



Network Appliance Platforms

Hardware Platforms for Network Computing

NCA-1526 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.

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Icon Descriptions

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

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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Contact Information

Taiwan Corporate Headquarters

Lanner Electronics Inc.

7F, No.173, Sec.2, Datong Rd.
Xizhi District, New Taipei City 22184,
Taiwan

立端科技股份有限公司

221 新北市汐止區
大同路二段 173 號 7 樓
T: +886-2-8692-6060
F: +886-2-8692-6101
E: contact@lannerinc.com

USA

Lanner Electronics Inc.

47790 Westinghouse Drive
Fremont, CA 94539
T: +1-855-852-6637
F: +1-510-979-0689
E: sales_us@lannerinc.com

Europe

Lanner Europe B.V.

Wilhelmina van Pruysenweg 104
2595 AN The Hague
The Netherlands
T: +31 70 701 3256
E: sales_eu@lannerinc.com

China

Beijing L&S Lancom Platform Tech. Co., Ltd.

Guodong LOFT 9 Layer No. 9 Huinan Road,
Huilongguan Town, Changping District, Beijing
102208 China
T: +86 010-82795600
F: +86 010-62963250
E: service@ls-china.com.cn

Canada

Lanner Electronics Canada Ltd

3160A Orlando Drive
Mississauga, ON
L4V 1R5 Canada
T: +1 877-813-2132
F: +1 905-362-2369
E: sales_ca@lannerinc.com

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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.
- ▶ Some USB devices may not be compatible with the system. If you encounter an error, please remove the USB device and restart the system.

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."



CAUTION: TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.

注意：要断开电源，请将所有电源线从本机上拔下。

WARNING: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

ATTENTION: DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

Electrical Safety Instructions

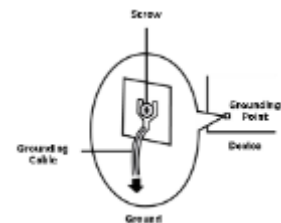
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

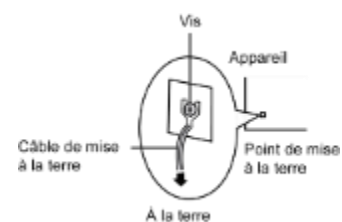


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CHAPTER 1: PRODUCT OVERVIEW

The NCA-1526 features Intel® Atom® C5325/C5315 CPU, Intel QuickAssist Technology, 0~40°C operating temperatures, Intel® AES-NI and support for both 5G mmWave and WiFi6 modules, delivering cryptographic acceleration and commercial-grade LAN functions for boosted network responsiveness and airtight network security.

Main Features

- ▶ Intel® Atom® C5325/C5315 CPU (Parker Ridge)
- ▶ 4x GbE RJ45, 2x 10G SFP+, 2x 1G RJ45 (PoE+ Support, Optional) Ports
- ▶ 2x 260-pin DDR4 2933/2400MHz, SODIMM, Max. 64GB Memory
- ▶ 1x RJ45 Console Port, 2x USB 3.0 Ports
- ▶ 1x Mini-PCIe slot (for Wi-Fi Module), 1x M.2 3042/3052 B-Key slot (for LTE/5G Module)
- ▶ 20G/10G Intel QAT Security Acceleration

Package Content

Your package contains the following items:

- ▶ 1x NCA-1526 Network Security Platform
- ▶ 1x Power Adaptor, 1x Power Cable, 1x Console Cable
- ▶ 1x Nameplate, 4x Rubber Footing Pads

Ordering Information

SKU No.	Main Features
NCA-1526A	C5325, 8-core, 2x 2933MHz DDR4 SODIMM, 4x GbE RJ45, 2x 10GbE SFP+, 2x GbE RJ45 (PoE+ support), 90W Adapter
NCA-1526B	C5315, 4-core, 2x 2400MHz DDR4 SODIMM, 4x GbE RJ45, 2x 10GbE SFP+, 2x GbE RJ45 (PoE+ support), 90W Adapter

Optional Accessories

Model	Description
FN980	5G Telit FN980 (Sub 6) Module Kit w/ screws, internal antenna cables, external antennas
EM7511	LTE Module Kit w/ screws, internal antenna cables, external antennas
IO-1516P1A	PoE+ Power Adapter Kit
Power Supply	90W Power Adapter Kit
Wall Mount Kit	Wall Mount Kit with brackets and screws

System Specifications

Form Factor		Desktop
Platform	Processor Options	SKU A: Intel® Atom® C5325 (Parker Ridge) SKU B: Intel® Atom® C5315 (Parker Ridge)
	CPU Socket	Onboard
	CPU Cores	SKU A: 8 Cores, 41W, 2.4GHz SKU B: 4 Cores, 38W, 2.4GHz
	Chipset	SoC
	Security Acceleration	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS
System Memory	Technology	SKU A: DDR4 2933MHz ECC/Non-ECC SODIMM SKU B: DDR4 2400MHz ECC/Non-ECC SODIMM
	Max. Capacity	64 GB
	Socket	2x 260-pin SODIMM
Networking	Ethernet Ports	4x GbE RJ45 via 88E1543; 2x 10G SFP+; 2x 1G GbE RJ45 via I350-AM2 (2x PoE+ Optional)
	Bypass	N/A
PoE+ PSE	# of PoE+ (PSE) Ports	2x PoE+ Ports
	Standard	IEEE 802.3at
	PoE+ Power Input	4-pin power connector with 54V/65W PoE+ adapter
I/O Interface	Reset Button	1x Reset Button (Software Reset)
	LED Indicators	Power/Status/Storage LED Indicators
	Power Button	1x Power Button with LED
	Console Port	1x RJ45 (Default Baud rate : 115200) Console Port
	USB Port	2x USB 3.0 Port
	Power Input	1x DC Jack with Lock; 1x 4-pin Power Connector for PoE+ adapter (54V/65W)
	Antenna Hole	2x Front Antenna holes; 4x Rear Antenna holes
Storage	Onboard Slots	1x M.2 (SATA) 2242/2280 B-Key
Expansion	Mini-PCIe	1x Mini-PCIe (PCIe/USB2.0) for Wi-Fi (/BT reserved)
	SIM Card Slot	2x M.2 3042/3052 B-Key for 5G/LTE 2x Nano SIM slot
Miscellaneous	Watchdog	YES
	Internal RTC with Li Battery	YES
	TPM	YES, TPM 2.0
Cooling	Processor	Passive CPU Heatsink
	System	2x 5-pin Smart Fan
Environmental Parameters	Temperature	0~40°C Operating, -40~70°C Non-Operating
	Humidity (RH)	5~90% Operating, 5~95% Non-Operating
System Dimensions	(WxDxH)	250 x 200 x 44mm
	Weight	TBC
Package Dimensions	(WxDxH)	TBC
	Weight	TBC
Power	Type/Watts	12V, 7.5A, 90W
	Input	AC 100~240V @50~60 Hz
OS Support		Linux
Approvals and Compliance		RoHS, CE/FCC Class B (PoE+ function will be Class A), UL, VCCI, UKCA

Front Panel



No.	Description	
R1	SIM Cover	2x Nano SIM Slots w/ Cover
R2	LED Indicators	LED Indicators
R3	Antenna	4x SMA Antenna Holes (For Wi-Fi/BT & LTE/5G)

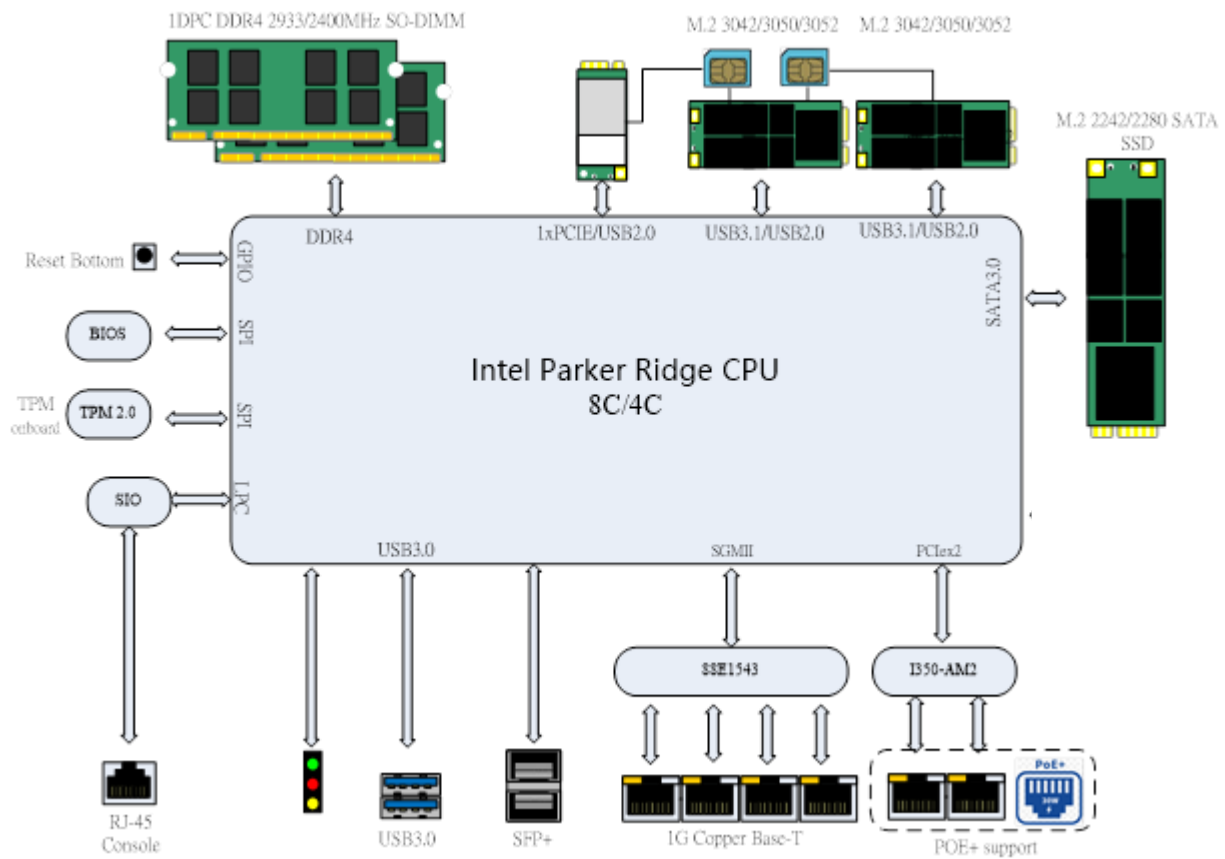
Rear Panel



No.	Description	
F1	Power Switch	1x Power ON/OFF Switch
F2	Reset Button	1x Reset Button
F3	Power Inlet	2x DC Jack Power-IN
F4	Console Port	1x RJ45 Console Port
F5	USB Port	2x USB 3.0 Ports
F6	LAN Ports	4x RJ45 GbE Ethernet Ports with LED
F7	LAN Ports	2x 10G SFP+ Ports with LED
F8	LAN Ports	2x 1G GbE RJ45 Ethernet Ports with LED (Optional support for PoE+)
F9	PoE+ Power Inlet	1x 65W/54V PoE+ Power Inlet (By Project)
F10	Antenna	2x SMA Antenna Holes (For LTE/5G)

