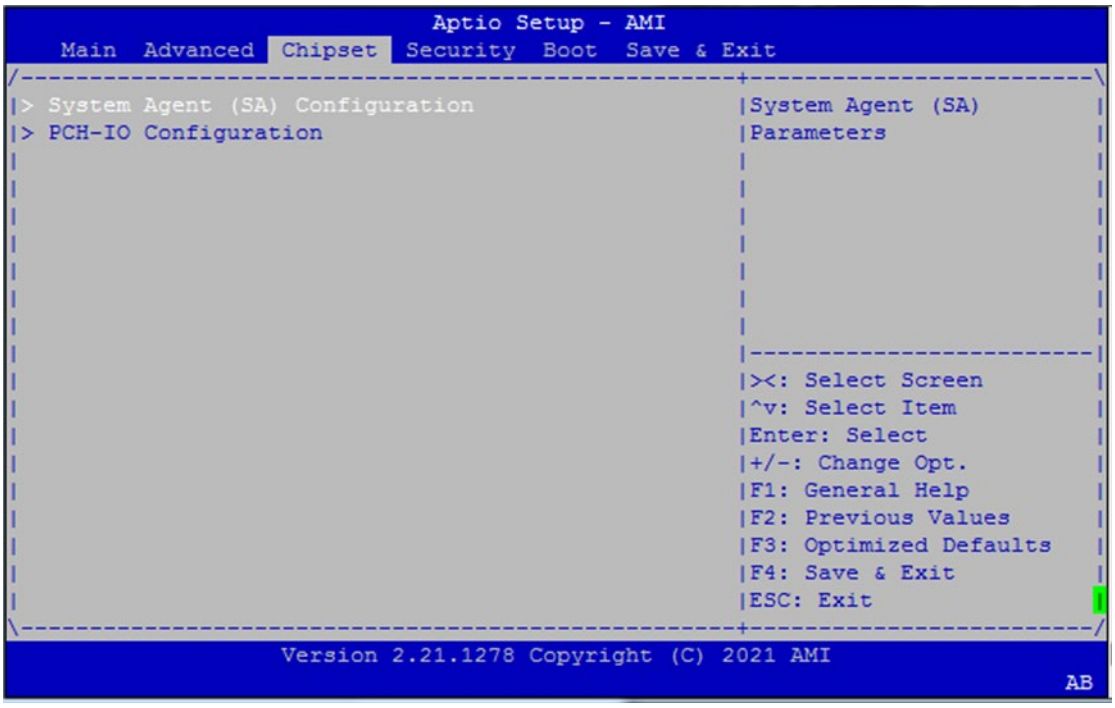
Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device	Do Not Launch UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

NVMe Configuration

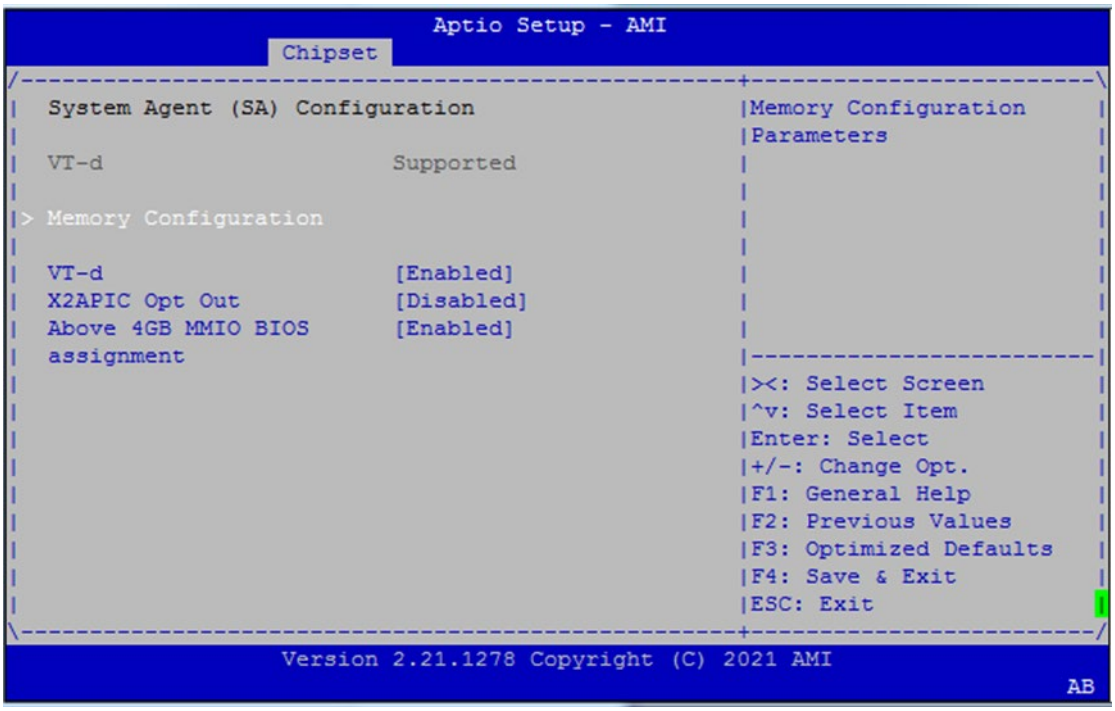


Chipset

Select the Chipset menu item from the BIOS setup screen to enter the "Chipset" setup screen. Users can select any of the items in the left frame of the screen.

