



# Network Appliance Platforms

Hardware Platforms for Network Computing

## NCA-1040 User Manual

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## About this Document

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

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

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

## Icon Description

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                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|  <b>Note or Information</b>  | This mark indicates that there is something you should pay special attention to while using the product.               |
|  <b>Warning or Important</b> | This mark indicates that there is a caution or warning and it is something that could damage your property or product. |

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## Federal Communication Commission Interference Statement

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

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

### FCC Caution

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



#### Note

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



#### Important

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

## Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free during and after installation.
- ▶ Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- ▶ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

- ▶ Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit; always check the circuit.

## Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

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

## Lithium Battery Caution

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

## Avertissement concernant la pile au lithium

- ▶ Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- ▶ Jetez les piles usagées conformément aux instructions.
- ▶ L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- ▶ Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

## Operating Safety

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

## Sécurité de fonctionnement

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

## Mounting Installation Precautions

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

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

## Installation & Operation

- ▶ This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.  
Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée
- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.  
Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- ▶ The machine can only be used in a restricted access location and must be installed by a skilled person.  
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.
- ▶ Some USB devices may not be compatible with the system. If you encounter an error, please remove the USB device and restart the system.
- ▶ The unit is to be connected only to PoE networks without routing to the outside plant.

## Warning

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

**Avertissement**

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

**Electrical Safety Instructions**

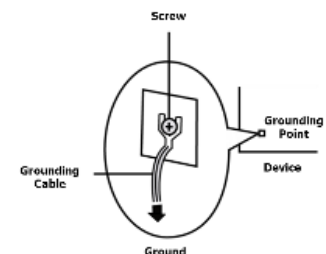
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire (green-and-yellow) is required and the part connecting the conductor must be greater than 4 mm<sup>2</sup> or 10 AWG.

**Consignes de sécurité électrique**

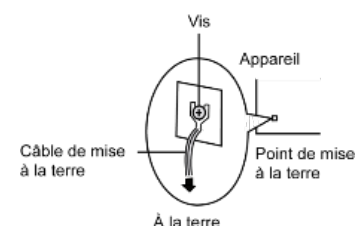
- ▶ Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- ▶ Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- ▶ Pour 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 mm<sup>2</sup> 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.



# Table of Contents

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|                                                 |           |
|-------------------------------------------------|-----------|
| <b>Chapter 1: Product Overview .....</b>        | <b>10</b> |
| Package Content.....                            | 10        |
| Ordering Information .....                      | 10        |
| Optional Accessories .....                      | 10        |
| System Specifications .....                     | 11        |
| Front Panel .....                               | 12        |
| Rear Panel.....                                 | 13        |
| <b>Chapter 2: Motherboard Information .....</b> | <b>14</b> |
| Jumpers and Connectors.....                     | 14        |
| <b>Chapter 3: Hardware Setup .....</b>          | <b>22</b> |
| Opening the Chassis .....                       | 22        |
| Installing the System Memory .....              | 23        |
| Installing M.2 Memory Card (Optional) .....     | 24        |
| Installing LTE/5G Module Card (Optional) .....  | 25        |
| Installing Wi-Fi Module Card (Optional).....    | 28        |
| Installing SIM card .....                       | 30        |
| Wallmount the System (Optional) .....           | 31        |
| Rackmount the System (Optional) .....           | 33        |
| <b>Chapter 4: BIOS Setup.....</b>               | <b>35</b> |
| Main Page.....                                  | 36        |
| Advanced .....                                  | 37        |
| Chipset.....                                    | 51        |
| Security.....                                   | 54        |



Boot Menu.....57

Save and Exit Menu .....58

**Appendix A: LED Indicator Explanations..... 60**

**Appendix B: Terms and Conditions..... 61**

Warranty Policy .....61

## CHAPTER 1: PRODUCT OVERVIEW

NCA-1040 is a compact desktop appliance empowered by Intel® Atom® x6413E (codenamed Elkhart lake) for deployment at edge environment, branch offices, and retail surroundings. Besides the low power consumption and decent processing capability, NCA-1040 also provides necessary I/O functionality for edge computing, multi-service gateways, VPN routers and CPE applications.

### Package Content

Your package contains the following items:

- ▶ 1x NCA-1040 Network Security Platform
- ▶ 1x Power Adaptor
- ▶ 1x Power Cable
- ▶ 1x Console Cable



### Ordering Information

| SKU No.          | Main Features                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>NCA-1040A</b> | 4-core 1.5GHz, Intel® Atom® X6413E (Elkhart Lake), 4x 1GbE RJ45, 1x DDR4 SO-DIMM, 1x PoE+ support, 1x TPM, Wi-Fi/LTE/5G Module Support |

### Optional Accessories

| Model          | SKU No.              | Description                                                             |
|----------------|----------------------|-------------------------------------------------------------------------|
| 5G Kit         | FN980                | Telit FN980 (sub 6) 5G Module with Antenna Kit                          |
|                | FN990A28             | Telit FN990A28 5G Module with Antenna Kit                               |
|                | FN990A40             | Telit FN990A40 5G Module with Antenna Kit                               |
|                | RM520N-GL            | 5G Module with Antenna Kit                                              |
| LTE Kit        | EM7565               | Sierra EM 7565 LTE Module with Antenna Kit                              |
|                | EM7411               | Sierra EM7411 LTE Module with Antenna Kit                               |
|                | EM7590               | Sierra EM7590 LTE Module with Antenna Kit                               |
|                | LN920A6-WW           | LTE Module with Antenna Kit                                             |
|                | EM060K-GL[USB3.0]    | LTE Module with Antenna Kit                                             |
| Wi-Fi Kit      | WPEQ-268AXI          | Wi-Fi Module with Antenna Kit                                           |
|                | ENL-Q9882C(WLE600VX) | Compex Wi-Fi Module with Antenna Kit                                    |
| PoE+ Kit       |                      | PoE+ Power Adapter Kit                                                  |
| Rackmount Kit  |                      | 1U Rackmount kit (long ear bracket with adapter holder, 2-sided design) |
| Wall Mount Kit |                      | Wall Mount Kit for NCA-1040                                             |

## System Specifications

|                                 |                              |                                                                          |
|---------------------------------|------------------------------|--------------------------------------------------------------------------|
| <b>Form Factor</b>              |                              | Fanless Desktop                                                          |
| <b>Platform</b>                 | Processor Options            | Intel® Atom x6413E (Elkhart Lake), 1.5GHz                                |
|                                 | CPU TDP                      | 9W                                                                       |
|                                 | CPU Socket                   | Onboard                                                                  |
|                                 | CPU Cores                    | 4                                                                        |
|                                 | Chipset                      | SoC                                                                      |
| <b>BIOS</b>                     |                              | AMI SPI Flash BIOS                                                       |
| <b>System Memory</b>            | Technology                   | DDR4 3200MT/s SO-DIMM                                                    |
|                                 | Max. Capacity                | 32 GB                                                                    |
|                                 | Socket                       | 1x 260pin SO-DIMM                                                        |
| <b>Networking</b>               | Ethernet Ports               | 4x 1GbE RJ45 via Intel® i210AT (1x PoE+ Port)                            |
|                                 | Bypass                       | N/A                                                                      |
| <b>PoE+ Support</b>             | # of PoE+ (PSE) Ports        | 1x PoE+ Port                                                             |
|                                 | Standard                     | IEEE 802.3at                                                             |
|                                 | PoE+ Power Input             | 4-pin power connector with 65W PoE+ adapter                              |
| <b>I/O Interface</b>            | Reset Button                 | 1x Reset Button                                                          |
|                                 | LED Indicators               | Power/Status/Storage/M.2/Mini PCIe, refer to <a href="#">Appendix A</a>  |
|                                 | Power Button                 | 1x Power Button with LED                                                 |
|                                 | Console Port                 | 1x RJ45 (Default Baud rate : 115200) Console Port                        |
|                                 | USB Port                     | 1x USB 3.1 Port                                                          |
|                                 | Display Port                 | 1x Display Port (without Audio Function)                                 |
|                                 | Power Input                  | 1x DC Jack with Lock                                                     |
|                                 | Antenna Hole                 | 2x Front Antenna holes;<br>2x Rear Antenna holes                         |
| <b>Storage</b>                  | Onboard Slots                | 1x M.2 (SATA) 2280 B-Key                                                 |
| <b>Expansion</b>                | Mini-PCIe                    | 1x Mini-PCIe (PCIe/USB2.0);<br>1x M.2 3042/3052 B-Key                    |
|                                 | SIM Card Slot                | 2x Nano SIM                                                              |
| <b>Miscellaneous</b>            | Watchdog                     | YES                                                                      |
|                                 | Internal RTC with Li Battery | YES                                                                      |
|                                 | TPM                          | YES                                                                      |
| <b>Cooling</b>                  | Processor                    | Passive CPU Heatsink                                                     |
|                                 | System                       | Fanless (Default), 1x 5-pin Fan Connector (By Project)                   |
| <b>Environmental Parameters</b> | Temperature                  | 0~40°C Operating, -20~70°C Non-Operating                                 |
|                                 | Humidity (RH)                | 5~90% Operating, 5~ 95% Non-Operating                                    |
| <b>System Dimensions</b>        | (WxDxH)                      | 183 x 168 x 32 mm                                                        |
|                                 | Weight                       | 0.9 kg                                                                   |
| <b>Package Dimensions</b>       | (WxDxH)                      | TBC                                                                      |
|                                 | Weight                       | TBC                                                                      |
| <b>Power</b>                    | Type/Watts                   | 1x 12V 3.33A 40W Power Adapter                                           |
|                                 | Input                        | AC 100~240V @50~60 Hz                                                    |
| <b>OS Support</b>               |                              | Linux                                                                    |
| <b>Approvals and Compliance</b> |                              | RoHS, CE/FCC Class B (with PoE function will be Class A), UL, VCCI, UKCA |

# Front Panel



| No. | Description    |                                                                         |
|-----|----------------|-------------------------------------------------------------------------|
| F1  | Antennas       | 2x SMA Antenna Holes                                                    |
| F2  | Reset Button   | 1x Reset Button                                                         |
| F3  | LED Indicators | Power/Status/Storage/M.2/Mini-PCle, refer to <a href="#">Appendix A</a> |
| F4  | Console Port   | 1x RJ45 Console Port                                                    |
| F5  | USB Port       | 1x USB 3.1 Port                                                         |

## Rear Panel



| No. | Description      |                                                               |
|-----|------------------|---------------------------------------------------------------|
| R1  | Antennas         | 2x SMA antenna holes                                          |
| R2  | Power Button     | 1x Power Button with LED                                      |
| R3  | Power Inlet      | 1x DC Jack with Lock                                          |
| R4  | PoE+ (PSE) Input | 1x 4-pin 54V Input Port with Lock (ATX4P) for PoE+ (Optional) |
| R5  | PoE+ Port        | 1x PoE+ Port (Optional)                                       |
| R6  | LAN Ports        | 3x 1GbE RJ45 Ethernet Ports with LED                          |
| R7  | Display Port     | 1x Display Port (without Audio Function)                      |



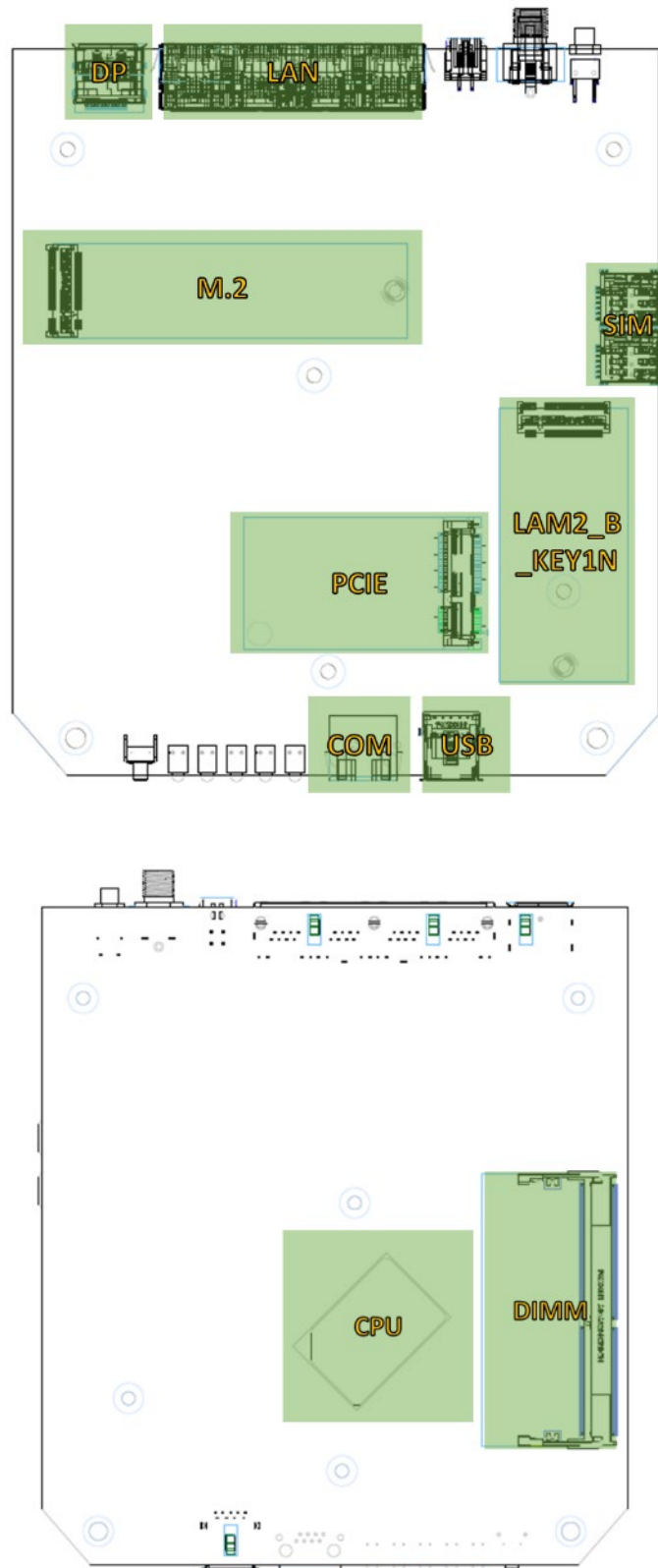
### Note

1. To enable PoE+ support on the first LAN port, it is necessary to integrate the PoE+ power adapter kit (PSF9758-001).
2. Certification is restricted to FCC Class A when using PoE. (Class B certification is available when PoE is not in use.)

