

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-1516 User Manual

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About this Document

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

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

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

Conventions & Icons

This document utilizes different font types and icons in order to make the selected text more transparent and explicable to users. This document contains the following conventions:

Font Conventions

Example	Convention	Usage
iptables –F	Monospace, shaded	A command to be entered at a shell command-line
Setup page	Bold	A title of a dialog box or a page
<enter></enter>	Between a pair of inequality signs	A physical keyboard button
"Menu"	Between a pair of quotation marks	A menu option or a software button to be clicked
Readme.txt	In Italic	A filename or a file path
IPMI User Guide	Underlined	The name of another document or a chapter in this document

Icon Descriptions

lcon	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.

Online Resources

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

For troubleshooting the issues with your system, please visit the <u>Lanner Q&A</u> page for diagnostic procedures and troubleshooting steps.

Technical Support

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

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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: <u>contact@lannerinc.com</u>

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

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 Pruisenweg 104 2595 AN The Hague The Netherlands T: +31 70 701 3256 E: sales eu@lannerinc.com

Canada

Lanner Electronics Canada Ltd

3160A Orlando Drive Mississauga, ON L4V 1R5 Canada T: +1 877-813-2132 F: +1 905-362-2369 E: <u>sales ca@lannerinc.com</u>

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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B 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.



- 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.



- 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 that 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).

Electrical Safety Instructions

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

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.

 Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

Grounding Procedure for DC Power Source

- Loosen the screw of the earthing point.
- 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

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



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 has installation instructions by a skilled person (for Fan side).

Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.



Instruction for the installation of the conductor to building earth by a skilled person.

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CHAPTER 1: PRODUCT OVERVIEW

The NCA-1516, a desktop network appliance powered by Intel® Atom® C3000, is capable of both mmWave 5G, Sub-6GHz 5G and its WIfi6 is both 2.4G and 5G compatible. Hardware performance is supercharged with Intel's QuickAssist Technology and Intel® AES-NI. The NCA-1516 is equipped with ample network communication features and configurations for vCPE/uCPE and Edge security.

Package Content

Your package contains the following items:

- 1x NCA-1516 Network Security Platform
- ▶ 1x Power Adapter
- 1x Power Cable
- 4x Rubber Foot
- 1x Nameplate
- 1x Console Cable



Optional Kits

Model	Description
FN980	5G Sub 6 Kit for NCA-1516
RM500Q-AE	5G Sub 6 Kit for NCA-1516
EM7455	LTE Kit for NCA-1516
EM7430	LTE Kit for NCA-1516
EM7465	LTE Kit for NCA-1516
EM7411	LTE Kit for NCA-1516
EM7511	LTE Kit for NCA-1516
WLE-1216VX	WiFi Kit for NCA-1516
WPEB-265AXI	WiFi Kit for NCA-1516
WLE600VX	WiFi Kit for NCA-1516
IO-1516P1A	PoE Kit for NCA-1516
Rackmount Kit	1U Rackmount kit

Ordering Information

SKU No.	Main Features
NCA-1516A	C3958, 2x DDR4 ECC SODIMM, 6x GbE RJ45 , 2x GbE SFP+ w/ LED, 60W Adapter
NCA-1516B	C3858, 2x DDR4 ECC SODIMM, 6x GbE RJ45 , 2x GbE SFP+ w/ LED, 60W Adapter
NCA-1516C	C3758, 2x DDR4 ECC SODIMM, 6x GbE RJ45 , 2x GbE SFP+ w/ LED, 60W Adapter
NCA-1516D	C3558, 2x DDR4 ECC SODIMM, 6x GbE RJ45 , 2x GbE SFP+ w/ LED, 60W Adapter
NCA-1516E	C3758R, 2xDDR4 ECC SODIMM, 6x GbE RJ45, 2x GbE SFP+ w/ LED, 60W Adapter
NCA-1516F	C3558R, 2xDDR4 ECC SODIMM, 6x GbE RJ45, 2x GbE SFP+ w/ LED, 60W Adapter

System Specifications

Form Factor		Desktop
	Processor Options	Intel® Atom® C3000
Diatform	CPU Socket	1 x Onboard
Platform	Chipset	SoC
	Security Acceleration	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS
Custom Monore	Technology	DDR4 1866/2133/2400MHz ECC/Non- ECC (By SKU)
System Memory	Max. Capacity	64GB
	Socket	2 x 260-pin SODIMM
Networking	Ethernet Ports (By SKU)	4 x GbE RJ45 Intel® i350 2 x GbE RJ45 Intel® SoC Integrated MAC (Optional PoE+ Support) 2 x SFP+ SoC Integrated MAC
	Bypass	N/A
	NIC Module Slot	N/A
LOM	IO Interface OPMA slot	N/A
	Reset Button	1
	LED	Power/Status/Storage
	Power Button	1 x ATX Power Switch
	Console	1 x RJ45
I/O Interface	USB	2 x USB 3.0
	LCD Module	N/A
	Display	N/A
	Power input	2 x DC Jack (Optional 2nd DC Jack)
<i>c</i> .	HDD/SSD Support	N/A
Storage	Onboard Slots	1 x Onboard EMMC 8G (By Request)
Expansion	M.2	1x M.2 3052/3580 B Key (PCle/USB 3.0) 1x M.2 3042 B Key (USB 3.0) 1x M.2 2242 B Key (SATA)
	mini-PCle	1 x Mini-PCle (PCle/USB2.0)
	SIM card Slot	2 x Nano SIM
	Watchdog	Yes
Miscellaneous	Internal RTC with Li Battery	Yes
	TPM	Yes
Cooling	System	1 x Cooling Fan with Smart Fan or Fanless (By Request)
cooling	Processor	Passive CPU Heatsink
Environmental Parameters	Temperature	0~40°C Operating -20~70°C Non-Operating
	Humidity (RH)	5~90% Operating 5~95% Non-Operating
System Dimensions	(WxDxH)	231 x 200x 44 mm
System Dimensions	Weight	1.2 kg
Package Dimensions	(WxDxH)	358 x 135 x 290 mm
	Weight	2.75 kg
Power	Type/Watts	60W 5A/12V PSU
	Input	AC 100~240V @50~60 Hz
Approvals and Compliance		RoHS, CE/FCC Class B, UL

Front Panel



No.	Description		
R1	SIM Card Slot	2 x Nano SIM Slots SFP2	
R2	LED Indicators	SPEED O O O O O O O O O O O O O O O O O O	
R3	Antenna Port	2 x SMA connector for LTE module	

Rear Panel



No.	Description		
F1	Power Switch	Press to power on/off the system	
F2	Reset Button	Press to perform a Hardware reset	
F3	DC Jack	Power supply	
F4	Console Port	1x RJ45 console port	
F5	USB Port	2 x USB 3.0 port	
F6	SFP Port	2 x SFP port	
F7	LAN Port	6 x RJ45 port	
F8	Antenna Port	4x SMA connector for the Wi-Fi / LTE module	
F9	PoE Expansion	Expansion PoE Kit Port (Optional)	

Motherboard Information

Block Diagram

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



Jumper Setting and Pin Assignment

The motherboard board layout shows the connectors on the board. Refer to the below picture as a reference of the pin assignments.