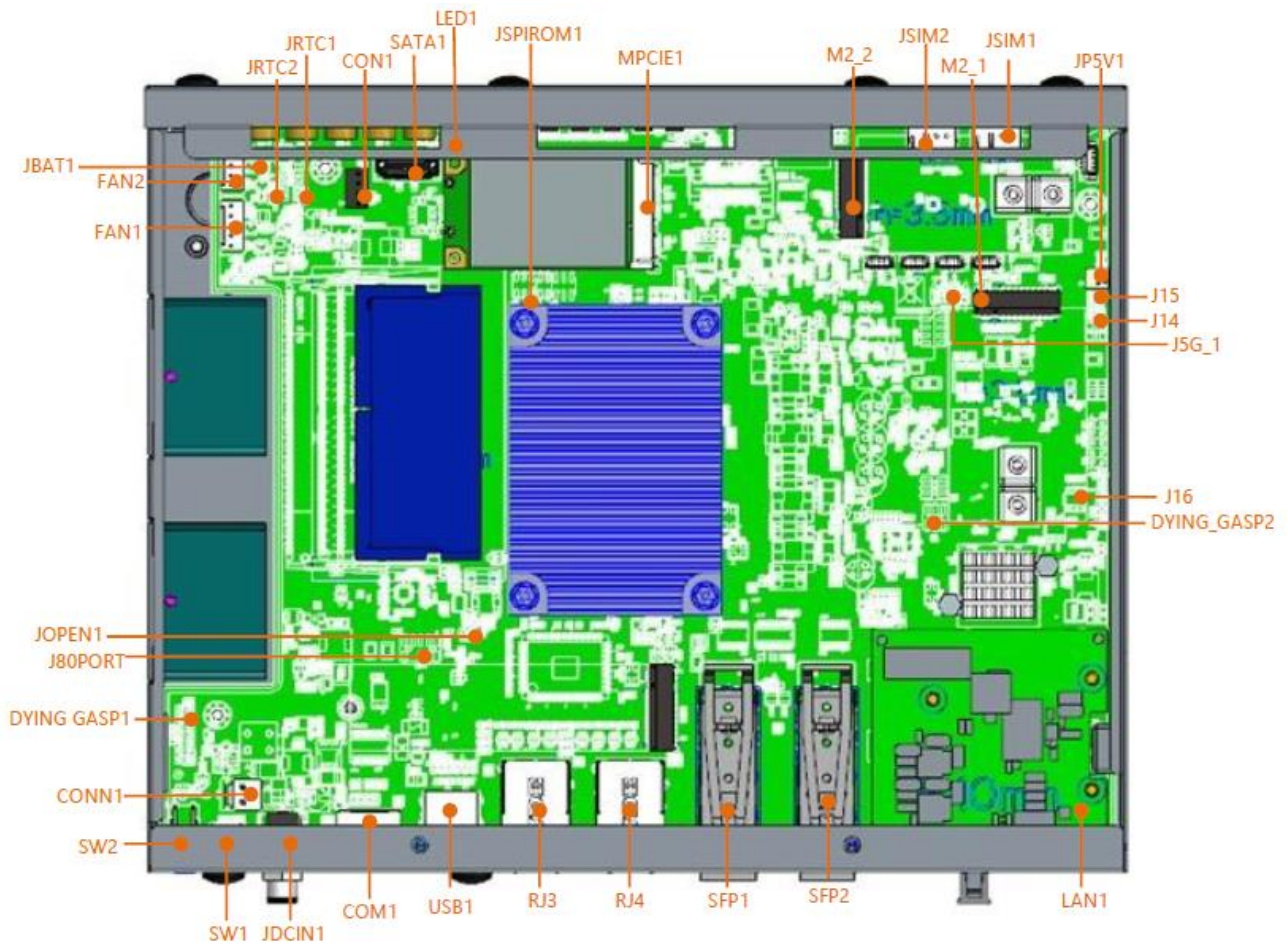
CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram



Jumpers and Connectors

The following displays the connectors and jumpers on the motherboard layout.



Jumper Setting and Connector Pin-out

The following references the pin assignments and internal connectors of NCA-1526.

JBAT1: RTC Battery Connector

Pin	Description
1	V_BATTERY
2	GND

COM1: Console Port

Pin	Description
1	COM1_RTS_N
2	COM1_DTR_N
3	COM1_TXD
4	LGND
5	LGND
6	COM1_RXD
7	COM1_DSR_N
8	COM1_CTS_N

CON1: SATA Power Connector

Pin	Description
1	P12V
2	GND
3	GND
4	P5V

CONN2: Power PIN Header

Pin	Description
1	GND
2	PWRON#

FAN1: System Fan

Pin	Description
5	SYSFANOUT
4	NC
3	FANIN
2	P12V
1	GND

FAN2: CPU Fan

Pin	Description
5	CPUFANOUT
4	NC
3	CPUFANIN
2	P12V
1	GND

J80PORT1: PORT80 Connector

Pin	Description	Pin	Description
1	CLK_LPC_OUT	2	SOC_LPC_LAD1
3	80PORT_RST#	4	SOC_LPC_LAD0
5	SOC_LPC_FRAME_N	6	P3V3_S
7	SOC_LPC_LAD3	8	NC
9	SOC_LPC_LAD2	10	GND

JOPEN1: Case Open Connector

Pin	Description
1	SIO_CASEOPEN0_N
2	GND

JRTC1: Clear CMOS

1-2: NORMAL

2-3: CLEAR RTC

Pin	Description
1	P3V3_RTC
2	SOC_SRTCRST_N
3	GND

JRTC2: Clear CMOS

1-2: NORMAL

2-3: CLEAR RTC

Pin	Description
1	P3V3_RTC
2	SOC_RTEST_N
3	GND

JSPIROM1: Flash BIOS Connector

Pin	Description	Pin	Description
1	SPI_HD1#	2	NC
3	SOC_SPI_CS0_R	4	P3V3_SB_SPI
5	SPI_MISO_DUAL_R	6	SPI_HOLD0_L
7	NC	8	SPI_CLK_DUAL_R
9	GND	10	SPI_MOSI_DUAL_R

M2_2: M.2 LTE Connector (Only for LTE)

Pin	Description	Pin	Description
1	NC	2	P3V3
3	GND	4	P3V3
5	GND	6	PWROFF#
7	USB2_SB_L_DP	8	W_DIS#
9	USB2_SB_L_DN	10	NC
11	GND	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	UIM1_VPP1
29	USB3_HRX_L_DTX_N	30	UIM1_RST1
31	USB3_HRX_L_DTX_P	32	UIM1_CLK1
33	GND	34	UIM1_DAT1
35	USB3_HTX_L_DRX_N	36	UIM1_PWR
37	USB3_HTX_L_DRX_P	38	NC
39	GND	40	NC
41	NC	42	NC
43	NC	44	NC
45	GND	46	NC
47	NC	48	NC
49	NC	50	NGFF_LTE_RST#
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC

57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	NC	70	P3V3
71	GND	72	P3V3
73	GND	74	P3V3
75	NC		

M2_SATA1: M.2 Storage Connector (Only for Storage)

Pin	Description	Pin	Description
1	GND	2	P3V3
3	GND	4	P3V3
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	GND	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	NC
41	SATA_HRX_C_DTX_P	42	NC
43	SATA_HRX_C_DTX_N	44	NC
45	GND	46	NC
47	SATA_HTX_C_DRX_N	48	NC
49	SATA_HTX_C_DRX_P	50	NGFF_STORAGE_RST#

51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	P3V3
71	GND	72	P3V3
73	GND	74	P3V3
75	GND		

MPCIE1: Mini PCIE 52-PIN

Pin	Description	Pin	Description
1	NC	2	P3V3
3	NC	4	GND
5	NC	6	NC
7	CLKREQ_MPCIE_SLOT2	8	NC
9	GND	10	NC
11	CLK_PCIE_SLOT_N	12	NC
13	CLK_PCIE_SLOT_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	P3V3
21	GND	22	MINI_PCI_RST#
23	PEX_RXN	24	P3V3
25	PEX_RXP	26	GND
27	GND	28	NC
29	GND	30	SMB_MPCIE_CLK
31	PEX_TXN_C	32	SMB_MPCIE_DATA
33	PEX_TXP_C	34	GND
35	GND	36	USB2_P0_DN_L
37	GND	38	USB2_P0_DP_L
39	P3V3	40	GND
41	P3V3	42	NC
43	GND	44	NC

45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	P3V3

M2_1: M.2 Connector (For 5G/Wi-Fi)

Pin	Description	Pin	Description
1	NC	2	W_DIS#
3	GND	4	NC
5	GND	6	NC
7	USB1_SB_L_DP	8	NC
9	USB1_SB_L_DN	10	NC
11	GND	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	NC	22	UIM1_VPP1
23	NC	24	UIM1_RST1
25	NC	26	UIM1_CLK1
27	GND	28	UIM1_DAT1
29	USB3_HRX_L_DTX_N16	30	UIM1_PWR
31	USB3_HRX_L_DTX_P16	32	NC
33	GND	34	NC
35	USB3_HTX_L_DRX_N16	36	NC
37	USB3_HTX_L_DRX_P16	38	NC
39	GND	40	NC
41	NC	42	NC
43	NC	44	NGFF_LTE_RST#
45	GND	46	NC
47	NC	48	NC
49	NC	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC

63	NC	64	P3V3
65	NC	66	P3V3
67	NC	68	P3V3
69	NC	70	W_DIS#
71	GND	72	NC
73	GND	74	NC
75	NC		

CONN1: DC Power Connector

Pin	Description
2	GND
1	P12V_SB

SATA1: SATA Connector

Pin	Description
1	GND
2	SATA_TX_DP_C
3	SATA_TX_DN_C
4	GND
5	SATA_RX_DN_C
6	SATA_RX_DP_C
7	GND

SIM2: M2_LTE SIM Card Slot

Pin	Description	Pin	Description
C1	UIM1_PWR	C4	UIM1_DAT1
C2	UIM1_RST1	C5	UIM1_VPP1
C3	UIM1_CLK1	C6	GND

SW1: Reset Button

Pin	Description	Pin	Description
4	GND	3	GND
2	GND	1	SW_RST_GP_N

SW2: Power Button

Pin	Description	Pin	Description
4	PWRON#	2	GND
3	PWRON#	1	GND
L2	PRLED-	L1	SUSLED

ATX1: 4-Pin Power Connector

Pin	Description
1	GND
2	12VSB
3	GND
4	12VSB

J14: SIM Socket Selection

SEL = 1, Host 2 → Card1 SIM Socket for Mini-PCIE 1st SIM Card

SEL = 0, Host 1 → Card1 (Default) SIM Socket for M2_1 (LTE) 2nd SIM Card

Pin	Description
1	P3V3
2	UIM1_SEL
3	GND

J15: SIM Socket Selection

SEL = 1, Host 2 → Card1 (Default) SIM Socket for M2_2 (5G) 1st SIM Card

SEL = 0, Host 1 → Card1 SIM Socket for M2_1 (LTE) 1st SIM Card

Pin	Description
1	P3V3
2	UIM2_SEL
3	GND

J5G_1: 5G Module Selection Pin Header

1-2/3-4/5-6/7-8/9-10 short for EM9190, remove for FM980n

Pin	Description	Pin	Description
1	PCIE_DIS	2	1.8V
3	VBUS_SENSE	4	1.8V
5	EM9190_VCC1	6	1.8V
7	EM9190_VCC2	8	1.8V
9	EM9190_VCC3	10	1.8V

JP5V1: 5V Power Connector for Feed Wi-Fi 6 Module

Pin	Description
1	GND
2	P5V5

J16: For Using Dying Gasp Module Pin Selection**1-2 For Dying Gasp****2-3 For Normal SFP+ Module**

Pin	Description
1	P3V3_SFP+
2	SFP+0_RS0
3	GND

1: Dying Gasp Board Pin Header1

Pin	Description	Pin	Description
1	P3V3_STBY	2	P3V3
3	P3V3_STBY	4	P3V3
5	P3V3_STBY	6	P3V3
7	GND	8	GND
9	GND	10	GND
11	GND	12	GND
13	P12V_UNDERVOLTAGE	14	RS_4

DYING_GASP2: Dying Gasp Board Pin Header 2

Pin	Description	Pin	Description
1	RESET_STATUS	2	EN_SCAP_CHARGE
3	SCAP_STATUS_FULL	4	DGPFI
5	NC	6	NC

CHAPTER 3: HARDWARE SETUP

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

Opening the Chassis

1. Power off the system and remove all power connections.
2. Locate and remove the six (6) screws on the chassis cover.

Right Side



Left Side



Top Side



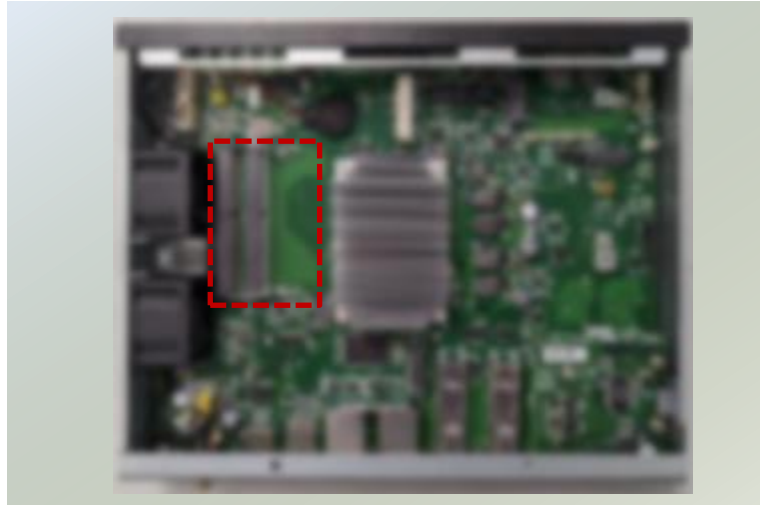
3. Gently slide the chassis cover away from the system and lift the cover to remove.