## CHAPTER 2: MOTHERBOARD INFORMATION

### Jumpers and Connectors

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

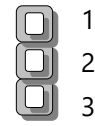


## Jumper Setting and Connector Pin-out

The following references the pin assignments and internal connectors of NCA-1040.

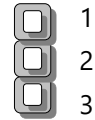
### JCOMS1: RTC Reset

| Pin | Description    |
|-----|----------------|
| 1-2 | Clear RTC_TEST |
| 2-3 | Clear RTC_RST  |



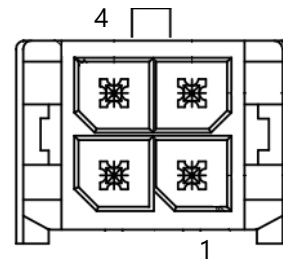
### J8: Reset Option

| Pin           | Description    |
|---------------|----------------|
| 1-2           | Hardware Reset |
| 2-3 (Default) | Software Reset |



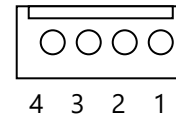
### PW2: Power Supply Connector of PSE

| Pin | Description |
|-----|-------------|
| 1   | GND         |
| 2   | GND         |
| 3   | +P54V       |
| 4   | +P54V       |



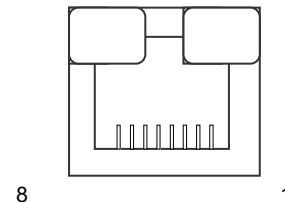
### JPW1: SATA Power Connector 1x4 Pins 2.54mm

| Pin | Description |
|-----|-------------|
| 1   | +P12V_S     |
| 2   | GND         |
| 3   | GND         |
| 4   | +P5V_S      |



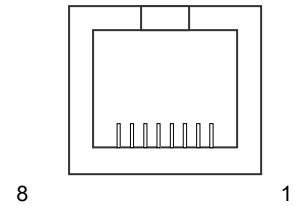
### LAN1: 1x4 RJ45 w/o transformer

| Pin | Description |
|-----|-------------|
| 1   | MD0+        |
| 2   | MD0-        |
| 3   | MD1+        |
| 4   | MD2+        |
| 5   | MD2-        |
| 6   | MD1-        |
| 7   | MD3+        |
| 8   | MD3-        |

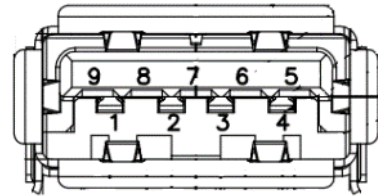


**COM1: RJ45 Console**

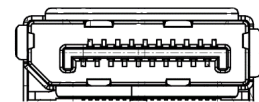
| Pin | Description            |
|-----|------------------------|
| 1   | Request to Send (RTS)  |
| 2   | NC                     |
| 3   | Transmitted Data (TxD) |
| 4   | Signal Ground          |
| 5   | Signal Ground          |
| 6   | Received Data (RxD)    |
| 7   | NC                     |
| 8   | Clear to Send (CTS)    |

**USB1: USB 3.1 single CONN**

| Pin | Description |
|-----|-------------|
| 1   | +P5V_USB1   |
| 2   | USB20_N1    |
| 3   | USB20_P1    |
| 4   | GND         |
| 5   | USB30_RXN0  |
| 6   | USB30_RXP0  |
| 7   | GND         |
| 8   | USB30_TXN0  |
| 9   | USB30_TXP0  |

**DP1: Display Port 20P 0.6mm**

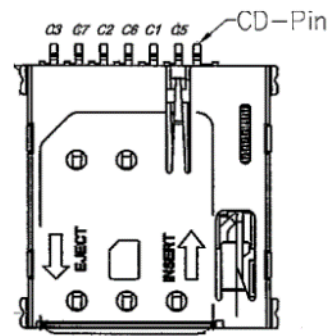
| Pin | Description  | Pin | Description         |
|-----|--------------|-----|---------------------|
| 1   | DP1_C_DATA0  | 11  | GND                 |
| 2   | GND          | 12  | DP1_C_DATAN3        |
| 3   | DP1_C_DATAN0 | 13  | DDI1_AUX_EN_P13     |
| 4   | DP1_C_DATAP1 | 14  | CONFIG2             |
| 5   | GND          | 15  | DDI1_DDC_CLK_AUX_DP |
| 6   | DP1_C_DATAN1 | 16  | GND                 |
| 7   | DP1_C_DATAP2 | 17  | DDI1_DDC_DAT_AUX_DN |
| 8   | GND          | 18  | DP1_HPD             |
| 9   | DP1_C_DATAN2 | 19  | GND                 |
| 10  | DP1_C_DATAP3 | 20  | +P3V3_DP            |





**SIM1/2: Nano SIM push-push**

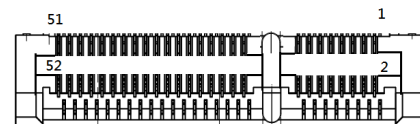
| Pin | Description |
|-----|-------------|
| 1   | UIMx_PWR    |
| 2   | UIMx_RST#   |
| 3   | UIMx_CLK    |
| 4   | UIMx_DETECT |
| 5   | GND         |
| 6   | NC          |
| 7   | UIMx_DAT    |

**SATA1:180° SATA Connector**

| Pin | Description |
|-----|-------------|
| 1   | GND         |
| 2   | TX+         |
| 3   | TX-         |
| 4   | GND         |
| 5   | RX-         |
| 6   | RX+         |
| 7   | GND         |

**PCIE1: MiniPCle Socket**

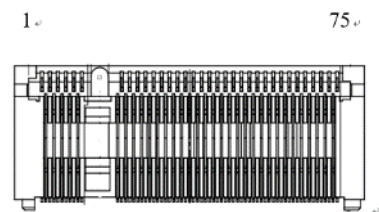
| Pin | Description   | Pin | Description  |
|-----|---------------|-----|--------------|
| 1   | NC, PMC_WAKE# | 27  | GND          |
| 2   | +P3V3_S       | 28  | +P1V5_S      |
| 3   | NC            | 29  | GND          |
| 4   | GND           | 30  | NC, SMB_CLK  |
| 5   | NC            | 31  | PCIE_TXN     |
| 6   | +P1V5_S       | 32  | NC, SMB_DATA |
| 7   | PCIE_CLKREQ5# | 33  | PCIE_TXP     |
| 8   | NC            | 34  | GND          |
| 9   | GND           | 35  | GND          |
| 10  | NC            | 36  | USB20_N0     |
| 11  | REFCLK-       | 37  | GND          |
| 12  | NC            | 38  | USB20_P0     |
| 13  | REFCLK+       | 39  | +P3V3_S      |
| 14  | NC            | 40  | GND          |
| 15  | GND           | 41  | +P3V3_S      |
| 16  | NC            | 42  | NC           |
| 17  | NC            | 43  | GND          |



|    |             |    |            |
|----|-------------|----|------------|
| 18 | GND         | 44 | LED_WLAN_N |
| 19 | NC          | 45 | NC         |
| 20 | PH, +P3V3_S | 46 | NC         |
| 21 | GND         | 47 | NC         |
| 22 | MPCIE_RST#  | 48 | +P1V5_S    |
| 23 | PCIE_RXN    | 49 | NC         |
| 24 | +P3V3_S     | 50 | GND        |
| 25 | PCIE_RXP    | 51 | NC         |
| 26 | GND         | 52 | +P3V3_S    |

**M2\_1: M.2 B-Key for Storage**

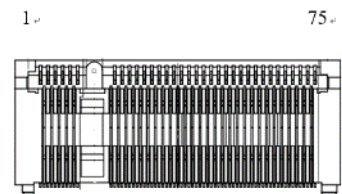
| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | NC          | 2   | +P3V3_S     |
| 3   | GND         | 4   | +P3V3_S     |
| 5   | GND         | 6   | NC          |
| 7   | NC          | 8   | NC          |
| 9   | NC          | 10  | NC          |
| 11  | GND         | 12  | B-KEY       |
| 13  | B-KEY       | 14  | B-KEY       |
| 15  | B-KEY       | 16  | B-KEY       |
| 17  | B-KEY       | 18  | B-KEY       |
| 19  | B-KEY       | 20  | NC          |
| 21  | NC          | 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_C_RXP0 | 42  | NC          |
| 43  | SATA_C_RXN0 | 44  | NC          |
| 45  | GND         | 46  | NC          |
| 47  | SATA_C_TXN0 | 48  | NC          |
| 49  | SATA_C_TXP0 | 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 | NC      |
| 65 | NC  | 66 | NC      |
| 67 | NC  | 68 | NC      |
| 69 | GND | 70 | +P3V3_S |
| 71 | GND | 72 | +P3V3_S |
| 73 | GND | 74 | +P3V3_S |
| 75 | NC  |    |         |

**M2\_B\_KEY1: M.2 B-Key for 4G/5G**

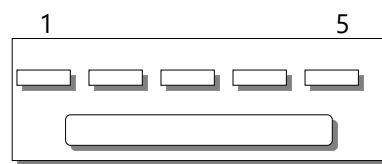
| Pin | Description   | Pin | Description   |
|-----|---------------|-----|---------------|
| 1   | NC            | 2   | +P3V3_A       |
| 3   | GND           | 4   | +P3V3_A       |
| 5   | GND           | 6   | PH, +P1V8_A   |
| 7   | USB2_DP0      | 8   | PH, +P3V3_A   |
| 9   | USB2_DN0      | 10  | LED_M2_WWAN_N |
| 11  | GND           | 12  | B-KEY         |
| 13  | B-KEY         | 14  | B-KEY         |
| 15  | B-KEY         | 16  | B-KEY         |
| 17  | B-KEY         | 18  | B-KEY         |
| 19  | B-KEY         | 20  | PH, +P1V8_A   |
| 21  | GND           | 22  | PH, +P3V3_A   |
| 23  | NC, WAKE_UP#  | 24  | NC            |
| 25  | DPR           | 26  | PH, +P3V3_A   |
| 27  | GND           | 28  | NC            |
| 29  | M2_USB30_TXN2 | 30  | UIM1_RST#     |
| 31  | M2_USB30_TXP2 | 32  | UIM1_CLK      |
| 33  | GND           | 34  | UIM1_DAT      |
| 35  | M2_USB30_RXN2 | 36  | UIM1_PWR      |
| 37  | M2_USB30_RXP2 | 38  | NC            |
| 39  | GND           | 40  | UIM2_DETECT   |
| 41  | M2_PCIE_RXN1  | 42  | UIM2_DAT      |
| 43  | M2_PCIE_RXP1  | 44  | UIM2_CLK      |
| 45  | GND           | 46  | UIM2_RST#     |



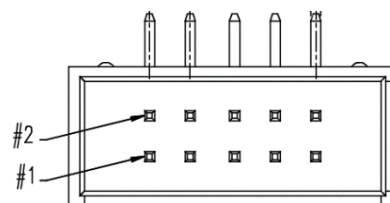
|    |               |    |                         |
|----|---------------|----|-------------------------|
| 47 | M2_PCIE_TXN1  | 48 | UIM2_PWR                |
| 49 | M2_PCIE_TXP1  | 50 | NC, PCIE_B_RST#         |
| 51 | GND           | 52 | NC,<br>M2_PCIE_CLKREQ1# |
| 53 | M2_PCIE_CLKN  | 54 | NC, B_WAKE#             |
| 55 | M2_PCIE_CLKP  | 56 | NC                      |
| 57 | GND           | 58 | NC                      |
| 59 | NC            | 60 | NC                      |
| 61 | NC            | 62 | NC                      |
| 63 | NC            | 64 | NC                      |
| 65 | NC            | 66 | UIM1_DETECT             |
| 67 | NC, M2_RESET# | 68 | NC                      |
| 69 | GND           | 70 | +P3V3_A                 |
| 71 | GND           | 72 | +P3V3_A                 |
| 73 | GND           | 74 | +P3V3_A                 |
| 75 | NC            |    |                         |

**JFAN1: DIP 2.54mm 5-Pin Fan Connector**

| Pin | Description |
|-----|-------------|
| 1   | GND         |
| 2   | TX+         |
| 3   | TX-         |
| 4   | GND         |
| 5   | RX-         |
| 6   | RX+         |
| 7   | GND         |

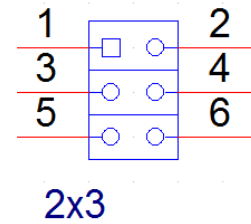
**JUSBDM1: DIP 2.54mm 2x5 Box Header R/A Type**

| Pin | Description |
|-----|-------------|
| 1   | +P5V_USB2   |
| 2   | NC          |
| 3   | USB20_L_N   |
| 4   | NC          |
| 5   | USB20_L_P   |
| 6   | NC          |
| 7   | GND         |
| 8   | NC          |
| 9   | NC,USB_R_WP |
| 10  | NC          |

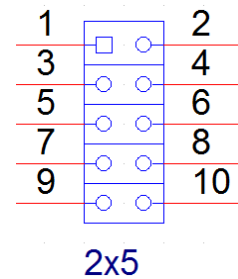


**JDI01: DIP 2.0mm 2x3 Pin Header**

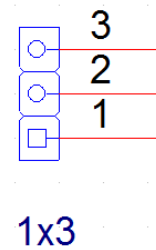
| Pin | Description |
|-----|-------------|
| 1   | DIO_GPI_1   |
| 2   | DIO_GPO_1   |
| 3   | DIO_GPI_2   |
| 4   | DIO_GPO_2   |
| 5   | GND         |
| 6   | GND         |

**JSPI1: SMD 2.0mm 2x5 Pin Header**

| Pin | Description     | Pin | Description     |
|-----|-----------------|-----|-----------------|
| 1   | SPI0_IO3_HOLD#  | 2   | NC              |
| 3   | SPI0_CS0_R#     | 4   | V_3P3_SPI       |
| 5   | SPI0_IO1_MISO_R | 6   | NC              |
| 7   | NC              | 8   | SPI0_CLK_R      |
| 9   | GND             | 10  | SPI0_IO0_MOSI_R |

**J2: DIP 2.43mm 1x3 Pin Header for VCCIN debug**

| Pin | Description |
|-----|-------------|
| 1   | SMB_DATA_VR |
| 2   | SMB_CLK_VR  |
| 3   | GND         |



## 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. Pls refer to the [Product Unboxing video](#) released by Lanner for reference.

