Lanner

Vehicle Computing

Rugged Platforms for Vehicles and Railway Computing

ISD-V330 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.

Conventions & Icons

The icons are used in the manual to serve as an indication of interest topics or important messages.

Icon	Usage
 **Note or Information**	This mark indicates that there is something you should pay special attention to while using the product.
 **Warning or Important**	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

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Federal Communication Commission Interference Statement

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.

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 the battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures 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 environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure 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 Precautions

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

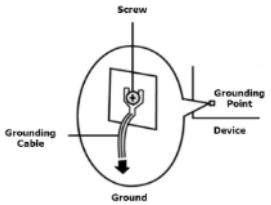
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire (green-and-yellow) 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 DC Power Source

- Connect the grounding cable to the ground.
- The protection device for the DC power source must provide 30 A current.
- This protection device must be connected to the power source before DC power.



Procédure de mise à la terre pour source d'alimentation CC

- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.

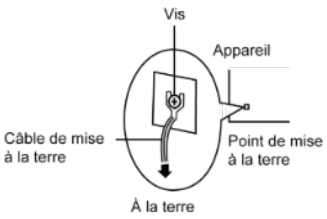


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CHAPTER 1: PRODUCT OVERVIEW

The ISD-V330 is a fanless rugged Multi-WAN in-vehicle SD-WAN featuring IoT-enhanced CPU, with rich I/O functionality and environmental endurance, making it highly applicable in smart bus evolution. ISD-V330 features the new generation 10 nm process SoC (System-on-Chip) Intel Atom x6425E processor (codenamed Elkhart Lake). This processor consumes low volume of power and delivers the required performance for vehicle computing needs, such as vehicle controls, fleet monitoring, and management systems that synchronize inputs from multiple sensors and direct actions in semiautonomous buses, trains, ships, and trucks.

ISD-V330 offers expandable functionality. It boasts an abundance of I/O peripheral connectivity including 1 CAN bus and 2 serial COM ports, 2 video output by HDMI, USB and MIO ports, 2 RJ-45 GbE LAN ports and SATA/mSATA storage options. To achieve multi-WAN aggregate wireless network connectivity, ISD-V330 offers 3 PGN removable caddy with dual SIM slot supporting 4G-LTE/5G cellular communications. In addition, the compact system comes with a native CAN bus for concerns of driving behavior analysis. ISD-V330 is compliant with E13, UL/cUL 62368-1 standard and passes MIL-STD-810G shock and vibration resistance certifications to ensure proper operations when traveling on non-flat surfaces. Temperature is another concern for in-vehicle installation. Therefore, ISD-V330 is built to support wide temperature range, from -40°C to 70°C.

Package Content

Your package contains the following items:

- 1x ISD-V330 Vehicle Gateway

Ordering Information

SKU No.	Description
ISD-V330A	Rugged In-vehicle Gateway with Multi-WAN Connectivity with Intel® Atom™ x6425E Processor

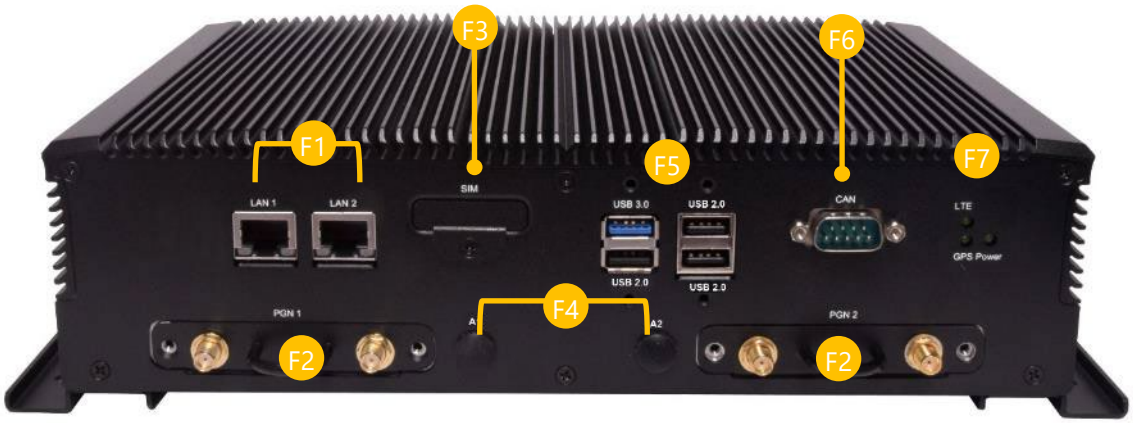
Optional Accessories

Model No.	Description
PGN-600	4G LTE-Advanced Pro Radio Modem with LTE Cat-12 embedded module, certified with PTCRB, AT&T
PGN-750A	Swappable 5G Telit FN980 module with antenna/cable kit.
PGN-750B	Swappable 5G Quectel RM500Q-AE module with antenna/cable kit.
PGN-750C	Swappable 5G Thales MV31-W module with antenna/cable kit

System Specifications

Processor System	CPU	Intel® Elkhart Lake Atom® x6425E Processor
	Frequency	2.0 GHz
	Core Number	Quad-core
	Chipset	SoC
Fanless		Yes
Memory	Technology	1x DDR4 3200MT SODIMM with In Band ECC
	Max. Capacity	Up to 32GB
	Socket	1x 260-pin SODIMM
Graphic	Graphic Processor	Intel® UHD Graphics
Miscellaneous	Hardware Monitoring	Yes
	Internal RTC with Li Battery	Yes
	TPM	Yes, onboard
Ethernet	Controller	Intel® i210IT
	Interface	2x RJ45 Ports
Storage	Type	Onboard eMMC 64GB; Up to 128GB 1x SATA (reserved)
I/O	Display Port	2x HDMI with screw lock
	LED Indicator	GPS; LTE; Power, refer to Appendix A
	LAN Port	2x GbE RJ45 LAN Ports
	CAN Bus Port	1x RS-232 CAN 2.0 (optional for J1939/1708) Bus Port
	COM Port	2x RS-232/422/485 COM Ports
	USB Port	3x USB 2.0, Type A Ports, 1x USB 3.0 Type A Port
	GPS/G-sensor	u-blox NEO-M8N/ADXL 345
	Digital I/O	4x digital input with isolation, 5-30V/100mA, 4x digital output with isolation, 30V/2A dry relay config either N.C. or N.O.; 1x IGN_DI to MCU
	Antenna	6x SMA Antenna Hole (Includes GNASSx1)
Expansion Interface	M.2	1x M.2 3042 B-Key Socket for LTE, with dual Nano-SIM slot 1x M.2 2230 E-Key Socket for Wi-Fi Module
Cooling	Processor	Passive CPU heatsink
	System	Fanless design with corrugated aluminum
Power	Connector	3-pin terminal block (+,-,ignition)
	Input	DC 9~36V (12/24V) level, support ignition delay on/off control
Environment	Operating Temperature	-40~70°C / -40~158°F
	Storage Temperature	-40~85°C / -40~185°F
	Relative Humidity	5%~90% @ 40°C / 104°F (Storage Level)
Mechanical	Dimension (WxHxD)	274 x 73 x 185mm (10.78" x 2.87" x 7.28")
	Weight	4.2 kg
	Mounting	Wall mount
Driver Support	Microsoft Windows	Windows 10 IoT Enterprise
	Linux	Linux Kernel 5.4
Certification	EMC	CE/FCC Class A, RoHS
	Safety	E13, UL/cUL 62368-1
Compliance	Vibration & Shock	MIL-STD-810G Anti-vibration& Shock

Front Panel



No.	Description	
F1	GbE Ports	2x RJ45 LAN Ports
F2	Module Slot	2x Removable PGN Module Slot supporting Dual SIM and 2x Antenna ports with dust cover
F3	SIM Slot	2x Nano-SIM cards with cover
F4	Antenna Holes	2x SMA Antenna Holes
F5	USB Port	1x USB 3.0 Type A, 3x USB 2.0 Type A Ports
F6	CAN Bus Port	1x RS232 CAN 2.0 (option for J1939/J1708)
F7	LED Indicator	GPS; LTE; Power; Storage refer to Appendix A

Rear Panel

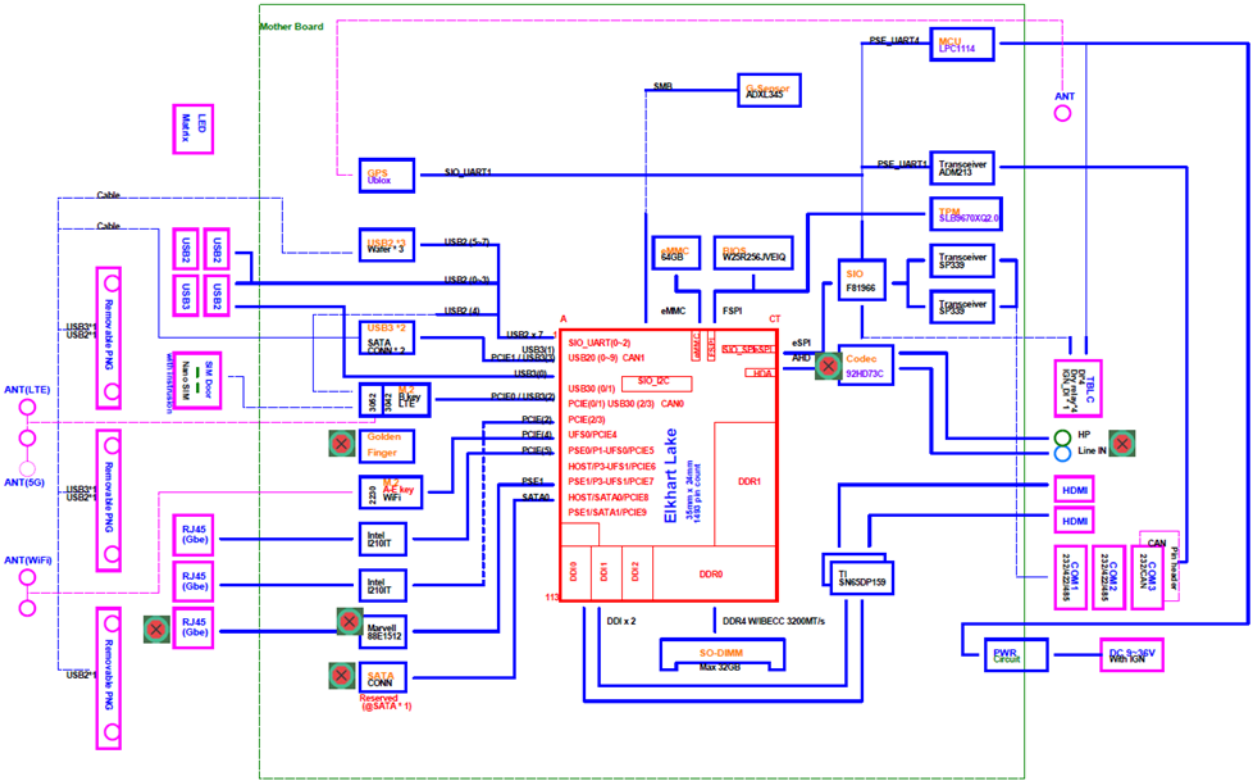


No.	Description	
R1	Multi-IO Port	4x DI @5-30V/100mA, 4x DO @30V/2A dry relay N.C./N.O., 1x IGN DI to MCU
R2	Module Slot	1x Removable PGN Module Slot supporting Dual SIM and 2x Antenna ports with dust cover
R3	HDMI Port	2x HDMI ports with cable lock
R4	GPS Antenna	1x GPS+GLONASS Antenna hole with dust cover
R5	COM Port	2x DB9 Male Connector for RS232/422/485
R6	Antenna Hole	3x SMA Antenna Holes
R7	DC Input	1x 3-pin terminal block for DC 9~36V external power source, GND and Ignition
R8	Ground Pin	1x Protective Grounding Hole

CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram

The block diagram indicates how data flows among components on the motherboard. Please refer to the following figure for the motherboard's layout design.



Internal Jumpers & Connectors

Refer to the following as reference for the pin assignments and internal connectors. 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 disabled. While changing the jumpers, make sure your system is turned off.

PRJK1 (+9V~36V)

Pin No.	Description
1	IGNITION
2	GND_IGNI
3	DC_VIN

SW3

Function Detec

All OFF: Normal Operate

SW1 ON: Detect by Power Good

SW2 ON: Enable Low Power Detect

SW3 ON: Disable Watchdog

SW4 ON: For Program MCU

Pin No.	Description
1	ON (Default)
2	OFF
3	OFF
4	OFF

J9

Pin No.	Description
1-2 (Default)	PSE_UART4_TX_L/ PSE_UART4_RX_L
2-3	NXP_RXD/ NXP_TXD

CON5

Pin No.	Description
1	IGN3V3_SB
2	NXP_RXD
3	GND
4	NXP_TXD

JCOMS1

Pin No.	Description
1	RTC_RST#
2	GND
3	SRTC_RST#

J1 (Debug Port for ARM)

Pin No.	Description	Pin No.	Description
1	V_ARM_JTAG	2	PSE_SWDIO
3	GND	4	PSE_SWCLK
5	GND	6	PSE_TRACESWO
7	NC	8	TP_TDI_PIN8
9	GND	10	PSE_JTAG_NRESET
11	NC	12	PSE_TRACECLK
13	NC	14	PSE_TRACEDATA0
15	GND	16	PSE_TRACEDATA1
17	GND	18	PSE_TRACEDATA2
19	GND	20	PSE_TRACEDATA3

JCOM1

Pin No.	Description
1	V3P3_A
2	PSE_I2C5_SDA
3	PSE_I2C5_SCL
4	GND

J8

Pin No.	Description
1	SMB_DATA_VR
2	SMB_CLK_VR
3	GND

JSPI1

Pin No.	Description
1	SPI0_IO3_HOLD#
2	NC
3	SPI0_CS0_R#

4	V3P3A_1P8A_SPI
5	SPI0_IO1_MISO_R
6	NC
7	NC
8	SPI0_CLK_R
9	GND
10	SPI0_IO0_MOSI_R

COM1

Pin No.	Description
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#

COM2

Pin No.	Description
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#

CON2

Pin No.	Description
1	V3P3S_PGN1
2	V3P3S_PGN1
3	V5_S

4	PGN1_SIM_SW
5	PGN1_RST#
6	GND
7	USB2_N4
8	USB2_P4

CON3

Pin No.	Description
1	V3P3S_PGN1
2	V3P3S_PGN1
3	V5_S
4	PGN1_SIM_SW
5	PGN1_RST#
6	GND
7	USB2_N4
8	USB2_P4

CON4

Pin No.	Description
1	V3P3S_PGN3
2	V3P3S_PGN3
3	V5_S
4	PGN3_SIM_SW
5	PGN3_RST#
6	GND
7	USB2_N6
8	USB2_P6

CN3

Pin No.	Description	Pin No.	Description
1	NC	2	NC
3	IGN_DI_ISO	4	IGN_ISOGND
5	DO4_N	6	DO4_P
7	DO3_N	8	DO3_P
9	DO2_N	10	DO2_P
11	DO1_N	12	DO1_P
13	EXT_DI4	14	GND_DI4

15	EXT_DI3	16	GND_DI3
17	EXT_DI2	18	GND_DI2
19	EXT_DI1	20	GND_DI1

SATA_PWR1

Pin No.	Description
1	V12_S
2	GND
3	GND
4	V5_S

CN2

Pin No.	Description	Pin No.	Description
1	BAT_12V_24V	2	K_LINE
3	DO	4	NC
5	GND	6	GND
7	NC	8	J1850+/J1708+
9	CAN_M_TX	10	J1850-/J1708-
11	CAN_M_RX	12	CAN_H/J1939+
13	V5_S	14	CAN_L/J1939-

COM2

Pin No.	Description
1	J1850-/J1708-_C
2	COM3_RXD
3	DSUB3_C
4	NC
5	DSUB5_C
6	J1850-/J1708-
7	J1850+/J1708+
8	J1850+/J1708+
9	BAT_12V_24V

CHAPTER 3: 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 conducting the steps in this chapter.

