

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-4012 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 selected text more transparent and explicable to users. This document contains the following conventions:

Font Conventions

Example	Convention	Usage
<code>iptables -F</code>	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>	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
<i>Readme.txt</i>	In Italic	A filename or a file path
<u>IPMI User Guide</u>	Underlined	The name of another document or a chapter in this document

Icon Descriptions

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

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 <http://www.lannerinc.com/> to access published documents and downloadable resources.

For troubleshooting the issues with your system, please visit the [Lanner Q&A](#) 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 <http://www.lannerinc.com/technical-support> where you can fill in a support ticket to our technical support department.

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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).

Electrical Safety Instructions

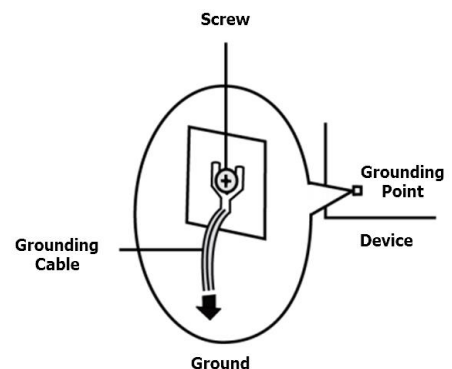
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

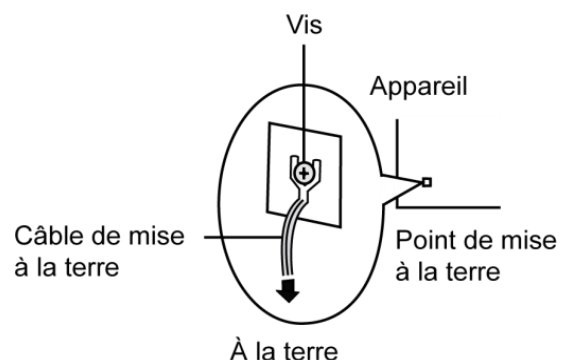
Grounding Procedure for DC Power Source

- ▶ 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.





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

注意：要断开电源，请将所有电源线从本机上拔下。

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

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

- ▶ This equipment must be grounded. The power cord for the 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.

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

The product is only to be connected to PoE network without routing to outside plant.

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

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CHAPTER 1: PRODUCT OVERVIEW

The NCA-4012 is a 1U 19" rackmount network appliance designed for optimal networking and virtualization performance. Its optimization capabilities are made possible by Intel®'s Xeon® D-1548 4 or 16-core CPU, codenamed Broadwell-DE, delivering exceptional computing performance, abundant LAN interface, redundant PSUs, configurable system memory and scalable storage options.

Main Features

- ▶ Intel® Xeon® D-1500 4~16 Cores Processor
- ▶ 300W Redundant PSUs, 2 x Cooling Fans
- ▶ 15x GbE, 1x IPMI and 2x 10G SFP+ or 8x GbE (By SKU)
- ▶ Max. 64GB (R-DIMM) or 32GB (ECC) System Memory
- ▶ 1x NIC Module Slot
- ▶ 2x 2.5" Internal HDD/SSD Bays, 1x mSATA
- ▶ 1x RJ45 Console, 2x USB 2.0

Package Content

Your package contains the following items:

- ▶ 1x NCA-4012 Network Appliance
- ▶ 1x Power Adapter
- ▶ 1x Power Cable (the provided plug type will vary by region)



Note

- (1) If any component is missing or damaged, please contact your dealer immediately for assistance.
- (2) The supplied power adapter and power cable are dedicated to this product only; do not use them with devices other than this model.

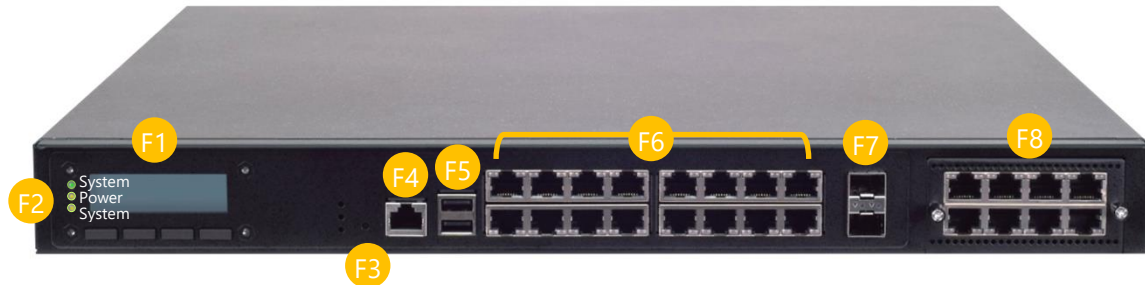
Ordering Information

SKU No.	Specification
NCA-4012A	Xeon D1548, IPMI (Optional), 15x GbE LAN, 2x 10G SFP+ (7 Pairs of Bypass)
NCA-4012B	Xeon D1518, 8x GbE (3 Pairs of Bypass)
NCA-4012C	Xeon D1577, 8x GbE LAN+ 2x 10G SFP+ (3 pairs of Bypass)

System Specifications

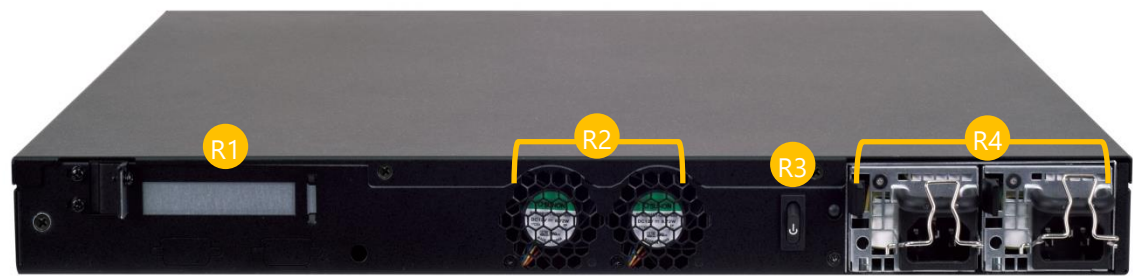
Form Factor		1U 19" Rackmount
Platform	Processor Options	Intel® Xeon® D-1500 4~16 Cores (Broadwell-DE)
	CPU Socket	Onboard
	Chipset	SoC
	Security Acceleration	N/A
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 2400 MHz REG, ECC or Non-ECC UDIMM
	Max. Capacity	R-DIMM: 64GB / ECC: 32GB
	Socket	2x 288-pin DIMM
Networking	Ethernet Ports	8x GbE RJ45 Intel® i210 (By SKU; SKU A with 7x GbE RJ45 + 1x LOM Port)
		8x GbE RJ45 Intel® i350-AM4 (By SKU)
	Bypass	2x 10G SFP+ Broadwell-D SOC (By SKU)
	NIC Module Slot	3x Pairs of Gen3 (By SKU)
LOM	IO Interface	1 x RJ45 (By Project) *Share with ETH0
	OPMA slot	Yes (By SKU)
I/O Interface	Reset Button	1
	LED	Power/Status/Storage
	Power Button	1x ATX Power Switch
	Console	1x RJ45
	USB	2x USB 2.0
	LCD Module	2x 20 Character LCM, 4x Keypads
	Display	From OPMA Slot (By SKU)
Storage	Power input	AC Power Inlet on PSU
	HDD/SSD Support	2x 2.5" Bay (Optional)
Expansion	Onboard Slots	1x mSATA
	PCIe	1x PCIe*8 HH/HL (Optional)
Miscellaneous	mini-PCIe	N/A
	Watchdog	Yes
	Internal RTC with Li Battery	Yes
Cooling	TPM	Yes(Optional)
	Processor	Passive CPU Heatsink
Environmental Parameters	System	2x Cooling Fans w/ Smart Fan
	Temperature	0~40°C Operating -20~70°C Non-Operating
	Humidity (RH)	5 to 90% Operating 5 to 95% Non-Operating
System Dimensions	(WxDxH)	438 mm x 431 mm x 44 mm
	Weight	7.24 kg
Package Dimensions	(WxDxH)	582 mm x 548 mm x 182 mm
	Weight	11.07 kg
Power	Type/Watts	300W Power Adapter
	Input	AC 100~240V @50~60Hz
Approvals and Compliance		CE/FCC Class A, UL