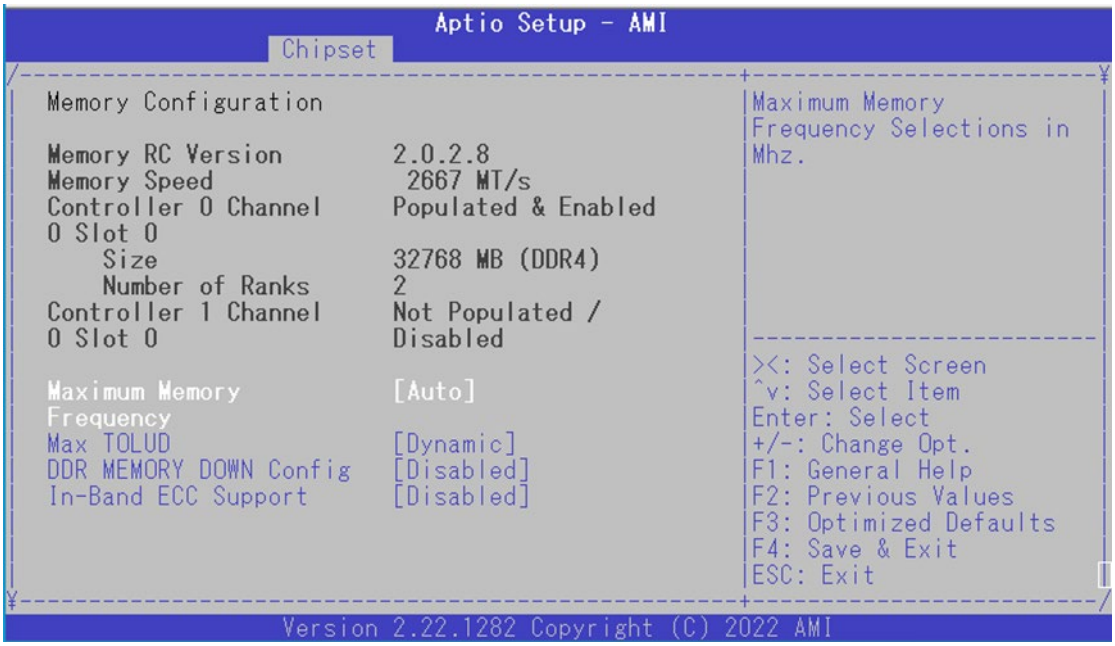


System Agent (SA) Configuration



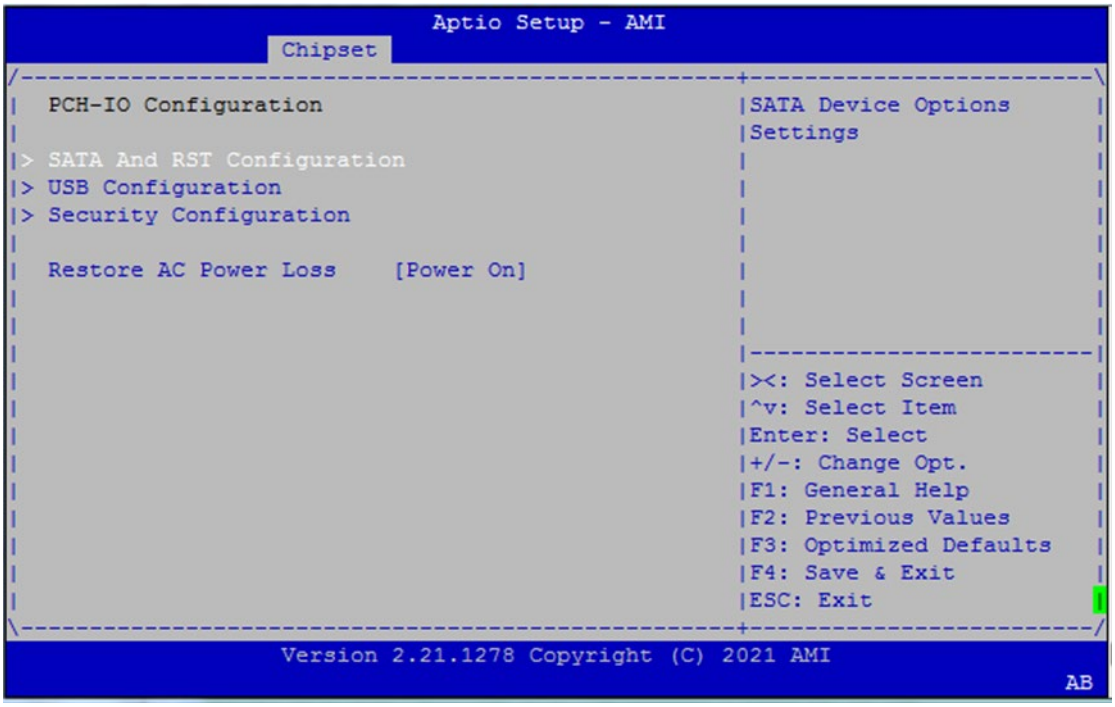
Feature	Options	Description
VT-d	Enabled Disabled	VT-d capability
X2APIC Opt Out	Enabled Disabled	Enable/Disable X2APIC_OPT_OUT bit
Above 4GB MMIO BIOS assignment	Enabled Disabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is disabled automatically when Aperture Size is set to 2048MB