### Opening the Chassis

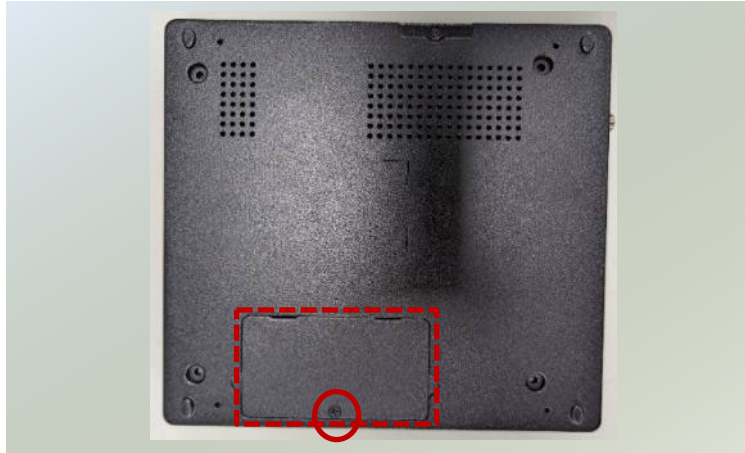
1. Power off the system and remove all power connections.
2. Turn the system upside down, with its bottom side facing up, and locate the four footing screws.
3. Remove the four (4) screws.
4. Turn the system right side up and gently lift the top chassis up.



## Installing the System Memory

The motherboard supports a DIMM DDR4 3200MHz non-ECC up to 32GB, which is located on the bottom side of the motherboard. Please follow the steps below to install the DIMM memory module properly.

1. Power off the system.
2. Turn the system upside down, with its bottom side facing up.
3. Locate the DIMM socket cover.

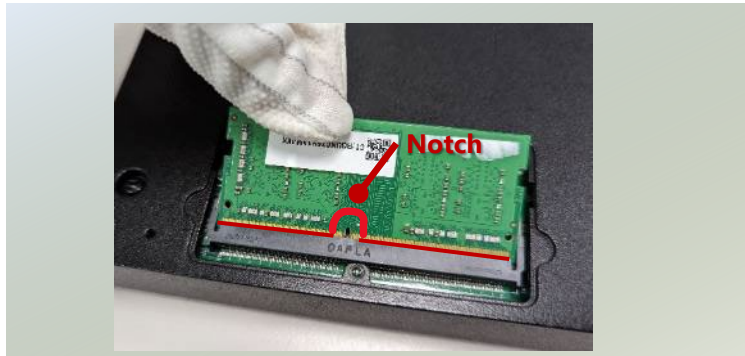


4. Unscrew the one (1) screw securing the cover. And gently lift up the DIMM socket cover.



5. Align the notch of the DIMM card with the socket key in the pin slot.

6. Insert the DIMM card at 30 degrees into the socket until it is fully seated.



7. Push down on the module card until the slot latches catches and clicks into place.

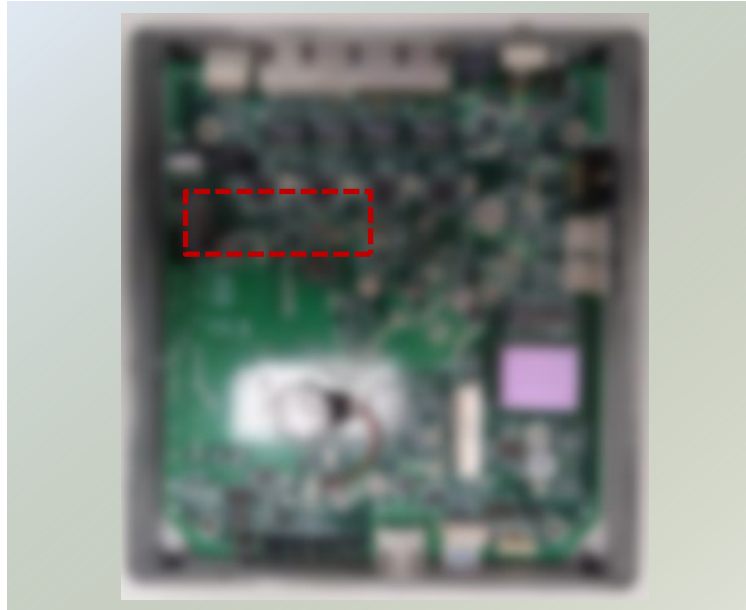




## Installing M.2 Memory Card (Optional)

The system supports one M.2 slot for additional data storage (SSD is recommended due to heat and vibration concerns). 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.

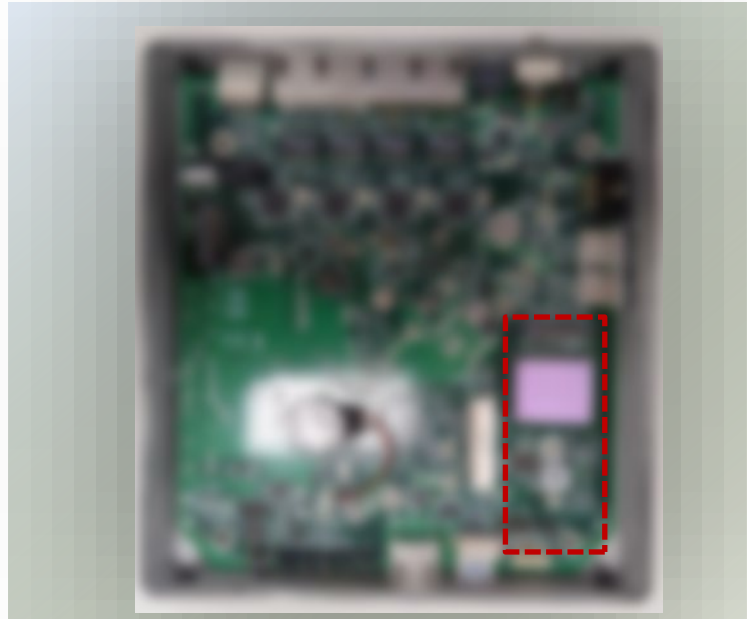




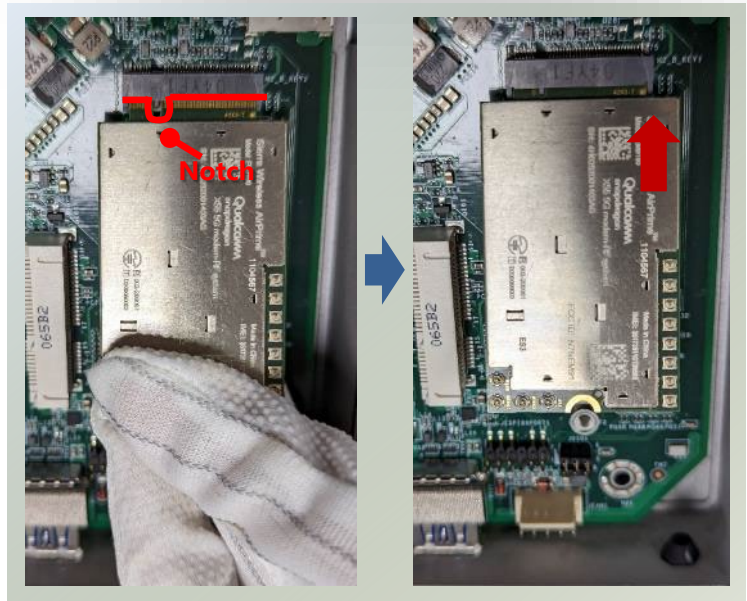
## Installing LTE/5G Module Card (Optional)

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

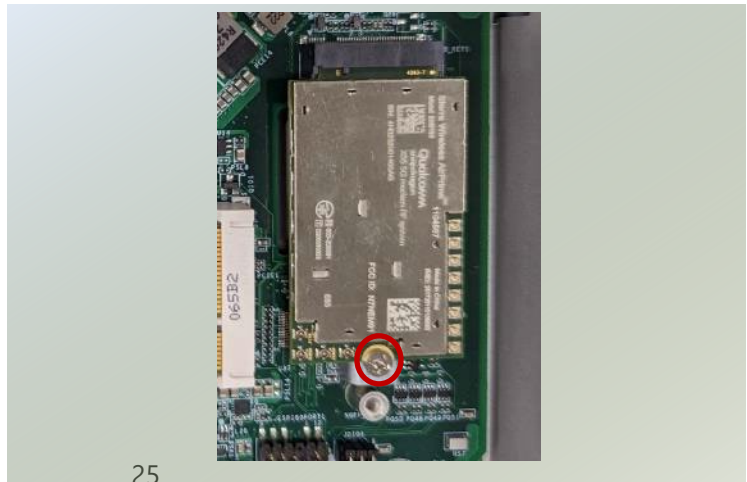
1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.



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

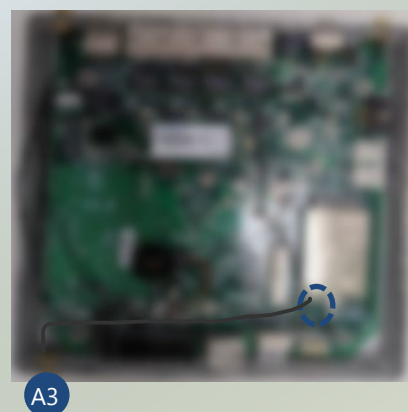
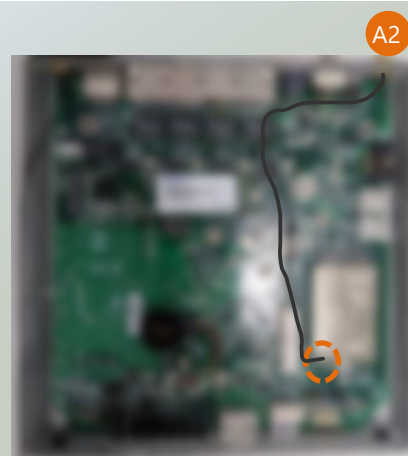
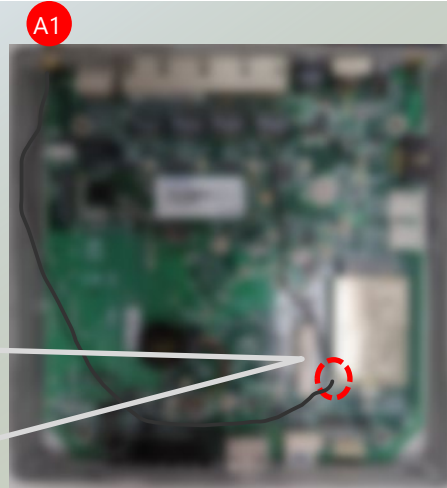
### Front Panel

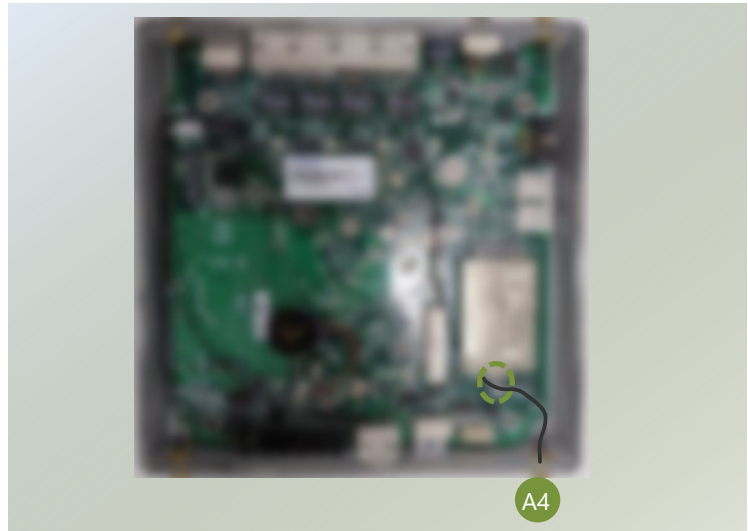


### Rear Panel



1. Locate the four (4) antenna RF cables. Locate the four (4) IPEX connectors on the 5G module card.
2. Connect RF cables to the 5G module card.





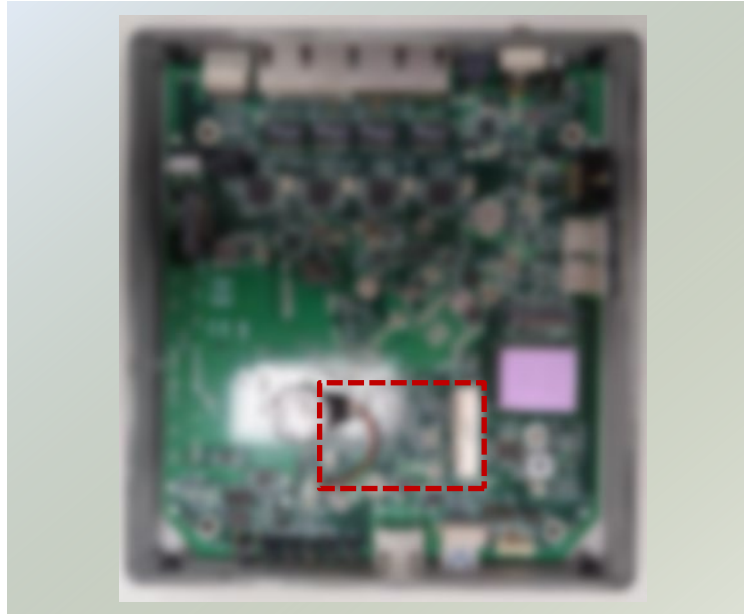
3. Screw on the four (4) antennas to the system.



## Installing Wi-Fi Module Card (Optional)

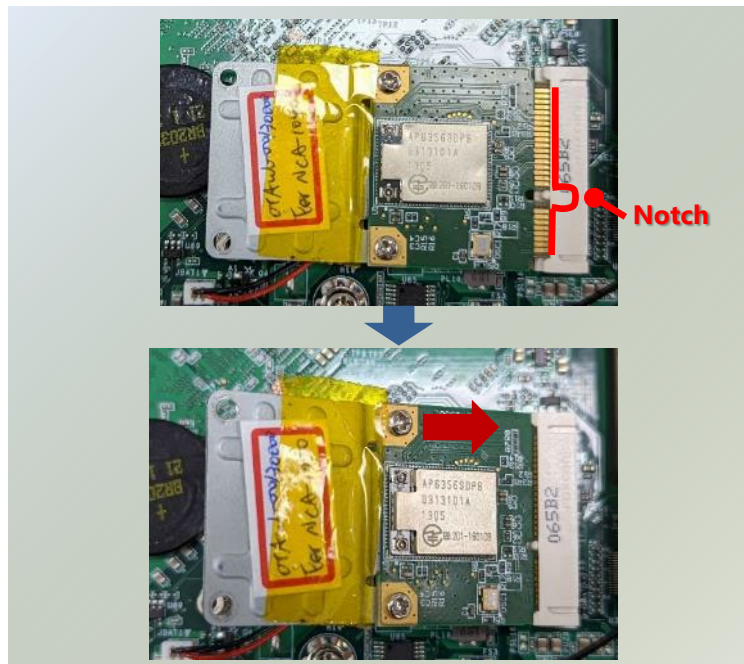
The system supports one mini-PCIe slot for a Wi-Fi or BT module card. Please follow the steps to install the Wi-Fi module card. Wi-Fi module requires two antennas.