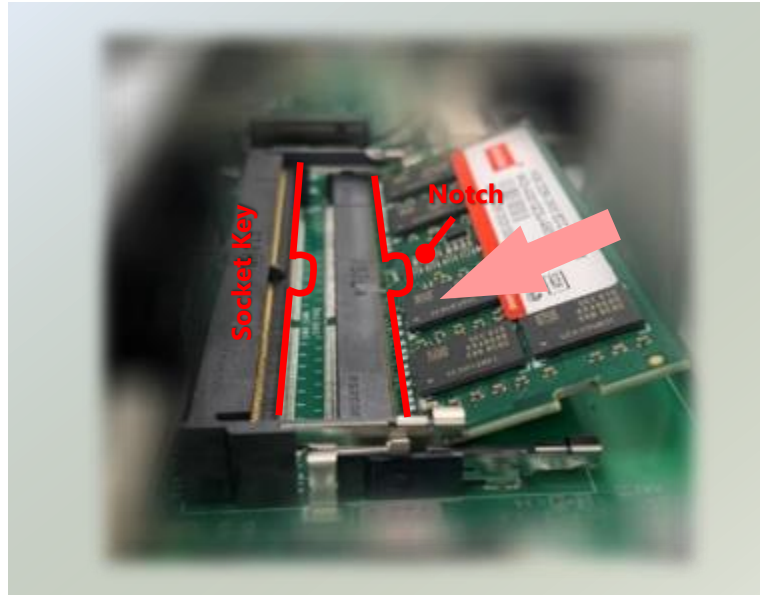
Installing the System Memory

The motherboard supports two DDR4 2933/2400MHz SO-DIMM system memory. Please follow the steps below to install the DIMM memory module.

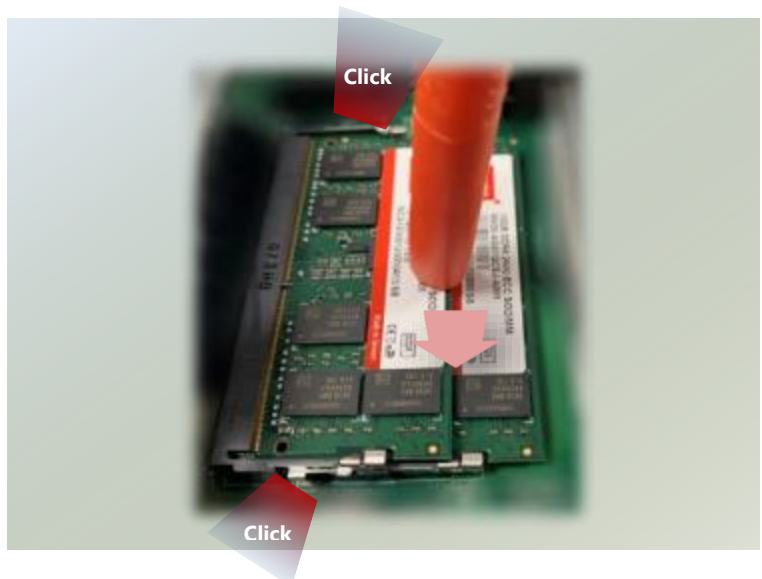
1. Power off the system and open the chassis cover.
2. Locate the system memory slot.



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



4. Push down on the module until the slot latch catches and clicks into place.



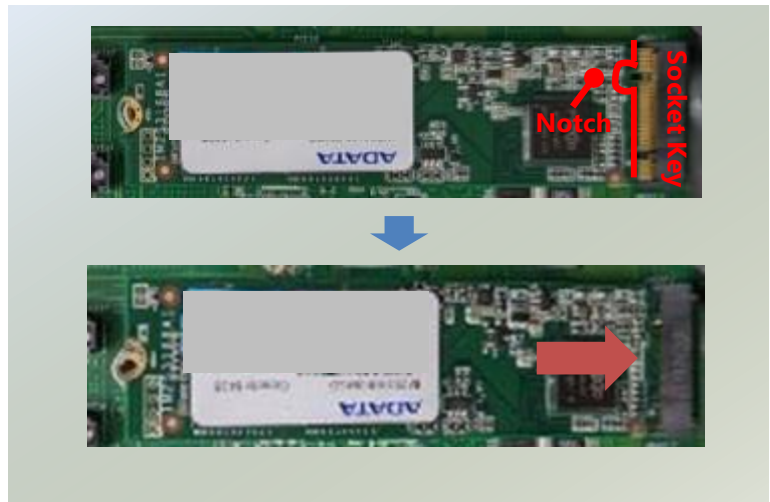
Installing M.2 Storage Module (Optional)

The system supports one M.2 slot for additional data storage. Please follow the steps for installation.

1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.



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



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



Installing Wi-Fi Module Card (Optional)

The system supports one mini-PCIe slot for a Wi-Fi or BT module card. Wi-Fi module requires two antennas. Please follow the steps to install the Wi-Fi module card.

1. Power off the system and open the chassis cover.
2. Locate the mPCIe slot on the motherboard.



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 a screw.



Installing Wi-Fi Antennas

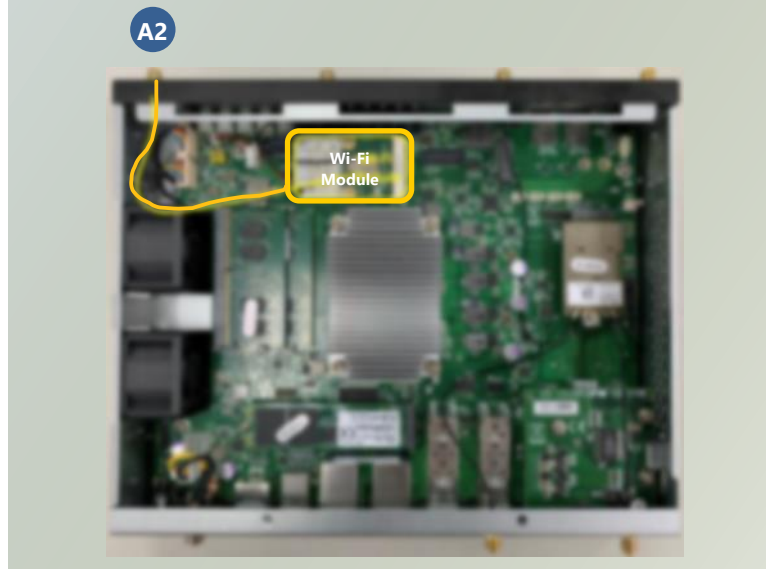
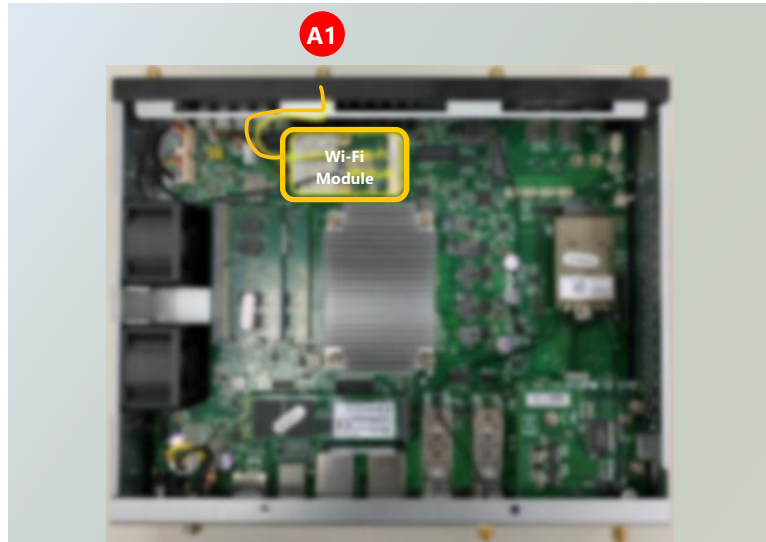
Rear Panel



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



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



3. Then, screw on the antennas on the outside of the system.



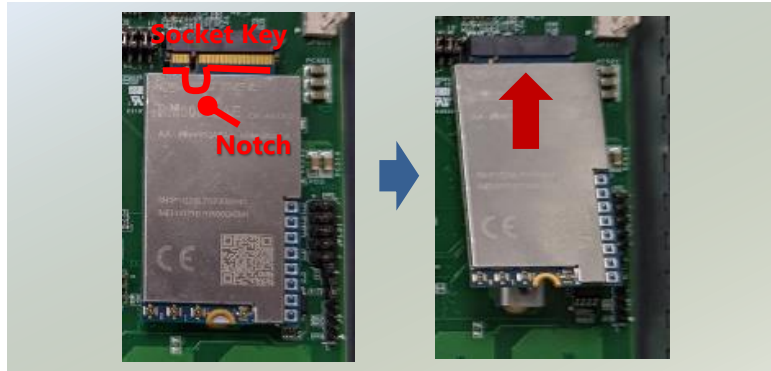
Installing LTE/5G Module Card (Optional)

The motherboard provides two M.2 slot for LTE/5G module card expansion. LTE module requires two antennas, and 5G module requires four antennas. Please follow the procedures for installation.

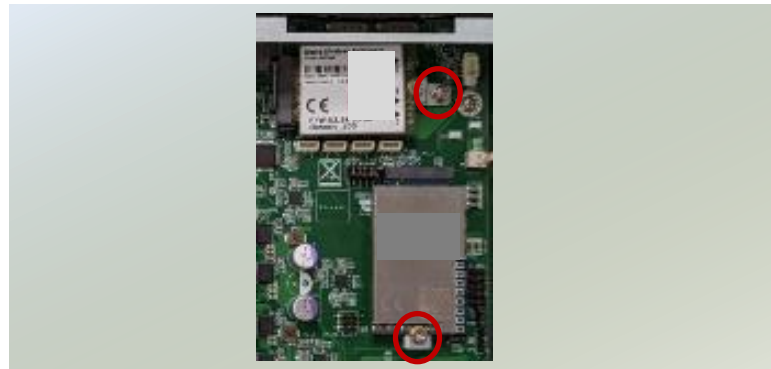
1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.



3. Align the notch of the 5G module card with the socket key in the pin slot.
4. Insert the 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 a screw.



Installing 5G Antennas

Front Panel



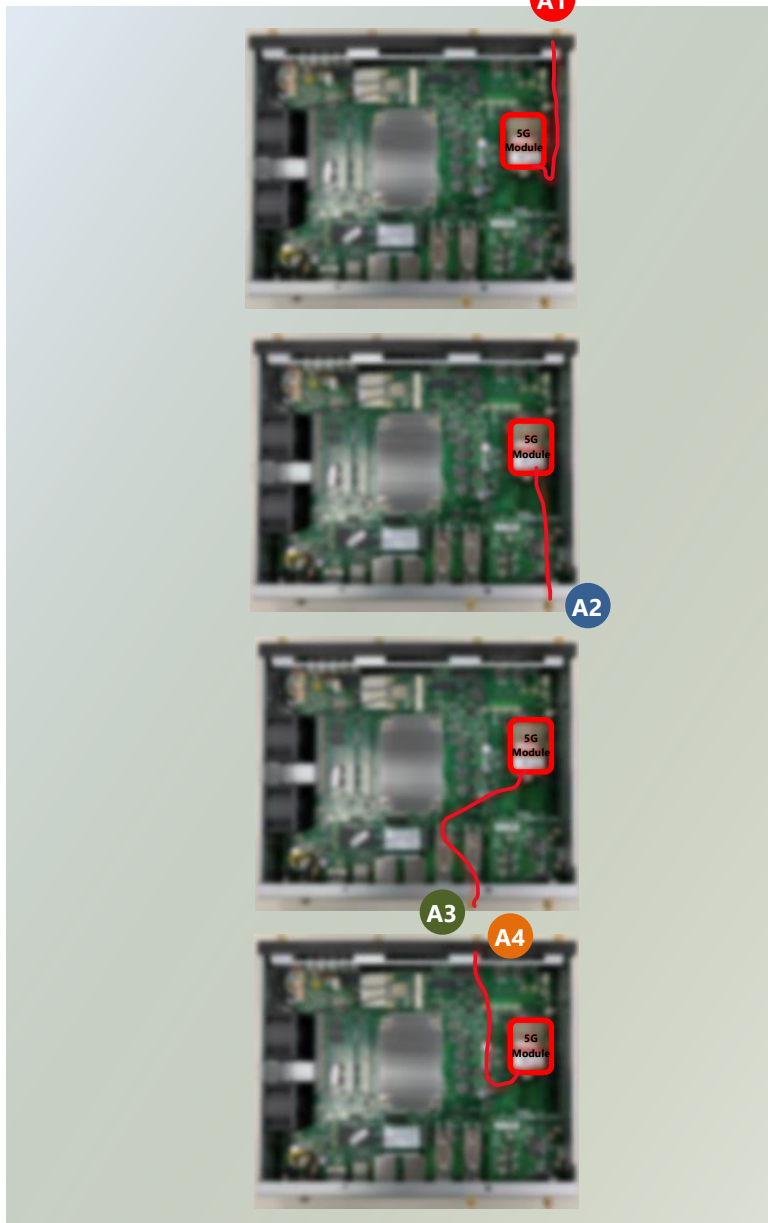
Rear Panel



1. Locate the four (4) antenna hole placement (A1, A2, A3, A4) on the front and rear panel. Locate the two four (4) antenna IPEX connectors on the 5G module card.