Memory Configuration



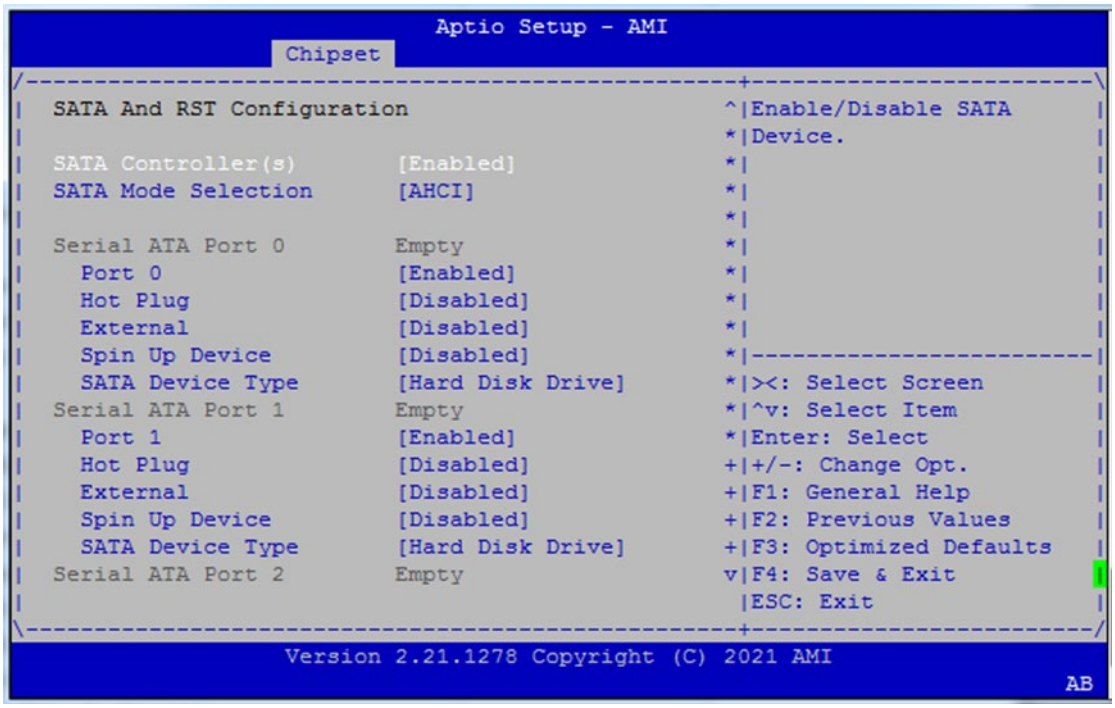
Feature	Options	Description
Maximum Memory Frequency	Auto	Maximum Memory | Frequency Selections in Mhz.
Max TOLUD	Dynamic	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller
DDR MEMORY DOWN Config	Enabled Disabled	DDR MEMORY DOWN Config Support
In-Band ECC Support	Enabled Disabled	Enable/Disable In-Band ECC. Either the IBECC or the TME can be enabled.