Opening the Chassis

1. Turn the system over so the bottom is facing up. Then, remove the 13 screws on the sides, front, and rear panels.

Bottom Side x3 screws



Front/Rear Panels x6 screws



Right/Left Side
x4 screws



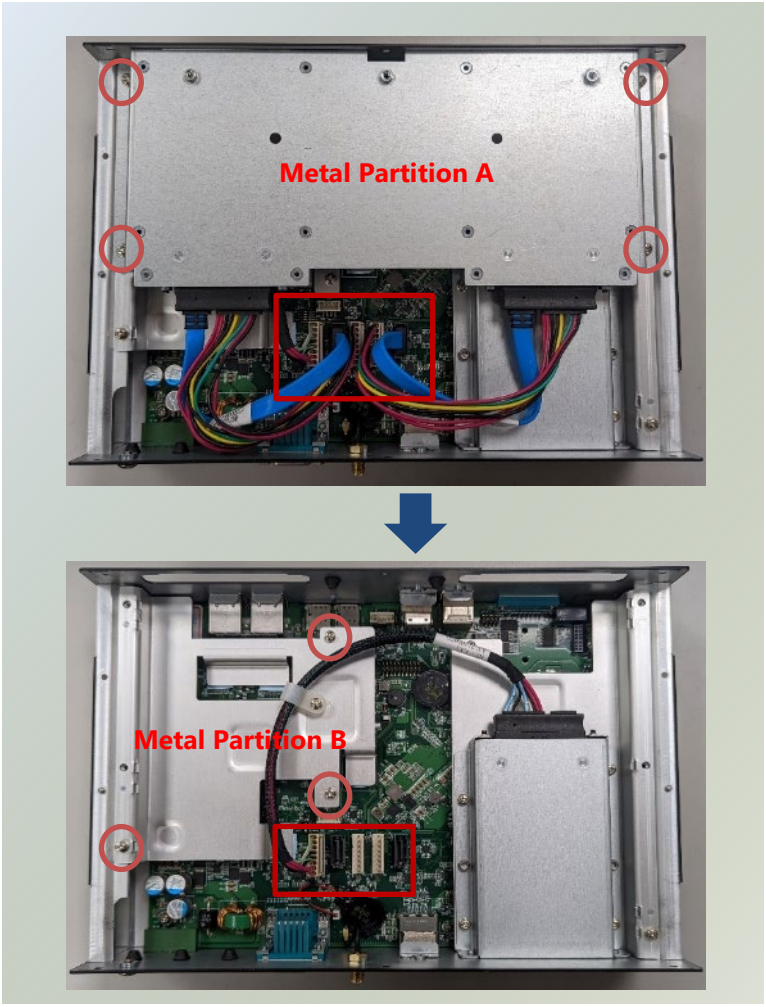
2. Lift up the bottom chassis



Access the motherboard

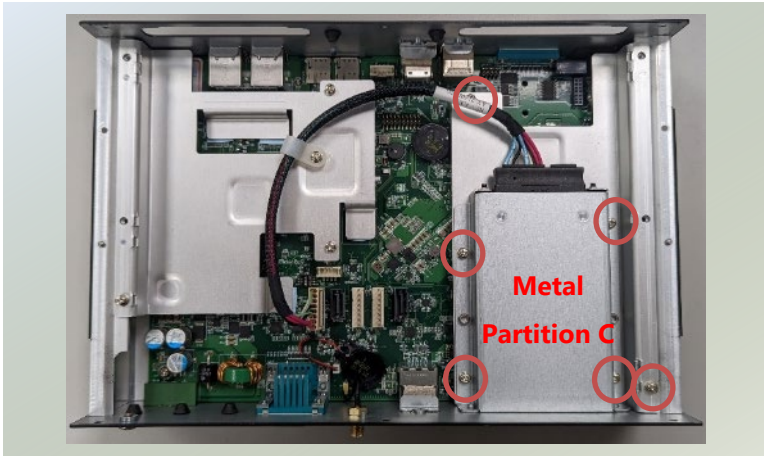
To access the motherboard and install LTE/Wi-Fi module or Memory module (DDR4 SODIMM), we must first detach the metal partitions.

1. Unscrew the four (4) screws on two sides of the Metal Partition A. Remove the signals cables and power cables. Lift the partition and place it aside.



2. Then, unscrew the three (3) screws on the Metal Partition B. Remove the signals and power cables (if any). Lift the partition and place it aside.

3. Unscrew the six (6) screws on Metal Partition C. Remove any (if any) cables. Lift the partition and place aside.

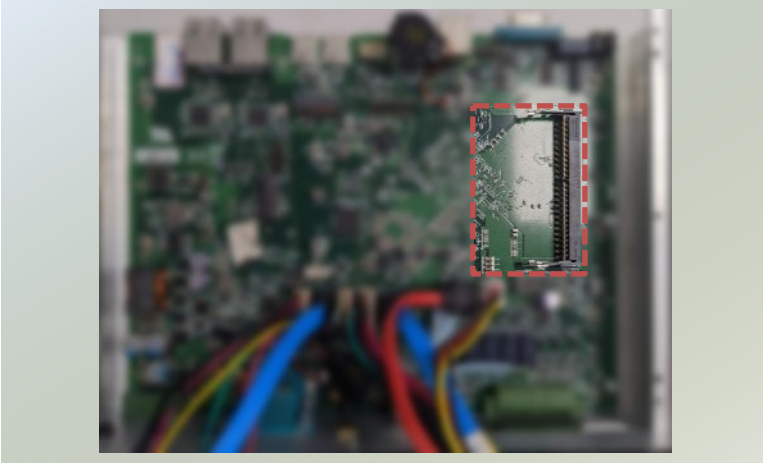


4. The optional accessories can now be installed. Make sure to reverse steps and place the metal partitions back after installation of optional accessories.

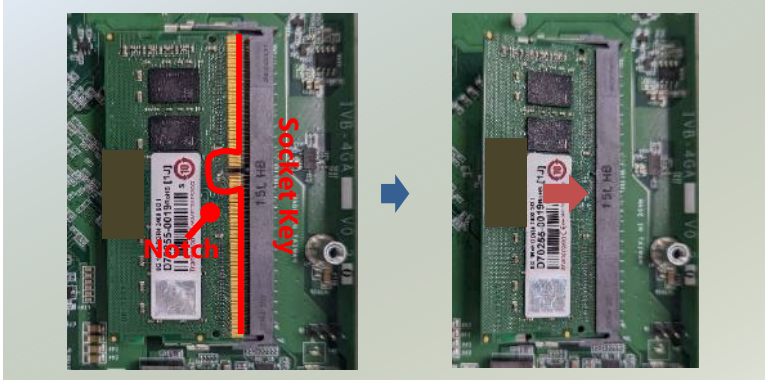
Installing the System Memory

The motherboard supports 1x DDR4 32000MHz SO-DIMM, up to 32GB, for additional system memory. Please follow the steps for installation.

1. Locate the DIMM socket on the motherboard.



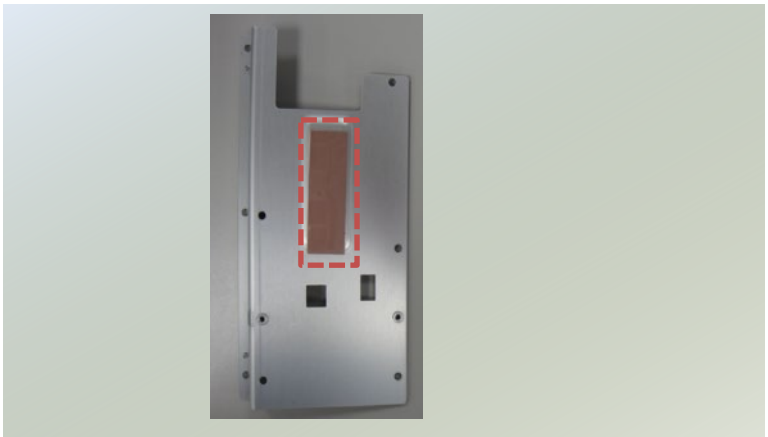
2. Align the notches of the DIMM module with the socket key in the pin slot and insert the module into the slot at a diagonal angle.



3. Press it down until it is firmly seated by the clips on both sides.



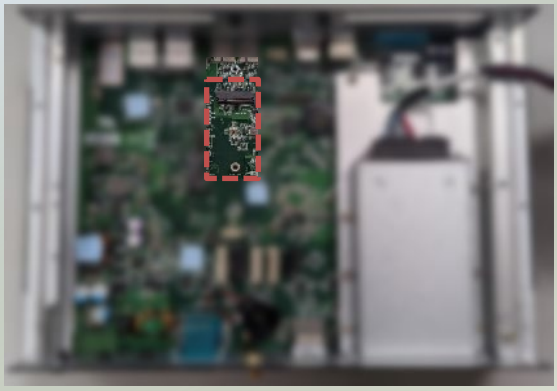
4. After the DIMM module has been securely inserted, a thermal pad needs to be placed over it. Remove the protective film from the Thermal Pad (included in the accessories box), and gently place on the underside of Metal Partition C. Then secure the Metal Partition C back onto the motherboard.



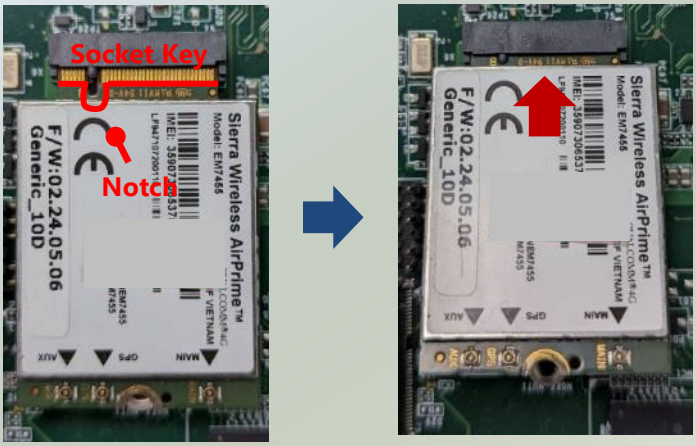
Installing the LTE Module (Optional)

The motherboard provides one M.2 3042 B-Key socket for LTE Module, with dual Nano-SIM slots. LTE module card will require two (2) antennas. Follow the steps for installations.

1. Power off the system, and open the bottom chassis cover, then remove the partitions.
2. Locate the M.2 slot on the motherboard.



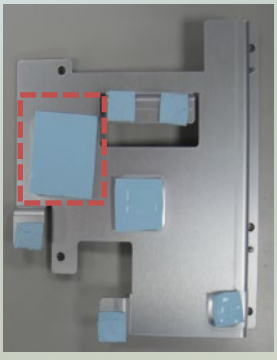
3. Align the notch of the LTE module card with the socket key in the slot.
4. Insert at 30 degrees into the socket until it is fully seated in the connector.



5. Push down on the LTE module card and secure it with one (1) screw.



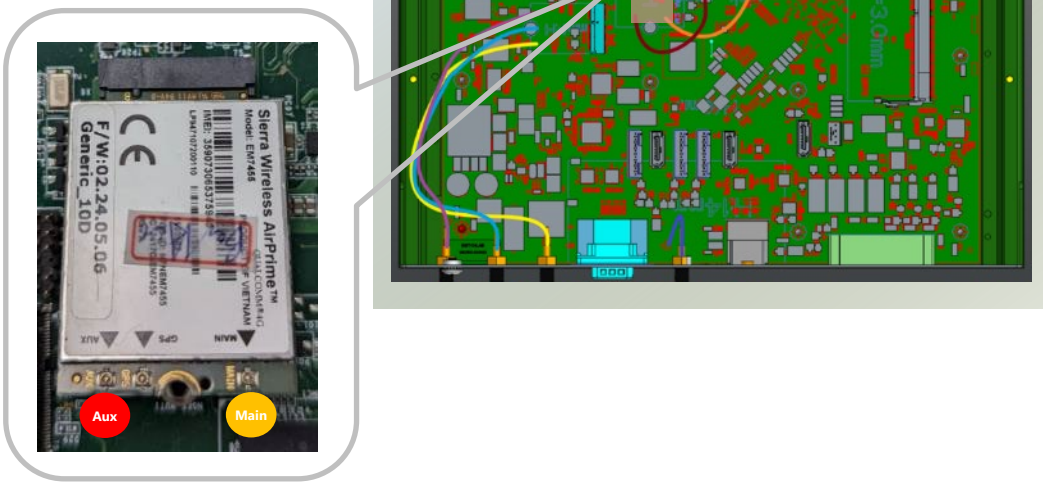
6. After the module has been securely inserted, a thermal pad needs to be placed over it. Remove the protective film from the Thermal Pad (included in the accessories box), and gently place on the underside of Metal Partition B.



Installing LTE Antennas



1. Locate the IPEX connectors (Aux, Main) on the LTE module card.
2. Connect the cables to the LTE module card IPEX connectors.



3. Screw on the two (2) antennas on the outside of the system

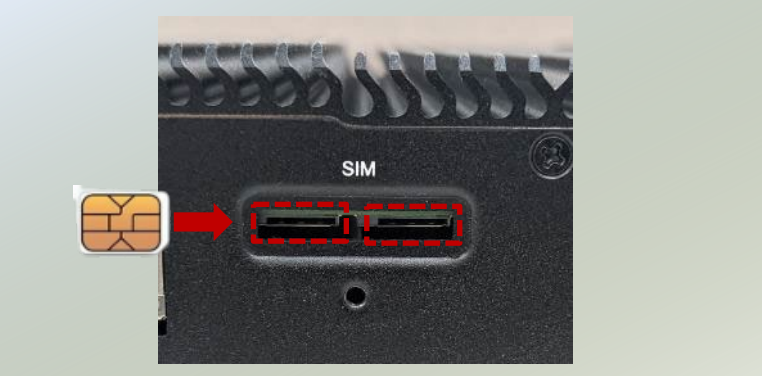
Installing Nano SIM Card

The dual nano SIM card slot on the front panel supports the LTE module card (optional). 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 door of the SIM card slot on the front panel.
2. Unscrew the one (1) screw and remove the slot cover.



3. There are two (2) nano SIM slots.
4. Insert and push the nano SIM card all the way in until its clicks in place.

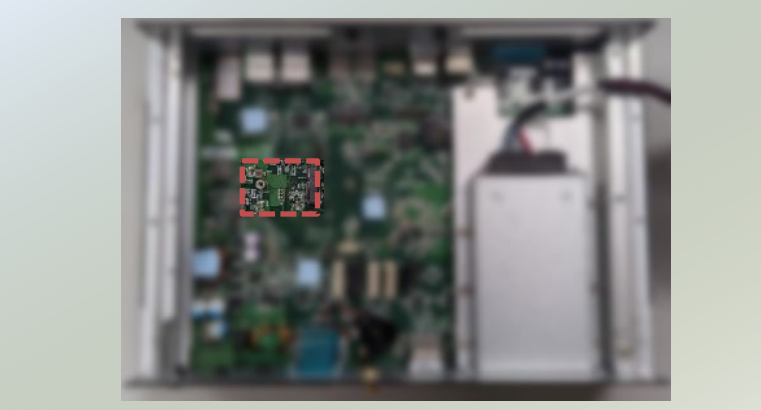


5. To remove the nano SIM card, use your fingertips to push it once, to have the card automatically eject.
6. Place the door back and secure with one (1) screw.

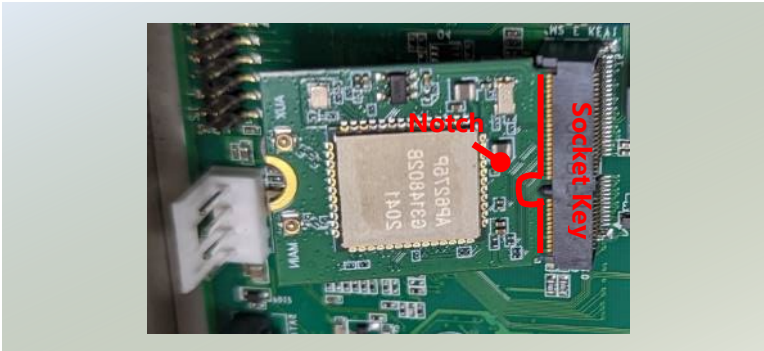
Installing the Wi-Fi Module (Optional)

The system provides one M.2 2230 E-Key slot for a Wi-Fi module card. Wi-Fi module card requires two (2) or three (3) antennas. Follow the steps for installation.

1. Power off the system, and open the bottom chassis cover, then remove the partition boards.
2. Locate the M.2 slot on the motherboard.



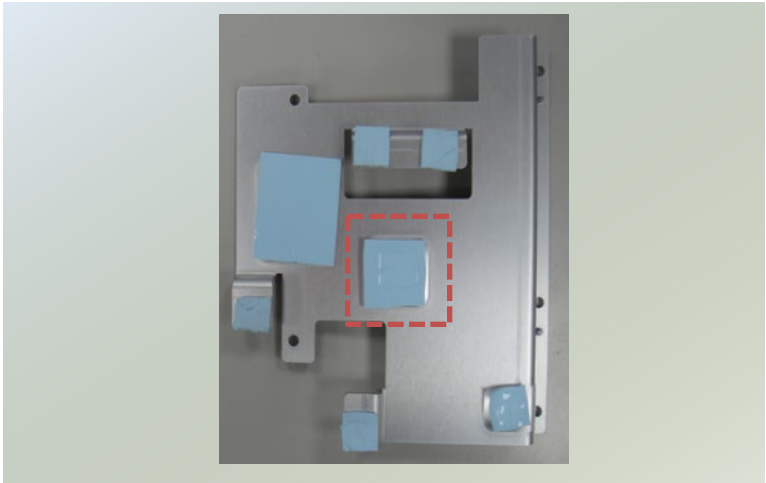
3. Align the notch of the Wi-Fi module card with the socket key in the slot.
4. Insert at 30 degrees into the socket until it is fully seated in the connector.