Front Panel



No.	Description	
F1	LCM Panel	With four keys
F2	LED Indicators	<p>System Power</p> <p>If the LED is on, it indicates that the system is powered on. If it is off, it indicates that the system is powered off. Status: This LED is programmable. You could program it to display the operating status with the following</p> <p>System Status</p> <p>If the LED is green, it indicates that the system's operational state is normal. If it is red, it indicates that the system is malfunctioning.</p> <p>HDD</p> <p>If the LED blinks, it indicates data access activities; otherwise, it remains off.</p>
F3	Reset Button	Press to perform a reset
F4	Console Port	1x GbE RJ45 console port
F5	USB Ports	2x Type A USB 2.0 port
F6	Ethernet Port	8x (NCA-4012B) or 16x (NCA-4012A) GbE RJ45 port
F7	SFP+	2x 10G SFP+ port (NCA-4012A)
F8	NIC Module Slot	1x NIC Module Slot

Rear Panel

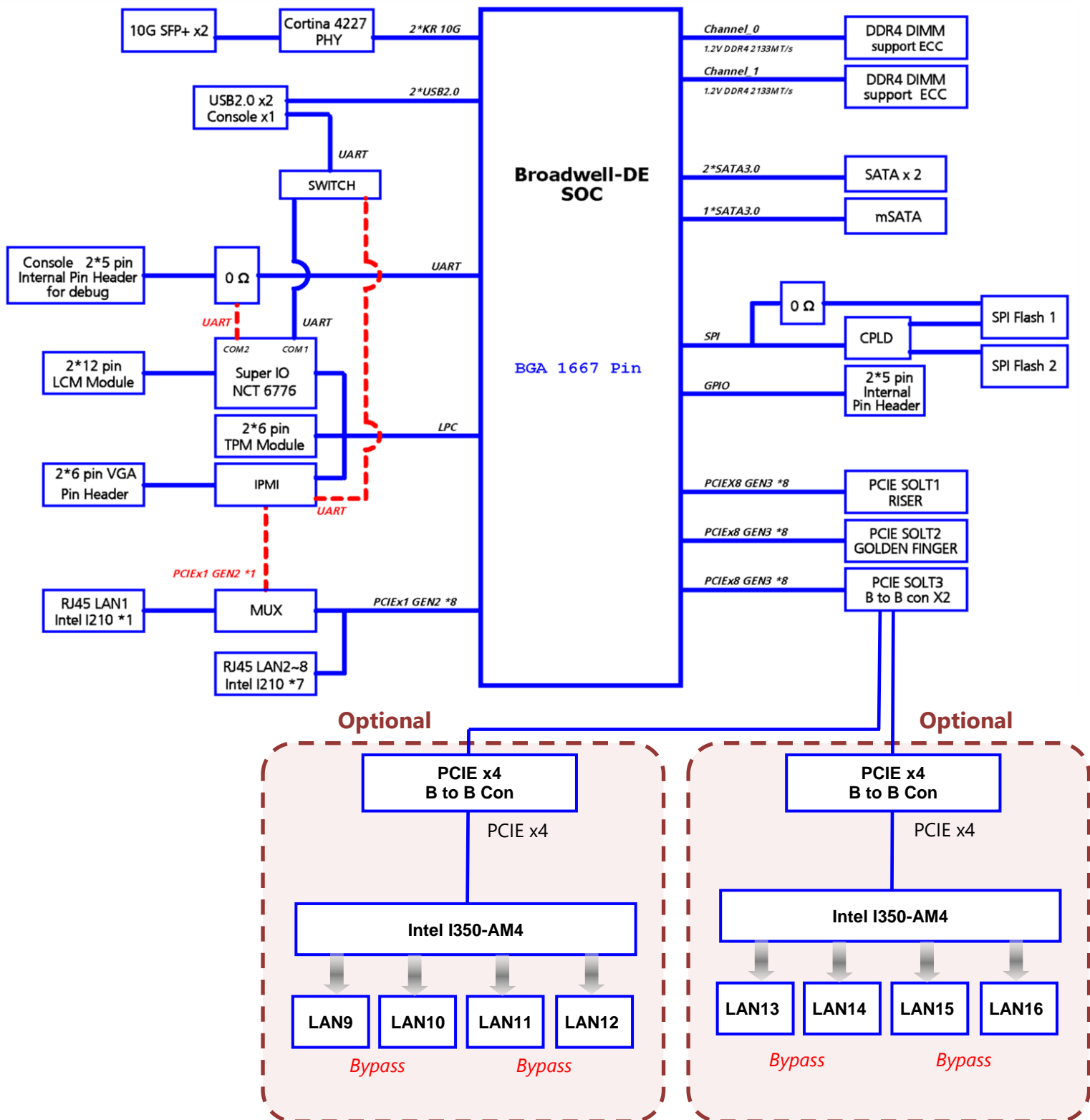


No.	Description	
R1	PCIe Slot	1x PCIe8 HH/HL slot (Optional)
R2	Cooling Fan	2x Cooling fans
R3	Power Switch	Flip to power on the system
R4	Redundant PSU	2x swappable Redundant PSUs

