Lanner

Vehicle Computing

Rugged Platforms for Vehicles and Railway Computing

EAI-R530 User Manual

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About this Document

This manual provides a comprehensive overview of this product's features and the essential information for its setup and operation. It is designed for individuals tasked with the system's installation, management, and troubleshooting, including IT professionals, system integrators, service personnel, and technicians, who are expected to have expertise in computer equipment servicing.

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.

Icon Descriptions

The icons are used in this manual serves 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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For additional assistance, feel free to submit a support ticket through our Lanner Technical Support portal, alongside contacting your distributor or sales representative.

Documentation Feedback

We greatly appreciate your feedback, as it plays a crucial role in enhancing the accuracy and relevance of our documentation. Should you have any comments, suggestions, or need to report an error, please don't hesitate to reach out to us at contact@lannerinc.com. Thank you for contributing to our continuous improvement.

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Acknowledgment

Federal Communication Commission Interference Statement

This equipment has been tested and meets the Class A digital device standards under FCC Part 15 Rules, aimed at minimizing harmful interference in residential areas. It may generate, use, and emit radio frequency energy. Without proper installation and use, it could interfere with radio communications. Although interference is not guaranteed to be absent in all installations, if this equipment does disrupt radio or television reception, discernible by powering the device off and on, users are encouraged to address the interference using one or more recommended 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.
- Turn off and unplug the power 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 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 extreme heat can cause an explosion or flammable leakage.
- A battery exposed to very low air pressure may explode or leak 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 rackmount 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. 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.
- This product is intended to be supplied by a Listed Power Adapter or DC power source, rated 12-24Vdc, 17.5-8A minimum, Tma = 70°C, and the altitude of operation = 5000m.

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

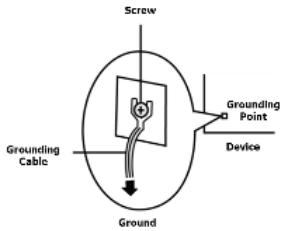
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect 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.

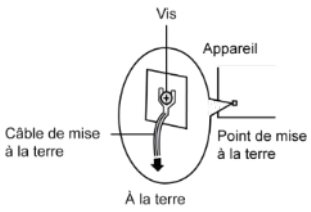
Grounding Procedure for Power Source

- 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



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CHAPTER 1 : PRODUCT OVERVIEW

The EAI-R530 series has been meticulously crafted around a high-performance embedded system, incorporating the Intel® Raptor Lake Extended Temp CPU. This ensures exceptional performance while offering a range of power consumption options, making it ideal for computing applications in rolling stock environments.

Package Content

Your package contains the following items:

- 1x EAI-R530 AI Acceleration Railway Computer
- 1x M12 Power Cable

Ordering Information

SKU	Main Features
EAI-R530A	Intel RPL-P® i7-13800HRE, 14C (6P+8E)/20T, 45W, 2x DDR5 4800 IBECC SODIMM, 2x M.2 2242/80 M-Key (PCIe x4), 1x Removable Storage Caddy supports 2x 2.5" SSD, 2x 2.5 GbE PoE+ LAN under maximum 60W power budget, 4x 2.5 GbE LAN, 1x MXM type A/B under maximum 60W power budget (Optional), 6x M.2 3042/3052 B-Key (4 out of 6 from PGNs), 1x M.2 2230 E-Key, GPS, DC 24-110V input by M12 K-coded, OOB, Operating Temperature -40~55°C
EAI-R530B	Intel RPL-P® i7-1370PRE, 14C (6P+8E)/20T, 28W, 2x DDR5 4800 IBECC SODIMM, 2x M.2 2242/80 M-Key (PCIe x4), 1x Removable storage caddy supports 2x 2.5" SSD, 2x 2.5 GbE PoE+ LAN under maximum 60W power budget, 4x 2.5 GbE LAN, 6x M.2 3042/3052 B-Key (4 out of 6 from PGNs), 1x M.2 2230 E-Key, GPS, DC 24-110V input by M12 K-coded, OOB, Operating Temperature -40~70°C
EAI-R530C	ntel RPL-P® i7-1365URE, 10C (2P+8E)/20T, 15W, 2x DDR5 4800 IBECC SODIMM, 2x M.2 2242/80 M Key (PCIe x4)), 1x Removable storage caddy supports 2x 2.5" SSD, 2x 2.5 GbE PoE+ LAN under maximum 60W power budget, 4x 2.5 GbE LAN, 6x M.2 3042/3052 B-Key (4 out of 6 from PGNs), 1x M.2 2230 E-Key, GPS, DC 24-110V input by M12 K-coded, OOB, Operating Temperature -40~70°C

Optional Accessories

Model	Description
080W000891000	LAN Cable M12, 8P, RJ45, 8P8C, 30cm, 180° – 180° Prodaconn TM-18L-R-R6S-03 (LAN/PoE/Console) (For AVL Testing Only)
098W000300014	Long Slider Rackmount Kit
098W000177000	Short Slider Rackmount Kit

System Specifications

Processor System	CPU	SKU A: Intel® RPL-P i7-13800HRE, 45W; SKU B: Intel® RPL-P i7-1370PRE, 28W; SKU C: Intel® RPL-P i7-1365URE, 15W
	Frequency	2.5 GHz
	Cores	14/10 Cores
	BIOS	AMI SPI Flash BIOS
	Chipset	SoC
Fanless		Yes
Memory	Technology	2x 262-pin SODIMM DDR5 4800MHz Sockets
	Max. Capacity	Up to 64GB (Default 2x 32G)
Ethernet	Controller	Intel i226IT
	Speed	100M/1G/2.5GbE Mbps
Storage	HDD/SSD	Removable 1x 2.5" HDD/SSD Drive Bay
I/O	Reset Button	1x Reset Button
	LED Indicator	Power/Status/Storage/Console/Programmable
	Display Port	2x HDMI, Up to 4K @ 30Hz
	LAN Port	SKU A/B: 4x 2.5GbE Port by M12 X-coded cable; SKU C: 6x 2.5GbE Ports by M12 X-coded cable
	PoE Port	SKU A/B: 2x 2.5GbE PoE+ IEEE 802.3af / at LAN, max 60W power budget (w/o MXM GPU Card)
	Console Port	1x RS232 by RJ45 Port
	GPS	Support BeiDou, Galileo, GLONASS, GPS/QZSS (4 Concurrent GNSS, NEO=M9V) with UDR
	OOB	1x RJ45 for Out-of-Band (OOB) Management Port
	USB	1x USB 2.0 Port, isolated 2x USB 3.2 Gen 1 Ports, without isolated
	Antenna	1x Antenna Hole for GPS; 8x Antenna Holes for 5G Sub6; 2x Antenna Holes for Wi-Fi 6E; 2x Antenna Reserved
Expansion Interface	M.2	2x M.2 3042/3052 B-Key for LTE/5G; 1x M.2 2230 E-Key for Wi-Fi 6/6E (BT);
	PCIe	1x PCIe Gen 3 x8 for MXM V3.1 Type A, B (SKUA Only, Optional)
	SIM Card	2x Nano-SIM (for LTE/5G Module) Slots; And eSIM
Cooling	Processor	Passive CPU heatsink
	System	Fanless
Power	Connector	1x 5-pin M12 K-coded Male Connector
	Input	24~110VDC, with 1.5KV Isolation Protection
Miscellaneous	Watchdog	Yes
	Internal RTC w/ Li Battery	Yes
	TPM	Onboard TPM 2.0
Environment	Operating Temperature	-40°C~70°C; With MXM GPU: -40°C~55°C
	Storage Temperature	-40°C~85°C
	Humidity	5%~95% RH
Mechanical	Dimension (WxDxH)	438mm x 300mm x 110.5mm
	Weight	11.5 kg
	Form Factor	IP40, 19' Rackmount, Wall mount (Optional)
OS Support	Microsoft Windows	Win 11 IoT
	Linux	Debian 10
Certification	EMC	CE/FCC Class A,
	Safety	UL
	Railway	EN50155, EN45545-2, EN50125-3
	Compliance	MIL-STD-810G

Front Panel

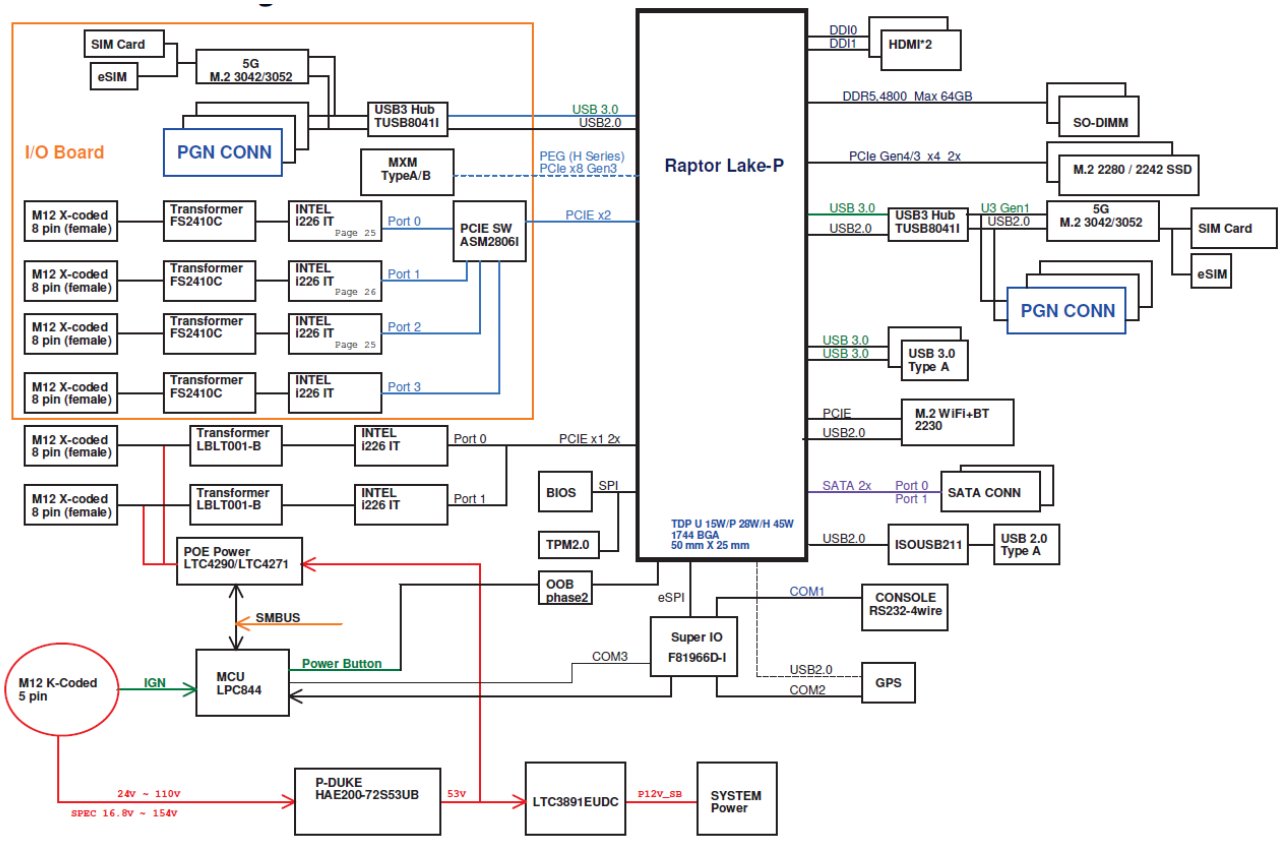
No	Description	
F1	Ground Hole	1x Grounding Screw
F2	Power Connector	1x M12 K-coded Male Connector
F3	Reset Button	1x Reset Button
F4	LED Indicator	LED Indicators for Power/Status/Storage/Console/Programmable
F5	Console Port	1x Console Port
F6	USB Port	1x USB 2.0; 2x USB 3.2
F7	HDMI Port	2x HDMI Ports
F8	Storage Bay	2x SATA interface storage bays to support removable 2.5” HDD/SSD drive bay
F9	LAN Port	2x PoE+ by M12 X-coded Ports; 4x 2.5GbE LAN by M12 X-coded Ports (By SKU)
F10	PGN Caddy	4x PGN Caddy for PGN-750 (Optional)
F11	Antenna Hole	12x Antenna Holes for Wi-Fi/LTE/5G Module; 1x GPS Antenna Hole

Rear Panel

No	Description	
R1	SIM Cover	2x Nano-SIM Covers for LTE/5G Module
R2	OOB	1x RJ45 OOB Port

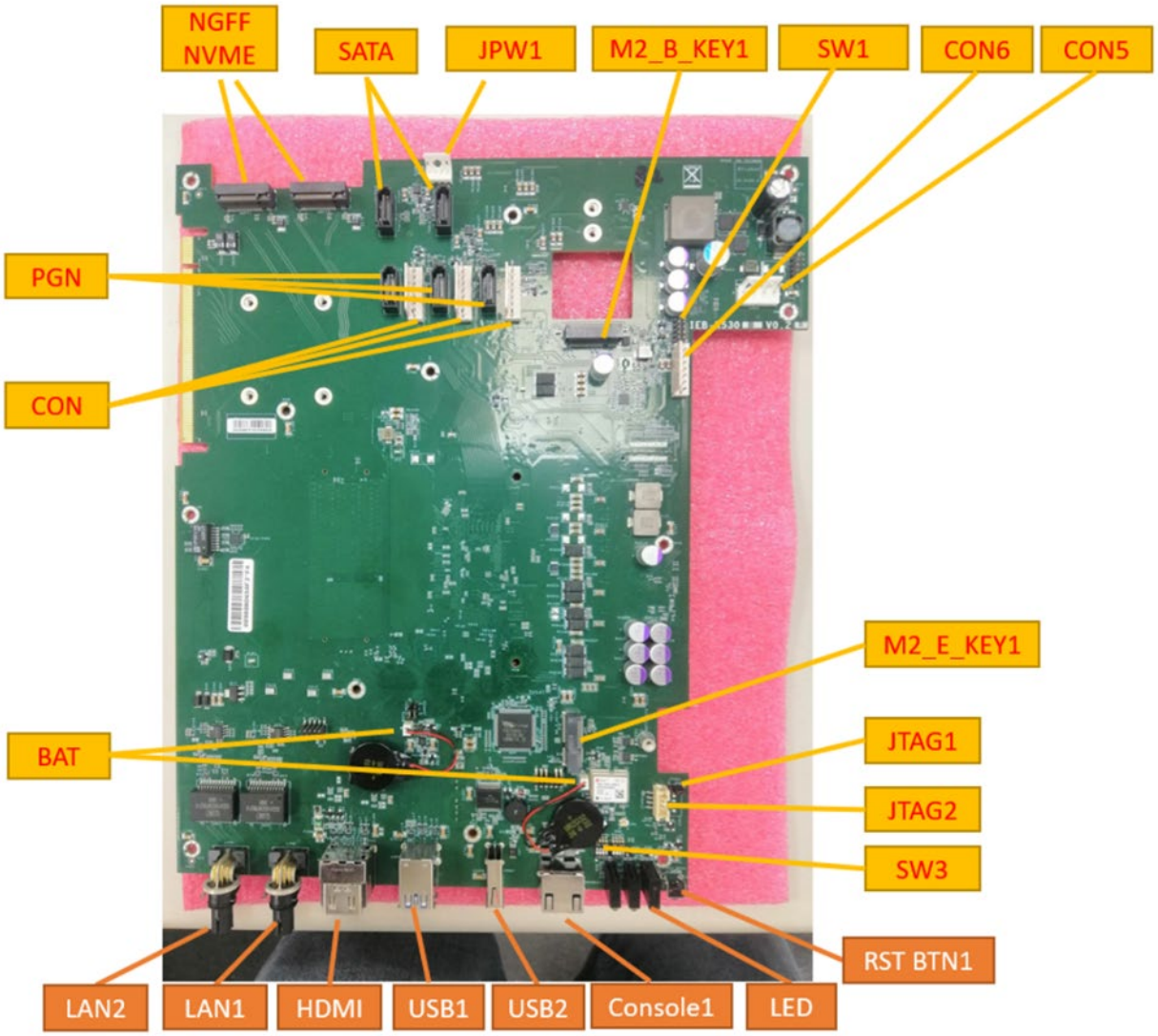
Motherboard Information

Block Diagram



Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



Internal Jumper & Connectors

CON5

Pin	Description
1	+P53V_STBY
2	+P53V_STBY
3	GND
4	GND

CON6

Pin	Description
1	+P3V3_MCU
2	+P3V3_MCU
3	NC
4	GND
5	GND
6	NC
7	NC
8	IGNOUT

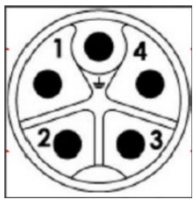
M2_B-KEY1

Pin	Description	Pin	Description	Pin	Description
1	NC	26	GND	51	GND
2	3V3	27	GND	52	NC
3	GND	28	NC	53	NC
4	3V3	29	USB3_RXN	54	NC
5	GND	30	SIM_RST	55	NC
6	F_CARD_POWER_OFF_N (default: 1V8)	31	USB3_RXP	56	NC
7	USB2_TXP	32	SIM_CLK	57	GND
8	NC	33	GND	58	NC
9	USB2_TXN	34	SIM_DAT	59	NC
10	NC	35	USB3_TXN	60	NC
11	GND	36	SIM_VCC	61	NC
12	LATCH	37	USB3_TXP	62	NC
13	LATCH	38	M2B2_P38	63	NC
14	LATCH	39	GND	64	NC
15	LATCH	40	NC	65	NC

16	LATCH	41	NC	66	SIM_DETECT (default: NC)
17	LATCH	42	NC	67	RESET
18	LATCH	43	NC	68	M2B_P68
19	LATCH	44	NC	69	NC
20	M2B_P20_PCIE_DIS	45	GND	70	3V3
21	NC	46	NC	71	GND
22	M2B_P22_VBUS_SENSE	47	NC	72	3V3
23	NC	48	NC	73	GND
24	M2B2_P24	49	NC	74	3V3
25	NC	50	NC	75	NC

JPW1

Pin	Description
1	NC
2	GND
3	GND
4	5V



SATA1~2

Pin	Description
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

NGFF1~2

Pin	Description	Pin	Description	Pin	Description
1	GND	27	GND	53	PCIE_CLKN
2	3V3	28	NC	54	PCIE_WAKE_N
3	GND	29	PCIE_RXN1	55	PCIE_CLKP
4	3V3	30	NC	56	NC
5	PCIE_RXN3	31	PCIE_RXP1	57	GND
6	NC	32	NC	58	NC
7	PCIE_RXP3	33	GND	59	LATCH
8	NC	34	NC	60	LATCH
9	GND	35	PCIE_TXN1	61	LATCH
10	SATA_LED	36	NC	62	LATCH
11	PCIE_TXN3	37	PCIE_TXP1	63	LATCH
12	3V3	38	NC	64	LATCH
13	PCIE_TXP3	39	GND	65	LATCH

14	3V3	40	NC	66	LATCH
15	GND	41	PCIE_RXN0	67	NC
16	3V3	42	NC	68	NC
17	PCIE_RXN2	43	PCIE_RXP0	69	NC
18	3V3	44	NC	70	3V3
19	PCIE_RXP2	45	GND	71	GND
20	NC	46	NC	72	3V3
21	GND	47	PCIE_TXN0	73	GND
22	NC	48	NC	74	3V3
23	PCIE_TXN2	49	PCIE_TXP0	75	GND
24	NC	50	PCIE_RST	76	NC
25	PCIE_TXP2	51	GND	77	NC
26	NC	52	PCIE_CLKREQ_N	-	

PGN1~PGN3

Pin	Description
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

CON1~3

Pin	Description
1	3V3
2	3V3
3	5V
4	SIM_SW
5	RESET
6	GND
7	USB_N
8	USB_P

M2_E-KEY1

Pin	Description	Pin	Description	Pin	Description
1	GND	26	LATCH	51	GND
2	3V3	27	LATCH	52	PCIE_RST
3	USB_DP	28	LATCH	53	PCIE_CLKREQ_N
4	3V3	29	LATCH	54	BT_DIS
5	USB_DN	30	LATCH	55	PEWAKE
6	LED_WIFI_N	31	LATCH	56	WIFI_DIS
7	GND	32	NC	57	GND
8	NC	33	GND	58	NC
9	NC	34	NC	59	NC
10	NC	35	PCIE_TXP	60	NC
11	NC	36	NC	61	NC

12	NC	37	PCIE_TXN	62	NC
13	NC	38	NC	63	GND
14	NC	39	GND	64	NC
15	NC	40	NC	65	NC
16	LED_BT_N	41	PCIE_RXP	66	NC
17	NC	42	NC	67	NC
18	GND	43	PCIE_RXN	68	NC
19	NC	44	NC	69	GND
20	NC	45	GND	70	NC
21	NC	46	NC	71	NC
22	NC	47	PCIE_CLKP	72	3V3
23	NC	48	NC	73	NC
24	LATCH	49	PCIE_CLKN	74	3V3
25	LATCH	50	SUSCLK_32KHz	75	GND

JTAG1

Pin	Description
1	PWR
2	MCU_ISP_MODE
3	GND

JTAG2

Pin	Description
1	PWR
2	UART_RX
3	GND
4	UART_TX

USB2

Pin	Description
1	PWR
2	USB_N
3	USB_P
4	GND

RST BTN1

Pin	Description
1	SYS_RST_N
2	GND

CONSOLE1

Pin	Description
1	RTS
2	NC
3	TXD
4	GND
5	GND
6	RXD
7	NC
8	CTS

BAT3~4

Pin	Description
1	VBAT
2	GND

USB1

Pin	Description
1	VBUS
2	USB2_DN
3	USB2_DP
4	GND
5	USB3_RXN
6	USB3_RXP
7	GND
8	USB3_TXN
9	USB3_TXP
10	VBUS
11	USB2_DN
12	USB2_DP
13	GND
14	USB3_RXN
15	USB3_RXP
16	GND
17	USB3_TXN
18	USB3_TXP

HDMI1 A~B

Pin	Description
1	DATA2_P
2	GND
3	DATA2_N
4	DATA1_P
5	GND
6	DATA1_N
7	DATA0_P
8	GND
9	DATA0_N
10	CLKP
11	GND
12	CLKN
13	CEC
14	NC
15	DDC CLK
16	DDC DAT
17	GND
18	PWR
19	HPD

LAN Port: W12 X-Coded

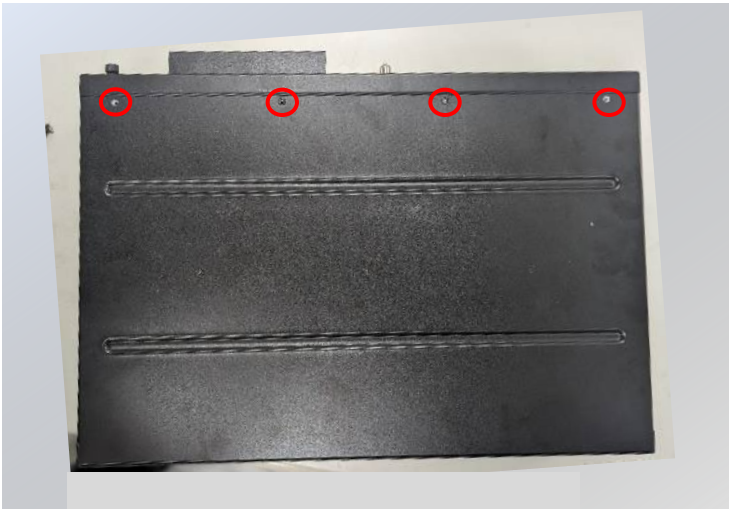
Pin	Description
1	MX0P
2	MX0N
3	MX1P
4	MX1N
5	MX3P
6	MX3N
7	MX2N
8	MX2P

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 turn the system over. Loosen the four (4) screws on the system's bottom chassis cover.



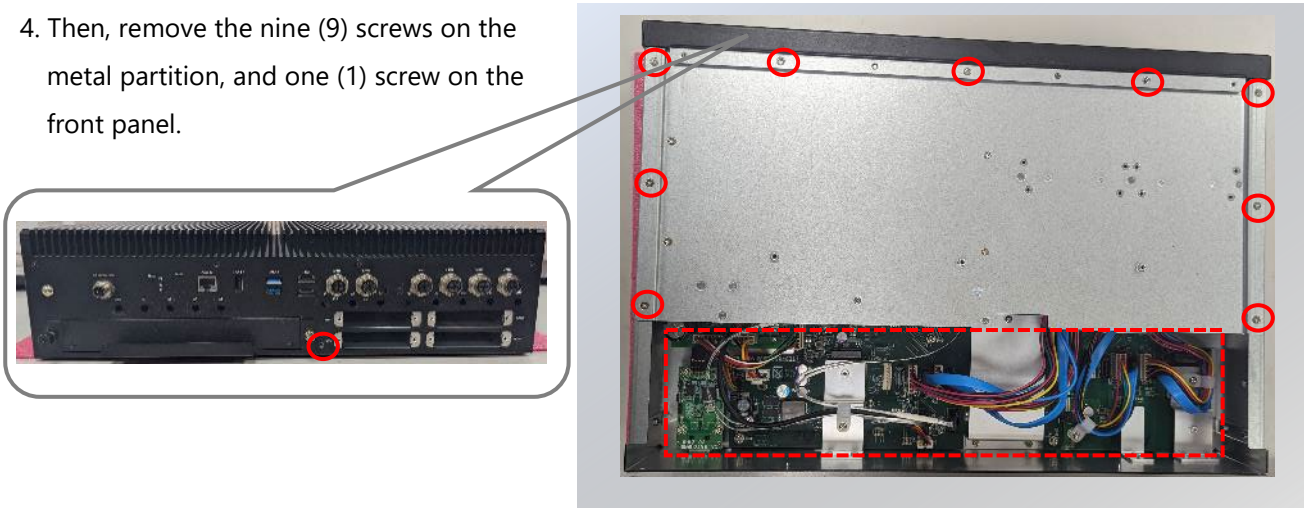
2. Then loosen the three (3) screws on the right side-panel, and the three (3) screws on the left side-panel.
3. Lift and open the bottom chassis cover.