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



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



Installing SIM card (Optional)

The SIM slot on the front panel supports the LTE/5G module card (optional). Please follow the steps below for SIM card placement.

1. Power off the system.
2. Locate the SIM slot cover. Unscrew the two (2) screw securing the cover.



3. Gently remove the SIM slot cover.
4. Insert and push the Nano-SIM card, gold contacts facing downwards, all the way in until it clicks into place. Repeat if dual Nano-SIM cards will be place.



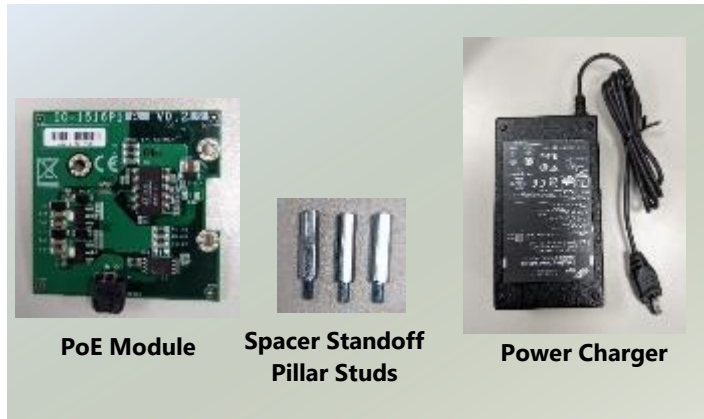
5. To remove the Nano-SIM cards, use your fingertips to push it once, to have the card automatically eject.
6. Place the slot door back and tighten the one (1) screw.

Installing PoE Module Kit (Optional)

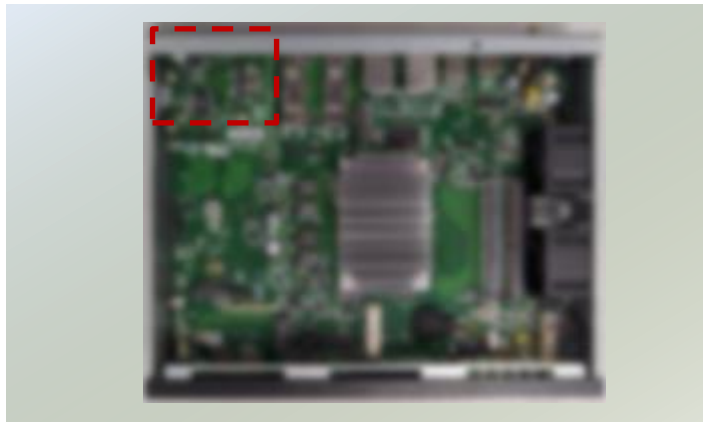
The motherboard supports one PoE module slot. Please follow the steps below to install the PoE kit.

1. The PoE Module Kit includes:

- ▶ 1x PoE Module
- ▶ 3x Spacer Standoff Pillar Studs
- ▶ 1x Power Adapter



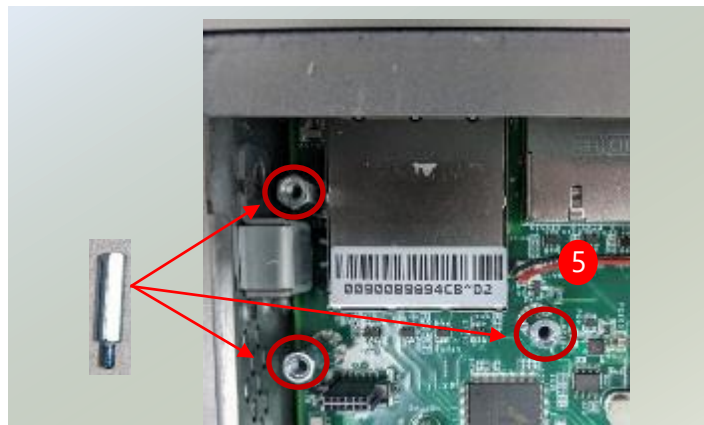
2. Power off the system and open the chassis cover.
3. Locate the PoE Module slot placement.



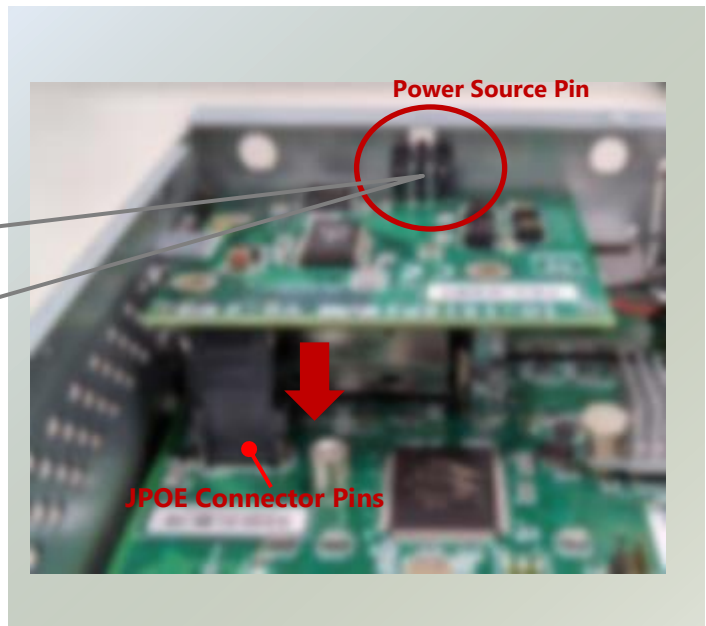
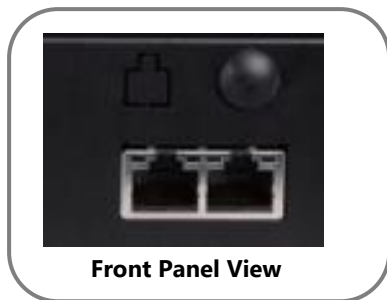
4. Remove the three (3) screws



5. Replace the three (3) screws with the spacer standoff pillar studs.



- Align the top power source pin to the chassis rear opening spot, and insert the bottom pins into JPOE connector pins.



- Screw in the original three (3) screws to secure the PoE module board.



- Connect the power source pin to the power adapter.



CHAPTER 4: BIOS SETUP

BIOS (Basic Input / Output System) is the program that controls the computer boot process. BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats.

Entering Setup

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

1. Boot up the system.
2. Pressing the **<Tab>** or **** key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

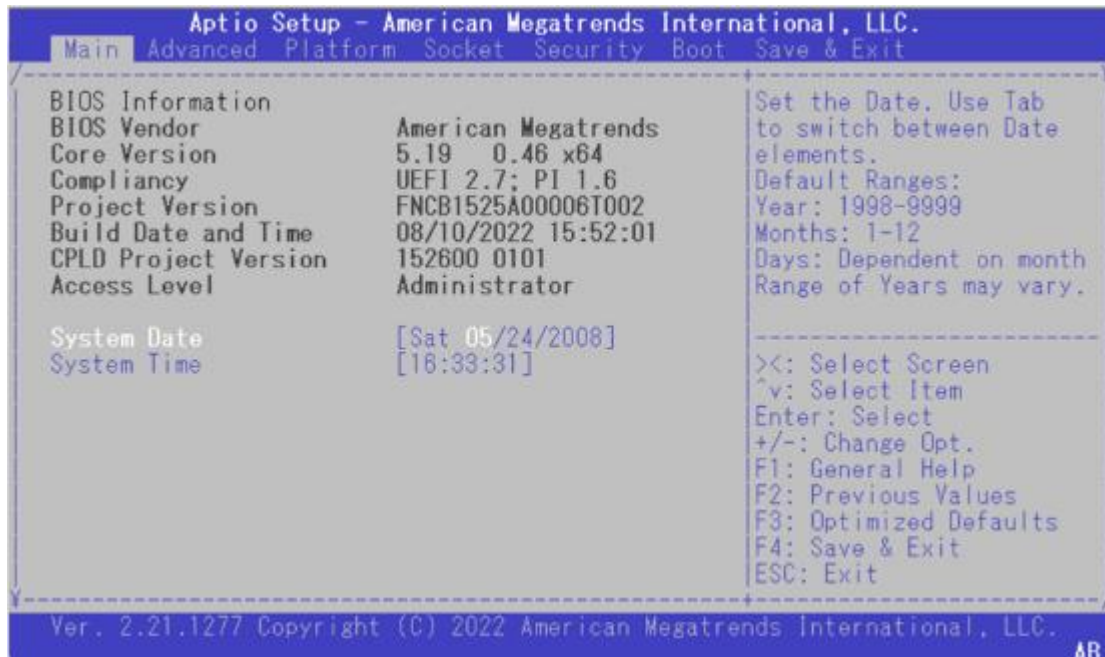
Control Keys	Description
→←	select a setup screen
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	adjust values for the selected setup item/option
F1	display General Help screen
F2	retrieve previous values, such as the last configured parameters during the last time you entered BIOS
F3	load optimized default values
F4	save configurations and exit BIOS
<Esc>	exit the current screen



Note: The images in the following section are for reference only.

Main Page

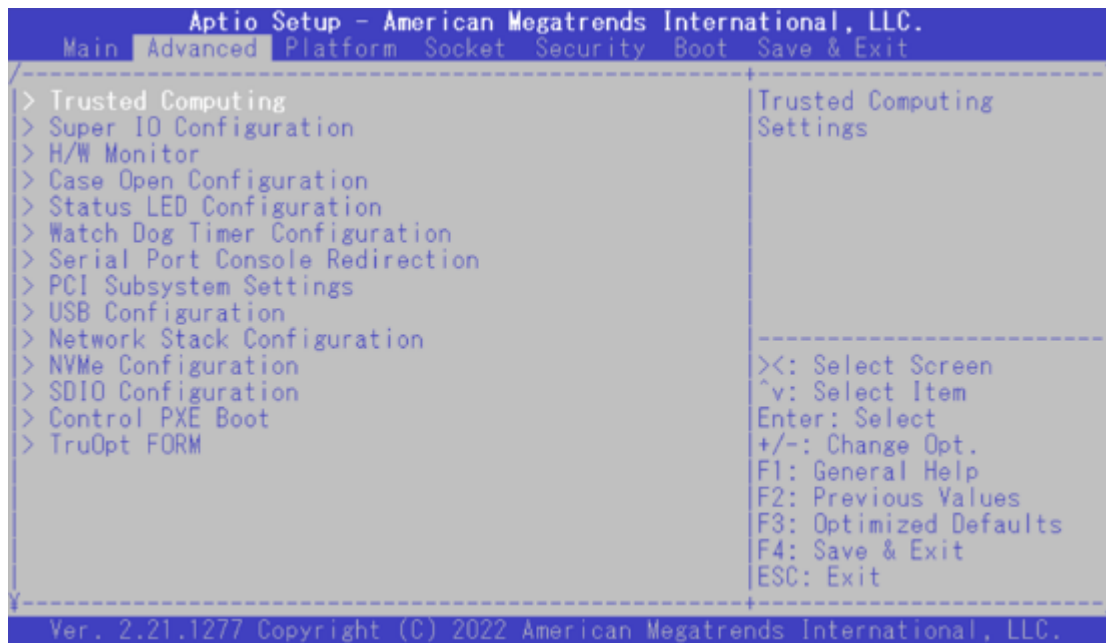
Setup main page contains BIOS information and project version information.



Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliance: 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

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.