Motherboard Information

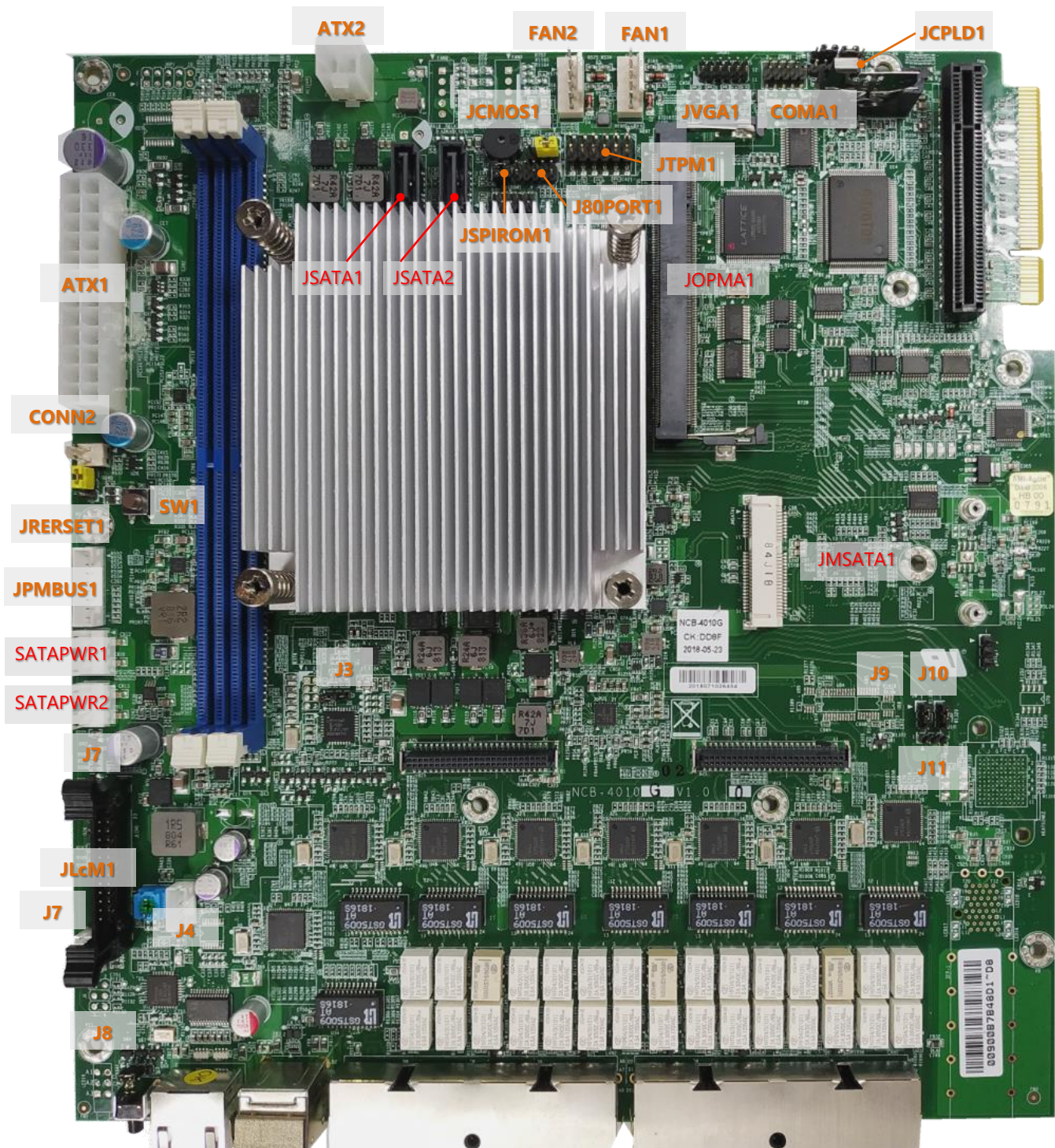
Block Diagram

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



Motherboard Layout

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

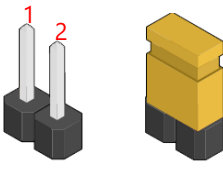
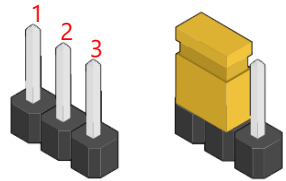
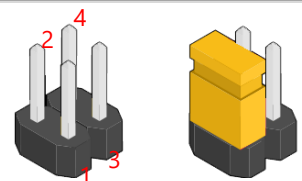


Internal Jumpers

The pin headers on the motherboard are often associated with important functions. With the shunt (Jumper) pushed down on the designated pins (the pin numbers are printed on the circuit board, surrounding the pin header), a certain feature can be enabled or disabled. While changing the jumpers, make sure your system is turned off.

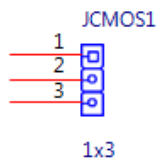
Jumper Setting

To short the designated pins, push the jumper down on them so that they become **SHORT**. To make the pins setting **OPEN**, simply remove the jumper cap.

2-pin Header		3-pin Header		4-pin Header	
					
Open	Short	Open	(1-2) Jumped	Open	(1-2) Jumped

Clear CMOS pin header(JCMOS1)

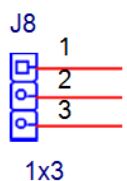
PIN	DESCRIPTION
1	VCC_RTC
2	PCH_RTCRST#
3	GND



1-2 : NORMAL
2-3 : CLEAR CMOS

Main board bypass flash jump setting pin header(J8)

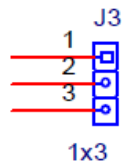
PIN	DESCRIPTION
1	P3V3_SB
2	CPLD_LED3
3	GND



ARM Programming Selection
0 (2-3) : Enable
1 (1-2) : Disable (default)

NM-4010IG401 I/O board bypass flash jump setting pin header(J3)

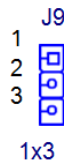
PIN	DESCRIPTION
1	P3V3_SB
2	IO_PIO0_1
3	GND



ARM Programming Selection
 0(2-3) : Enable
 1(1-2) : Disable (default)

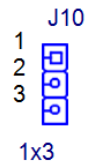
Inphi 10G PHY debug port pin header(J9) (J10)

PIN	DESCRIPTION
1	PHY_I2C_SDA
2	PHY_I2C_SDA_JUMP
3	PHY_I2C_SDA_TOOL



PHY I2C Source Selection
 (2-3) : From Tool
 (1-2) : From CPU (default)

PIN	DESCRIPTION
1	PHY_I2C_SCL
2	PHY_I2C_SCL_JUMP
3	PHY_I2C_SCL_TOOL



PHY I2C Source Selection
 (2-3) : From Tool
 (1-2) : From CPU (default)

(JRESET1): Select front-panel reset option

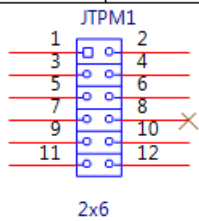
- (1-2) Hardware Reset
- (2-3) Software Reset (Default)

PIN	DESCRIPTION
1	BTN_SYS_RESET#
2	FP_RESET#
3	SW_RST_GP5#

Internal Connectors

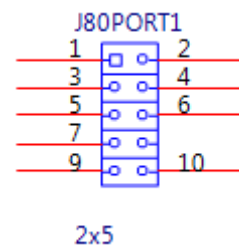
TPM module pin header (**JTPM1**)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	LPC_SERIRQ	2	LPC_FRAME#
3	LPC_LAD0	4	CLK_33M_PORT80
5	LPC_LAD1	6	P3V3_SB
7	LPC_LAD2	8	NC
9	LPC_LAD3	10	P3V3
11	PLT_RST#	12	GND



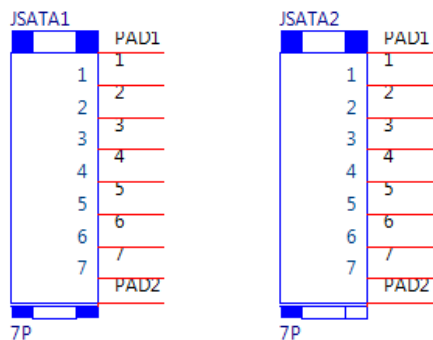
80 Debug port(**J80PORT1**)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	CLK_33M_PORT80	2	LPC_LAD1_R
3	80PORT_RST#	4	LPC_LAD0_R
5	LPC_FRAME#_P80	6	P3V3
7	LPC_LAD3_P80	8	NC
9	LPC_LAD2_P80	10	GND