Right Side-Panel

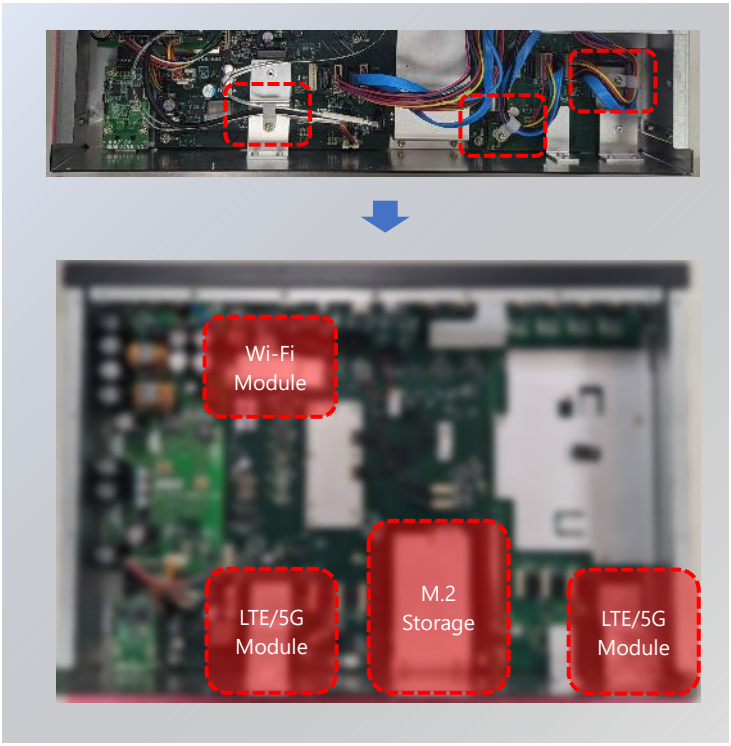
Left Side-Panel

Rear Panel

4. Then, remove the nine (9) screws on the metal partition, and one (1) screw on the front panel.



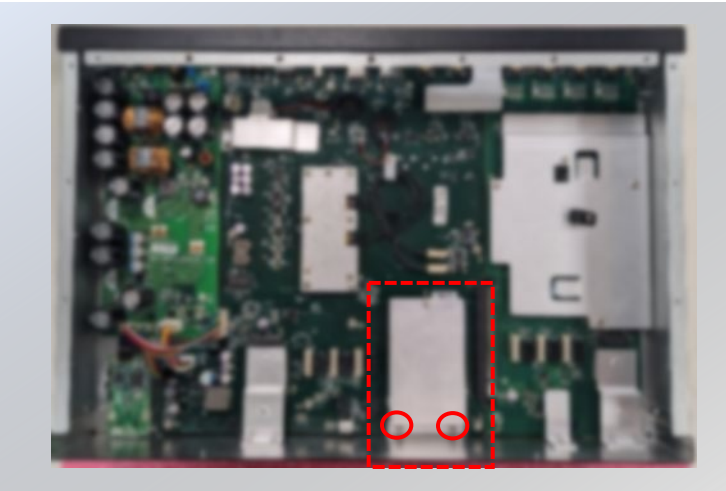
5. Then, disconnect the cables, and lift up the metal partition section.



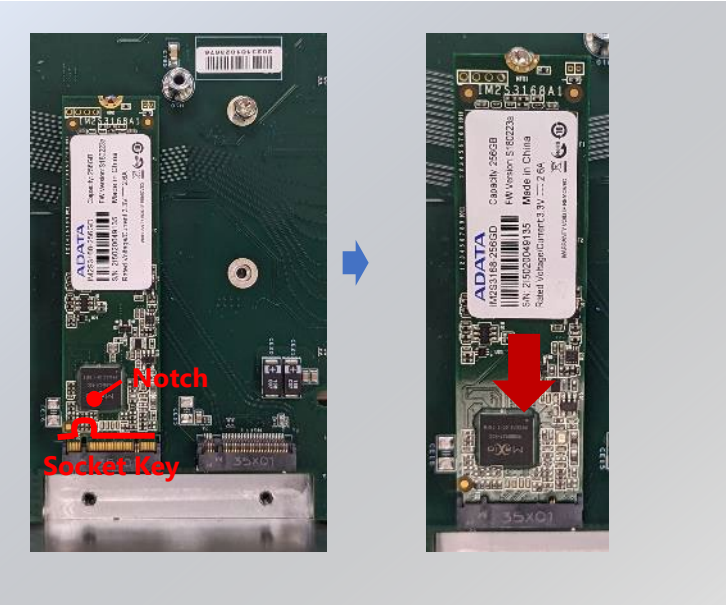
Installing M.2 SATA Storage (Optional)

The system comes with two M.2 memory card slot for storage expansion. Please follow the steps for installation.

1. Power off the system and remove the bottom chassis cover. Locate the metal partition covering the M.2 storage slot on the motherboard. Then loosen the two (2) screws on the metal partition cover, and remove the cover.



2. Align the notch of the M.2 storage module with the socket key in the pin slot.
3. Insert the M.2 storage module at 30 degrees into the socket until it is fully seated.

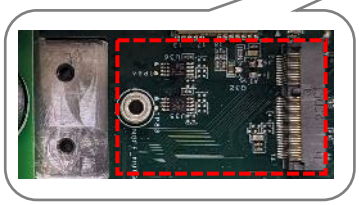


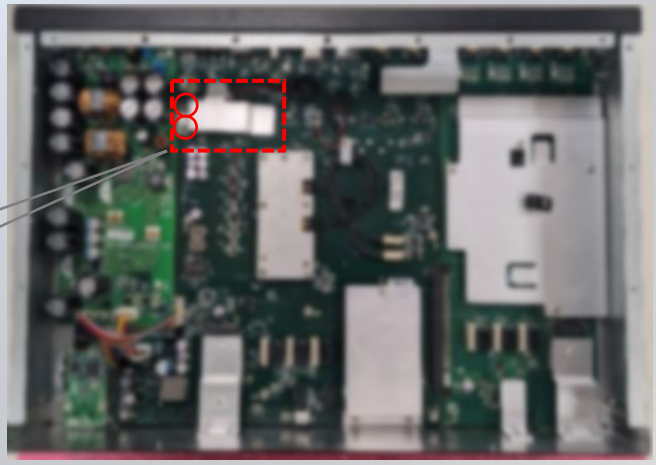
4. Press down on the module and secure it with a screw.
5. Repeat steps if installing a second storage module.

Installing Wi-Fi Module Card (Optional)

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

1. Power off the system, turn the system around, and open the bottom chassis cover.
2. Locate the metal partition covering the M.2 E-Key slot on the motherboard. Then loosen the two (2) screws on the metal partition cover, and remove the cover.





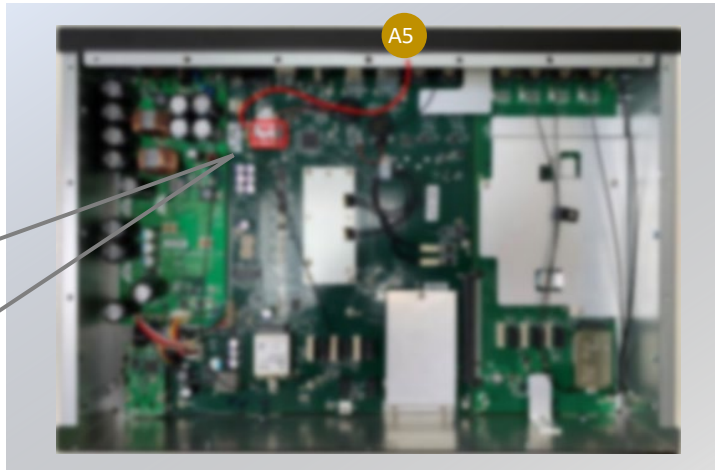
3. Align the notch of the Wi-Fi module card with the socket key in the pin slot.
4. Insert the Wi-Fi module card pins at 30 degrees into the socket until it is fully seated.

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

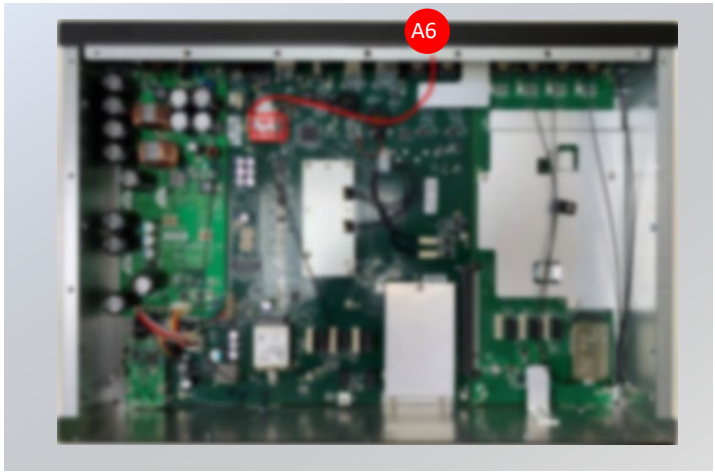
Installing Wi-Fi Antennas

Front Panel

1. Locate the two (2) antenna hole placement (A5, A6). 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.

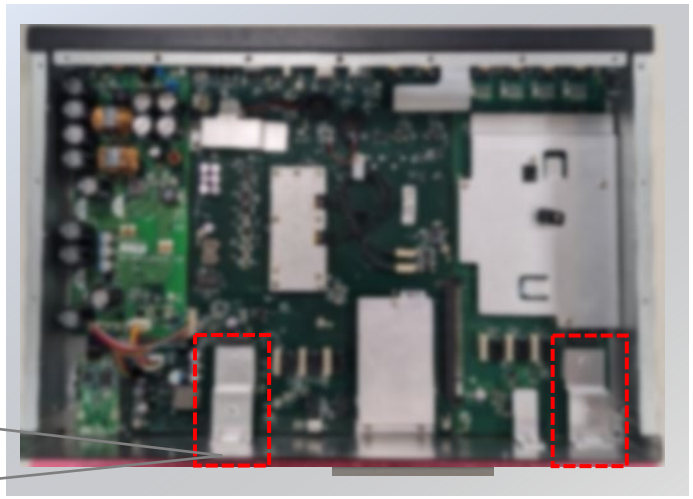


3. Then, screw the two (2) antennas on the front panel of the system.

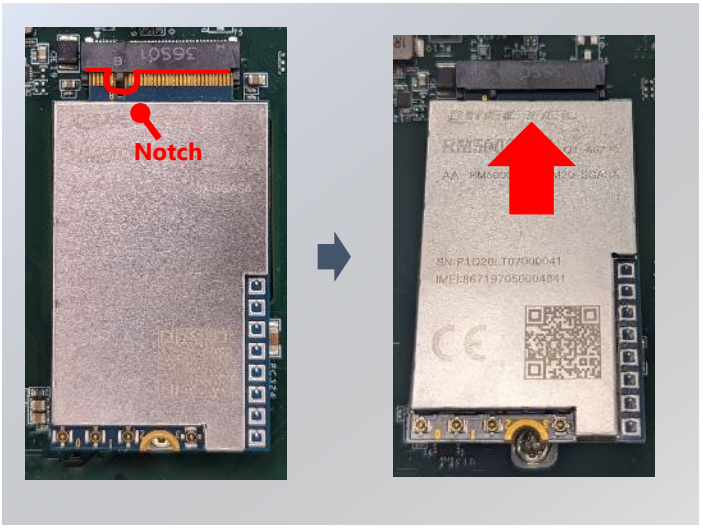
Installing LTE/5G Module Card (Optional)

This system features two M.2 B-Key slots for an LTE or 5G module card, supporting a dual SIM design. The LTE module requires two antennas, while the 5G module requires four antennas. Please follow these steps to install the LTE/5G module.

1. Power off the system, turn the system around, and open the bottom chassis cover.
2. Locate the metal partition covering the M.2 storage slots on the motherboard. Then loosen the two (2) screws (each) on the rear panel, and remove the metal partition cover.



3. Align the notch of the LTE/5G module card with the socket key in the pin slot.
4. Insert the LTE/5G module card pins at 30 degrees into the socket until it is fully seated.

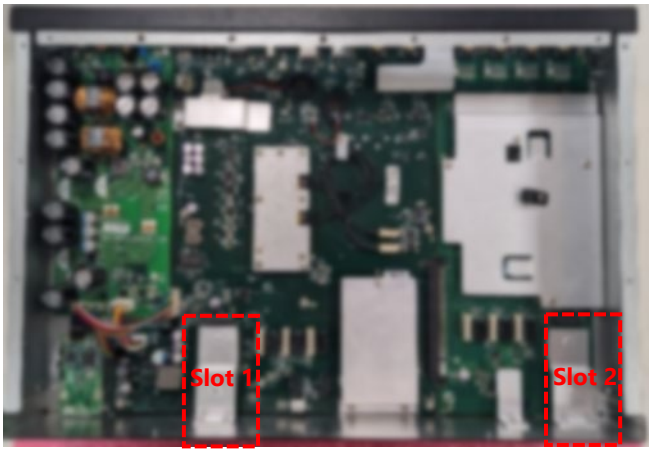


5. Push down on the module card and secure it with one screw.
6. Repeat steps if installing a second LTE/5G module.

LTE/5G Antenna Placement (Optional)

Lanner provides multiple options and customizations for our network appliances to suit all our customer's needs. EAI-R530 features two M.2 B-Key slots for an LTE or 5G module card expansion, and is compatible with many optional kits for LTE & 5G. The LTE module requires two antennas, while the 5G module requires four antennas. Below is best suited antenna placement to optimize coverage, and quality for LTE and 5G modules.

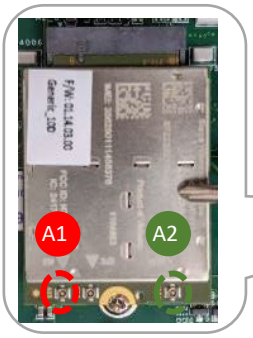
	Slot 1	Slot 2
Option A	LTE	LTE
Option B	5G	5G
Option C	5G	LTE
Option D	LTE	5G

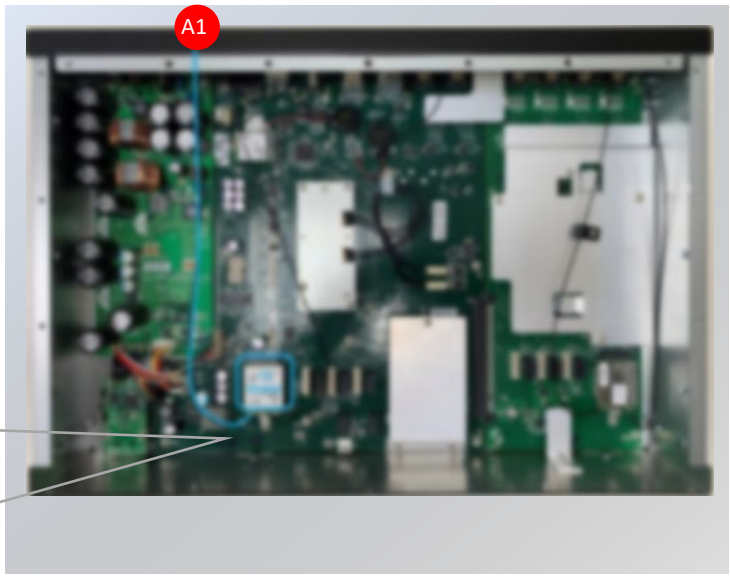


Option A – Installing LTE Antennas

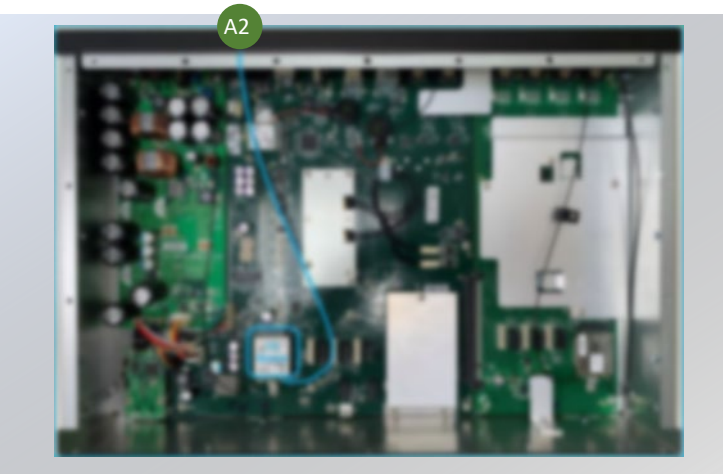
Front Panel

1. Install an LTE Module to Slot 1. Locate the two (2) antenna hole placement (A1, A2). Locate the two (2) IPEX connectors on the LTE module card.





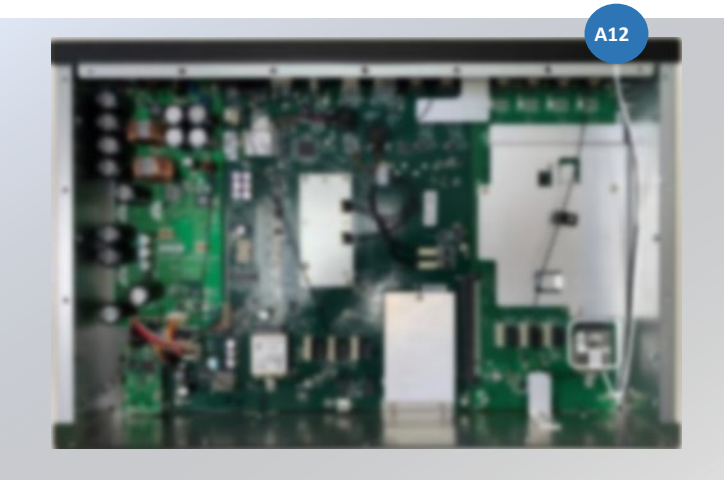
2. Connect the RF cables to the IPEX connectors on the LTE module and screw the other end of the cables in the antenna holes.



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

4. Install another LTE module to Slot 2. Locate the two (2) antenna hole placement (A11, A12). Locate the two (2) IPEX connectors on the LTE module card.

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

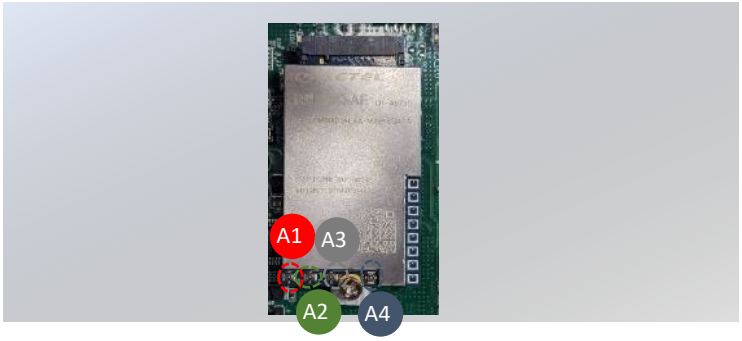


6. Then, screw on the two (2) antennas on the front panel of the system.

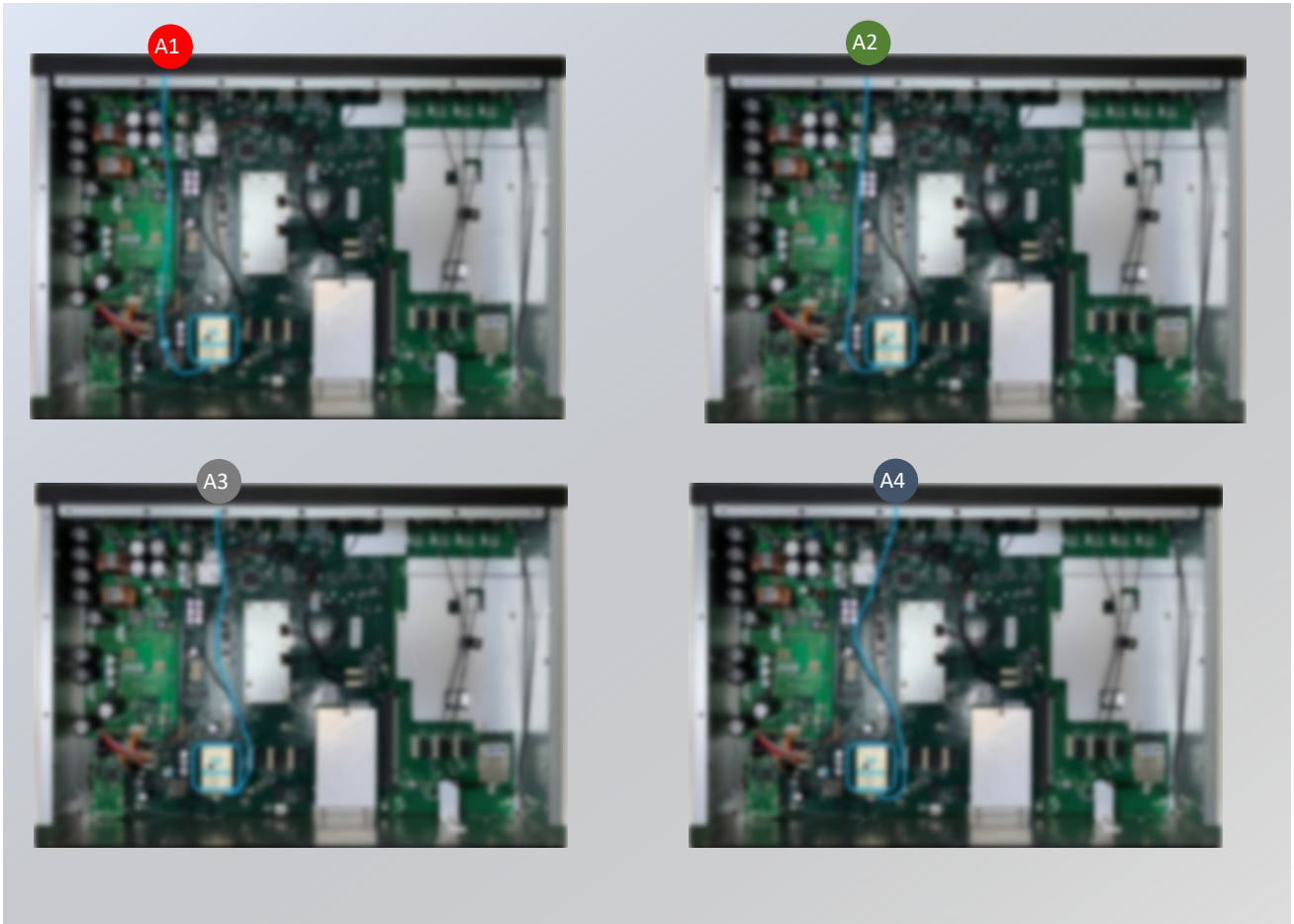
Option B – Installing 5G Antennas

Front Panel

1. Install an 5G Module in Slot 1. Locate the four (4) antenna hole placement (A1, A2, A3, A4). Locate the four (4) IPEX connectors on the 5G module card.

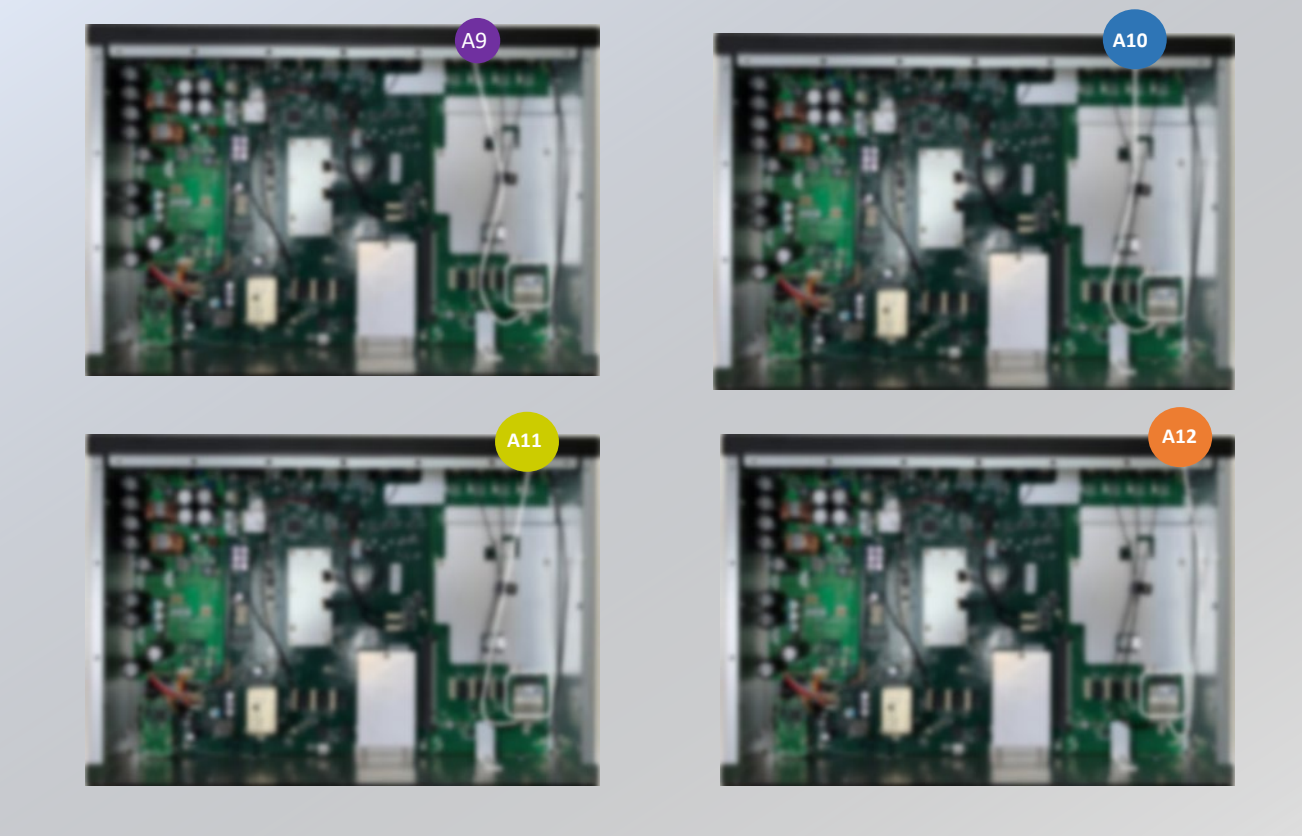


2. Connect the RF cables to the IPEX connectors on the 5G module and screw the other end of the cables in the antenna holes.



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

4. Install another 5G module to Slot 2. Locate the four (4) antenna hole placement (A9, A10, A11, A12). Locate the four (4) IPEX connectors on the 5G module card.
5. Connect the RF cables to the IPEX connectors on the 5G module and screw the other end of the cables in the antenna holes.