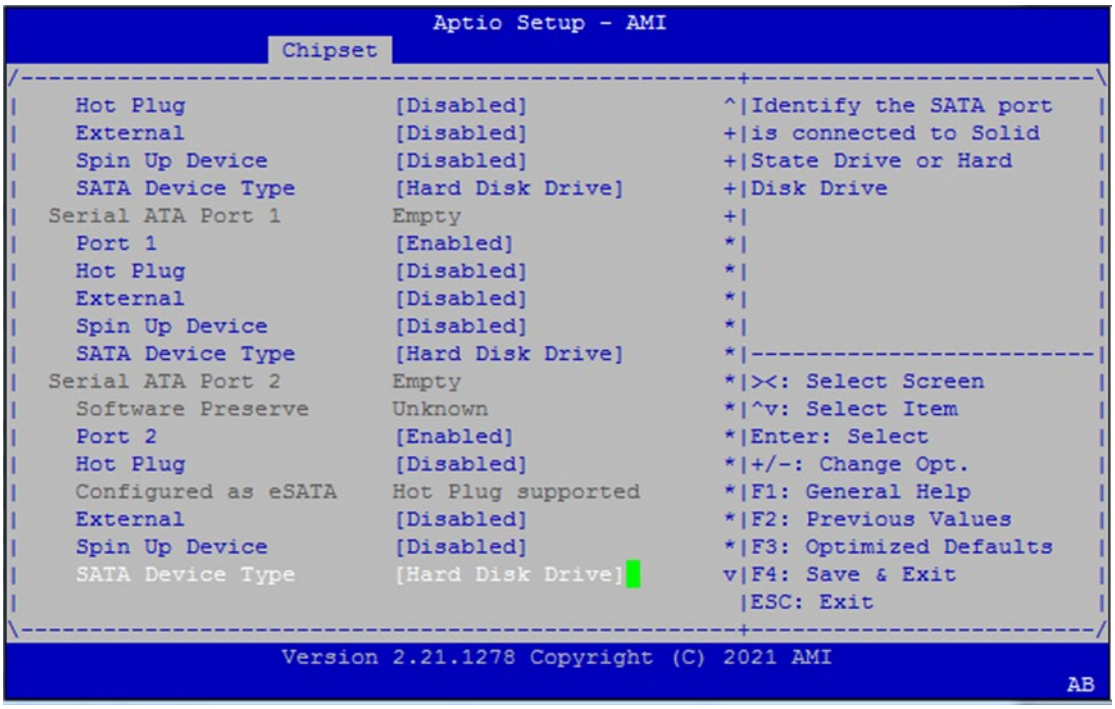
PCH-IO Configuration



Feature	Options	Description
Restore AC Power Loss	Power On Power Off	Specify what state to go to when power is re-applied after a power failure (G3 state).

SATA and RST Configuration



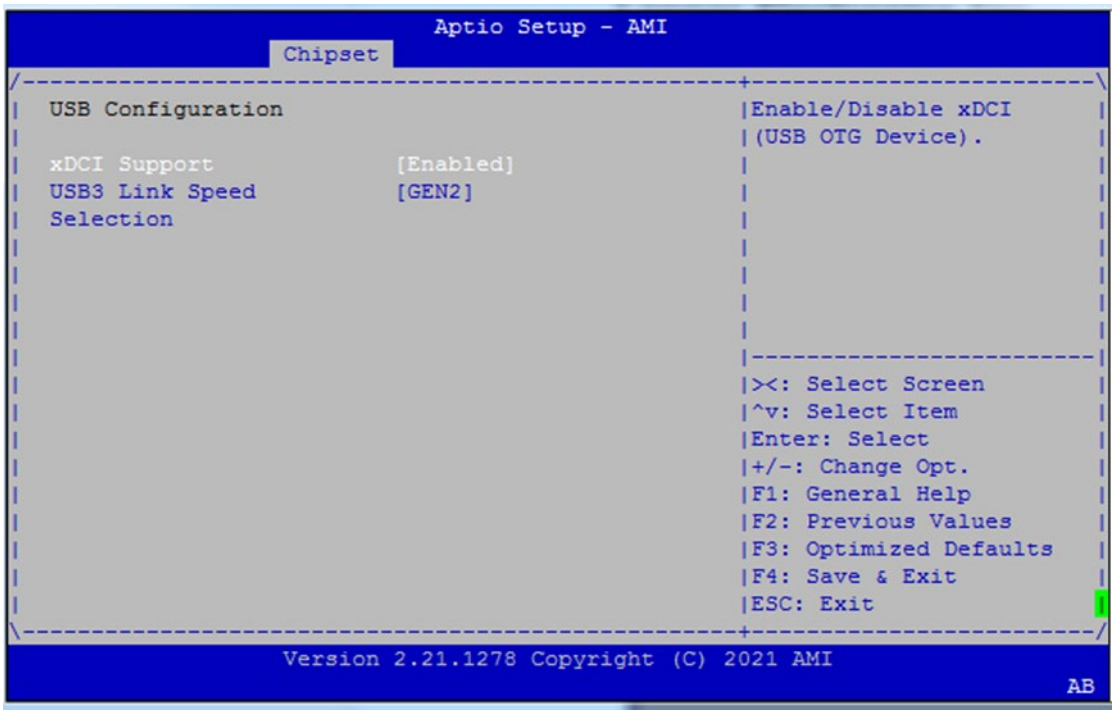


Feature	Options	Description
SATA Controller(s)	Enabled Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI Intel RST	Determines how SATA controller(s) operate.
Port 0	Enabled Disabled	Enable or Disable SATA Port

Hot Plug	Enabled Disabled	Designates this port as Hot Pluggable.
External	Enabled Disabled	Marks this port as external.
Spin Up Device	Enabled Disabled	If enabled for any of ports Staggerred 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.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive
SATA Port 0 DevSlp	Enabled Disabled	Enable/Disable SATA Port 0 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.
Port 1	Enabled Disabled	Enable or Disable SATA Port
Hot Plug	Enabled Disabled	Designates this port as Hot Pluggable.
External	Enabled Disabled	Marks this port as external.
Spin Up Device	Enabled Disabled	If enabled for any of ports Staggerred 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.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive
SATA Port 1 DevSlp	Enabled Disabled	Enable/Disable SATA Port 0 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.
Port 2	Enabled Disabled	Enable or Disable SATA Port
Hot Plug	Enabled Disabled	Designates this port as Hot Pluggable.
External	Enabled Disabled	Marks this port as external.