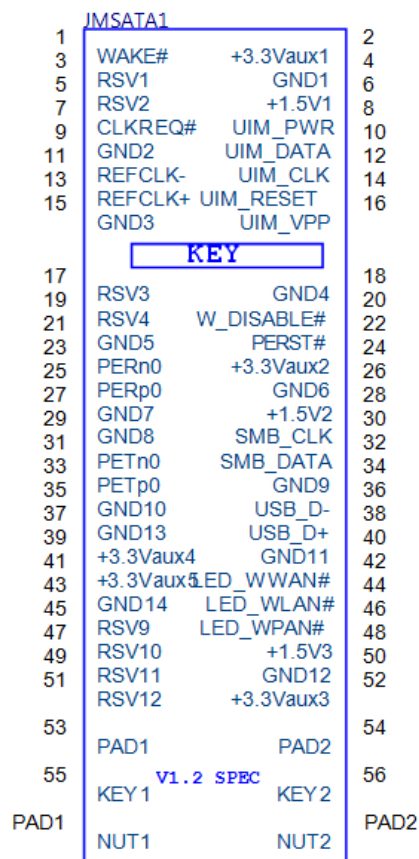


SATA Connector(**JSATA1&2**)

PIN	DESCRIPTION
1	GND
2	SATA_CTX_C_DRX_P
3	SATA_CTX_C_DRX_N
4	GND
5	SATA_DTX_CRX_N
6	SATA_DTX_CRX_P
7	GND



mSATA connector (**JMSATA1**)



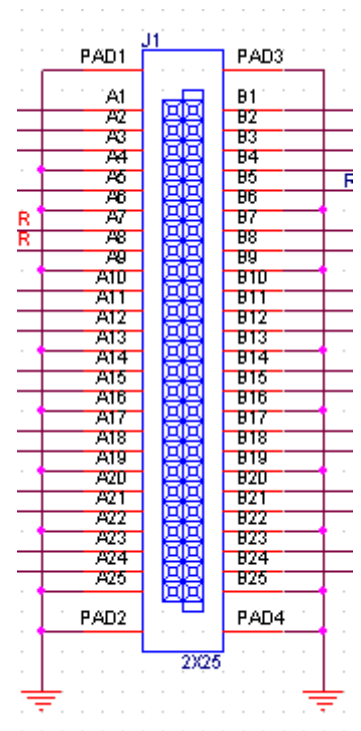
NM-4010IG401 I/O board connector

PIN	DESCRIPTION	PIN	DESCRIPTION
A1	P3V3_ATX	B1	P12V
A2	P3V3_ATX	B2	P12V
A3	P3V3_ATX	B3	PCH_SLOT3_A8
A4	GND	B4	PCIESLOT3_I350A_RST#
A5	P3V3_ATX	B5	PHY_WAKE#
A6	GND	B6	GND
A7	SLT3A_SCLK2_R	B7	CLK100_PCIE_SOLT3_1P
A8	SLT3A_SDAT2_R	B8	CLK100_PCIE_SOLT3_1N
A9	GND	B9	GND
A10	IO_LAN12GND	B10	IO_LAN34GND
A11	IO_P0_S0_1	B11	IO_P1_S0_1
A12	IO_P0_S0_2	B12	IO_P1_S0_2
A13	GND	B13	GND
A14	PCIE_CTX_C_SLOT3RX_P0	B14	PCIE_SLOT3TX_C_CRX_P0
A15	PCIE_CTX_C_SLOT3RX_N0	B15	PCIE_SLOT3TX_C_CRX_N0
A16	GND	B16	GND
A17	PCIE_CTX_C_SLOT3RX_P1	B17	PCIE_SLOT3TX_C_CRX_P1
A18	PCIE_CTX_C_SLOT3RX_N1	B18	PCIE_SLOT3TX_C_CRX_N1
A19	GND	B19	GND
A20	PCIE_CTX_C_SLOT3RX_P2	B20	PCIE_SLOT3TX_C_CRX_P2
A21	PCIE_CTX_C_SLOT3RX_N2	B21	PCIE_SLOT3TX_C_CRX_N2
A22	GND	B22	GND
A23	PCIE_CTX_C_SLOT3RX_P3	B23	PCIE_SLOT3TX_C_CRX_P3
A24	PCIE_CTX_C_SLOT3RX_N3	B24	PCIE_SLOT3TX_C_CRX_N3
A25	GND	B25	GND

(J1&J2) : 2 x 50-pin I/O board connectors, for jointing with I/O board NM-4010IG401.

J1:

PIN	DESCRIPTION	PIN	DESCRIPTION
A1	P3V3	B1	P12V
A2	P3V3	B2	P12V
A3	P3V3	B3	PCH_SLOT3_A8
A4	GND	B4	PCIESLOT3_I350A_RST#
A5	P3V3	B5	PHY_WAKE#
A6	GND	B6	GND
A7	SLT3A_SCLK2	B7	CLK100_PCIE_SOLT3_1P
A8	SLT3A_SDAT2	B8	CLK100_PCIE_SOLT3_1N
A9	GND	B9	GND
A10	IO_LAN12GND	B10	IO_LAN34GND
A11	IO_P0_S0_1	B11	IO_P1_S0_1
A12	IO_P0_S0_2	B12	IO_P1_S0_2
A13	GND	B13	GND
A14	PCIE_CTX_C_SLOT3RX_P0	B14	PCIE_SLOT3TX_C_CRX_P0
A15	PCIE_CTX_C_SLOT3RX_N0	B15	PCIE_SLOT3TX_C_CRX_N0
A16	GND	B16	GND
A17	PCIE_CTX_C_SLOT3RX_P1	B17	PCIE_SLOT3TX_C_CRX_P1
A18	PCIE_CTX_C_SLOT3RX_N1	B18	PCIE_SLOT3TX_C_CRX_N1
A19	GND	B19	GND
A20	PCIE_CTX_C_SLOT3RX_P2	B20	PCIE_SLOT3TX_C_CRX_P2
A21	PCIE_CTX_C_SLOT3RX_N2	B21	PCIE_SLOT3TX_C_CRX_N2
A22	GND	B22	GND
A23	PCIE_CTX_C_SLOT3RX_P3	B23	PCIE_SLOT3TX_C_CRX_P3
A24	PCIE_CTX_C_SLOT3RX_N3	B24	PCIE_SLOT3TX_C_CRX_N3
A25	GND	B25	GND

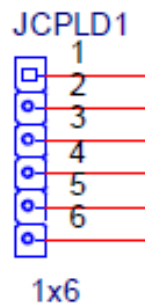


J2 :