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.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1 PCR Bank.
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.
TPM2.0 UEFI Spec Version	TCG_1_2 TCG_2	Select the TCG2 Spec Version, TCG_1_2 : Supports the Compatible mode for Win8/Win10 TCG_2 : Supports new TCG2 protocol and event format for Win10 or later.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE : Some HCK tests might not support 1.3.
TPM 20 Interface Type	TIS	Select TPM 20 Device for the Communication Interface.
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



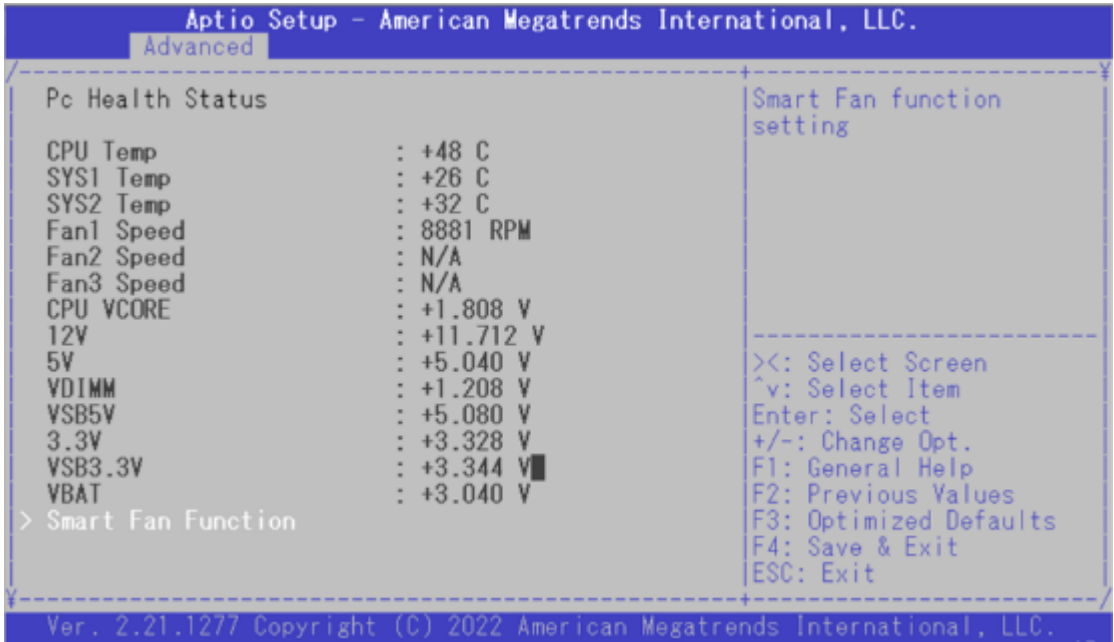
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings		

Serial Port 2 Configuration



Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings		

H/W Monitor



Feature	Options	Description
Smart Fan 2 Mode	Manual mode SMART FAN IV	Smart Fan 2 Mode Select

Case Open Configuration



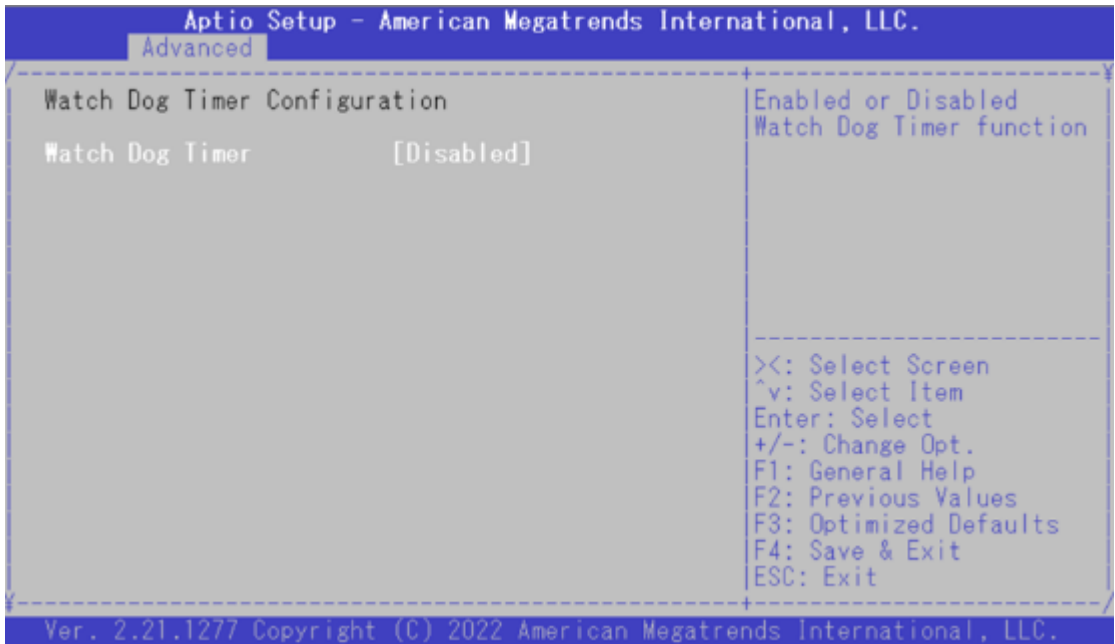
Feature	Options	Description
Case Open	Enabled Disabled	Enables or disables Case Open function

Status LED Configuration



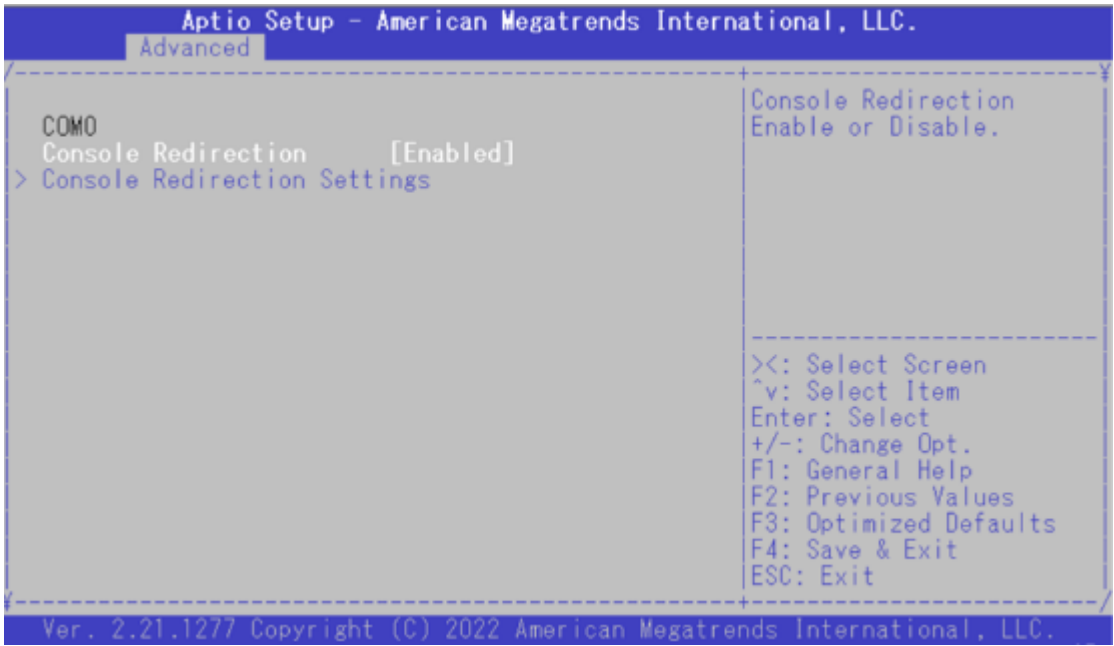
Feature	Options	Description
Status LED	OFF GREEN RED	Configures Status LED color

Watch Dog Timer Configuration



Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enables or disables Watch Dog Timer function
Watch Dog Timer Count Mode	Second Mode Minute Mode	Select Second Mode or Minute Mode
Watch Dog Timer Time out Value	60	Watch Dog Timer Time out Value.

Serial Port Console Redirection



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

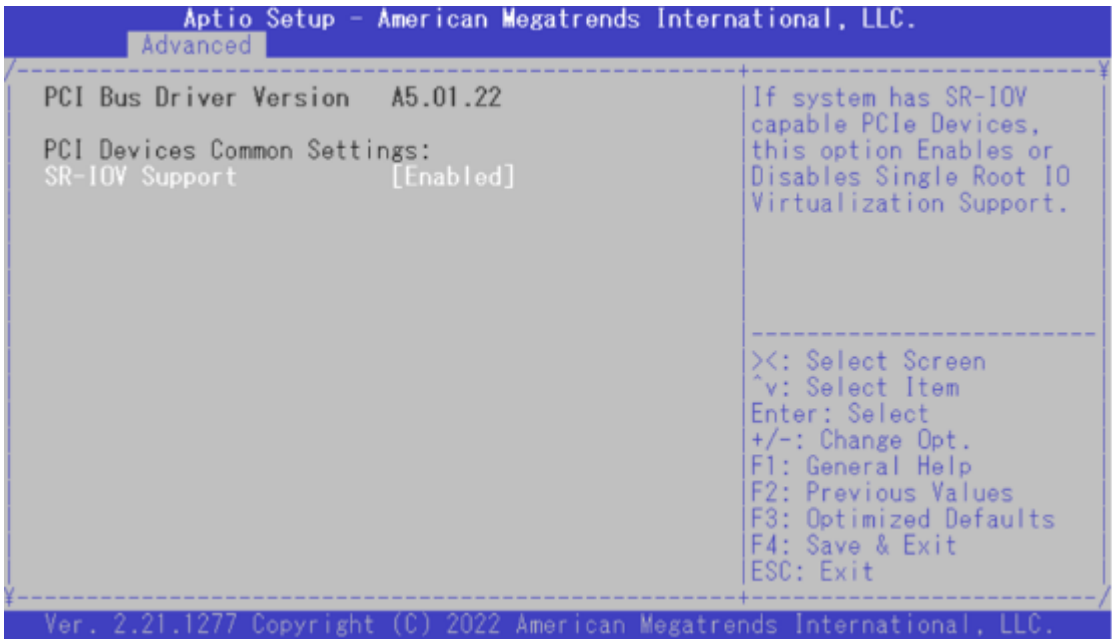
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	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 ANSI: Extended ASCII char set
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 FunctionKey and KeyPad on Putty.

PCI Subsystem Setting



Feature	Options	Description
SR-IOV Support	Disabled Enabled	If the system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

USB Configuration



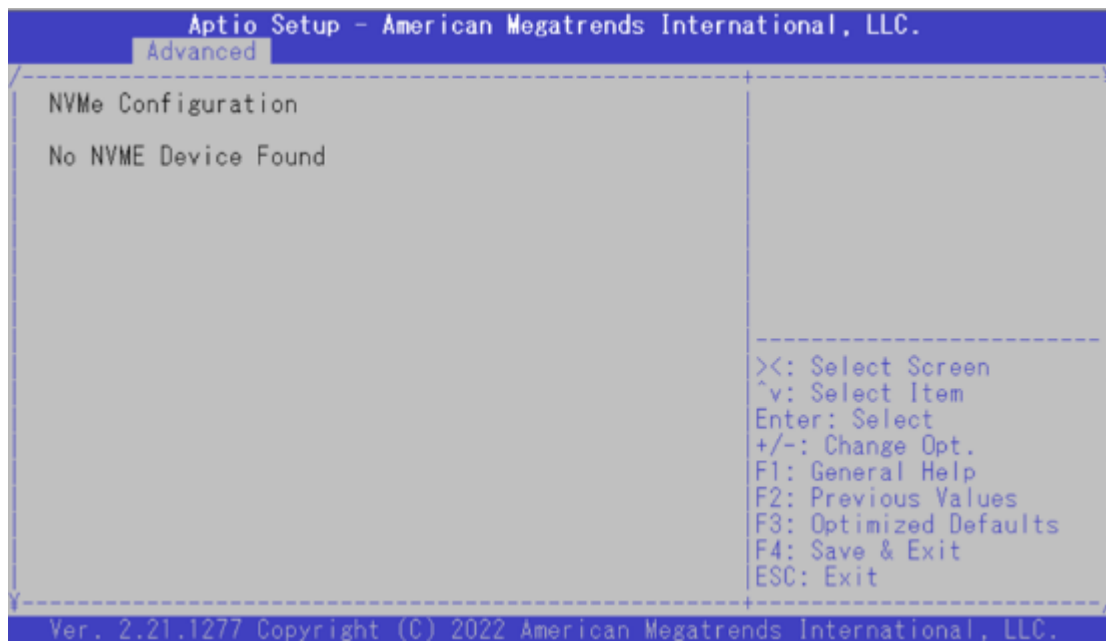
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. Auto option disables legacy support if no USB devices are connected; Disabled option will keep USB devices available only for EFI applications.
USB Mass Storage Driver Support	Enabled Disabled	Enables or 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