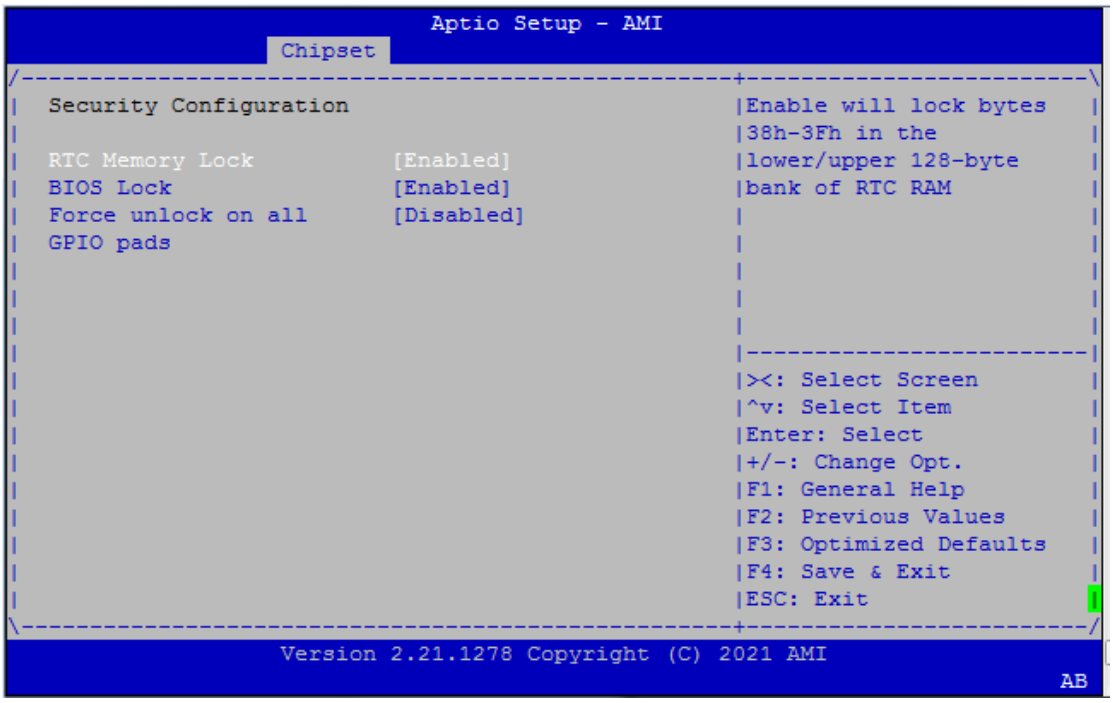
Spin Up Device	Enabled Disabled	If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive
SATA Port 2 DevSlp	Enabled Disabled	Enable/Disable SATA Port 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.

USB Configuration



Feature	Options	Description
xDCI Support	Enable Disable	Enable/Disable xDCI (USB OTG Device).
USB3 Link Speed Selection	GEN1 GEN2	This option is to select USB3 Link Speed GEN1 or GEN2