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.



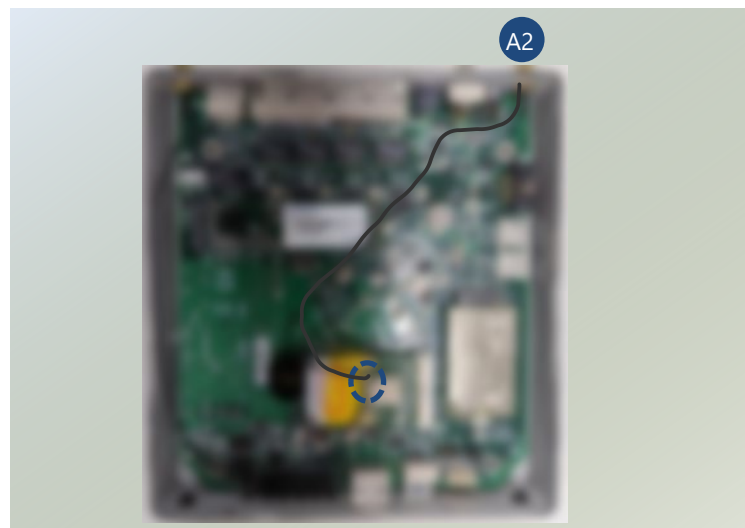
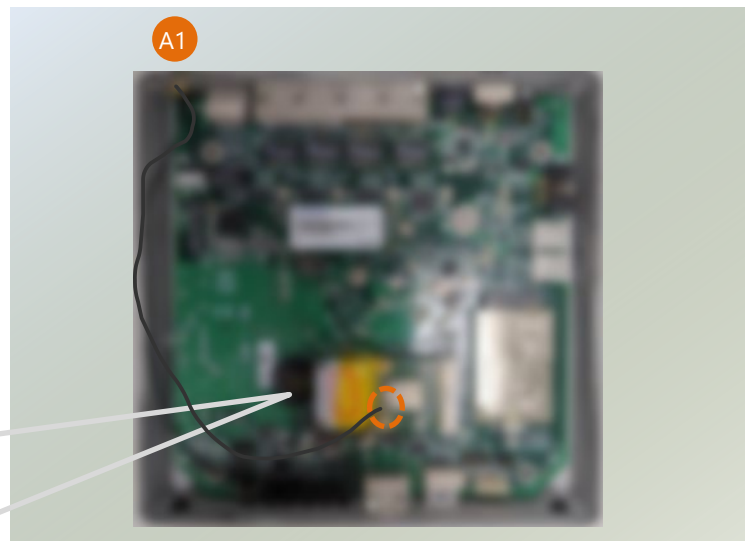


## Installing Wi-Fi Antennas

### Rear Panel



1. Locate the two (2) antenna RF cables. Locate the two (2) IPEX connectors on the Wi-Fi module card
2. Connect the RF cables to the Wi-Fi module card.



3. Screw on the two (2) antennas to the system.



## Installing SIM card

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

1. Power off the system.
2. Turn the system upside down, with its bottom side facing up.
3. Locate the SIM slot cover.



4. Unscrew the one (1) screw securing the cover. And gently remove the SIM slot cover.
5. Insert and push the nano-SIM card all the way in until it clicks into place.



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

## Wallmount the System (Optional)

With the wall mount kit, this system can be fixed on the wall surface. Please contact Lanner sales representative for purchasing this kit.

The Wall-mount Kit contains for the following items:

- ▶ 2x Wall Brackets
- ▶ 1x Screw Pack

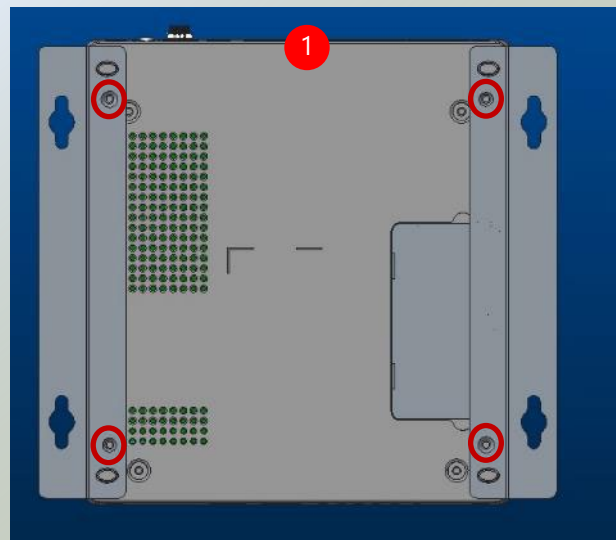


Wall Brackets

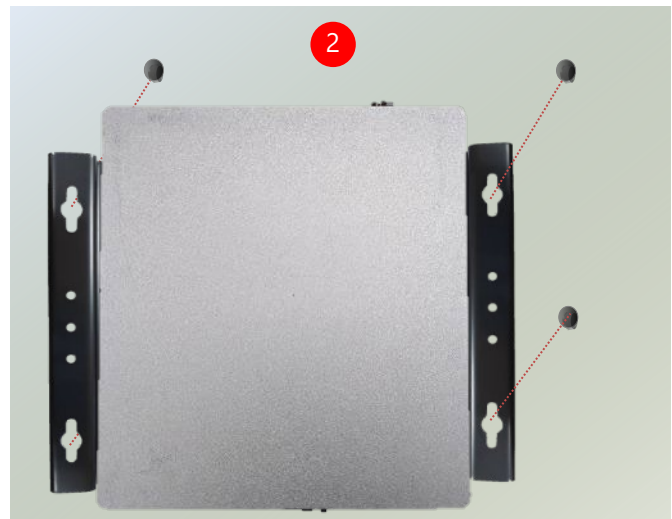


Screws Pack

1. Turn the system over, and fix the wall brackets onto the bottom side of the system, secure with the four (4) provided screws.



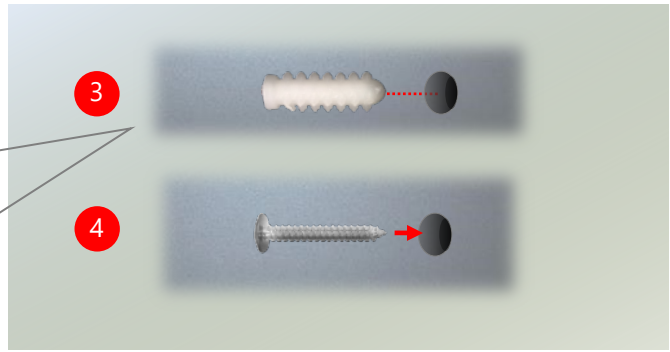
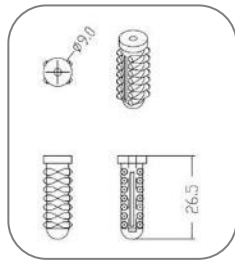
2. On the wall, measure the exact place where you want to mount the system, and drill four holes that match the four mounting holes on the brackets.



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

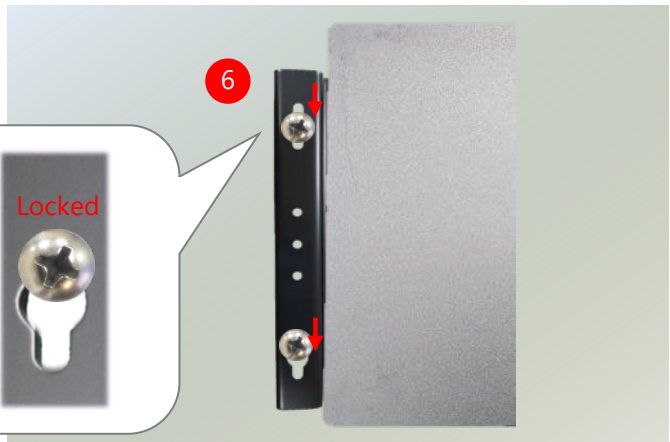
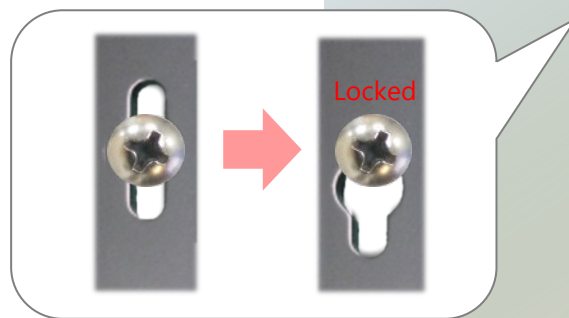
3. Insert the wall plugs into the holes.

4. Then, insert the long screws into the wall screws.



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

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



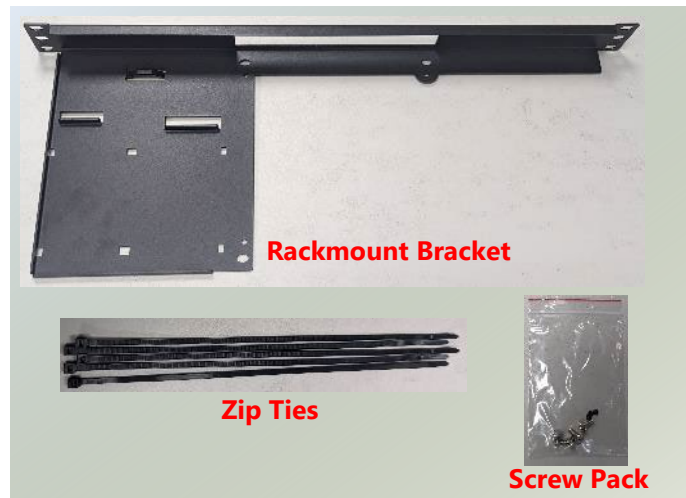


## Rackmount the System (Optional)

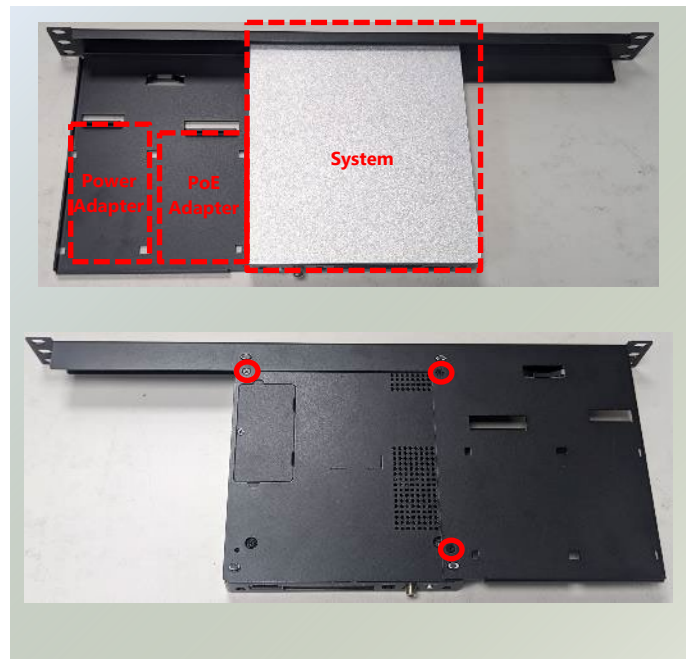
With a rackmount kit, NCA-1040 can be installed into a rack. Please contact Lanner's sales representative for purchasing the rackmount kit.

The rackmount kit contains the following:

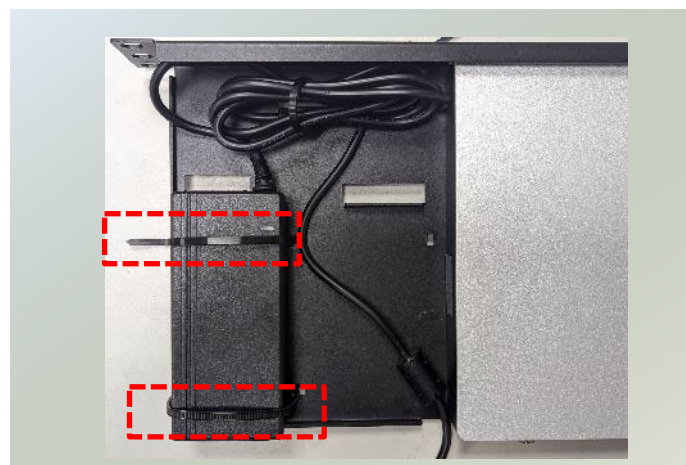
- ▶ 1x Rackmount bracket
- ▶ 5x Zip ties
- ▶ 1x Screw pack (bracket screws and rack mounting screws)



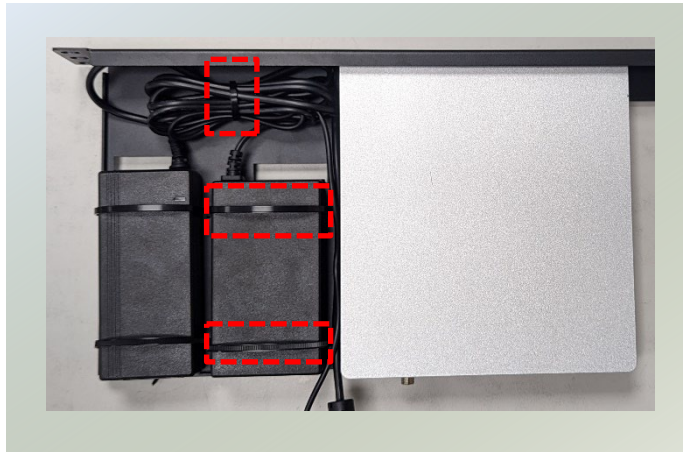
1. The system should be placed in the middle of the rackmount bracket, with the adapter holder section holding the power adapter and PoE adapter. Place the system into the rackmount bracket, and secure with three (3) screws on the back side.