5. Push down on the Wi-Fi module card and secure it with one (1) screw.



6. After the module has been securely inserted, a thermal pad needs to be placed over it. Remove the protective film from the thermal pad (included in the accessories box), and gently place on the underside of Metal Partition B.

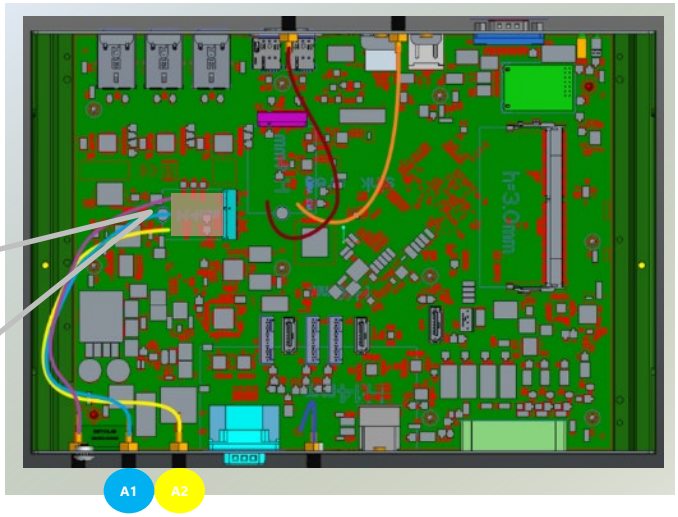


Installing Wi-Fi Antennas



1. Locate the IPEX connectors (A1, A2) on the Wi-Fi module card.
2. Connect the cables to the Wi-Fi module card IPEX connectors.





Note: The system supports Wi-Fi Module cards with up to three antenna connectors. The images above are for illustration purposes only.

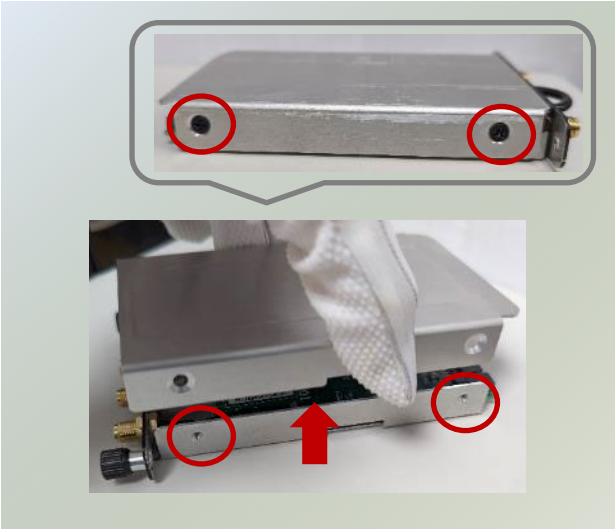
3. Screw on the two (2) or three (3) antennas on the outside of the system

Installing the PGN Module (Optional)

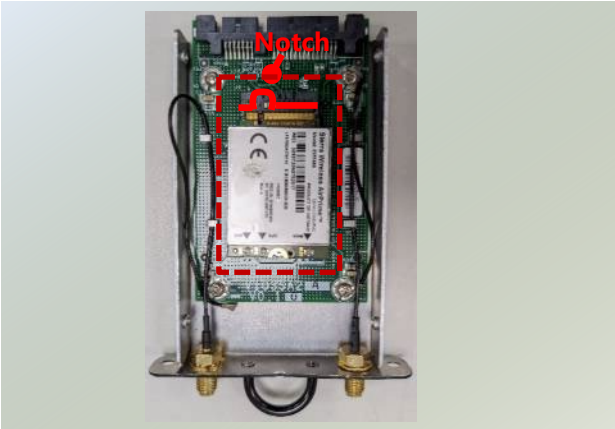
ISD-V330 comes with three PGN module slot for 5G/LTE add-on. Follow the steps for installation.

Setting up PGN-600 Module

1. Loosen the two (2) screws on each side of the PGN module and lift the cover.

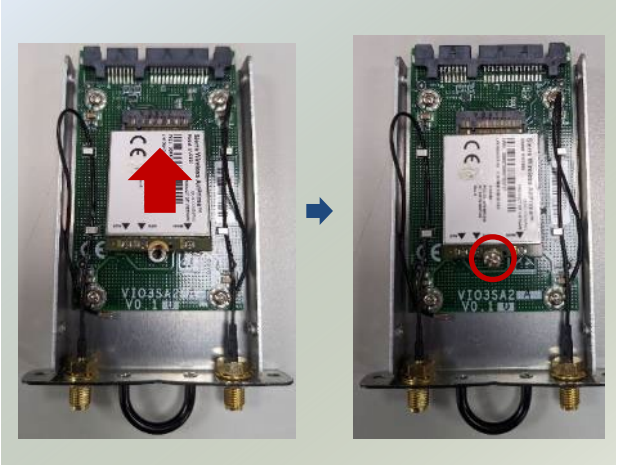


2. Locate the LTE module card slot on the board. Align the notch of the LTE module card with the socket key in the slot.



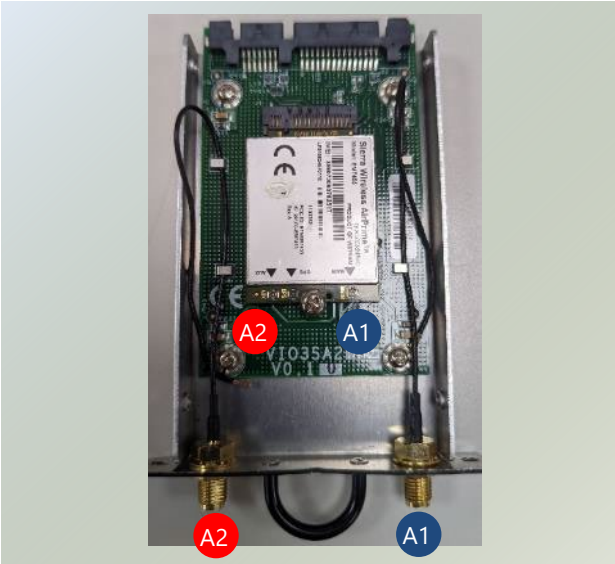
3. Insert at 30 degrees into the socket until it is fully seated in the connector.

4. Vertically push down on the LTE module card and secure it with one (1) screw.



Installing LTE Antennas

1. Locate the IPEX connectors (A1, A2) on the LTE module card.



2. Connect the cables to the LTE module card IPEX connectors.

3. Place the top cover back on and secure with two (2) screws on each side.



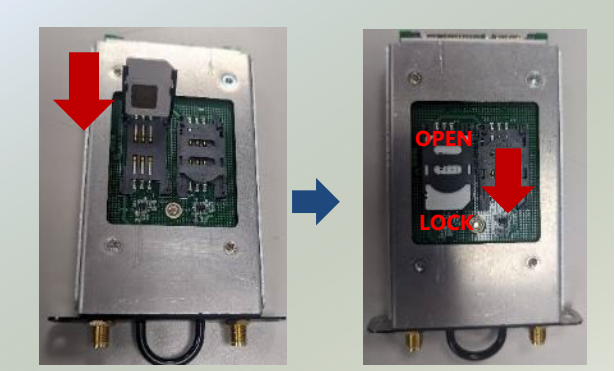
Installing SIM Cards

1. Locate the SIM card holder on the bottom side of the PGN module.

2. Slide the SIM card holder to the open position, and then carefully lift the cover on its hinges.



3. Insert the SIM card into the slot, fold down the SIM card holder and slide the socket cover to the Lock position.



Setting up PGN-750 Module

The PGN module kit contains the following items:

- 1x PGN Module
- 4x Antennas

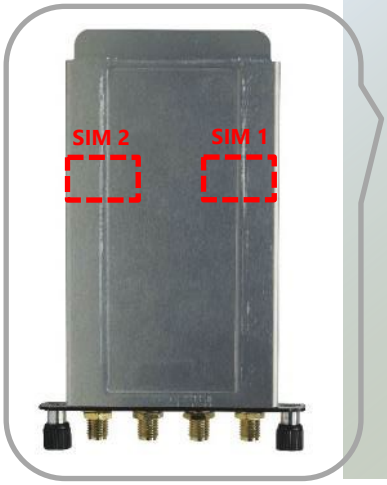


PGN-750 Module



4x Antennas

1. Locate the SIM card holder on the bottom sides (one right, one left) of the PGN module.







2. Insert and push the SIM card all the way in until it clicks into place.



3. To remove the SIM card, push the card once, and the card will automatically eject.

Installing PGN Module

1. Locate the two PGN module slot on the front panel of the system, and/or one PGN module slot on the rear panel. Take the module cover off.



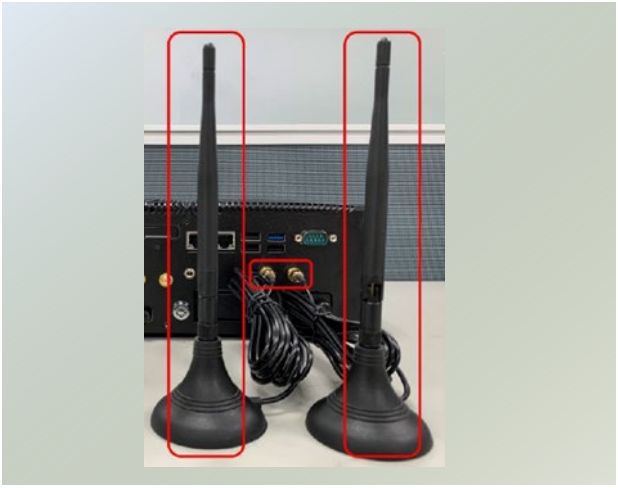
2. Insert a PGN module.



3. Once the module is firmly seated, secure with the two (2) original screws.



4. Secure the two (2) antennas on the front side of the PGN module.

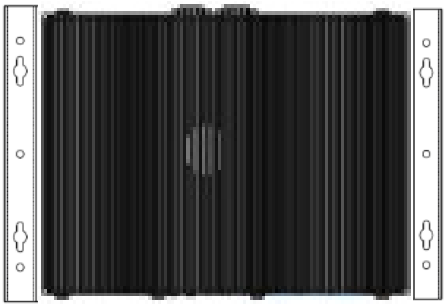


Wall Mounting

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.

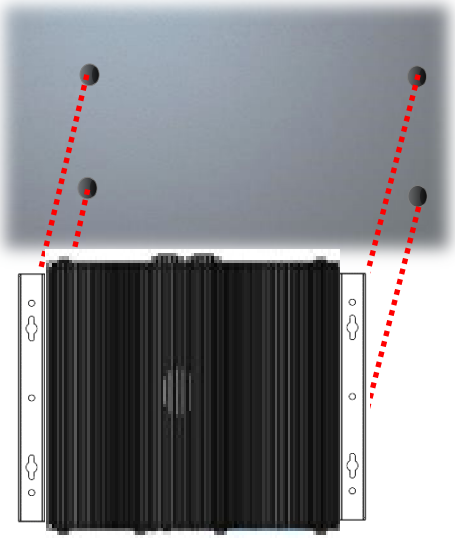
1. Fix the wall mount brackets onto the system bottom by securing them with six (6) provided screws.



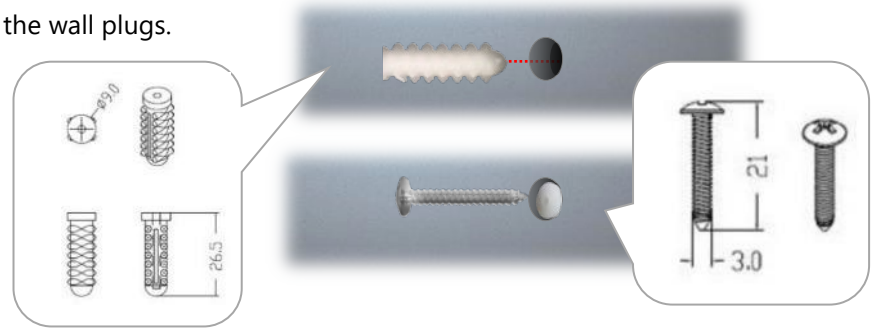


2. On the wall, measure the exact place where you want to hang the system, and drill four holes that match the four mounting holes on both brackets.

NOTE: the demonstrated screw type can fit in general drywall or shelves. Please identify the wall type and select a suitable fixing approach to fix this system to the wall and consult qualified trained person if you are unsure.



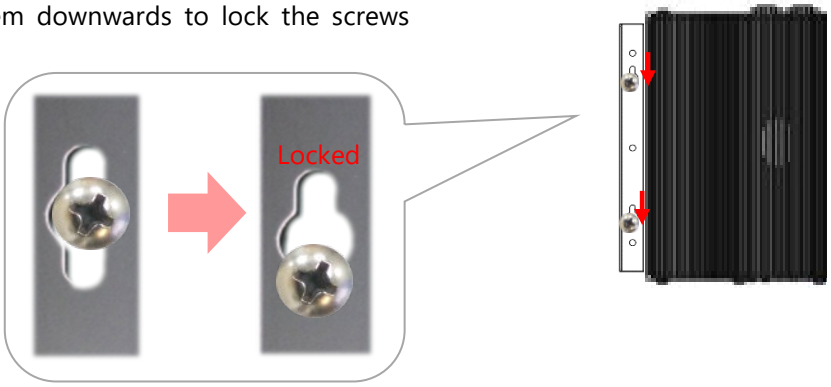
3. Insert the wall plugs into the holes.
4. Then, insert the long screws into the wall plugs.



5. Align the four screw holes on the system's wall brackets with the four long screws you just installed on the wall.



6. Engage the four screws in the bracket holes and push the system downwards to lock the screws into position.



CHAPTER 4: BIOS 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.

Entering BIOS Setup

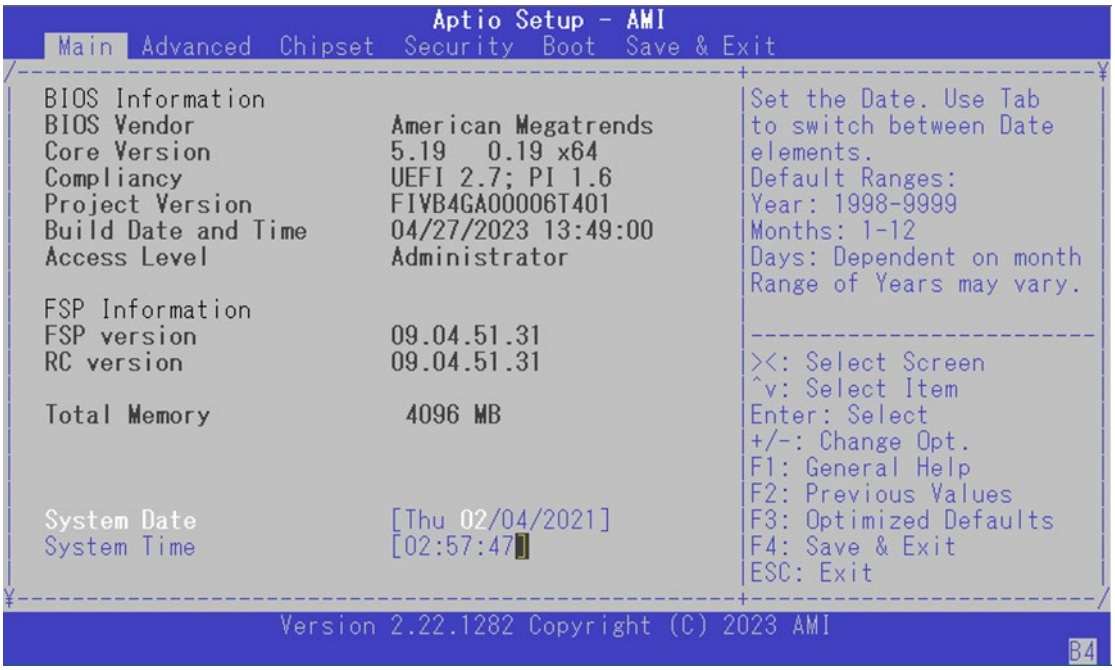
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Press the **<Tab>** or **<Del>** key immediately allows you to enter the Setup utility. Then you will be directed to the BIOS main screen.
3. BIOS navigations instructions:

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced],[IntelRCSetup], [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

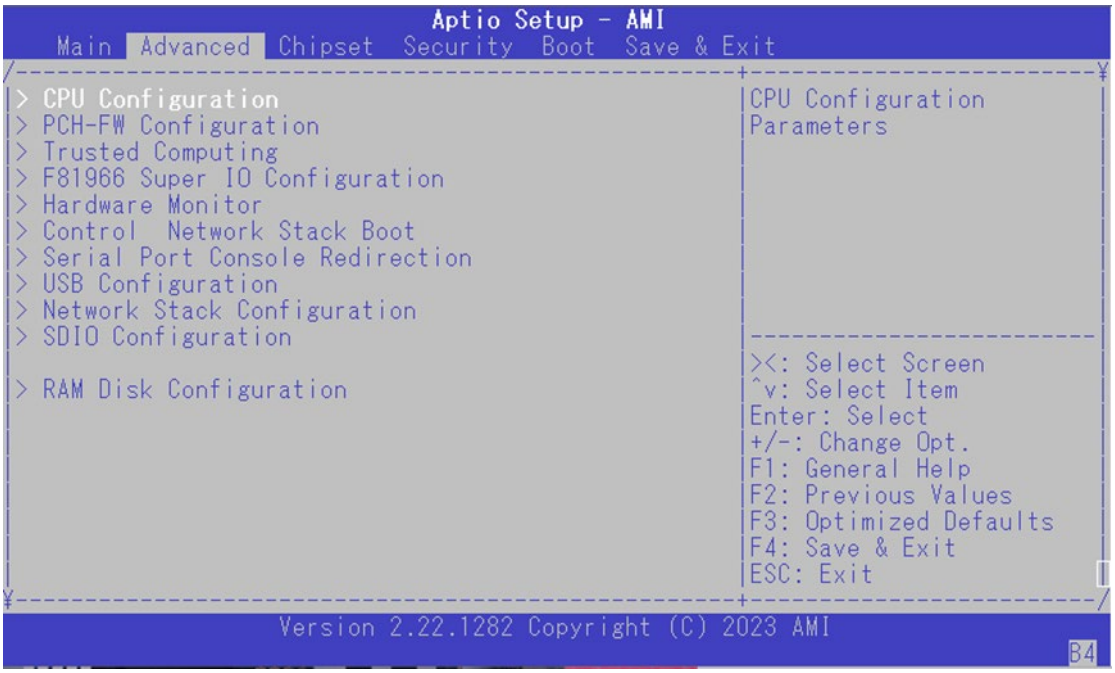
Setup main page contains BIOS information and project version information.