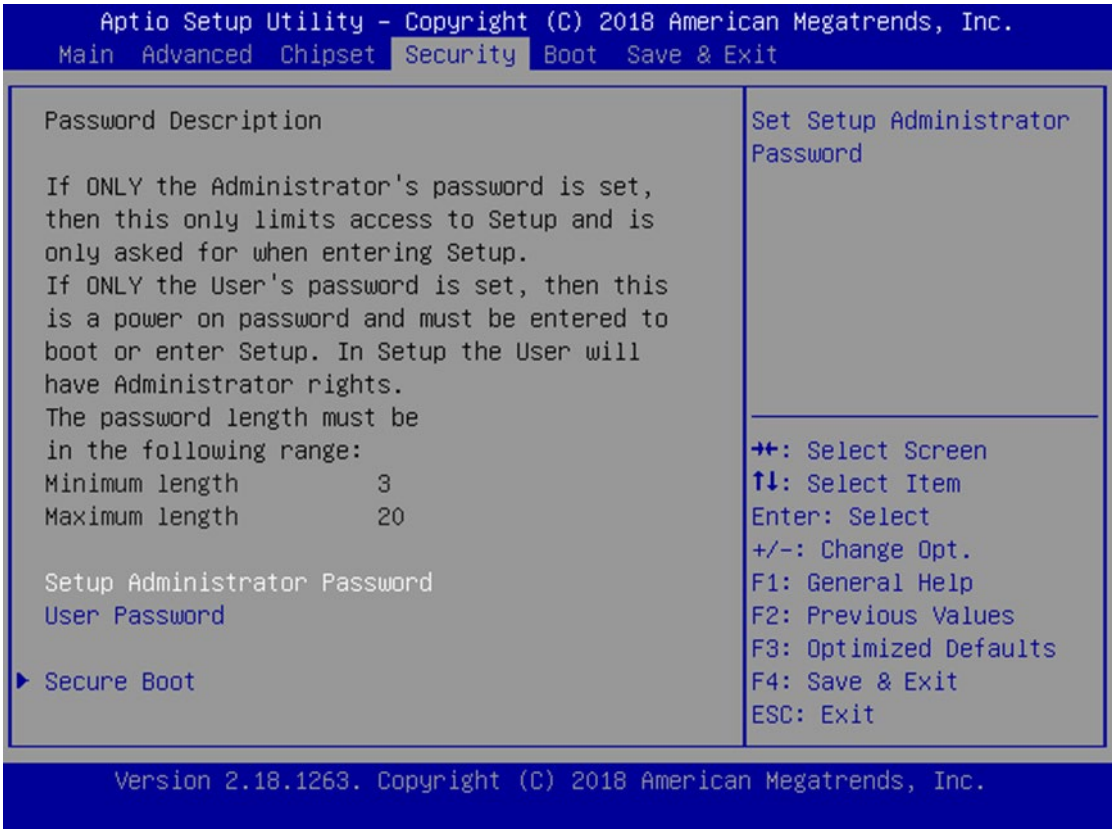
Security Configuration



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

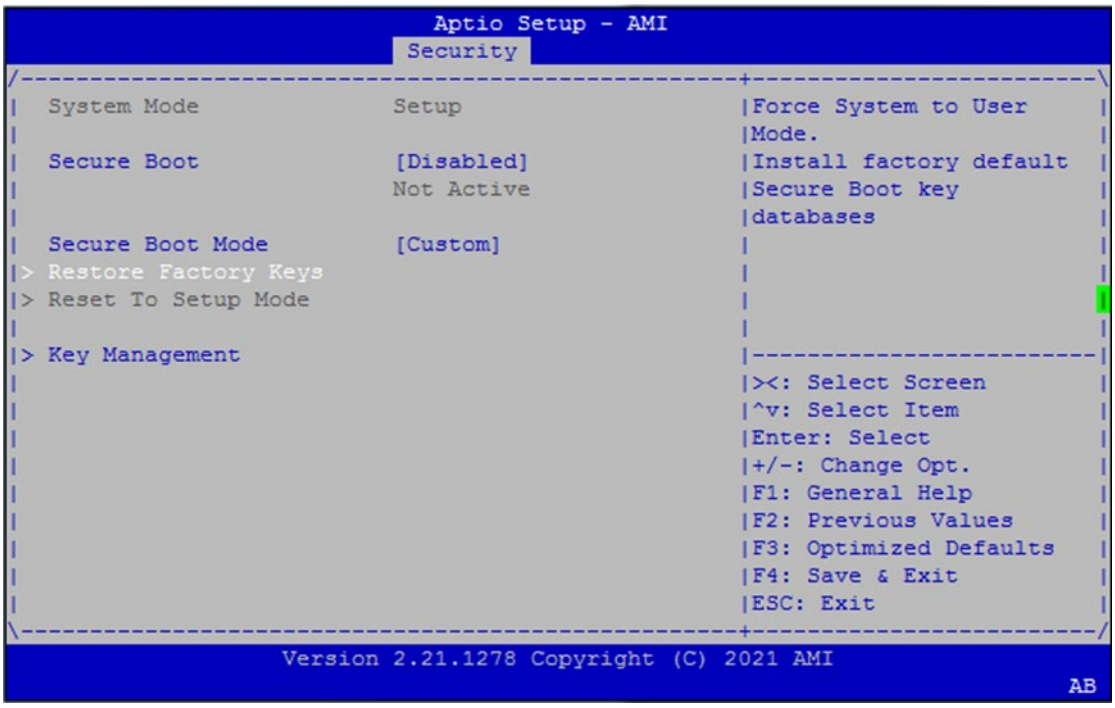
Security

Select the Security menu item from the BIOS setup screen to enter the "Security" setup screen. Users can select any of the items in the left frame of the screen.



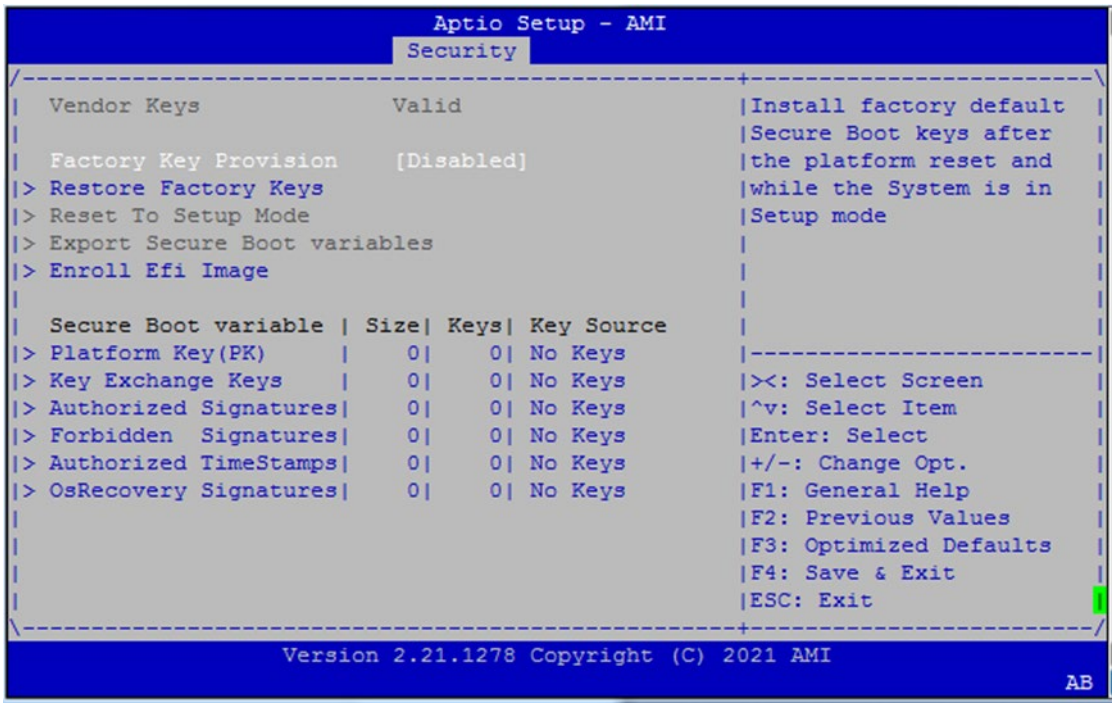
Feature	Description
Setup Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the User will have Administrator rights.