2. Next, place the power adapter on the adapter holder section, and secure with two (2) zip ties.



3. Then, we place the PoE adapter in the adapter holder section, and secure with two (2) zip ties. Also secure the cables with a zip tie.



4. Attach the power adapter and PoE adapter connector to the system's rear panel.



### Installing the System to the Rack

1. Hold the system with its front facing, and lift carefully to insert the system into the rack. Attach the brackets to the rail rack using rack-mounting screws. It is also recommended to install a shelf in the rack to support the system.



## CHAPTER 4: BIOS SETUP

BIOS (Basic Input / Output System) is the program that controls the computer boot process.

### Entering Setup

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.

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

1. Boot up the system.
2. Pressing the **<Tab>** or **<Del>** 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

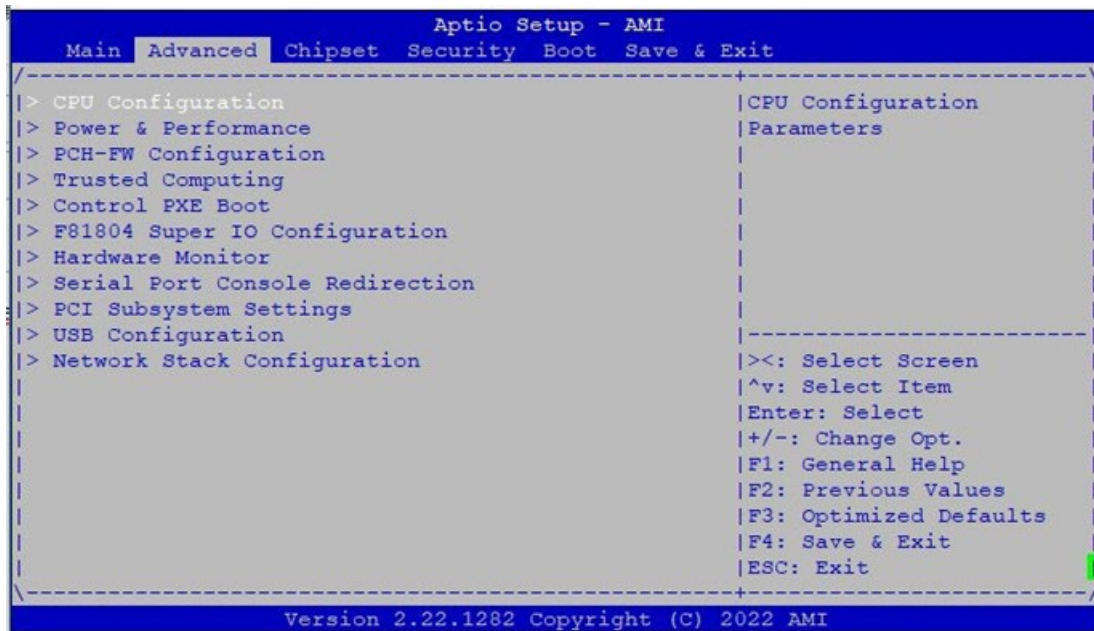
Setup main page contains BIOS information and project version information.



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

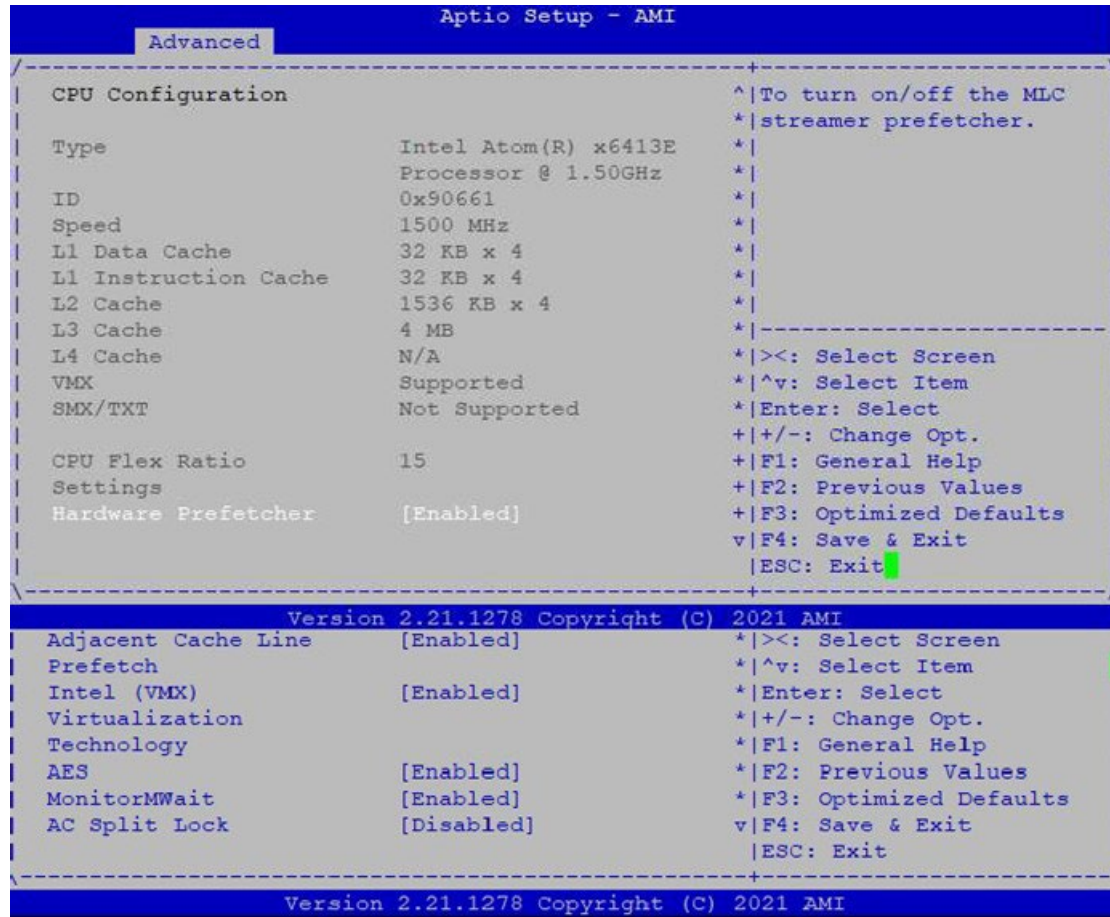
## Advanced

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.



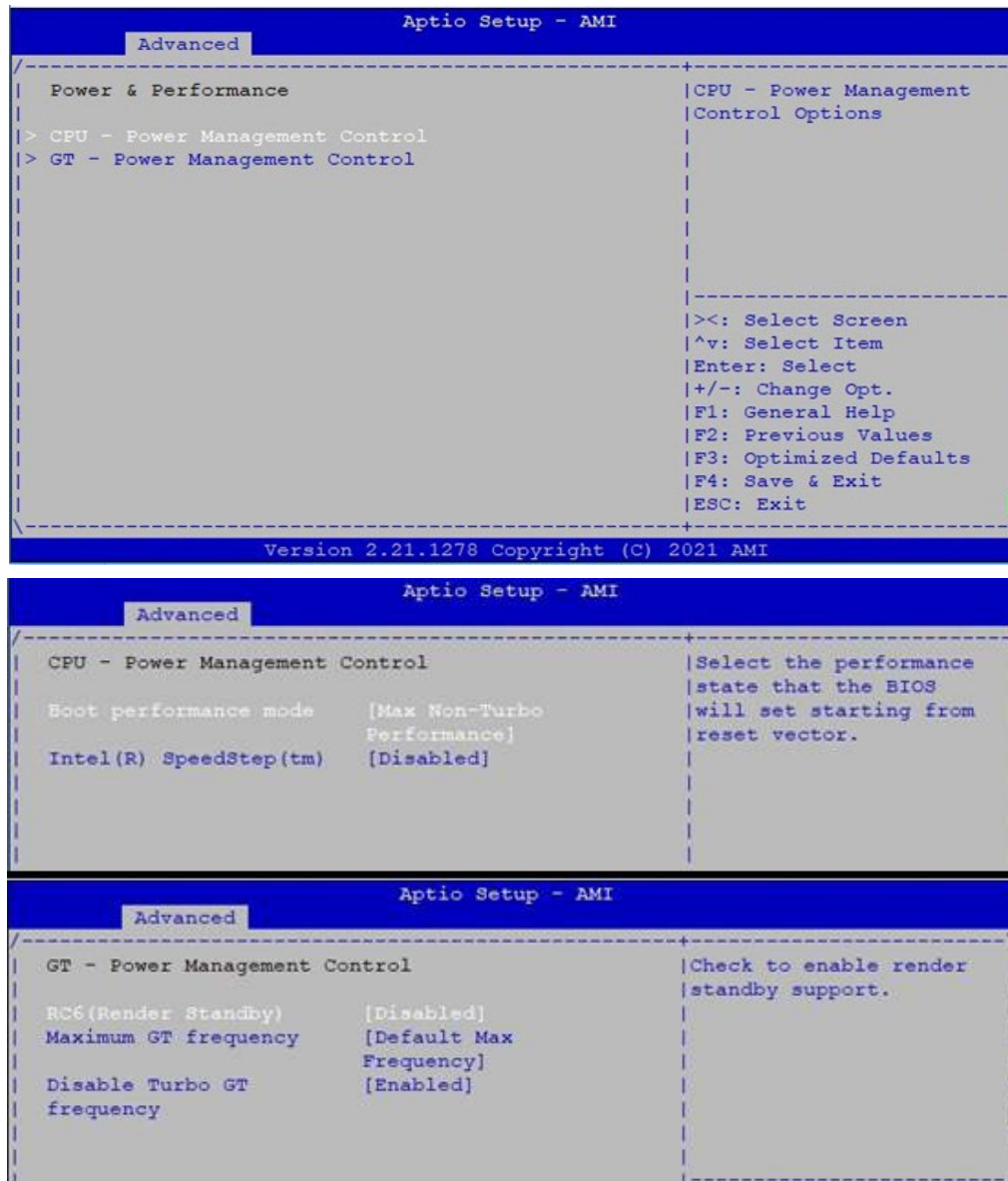


## CPU Configuration



| Feature                               | Options             | Description                                         |
|---------------------------------------|---------------------|-----------------------------------------------------|
| Hardware Prefetcher                   | Enabled<br>Disabled | To turn ON/OFF the MLC streamer prefetcher          |
| Adjacent Cache Line Prefetch          | Enabled<br>Disabled | To turn ON/OFF prefetching of adjacent cache lines. |
| Intel (VMX) Virtualization Technology | Enabled<br>Disabled | Intel (VMX) Virtualization Technology               |
| AES                                   | Enabled<br>Disabled | Enable/Disable AES (Advanced Encryption Standard)   |
| MonitorMWait                          | Enabled<br>Disabled | Enable/Disable MounitorMWait                        |
| AC Split Lock                         | Enabled<br>Disabled | Enable/Disable AC Split Lock                        |

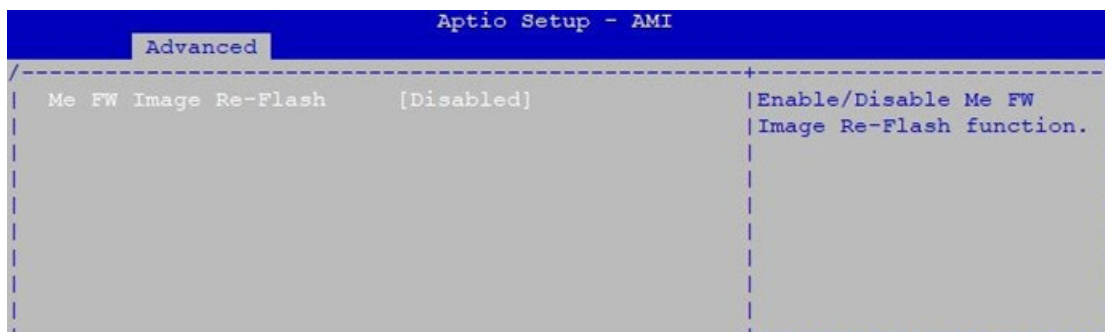
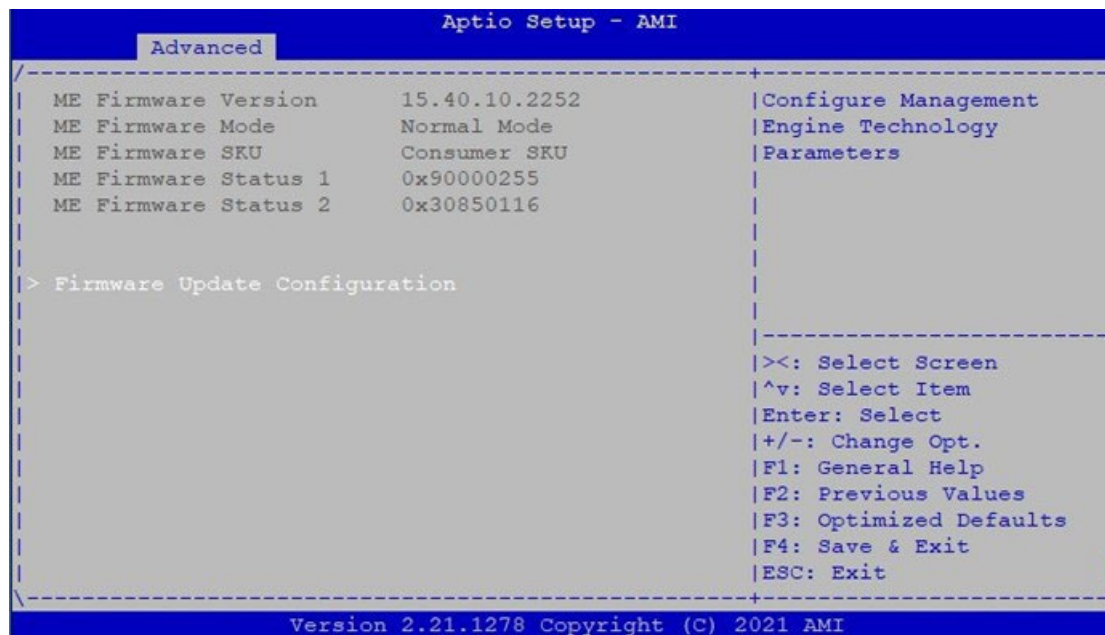
## Power & Performance



| Feature                    | Options               | Description                                                                     |
|----------------------------|-----------------------|---------------------------------------------------------------------------------|
| Boot Performance Mode      | Max Battery           | Select the performance state that the BIOS will set starting from reset vector. |
|                            | Max                   |                                                                                 |
|                            | Non-Turbo Performance |                                                                                 |
| Intel® SpeedStep™          | Turbo Performance     | Allows more than two frequency ranges to be supported.                          |
|                            | Enabled               |                                                                                 |
| RC6 (Render Standby)       | Disabled              | Check to enable render standby support.                                         |
|                            | Enabled               |                                                                                 |
| Disable Turbo GT Frequency | Disabled              | Enabled: Disables Turbo GT frequency.<br>Disabled: GT frequency is not limited. |
|                            | Enabled               |                                                                                 |