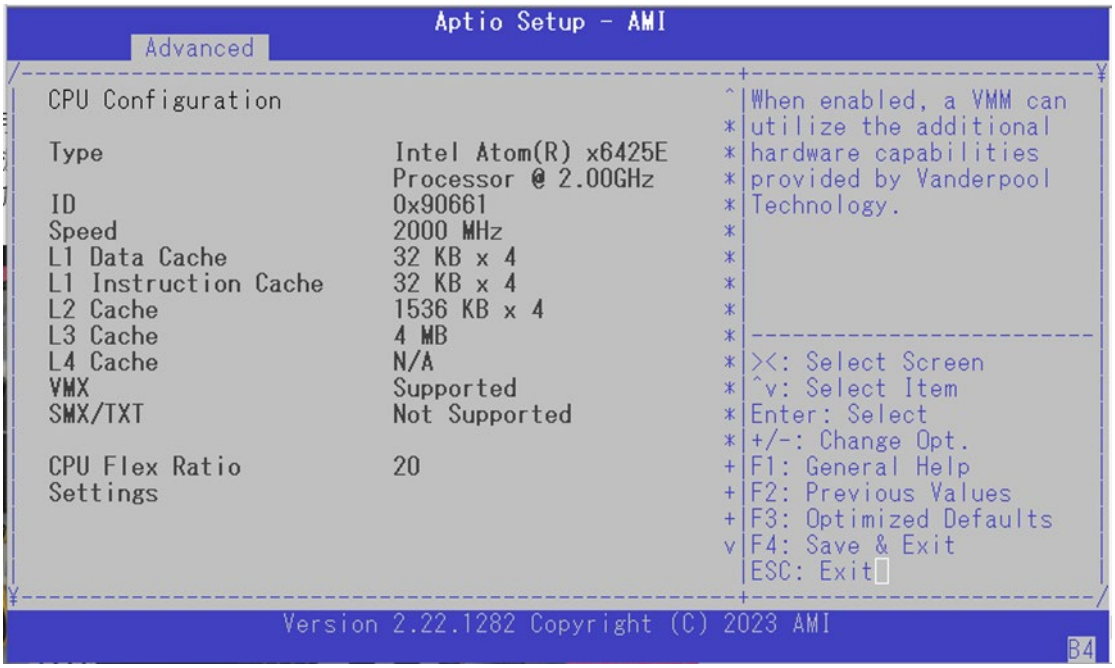
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **<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.

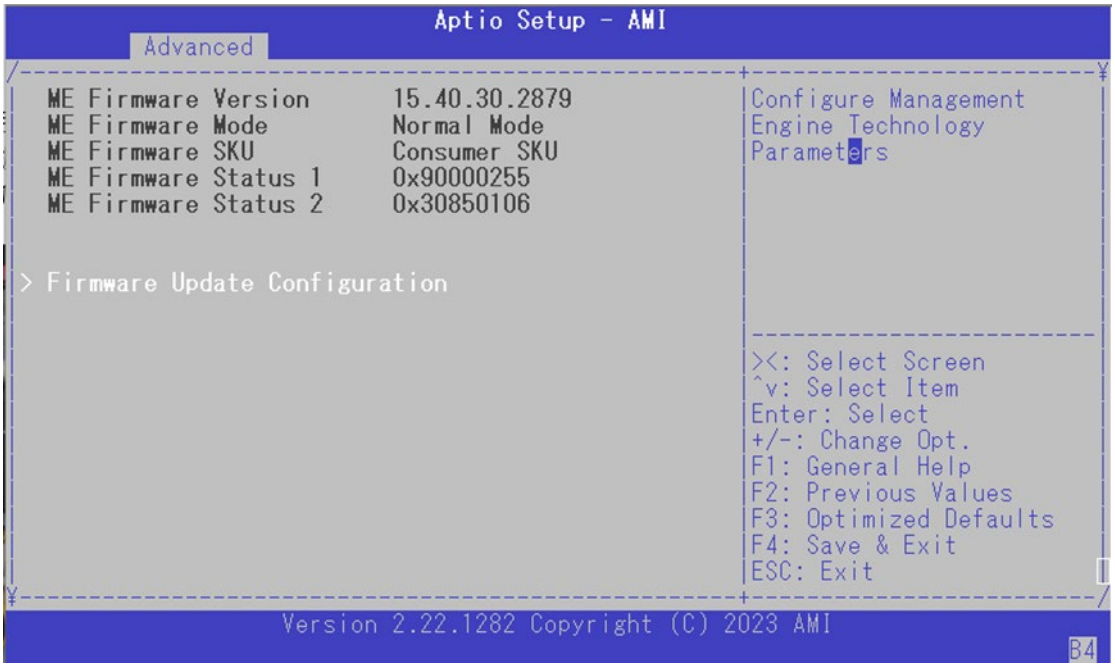


CPU Configuration

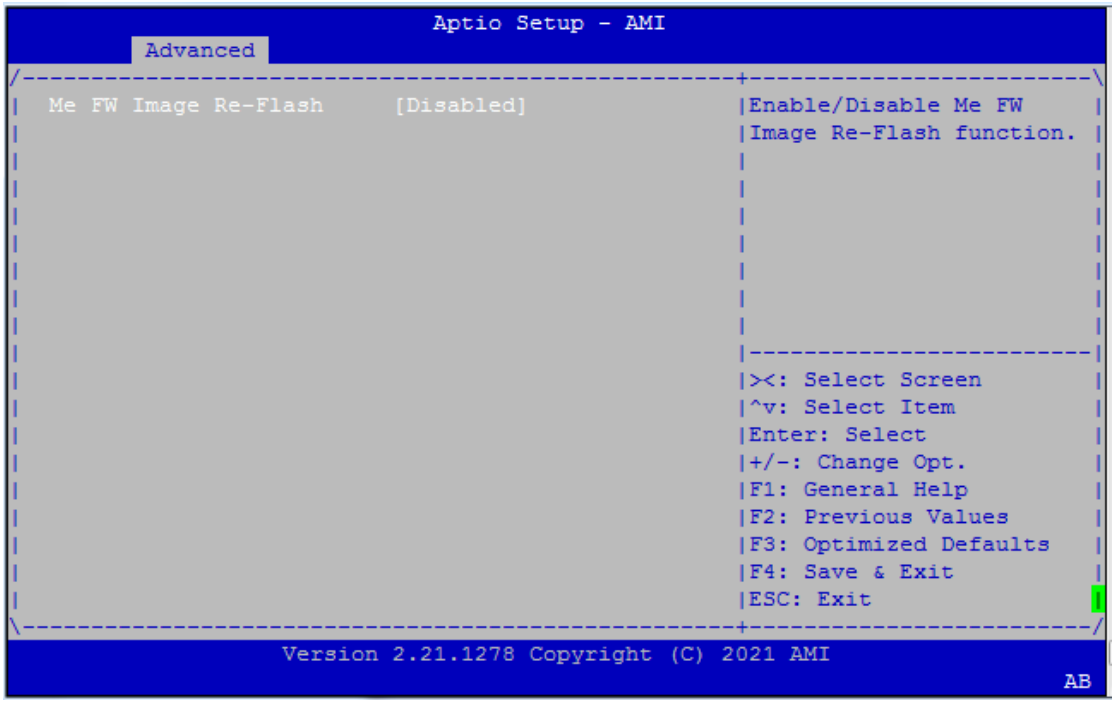


Feature	Options	Description
Intel (VMX) Virtualization Technology	Enabled Disabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All 1 2 3	Number of cores to enable in each processor package.
BIST	Enabled Disabled	Enable/Disable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

PCH-FW Configuration

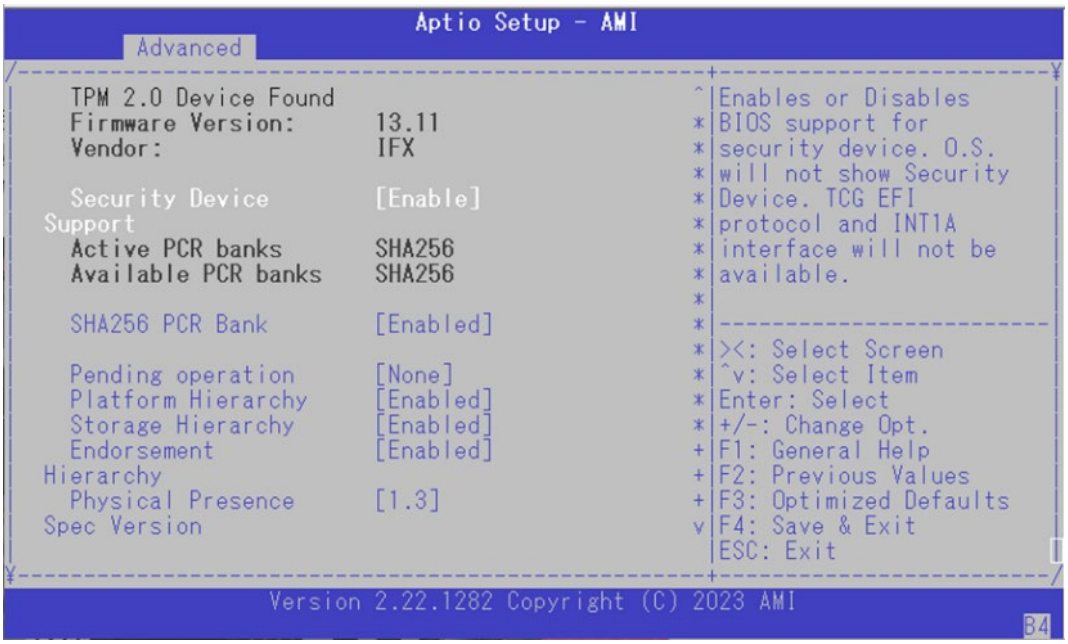


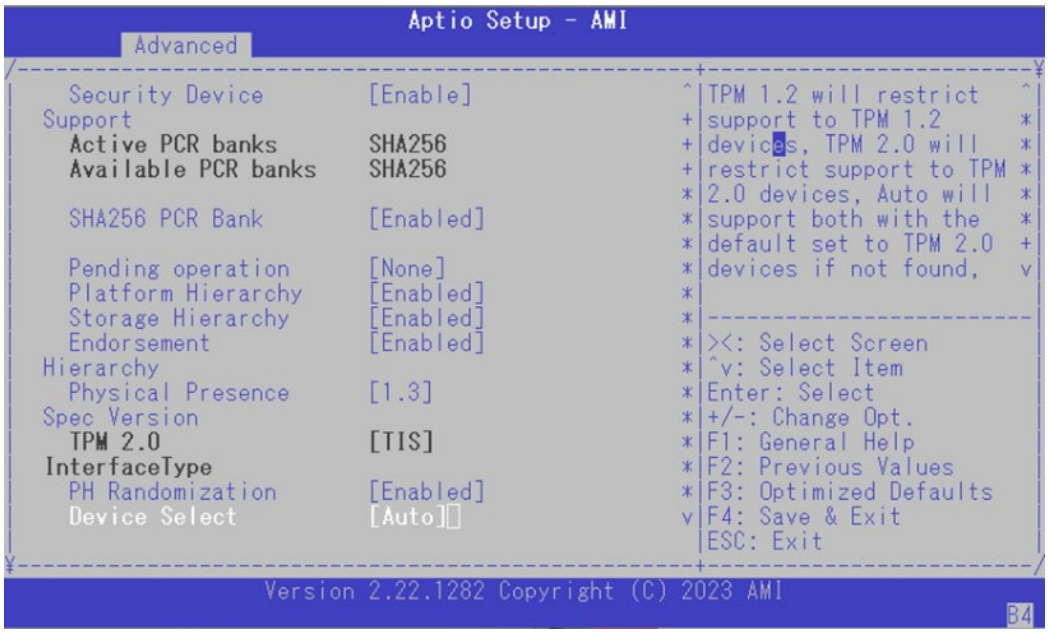
Firmware Update Configuration



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

Trusted Computing

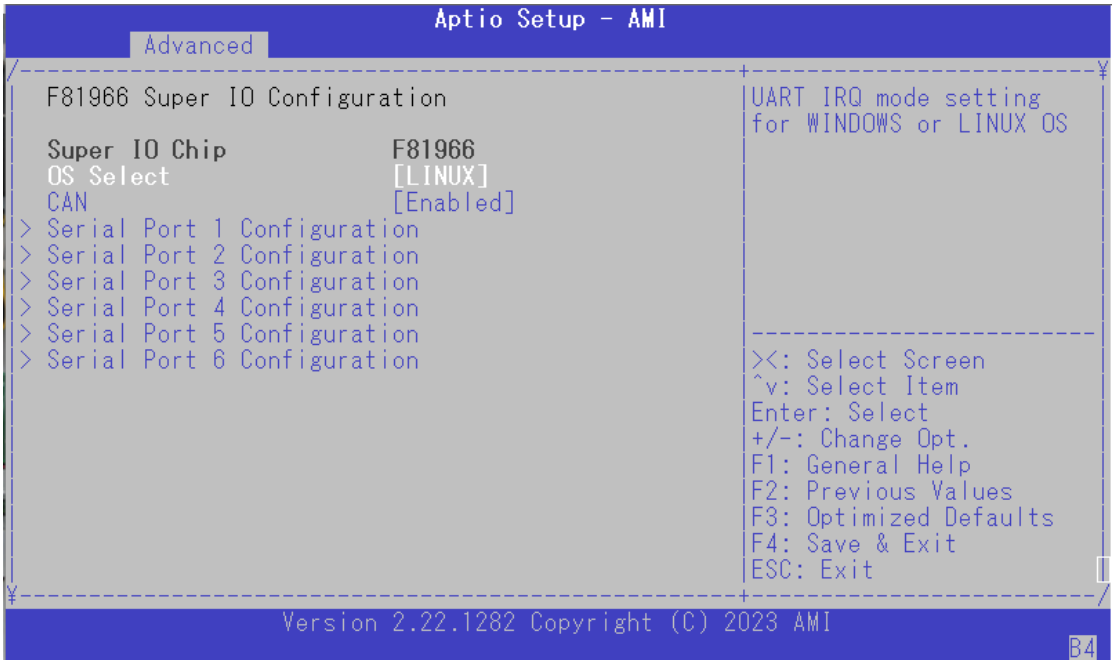




Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA256 PCR Bank	Enabled Disabled	Enables or Disables SHA256 PCR Bank.
Pending operation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