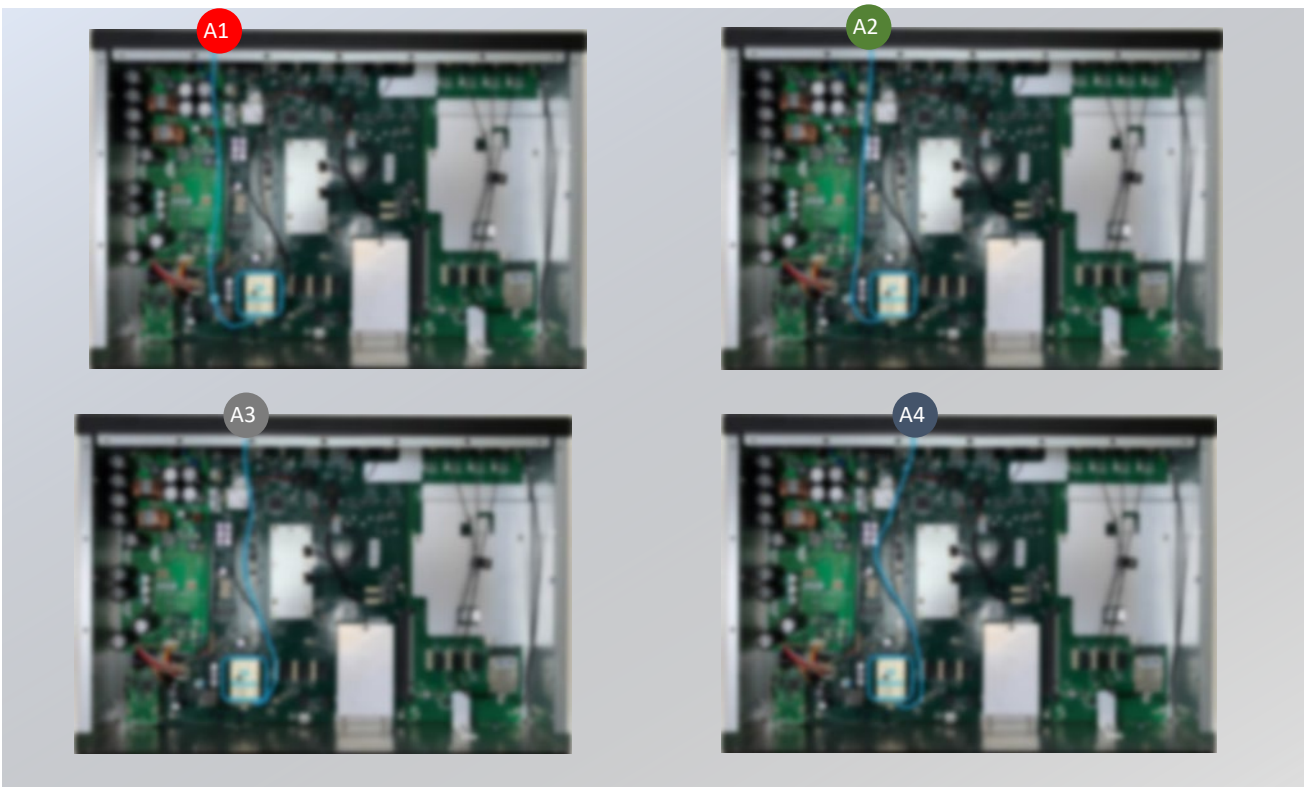


6. Then, screw on the four (4) antennas on the front panel of the system.

Option C – Installing 5G & LTE Antennas

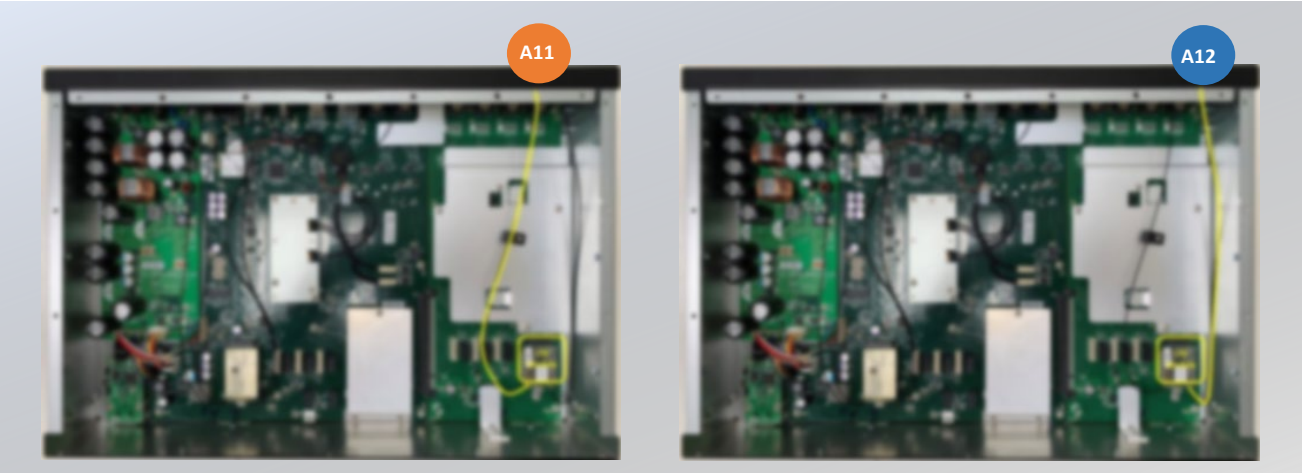
Front Panel

1. Install a 5G Module in Slot 1. Locate the four (4) antenna hole placement (A1, A2, A3, A4). 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 panel of the system.

4. Install an LTE module to Slot 2. Locate the two (2) antenna hole placement (A11, A12). Locate the two (2) IPEX connectors on the LTE module card.
5. Connect the RF cables to the IPEX connectors on the LTE module and screw the other end of the cables in the antenna holes.

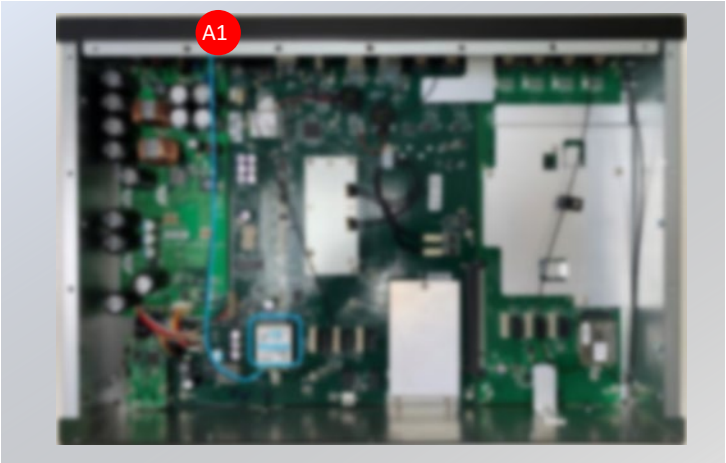


6. Then, screw on the two (2) antennas on the front panel of the system.

Option D – Installing LTE & 5G Antennas

Front Panel

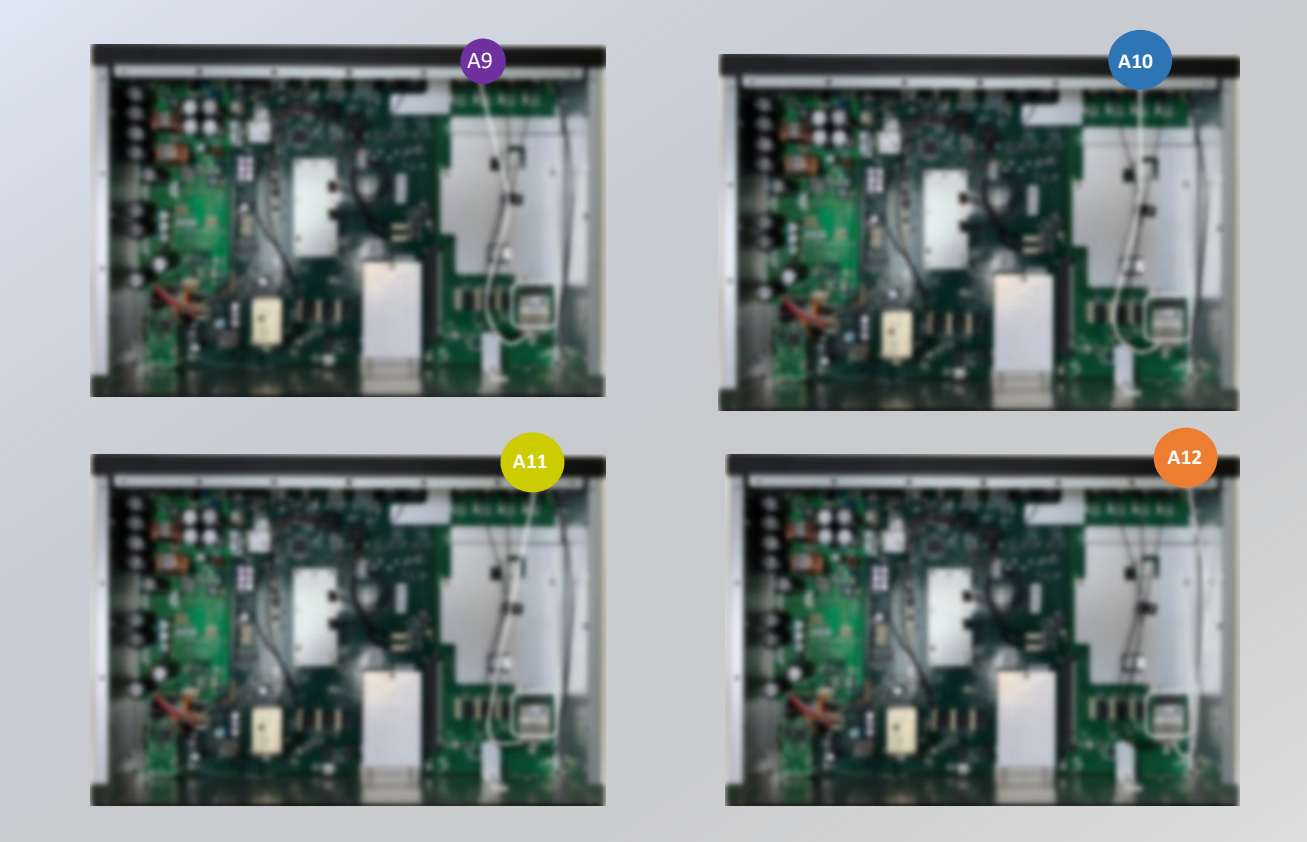
1. Install an LTE module in Slot 1. Locate the two (2) antenna hole placement (A1, A2). Locate the two (2) IPEX connectors on the LTE module card.



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

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

4. Next, install a 5G Module in Slot 2. Locate the four (4) antenna hole placement (A9, A10, A11, A12). Locate the four (4) IPEX connectors on the LTE module card.
5. Connect the RF cables to the IPEX connectors on the LTE module and screw the other end of the cables in the antenna holes.



6. Then, screw on the four (4) antennas on the front panel of the system.

Installing Nano SIM Card (Optional)

The SIM slot on the front panel supports 2x 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 rear panel.
2. Loosen and unscrew the one screw on the SIM card cover and remove the cover.

3. Insert and push a Nano-SIM card, gold contacts facing upwards, all the way until the card clicks into place.

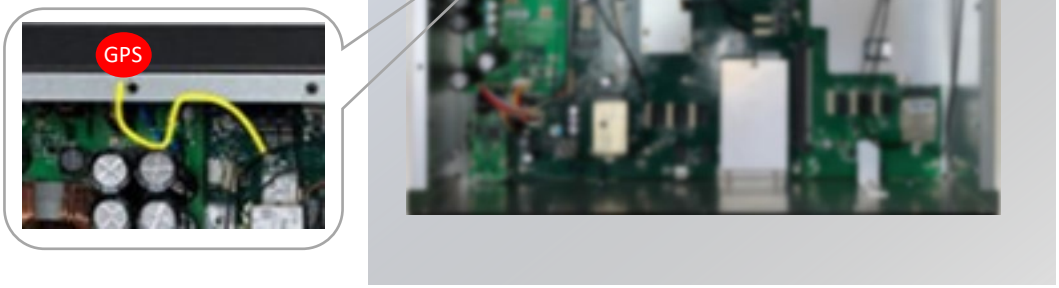
4. To remove the SIM card, use your fingertips to push it once, to have the card automatically eject.
5. Place the cover back and secure with one screw.
6. Repeat steps if installing a second Nano-SIM Card.

Installing GPS Antenna (Optional)

EAI-R530 has a built-in GPS module card. Follow procedure to install the GPS antenna.

Front Panel

1. Locate the antenna hole placement (GPS). Locate the IPEX connector on the GPS module card.
2. Connect the RF cables to the IPEX connectors on the GPS module and screw the other end of the cables in the antenna holes.



3. Then, screw on the antennas on the front panel of the system.

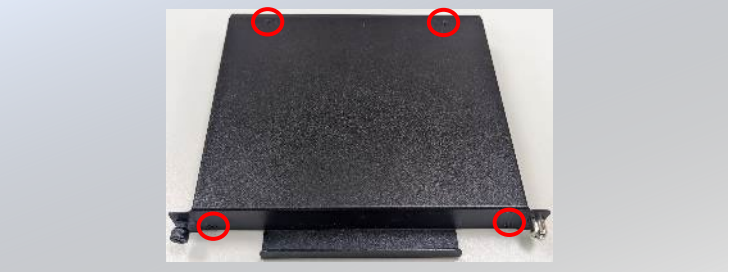
Installing Disk Drive (Optional)

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

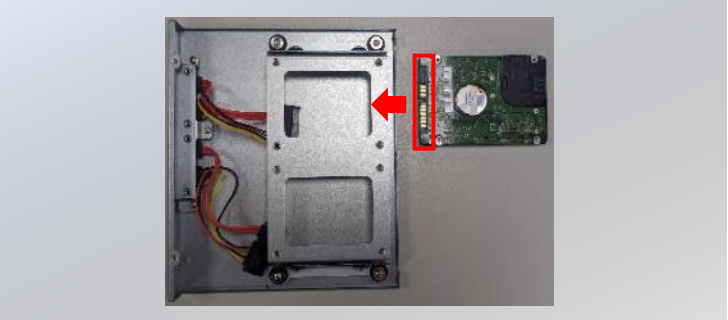
1. Power off the system. Locate the 2.5" HDD/SSD removable drive bay on the front panel of the system.

2. Unscrew the thumbscrew and lock on the drive bay and pull the drive bay away from the system.

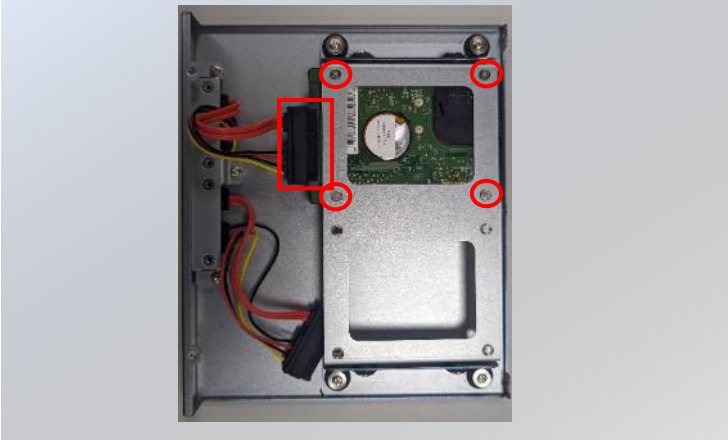
3. Remove the four (4) screws securing the drive bay cover.



4. Install the disk onto the tray and secure with four (4) screws, two on each side. Make sure the SATA connectors faces inwards as shown in the image.



5. Insert the SATA cables to the disk.
6. Repeat steps if installing a second HDD/SSD drive. Then, place the drive bay cover back on and secure with the original four (4) screws.
7. Insert the drive bay back into the system and lock.

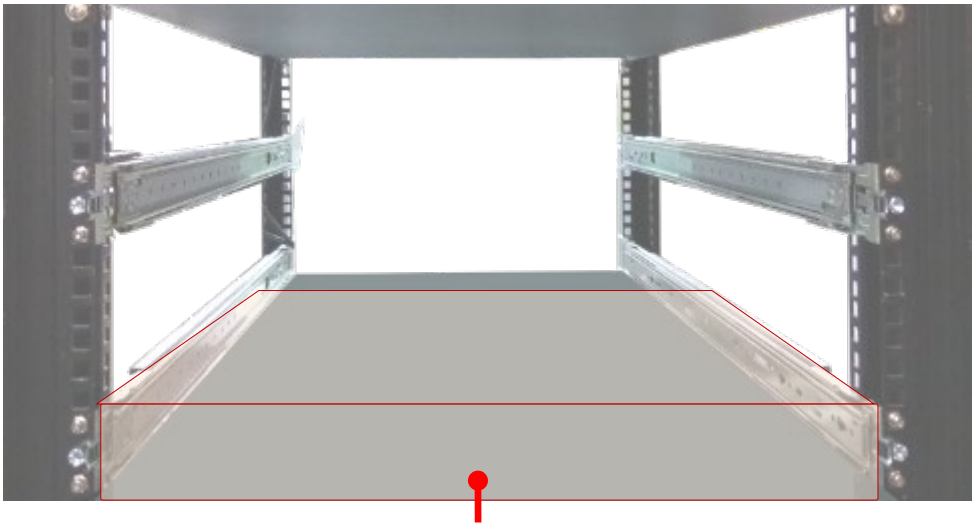


Rack Mounting

There are two methods for installing this system into a rack:

▸ With Mounting Ear Brackets only

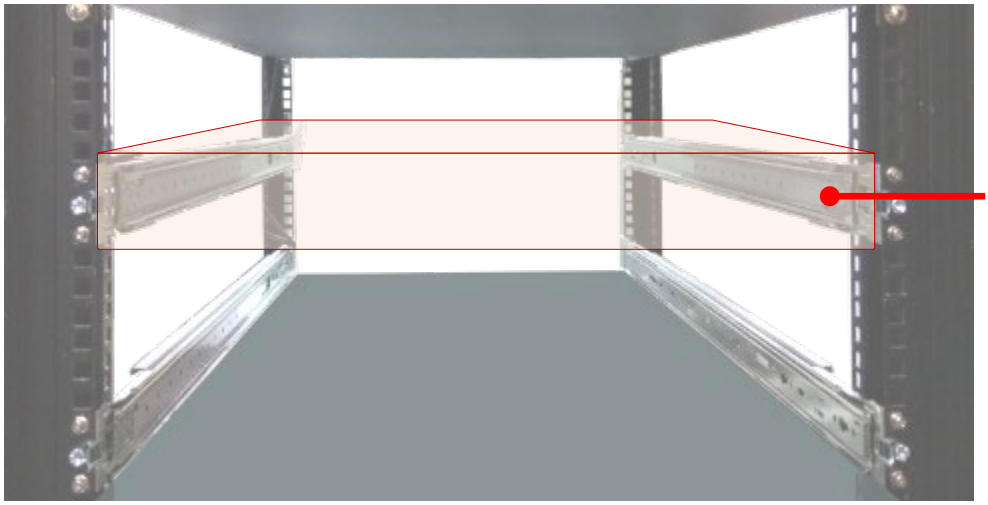
This method is quick and easy by fixing this system to the front posts of the rack, but it also makes servicing the system more difficult. Please note that the use of these brackets must go with a rack shelf or slide rails to prevent the chassis from falling over, for the bracket assembly alone cannot provide sufficient support to the chassis.



The system should be installed on the rack along with a shelf or slide rails, for the "Mounting Ears" are meant to secure the system, not to *support* it.

▸ With Slide Rail Kit & Mounting Ear Brackets

This method is rather complicated, but the slidable rails allow you to access the system easily while securing it in the rack solidly.



The Slide Rail Kit can secure the system while providing sufficient weight support for the device.

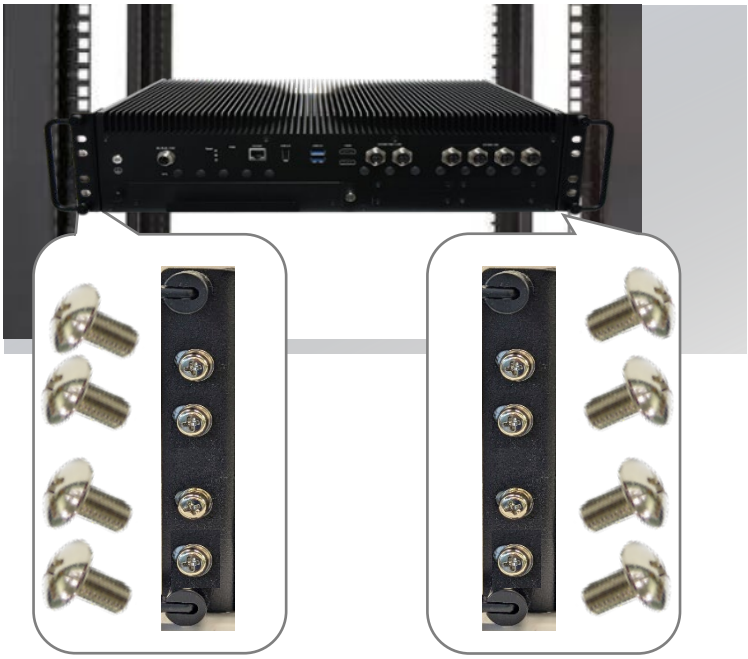
Installing the System Using Mounting Ear Brackets Only

1. Check the accessory pack for the following items:
   - 1x Screw Pack
   - 2x Ear Brackets

2. Align the bracket to the side of the chassis and make sure the screw-holes are matched, and then secure the bracket onto the chassis with the four (4) provided screws.

3. Repeat Step 2 to attach the bracket to the other side of the chassis.

4. Install the chassis into the rack with the brackets fixed onto the posts using the provided screws. The actual approach you adopt and the needed parts for assembly will depend on the supporting accessory (shelf or rail kit) you use.



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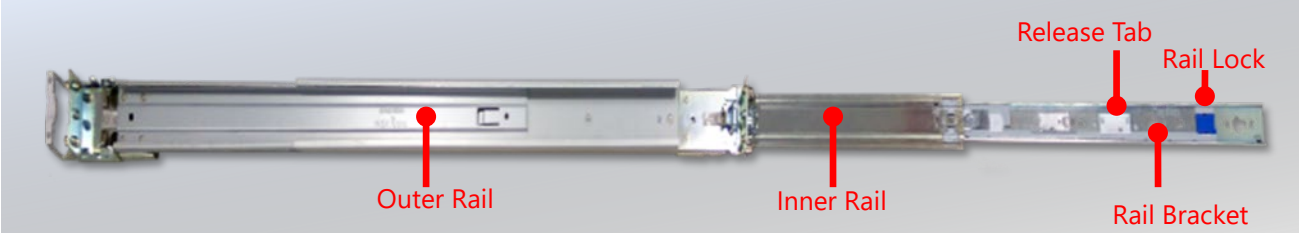
Installing the System Using the Slide Rail Kit (with Mounting Ear Brackets)

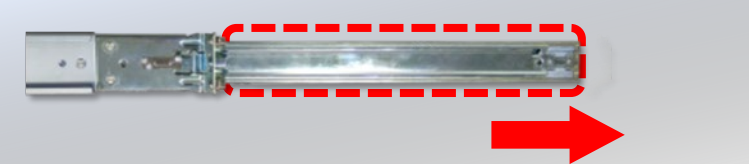
1. The Slide Rail Kit should include the following items:

- 1x Screw Pack
- 1x pack of M4X4L screws (for securing the Rail Brackets on the system)
- 1x pack of 7.1 Round Hole screws (for securing the system on the rail posts)
- 2x Slide Rails

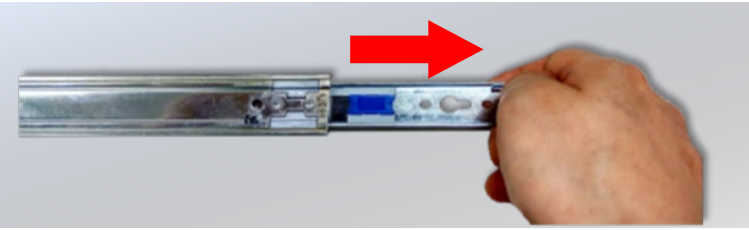
A rail consists of the following parts:



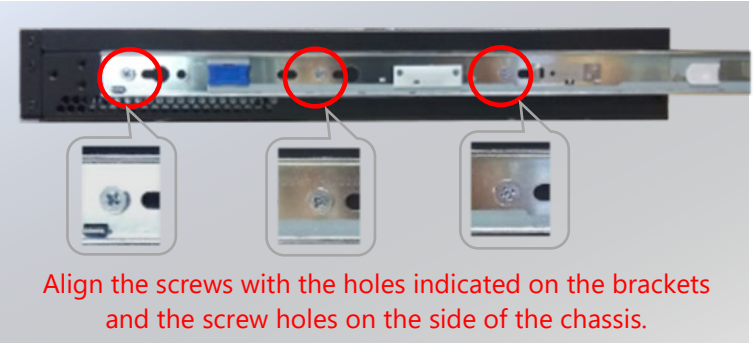
2. Unpack a slide rail and slide the Inner Rail all the way to the end.



3. Stretch the Rail Bracket to the fullest.
4. Remove the Rail Bracket from the Inner Rail by pushing the Release Tab on the bracket outwards while sliding it out.



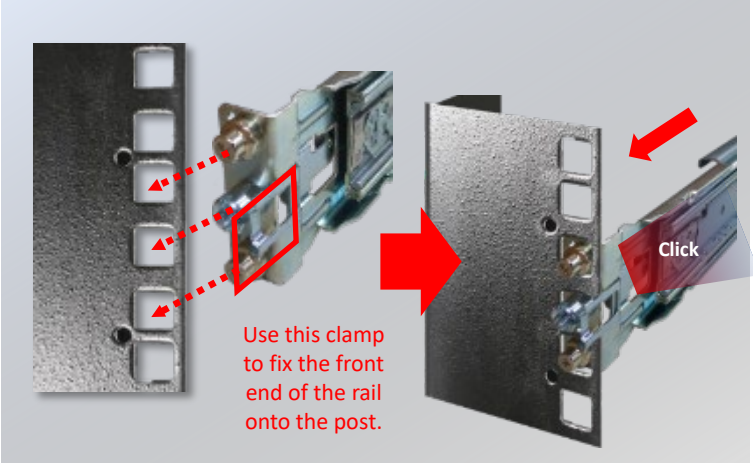
5. Align the bracket to the side of the chassis and make sure the screw-holes are matched, and then secure the bracket onto the chassis with three provided M4X4L screws.



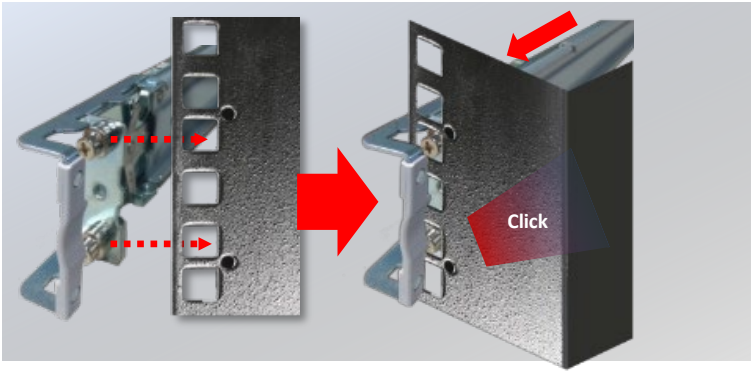
6. Repeat Steps 2~5 to attach the bracket to the other side of the chassis.
7. Follow the instructions in Installing the System Using Mounting Ear Brackets Only to attach the Mounting Ear Brackets.

Now, you shall install the slide rail assemblies onto the rack.

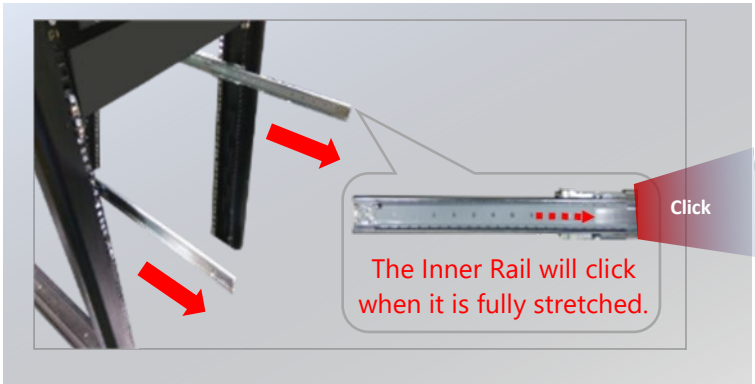
8. This slide rail kit does NOT require screw-fixing. Simply aim at three available screw holes on the rack front and snap the rail front into the rack post as shown in the image. You should hear a “click” sound once it is firmly attached.