FAN1 · FAN2

PIN number	Description
1	GND
2	12V
3	FANIN
4	NC
5	FANOUT

J1: SIM socket selection

PIN number	Description
1	3V
2	UIM1_SEL
3	GND
	-

SEL=1, Host2 \rightarrow Card1 SIM Socket for MiniPCIe 1st SIM card

SEL=0, Host1 \rightarrow Card1 (default) SIM socket for M2_1 (LTE) 2nd SIM card

J2: SIM socket selection

PIN number	Description
1	3V
2	UIM2_SEL
3	GND

SEL=1, Host2 \rightarrow Card1 (default) SIM socket for M2_2 (5G) 1st SIM card

SEL=0, Host2 \rightarrow Card1 SIM socket for M2_1 (LTE) 1st card

JCPLD1: Burning CPLD code pin header

PIN number	Description	PIN number	Description
1	JTAG_PLD_TCK	2	GND
3	JTAG_PLD_TDO	4	+P3V3_AUX
5	JTAG_PLD_TMS	6	Not connected
7	Not connected	8	Not connected
9	JTAG_PLD_TDI	10	GND

FAN3: 5G module FAN connector

PIN number	Description
1	GND
2	12V
3	5G_FAN_IN_CONN
4	5G_FAN_CTL_CONN

	MMWAVE1		MMWAVE2		MMWAVE3		MMWAVE4
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	MMWAVE_PON0	1	MMWAVE_PON1	1	MMWAVE_PON2	1	MMWAVE_PON3
2	PON_GND	2	PON_GND	2	PON_GND	2	PON_GND
3	+mmWAVE_PWR	3	+mmWAVE_PWR	3	+mmWAVE_PWR	3	+mmWAVE_PWR
4	+P3V7_S	4	+P3V7_S	4	+P3V7_S	4	+P3V7_S
5	GND	5	GND	5	GND	5	GND

MMWAVE1 MMWAVE2 MMWAVE3 MMWAVE4: Millimeter wave power connector source to antenna

J5G_1: 5G module selection pin header

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

PIN number	Description	PIN number	Description
1	PCIE_DIS	2	1.8V
3	VBUS_SENSE	4	1.8V
5	EM9190_VCC1	6	3.3V
7	EM9190_VCC2	8	3.3V
9	EM9190_VCC3	10	3.3V

JP5V1: 5V power connector for feed WiFi6 module

PIN number	Description
1	GND
2	5V

J80PORT1: Debug 80 port pin header

PIN number	Description	PIN number	Description
1	LPC_CLKOUT0	2	SOC_LPC_LAD1
3	SOC_PLTRST_N	4	SOC_LPC_LAD0
5	SOC_LPC_FRAME_N	6	3.3V
7	SOC_LPC_LAD3	8	Not connected
9	SOC_LPC_LAD2	10	GND

DYING_GASP1: To Dying Gasp board pin header 1

PIN number	Description	PIN number	Description
1	LTC3350_RESET_STATUS	2	EN_SCAP_CHARGE
3	SCAP_STATUS_FULL	4	DGPFI
5	Not connected	6	Not connected

J3: ME RECOVER MODE, mounted for normal use

PIN number	Description
1	GND
2	ME_RECVR_MODE

JSPIROM1: For Burning SPI ROM pin header

PIN number	Description	PIN number	Description
1	SPI_HD1#	2	Not connected
3	SOC_SPI_CS0#_ROM	4	3.3V
5	SOC_SPI_MISO_ROM	6	SOC_SPI_IO3_ROM
7	Not connected	8	SOC_SPI_CLK_ROM
9	GND	10	SOC_SPI_MOSI_ROM

J4: For using Dying Gasp module pin selection

1-2 for Dying Gasp

2-3 for Normal SFP+ module

PIN number	Description
1	+P3V3_SFP+
2	SFP+0_RS0
3	GND

JRTC1: Clear RTC pin header

1-2 for normal usage 2-3 clear RTC

PIN number	Description
1	Not connected
2	SOC_SRTCRST_N
3	GND

JCMOS1: Clear CMOS pin header

1-2 for normal usage2-3 clear CMOS

PIN number	Description
1	Not connected
2	SOC_RTEST_N
3	GND

JPOE1: Connected PoE+ board to board connector

PIN number	Description	PIN number	Description	
A1	POE_VPORT_OUT1	B1	Not connected	
A2	POE_VPORT_OUT1	B2	Not connected	
A3	POE_GND	B3	GND	
A4	POE_GND	B4	GND	
A5	Not connected	B5	3.3V	
A6	Not connected	B6	3.3V	

DYING_GASP2: To Dying Gasp board pin header2

PIN number	Description	PIN number	Description	
1	SPI_HD1#	2	Not connected	
3	SOC_SPI_CS0#_ROM	4	3.3V	
5	SOC_SPI_MISO_ROM	6	SOC_SPI_IO3_ROM	
7	Not connected	8	SOC_SPI_CLK_ROM	
9	GND	10	SOC_SPI_MOSI_ROM	

CONN1: 2nd 12V DC-IN adapter pin header

PIN number	Description	
1	V12A_DC_B	
2	GND	

JCASEOPEN1: To Case open slide switch connector

PIN number	Description	
1	SIO_CASEOPEN0_N	
2	GND	

JBAT1: Pin header for button cell

PIN number	Description		
1	SIO_CASEOPEN0_N		
2	GND		

CHAPTER 2: HARDWARE INSTALLATION

To reduce the risk of personal injury, electric shock, or damage to the equipment, please remove all power connections to completely shut down the device. Also, please wear ESD protection gloves when conducting the steps described hereafter.

This system supports multiple wireless connectivity methods with two M.2 slots and an MPCIE slot. Based on your application and modules used, install modules in the corresponding slots.



Opening the Chassis

1. Unscrew the six (6) screws which secure the chassis on the system's front, side panels and the top panel.



2. Pull open the chassis and lift it up to remove.



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Installing M.2 module for Storage

The motherboard supports one M.2 storage on M2_1. Follow the instructions below for installation.

1. Locate the M2_1 slot.



 Align the notches of the module with the socket keys in the slot, and insert it at 30 degrees into the socket until it is fully seated in the connector.





3. Push down the module and secure it with the screw that comes with it.



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Installing System Memory

The motherboard supports DDR4 registered DIMM memory for heavy-duty operations. Please follow the steps below to install the DIMM memory modules.

1. Locate the system memory slot.



 Align the notch of the module with the socket key in the slot. Tilt the end of the golden fingers down while carefully inserting the card into the slot.



3. Press vertically on the other end of the card until it clicks into place.



Installing M.2 module for LTE or Wifi

The motherboard supports two M.2 for LTE or WiFi modules on M2_1. Please follow the steps below to install the LTE or WiFi modules.

1. Locate the M.2 slot



 Align the notches of the M.2 card with the socket keys in the slot. Tilt the end of the gold fingers down while carefully inserting the card into the slot.



 Fix the card with the dedicated screw provided in the accessory pack.



Installing mPCIE module for Wifi

The motherboard supports one mPCIE slot for a WiFi module. Please follow the steps below to install the WiFi module.

1. Locate the mPCIE slot.



 Align the notches of the card with the socket keys in the slot. Tilt the end of gold fingers down while carefully inserting the card into the slot.





3. Fix the module with the screw provided in the accessory pack.



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



PoE Module



Pillar Studs



Power Charger

- 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.





8. Connect the power source pin to the power adapter.



Installing Nano SIM Card

The SIM slot on front panel supports an LTE module. The SIM socket supports the push-push mechanism, allowing inserting and ejecting the SIM card to be as easy as one push.



 Loosen the two screws that secure the SIM slot cover and remove the slot cover. With the angled corner facing inward, push the SIM card all the way in until it clicks into place.