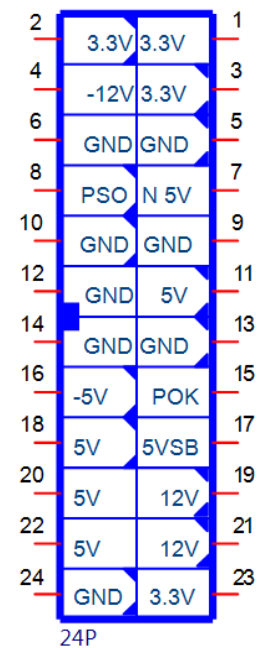
PIN	DESCRIPTION	PIN	DESCRIPTION
A1	P3V3	B1	P12V
A2	P3V3	B2	P12V
A3	P3V3	B3	PCH_SLOT3_A8
A4	GND	B4	PCIESLOT3_I350B_RST#
A5	P3V3	B5	PHY_WAKE#
A6	GND	B6	GND
A7	SLT3B_SCLK3	B7	CLK100_PCIE_SOLT3_2P
A8	SLT3B_SDAT3	B8	CLK100_PCIE_SOLT3_2N
A9	GND	B9	GND
A10	IO_LAN56GND	B10	IO_LAN78GND
A11	IO_P2_S0_1	B11	IO_P3_S0_1
A12	IO_P2_S0_2	B12	IO_P3_S0_2
A13	GND	B13	GND
A14	PCIE_CTX_C_SLOT3RX_P4	B14	PCIE_SLOT3TX_C_CRX_P4
A15	PCIE_CTX_C_SLOT3RX_N4	B15	PCIE_SLOT3TX_C_CRX_N4
A16	GND	B16	GND
A17	PCIE_CTX_C_SLOT3RX_P5	B17	PCIE_SLOT3TX_C_CRX_P5
A18	PCIE_CTX_C_SLOT3RX_N5	B18	PCIE_SLOT3TX_C_CRX_N5
A19	GND	B19	GND
A20	PCIE_CTX_C_SLOT3RX_P6	B20	PCIE_SLOT3TX_C_CRX_P6
A21	PCIE_CTX_C_SLOT3RX_N6	B21	PCIE_SLOT3TX_C_CRX_N6
A22	GND	B22	GND
A23	PCIE_CTX_C_SLOT3RX_P7	B23	PCIE_SLOT3TX_C_CRX_P7
A24	PCIE_CTX_C_SLOT3RX_N7	B24	PCIE_SLOT3TX_C_CRX_N7
A25	GND	B25	GND

CPLD Flash pin header (JCPLD1)

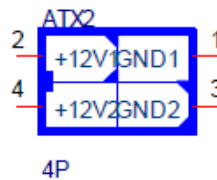
PIN	DESCRIPTION
1	P3V3_SB
2	DUAL_SPI_TDO
3	J_CPLD_TDI
4	CPLD_TMS
5	GND
6	CPLD_TCK

**ATX Power connector 24P(ATX1)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	P3V3_ATX	2	P3V3_ATX
3	P3V3_ATX	4	-12V
5	GND	6	GND
7	P5V	8	ATX_PSON#
9	GND	10	GND
11	P5V	12	GND
13	GND	14	GND
15	ATXPWGD	16	-5V
17	ATX_P5V_SB	18	P5V
19	P12V	20	P5V
21	P12V	22	P5V
23	P3V3_ATX	24	GND

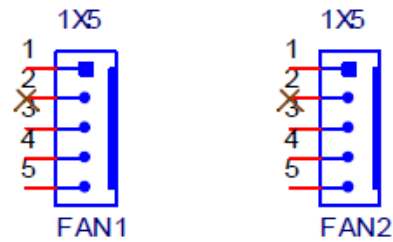
**ATX Power connector 4P(ATX2)**

PIN	DESCRIPTION
1	GND
2	P12V
3	GND
4	P12V



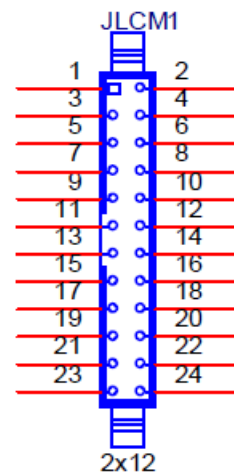
CPU Fan (FAN1&2)

PIN	DESCRIPTION
1	CPUFANOUTPWM_1
2	NC
3	CPUFANIN
4	P12V
5	GND



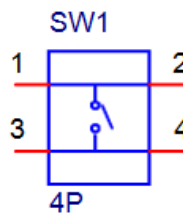
LCM module connector(JLCM1)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	P5V	2	GND
3	P_SLIN_N	4	VEE
5	P_AFD_N	6	P_INIT_N
7	LPD1	8	LPD0
9	LPD3	10	LPD2
11	LPD5	12	LPD4
13	LPD7	14	LPD6
15	LCD-	16	P5V
17	KPA1	18	KPA2
19	KPA3	20	KPA4
21	LCM_RST	22	CTR_GRN
23	CTR_YEW	24	HDD_LED#



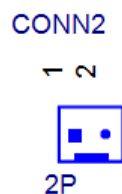
Power button (SW1)

PIN	DESCRIPTION
1	GND
2	GND
3	PWRON#
4	PWRON#



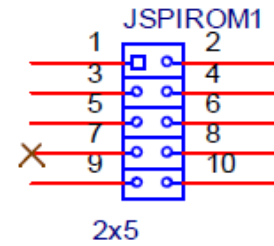
Power pin header(CONN2)

PIN	DESCRIPTION
1	GND
2	PWRON#

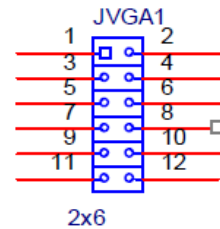


SPI ROM flash pin header(JSPIROM1)

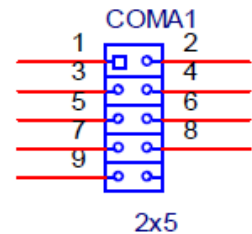
PIN	DESCRIPTION	PIN	DESCRIPTION
1	SPI_HD1#	2	J_SPI2_CS0#_DUAL
3	J_SPI1_CS0#_DUAL	4	P3V3_SB_SPI
5	SPI_MISO_DUAL	6	SPI_HOLD0_L
7	NC	8	SPI_CLK_DUAL
9	GND	10	SPI_MOSI_DUAL