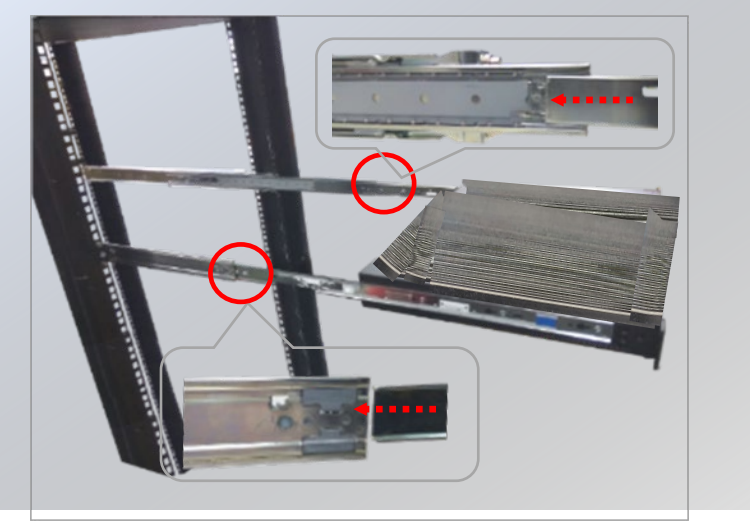
9. For the rear rack installation, slide the rail to aim and engage the bolts on the rail’s rear end with the two available holes on the post, and the rail assembly will click into place.



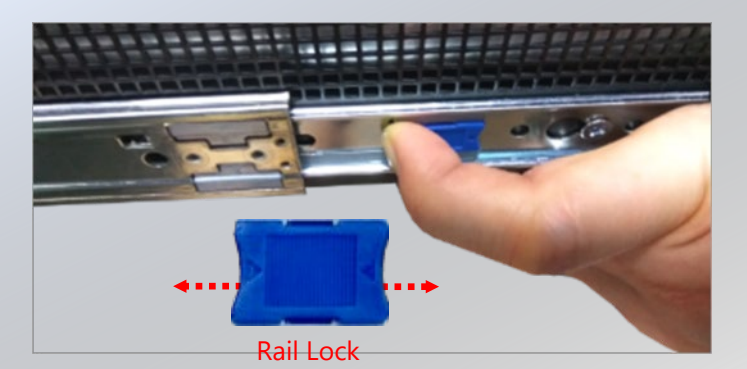
10. Stretch both of the Inner Rails out to their fullest extent. You will hear a click sound when they are fully stretched and locked.



11. Hold the system with its front facing you, lift the chassis and gently engage the brackets on the system while aligning them with the Inner Rails as shown in the image, and then push the system into the cabinet.



12. While pushing in the system, also push and hold the Rail Lock tab on both brackets.



13. Push the system all the way in until it stops.

CHAPTER 3 : SOFTWARE 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.

Enter BIOS Setup

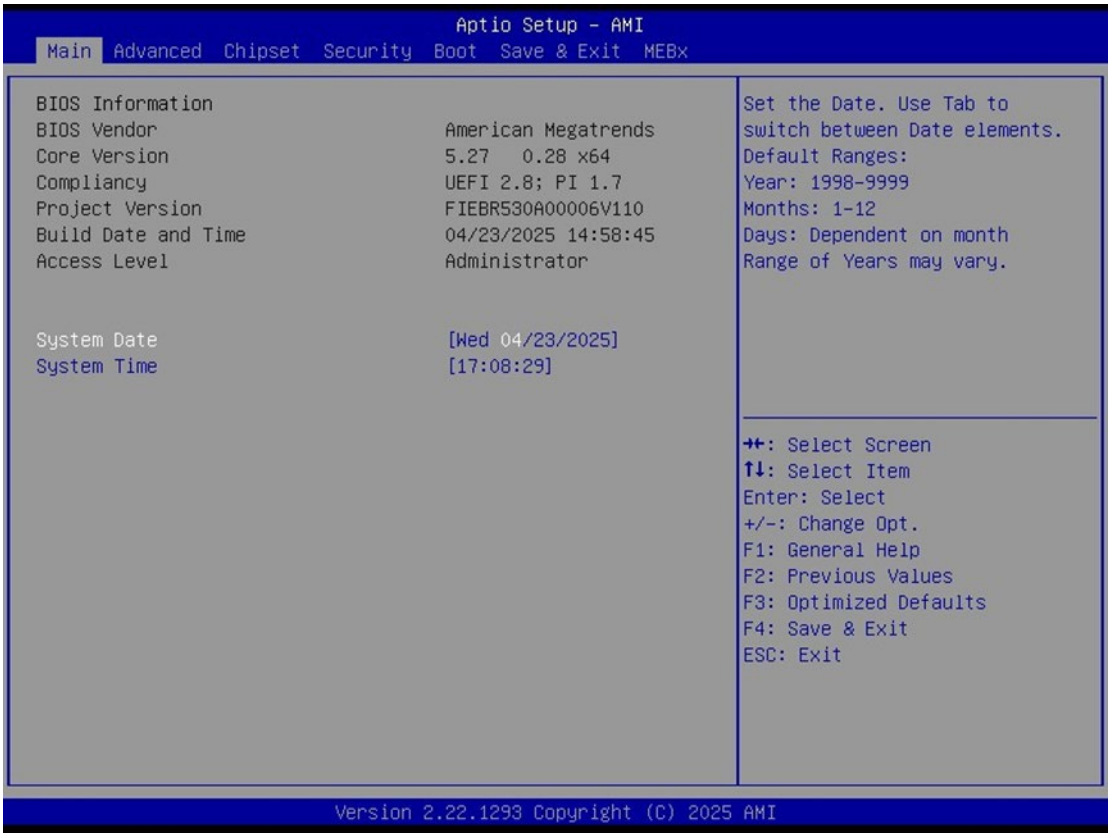
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Press **<Del>** during the boot-up if you connect a keyboard to this unit. But if you connect a PC to this unit through console USB/Serial connection, then press **<Tab>**. Your system should be running POST (Power-On-Self-Test) upon booting up.
3. Then you will be directed to the BIOS main screen.
4. Instructions of BIOS navigations:

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced], [Platform], [Socket], [Server Mgmt], [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>	exit the current screen

Main Page

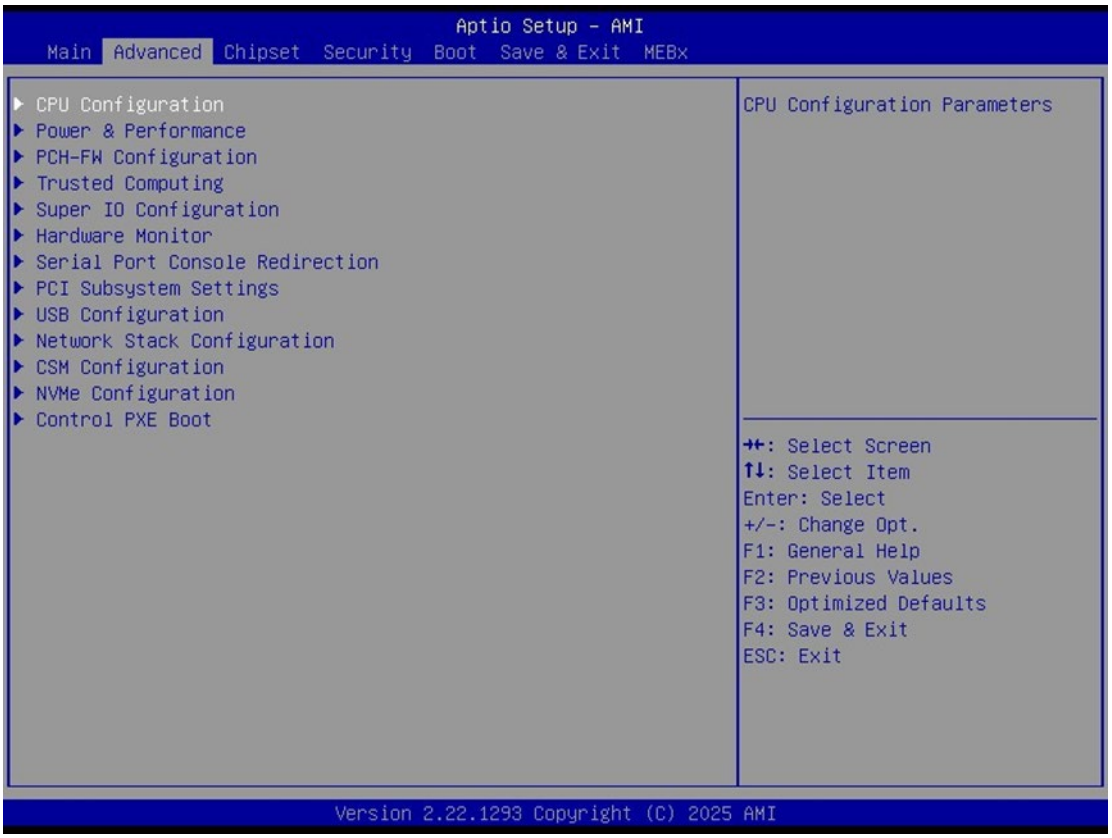
Setup Main Page contains BIOS information and project version information.



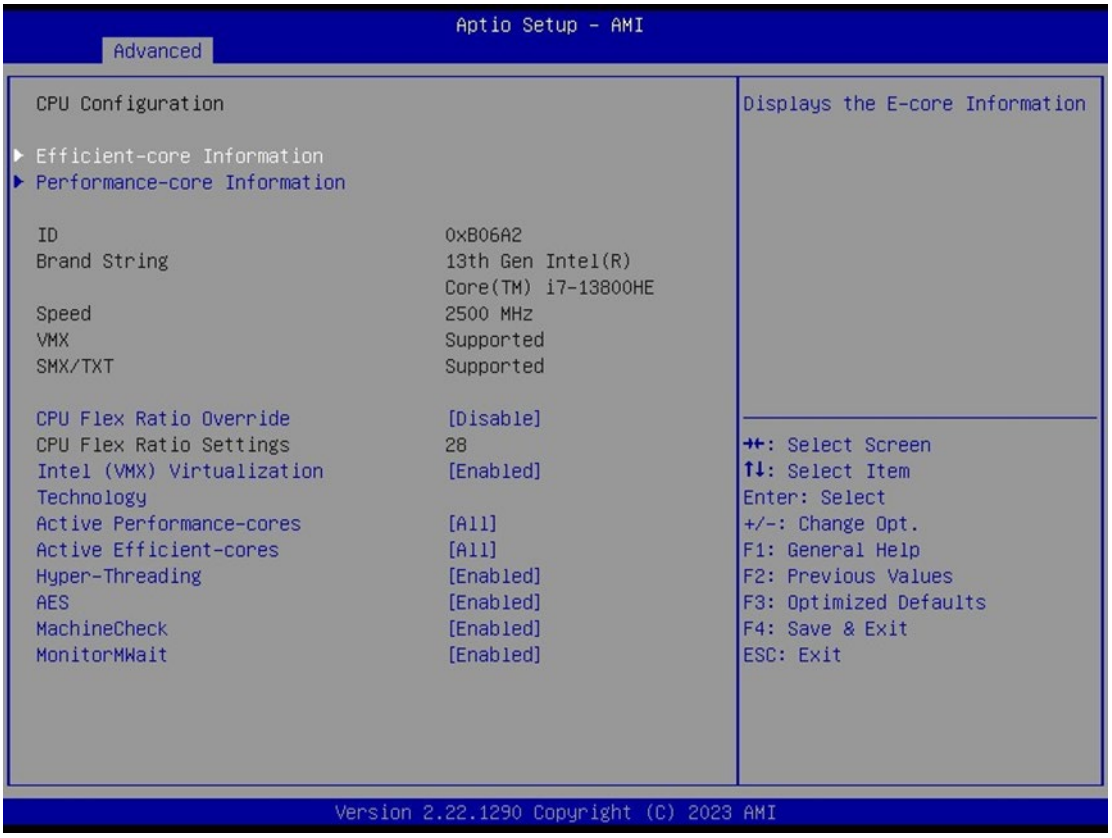
Item	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use**<Tab>**to switch between Date elements. Default Range of Year: 1998-9999 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

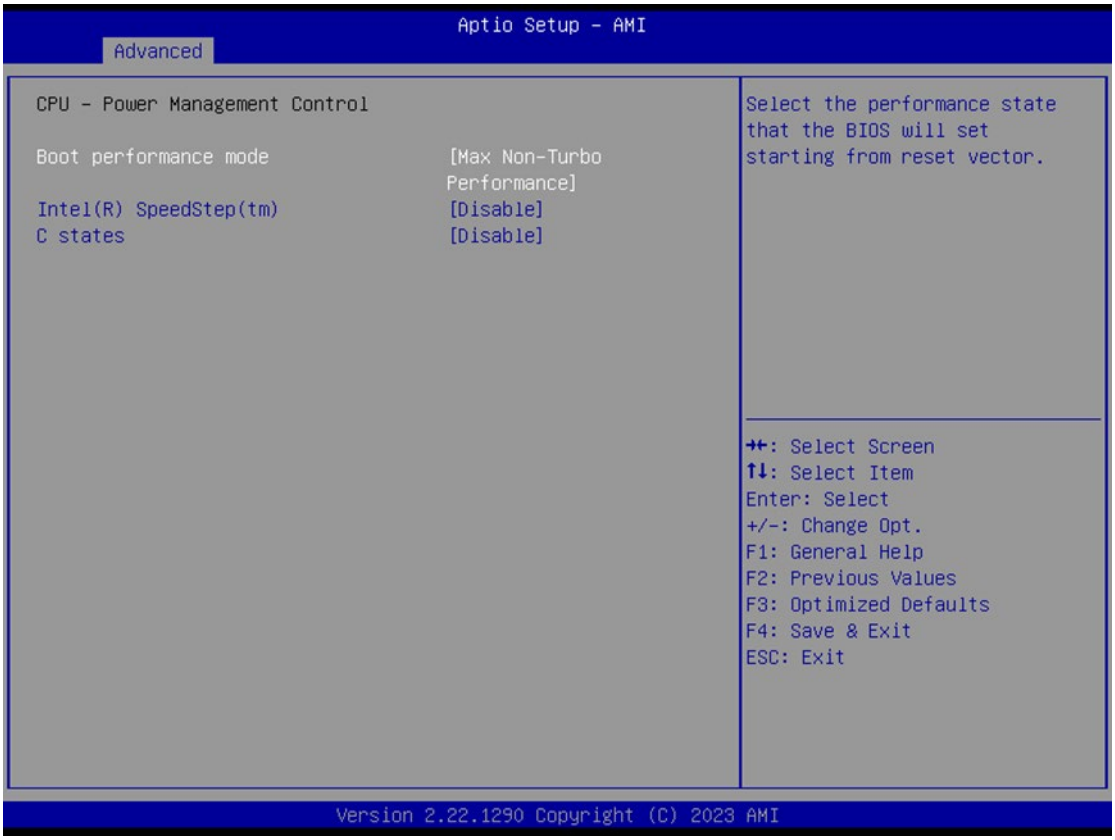


Feature	Options	Description
CPU Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Flex Ratio Settings	28	This value must be between Max Efficiency Ratio (LFM) and Maximum non-turbo ratio set by Hardware (HFM).
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	All 1 2 3 4 5 6 7 8	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

Active Efficient-cores	All 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores. The options will automatically increase or decrease with different CPUs.
Hyper-Threading	Disabled Enabled	Enable or Disable Hyper-Threading Technology.
AES	Disabled Enabled	Enable/Disable AES (Advanced Encryption Standard)
MachineCheck	Disabled Enabled	Enable/Disable Machine Check
MonitorMWait	Disabled Enabled	Enable/Disable MonitorMWait, if Disable MonitorMwait, the AP threads Idle Manner should not set in MWAIT Loop

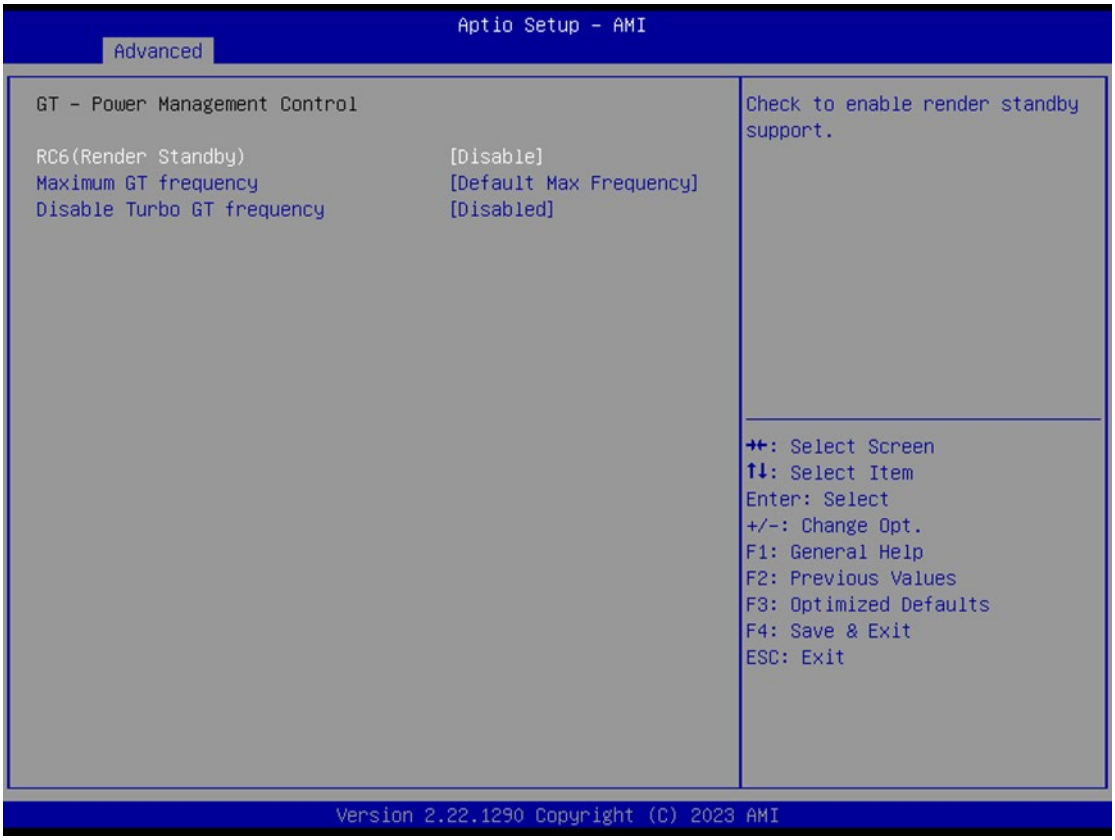
Power & Performance

CPU Power Management Control



Feature	Options	Description
Boot performance mode	Max Battery Max Non-Turbo Performance Turbo Performance	Select the performance state that the BIOS will set starting from reset vector.
Intel(R) SpeedStep(tm)	Disabled Enabled	Allows more than two frequency ranges to be supported.
C states	Disabled Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

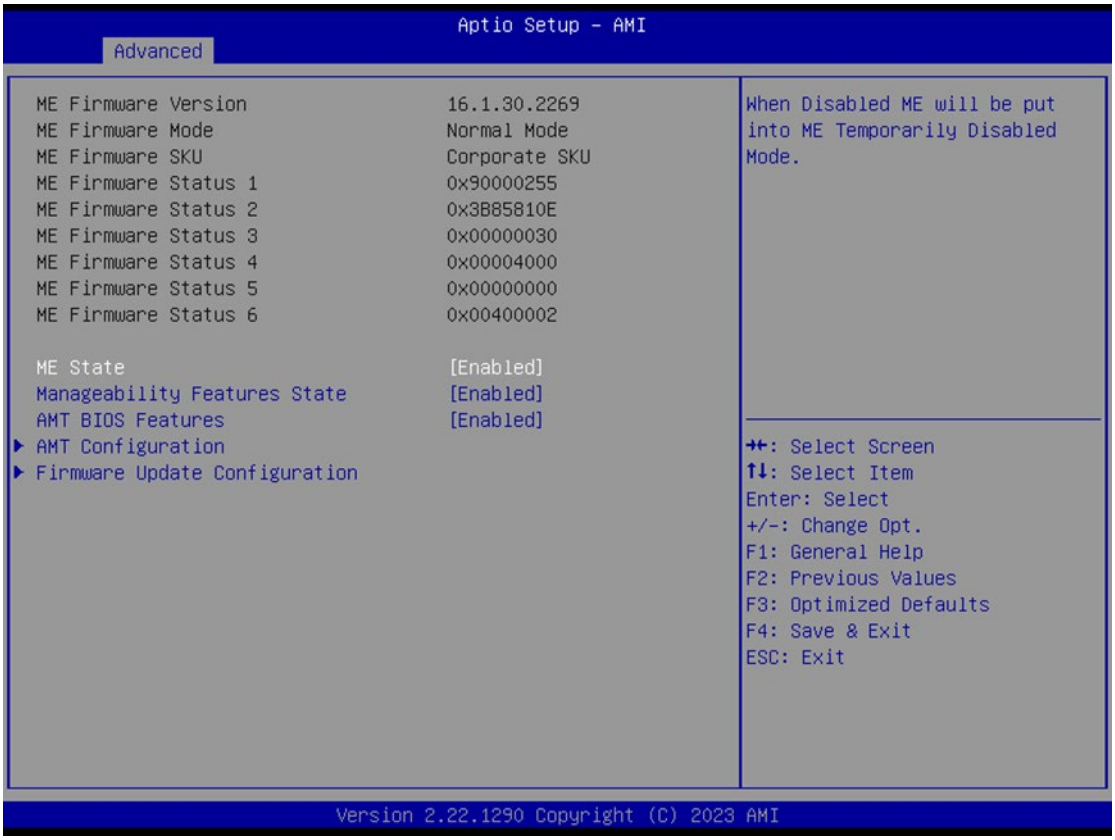
GT Power Management Control



Feature	Options	Description
RC6(Render Standby)	Disabled Enabled	Check to enable render standby support.
Maximum GT frequency	100Mhz 150Mhz 200Mhz 250Mhz 300Mhz 350Mhz 400Mhz 450Mhz 500Mhz 550Mhz 600Mhz 650Mhz 700Mhz 750Mhz 800Mhz 850Mhz	Auto Updated

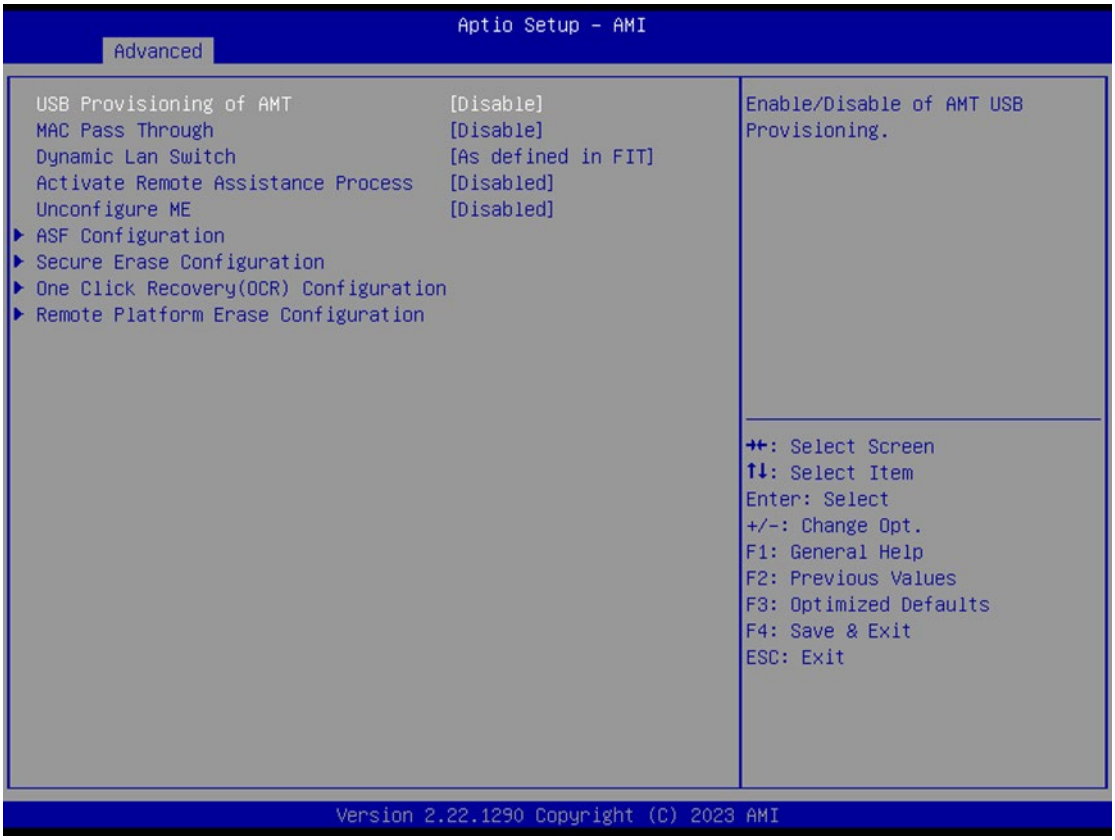
	900Mhz 950Mhz 1000Mhz 1050Mhz 1100Mhz 1150Mhz 1200Mhz Default Max- Frequency	
Disable Turbo GT frequency	Disabled Enabled	Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited.

PCH-FW Configuration



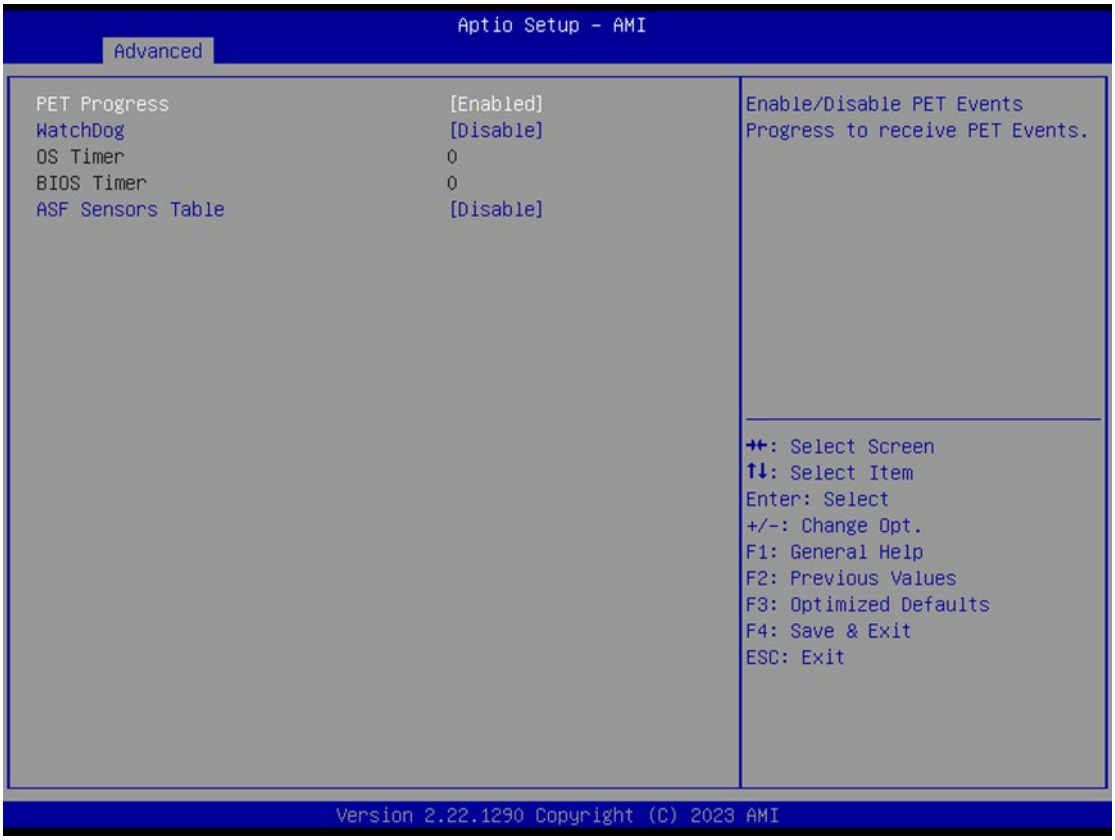
Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode.
Manageability Features State	Enabled Disabled	Enable/Disable Intel(R) Manageability features. NOTE: This option disables/enables Manageability Features support in FW. To disable support platform must be in an un-provisioned state first.
AMT BIOS Features	Enabled Disabled	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. NOTE: This option does not disable Manageability Features in FW.