Secure Boot



Feature	Options	Description
Secure Boot	Disabled Enabled	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset
Secure Boot Mode	Standard Custom	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

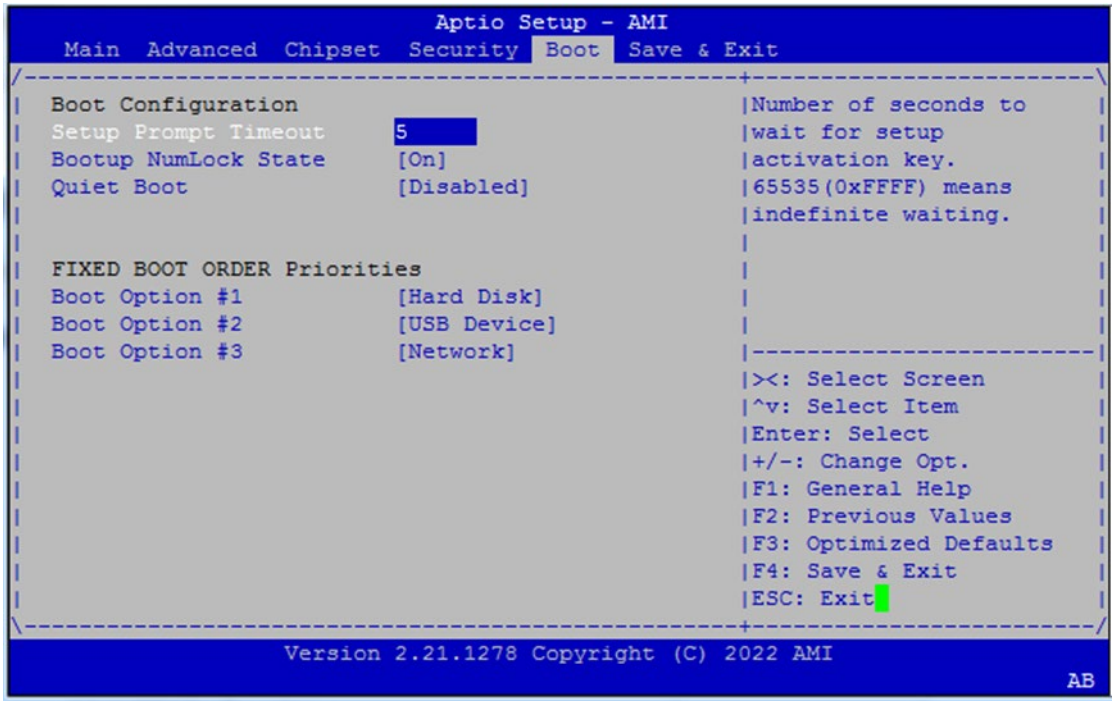
Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode
Restore Factory Keys	None	Force System to User Mode. Install factory default Secure Boot key databases
Reset To Setup Mode	None	Delete all Secure Boot key databases from NVRAM
Export Secure Boot variables	None	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device
Enroll Efi Image	None	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

Boot Menu

Select the Boot menu item from the BIOS setup screen to enter the "Boot" setup screen. Users can select any of the items in the left frame of the screen.