**VGA pin header (JVGA1)**

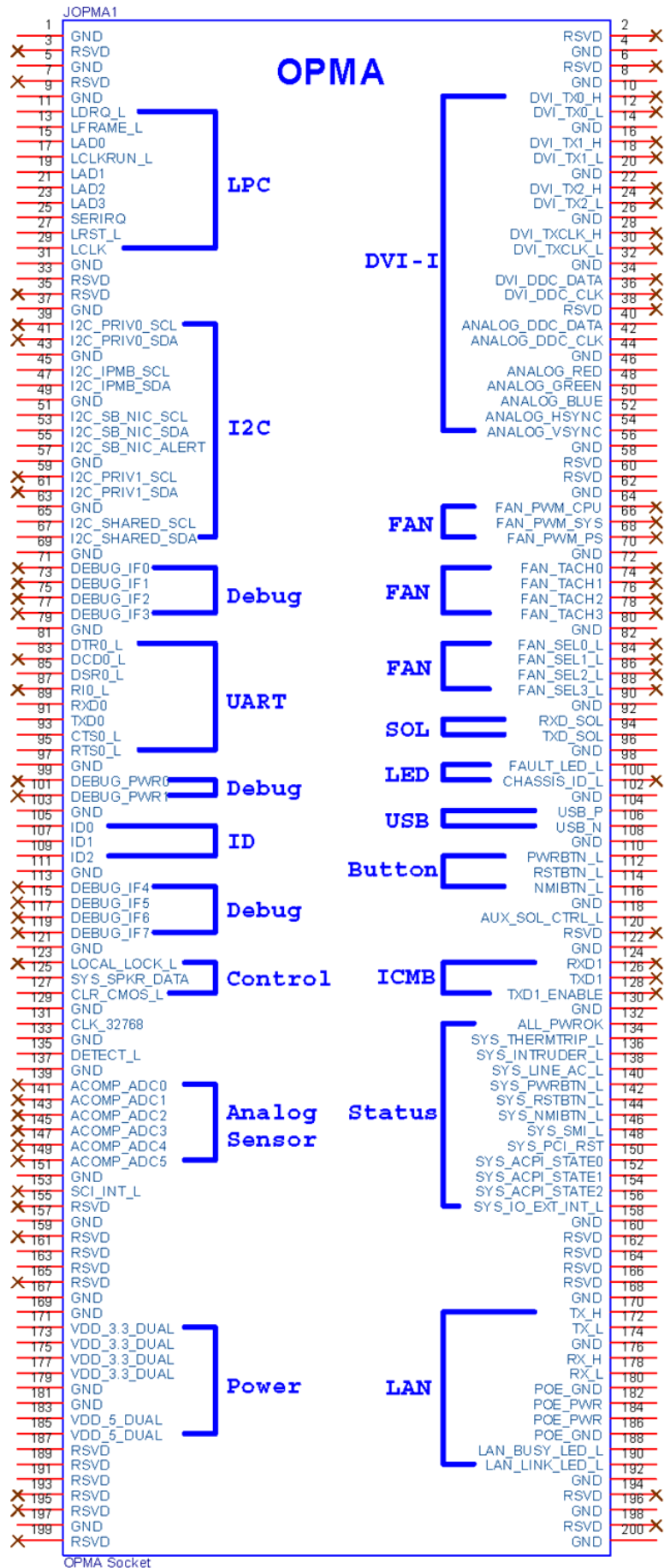
PIN	DESCRIPTION	PIN	DESCRIPTION
1	DAC_RO	2	GND
3	DAC_GO	4	GND
5	DAC_BO	6	GND
7	HSYNC_O	8	NC
9	VSYNC_O	10	GND
11	DDC_DATA	12	DDC_CLK

**COM port pin header (COMA1)**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	NDCD2-	2	NDSR2-
3	NRXD2	4	NRTS2-
5	NTXD2	6	NCTS2-
7	NDTR2-	8	NRI2-
9	GND	10	NC

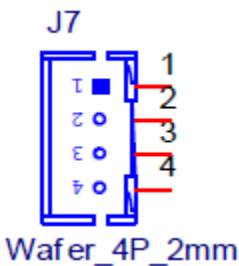


IPMI connector(JOPMA1)



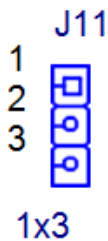
Main board bypass flash connector (J7)

PIN	DESCRIPTION
1	P3V3_SB
2	NXP_RXD
3	GND
4	NXP_TXD



PHY I2C debug pin header(J11)