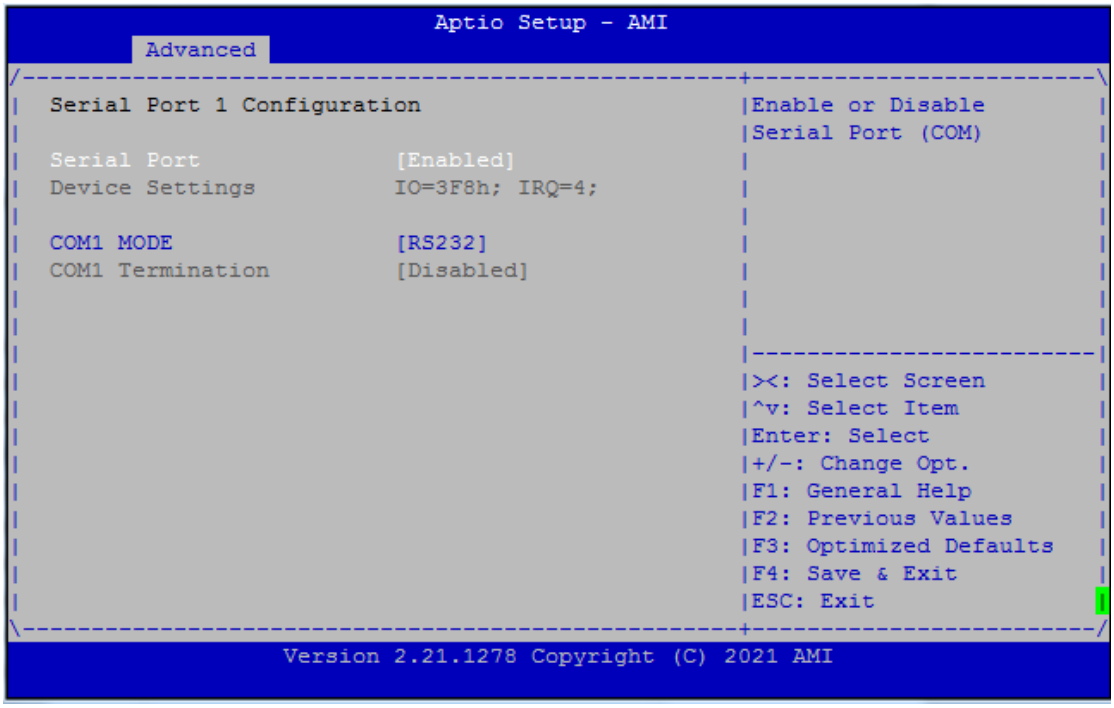
Platform Hierarchy	Enabled Disabled	Enables or disables Platform Hierarchy.
Storage Hierarchy	Enabled Disabled	Enables or disables Storage Hierarchy.
Endorsement Hierarchy	Enabled Disabled	Enables or disables Endorsement Hierarchy.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE: Some HCK tests might not support 1.3.
PH Randomization	Enabled Disabled	Enables or Disables Platform Hierarchy randomization. DO NOT ENABLE THIS QUESTION IN PRODUCTION PLATFORMS. THIS IS FOR DEVELOPMENT TESTING. OVERRIDE ChangePlatformAuth ELINK for production platforms supporting TXT.
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



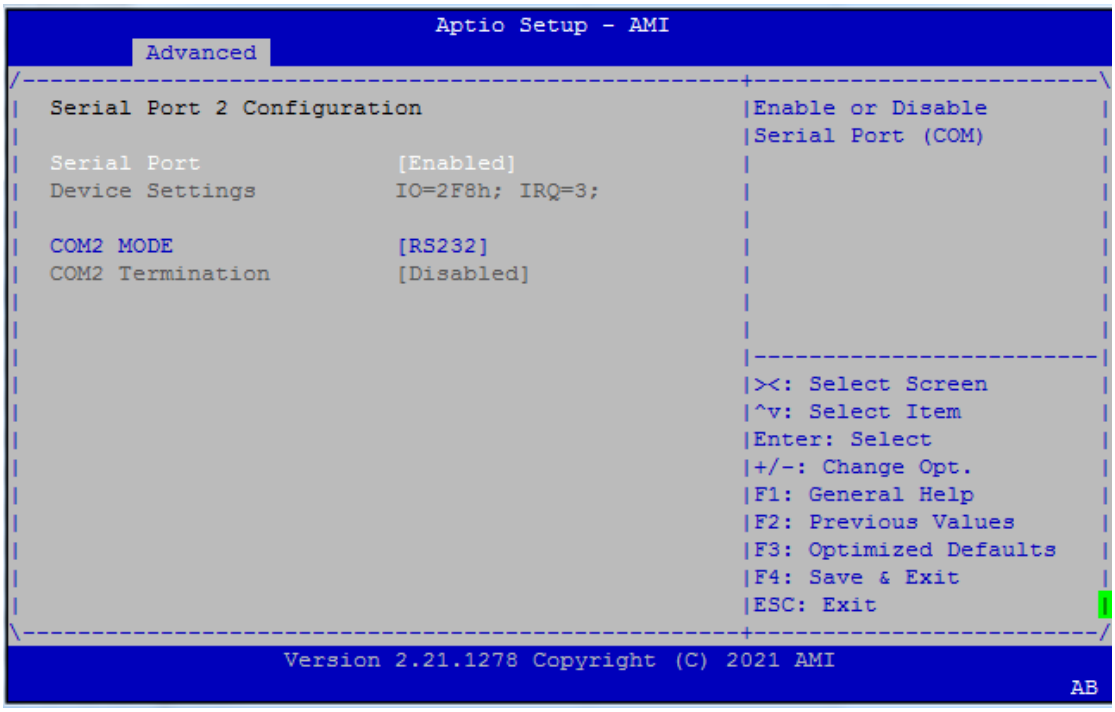
Feature	Options	Description
OS Select	WINDOWS LINUX	UART IRQ mode setting for WINDOWS or LINUX OS
CAN	Enabled Disabled	CAN enable or disable

Serial Port 1 Configuration



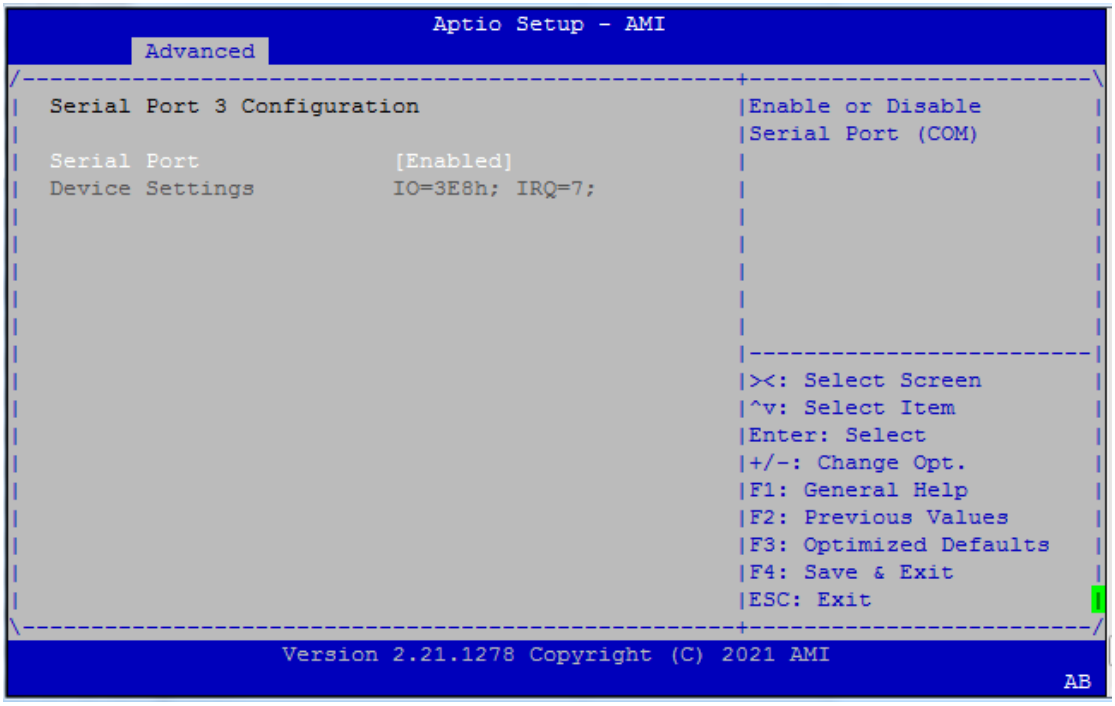
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
COM1 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM1 Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Serial Port 2 Configuration



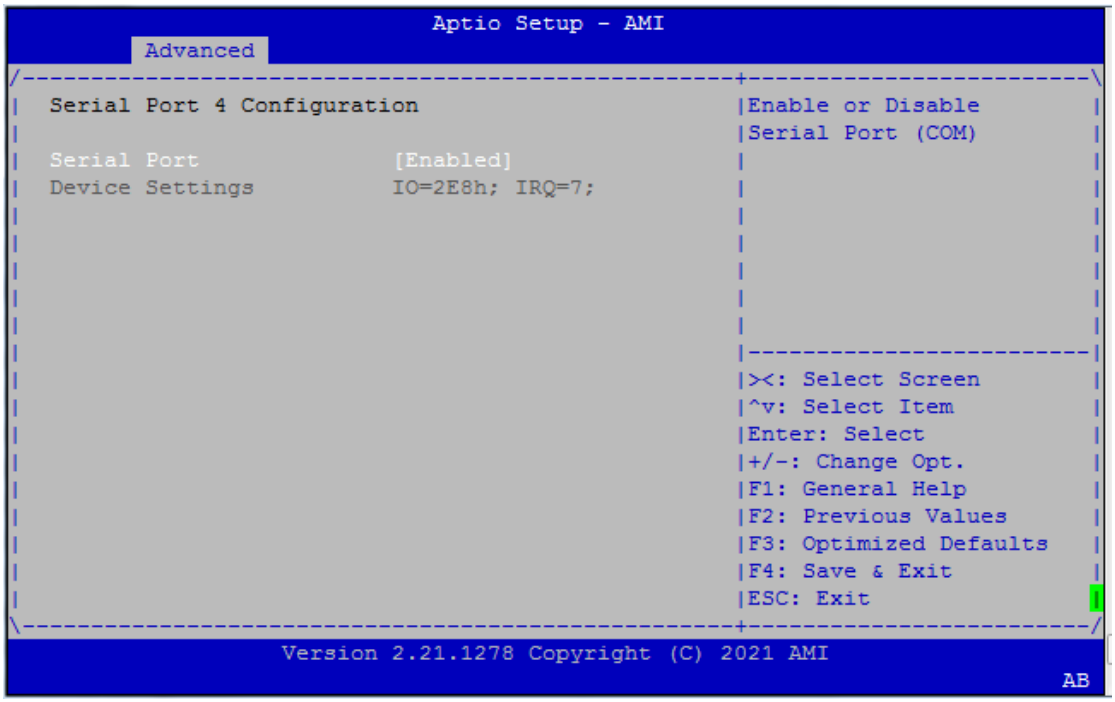
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)
COM2 MODE	Loopback RS232 RS485 Half Duplex RS485/422 Full Duplex	Select Com Mode as RS232/RS485
COM2 Termination	Enabled Disabled	COM RS-422/485 Receiver Termination

Serial Port 3 Configuration



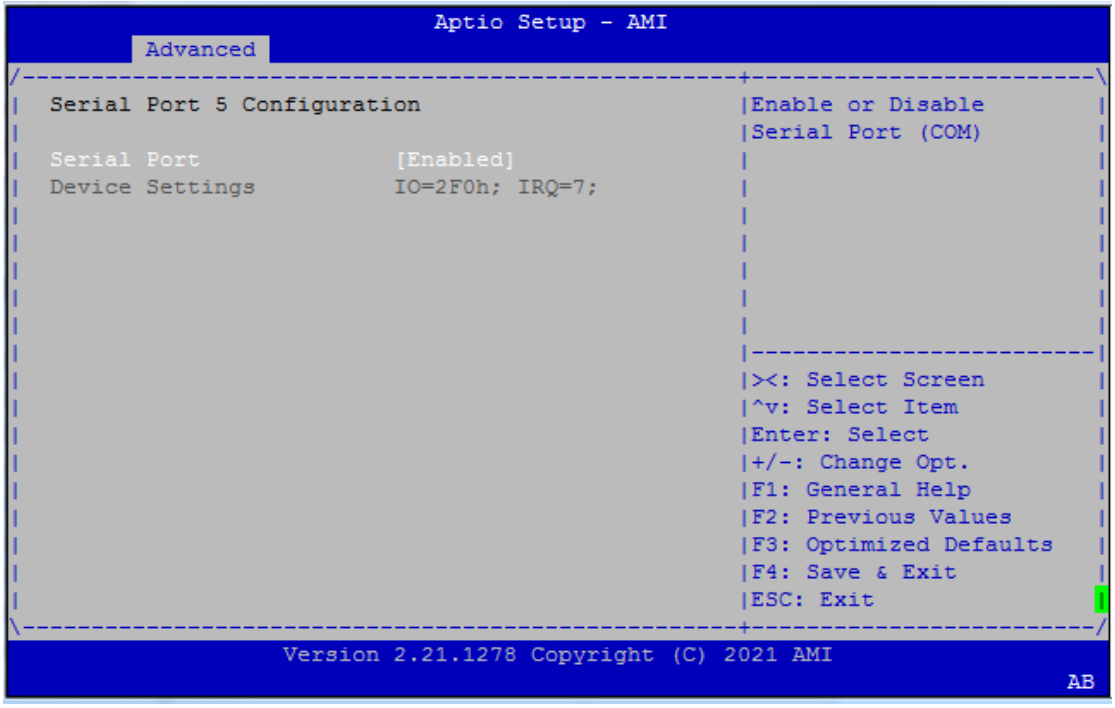
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)

Serial Port 4 Configuration



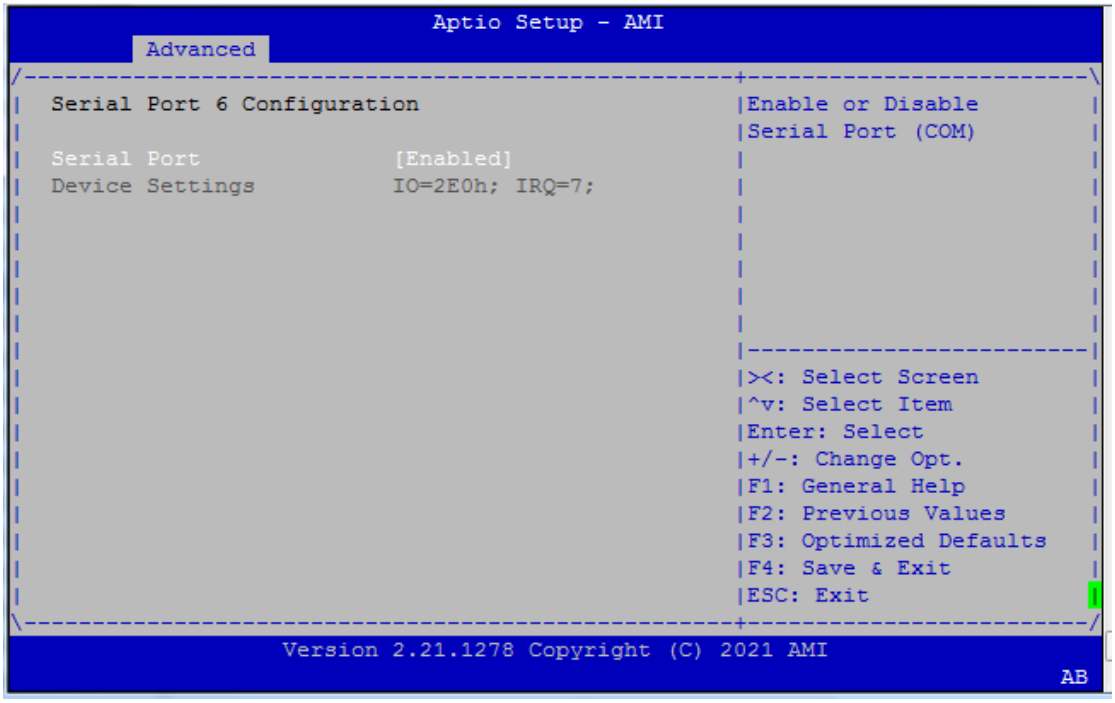
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)