2. With the angled corner facing inward, push the SIM card all the way in until it clicks into place.





 To remove the SIM card, use your fingertip to push it a little to have the card automatically ejected.



Antenna Cable Assembly

To mount the Wi-Fi/LTE antennas:

 Take out the antenna pigtail cable from the Antenna Kit. From inside the chassis, insert the SMA Female Bulkhead through the antenna hole on the panel.



 From outside the panel, attach the Washer and Nut, and tighten the Nut using an SMA Torque Wrench.





Warning: Do not use any tool other than an SMA Torque Wrench to fasten the nut. For example, general pliers or tweezers without limited twisting force are very likely to cause the distortion of SMA connector.

Antenna Placement

Lanner provides multiple options and customizations for our network appliances to suit all our customer's needs. NCA-1516 is compatible with many optional kits for 5G, LTE, and WiFi. Below is best suited antenna placement to optimize coverage, and quality for 5G, LTE, and WiFi modules.

SKU/Module	LTE	5G	WiFi 5 Wave 1	WiFi 5 Wave 2	WiFi 6
А	V				
В	Vx2				
С		V			
D			V		
E				V	
F					V
G	V		V		
Н	V			V	
I	V				V
J		V	V		

A. Antenna Placement Optimization for 1x LTE module:



B. Antenna Placement Optimization for 2x LTE module:



Front Panel



C. Antenna Placement Optimization for 1x 5G module:



Front Panel



D. Antenna Placement Optimization for 1x WiFi 5 (802.11ac Wave 1) module:



E. Antenna Placement Optimization for 1x WiFi 5 (802.11ac Wave 2) module:



Front Panel



F. Antenna Placement Optimization for 1x WiFi 6 module:



G. Antenna Placement Optimization for 1x LTE and 1x WiFi 5 (802.11ac Wave 1) module:



H. Antenna Placement Optimization for 1x LTE and 1x WiFi 5 (802.11ac Wave 2):



Front Panel



I. Antenna Placement Optimization for 1x LTE and 1x WiFi 6 module:



J. Antenna Placement Optimization for 1x 5G and 1x WiFi 5 (802.11ac Wave 1) module:



Front Panel



Rack-mounting the System

With the rack mount kit, this system can be fixed onto rack posts. Please contact Lanner's sales representative for purchasing this kit.

What's in the Rack-mount Kit

Check the kit for the following items:

- 2x Ear Bracket
- 1x Adapter Bracket
- 1x Adapter Holder
- Screws for the fixture of the Brackets and the Holder (8x Screw A, 2x Screw B)









Adapter holder



Adapter Bracket





Attaching the Assembly to the Chassis

1. On one side of the system, align the ear bracket to the screw holes on the side panel and fix it using <u>3</u> screws (Screw A).



2. Secure the other ear bracket to the other side of the system.



3. The adapter holder assembly is designed to secure a 5V adapter or a 3V adapter. Secure the adapter onto the holder with the adapter bracket and <u>2</u> provided screws (Screw B). Make sure the way you place the bracket is as shown in the picture.



4. Attach the adapter holder to the left side of system and secure it with 2 screws (Screw A)



5. Secure the adapter's cable onto the adapter holder.


CHAPTER 3: SOFTWARE SETUP

BIOS 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. BIOS update for Lanner PCs are available for download at

http://www.lannerinc.com/products/firmware-and-software/securityenhanced-bios

Main Setup

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

- **1.** Boot up the system.
- 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	
$\wedge \downarrow$	select an item/option on a setup screen	
<enter></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	
F2	time you entered BIOS	
F3	load optimized default values	
F4	save configurations and exit BIOS	
<esc></esc>	exit the current screen	

Setup main page contains BIOS information and project version information.

Aptio Setup Utility Main Advanced IntelR	– <mark>Copyright (C) 2019 Ameri</mark> CSetup Security Boot Sav	can Megatrends, Inc. e & Exit
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level System Date System Time	American Megatrends 5.13 0.36 x64 UEFI 2.6; PI 1.4 FNCA1513A00006T005 06/19/2019 16:38:05 Administrator [Wed 10/01/2008] [20:39:58]	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005-2099 Months: 1-12 Days: dependent on month ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.19.1266. Copyright (C) 2019 American Megatrends, Inc.

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

Advanced Page

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

Aptio Setup Utility – Copyri Main Advanced IntelRCSetup S	g <mark>ht (C) 2019 American Megatrends, Inc.</mark> ecurity Boot Save & Exit
 Trusted Computing Super IO Configuration H/W Monitor Watch Dog Timer Configuration Digital I/O Configuration Status LED Configuration Case Open Configuration Serial Port Console Redirection PCI Subsystem Settings Network Stack Configuration CSM Configuration SDIO Configuration USB Configuration Control Legacy PXE Boot NVMe Configuration 	Trusted Computing Settings ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. Copyrigh	: (C) 2019 American Megatrends, Inc.

Trusted Computing

Aptio Setup Utility Advanced	– Copyright (C) 2017 Amer	rican Megatrends, Inc.
TPM20 Device Found Vendor: NTC Firmware Version: 1.3	1	 Enables or Disables BIOS support for security device. 0.S. will not show Security Device TCG FET
Security Device Support Active PCR banks Available PCR banks	[Enable] SHA-1,SHA256 SHA-1,SHA256	protocol and INT1A interface will not be available.
SHA-1 PCR Bank SHA256 PCR Bank	[Enabled] [Enabled]	<pre>++: Select Screen f↓: Select Item Enter: Select</pre>
Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy	[None] [Enabled] [Enabled] [Enabled]	 +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults ▼ F4: Save & Exit ESC: Exit
Version 2.19.1268.	Copyright (C) 2017 Americ	can Megatrends, Inc.

AE

Aptio Setup Utility Advanced) – Copyright (C) 2	017 American Megatrends, Inc.
Active PCR banks Available PCR banks	SHA-1,SHA256 SHA-1,SHA256	▲ TPM 1.2 will restrict support to TPM 1.2 devices TPM 2.0 will
SHA-1 PCR Bank SHA256 PCR Bank	[Enabled] [Enabled]	restrict support to TPM 2.0 devices, Auto will support both with the
Pending operation Platform Hierarchy Storage Hierarchy	[None] [Enabled] [Enabled]	default set to TPM 2.0 devices if not found,
Hierarchy TPM2.0 UEFI Spec	[Enabled]	<pre>++: Select Screen f↓: Select Item</pre>
Physical Presence Spec Version	[1.3]	+/-: Change Opt. F1: General Help
InterfaceType Device Select	[Auto]	F3: Optimized Defaults ▼ F4: Save & Exit ESC: Exit

NCA-1516 User Manual

Feature	Options	Description	
		Enables or disables BIOS support for security device.	
Security Device	Enabled	By disabling this function, OS will not show Security	
Support	Disabled	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	None	Schedules an Operation for the Security Device.	
operation	TPM Clear	NOTE: Your computer will reboot during restart in	
operation		order to change State of Security Device.	
Platform	Enabled	Enables or disables Platform Hierarchy	
Hierarchy	Disabled		
Storage Hierarchy	Enabled Disabled	ed Enables or disables Storage Hierarchy. led	
Endorsement	Enabled	Enables or disables Endorsement Hierarchy	
Hierarchy	Disabled	Enables of disables Endorsement meralchy.	
		Select the TCG2 Spec Version,	
TPM2.0 UFFI Spec	TCG_1_2 TCG_2	TCG_1_2 : Supports the Compatible mode for	
Version		Win8/Win10	
Version		TCG_2 : Supports new TCG2 protocol and event	
		format for Win10 or later.	
Physical Presence	1.2	Select to tell OS to support PPI Spec Version 1.2 or	
Spec Version	13	1.3.	
		NOTE: Some HCK tests might not support 1.3.	
TPM 20	TIS	Select TPM 20 Device for the Communication	
InterfaceType		Interface.	
		TPM 1.2 will restrict support to TPM 1.2 devices;	
	TPM 1.2	while TPM 2.0 will restrict support to TPM 2.0	
Device Select	TPM 2.0	devices; Auto will support both with the default set to	
	Auto	TPM 2.0 devices. If not found, TPM 1.2 devices will be	
		enumerated.	