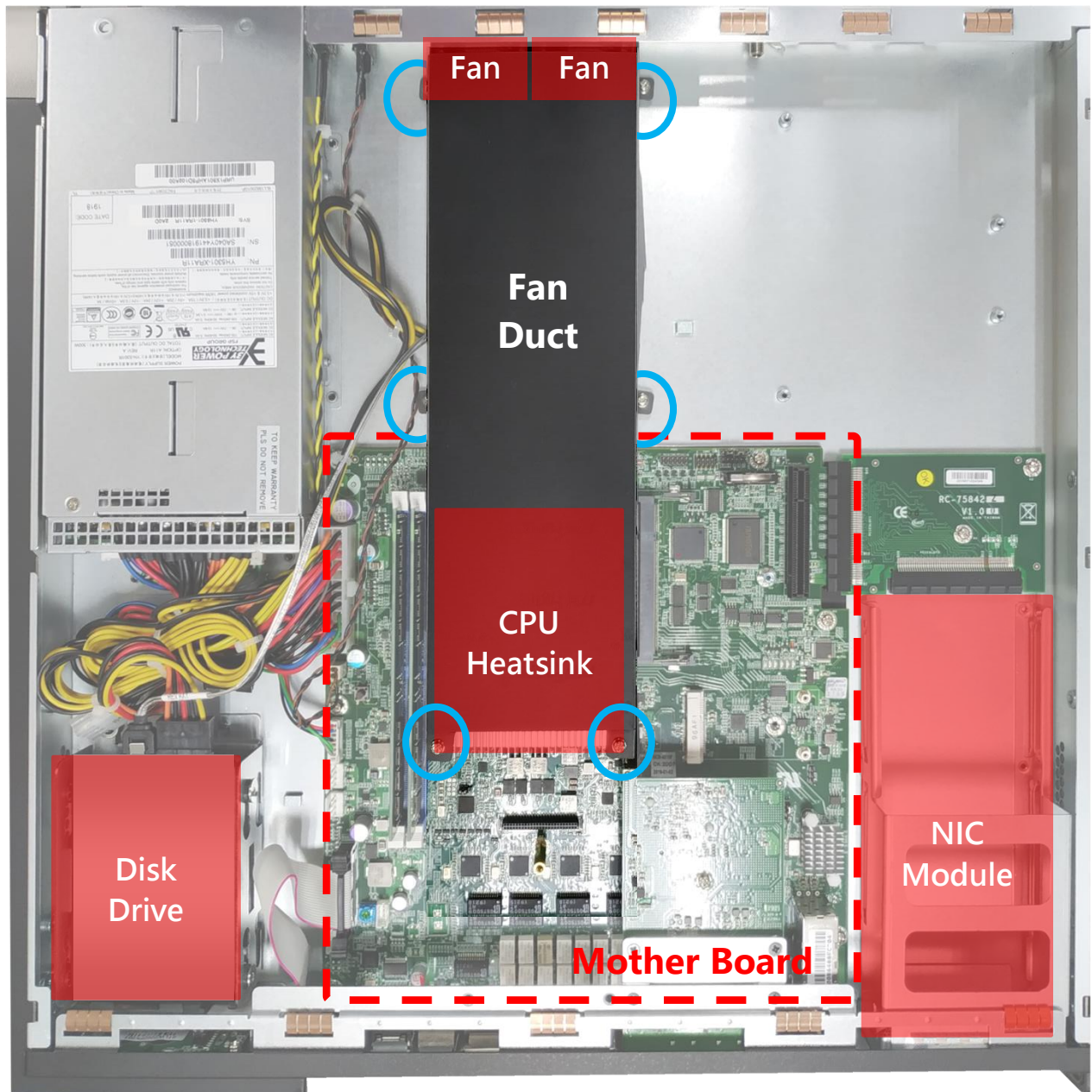
PIN	DESCRIPTION
1	PHY_I2C_SDA_TOOL
2	GND
3	PHY_I2C_SCL_TOOL



CHAPTER 2: HARDWARE SETUP

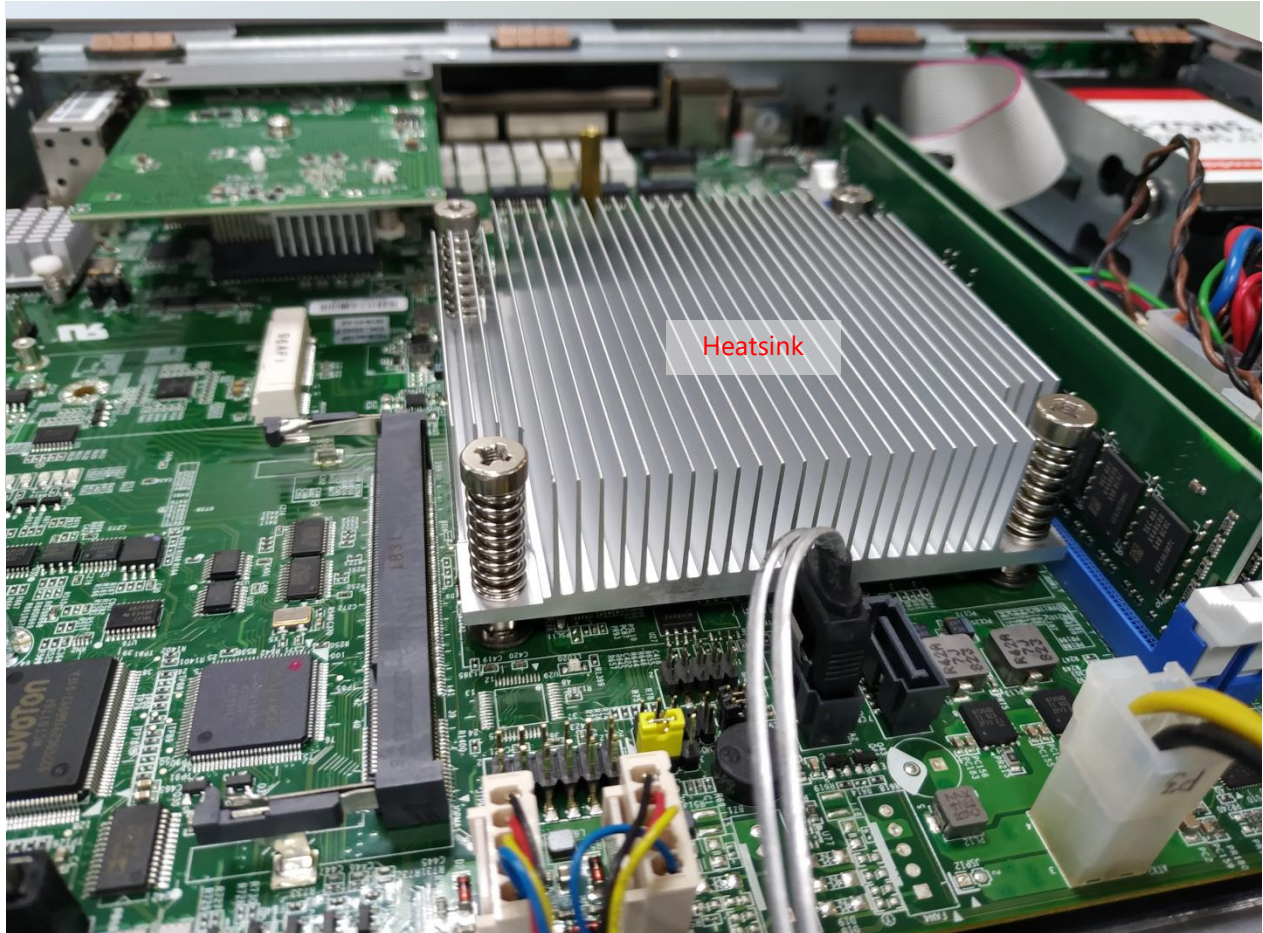
To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely. Also, please wear ESD protection gloves when conducting the steps in this chapter.

After opening the chassis, in order to reveal the entire motherboard, remove the fan duct by unscrewing the six screws indicated in the picture below. Based on your application and modules used, install modules in the corresponding slots.



About the CPU and Heatsink

Since the CPU is soldered onboard, the heatsink and the CPU are pre-installed before shipment. In normal circumstances, no installation or replacement is required. If there is any issue related to CPU overheat or damage, please contact the dealership or distributor where you purchase this appliance.



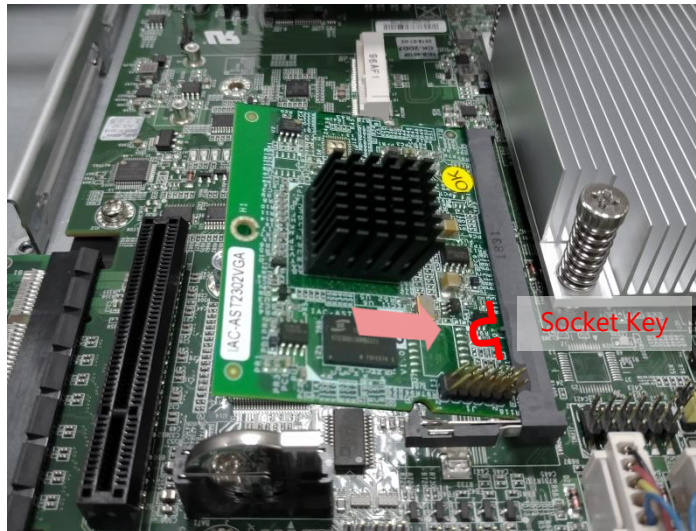
Installing the IPMI Card

This system provides one OPMA slot for installing the IPMI card. Follow these procedures below for installing an IPMI card.