Serial Port 5 Configuration



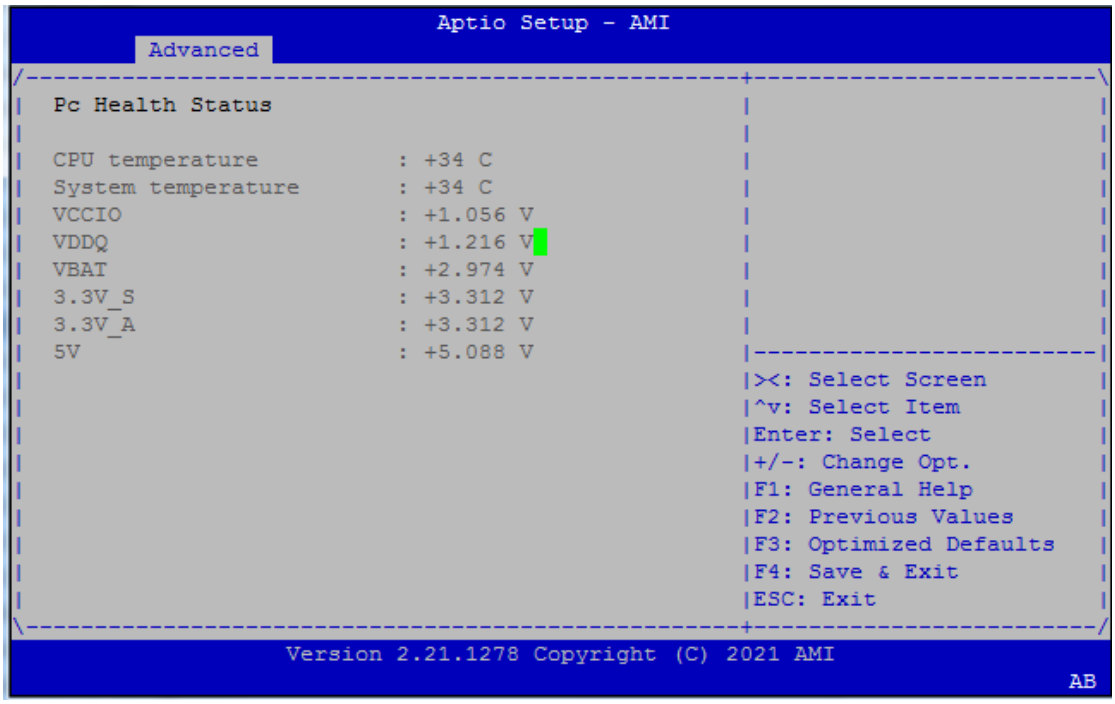
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)

Serial Port 6 Configuration



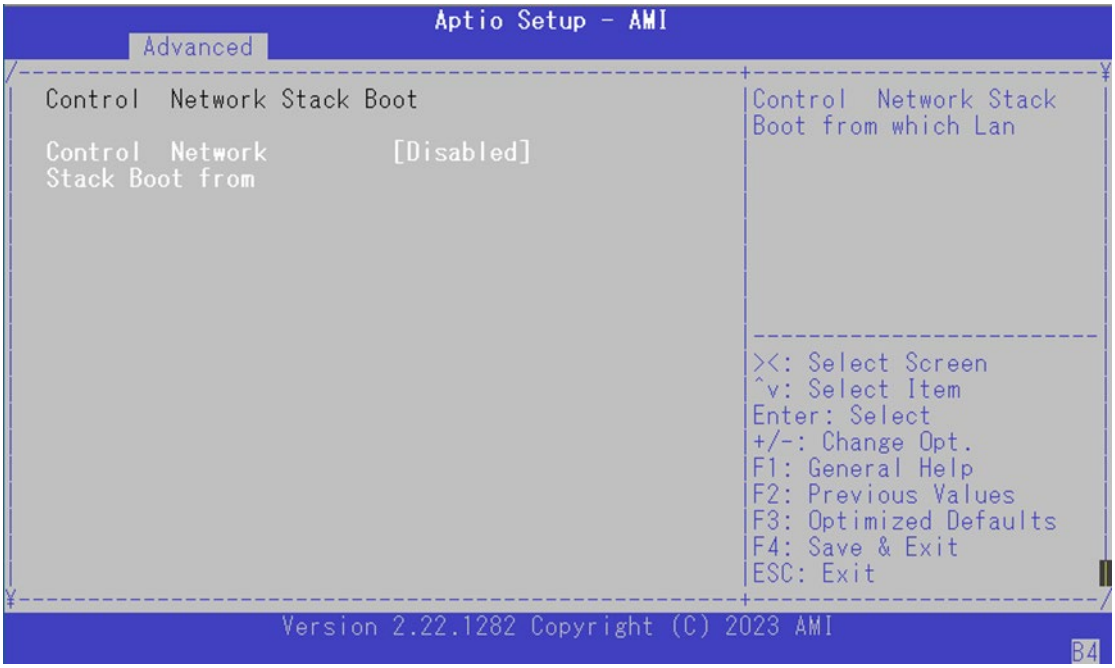
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or Disables Serial Port (COM)

Hardware Monitor



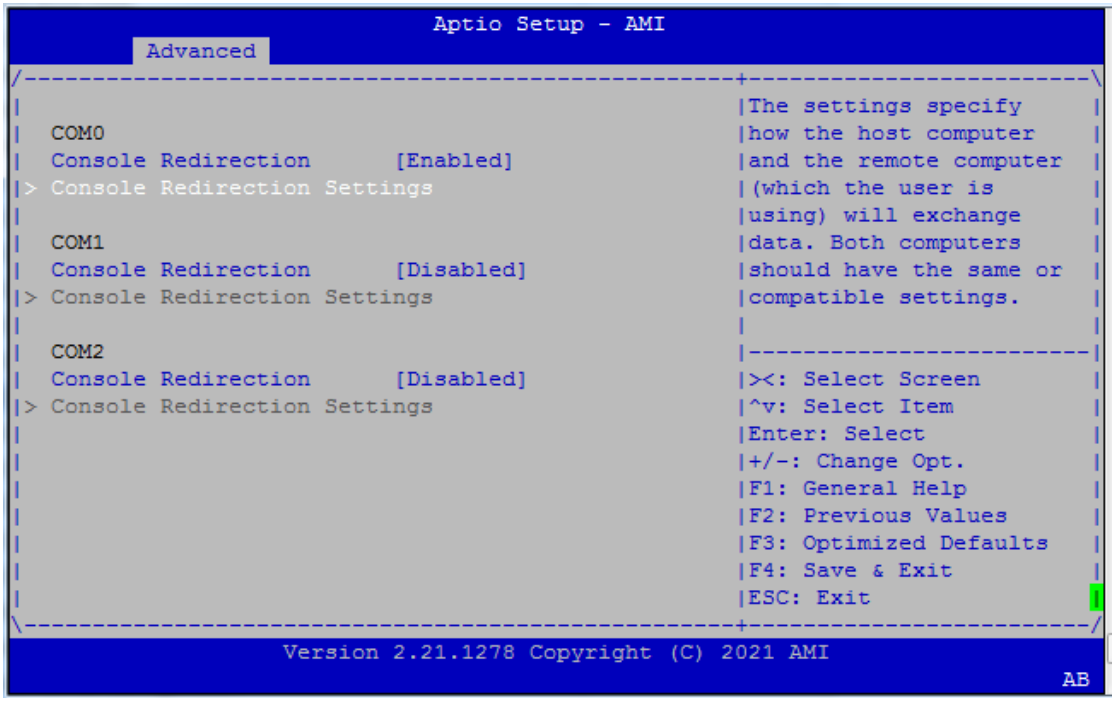
Feature	Description
CPU temperature	This value reports the CPU temperature.
SYS temperature	This value reports the System temperature.
VCCIO	This value reports the CPU VCORE.
VDDQ	This value reports the VDDQ.
VBAT	This value reports the VBAT Input voltage.
3.3V_S	This value reports the 3.3V_S Input voltage.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

Control Network Stack Boot



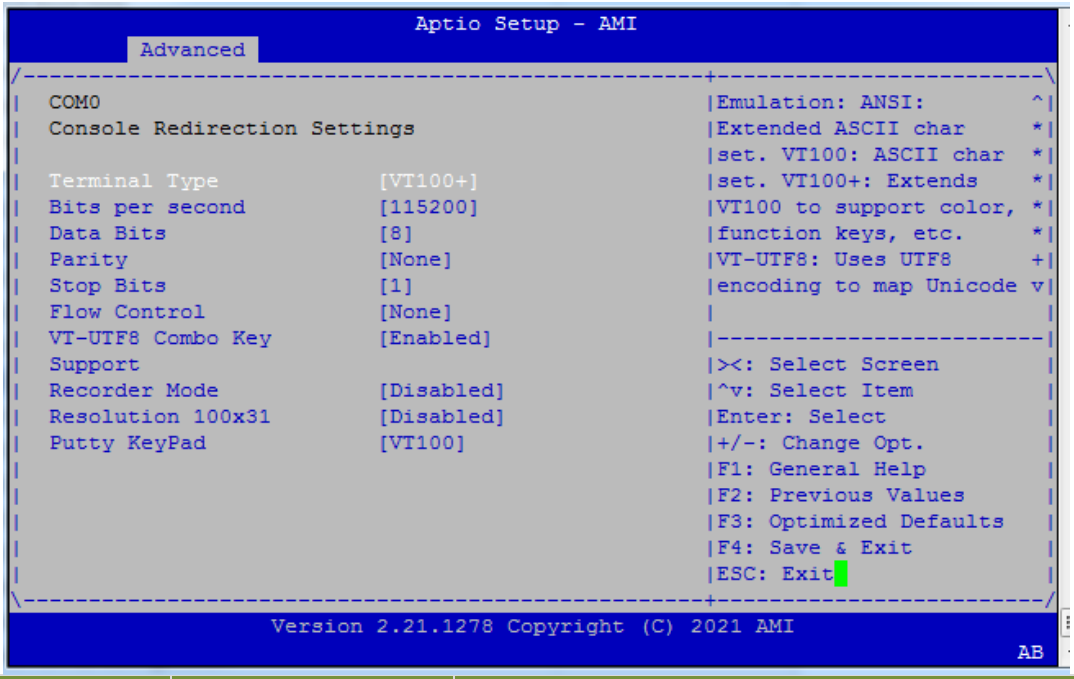
Feature	Options	Description
Control Network Stack Boot from	Disabled LAN1 LAN2	Control Network Stack Boot from which Lan

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
COM2 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

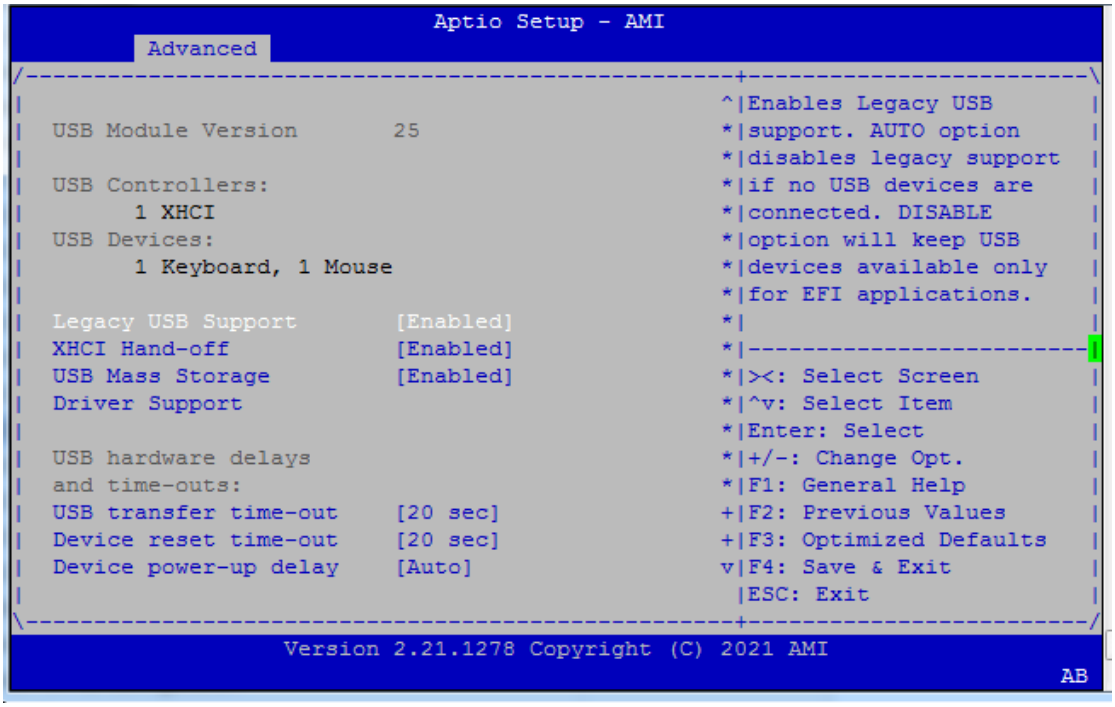
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-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.

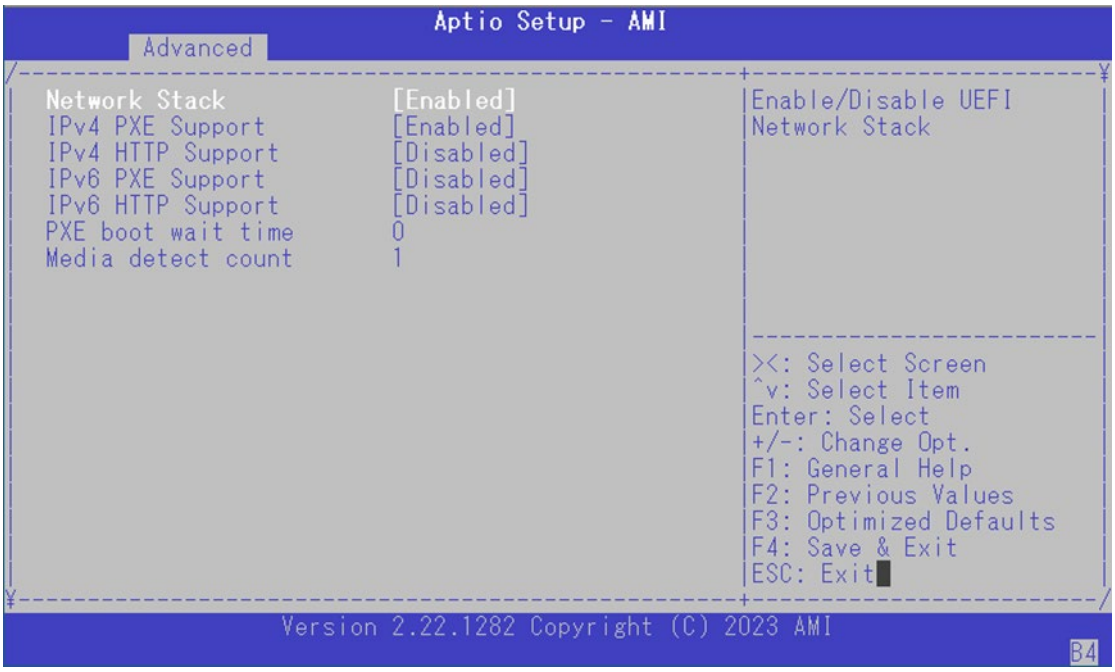
VT-UTF8 Combo Key Support	Disabled Enabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution.
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

USB Configuration



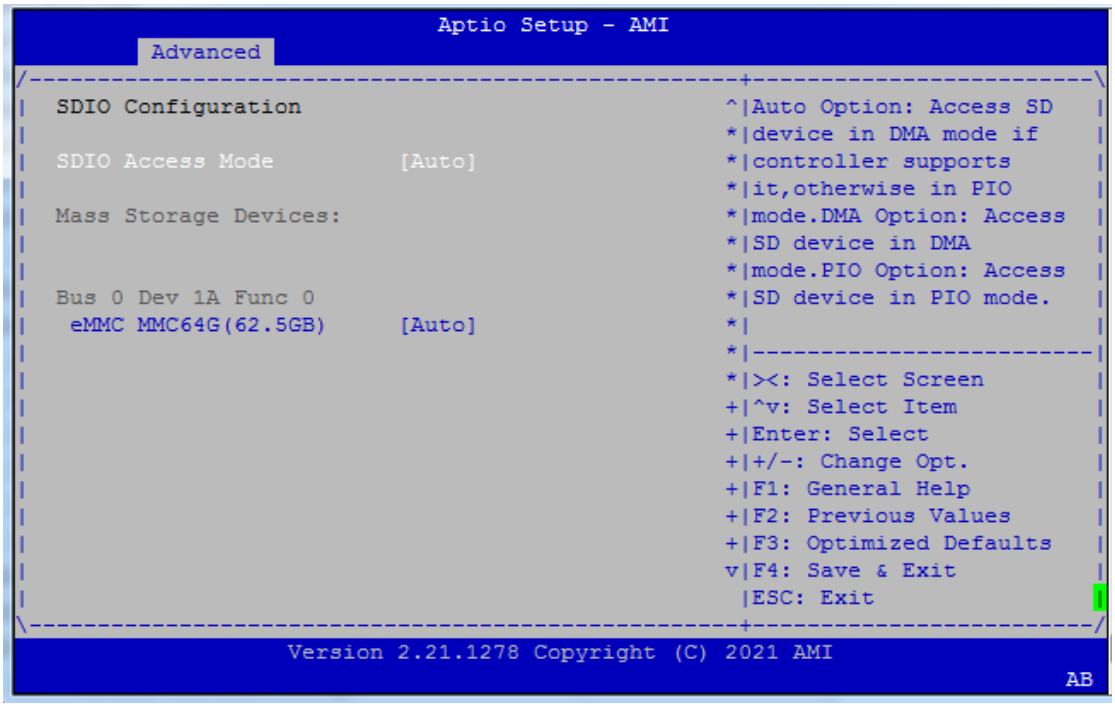
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround 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 select	Disabled Enable	Select 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.
PXE boot wait time	0	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.
Media detect count	1	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