Super IO Configuration

Aptio Setup Utility – Copyright (C) 2017 Ameri Advanced	can Megatrends, Inc.
Super IO Configuration	Set Parameters of Serial Port 1 (COMA)
 Serial Port 1 Configuration Serial Port 2 Configuration 	
	 ┿: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268. Copyright (C) 2017 America	n Megatrends, Inc.

Serial Port 1 Configuration

Aptio Setup Util Advanced	ity – Copyright (C) 2018	American Megatrends, Inc.
Serial Port 1 Config	uration	Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=7;	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults E4: Serve 2 Suit</pre>
		ESC: Exit
Version 2.19.12	66. Copyright (C) 2018 An	merican Megatrends, Inc.

Feature	Options	Description	
Serial Port	Enabled	Enables or disables Serial Port 1.	
	Disabled		
Device Settings	NA	IO=3F8h; IRQ = 7	

Serial Port 2 Configuration

Aptio Setup Utili Advanced	ty – Copyright (C) 2018 Amer	ican Megatrends, Inc.
Serial Port 2 Configu	ration	Enable or Disable Serial Port (COM)
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=10;	
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.126	5. Copyright (C) 2018 Americ	an Megatrends, Inc.

Feature	Options	Description
Serial Port	Enabled	Enable or Disable Serial Port 2.
	Disabled	
Device Settings	NA	IO=2F8h; IRQ = 10

H/W Monitor

Aptio Setup Utility Advanced	y — Copyright (C) 2019 Ameri	can Megatrends, Inc.
Pc Health Status ▶ Smart Fan Control		Smart Fan Parameters
System Temp CPU Temp Fan2 Speed VCORE 12V 5V 1.2V 3.3V VBAT	: +45 C : +40 C : 3924 RPM : +1.032 V : +12.096 V : +5.020 V : +1.200 V : +3.288 V : +3.120 V	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266.	. Copyright (C) 2019 America	n Megatrends, Inc.

Watch Dog Timer Configuration

Aptio Setup U Advanced	tility – Copyri	ight (C) 2017 American	Megatrends, Inc.
Watch Dog Timer C	onfiguration	Ena	abled or Disabled
Watch Dog Timer	[Disable	ed]	
		++: 11: Ent +/- F1: F2: F3: F4: ESC	Select Screen Select Item Ser: Select Change Opt. General Help Previous Values Optimized Defaults Save & Exit
Version 2.19	.1266. Copyrigh	nt (C) 2017 American Me	gatrends, Inc.
Feature	Options	Desci	ription
Watch Dog Timer	Enabled Disabled	Enables or disables Watch	h Dog Timer function

Digital I/O Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2018 Ameri	can Megatrends, Inc.
Digital I/O Configuratio	on	Configure Digital I/O Pin 1.
Digital I/O Pin 1 Digital I/O Pin 3 Digital I/O Pin 5 Digital I/O Pin 7	[Output High] [Output High] [Output High] [Output High]	
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266.	Copyright (C) 2018 America	n Megatrends, Inc.

Feature	Options	Description	
Digital 1/0 Output 1	Output Low	Configure Digital I/O Bin1	
	Output High		
Disital 1/0 Output 2	Output Low	Configure Digital 1/O Dig2	
Digital I/O Output 3	Output High	Configure Digital I/O Pin3	
Disital 1/0 Output 5	Output Low	Configure Digital I/O Pin5	
Digital I/O Output 5	Output High		
Disital 1/0 Output 7	Output Low	Configure Disitel 1/O Dis 7	
Digital 1/O Output 7	Output High		

Status LED Configuration

Aptio Setu Advance	o Utility – Co d	pyright (C) 2017 American Megatrends, Inc.
Status LED Con	figuration	Configure Status LED.
Status LED	[OF	F]
		<pre> ++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.19.1269. Copy	yright (C) 2017 American Megatrends, Inc.
Feature	Options	Description
Status LED	OFF GREEN	Configures Status LED color

RED

Serial Port Console Redirection

Aptio Setu Advanced	o Utility – Co d	pyright (C) 2017 Americ	can Megatrends, Inc.
COMO Console Redired ▶ Console Redired Legacy Console ▶ Legacy Console	ction [En ction Settings Redirection Redirection S	abled] : ettings	Console Redirection Enable or Disable.
			<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.19.1269. Copy	right (C) 2017 Americar	n Megatrends, Inc.
Feature	Options	Des	cription
COM0 Console Redirection	Enabled Disabled	Enables or disable	es Console Redirection

Console Redirection Settings

Aptio Setup Utilit Advanced	y – Copyright (C) 2017 Ame	rican Megatrends, Inc.
Console Redirection Se	ttings	Emulation: ANSI:
Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key	[VT100+] [115200] [8] [None] [1] [None] [Enabled]	set. VT100: ASCII chan set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode
Recorder Mode Putty KeyPad	[Disabled] [VT100]	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.

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

VT-UTF8 Combo Key	Disabled	Enables VT-UTF8 Combination Key Support for	
Support	Enabled	ANSI/VT100 terminals	
Decordor Mode	Disabled	With this mode enabled, only text will be sent.	
Recorder Mode	Enabled	This is to capture Terminal data.	
	VT100		
Putty KeyPad	LINUX		
	XTERM86	Salacts Eurotion Kay and Kay Dad on Putty	
	SCO	Selects Functionkey and KeyPad on Putty.	
	ESCN		
	VT400		

Console Redirection Settings

Aptio Setup Utility Advanced	– Copyright (C) 2017 Ameri	can Megatrends, Inc.
Legacy Console Redirecti	on Settings	Select a COM port to display redirection of
Redirection COM Port Resolution Redirect After POST	[COMO] [80x24] [Always Enable]	<pre>++: Select Screen ++: Select Screen ++: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

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

PCI Subsystem Settings

Aptio Setup Utili Advanced	ty – Copyright (C) 201	18 American Megatrends, Inc.
PCI Bus Driver Version	A5.01.12	Enables or Disables 64bit capable Devices to be Decoded in Above
PCI Devices Common Se	ttings:	4G Address Space (Only
Above 4G Decoding	[Disabled]	if System Supports 64
SR-IOV Support	[Disabled]	bit PCI Decoding).
		 ↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit

Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Enable or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

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

Aptio Setup Ut Advanced	ility – Copyright (C) 201	7 American Megatrends, Inc.
Network Stack	[Disabled]	Enable/Disable UEFI Network Stack
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Network Stack Configuration

Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
lpv4 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></esc> key to abort the PXE boot
Media detect count	1	Number of times the presence of media will be checked

CSM Configuration

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. Advanced		
Compatibility Support M	odule Configuration	Enable/Disable CSM Support
CSM Support	[Enabled]	
CSM16 Module Version	07.81	
Option ROM execution		
Network Storage Video Other PCI devices	[Legacy] [Legacy] [Legacy] [Legacy]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Feature	Options	Description
CSM Support	Disabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI <mark>Legacy</mark>	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device	Do Not Launch UEFI <mark>Legacy</mark>	Determines OpROM execution policy for devices other than Network, Storage, or Video

SDIO Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2018 Ameri	can Megatrends, Inc.
SDIO Configuration	•	Auto Option: Access SD device in DMA mode if
SDIO Access Mode	[Auto]	controller supports
Mass Storage Devices:		mode.DMA Option: Access SD device in DMA
Sdio Device 1 Details:		mode.PIO Option: Access SD device in PIO mode.
Bus 0 Dev 1c Func 0		
MMC – M32508(7.8GB)	[Auto]	↔: Select Screen ↓: Select Item
		Enter: Select
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		ESC: Exit
Version 2.19.1266.	Copyright (C) 2018 America	n Megatrends, Inc.