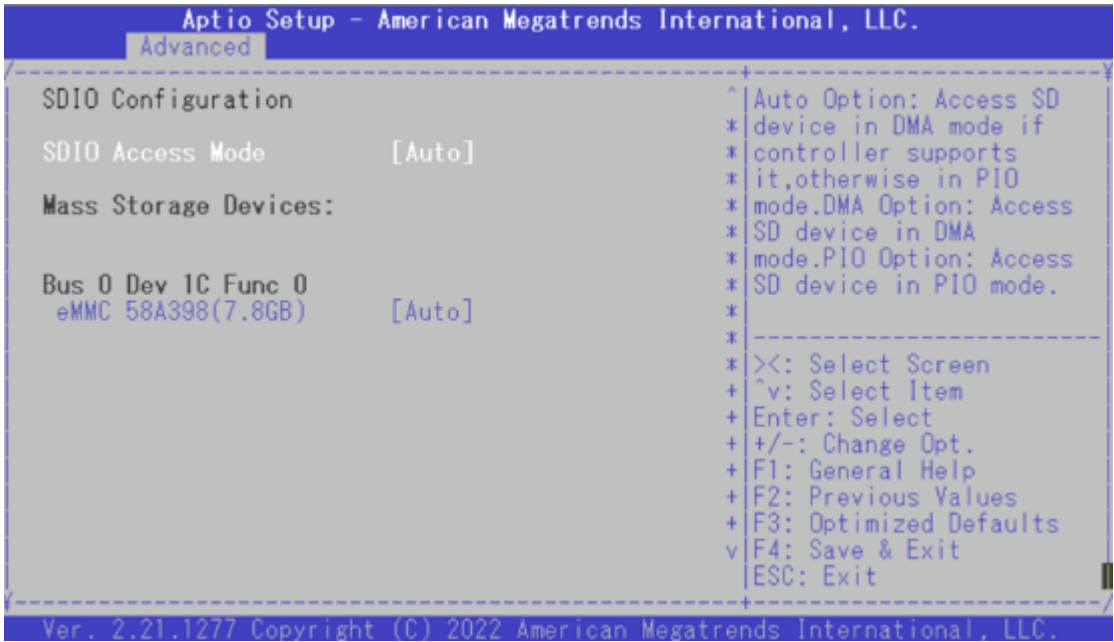


Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
Ipv4 PXE Support	Disabled Enabled	Enables Ipv4 PXE Boot Support. If IPV4 is disabled, PXE boot option will not be created.
Ipv4 HTTP Support	Disabled Enabled	Enables Ipv4 HTTP Boot Support. If IPV4 is disabled, HTTP boot option will not be created.
Ipv6 PXE Support	Disabled Enabled	Enables Ipv6 PXE Boot Support. If IPV6 is disabled, PXE boot option will not be created.
Ipv6 HTTP Support	Disabled Enabled	Enables Ipv6 HTTP Boot Support. If IPV6 is disabled, HTTP boot option will not be created.
PXE boot wait time	0	Wait time to press <ESC> key to abort the PXE boot
Media detect count	1	Number of times the presence of media will be checked

NVMe Configuration



SDIO Configuration



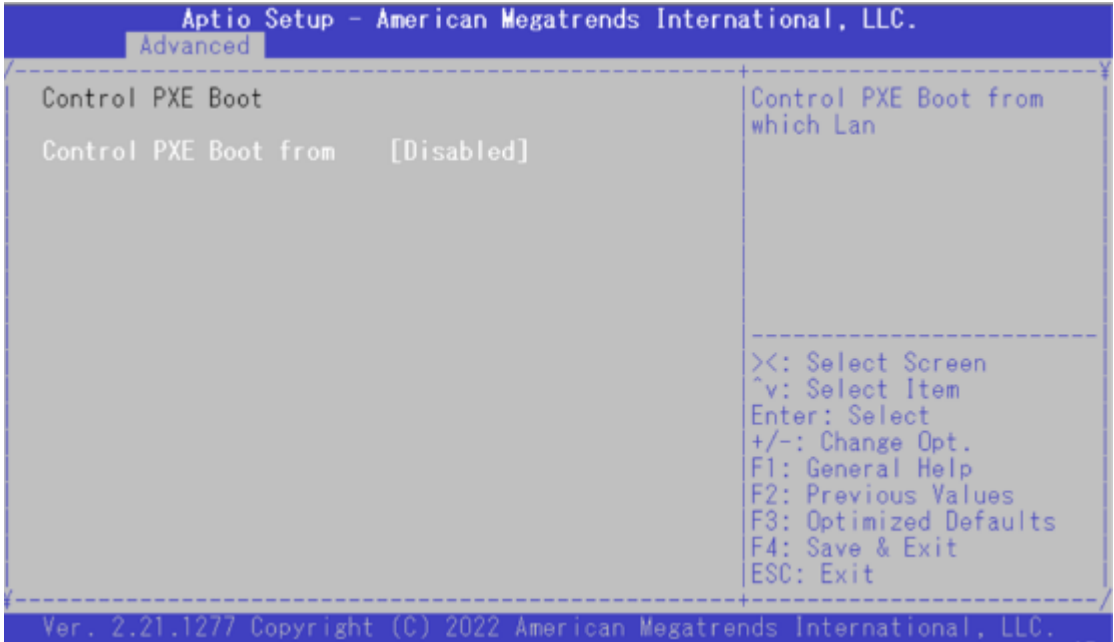
Feature	Options	Description
SDIO Access Mode	Auto	Auto Option: Access SD device in DMA mode if controller supports it, otherwise in PIO mode.
	ADMA	
	SDMA	DMA Option: Access SD device in DMA mode.
	PIO	PIO Option: Access SD device in PIO mode.

Control PXE Boot



Feature	Options	Description
Control PXE Boot from	Disabled	Control PXE Boot from which Lan
	Lan1	
	Lan2	
	Lan3	
	Lan4	

TruOpt FORM



Feature	Options	Description
TruOpt	Optimize Manual	Lanner optimization

Platform

Select the **Platform** 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.



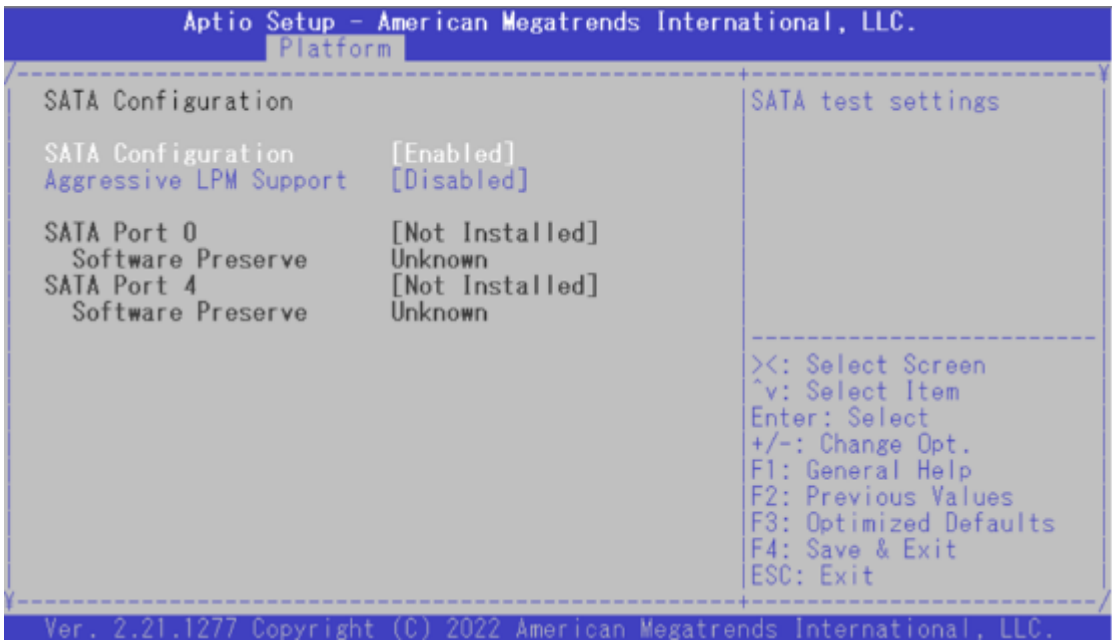
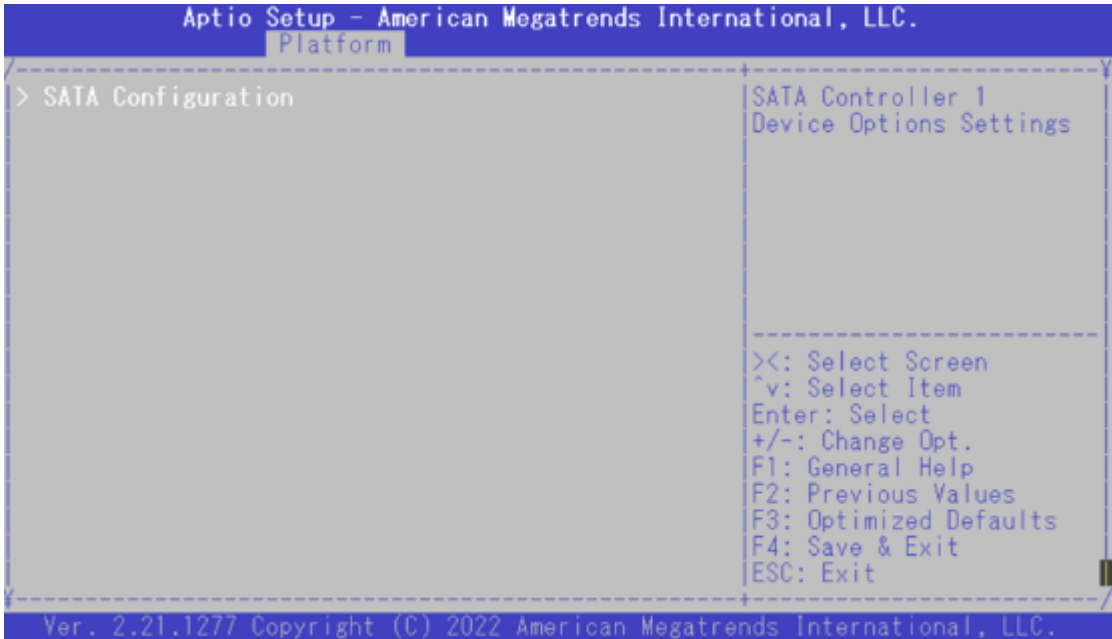
Feature	Options	Description
PCH-IO Configuration	None	PCH Parameters
Server ME Configuration	None	Configure Server ME Technology Parameters
System Event Log	None	Press <Enter> to view or change the event log configuration.

PCH-IO Configuration



Feature	Options	Description
PCH SATA Configuration	None	Device Options settings
Restore AC Power Loss	Power On Power Off Last State	Select S0/S5 for ACPI state after a G3
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode.

SATA Configuration

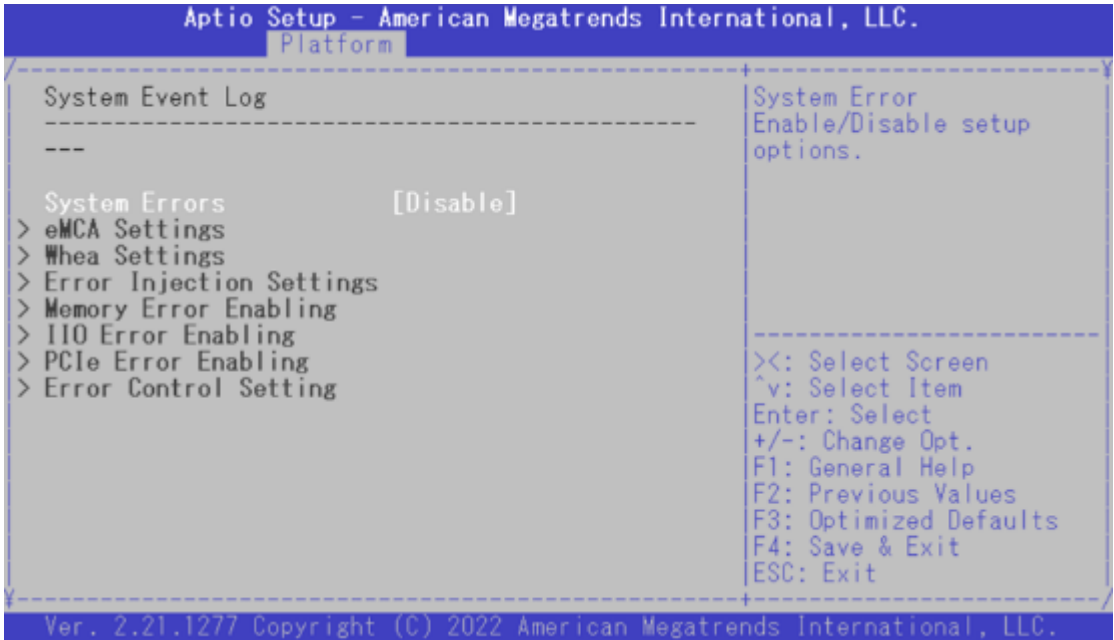


Feature	Options	Description
SATA Configuration	Disabled Enabled	SATA test settings
Aggressive LPM Support	Disabled Enabled	Enable PCH to aggressively enter link power state.