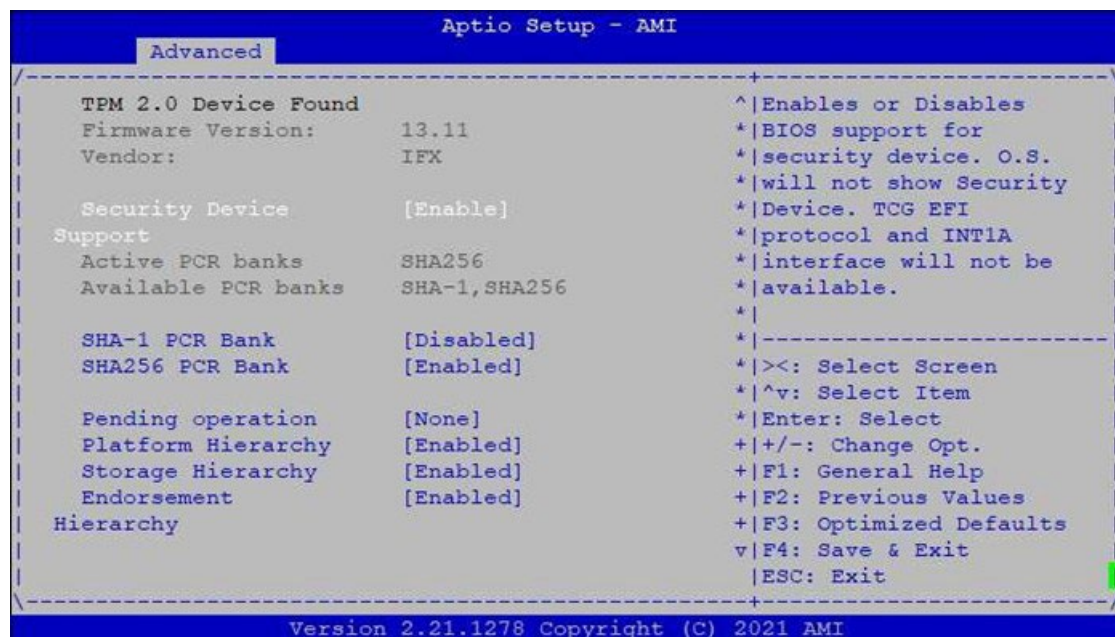


## PCH-FW Configuration



| Feature              | Options                    | Description                           |
|----------------------|----------------------------|---------------------------------------|
| Me FW Image Re-Flash | Enabled<br><b>Disabled</b> | Enable/Disable ME FW Update function. |

## Trusted Computing

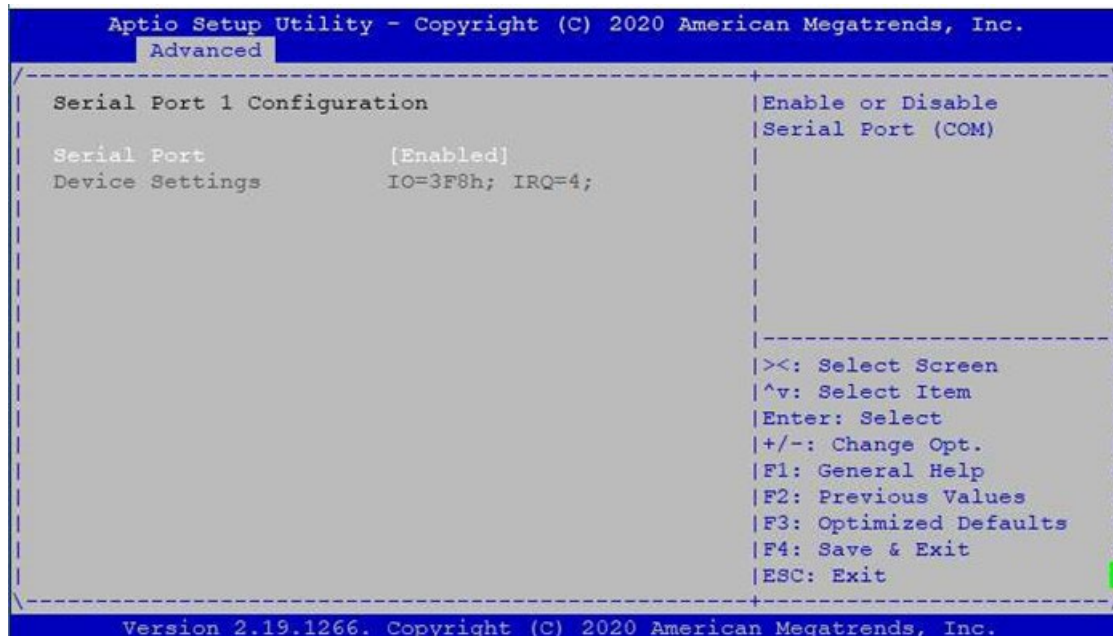
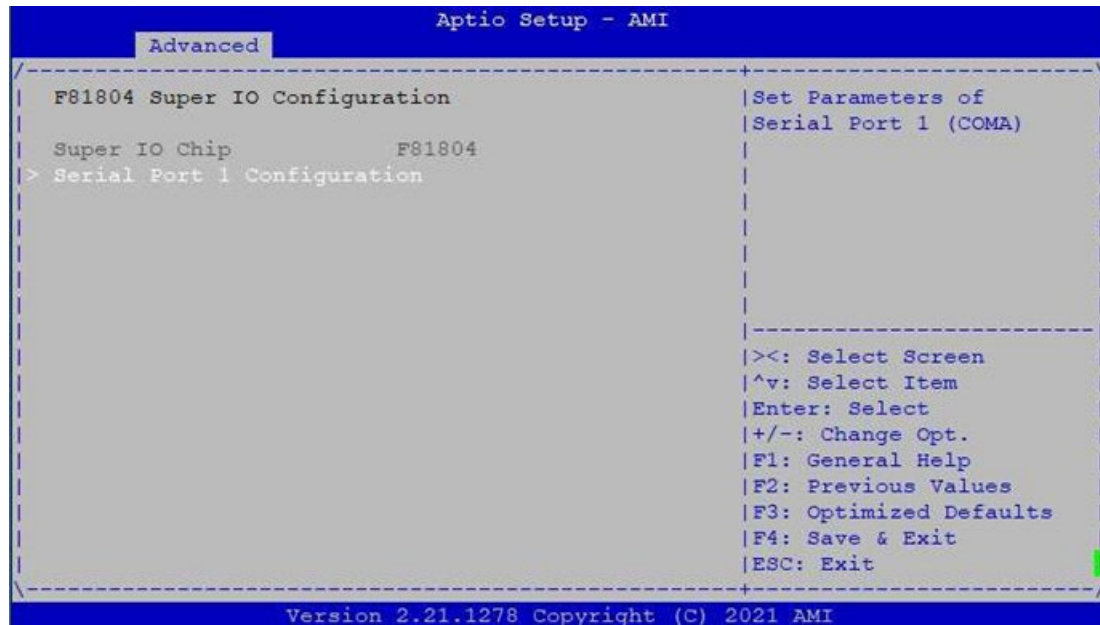


| Feature                 | Options             | Description                                                                                                                                                                     |
|-------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security Device Support | Enabled<br>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<br>Disabled | Enables or disables SHA-1 PCR Bank.                                                                                                                                             |
| SHA256 PCR Bank         | Enabled<br>Disabled | Enables or disables SHA256 PCR Bank                                                                                                                                             |
| Pending Operation       | None<br>TPM Clear   | Schedules an Operation for the Security Device.<br>NOTE: Your computer will reboot during restart in order to change State of Security Device.                                  |
| Platform Hierarchy      | Enabled<br>Disabled | Enables or disables Platform Hierarchy.                                                                                                                                         |
| Storage Hierarchy       | Enabled<br>Disabled | Enables or disables Storage Hierarchy                                                                                                                                           |
| Endorsement Hierarchy   | Enabled<br>Disabled | Enables or disables Endorsement Hierarchy.                                                                                                                                      |

**Control PXE Boot**

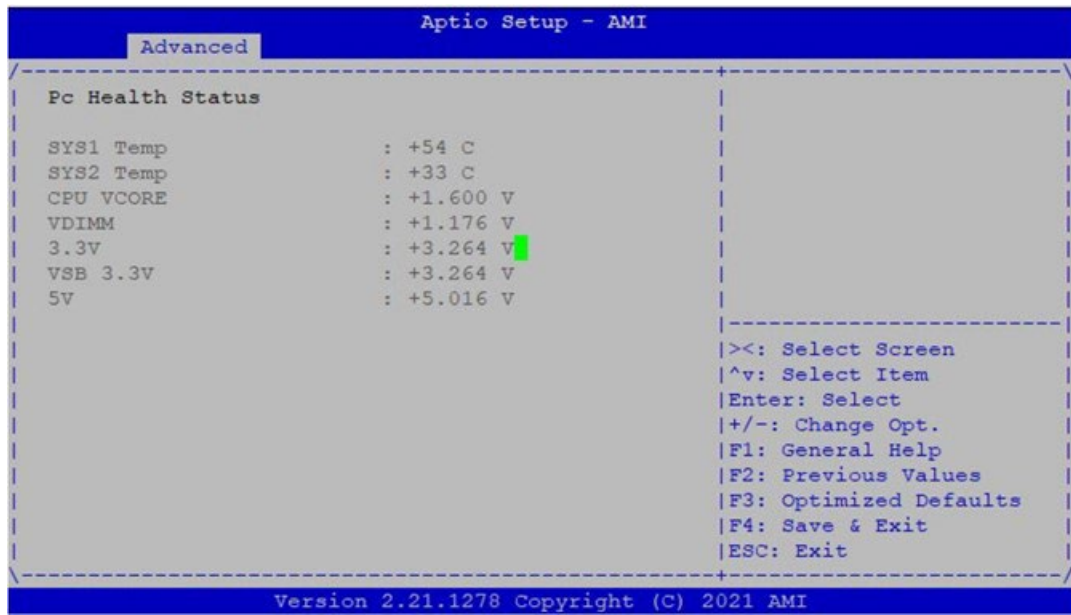
| Feature                         | Options                                  | Description                      |
|---------------------------------|------------------------------------------|----------------------------------|
| Control Legacy PXE<br>Boot From | Disabled<br>LAN1<br>LAN2<br>LAN3<br>LAN4 | Control PXE Boot from which LAN. |

## Super IO Configuration



| Feature         | Options             | Description                       |
|-----------------|---------------------|-----------------------------------|
| Serial Port     | Enabled<br>Disabled | Enables or Disables Serial Port 1 |
| Device Settings | NA                  | IO=3F8h; IRQ=4                    |

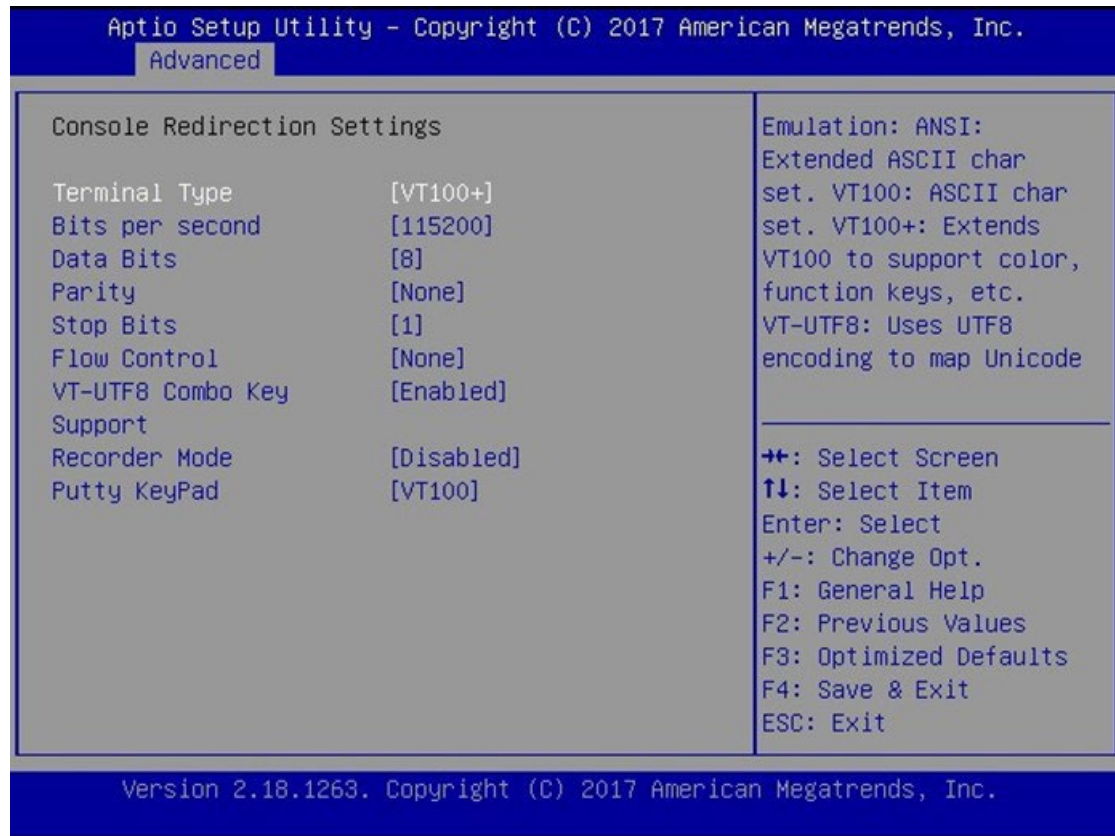
## H/W Monitor



## Serial Port Console Redirection

| <div><div>Aptio Setup - AMI</div><div>Advanced</div><div><div>COM0</div><div>Console Redirection [Enabled]</div><div>&gt; Console Redirection Settings</div></div><div><div>Console Redirection</div><div>Enable or Disable.</div></div><div><div>&gt;&lt;: Select Screen</div><div>^v: Select Item</div><div>Enter: Select</div><div>+/-: Change Opt.</div><div>F1: General Help</div><div>F2: Previous Values</div><div>F3: Optimized Defaults</div><div>F4: Save &amp; Exit</div><div>ESC: Exit</div></div><div>Version 2.21.1278 Copyright (C) 2021 AMI</div></div> |                     |                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------|
| Feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Options             | Description                             |
| Console Redirection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Enabled<br>Disabled | Enables or Disables Console Redirection |