AMT Configuration



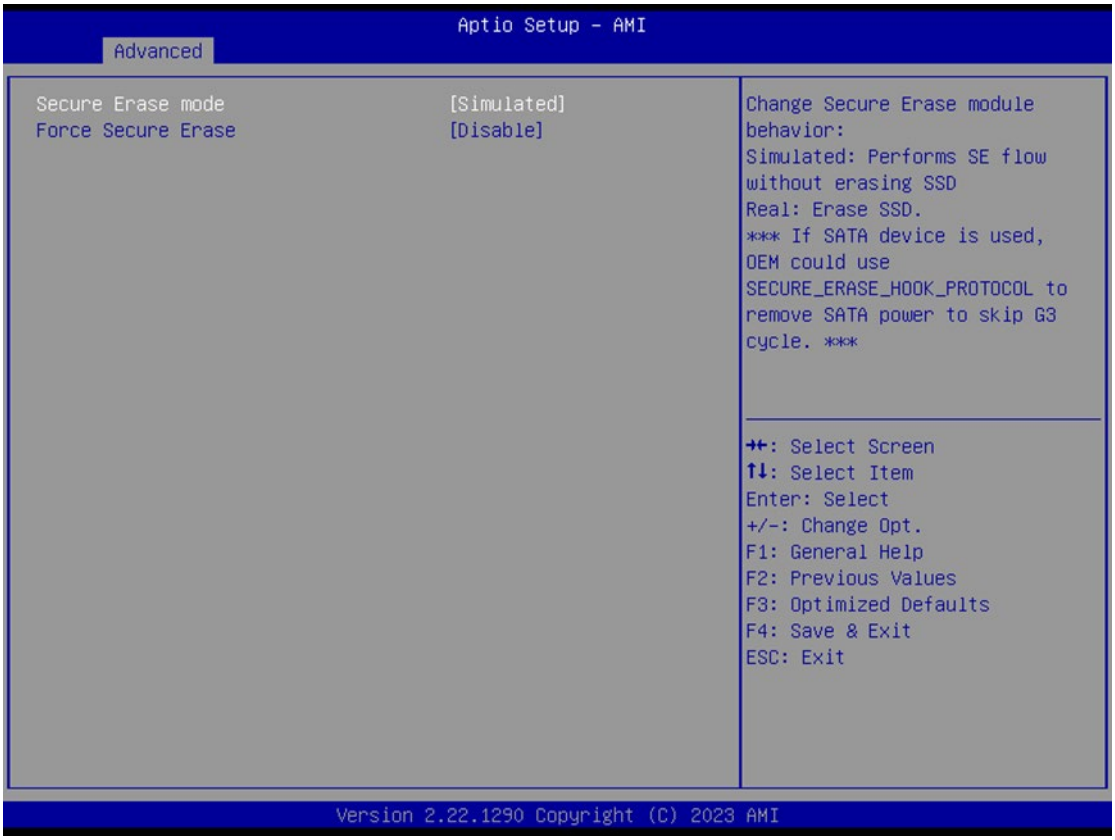
Feature	Options	Description
USB Provisioning of AMT	Enabled Disabled	Enable/Disable of AMT USB Provisioning.
MAC Pass Through	Enabled Disabled	Enable/Disable MAC Pass Through function.
Dynamic Lan Switch	As defined in FIT Integrated LAN Discrete LAN	Allow switching AMT support from Integrated LAN to Discrete LAN.
Activate Remote Assistance Process	Enabled Disabled	Trigger CIRA boot. Note: Network Access must be activated first from MEBx Setup.
Unconfigure ME	Enabled Disabled	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.

ASF Configuration



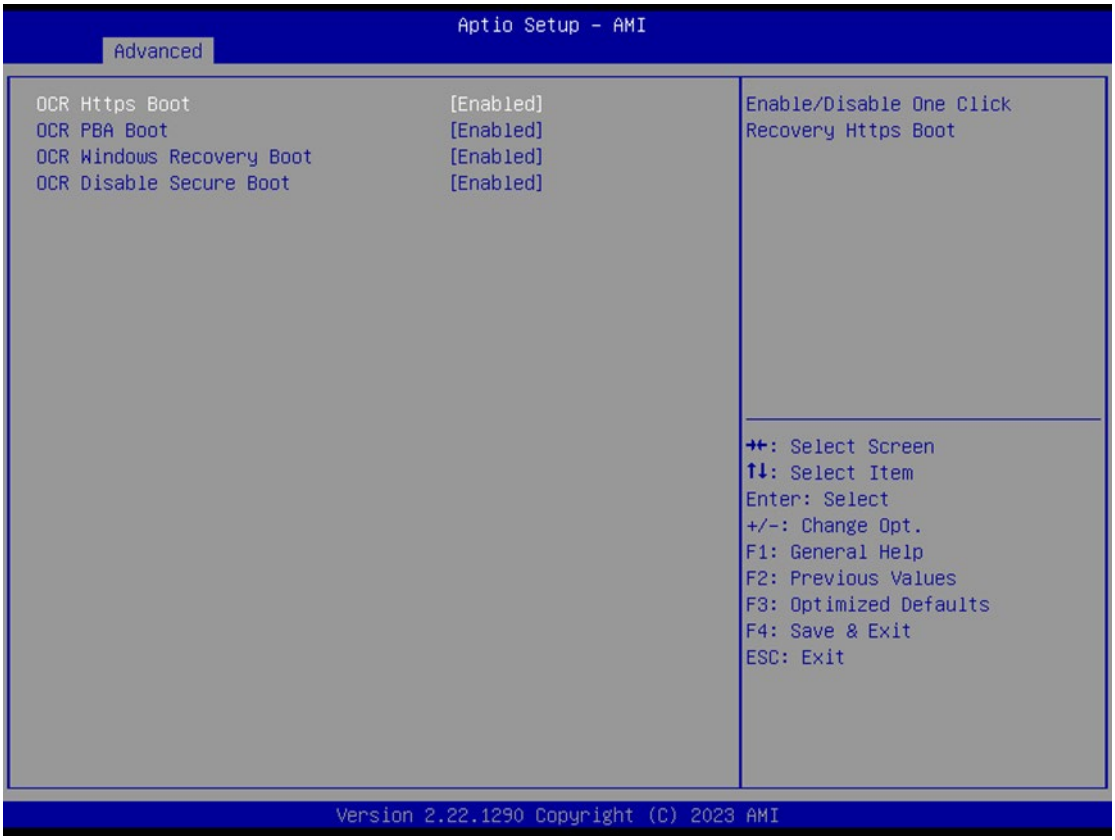
Feature	Options	Description
PET Progress	Enabled Disabled	Enable/Disable PET Events Progress to receive PET Events.
WatchDog	Enabled Disabled	Enable/Disable WatchDog Timer.
ASF Sensors Table	Enabled Disabled	Adds ASF Sensor Table into ASF! ACPI Table

Secure Erase Configuration



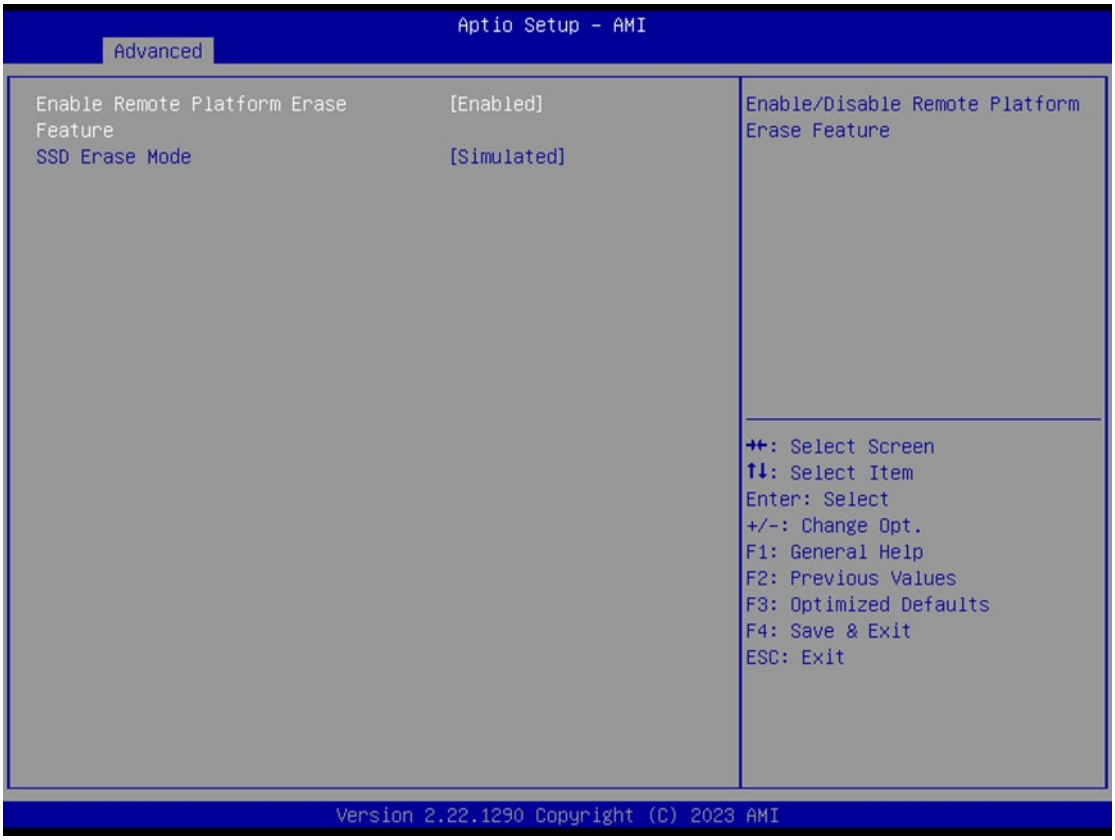
Feature	Options	Description
Secure Erase mode	Simulated Real	Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD Real: Erase SSD. *** If SATA device is used, OEM could use SECURE_ERASE_HOOK_PROTOCOL to remove SATA power to skip G3 cycle. ***
Force Secure Erase	Enabled Disabled	Force Secure Erase on next boot

One Click Recovery (OCR) Configuration



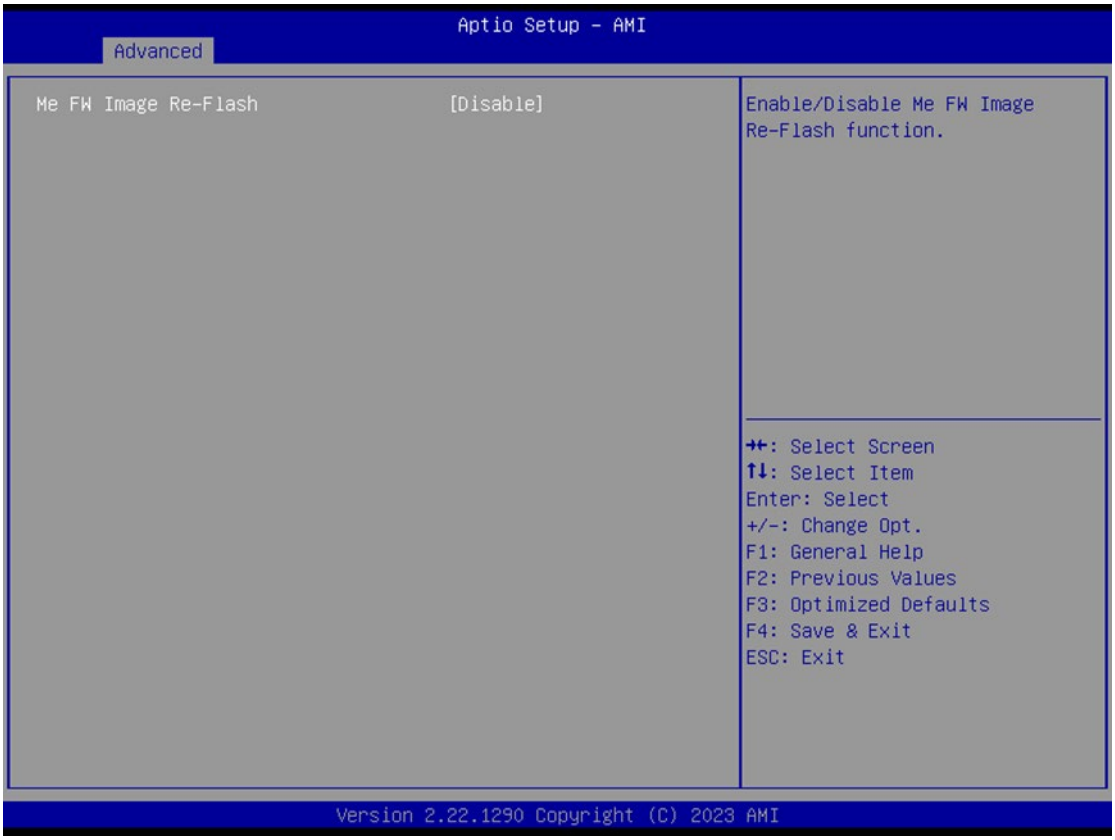
Feature	Options	Description
OCR Https Boot	Enabled Disabled	Enable/Disable One Click Recovery Https Boot
OCR PBA Boot	Enabled Disabled	Enable/Disable One Click Recovery PBA Boot
OCR Windows Recovery Boot	Enabled Disabled	Enable/Disable One Click Recovery Windows Recovery Boot
OCR Disable Secure Boot	Enabled Disabled	Allows CSME to request SecureBoot to be disabled for One Click Recovery

Remote Platform Erase Configuration



Feature	Options	Description
Enable Remote Platform Erase Feature	Enabled Disabled	Enable/Disable Remote Platform Erase Feature
SSD Erase Mode	Simulated Real	Change RPE SSD Erase Action behavior: Simulated: Performs RPE SSD Erase flow without erasing SSD Real: Erase SSD. *** If SATA device is used, OEM could use SECURE_ERASE_HOOK_PROTOCOL to remove SATA power to skip G3 cycle. ***

PCH-FW Configuration



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

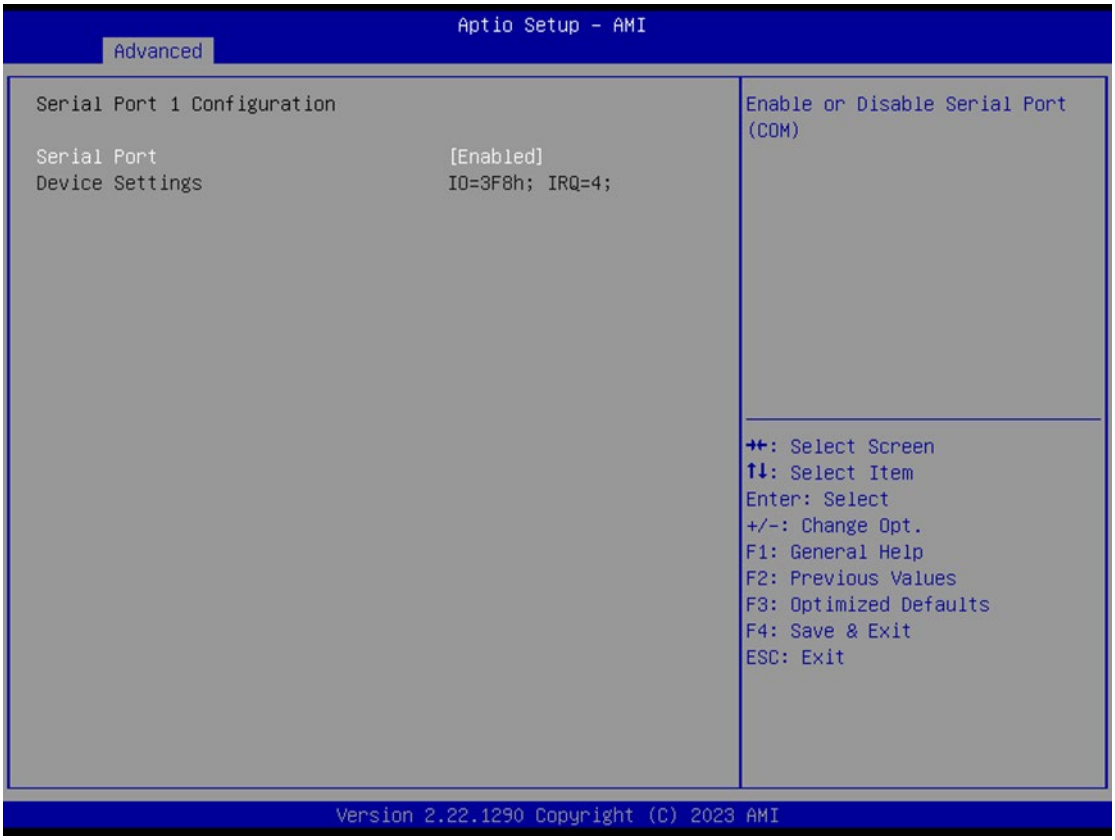
Trusted Computing

Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS 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.
TPM 20	TIS	Select **TPM 20 Device** for the Communication Interface.

InterfaceType		
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.

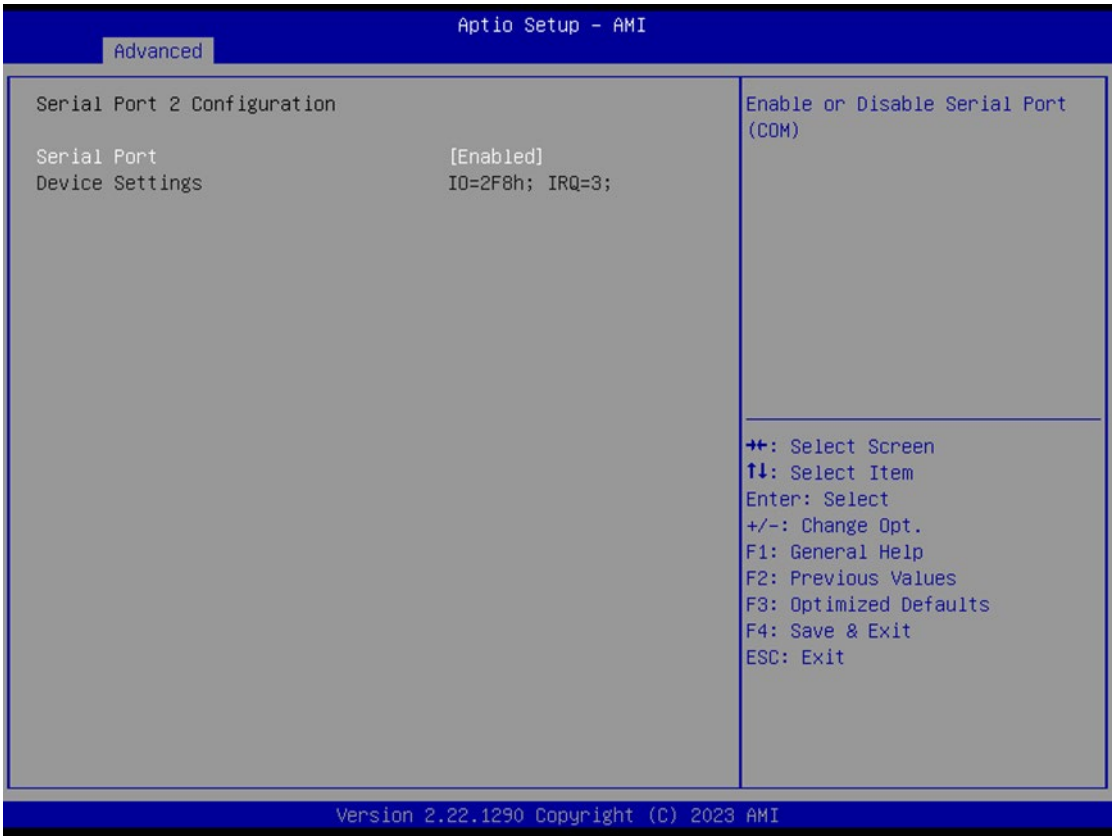
Super IO Configuration

Serial Port 1 Configuration



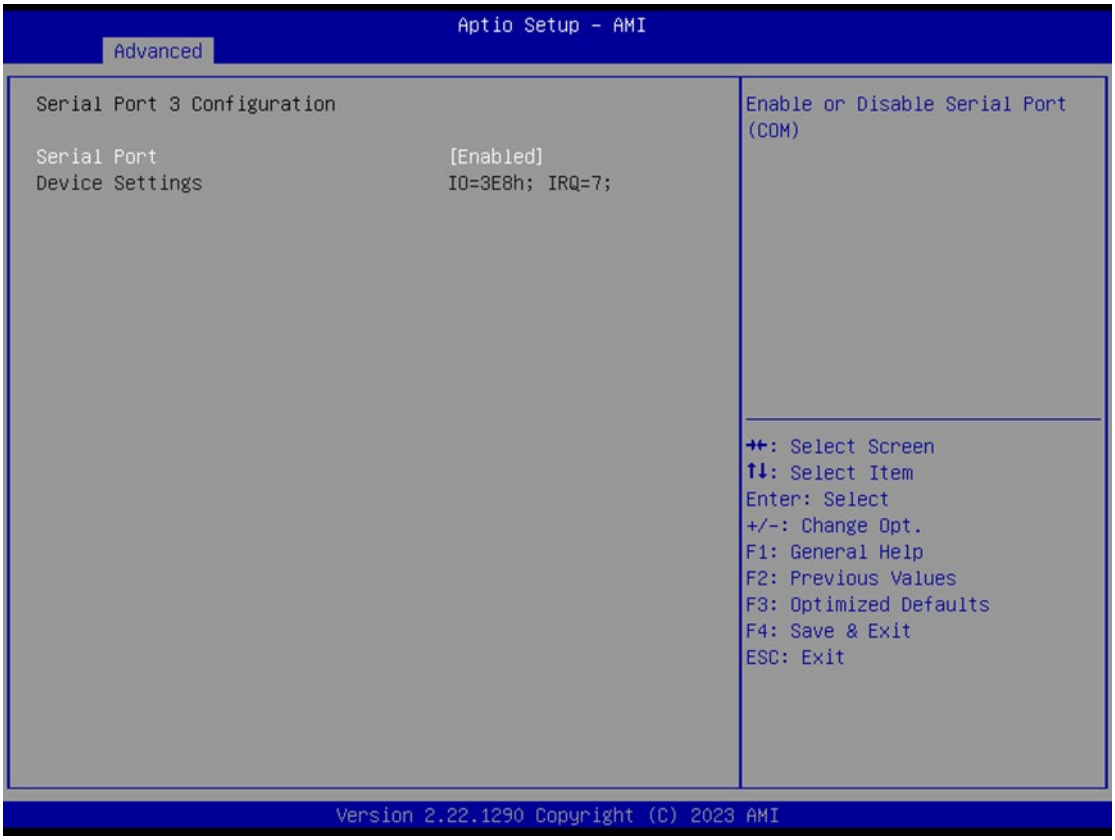
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port 2 Configuration



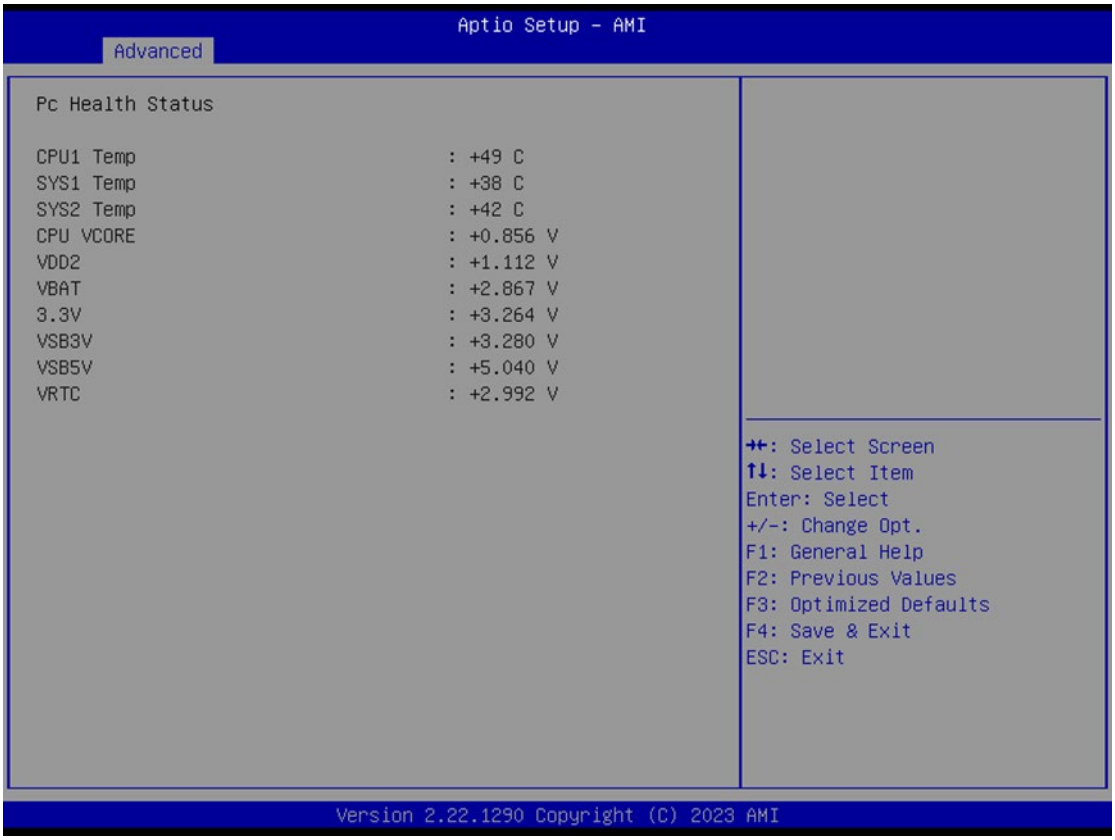
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 2.
Device Settings	NA	IO=2F8h; IRQ = 3