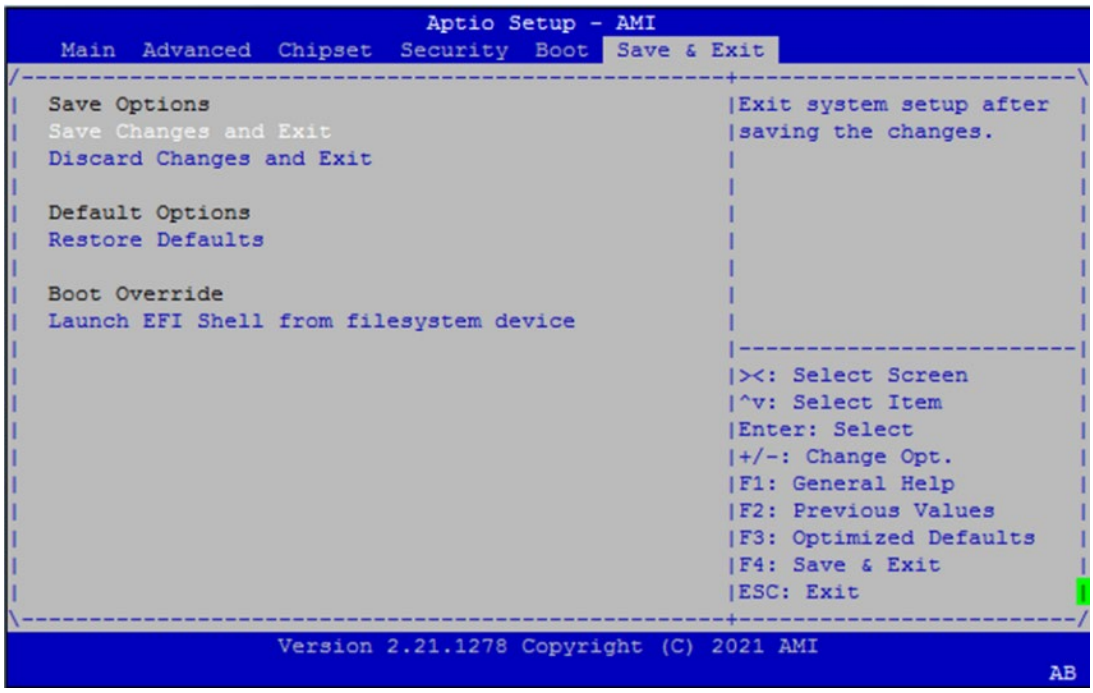


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.

- Choose boot priority from boot option group.
- Choose specifies boot device priority sequence from available Group device.

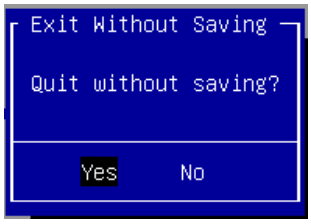
Save and Exit Menu

Select the **Save and Exit** menu item from the BIOS setup screen to enter the "Save and Exit" setup screen. Users can select any of the items in the left frame of the screen.



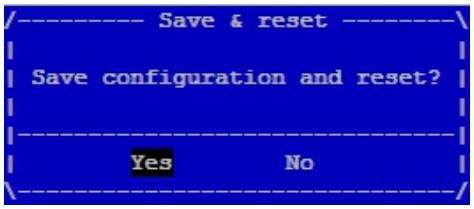
■ Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the "**Discard Changes and Exit**" option is selected. Select "**Yes"** to Discard changes and Exit Setup.



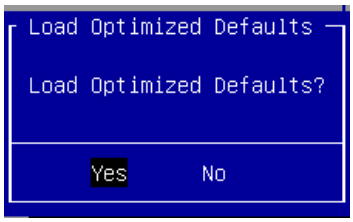
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and reset from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the "**Save Changes and Reset**" option is selected. Select "**Yes**" to Save Changes and reset.



■ **Restore Defaults**

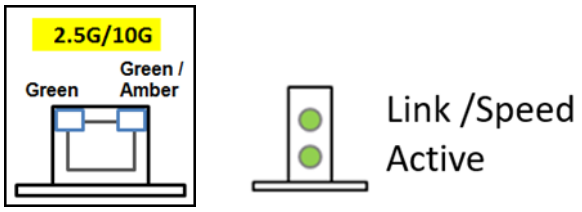
Restore default values for all setup options. Select "**Yes"** to load Optimized defaults.



Note: The items under Boot Override may not be the same, as it would depend on the devices connected on the system.

APPENDIX A: LED INDICATOR EXPLANATIONS

▸ RJ45 LAN LED



2.5Gb RJ45 LAN LED Define:

Speed	Green (Link/Active)	Green/Amber (Speed)
100M	ON / Blinking (Data Access)	OFF
1G	ON / Blinking (Data Access)	ON (**Amber**)
2.5G	ON / Blinking (Data access)	ON (**Green**)
1. When cable is plugged-in and network is linked. Both LED lights will be bright. The behavior is as defined. 2. Without the cable plugged-in, the LED should be off 3. If LAN Driver controls the LED, the behavior will follow the driver		

APPENDIX B: ENABLE 2.5GBE LAN FUNCTIONALITY

The IIOT-I531 comes equipped with Intel® i226 Ethernet Controller. In order to enable Intel® i226 2.5GbE LAN functionality, your Linux Kernel should be version 5.16.18. or higher.

The OS Support matrix can be found here.

Open Source support for 2.5 GbE Intel® Ethernet Network Controllers (igc)

Product Specifications	Linux Driver	Linux*										FreeBSD*	VMware*	DPDK*	
		Kernel 5.4	Kernel 5.8	Kernel 5.16.18	RHEL 7.9	RHEL 8.1	RHEL 8.3	RHEL 8.6	Ubuntu* 18.04 LTS	Ubuntu* 20.04 LTS	Ubuntu* 22.04 LTS	13.0	ESXi8.0	20.05	22.07
I226-LM	igc	-	-	Yes	-	-	-	Yes	-	-	-	-	Yes	-	Yes
I226-V	igc	-	-	Yes	-	-	-	Yes	-	-	-	-	Yes	-	Yes
I226-IT	igc	-	-	Yes	-	-	-	Yes	-	-	-	-	Yes	-	Yes

If a customer requires assistance with a Kernel that is not mentioned in the table above, kindly contact our technical support team.

APPENDIX C: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after-service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
   - Improper or inadequate maintenance by the customer
   - Unauthorized modification, misuse, or reversed engineering of the product
   - Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form," to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____ Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date