## Console Redirection Settings

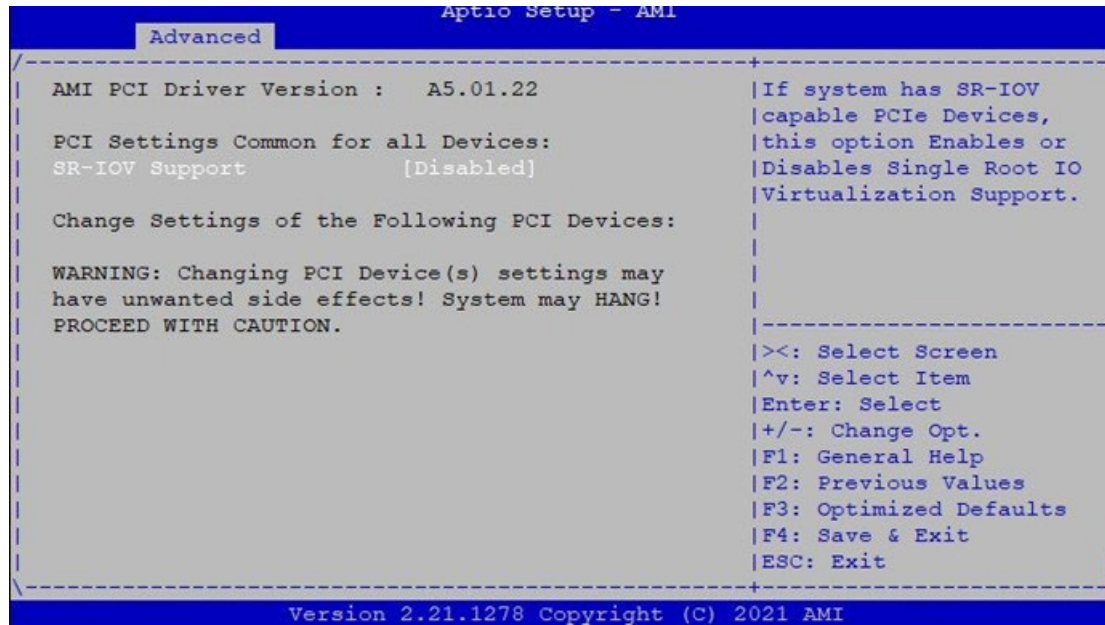


| Feature         | Options | Description                                                                                                                        |
|-----------------|---------|------------------------------------------------------------------------------------------------------------------------------------|
| Terminal Type   | VT100   | VT100: ASCII char set                                                                                                              |
|                 | VT100+  | VT100+: Extends VT100 to support color, function keys, etc.                                                                        |
|                 | VT-UTF8 | VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes                                                              |
|                 | ANSI    |                                                                                                                                    |
| Bits per second | 9600    | Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. |
|                 | 19200   |                                                                                                                                    |
|                 | 38400   |                                                                                                                                    |
|                 | 57600   |                                                                                                                                    |
|                 | 115200  |                                                                                                                                    |
| Data Bits       | 7       | Data Bits                                                                                                                          |
|                 | 8       |                                                                                                                                    |
| Parity          | None    | A parity bit can be sent with the data bits to detect some transmission errors.                                                    |
|                 | Even    |                                                                                                                                    |
|                 | Odd     |                                                                                                                                    |
|                 | Mark    |                                                                                                                                    |
|                 | Space   |                                                                                                                                    |
| Stop Bits       | 1       | Indicates the end of a serial data packet.                                                                                         |
|                 | 2       |                                                                                                                                    |



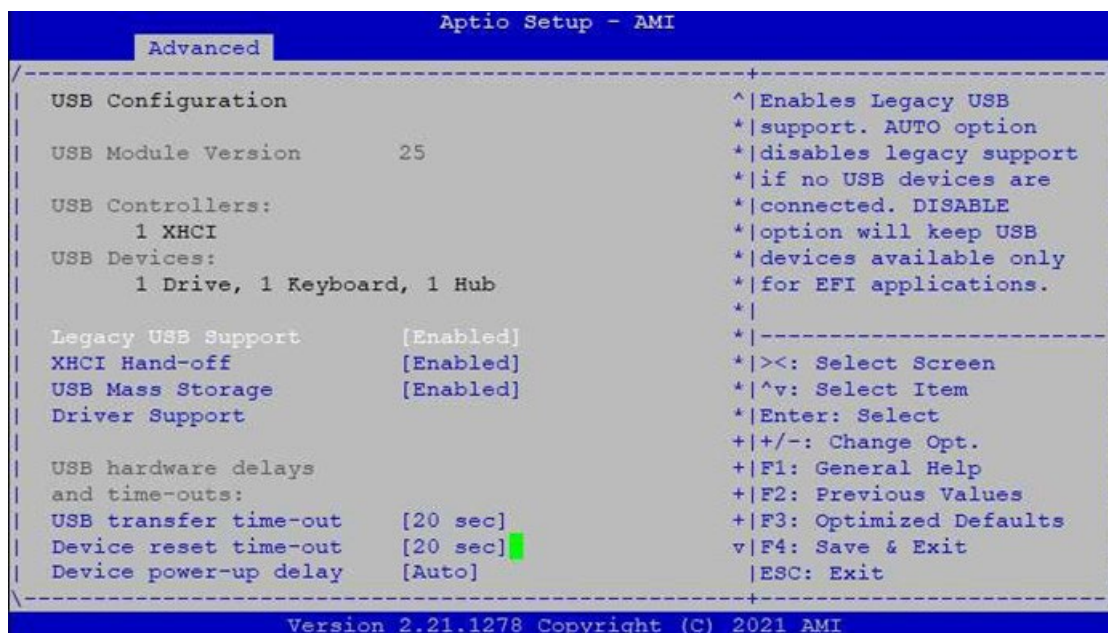
|                              |                                                   |                                                                                  |
|------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------|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

## PCI Subsystem Settings



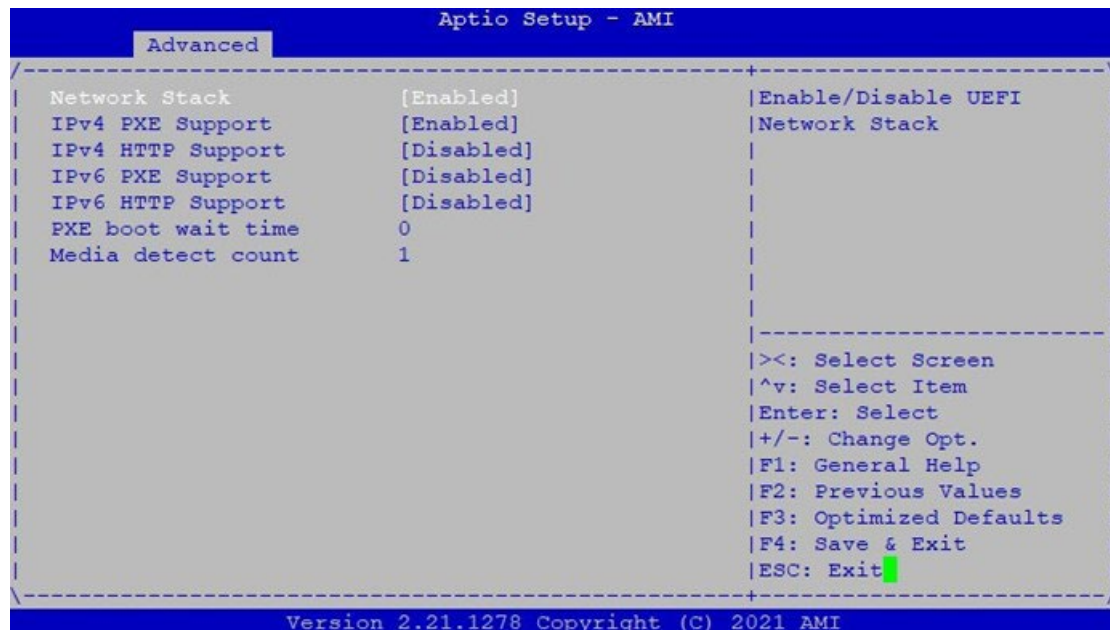
| Feature        | Options             | Description                                                                                                           |
|----------------|---------------------|-----------------------------------------------------------------------------------------------------------------------|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

## USB Configuration



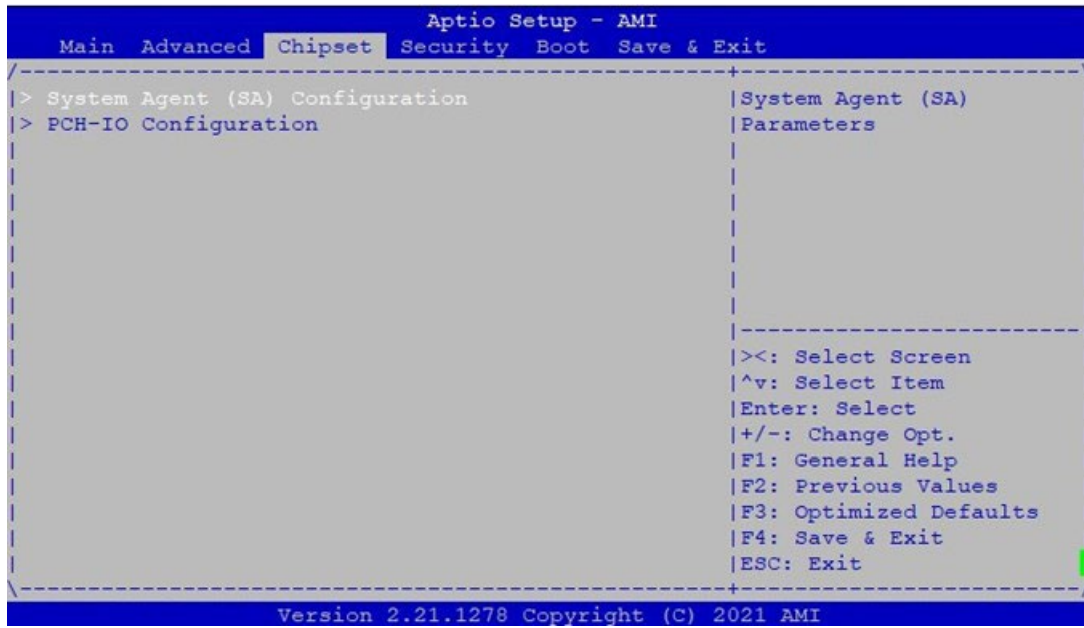
| Feature                         | Options                            | Description                                                                                                                                                                                                      |
|---------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Legacy USB Support              | Enabled<br>Disabled<br>Auto        | Enables Legacy USB support.<br><b>Auto</b> option disables legacy support if no USB devices are connected;<br><b>Disabled</b> option will keep USB devices available only for EFI applications                   |
| XHCI Hand-off                   | Enabled<br>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<br>Disabled                | Enables or disables USB Mass Storage Driver Support                                                                                                                                                              |
| USB transfer time-out           | 1 sec<br>5 sec<br>10 sec<br>20 sec | The time-out value for Control, Bulk, and Interrupt transfers                                                                                                                                                    |
| Device reset time-out           | 1 sec<br>5 sec<br>10 sec<br>20 sec | USB mass storage device Start Unit command time-out                                                                                                                                                              |
| Device power-up delay           | Auto<br>Manual                     | Maximum time the device will take before it properly reports itself to the Host Controller. <b>Auto</b> uses default value: for a Root port, it is 100ms, for a Hub port the delay is taken from Hub descriptor. |

## Network Stack Configuration

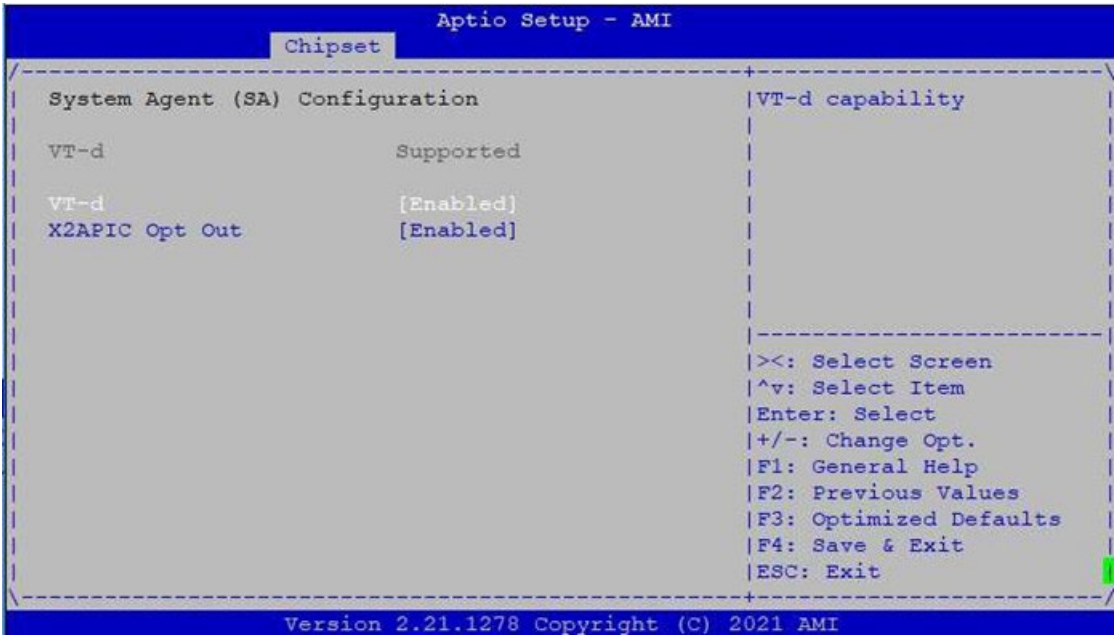


| Feature            | Options             | Description                                                                                |
|--------------------|---------------------|--------------------------------------------------------------------------------------------|
| Network Stack      | Disabled<br>Enabled | Enables or disables UEFI Network Stack                                                     |
| IPv4 PXE Support   | Disabled<br>Enabled | Enables IPv4 PXE Boot Support. If IPv4 is disabled, PXE boot option will not be created.   |
| IPv4 HTTP Support  | Disabled<br>Enabled | Enables IPv4 HTTP Boot Support. If IPv4 is disabled, HTTP boot option will not be created. |
| IPv6 PXE Support   | Disabled<br>Enabled | Enables IPv6 PXE Boot Support. If IPv6 is disabled, PXE boot option will not be created.   |
| IPv6 HTTP Support  | Disabled<br>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.                                     |