Serial Port 3 Configuration

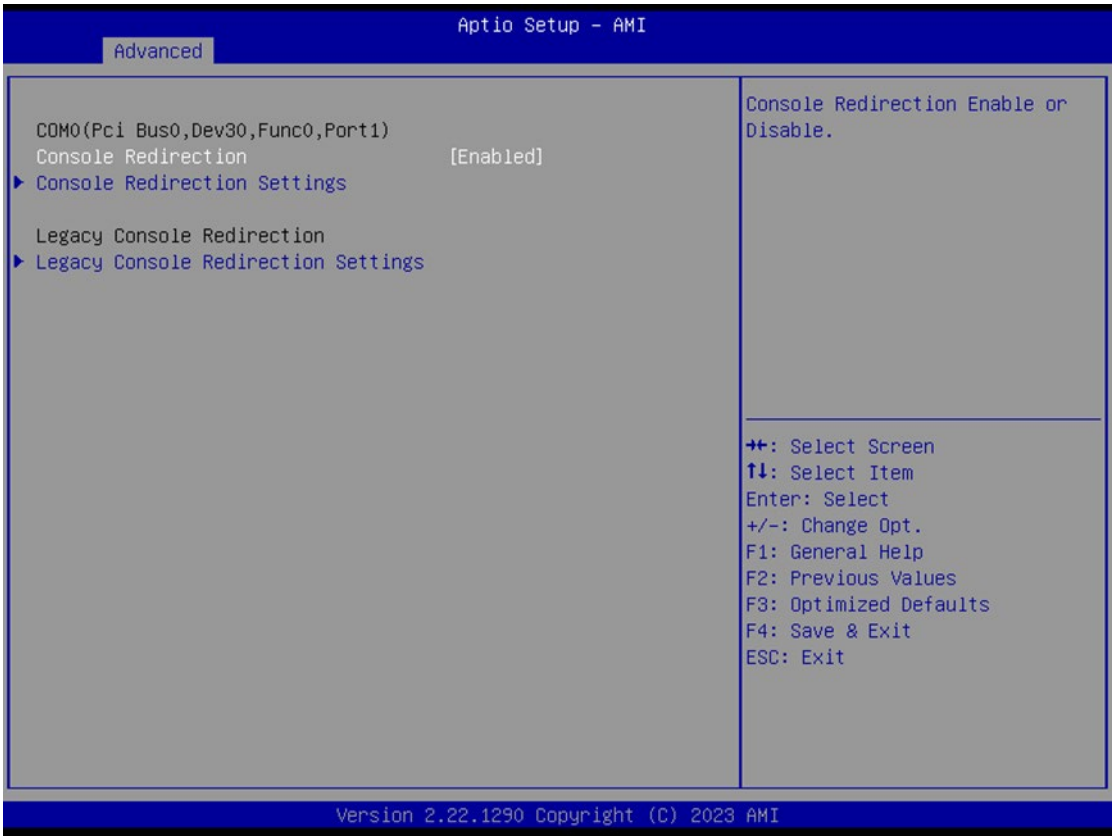


Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 3.
Device Settings	NA	IO=3E8h; IRQ = 7

H/W Monitor

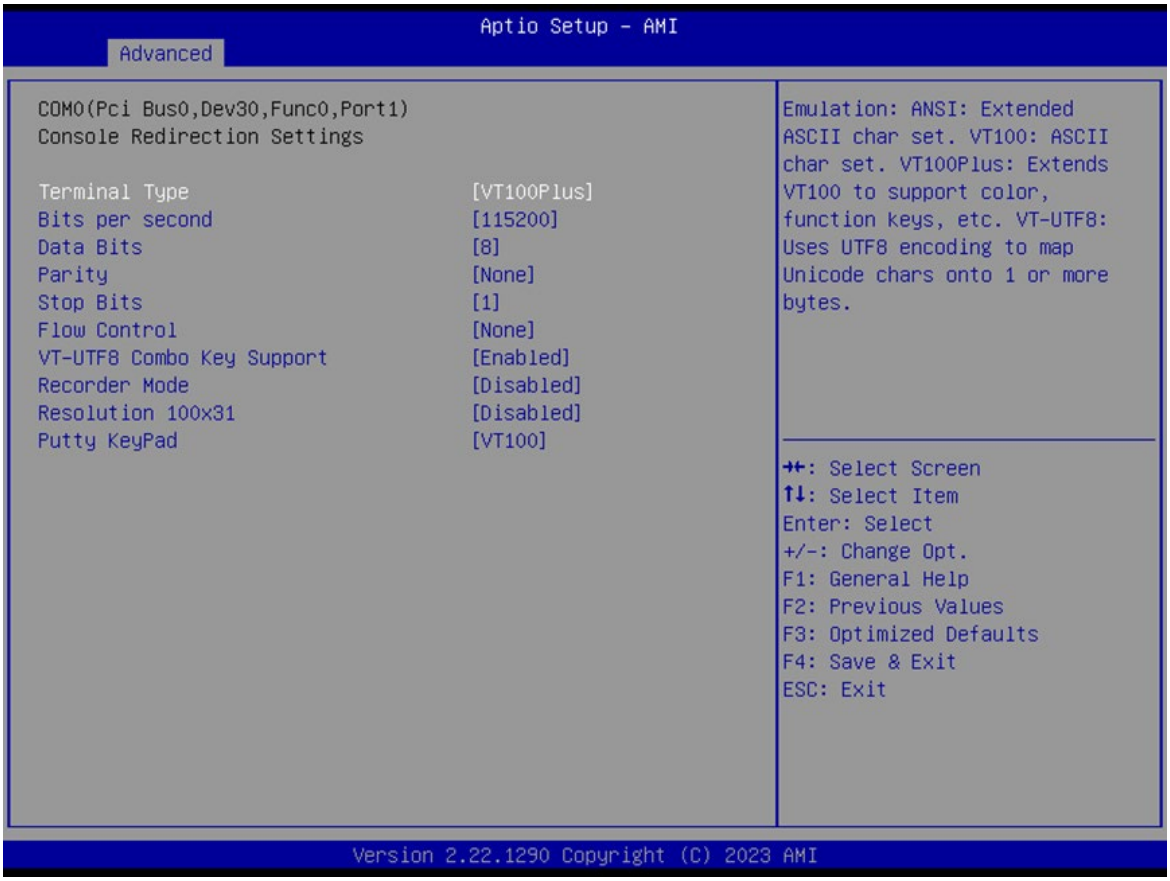

Aptio Setup – AMI
Advanced
Pc Health Status
CPU1 Temp : +49 C
SYS1 Temp : +38 C
SYS2 Temp : +42 C
CPU VCORE : +0.856 V
VDD2 : +1.112 V
VBAT : +2.867 V
3.3V : +3.264 V
VSB3V : +3.280 V
VSB5V : +5.040 V
VRTC : +2.992 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1290 Copyright (C) 2023 AMI

Serial Port Console Redirection



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

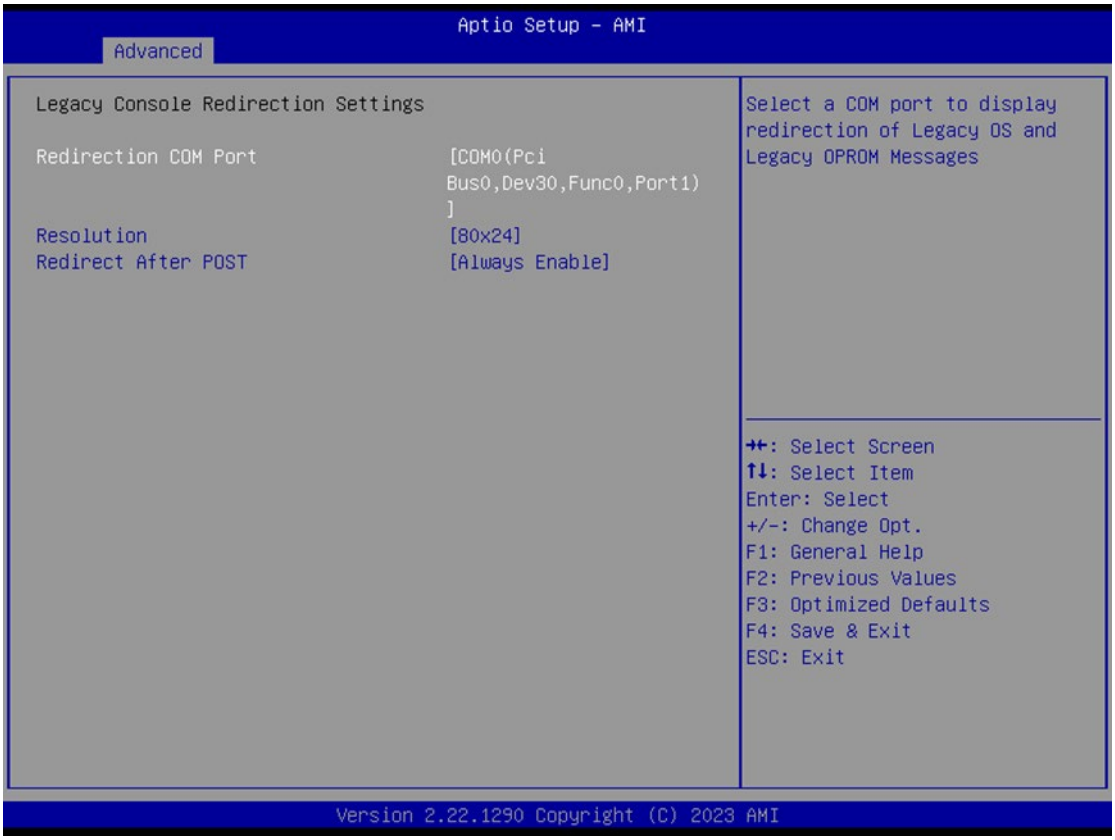
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100Plus VT-UTF8 ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: 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	Indicates the end of a serial data packet.

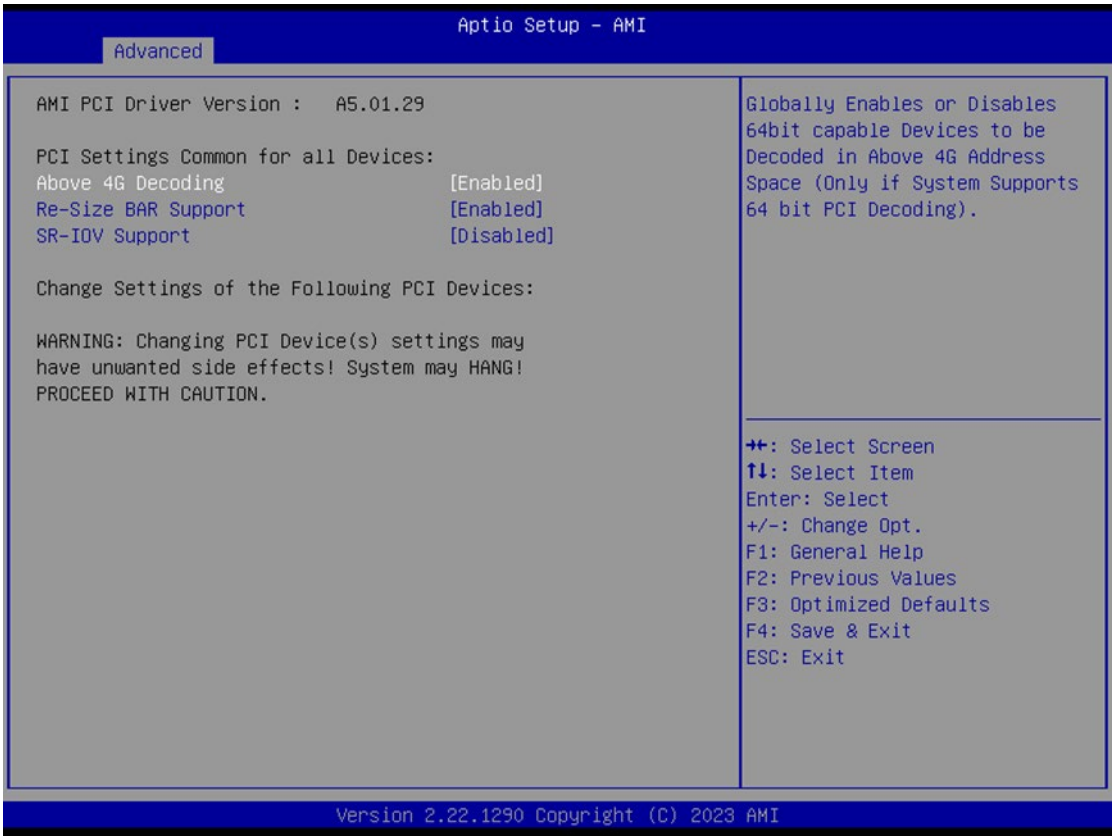
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects Function Key and Key Pad on Putty.

Legacy Console Redirection Settings



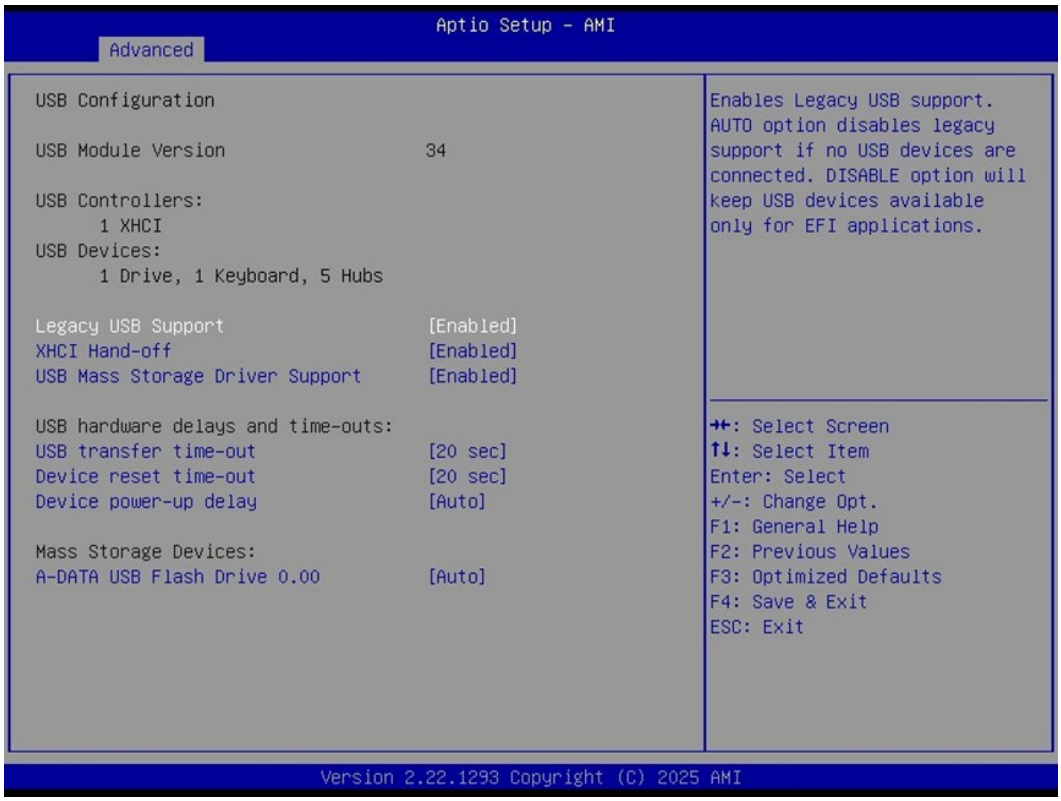
Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When **Bootloader** is selected, 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**.

PCI Subsystem Settings



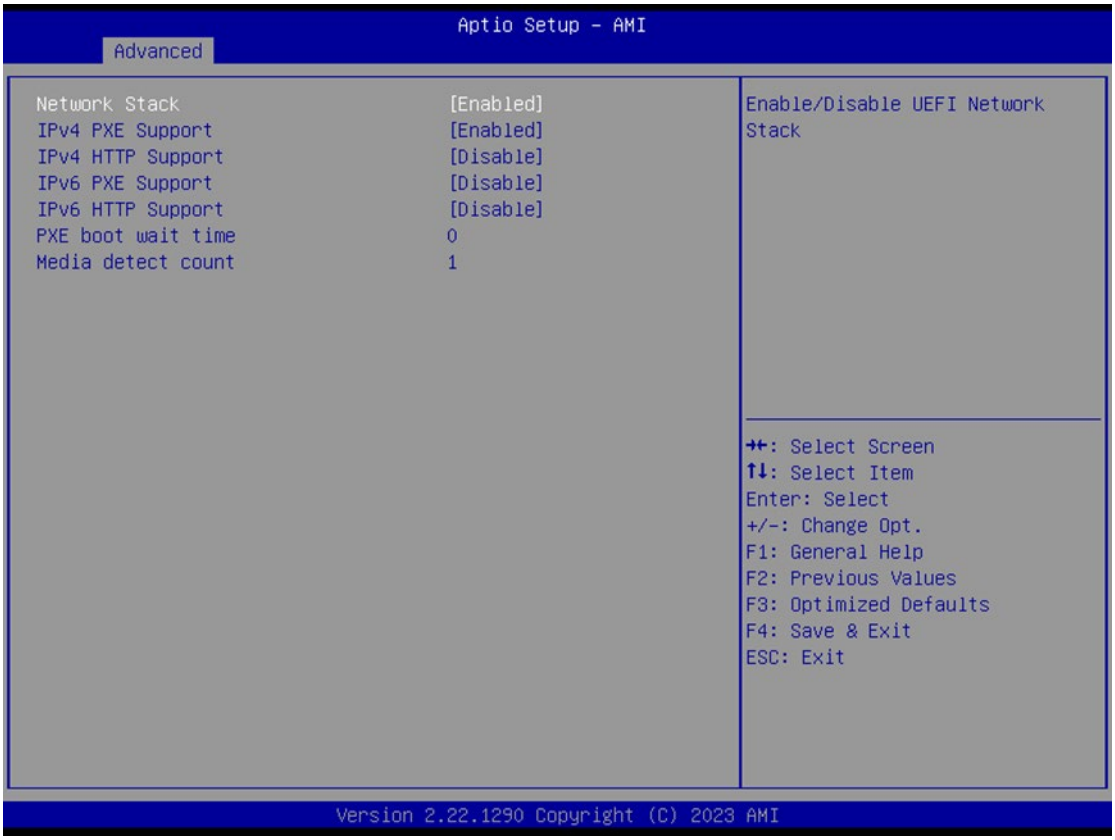
Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64-bit PCI Decoding).
Re-Size BAR Support	Disabled Enabled	If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.
SR-IOV Support	Disabled Enabled	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

USB Configuration



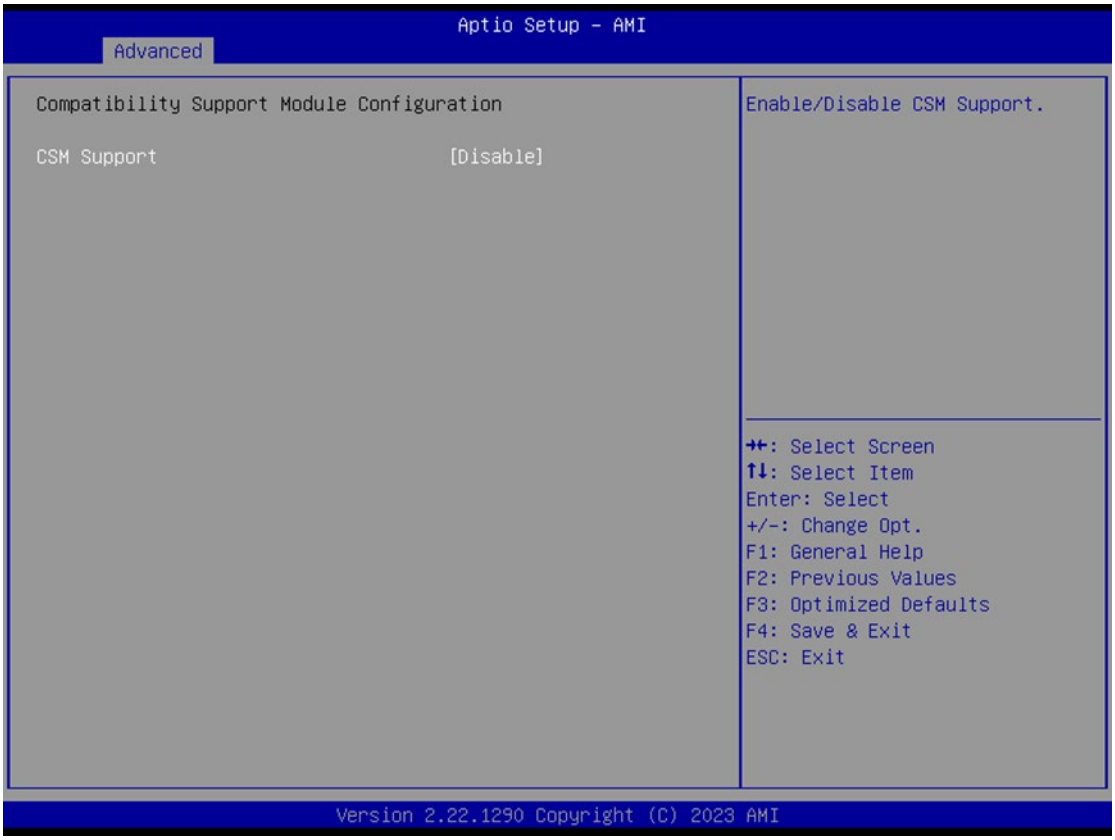
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround 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 Enabled	Enables or disables UEFI Network Stack
IPv4 PXE Support	Disabled Enabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP Support	Disabled Enabled	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	Disabled Enabled	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
IPv6 HTTP Support	Disabled Enabled	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.

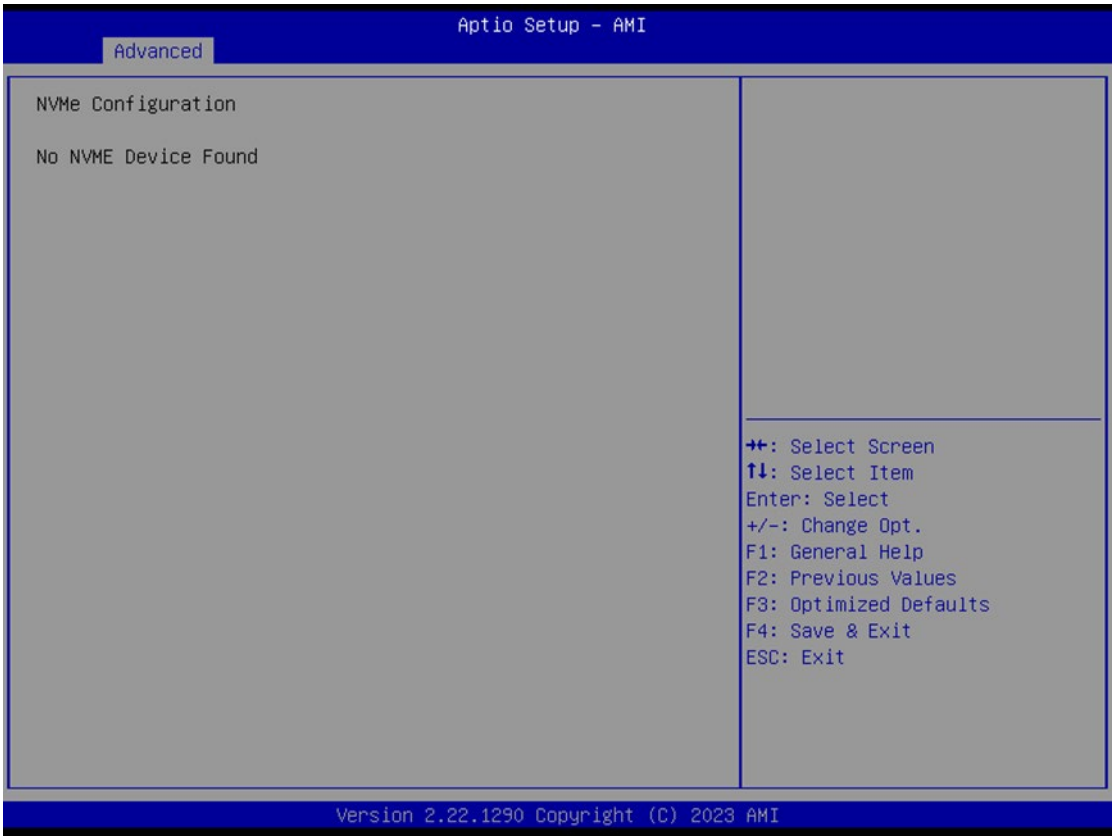
CSM Configuration



Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support

NOTE: UEFI mode is the default value. Users can choose Legacy mode; however, Legacy VGA/Onboard LAN will NOT be supported.