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

USB Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2017 Ameri	can Megatrends, Inc.
USB Configuration	1	Enables Legacy USB support AUTO option
USB Module Version	19	disables legacy support if no USB devices are
USB Controllers: 1 XHCI		connected. DISABLE option will keep USB
USB Devices: 4 Drives, 2 Keybo	ards, 2 Mice, 2 Hubs	devices available only for EFI applications.
Legacy USB Support	[Enabled]	
XHCI Hand-off USB Mass Storage	[Enabled] [Enabled]	<pre>++: Select Screen 11: Select Item</pre>
Driver Support		Enter: Select
Port 60/64 Emulation	[Enabled]	+∕–: Change Opt. F1: General Help
USB hardware delays and time-outs:		F2: Previous Values F3: Optimized Defaults
USB transfer time-out	[20 sec]	F4: Save & Exit ESC: Exit

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

Device power-up delay	<mark>Auto</mark> 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.

Control Legacy PXE Boot

Aptio Setup Utility – Copyright (C) 2019 Ameri Advanced	can Megatrends, Inc.
Control Legacy PXE Boot Control Legacy PXE [Disabled] Boot from	Control Legacy PXE Boot from which Lan
Control Legacy PXE Boot fro Disabled Lan3 Lan4 Lan5 Lan6	ect Screen ect Item Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266. Copyright (C) 2019 America	n Megatrends, Inc.

Feature	Options	Description
Control Legacy PXE Boot From	Disabled	
	Lan3	
	Lan4	Control Legacy PXE Boot from which Lan.
	Lan5	
	Lan6	

NVME Configuration

Aptio Setup Utility – Copyright (C) 2018 Ameri Advanced	can Megatrends, Inc.
NVMe Configuration	
No NVME Device Found	
	↔: Select Screen ↓: Select Item
	Enter: Select +/-: Change Opt.
	F1: General Help F2: Previous Values F3: Optimized Defaults
	F4: Save & Exit ESC: Exit
Version 2.19.1266. Copyright (C) 2018 America	n Megatrends, Inc.

IntelRCSetup

Select the IntelRCSetup 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.

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. Main Advanced IntelRCSetup Security Boot Save & Exit		
Relax Security [Disabled] Configuration Processor Configuration Server ME Configuration North Bridge Chipset Configuration South Bridge Chipset Configuration System Event Log Restore On Power Loss [Last State]	Displays and provides option to change the Processor Settings ++: Select Screen fl: Select Item	
	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.19.1266. Copyright (C) 2018 A	American Megatrends, Inc.	

Feature	Options	Description
Relax Security	Disable	Relaxes the security configuration to be
Configuration	Enabled	able to use BIOS update tool.
Restore On Power Loss	Power On	Specify what state to go to when power is
	Power Off	re-applied after a power failure (G3 state).
	Last State	

Processor Configuration

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. IntelRCSetup		
Processor Version	Intel(R) Atom(TM) CPU C3958 @ 2.00GHz	Enable/disable AES-NI support
EIST (GV3) Turbo CPU C State Package C State limit Max Core C-State Enhanced Halt State	[Disable] [Enable] [Disable] [No Limit] [C6] [Enable]	
Monitor/Mwait L1 Prefetcher L2 Prefetcher Fast String Machine Check Execute Disable Bit VMX AES-NI	[Enable] [Enable] [Enable] [Enable] [Enable] [Enable] [Enable]	 **: Select Screen †4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2 19 1266	Conuright (C) 2018 Ameri	can Megatrends Inc

Feature	Options	Description
EIST (GV3)	Disable Enable	Enables/Disable EIST. GV3 must be enable for Turbo.
Turbo	Enable Disable	Enable or Disable CPU Turbo capability. This option only applies to ES2 and above.
CPU C State	Disable Enable	Enable the Enhanced Cx state of the CPU, takes effect after reboot.
Package C state limit	No Pkg C-state No S0lx <mark>No limit</mark>	Package C state limit.
Max core C-state	C1 C6	Options are:C1 and C6.
Enhanced Halt	Disable	Enables the enhanced C1E state of the
State(C1E)	Enable	CPU, takes effects after reboot.
Monitor/Mwait	Enable	Enable or Disable the Monitor/Mwait
	Disable	Instruction.
L1 Prefetcher	Enable Disable	Enable/Disable L1 Prefetch.

L2 Prefetcher	Enable	Enable/Disable L2 Prefetch
	Disable	
Fast String	Disable	When enables, enable fast strings for REP
	Enable	MOVS/STOS.
Machine Check	Disable	Enable or Disable the Machine Check.
	Enable	
Execute Disable Bit	Disable	When disabled, forces the XD feature flag
	Enable	to always return 0.
VMS	Disable	Enables the Vanderpool Technology,
	Enable	takes effect after reboot.
AES-NI	Disable	Enable/disable AES-NI support.
	Enable	

Server ME Configuration

Aptio Setup Utility Intel	y — Copyright (C) 2018 RCSetup	3 American Megatrends, Inc.
General ME Configuratio Operational Firmware Version ME Firmware Type Recovery Firmware Version ME Firmware Status #1 ME Firmware Status #2 Current State Error Code	on OB:4.0.4.172 SPS OB:4.0.4.172 Ox000F0345 Ox8811A000 Operational No Error	++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266	. Copyright (C) 2018 A	American Megatrends, Inc.

North Bridge Chipset Configuration

Aptio Setup Utility IntelR(– Copyright (C) 2018 (CSetup	American Megatrends, Inc.
North Bridge Chipset Cor Memory Information MRC Version Total Memory Memory Frequency	nfiguration 0.149.4.43 32768 MB DDR4 – 2133 MHz	Enables/Disables fast boot which skips memory training and attempts to boot using last known good configuration.
Fast Boot Memory Frequency VT-d	[Enabled] [DDR-2400] [Enabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Version 2.19.1266. Copyright (C) 2018 American Megatrends, Inc.

Feature	Options	Description
Fast Boot	Disabled Enabled	Enables/Disables fast boot, which skips memory training and attempts to boot using fast known good configuration.
Memory	DDR-1600	DDR memory frequency:
Frequency	DDR-1867	DDR4 up to DDR-2666
	DDR-2133	DDR3 up to DDR-1867.
	DDR-2400	
VT-d	Disable	Option to enable /Disable VT-d.
	Enable	

South Bridge Chipset Configuration

Aptio Setup Utility – Copyright (C) 201 IntelRCSetup	7 American Megatrends, Inc.
 SATA Configuration PCIE IP Configuration IQAT Configuration 	Configuration of SATA Controller
	<pre> ++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.1266. Copyright (C) 2017	American Megatrends, Inc.