## Chipset



## System Agent (SA) Configuration



| Feature           | Options           | Description                                     |
|-------------------|-------------------|-------------------------------------------------|
| VT-d              | Disable<br>Enable | VT-d capability. Option to Enable/Disable VT-d. |
| X2APIC<br>Opt Out | Disable<br>Enable | Enable/Disable X2APIC_OPT_OUT                   |

PCH-IO Configuration



| Feature             | Options             | Description                      |
|---------------------|---------------------|----------------------------------|
| SATA Controller(s)  | Disabled<br>Enabled | Enables/Disables SATA controller |
| SATA Mode Selection | AHCI                | SATA mode support.               |



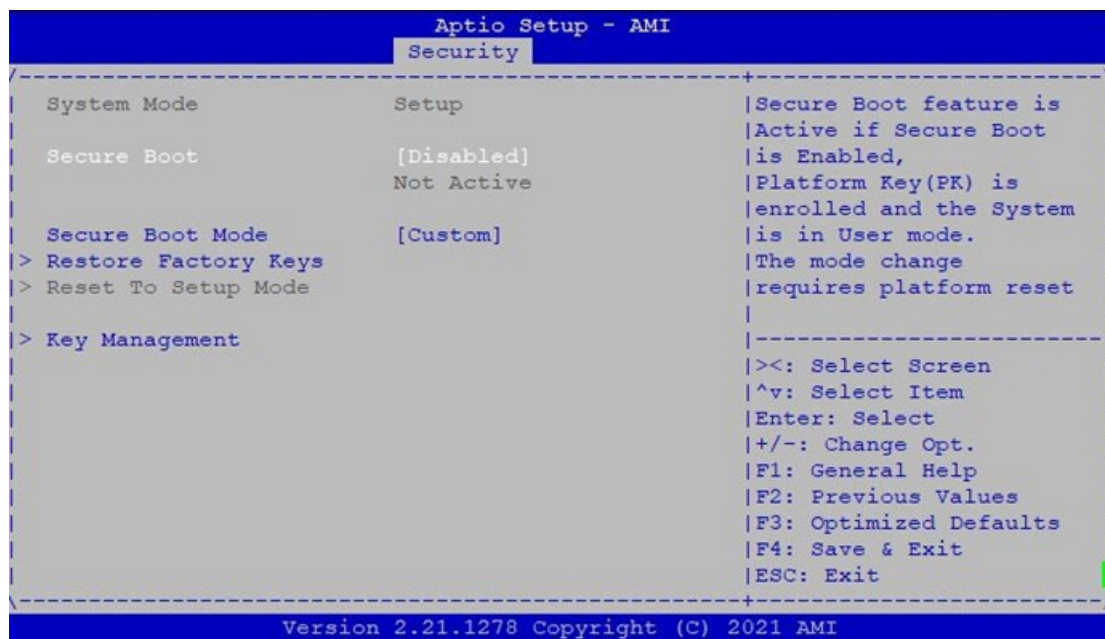
# Security

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.



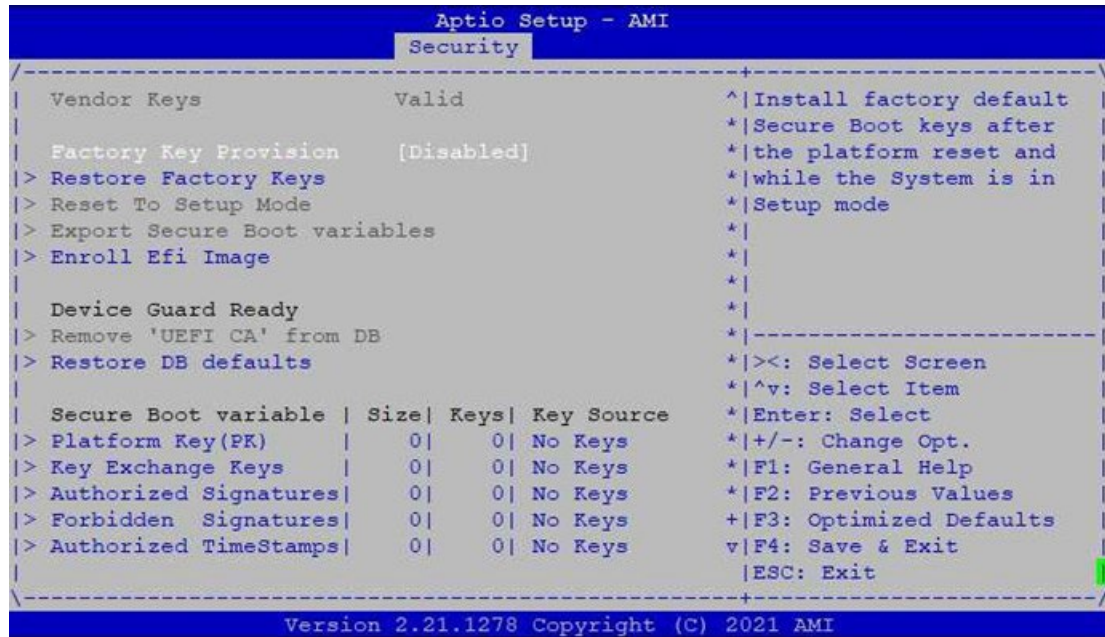
| Feature                | Description                                                                                                                                                         |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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<br>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<br>Custom  | Customizable Secure Boot mode: In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication. |

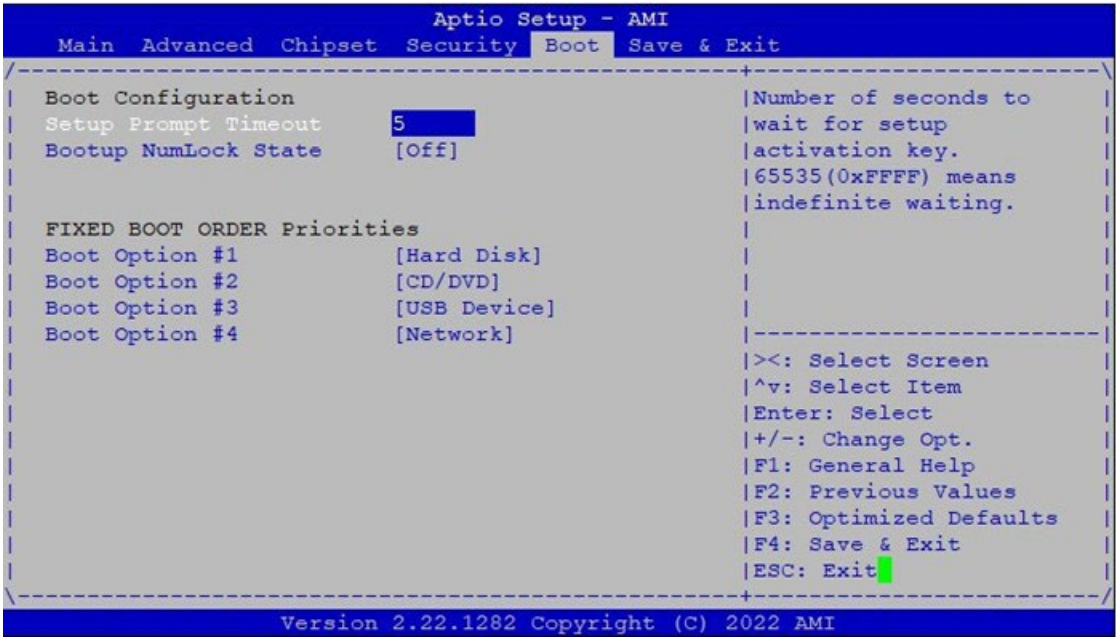
## Key Management



| Feature               | Options  | Description                                                                                                            |
|-----------------------|----------|------------------------------------------------------------------------------------------------------------------------|
| Factory Key Provision | Disabled | 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 SHA 256 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.

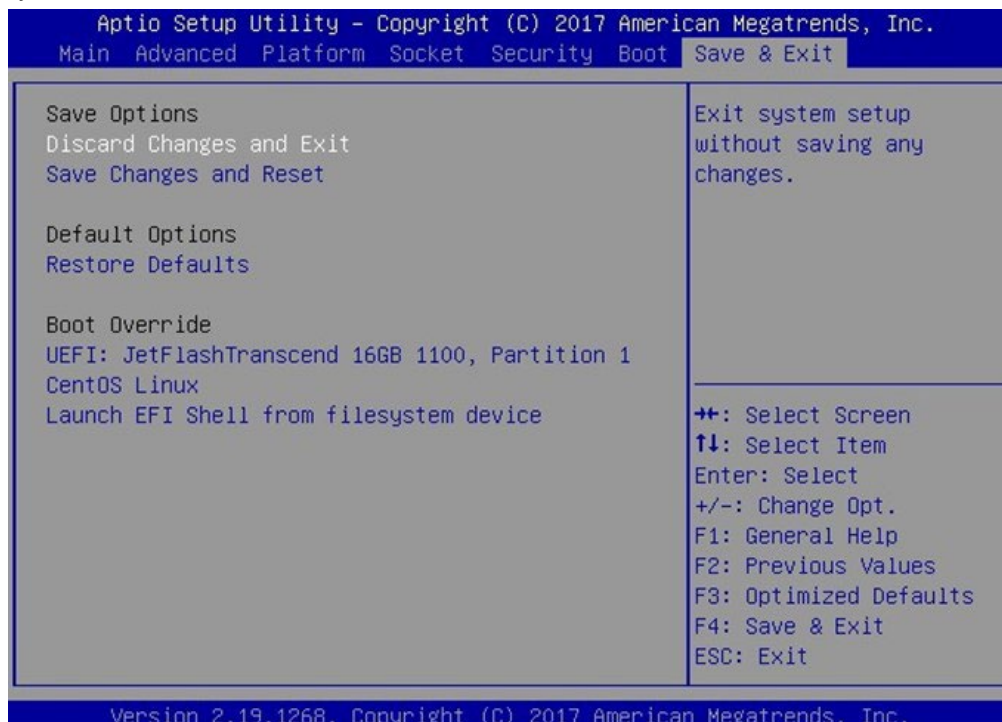


| Feature              | Options   | Description                                                                            |
|----------------------|-----------|----------------------------------------------------------------------------------------|
| Setup Prompt Timeout | 5         | The number of seconds to wait for setup activation key. 65535 means indefinite waiting |
| Bootup NumLock State | ON<br>OFF | Select the keyboard NumLock state                                                      |

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

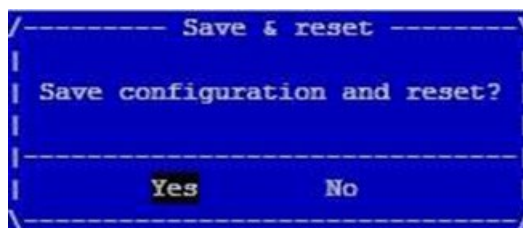
## Save and Exit Menu

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



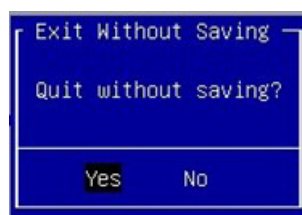
### ■ Save Changes and Rest

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.



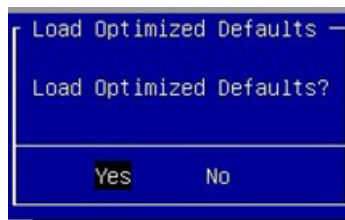
### ■ Discard Changes and Exit

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

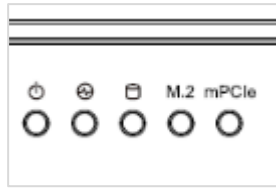
Restore default values for all setup options. Select **“Yes”** to load Optimized defaults.



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

## APPENDIX A: LED INDICATOR EXPLANATIONS

### ► Power / Status / Storage / M.2 / mPCIe LED



| LED            | COLOR                                                                  | LED ACTION | DESCRIPTION                |
|----------------|------------------------------------------------------------------------|------------|----------------------------|
| <b>Power</b>   | <b>Green</b>                                                           | Steady     | System is powered ON       |
|                | <b>OFF</b>                                                             | N/A        | System is powered OFF      |
| <b>Status</b>  | <b>Green</b>                                                           | Steady     | System is Active           |
|                | <b>Red</b>                                                             | Steady     | System Error               |
|                | <b>OFF</b>                                                             | N/A        | System is powered OFF      |
|                | Note: Status bi-color LED controlled by GPIO                           |            |                            |
| <b>Storage</b> | <b>Yellow</b>                                                          | Blinking   | Storage (SATA/NVME) Active |
|                | <b>OFF</b>                                                             | N/A        | No Data Access             |
| <b>M.2</b>     | LED behavior will be determined by the inserted module card (optional) |            |                            |
| <b>mPCIe</b>   | LED behavior will be determined by the inserted module card (optional) |            |                            |



## 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 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.

| <b>RMA No:</b>                                                                                                        |            | 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.<br>02: Second Time R.M.A.<br>03: CMOS Data Lost<br>04: FDC Fail<br>05: HDC Fail<br>06: Bad Slot | 07: BIOS Problem<br>08: Keyboard Controller Fail<br>09: Cache RMA Problem<br>10: Memory Socket Bad<br>11: Hang Up Software<br>12: Out Look Damage | 13: SCSI<br>14: LPT Port<br>15: PS2<br>16: LAN<br>17: COM Port<br>18: Watchdog Timer | 19: DIO<br>20: Buzzer<br>21: Shut Down<br>22: Panel Fail<br>23: CRT Fail<br>24: Others (Pls specify) |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|

***Request Party***

***Confirmed By Supplier***

\_\_\_\_\_  
**Authorized Signature / Date**

\_\_\_\_\_  
**Authorized Signature / Date**