Server ME Configuration



System Event Log



Feature	Options	Description
System Errors	Disabled Enabled	System Error Enable/Disable setup options.

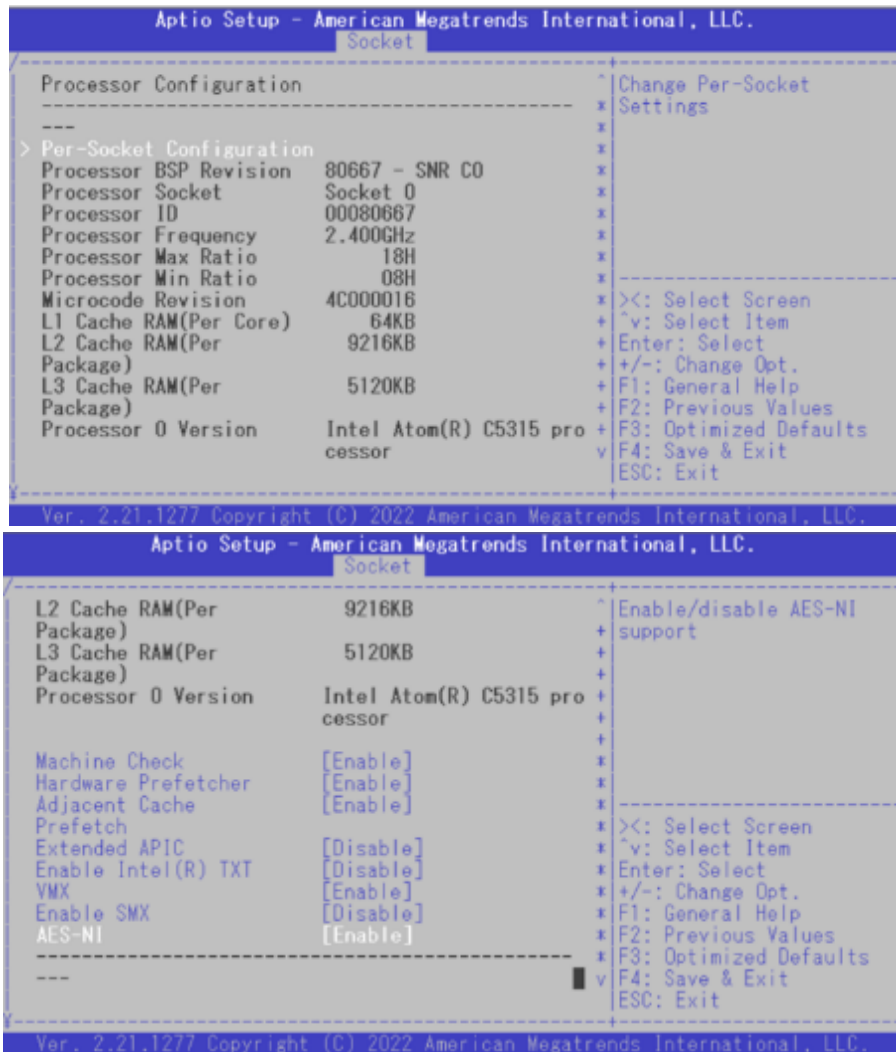
Socket

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



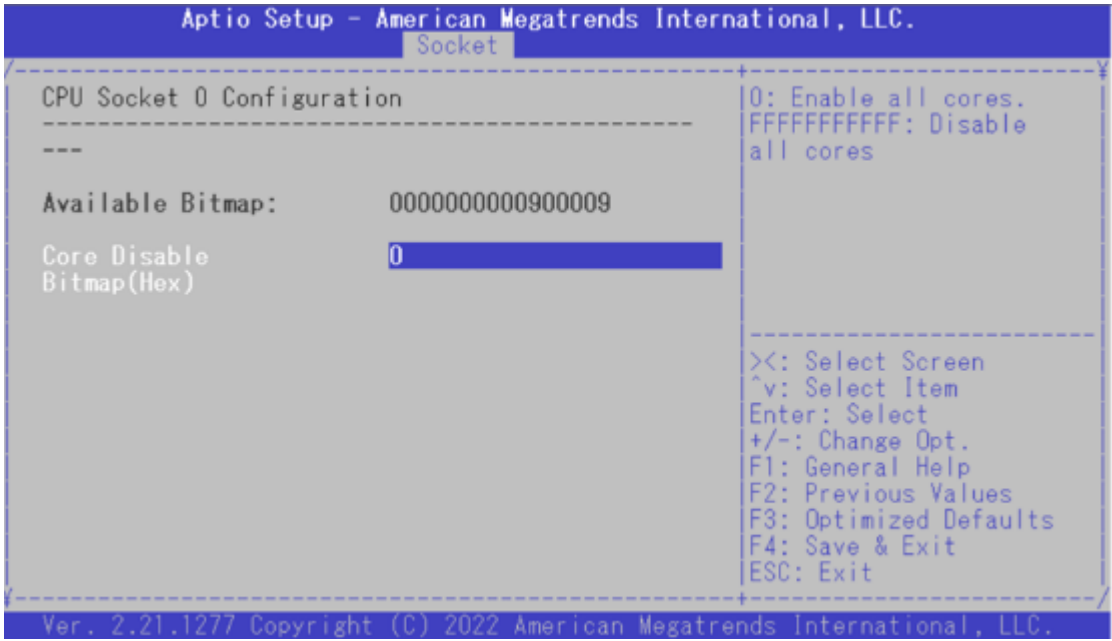
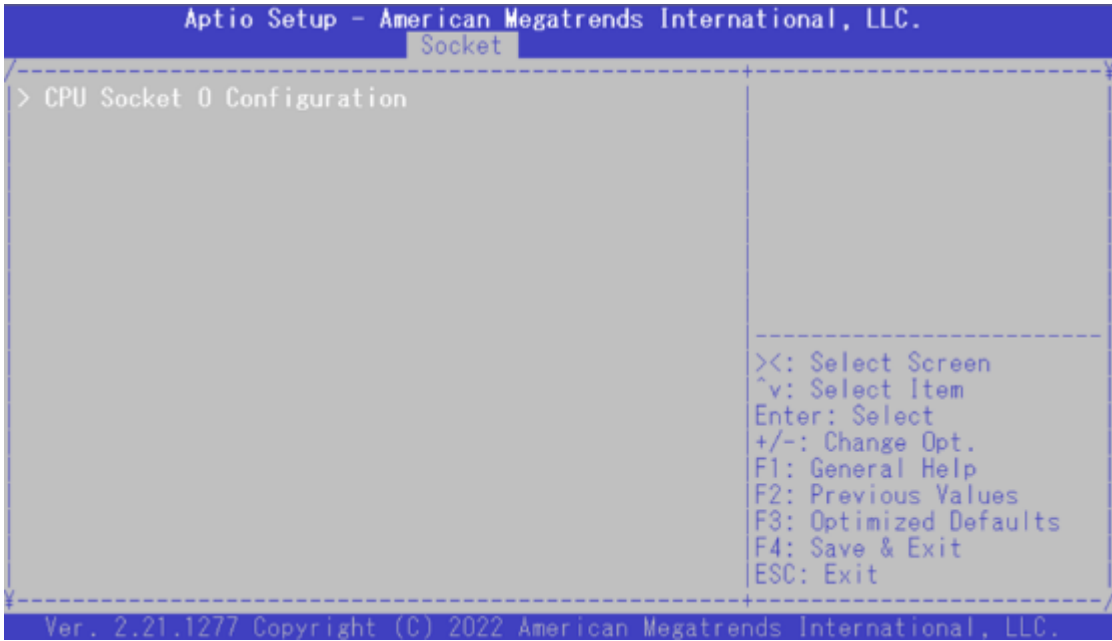
Feature	Options	Description
Processor Configuration	None	Displays and provides option to change the Processor Settings
Memory Configuration	None	Displays and provides option to change the Memory Settings
IIO Configuration	None	Displays and provides option to change the IIO Settings
Advanced Power Management Configuration	None	Displays and provides option to change the Power Management Settings

Processor Configuration



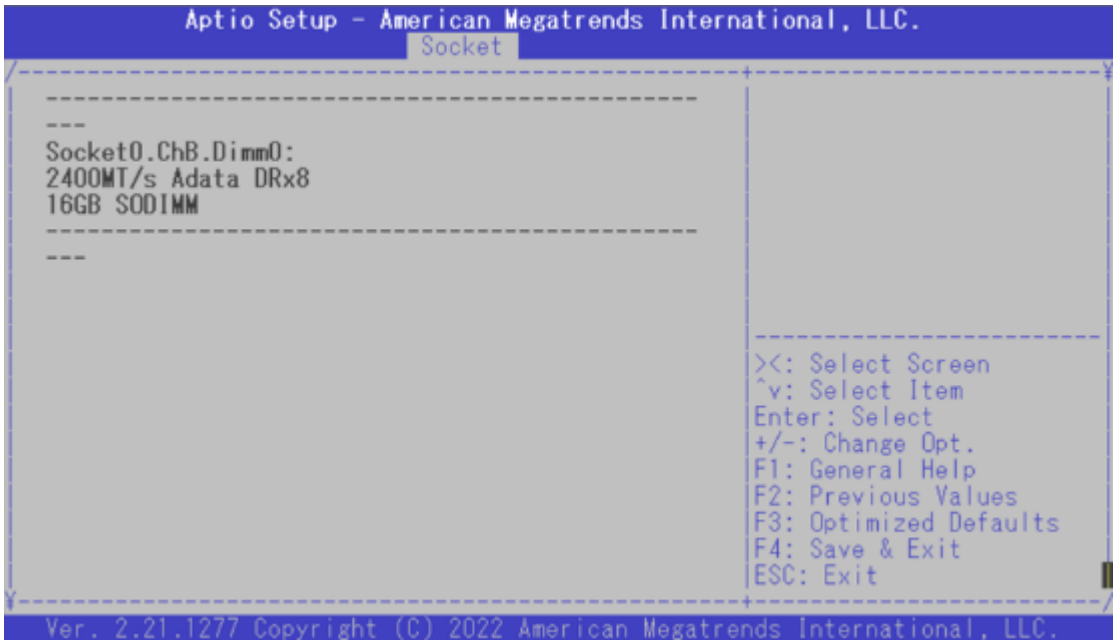
Feature	Options	Description
Machine Check	Disabled Enabled	Enable or Disable the Machine Check
Hardware Prefetcher	Disabled Enabled	= MLC Streamer Prefetcher (MSR 1A4h Bit [0])
Adjacent Cache Prefetcher	Disabled Enabled	= MLC Spatial Prefetcher (MSR 1A4h Bit [1])
Extended APIC	Disabled Enabled	Enables / disables extended APIC support. Note: This will enable VT-d automatically if x2APIC is enabled
Enable Intel(R) TXT	Disabled Enabled	Enables Intel(R) TXT.
VMX	Disabled Enabled	Enables the Vanderpool Technology, which takes effect after reboot.
Enable SMX	Disabled Enabled	Enables Safer Mode Extensions
AES-NI	Disabled Enabled	Enable/disable AES-NI support

Per-Socket Configuration



Feature	Options	Description
Core Disable Bitmap(Hex)	0	0: Enable All cores. FFFFFFFF: Disable all cores

Memory Configuration



Feature	Options	Description
Memory Topology	None	Displays memory topology with Dimm population information