SATA Configuration

Aptio Setup Utility — Copyright (C) 2018 American Megatrends, Inc. IntelRCSetup		
SATA 1 Enable controller LPM ALPM Speed limit ▶ SATA1	[Enabled] [Disabled] [Disabled] [Gen 3]	Enables/Disables SATA Controller if supported by current cpu SKU.
SATA O Enable controller LPM ALPM Speed limit ▶ M2SATA	[Enabled] [Disabled] [Disabled] [Gen 3]	<pre>#*: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Version 2.19.1266. Copyright (C) 2018 American Megatrends, Inc.

Feature	Options	Description
Enable controller	Enabled	Enables/Disables SATA Controller if supported by
	Disabled	current CPU sku
LPM	Enabled	Enables/Disables Link Power Management
	Disabled	
ALPM	Enabled	Enable/Disables Agresive Link Power Management
	Disabled	
Speed Limit	Gen 1	Indicates the highest allowable speed of the interface
	Gen 2	
	Gen 3	

SATA1 Configuration

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. IntelRCSetup		
SATA 1 Port 7 Device Information: Device Size: Enable/disable port Hot plug Spin up	[Not Installed] [Unknown] [Enabled] [Enabled] [Disabled]	Enables/Disables SATA Controller port if supported by current cpu SKU. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266	6. Copyright (C) 2018 Am	merican Megatrends, Inc.

Feature	Options	Description
Enable/disable port	Enabled	Enables/Disables SATA Controller port if
	Disabled	supported by current cpu SKU.
Hot plug	Enabled	Hot plug
	Disabled	
Spin up	Enabled	Spin up
	Disabled	

M2SATA1 Configuration

Aptio Setup Utilit Intel	y – Copyright (C) 2018 RCSetup	American Megatrends, Inc.
SATA 0 Port 0 Device Information: Device Size: Enable/disable port Hot plug Spin up	[Not Installed] [Unknown] [Enabled] [Enabled] [Disabled]	Enables/Disables SATA Controller port if supported by current cpu SKU. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1266	6. Copyright (C) 2018 An	merican Megatrends, Inc.

Feature	Options	Description
Enable/disable port	Enabled	Enables/Disables SATA Controller port if
	Disabled	supported by current cpu SKU.
Hot plug	Enabled	Hot plug
	Disabled	
Spin up	Enabled	Spin up
	Disabled	

PCIE IP Configuration

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. IntelRCSetup		
Bifurcation PCIE0 Bifurcation PCIE1	[x4x2x2] [x2x2x2x2]	Select and force Root Complex Bifurcation Configuration regardless board or trident detection
		<pre> ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.12	66. Copyright (C) 2018	American Megatrends, Inc.

Feature	Options	Description
Bifurcation PCIE0	Auto	Select and force Root Complex Bifurcation
	X8	Configuration regardless board or trident
	X4x4	detection.
	X4x2x2	
	X2x2x4	
	X2x2x2x2	
Bifurcation PCIE1	Auto	Select and force Root Complex Bifurcation
	X8	Configuration regardless board or trident
	X4x4	detection.
	X4x2x2	
	X2x2x4	
	X2x2x2x2	

IQAT Configuration

Aptio Setup Util Int	ity – Copyright (C) 201 elRCSetup	7 American Megatrends, Inc.
IQAT Set IQAT FUSECTL Set 64B MRR/MPL	[Enabled] [Disabled] [Enabled]	Hides IQAT device from an OS
		<pre> ++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.19.12	266. Copyright (C) 2017	American Megatrends, Inc.

Feature	Options	Description
IQAT	Enabled	Hides IQAT device from and OS.
	Disabled	

System Event Log

Aptio Setup Utility IntelR	– Copyright (C) 2018 Ameri <mark>CSetup</mark>	can Megatrends, Inc.
System Event Log		System Error Enable/Disable/ Auto
<u> </u>		setup options. If Auto is selected the
System Errors Memory Event Log PCIe Event Log Whea Settings	[Enable]	enabling or disbling of errors in the driver is skipped.
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Feature	Options	Description		
System Errors	Disable	System Error enabling and logging setur		
	Enable	system error enabling and logging setup		
	Auto	option.		
Mamory Flog Support	Disable	Enable/Disable Memory Error logging		
Memory Elog Support	Enable	support		
Devity Cheedy	Enable	Frakla (Disable Davity Charle		
Parity Check	Disable	Enable/Disable Parity Check		
Log Correctable	Enable	Enable/Disable Correctable Memory		
	Disable	Error logging support		
Log Un-Correctable	Enable	Enable/Disable Un-correctable Memory		
	Disable	Error logging support		
Enable/Disable Error	Disable	Error Cloaking Feature to hide CE Error to		
Cloaking	Enable	OS		
	Disable	Enable/Disable PCle Error logging		
PCIE Elog Support	Enable	support		
Lee Fatal France	Disable	Cand autom quant Circal an Estal array		
Log Fatal Error	Enable	Send system event Signal on Fatal error		
Log Non-Fatal Error	Disable	Send system event Signal on Non Fatal		
	Enable	error.		
Log Correctable Error	Disable	Send system event Signal on Correctable		
	Enable	error.		
----------------------	-------------------	--	--	--
PCIe System Error	Disable Enable	Enable System Error reporting on all enumerated Root ports, bridges and devices.		
PCIe Parity Error	Disable Enable	Enable Parity Error reporting on a enumerated Root ports, bridges ar devices.		
WHEA Support	Disable Enable	Enable/Disable WHEA ACPI support.		
WHEA Error Injection	Disable	When EINJ ACPI 5.0 support for set error		
5.0 Extension	Enable	type with address and vendor extensions.		
Whea Logging	Disable Enable	Enable/Disable Whea logging of errors.		
WHEA PCIe Error	Disable	Enable/Disable WHEA PCIe Error		
Injection	Enable	Injection .		

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.

Aptio Setup Utility Main Advanced Platfo	– Copyright (C) 2017 Ameri rm Socket Security Boot	c an Megatrends, Inc. Save & Exit
Password Description If ONLY the Administrate then this only limits ac only asked for when ente If ONLY the User's pass is a power on password :	or's password is set, ccess to Setup and is ering Setup. word is set, then this and must be entered to	Set Administrator Password
boot or enter Setup. In have Administrator righ		
in the following range:	t be	++: Select Screen
Minimum length	3	f↓: Select Item
Maximum length	20	Enter: Select +/-: Change Opt.
Administrator Password		F1: General Help
User Password		F2: Previous Values F3: Optimized Defaults
▶ Secure Boot		F4: Save & Exit ESC: Exit
Version 2.19.1268.	Copyright (C) 2017 America	n Megatrends, Inc.

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

Secure Boot

Aptio Setup Utility	– Copyright (C) 2017 Americ Security	can Megatrends, Inc.
System Mode Secure Boot Vendor Keys Attempt Secure Boot Secure Boot Mode ▶ Key Management	Setup Not Active Active [Disable] [Custom]	Secure Boot activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM function is disabled ++: Select Screen tl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.19.1268.	Copyright (C) 2017 America	n Megatrends, Inc.

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

Aptio Setup Utility	- Сору	right S((C) edui	2017 f rity	Ameri	can Megatrends, Inc.
Provision Factory Defaults Install Factory Default Enroll Efi Image	[Disab	1e]				Allow to provision factory default Secure Boot keys when System is in Setup Mode
Secure Boot variable Platform Key(PK) Key Exchange Keys	Size 0	Keys# 0 0	Key No No	y Sourc Key Key	се	
Authorized Signatures Forbidden Signatures Authorized TimeStamps OsRecovery Signatures	0 0 0 0	0 0 0	No No No	Key Key Key Key		 ↔: Select Screen ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
Version 2.19.1268.	Copyri	ght (C)) 2(017 Ame	erica	F4: Save & Exit ESC: Exit

Feature	Options	Description		
Factory Key	Disabled	Provision factory default keys on next re-boot only		
Provision	Enabled	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.

	Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc. Main Advanced Platform Socket Server Mgmt Security <mark>Boot</mark>				
	Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot	<mark>5 [</mark> On] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.		
	Boot mode select	[LEGACY]			
•	FIXED BOOT ORDER Priorit Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 USB Drive BBS Priorities	ties [Hard Disk] [USB Device:LEI Virtual CDROMO 1.00] [CD/DVD] [Network]	<pre>++: Select Screen +↓: Select Item Enter: Select +/-: Change Opt. F1: General Help E2: Provision Values</pre>		
			F2: Previous values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
	Version 2.19.1268.	Copyright (C) 2018 American	n Megatrends, Inc.		

Feature	Options	Description	
		The number of seconds to wait for setup	
Setup Prompt Timeout	5	activation key.	
		65535 means indefinite waiting.	
Pootun Numlock State	On	Coloct the Koyle and Numberly state	
Bootup NumLock State	Off	Select the keyboard NumLock state	
Quiet De et	Disabled	Fuchlas an dischlas Quiet Post antion	
Quiet Boot	Enabled	Enables of disables Quiet Boot option.	
	LEGACY		
Boot mode select	UEFI	Select boot mode for LEGACY or UEFI.	
	DUAL		

• Choose boot priority from the 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.

Aptio Setup Utility – Copyright (C) 2017 Amer. Main Advanced Platform Socket Security Boot	ican Megatrends, Inc. Save & Exit
Save Options Discard Changes and Exit Save Changes and Reset Default Options Restore Defaults Boot Override UEFI: JetFlashTranscend 16GB 1100, Partition 1	Exit system setup without saving any changes.
Launch EFI Shell from filesystem device	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2,19,1268, Convright (C) 2017 America	an Megatrends, Inc.

Save Changes and Reset

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. 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 listed under Boot Override depend on devices connected to system.

APPENDIX A: SETTING UP CONSOLE REDIRECTIONS

Console redirection lets you monitor and configure a system from a remote terminal computer by redirecting keyboard input and text output through the serial port. The following steps illustrate how to use this feature. The BIOS of the system allows the redirection of the console I/O to a serial port. With this configured, you can remotely access the entire boot sequence through a console port.

- **1.** Connect one end of the console cable to console port of the system and the other end to the serial port of the Remote Client System.
- 2.
- **3.** Configure the following settings in the BIOS Setup menu:

BIOS > Advanced > Serial Port Console Redirection > Console Redirection Settings, select 115200 for the Baud Rate, None. for Flow control, 8 for the Data Bit, None for Parity Check, and 1 for the Stop Bit.

4. Configure console redirection related settings on the client system. You can use a terminal emulation program that features communication with serial COM ports such as *TeraTerm* or *Putty*. Make sure the serial connection properties of the client conform to those set in Step 1 for server.

APPENDIX B: LED INDICATOR EXPLANATIONS

The status explanations of LED indicators on the Front Panel are as follows:



System Power

Green	The system is powered and running
Off	The system is powered off

System Status

This LED indicator is programmable. You could program it to display the operating status of the behaviors

described below:

Solid Green	Defined by GPIO
Solid Red	Defined by GPIO
Off	Defined by GPIO

HDD Activity

Green	A hard disk is detected
Off	No hard disk is detected

Speed

Link Activity Speed



Link Activity

Link Activity

Blinking Amber	Link has been established, and there is activity on this port
Solid Amber	Link has been established and there is no activity on this port
Off	No link is established
Current	

Speed

Solid Amber	Operating as a Gigabit connection (1000 Mbps)
Solid Green	Operating as a 100-Mbps connection
Off	Operating as a 10-Mbps connection

APPENDIX C: RENAMING NETWORK INTERFACE

Prerequisite

- **1.** Login as "root."
- 2. Have all network interfaces disconnected.

Description

It requires five steps to rename system's network interface in Linux.

- 1. Scan all network-related interfaces in the system.
- 2. Filter the network interfaces. Please only preserve the interface that you want to rename.
- 3. Check interfaces' status.
- 4. Rename.
- 5. Save the new name to the configuration file.

Config(rnif.conf)

There are some parameters that can be modified in the config file. (E.g. Character '#' in the config file means

comment).

- Filter: The network interface that user wants to rename.
- UdevAddress: The path of udev rule files.
- UdevFilename: Udev rule file name.
- IfcfgAddress: The path of ifcfg files.
- **SaveStep:** If set to 0, the program will skip the step of saving.
- AutoNaming: The program will auto rename the network interface if user sets AutoNaming in the config file. The format is "AutoNaming oldName:newName." For example, if set "AutoNaming eth0:lanner0", the program will rename eth0 to lanner0 automatically.

Config Example

```
Filter eth
UdevAddress /etc/udev/rules.d
UdevFilename 10-lanner_net.rule
IfcfgAddress /etc/sysconfig/network-scrips
AutoSave 0
AutoNaming eth0:lanner0
AutoNaming eth1:lanner1
AutoNaming eth2:eth10
```

Screenshots of Renaming Procedures

1. Scan and filter.

		Terminal
File F	dit View Terr	minal Tabs Help
debian	:~/lanner_re	name_netif_v1_00# ./rename_netif
[Scan]	All network	interfaces in your system:
Index	Name	HW Addr
1	lo	00:00:00:00:00:00
2	eth0	00:90:0b:1e:b1:41
3	eth3	00:90:0b:1f:e1:10
4	eth1	00:90:0b:1a:12:ba
5	eth2	00:90:0b:1a:12:bb
6	eth4	00:90:0b:1f:e1:11
7	eth5	00:90:0b:1f:e1:0e
8	eth6	00:90:0b:1f:e1:0f
9	eth7	00:90:0b:1f:el:0c
10	eth8	00:90:0b:1f:e1:0d
11	eth0	00:50:05:11:01:00
12	eth10	00:90:0b:1f:e1:0b
13	eth11	00:90:0b:1c:37:8e
14	oth12	00:00:10:37:8f
15	eth13	00.90.00.10.37.80
16	oth1/	00.50.00.1c.37.8c
17	cit0	00.00.00.00.00.00
1/	SILU	00:00:00:00:00
[Filte	r] Only pres	erve the network interfaces you want to rename:
Index	Name	HW Addr
2	eth0	00:90:0b:1e:b1:41
3	eth3	00:00:0b:1f:e1:10
4	eth1	00:90:0b:1a:12:ba
5	eth2	00:90:0b:1a:12:bb
6	eth4	00:90:0b:1f:e1:11
7	oth5	00:00:0b:1f:c1:0e
, o	eth6	00:50:00:11:e1:0e
a	oth7	00:00:0b:1f:e1:0c
10	oth9	00:50:00:11:e1:00
11	othQ	00.90.0b.1f.e1.0a
12	eth10	00:50:00:11:e1:00
13	oth11	00:00:00:00:11:00 00:00:00:1c:37:80
14	oth12	00:00:00:1c:37:8e
14	eth12	00.00.00.10.37.81
15	eth13	00.90.00.1c.37.8c
10	eth14	00:90:00:10:37:80