NVMe Configuration



Control PXE Boot

Feature	Options	Description
Control PXE Boot from	Disabled Enabled	Enable/Disable PXE function

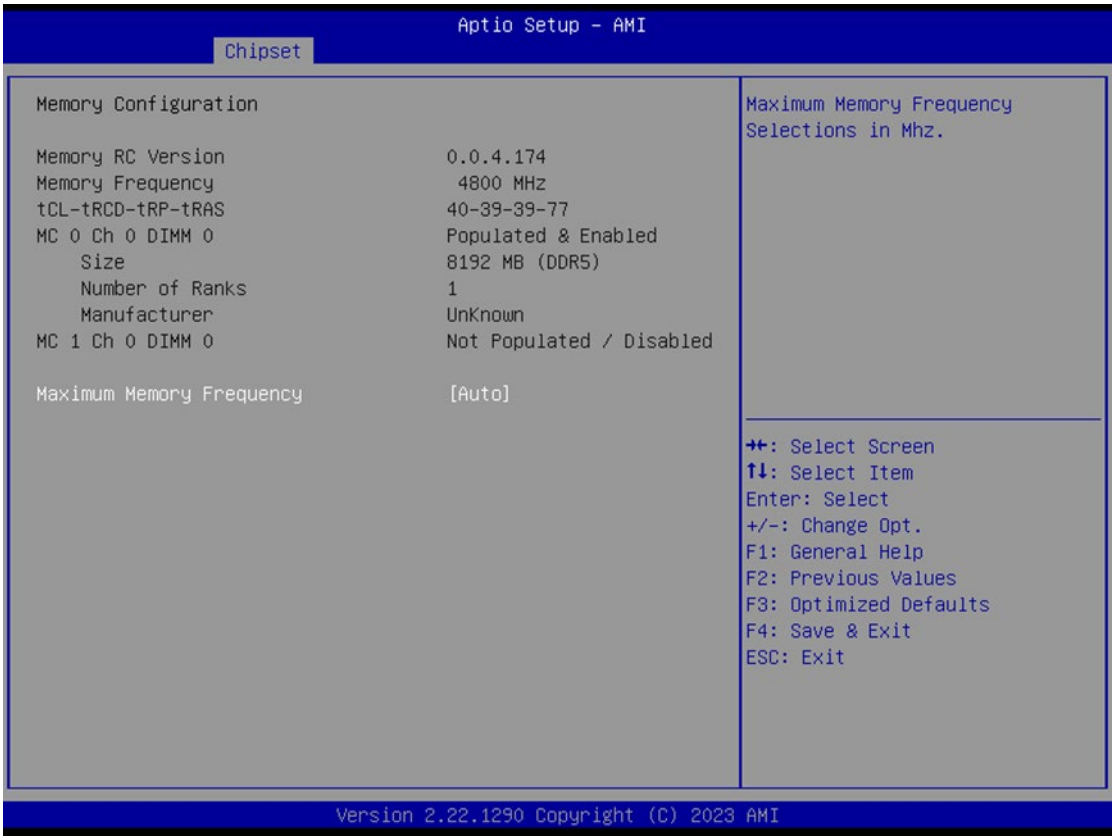
Chipset

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

System Agent (SA) Configuration

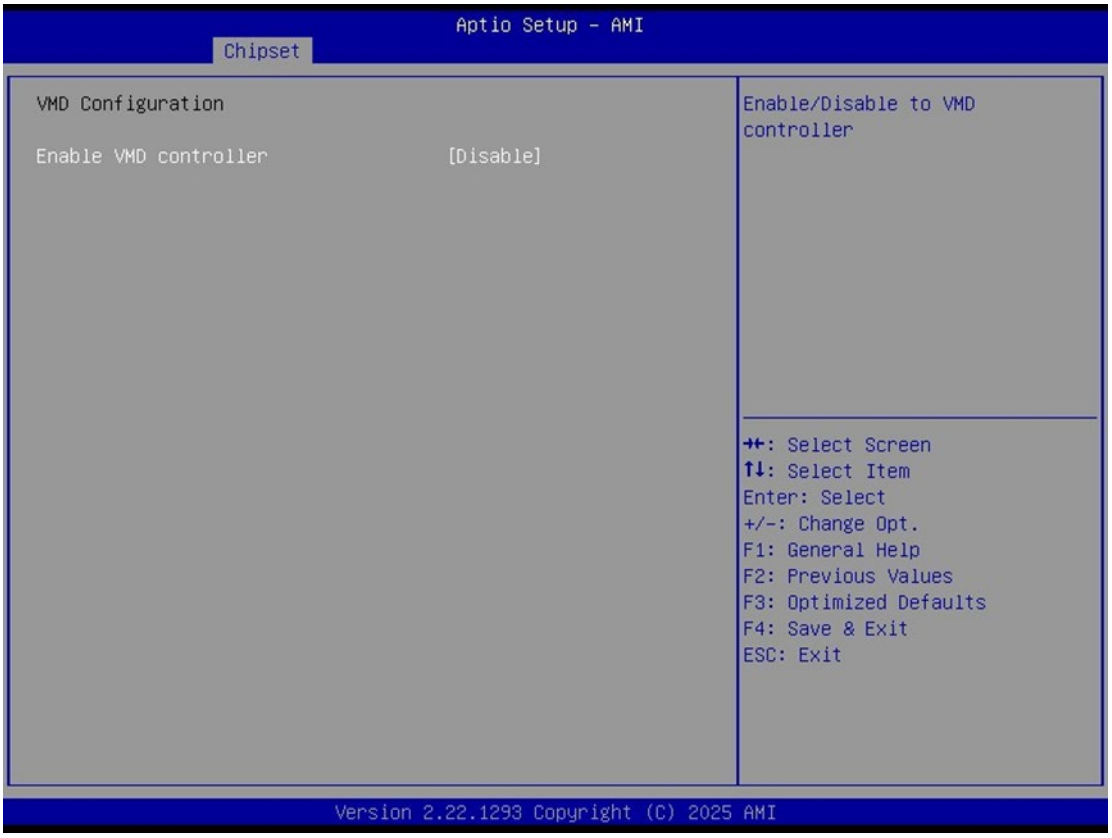
Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability
X2APIC Opt Out	Disabled Enabled	Enable/Disable X2APIC_OPT_OUT bit
Above 4GB MMIO BIOS assignment	Disabled Enabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.

Memory Configuration



Feature	Options	Description
Maximum Memory Frequency	Auto 1067 ~ 12800	Maximum Memory Frequency Selections in Mhz.

VMD Configuration

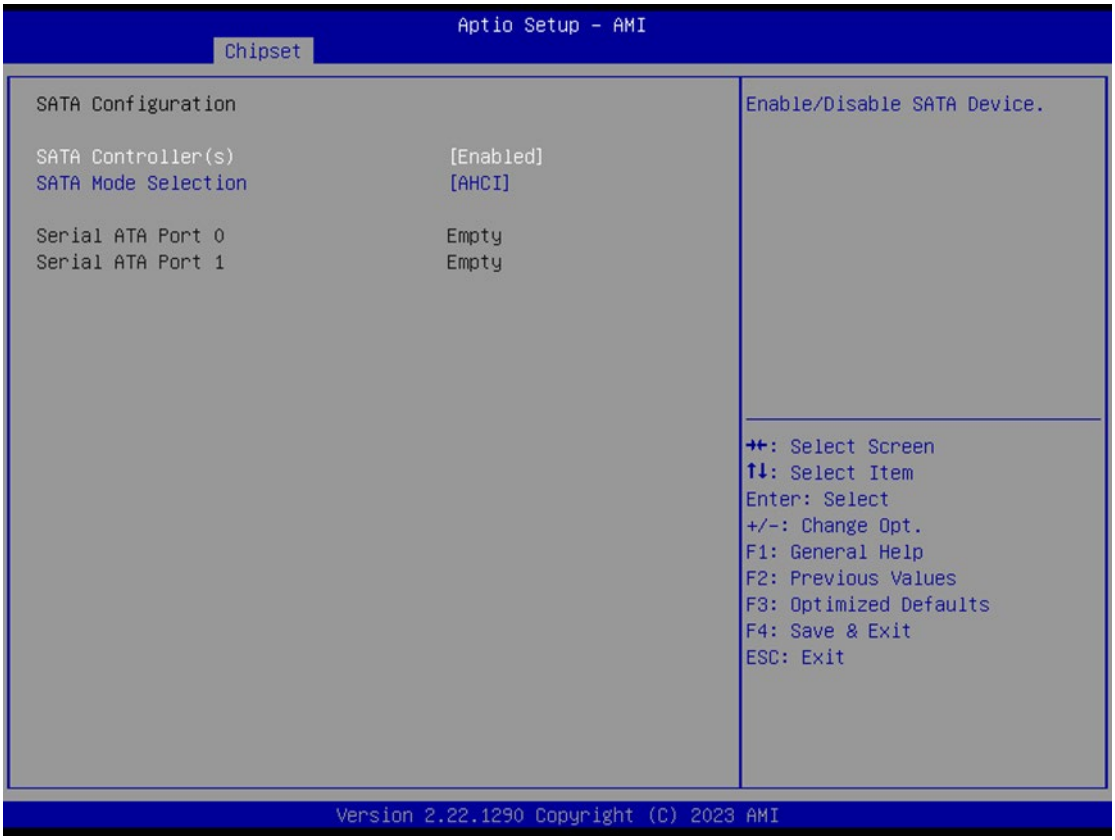


Feature	Options	Description
Enable VMD controller	Enabled Disabled	Enable/Disable to VMD controller

PCH-IO Configuration

Feature	Options	Description
Pcie PII SSC	Auto 0.0% 0.1% 0.2% 0.3% 0.4% 0.5% Disabled	Pcie PII SSC percentage.AUTO - Keep hw default, no BIOS override. Range is 0.0%-0.5%.

SATA Configuration



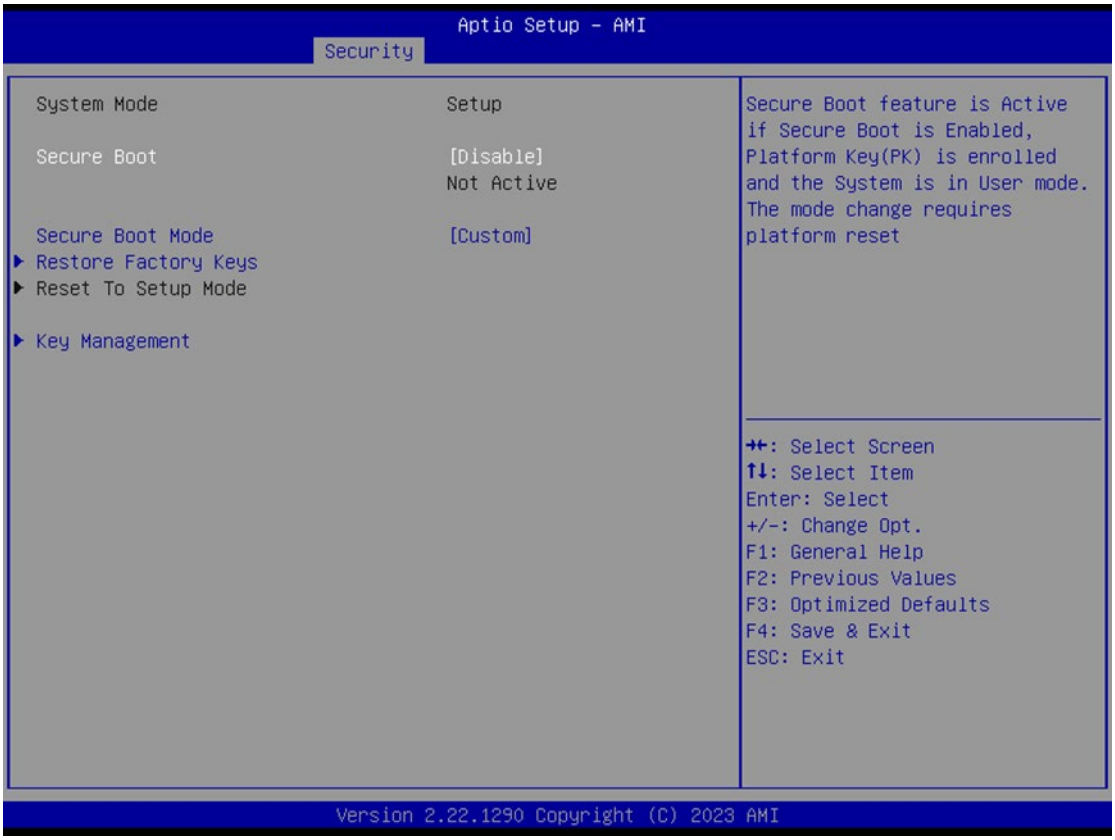
Feature	Options	Description
SATA Controller(s)	Enabled Disabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI	Determines how SATA controller(s) operate.

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.

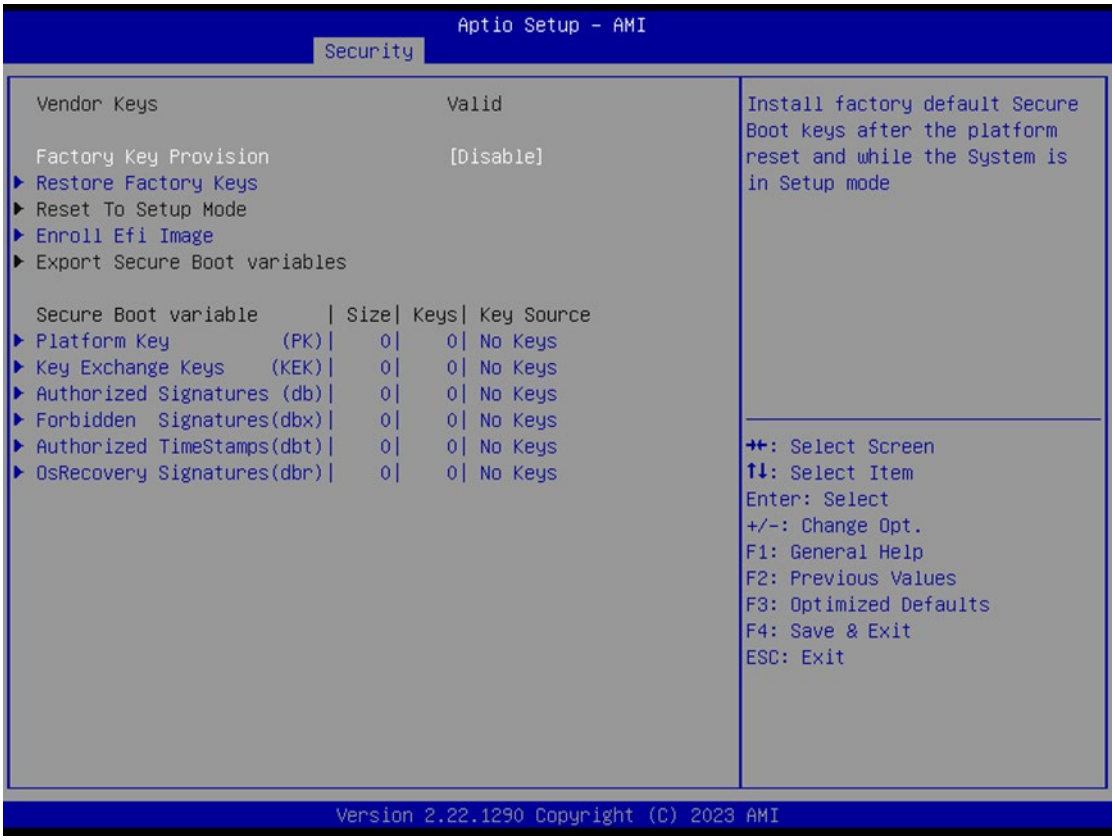
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

Secure Boot



Feature	Options	Description
Secure Boot	Disabled Enabled	Secure Boot is activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Mode	Standard Custom	Customizable Secure Boot mode: In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

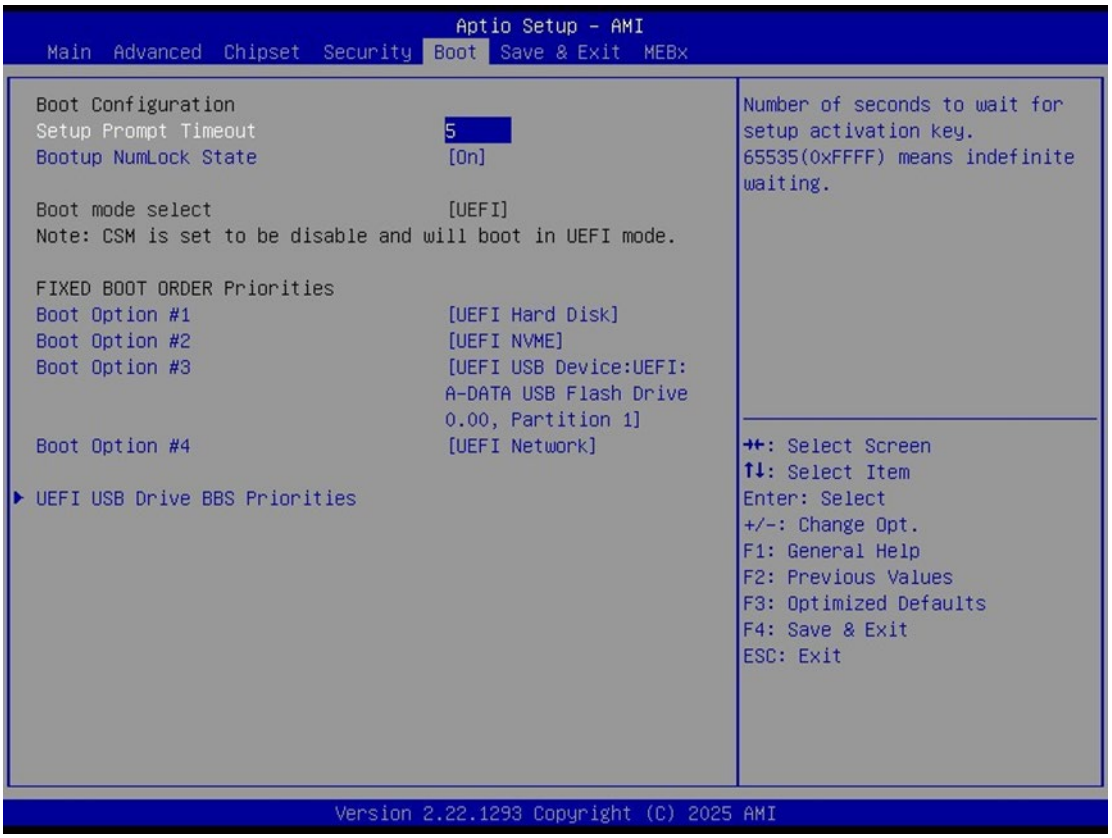
Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Provision factory default keys on next re-boot only when System in Setup Mode.
Restore Factory keys	None	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Enroll Efi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary 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.

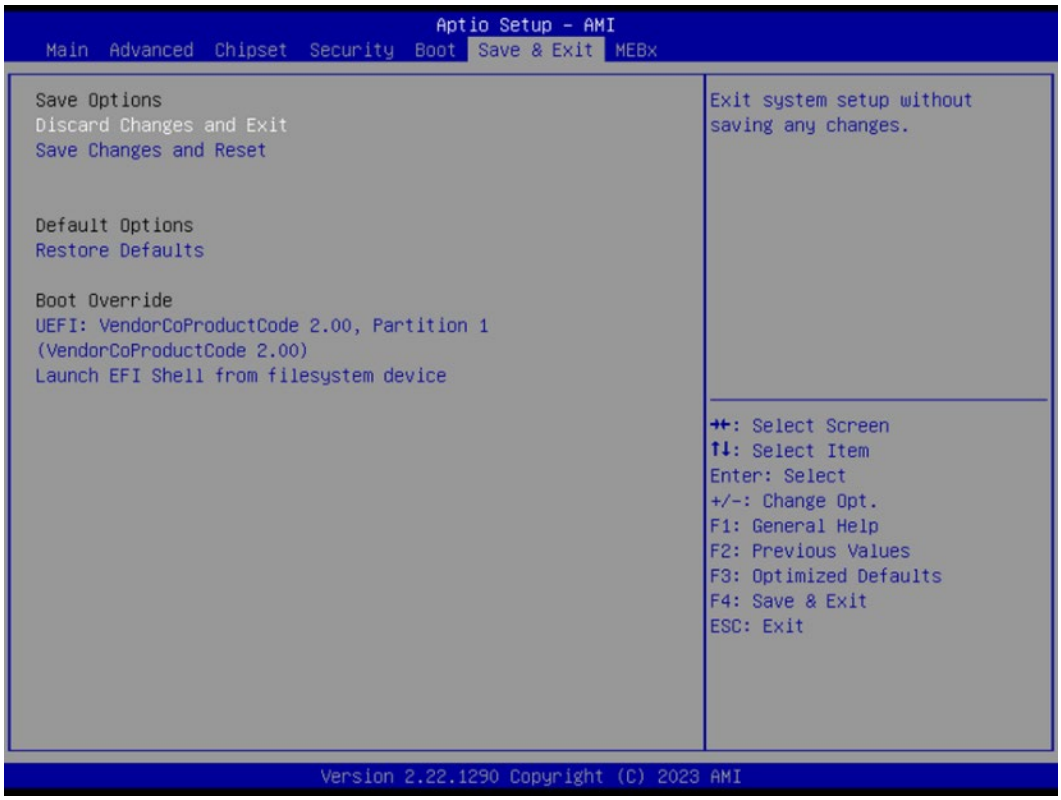


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
BootupNumLock State	On Off	Select the keyboard NumLock state
Boot mode select	LEGACY UEFI	Select boot mode for LEGACY or UEFI. **Note**: CSM is set to be disable and will boot in UEFI mode.

- Default boot priority: Hard Disk → NVMe → USB → Network
- Choose boot priority from boot option group.
- Choose specifies boot device priority sequence from available Group device.

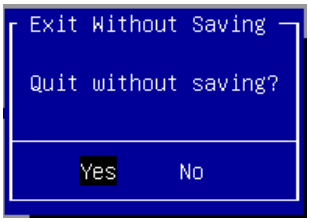
Save and Exit Menu

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 on the left frame of the screen.



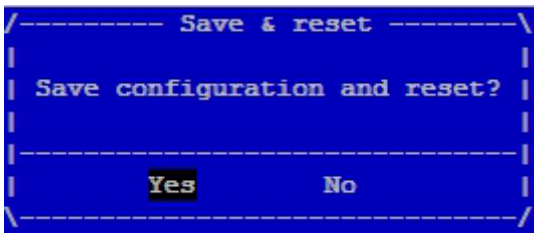
■ **Discard Changes and Exit**

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.



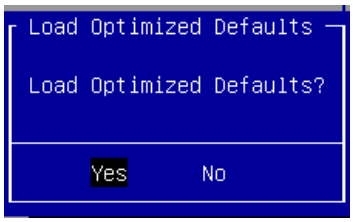
■ **Save Changes and Reset**

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 shown above as it should depend on the actual devices connect to the system.

MEBx

The default password is 'admin'. This default password must be changed by the user. When an IT administrator first enters the Intel® MEBX configuration menu with the default password, they must change the default password before any feature can be used.

The new Intel® MEBX password must meet the following requirements for strong passwords:

1. **Password Length**: At least 8 characters, and no more than 32.

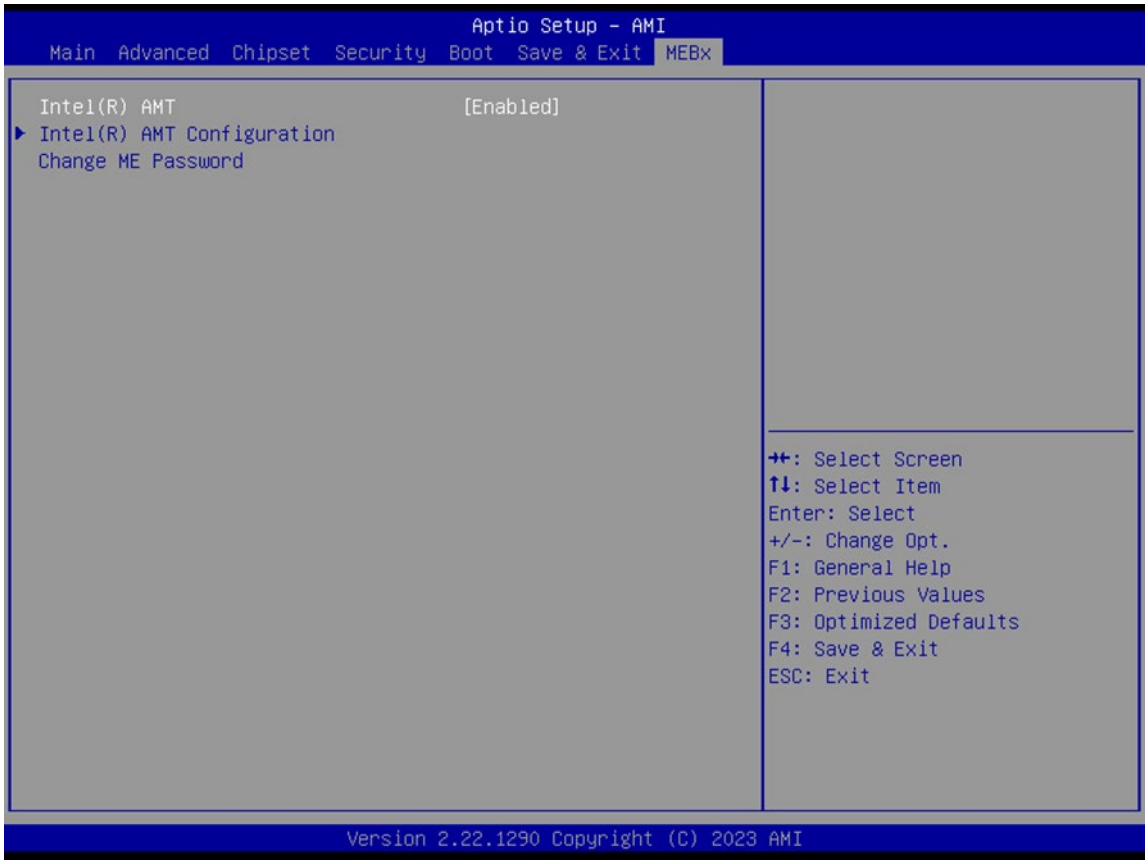
2. **Password Complexity**: Password must include the following:

• At least one-digit character ('0', '1', … '9')

• At least one 7-bit ASCII non-alpha-numeric character (e.g. '!', '$', ';'), but excluding ':', ',' and '"' characters.

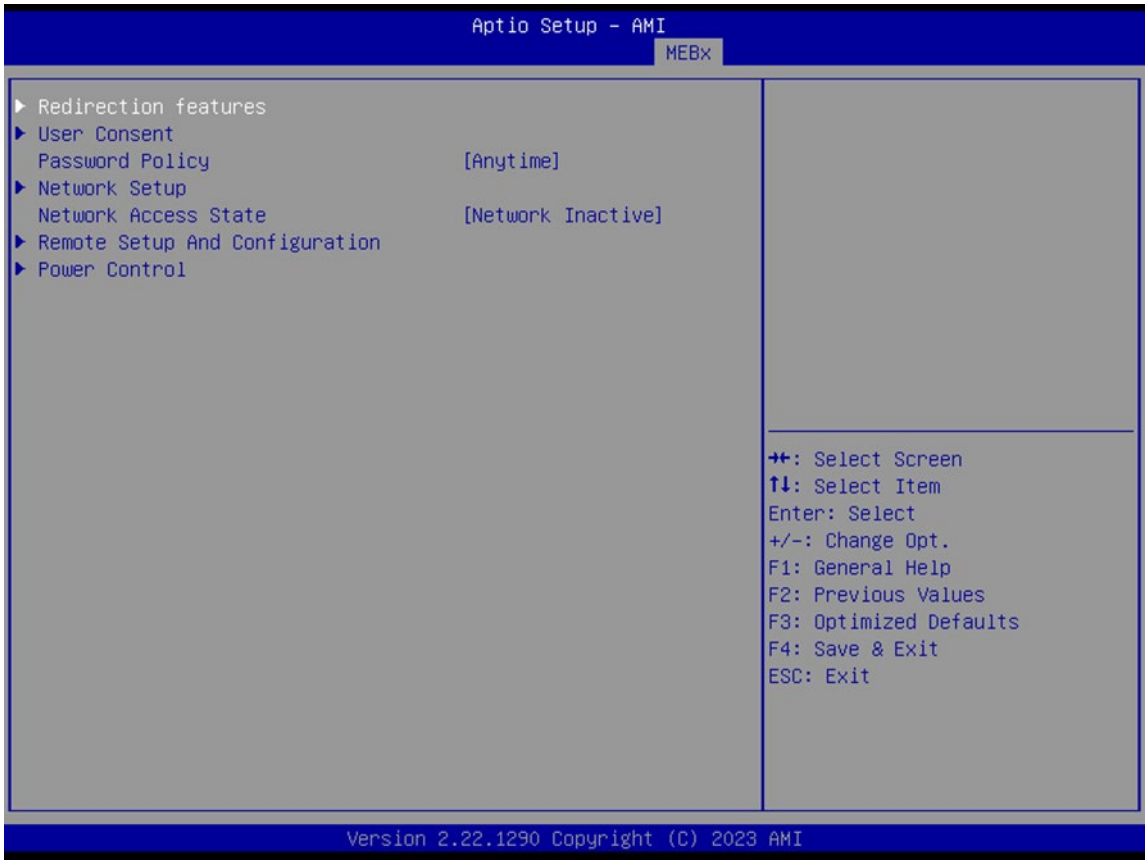
• At least one lower-case letter ('a', 'b'…'z') and at least one upper case letter ('A', 'B'…'Z').