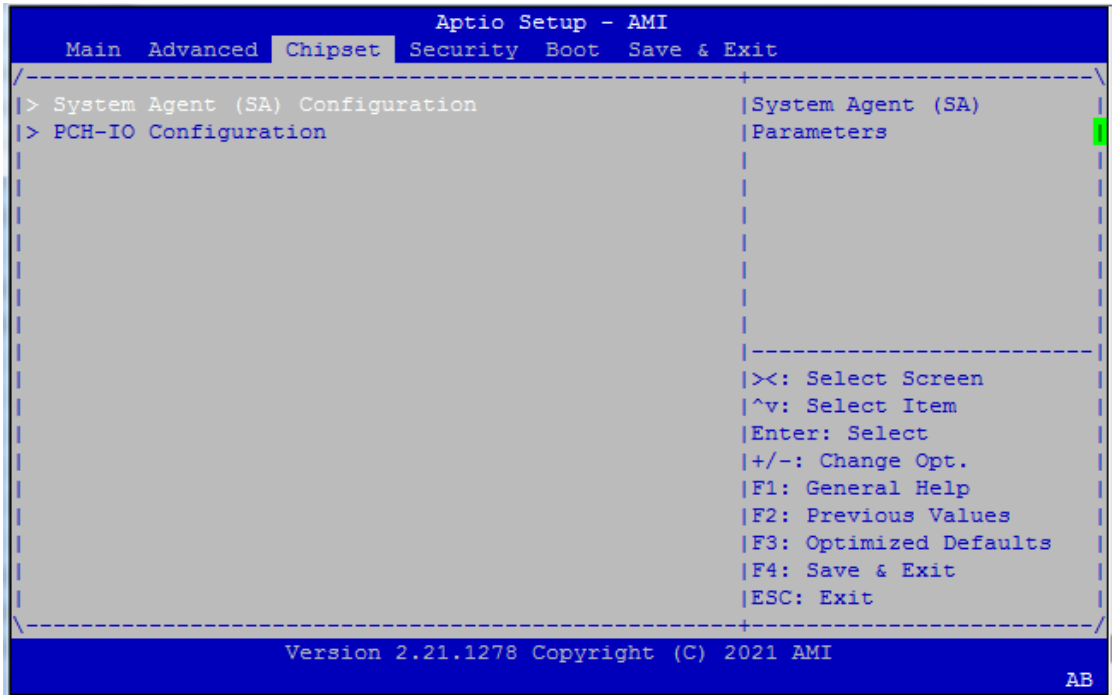
SDIO Configuration



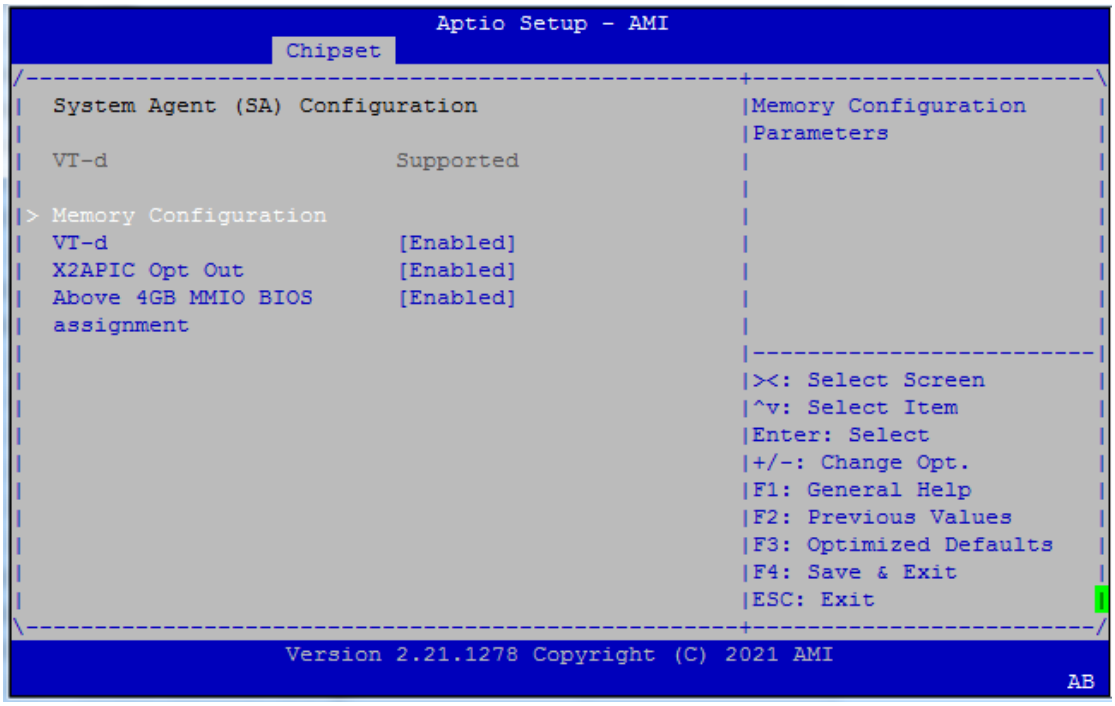
Feature	Options	Description
SDIO Access Mode	Auto	Auto Option: Access SD device in DMA mode if controller supports it, otherwise in PIO mode.
	ADMA	DMA Option: Access SD device in DMA mode.
	SDMA	PIO Option: Access SD device in PIO mode.
	PIO	

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



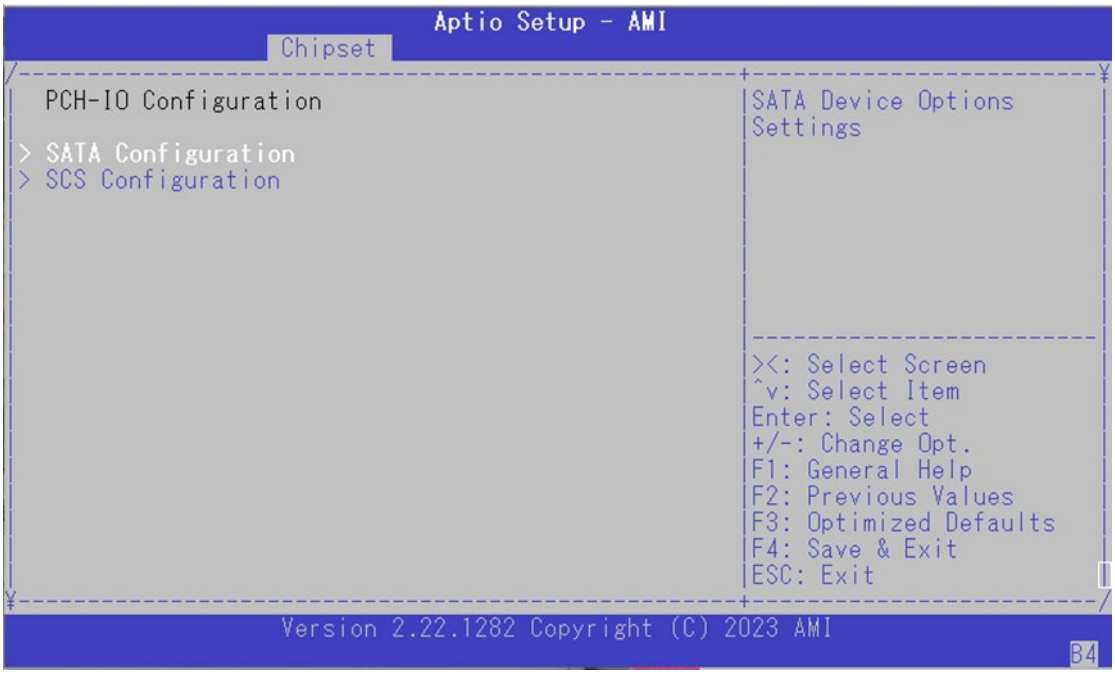
Feature	Options	Description
VT-d	Enabled Disabled	VT-d capability
X2APIC Opt Out	Enabled Disabled	Enable/Disable X2APIC_OPT_OUT bit
Above 4GB MMIO BIOS assignment	Enabled Disabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is disabled automatically when Aperture Size is set to 2048MB

Memory Configuration

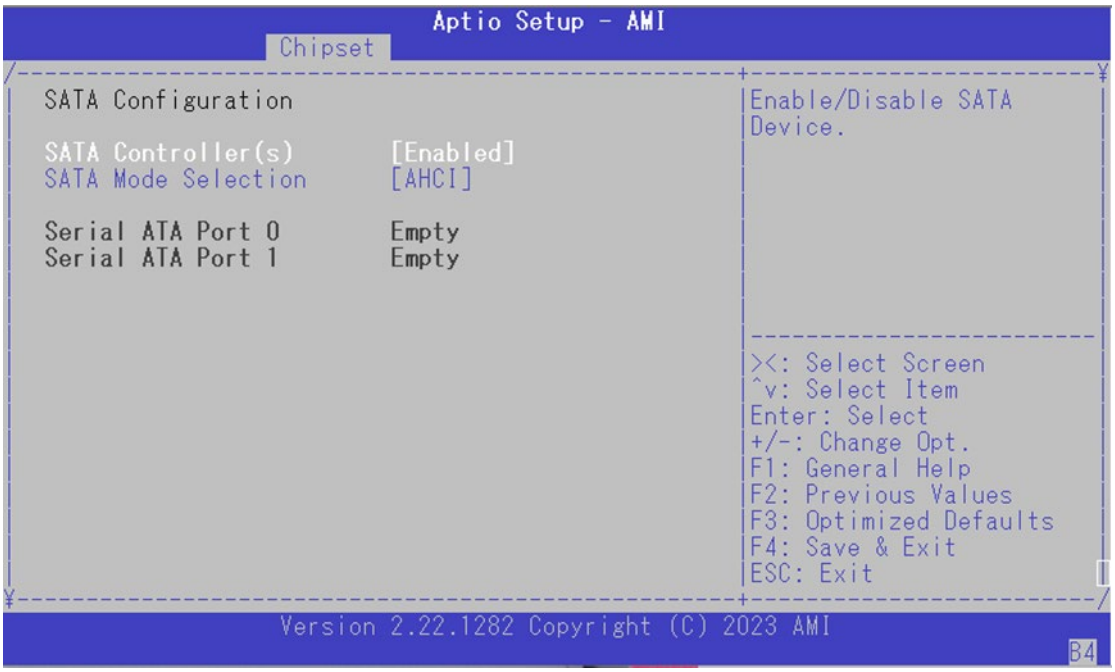


Feature	Options	Description
Maximum Memory Frequency	Auto 1067-4267	Maximum Memory Frequency in Mhz. Must divide by 133 or 100 according to the refclk. In Gear2 must divide by 266 or 200. Lowest Gear2 speed is 2133
Max TOLUD	Dynamic 1GB – 2.5 GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller

PCH-IO Configuration

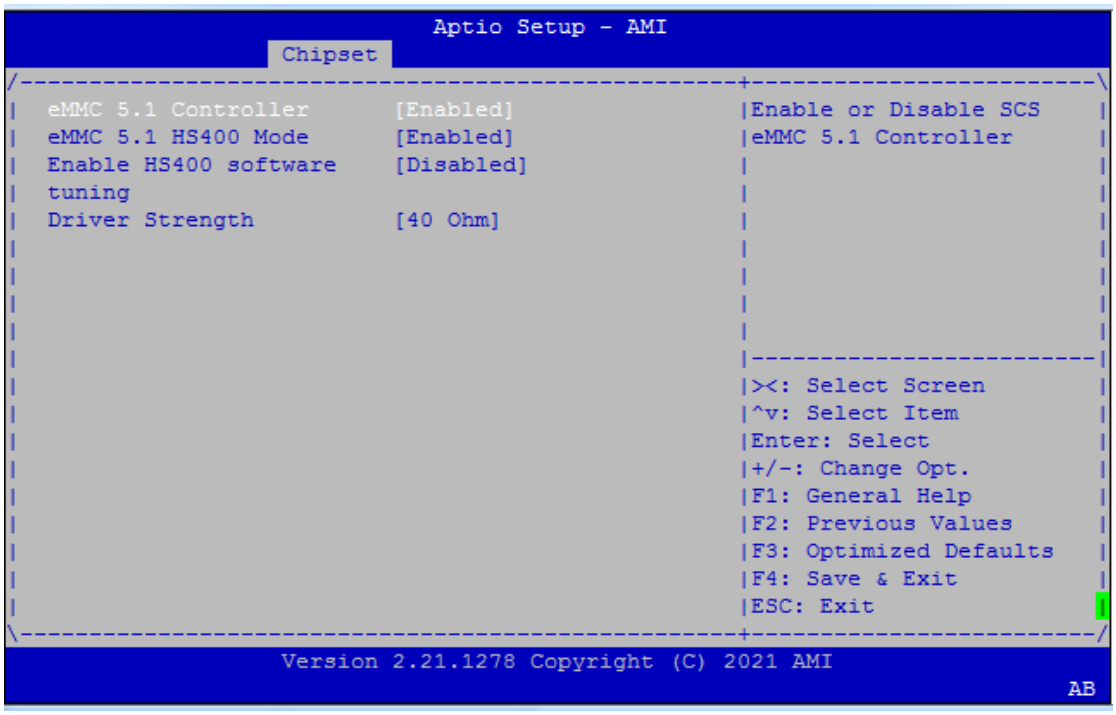


SATA Configuration



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

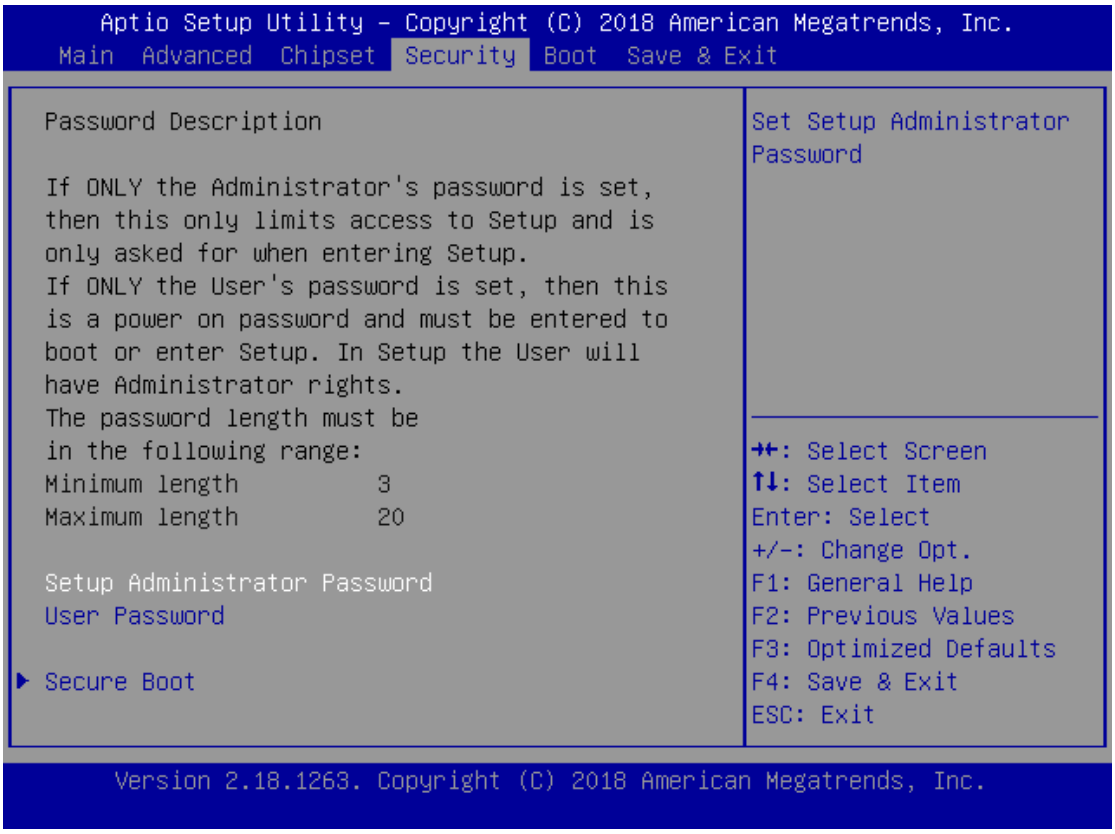
SCS Configuration



Feature	Options	Description
eMMC 5.1 Controller	Enabled Disabled	Enable or Disable SCS eMMC 5.1 Controller
eMMC 5.1 HS400 Mode	Enabled Disabled	Enable or Disable SCS eMMC 5.1 HS400 Mode
Enable HS400 software tuning	Enabled Disabled	Software tuning should improve eMMC HS400 stability at the expense of boot time
Driver Strength	33 Ohm 40 Ohm 50 Ohm	Sets I/O driver strength