2. If any network interface is still running, the utility will exit.

Termina	
<u>F</u> ile <u>E</u> dit ⊻iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
	<u> </u>
[Check] Check the network interfaces'	status:
eth0 is UP	
eth3 is UP	
eth1 is UP	
eth2 is UP	
eth4 15 UP	
eth6 is UP	
eth7 is UP	
eth8 is UP	
eth9 is UP	
eth11 is UP	
eth12 is UP	
eth13 is UP	
eth14 is UP	
Error: There are some interfaces still	active
Please stop them and retry again	active
debian:~/lanner_rename_netif_v1_00# []	

3. Renaming will start after the message shows "PASS: All interfaces are DOWN".

					Terminal	
<u>F</u> ile	<u>E</u> dit	⊻iew	Terminal	Ta <u>b</u> s	Help	
						
[Fil	ter]	Only	preserve	the r	etwork interfaces you want to rename:	
Inde	X N	ame		HW A	ddr	
2	e	th0		00:9	0:0b:1e:b1:41	
3	e	th3		00:9	0:0b:1f:e1:10	
4	e	th1		00:9	0:0b:1a:12:ba	
5	e	th2		00:9	0:0b:1a:12:bb	
6	e	th4		00:9	0:0b:1f:e1:11	
7	e	th5		00:9	0:0b:1f:e1:0e	
8	e	th6		00:9	0:0b:1f:e1:0f	
9	e	th7		00:9	0:0b:1f:e1:0c	
10	e	th8		00:9	0:0b:1f:e1:0d	
11	e	th9		00:9	0:0b:1f:e1:0a	
12	e	th10		00:9	0:0b:1f:e1:0b	
13	e	th11		00:9	0:0b:1c:37:8e	
14	e	th12		00:9	0:0b:1c:37:8f	
15	e	th13		00:9	0:0b:1c:37:8c	
16	e	th14		00:9	0:0b:1c:37:8d	
[Che	ck] C	heck	the netwo	ork in	terfaces' status:	
PASS	: All	inte	rfaces a	re DOW	N	
[Ren	ame]	Start	to rena	ne net	work interfaces:	=
Rena	me et	h0 to	:			•

4. If renaming fails (using the same name), the utility will skip saving step and exit.

	Terminal	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> ermi	nal Ta <u>b</u> s <u>H</u> elp	
		•
[Check] Check the ne	etwork interfaces' status:	
PASS: All interfaces		
ASS. ACC Incertaces		
[Rename] Start to re	ename network interfaces:	
Rename eth0 to:	eth0	
Rename eth3 to:	eth3	
Rename eth1 to:	ethl	
Rename eth2 to:	etn2	
Rename eth4 to:	eth4	
Rename eth6 to:	eth6	
Rename eth7 to:	eth7	
Rename eth8 to:	eth8	
Rename eth9 to:	eth9	
Rename eth10 to:	eth10	
Rename eth11 to:	eth11	
Rename eth12 to:	eth12	
Rename eth13 to:	eth13	
Rename eth14 to:	eth3	
C++		
Start rename	failed	=
EATL: Skip [Save] st	an a	
THIE, SKIP [Save] ST		-
acorant , canner_rene		

5. If renaming is successful, choose a save method or just leave.

		Terminal	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erm	nal Ta <u>b</u> s <u>H</u> elp		
			-
[Check] Check the n	twork interfaces' status:		
DACC: All interface			
PASS: ALL INTERNACE	are Down		
[Rename] Start to r	name network interfaces:		
Rename eth0 to:	lanner0		
Rename eth3 to:	lanner3		
Rename eth1 to:	lanner1		
Rename eth2 to:	lanner2		
Rename eth4 to:	lanner4		
Rename eth5 to:	lanner5		
Rename eth6 to:	lanner6		
Rename eth7 to:	lanner7		
Rename eth8 to:	lanner8		
Rename eth9 to:	lanner9		
Rename eth10 to:	lanner10		
Rename ethll to:	lanner11		
Rename eth12 to:	lanner12		
Rename eth13 to:	lanner13		
Rename eth14 to:	lanner14		
Start rename			
PASS: Rename succes	fully		
	,		
[Save] Please select	a method for save your conf	iguration	
 Save as udev rule 	s.		_
Save as ifcfg.			
Don't save. Just	test.		
Your choice:			•

6. Save successfully.

	Terminal		
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal	Ta <u>b</u> s <u>H</u> elp		
			
Start rename PASS: Rename successfu	llv		
[Save] Please select a	method for save your configuration		
 Save as udev rules. Save as ifcfg. Don't save. Just te Your choice: 1 	st.		
Start to write udev ru Write udev rule done debian:~/lanner rename	les .patif v1 00# ls /atr/uday/rules d/		
020 permissions.rules	z20 persistent-input.rules	z55 hotplug.rules	
025 libgphoto2.rules	z20 persistent.rules	z60 alsa-utils.rules	
025_libsane.rules	z25_persistent-cd.rules	z60_hdparm.rules	
10-lanner_net.rules	z25_persistent-net.rules	z60_xserver-xorg-input-wacom.rules	
85-pcmcia.rules	z45_persistent-net-generator.rules	z75_cd-aliases-generator.rules	
udev.rules	z50_run.rules_	z99_hal.rules	=
debian:~/lanner_rename	_netif_v1_00#		•

7. You can skip saving and set AutoNaming.

	Terminal	
<u>F</u> ile	<u>E</u> dit ⊻iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
		-
[Cheo	ck] Check the network interfaces' status:	
PASS:	: All interfaces are DOWN	
(Bonz	amal Start to repame notwork interfaces	
[Rella	amej start to rename network interfaces.	
Auto	Naming: Rename eth0 to lanner0	
Auto	Naming: Rename ethl to lanner1	
Auto	Naming: Rename eth2 to lanner2	
Auto	Naming: Rename eth3 to lanner3	
Auto	Naming: Rename eth4 to lanner4	
Auto	Naming: Rename eth5 to lanner5	
Auto	Naming: Rename eth6 to lanner6	
Auto	Naming: Rename etn/ to lanner/	
Auto	Naming: Rename etho to Lamero	
Auto	Naming: Rename ethic to lanneria	
Auto	Maming: Rename ethil to lanerll	
Auto	Naming: Rename eth12 to lanner12	
Auto	Naming: Rename eth13 to lanner13	
Auto	Naming: Rename eth14 to lanner14	
-		
Start	t rename	
PASS	: Rename successfully	
liser	skin save sten	
debia	an:~/lanner rename netif v1 01# []	

APPENDIX D: TERMS AND CONDITIONS

Warranty Policy

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

RMA Service

Requesting an RMA#

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



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

RMA Service Request Form

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

	0:	Reasons to Return: - Testing Purpose	Repair(Please include failure details)
Compa	any:	Contact Person:	
Phone	No.	Purchased Date:	
Fax No	».:	Applied Date:	
Return	Shipping Addr	ess:	
Shippi D Othe	ng by: Air Fre ers:	eight 🗆 Sea 🗆 Express 	
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code: 01:D.O.A. 02: Second Time R.M.A. 04: FDC Fail 05: HDC Fail 06: Bad Slot

07: BIOS Problem 08: Keyboard Controller Fail 09: Cache RMA Problem 03: CMOS Data Lost 10: Memory Socket Bad 11: Hang Up Software 12: Out Look Damage

13: SCSI 14: LPT Port 15: PS2 16: LAN 17: COM Port 18: Watchdog Timer 24: Others (Pls specify)

19: DIO 20: Buzzer 21: Shut Down 22: Panel Fail 23: CRT Fail

Request	Party
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Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date