MEBx



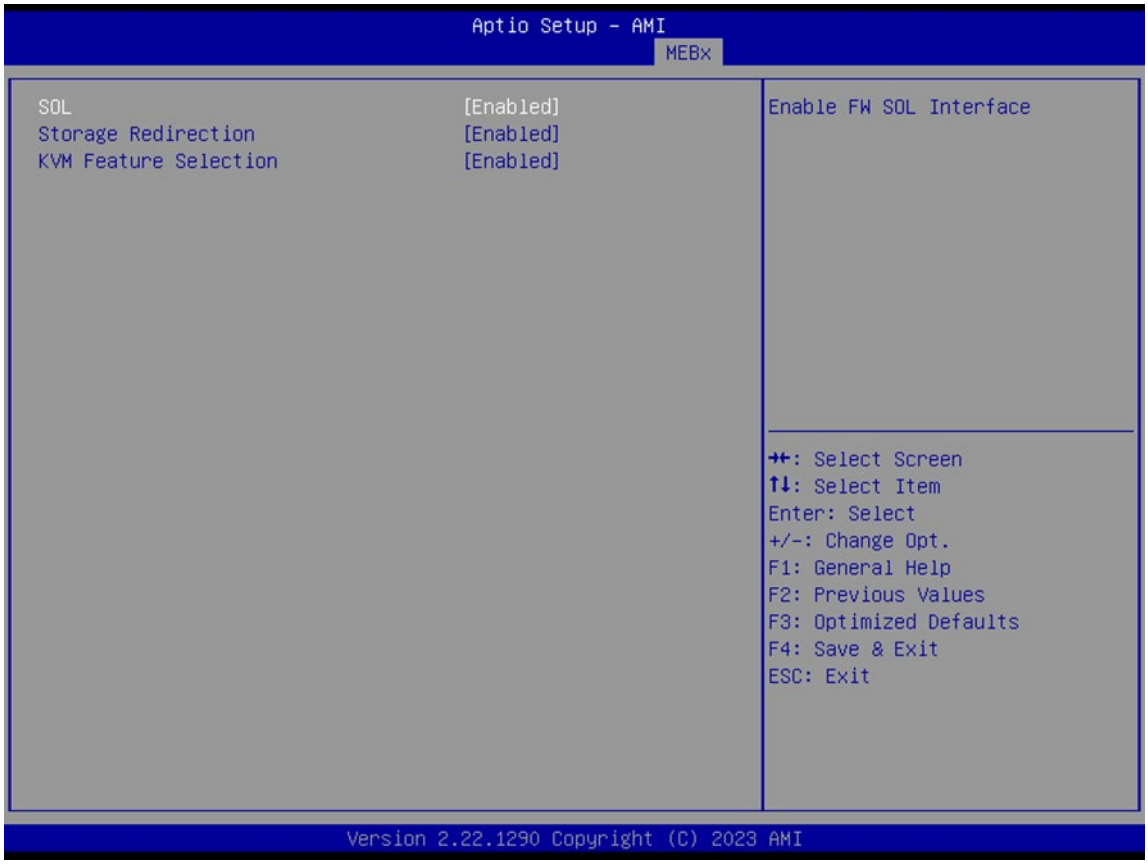
Feature	Options	Description
Intel® AMT	Enabled Partially Disabled Disabled	--

Intel® AMT Configuration



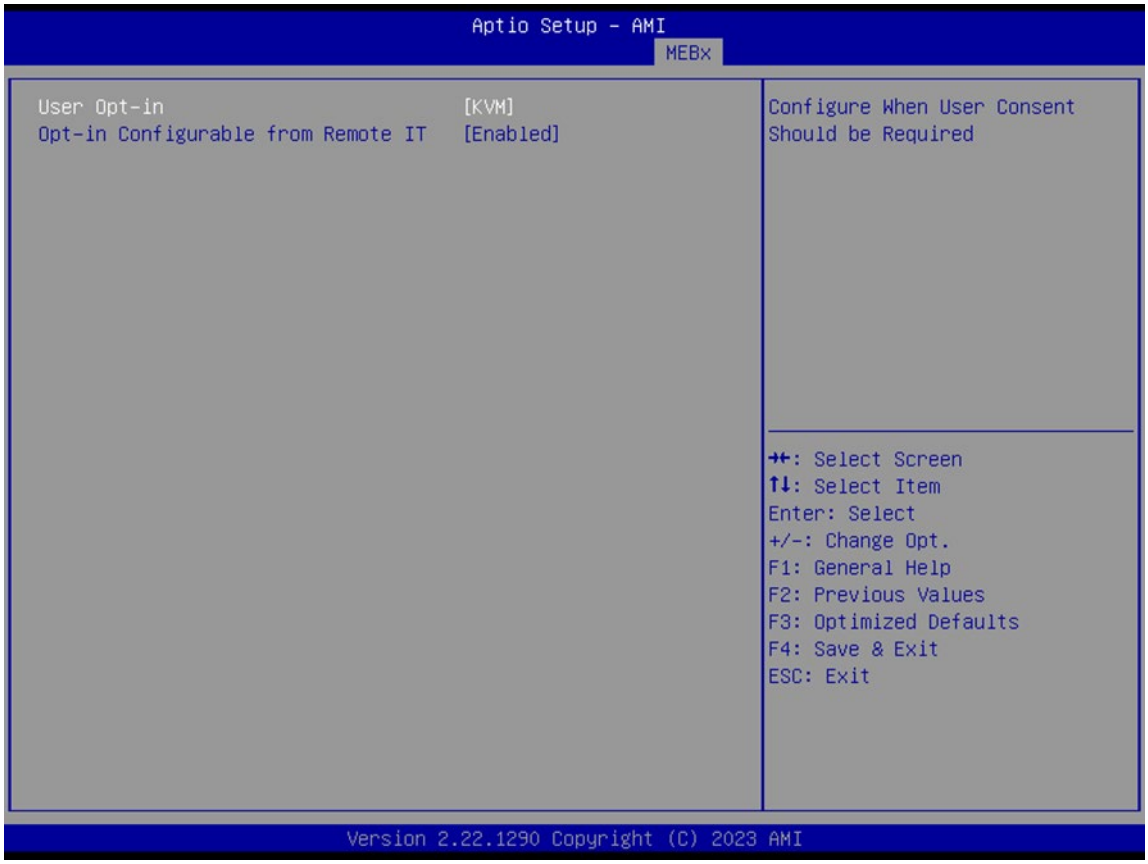
Feature	Options	Description
Password Policy	Default Password Only During Setup And Configuration Anytime	
Network Access State	Network Active Network Inactive Full Unprovision	Changes network state of ME. When disabling, it will also clear some other settings.

Redirection Features



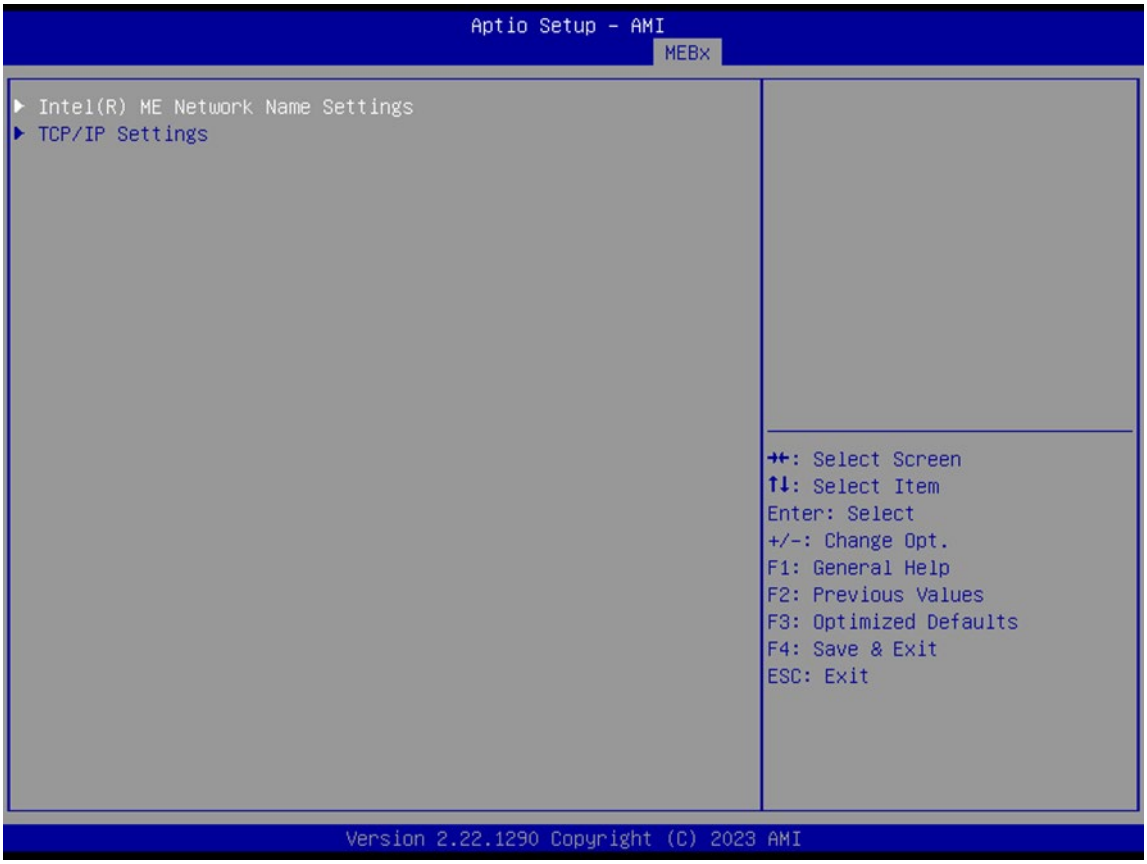
Feature	Options	Description
SOL	Enabled Disabled	Enable FW SOL Interface
Storage Redirection	Enabled Disabled	Enable FW Remote - Storage Redirection
KVM Feature Selection	Enabled Disabled	Enable FW KVM Feature

Redirection Features

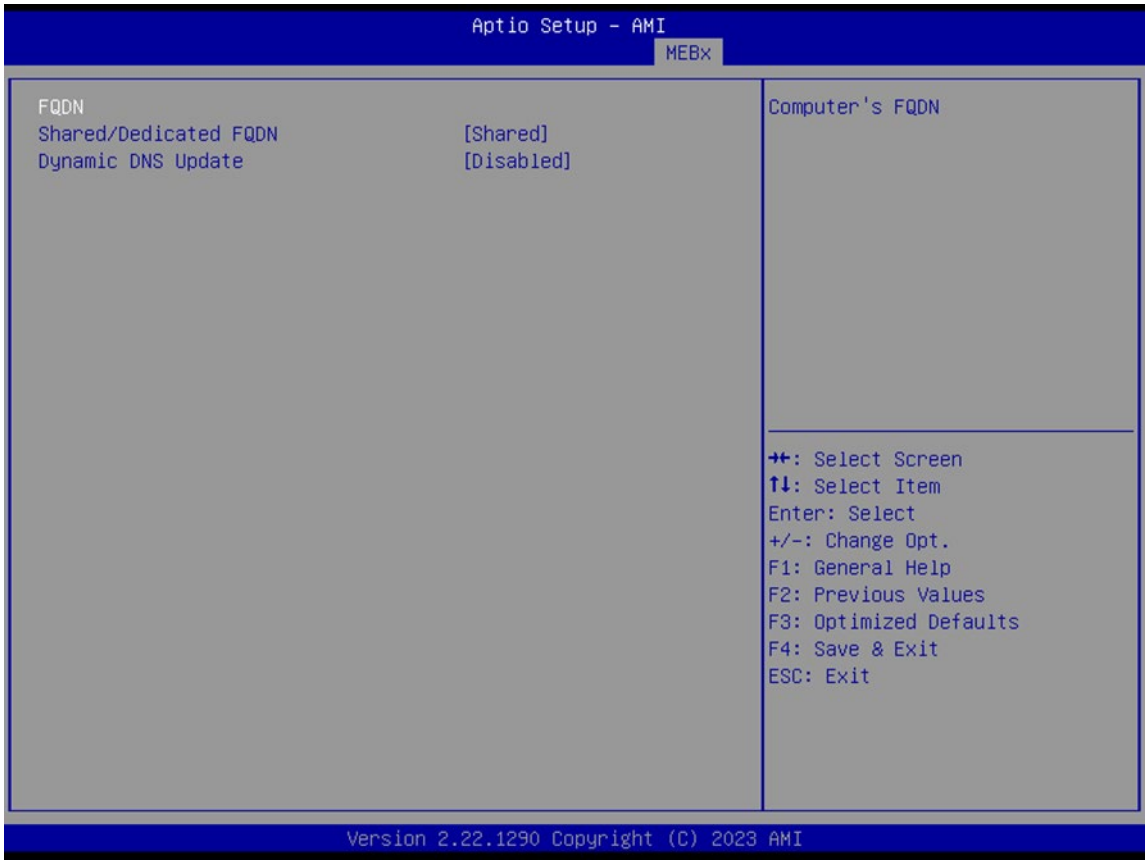


Feature	Options	Description
User Opt-in	NONE KVM ALL	Configure When User Consent Should be Required
Opt-in Configurable from Remote IT	Enabled Disabled	Enable/Disable Remote Change Capability of User Consent Feature

Network Setup

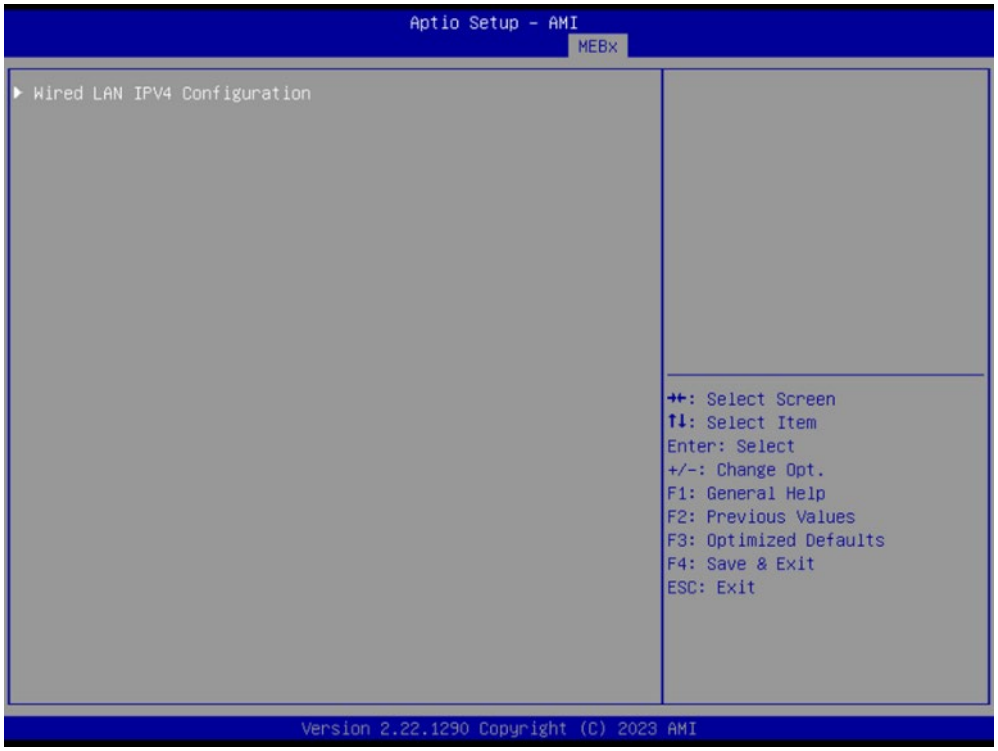


Intel® ME Network Name Settings



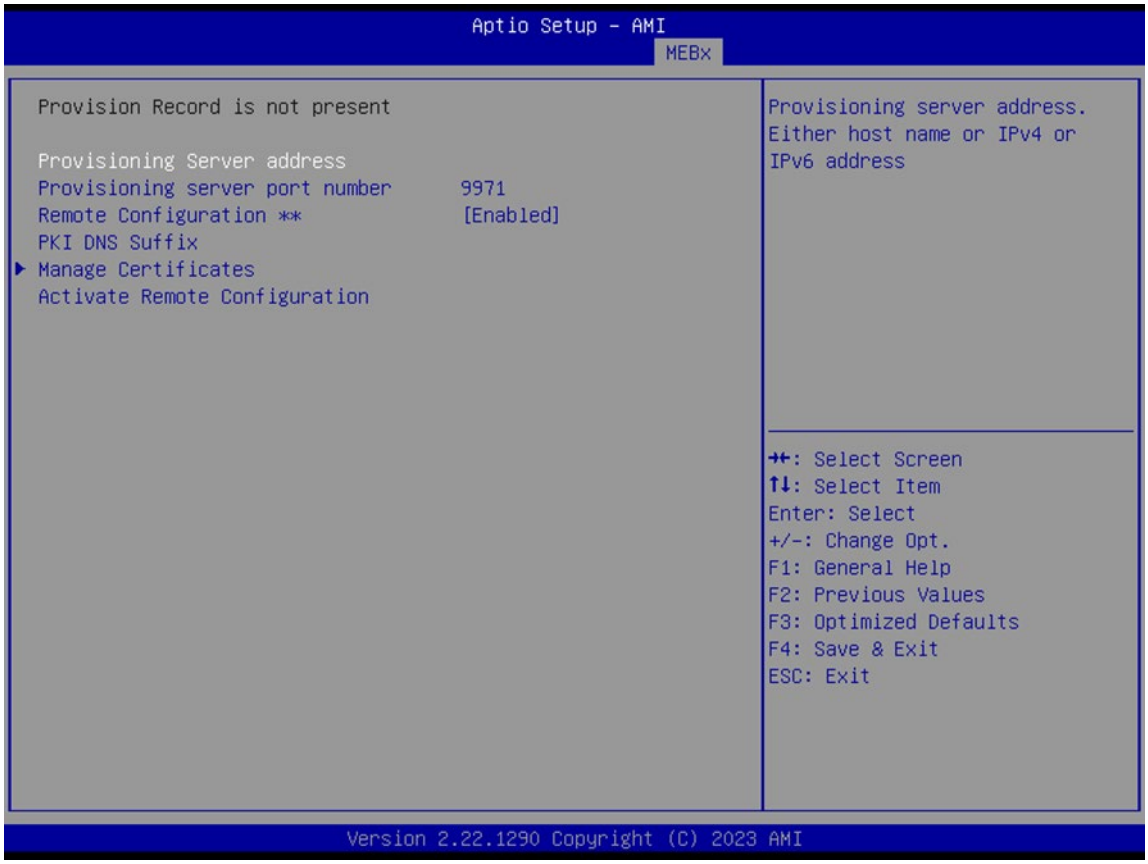
Feature	Options	Description
FQDN		Computer's FQDN
Shared/Dedicated FQDN	Dedicated Shared	--
Dynamic DNS Update	Enabled Disabled	--

TCP/IP Settings



Feature	Options	Description
DHCP Mode	Disabled Enabled	Enable/Disable IPV4 DHCP Mode

Remote Setup and Configuration



Feature	Options	Description
Provisioning Server address	--	Provisioning server address. Either host name or IPv4 or IPv6 address
Provisioning server port number	9971	Provisioning server port number (0-65535)
Remote Configuration **	Disabled Enabled	--
PKI DNS Suffix	--	Enter PKI DNS Suffix
Activate Remote Configuration	--	Activate Remote Configuration

CHAPTER 4 : ALLXON REMOTE MANAGEMENT SETUP

Remote Management with Allxon

The ICS-R570 security appliance integrates remote management via the Allxon platform, providing comprehensive remote monitoring and management (RMM) for both software-based In-band (INB) and hardware-based Out-of-Band (OOB) support.

The following section outlines the steps to enable and activate Allxon services. Follow these instructions to effectively utilize Allxon's remote management capabilities.

Enable Allxon INB & OOB Services

What Users Will Need:

A.) Edge Devices integrated with OOB Enabler

Supports ARM and x86 architectures.

B.) Host PC (Such as a Desktop, Laptop, or Tablet)

Used to connect to Allxon Portal to enable and activate OOB services. A web browser installation is required.

C.) Allxon Portal Account

Visit Allxon Website to learn how to register an Allxon Portal account.

D.) Internet Connection

Ensure the edge device, OOB Enabler, and the host PC is connected to a stable network.

Install Allxon Agent on Device

There are two methods to install the Allxon Agent. For detailed instructions, refer to the following webpages:

Install Allxon Agent via Command Prompt

Install Allxon Agent via Desktop Installer

Pairing Edge Device to Allxon Portal

► Get Device Pairing Code

Refer to the following webpage for detailed instructions: Get Device Pairing Code

► Add Your Device on Allxon Portal

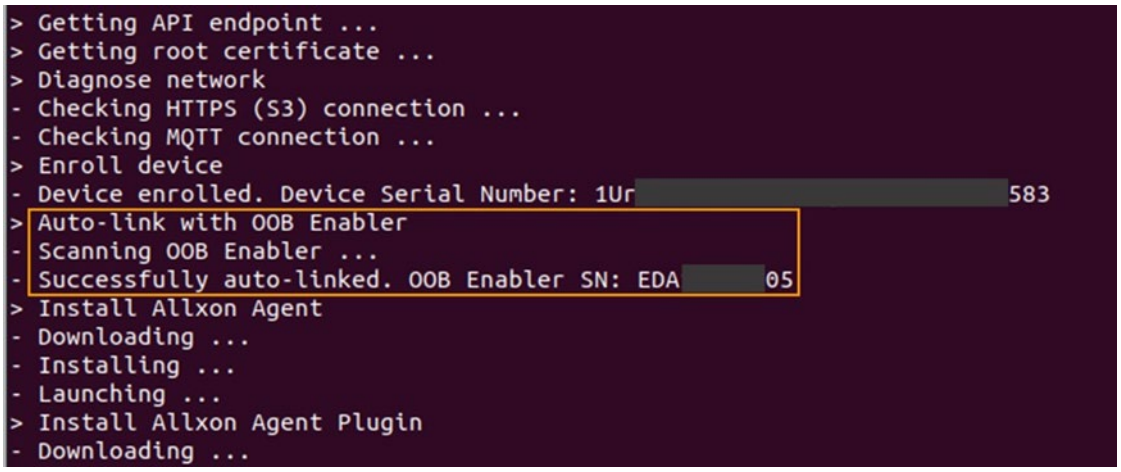
Refer to the following webpage for detailed instructions: Add Your Device on Allxon Portal

Note

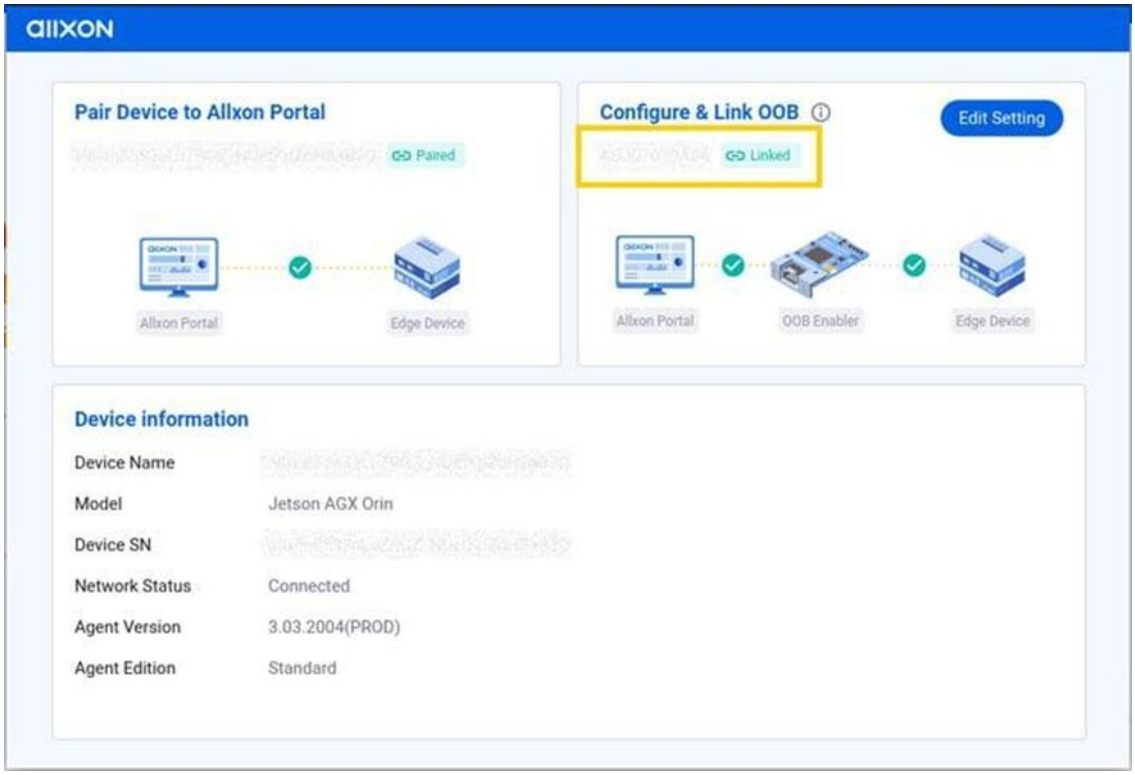
If you need complete getting started information, please refer to the following link for detailed guidance.

Enable Allxon OOB Service

After pairing and adding your device to the Allxon Portal, you can also link the OOB Enabler. If your devices support auto-link communication, the OOB Enabler will connect automatically. During the Allxon Agent installation, you will see the following messages, as shown in the picture below.



Upon completing the installation, the Allxon Agent will launch automatically, and the 'Configure and Link OOB' section will display as "Linked," as shown in the picture below.



Note

If your devices do not support auto-link, the above information will not appear. In this case, follow the instructions below to manually link the OOB Enabler.

Enable OOB Management on Device

Allxon swiftDR for Power Cycling

The Allxon swiftDR Series is a robust OOB remote device management solution designed for disaster recovery. This section outlines Allxon swiftDR for Power Cycling on the Allxon Portal, highlighting its power-related OOB features.

For detailed instructions, refer to the following webpage: Allxon swiftDR for Power Cycling

Troubleshooting Your OOB Enabler

For optimal use of Allxon services, ensure a stable internet connection.

If your organization restricts internet access via a firewall or proxy, refer to the following webpage for detailed information: Allxon Service Port/Protocol and Whitelist Information

APPENDIX A: LED INDICATOR EXPLANATIONS

- **System Power / Status / Storage Activity**

The status explanations of LED indicators on front panel are as follows:

LED	COLOR	LED ACTION	DESCRIPTION
Power	**Green**	Steady	System is powered ON
	OFF	N/A	System is powered OFF
Status	**Green**	Steady	Control by GPIO
	Red	Steady	Control by GPIO
	OFF	N/A	Control by GPIO (Default) Or No Power ON/ Power OFF
Storage	**Amber**	Blinking	Storage (HDD/SSD) Active
	OFF	N/A	No Data Access or No Power ON
Console	**Green**	N/A	For LED 1~2

- **RJ45 LAN LED**

2.5Gb RJ-45 Define:

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

APPENDIX B: 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