I/O Configuration



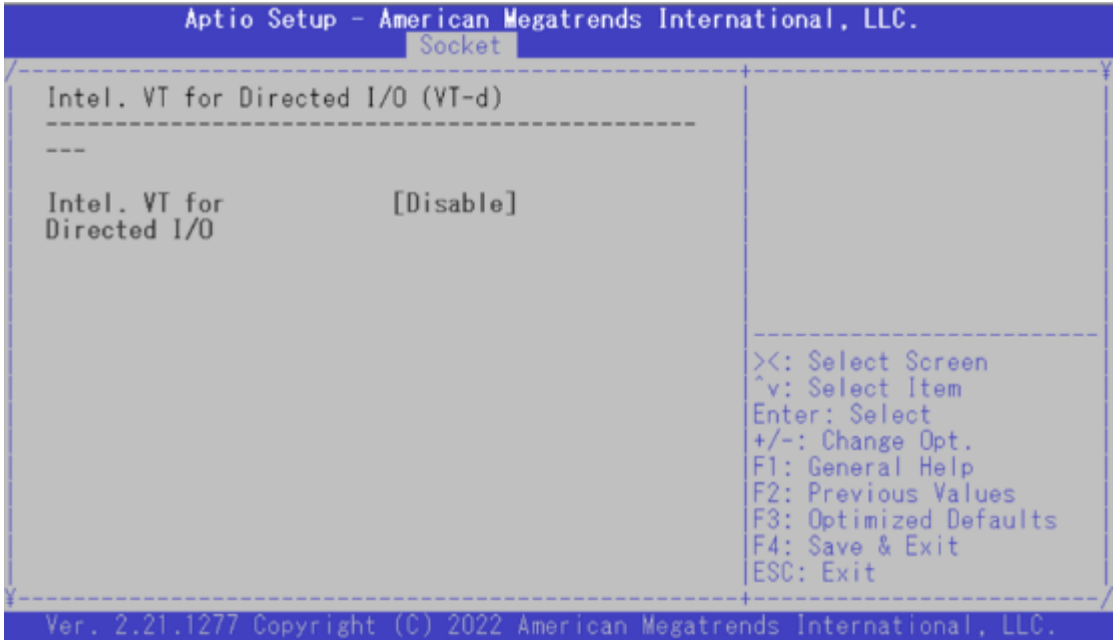
Feature	Options	Description
IOAT Configuration	None	All IOAT configuration options
Intel® VT for Directed I/O (VT-d)	None	Press <Enter> to bring up the Intel® VT for Directed I/O (VT-d) Configuration menu.
PCI-E ASPM Support (Global)	No Per-Port L1 Only	This option enables / disables the ASPM support for all downstream devices.
PCIe Extended Tag Enable	Auto No Yes	Auto/Enable - BIOS sets 8-bit Tag Field for PCIe Root Port/EndPoint. Disable - BIOS sets 5-bit Tag Field for PCIe Root Port/EndPoint
PCIe Max Read Request Size	Auto 128B 256B 512B 1024B 2048B 4096B	Set Max Read Request Size in EndPoints

IOAT Configuration



Feature	Options	Description
Sck0 IOAT Config	None	None
Disable TPH	No Yes	TLP Processing Hint disable
Prioritize TPH	Disabled Enabled	Prioritize TPH
Relaxed Ordering	No Yes	Relaxed Ordering Enable/Disable

Intel® VT for Directed I/O (VT-d)



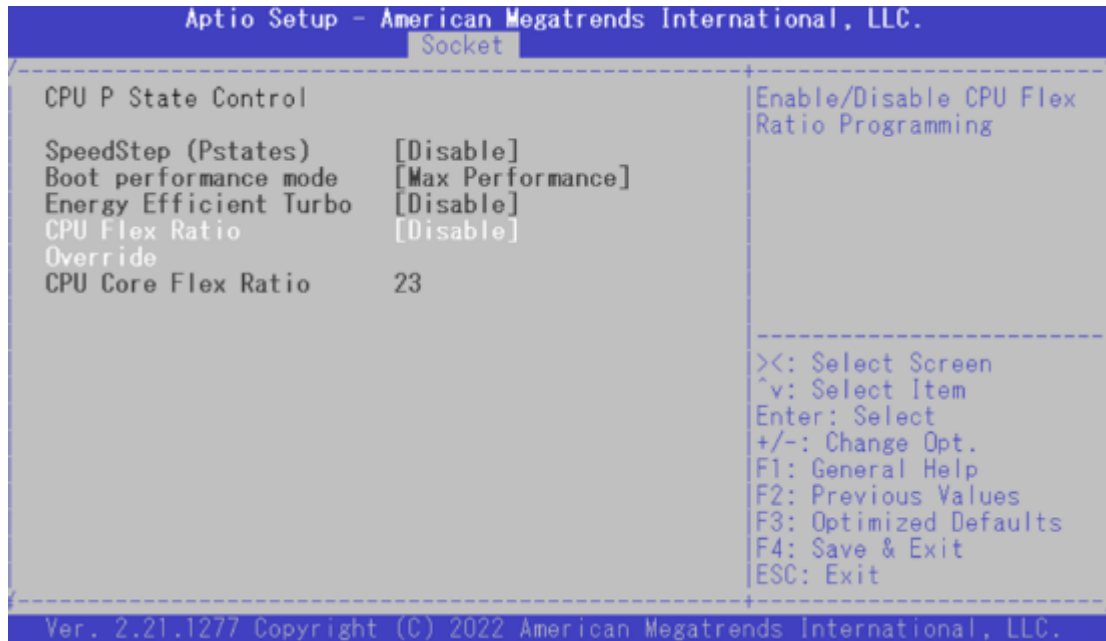
Feature	Options	Description
Intel® VT for Directed I/O	Disabled Enabled	Enable/Disable Intel® <u>Virtualization</u> Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables.

Advanced Power Management Configuration



Feature	Options	Description
CPU P State Control	None	P State Control Configuration Sub Menu, include Turbo, XE etc.

CPU P State Control



Feature	Options	Description
SpeedStep (Pstates)	Disabled Enabled	Enables or disables EIST (P-States)
Boot performance mode	Max Performance Max Efficient Set by Intel Node Manager	Select the performance state that the BIOS will set before OS hand off.
Energy Efficient Turbo	Disabled Enabled	Energy Efficient Turbo Disable, MSR 0x1FC [19]
CPU Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Core Flex Ratio	23	Non-Turbo Mode Processor Core Ratio Multiplier

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 Enable	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.

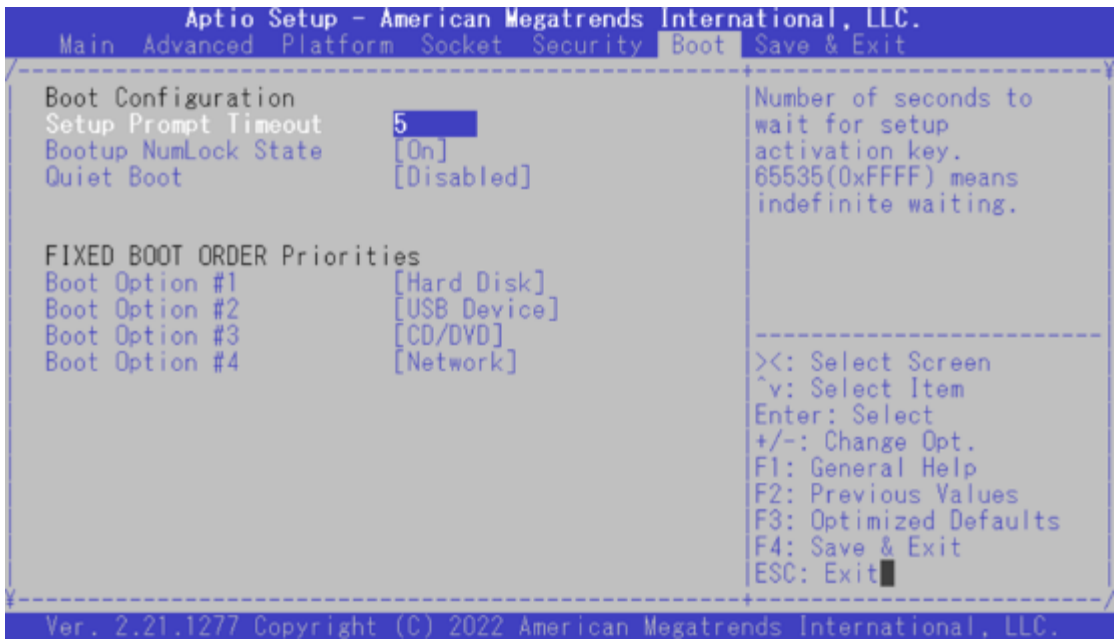
Key Management



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.



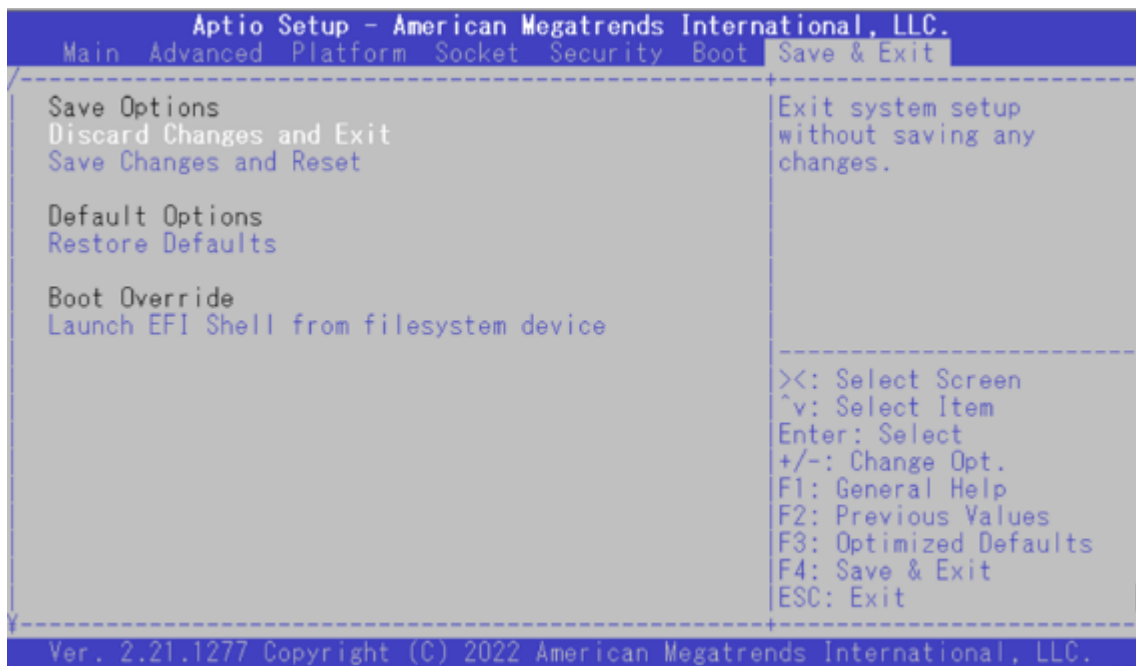
Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.

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

Save and Exit Menu

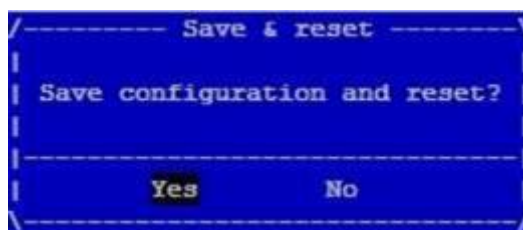
Select the **Save and Exit** menu item from the BIOS setup screen to enter the Save and Exit Setup screen.

Users can select any of the items in the left frame of the screen.



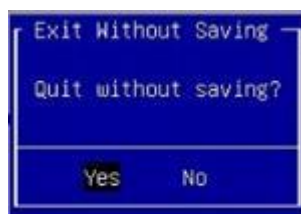
■ Save Changes and Rest

When Users have completed the system configuration changes, select this option to save the changes and exit 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 Exit”** option is selected. Select **“Yes”** to Save Changes and Exit Setup.



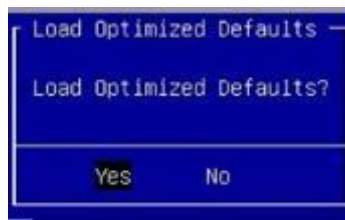
■ Discard Changes and Exit

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.



■ Restore Defaults

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



Note: The items under Boot Override may not have the same image. It would depend on the devices connected to the system.

APPENDIX A: 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 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: <input type="checkbox"/> Repair(Please include failure details)	
		<input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> 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
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date