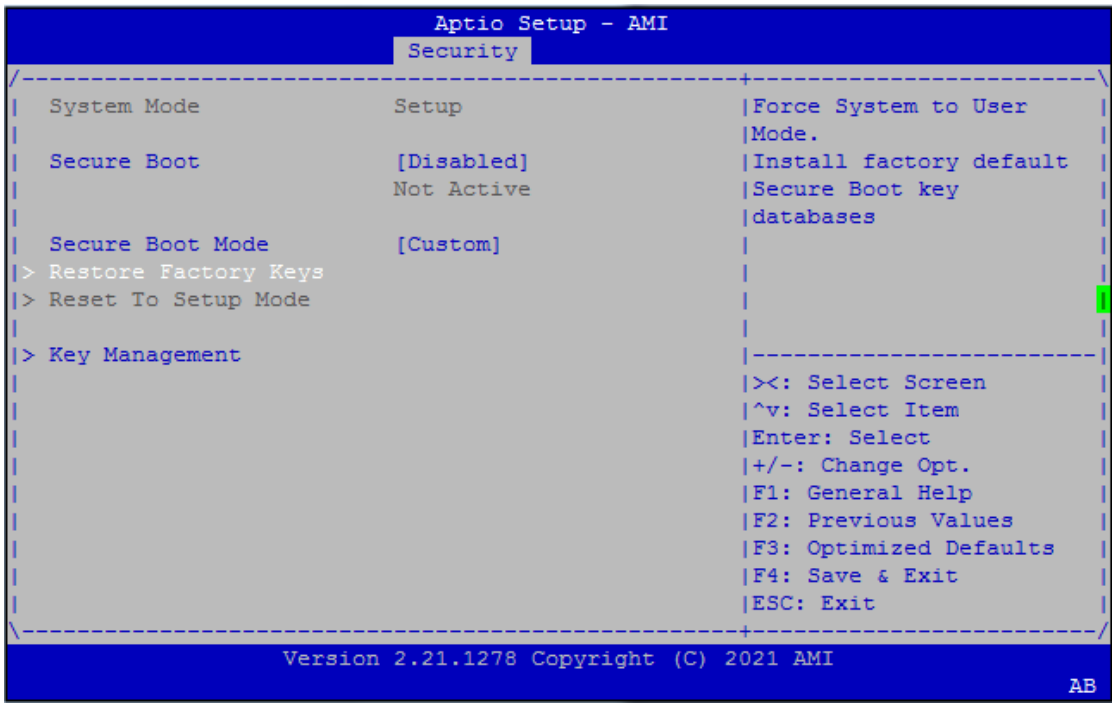
Security

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.



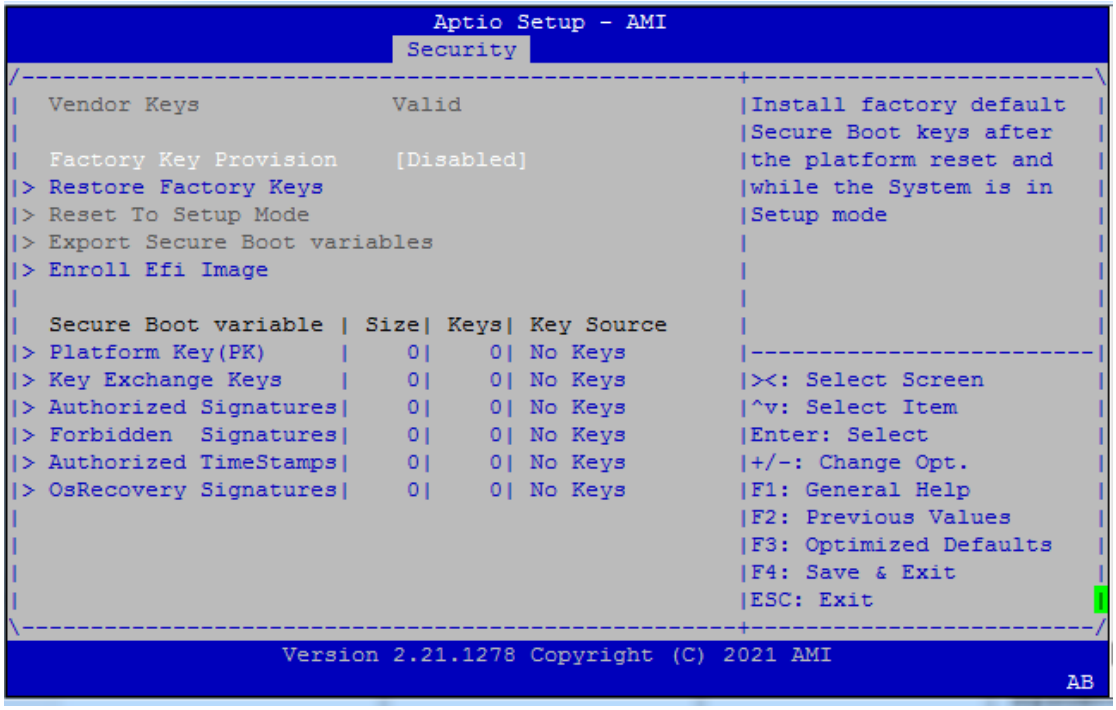
Feature	Description
Setup Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup,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

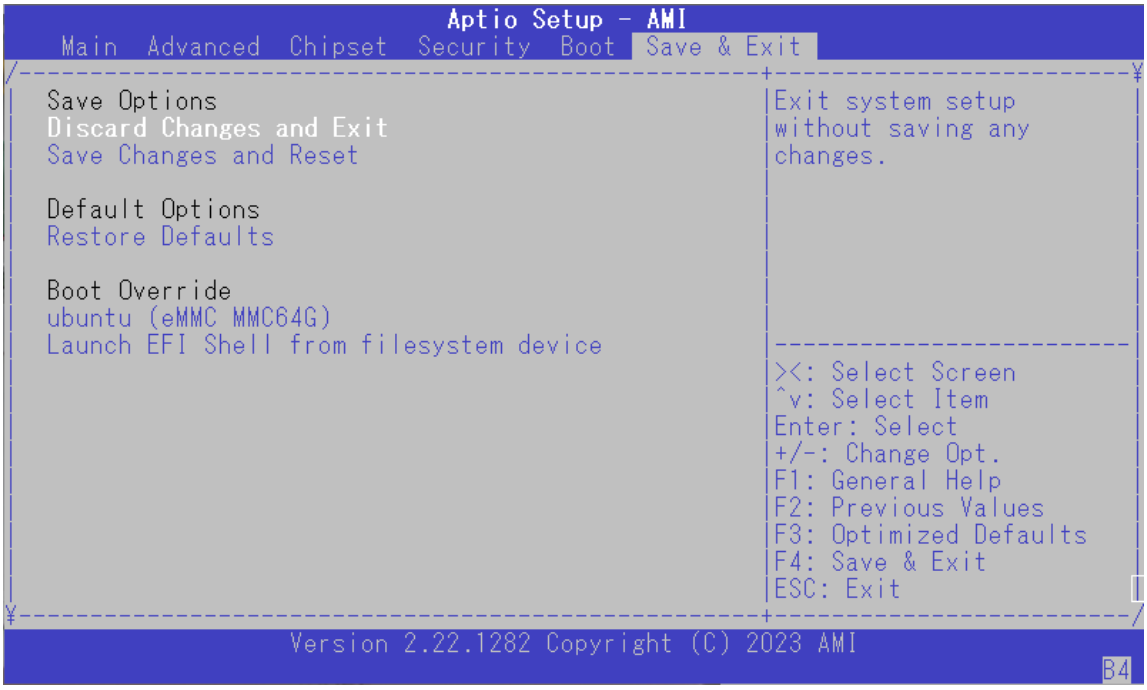


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state

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

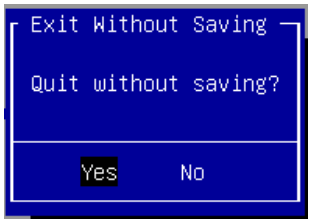
Save and Exit Menu

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.



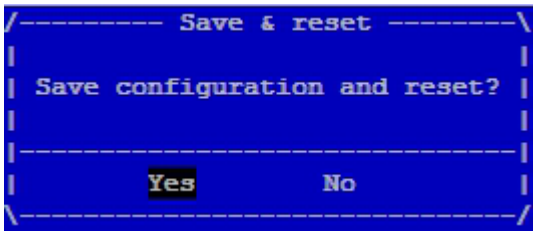
■ Discard Changes and Exit

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.



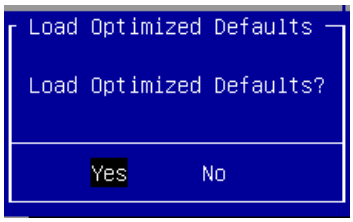
■ Save Changes and Reset

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.



PS: The items under Boot Override may not be the same as the image above, as it should depend on the actual devices connected to the system.

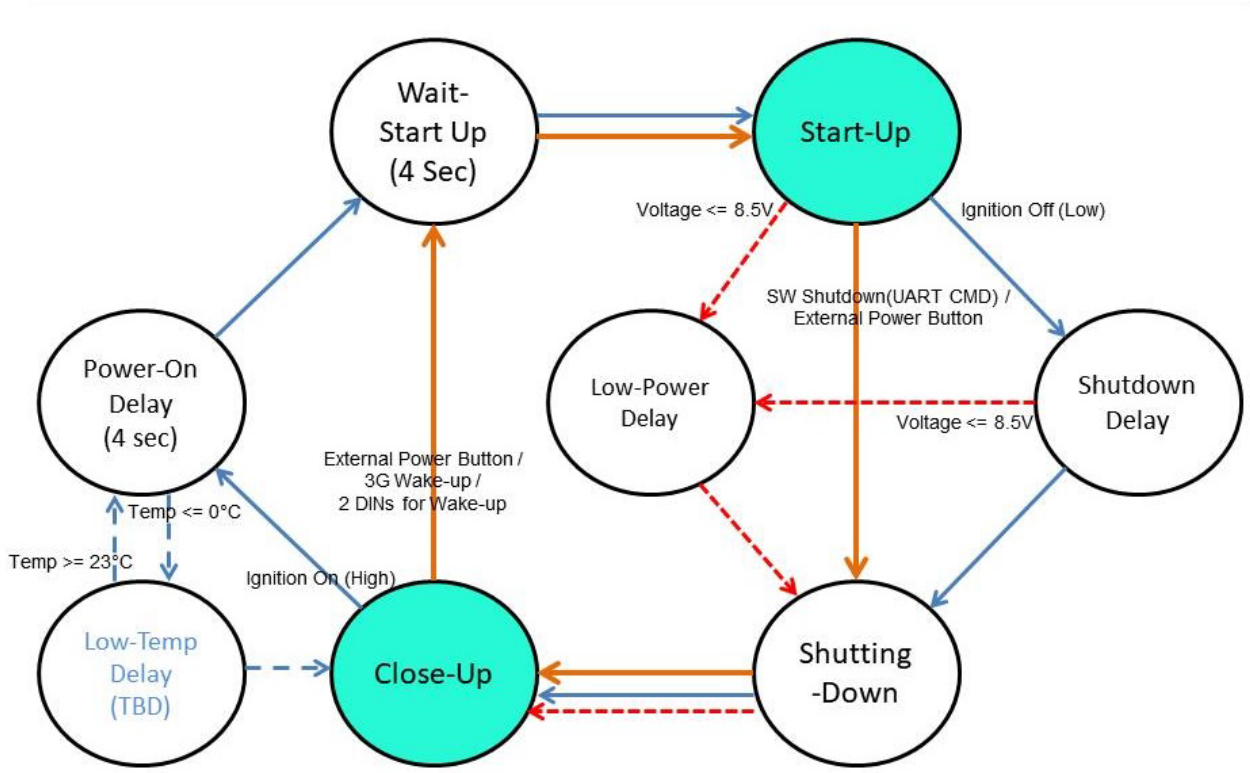
APPENDIX A: LED INDICATOR EXPLANATIONS



The status explanations of LED indicators are as follows:

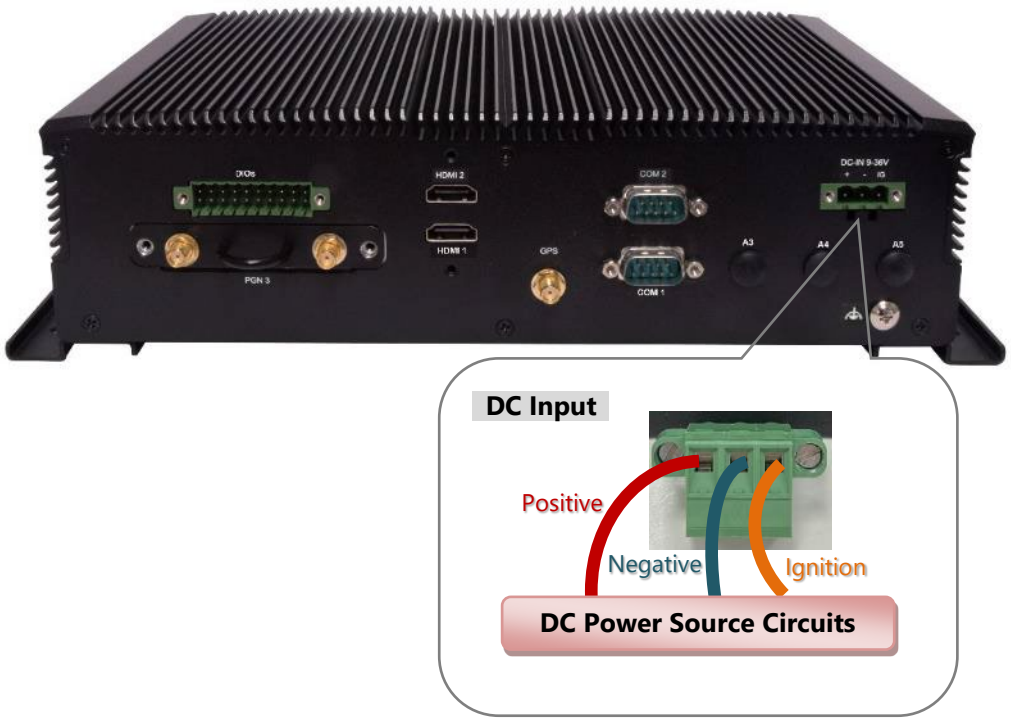
LED	COLOR	LED ACTION	DESCRIPTION
Power	**Green**	Steady	System is powered ON
	OFF	N/A	System is powered OFF
GPS	Programmable LED		
WWAN (LTE)	Programmable LED		

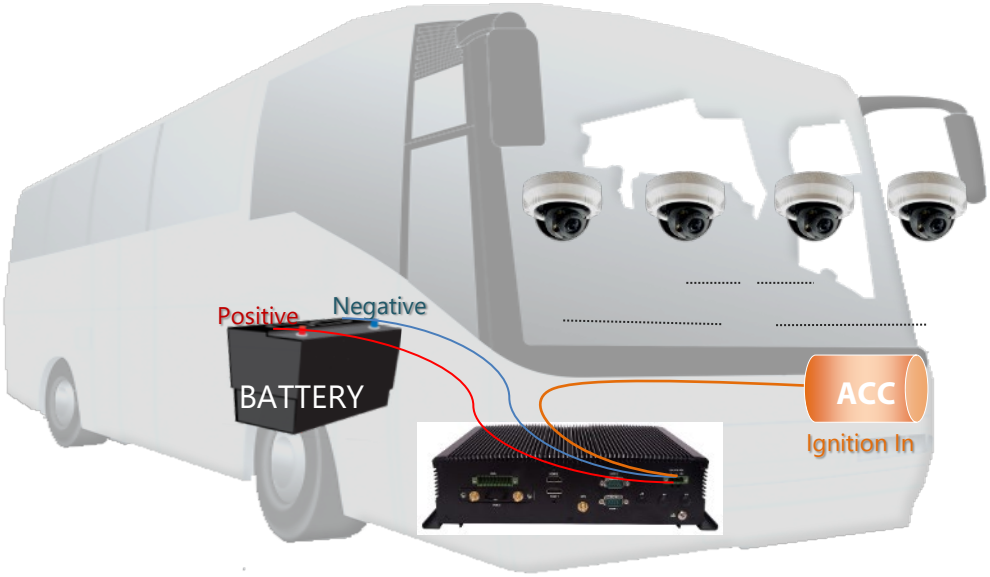
APPENDIX B: IGNITION FLOW CHART



APPENDIX C: CONNECT TO DC POWER

1. Make sure your system is turned off.
2. Follow the wiring definition and illustration below to connect the power source to the system through the 3-pin terminal block connector as DC Input. Connect the two Power Wires to the Terminal Block (supplied along with the system) by inserting the red wire to the Positive contact, the other wire to the Negative contact, and then securing them onto the terminal block.





DC Input



+	-	IG
Positive	Negative	Ignition

APPENDIX D: 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