1. Locate the OPMA socket.

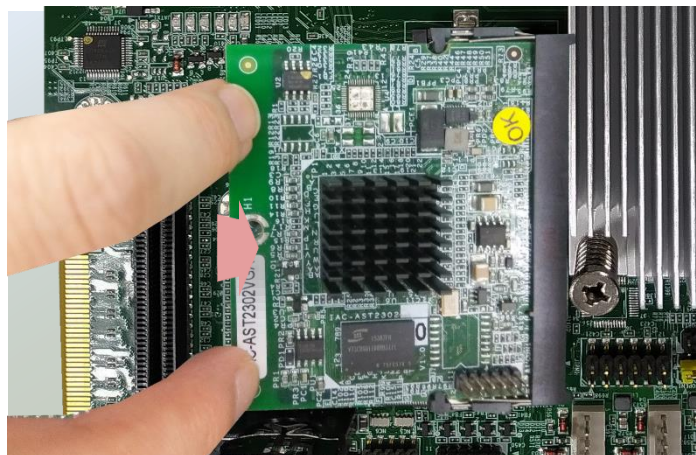


2. Align the notch of the card with the socket key in the slot.

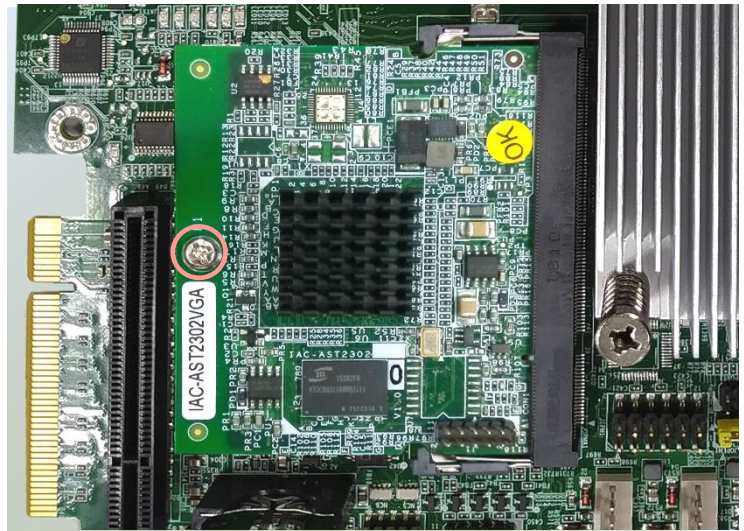


3. Insert the module at 30 degrees into the socket until it is fully seated in the connector.

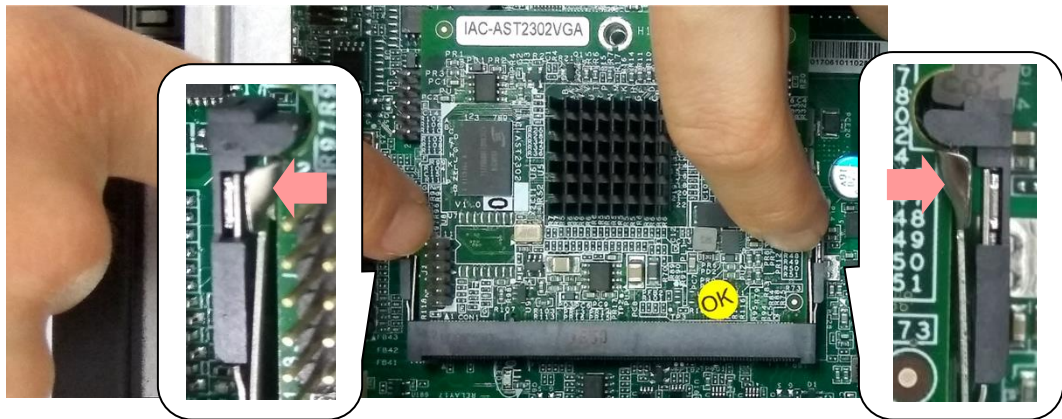
4. Press on two corners of the card and push it down vertically until it clicks into place.



5. Secure the card with a screw that comes with it.



To remove the card, loosen the screw that secures it to the motherboard, push aside the two metal leaves that hold the card to release it from the socket before you can pull it out.



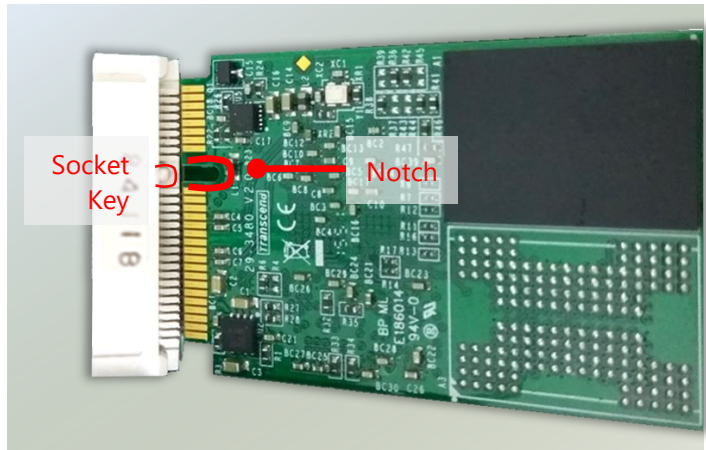
Installing the mSATA

The motherboard provides one mSATA slot. Follow the procedures below for installing an mSATA card.

1. Locate the mSATA slot.

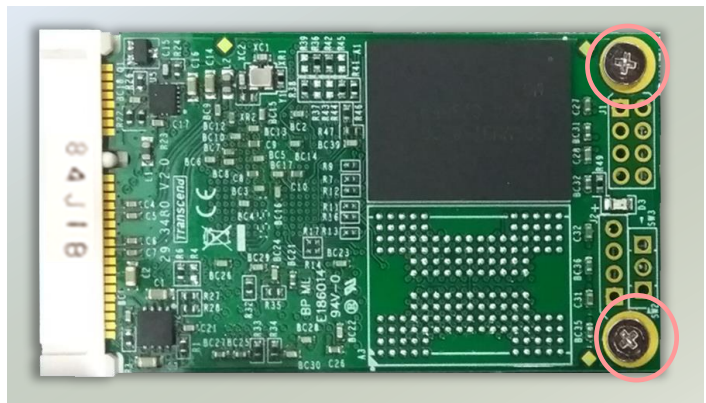


2. Align the notch of the module with the socket key in the slot.



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

4. Press down on the module and secure it with screws that come with it.

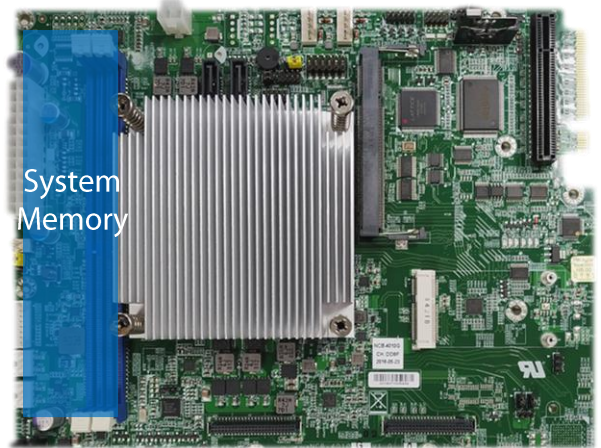


Installing the System Memory

DIMM Population Guidelines

Please do follow the memory module installation instructions to install the DIMMs, and make sure

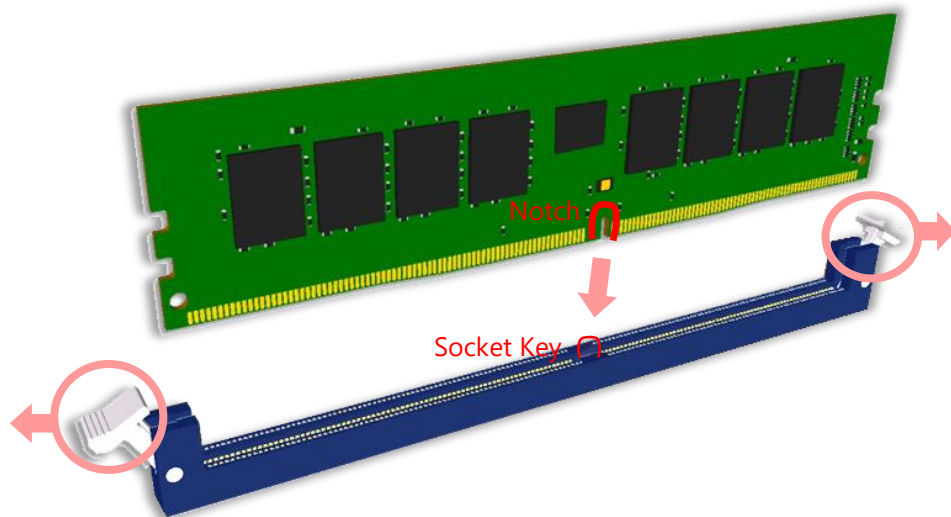
- Do not mix RDIMMs with LRDIMMs.
- Using memory modules of the same capacity, speed and from the same manufacturer are highly recommended. However, with mixed module speeds, the overall speed will be that of the slowest installed memory module.



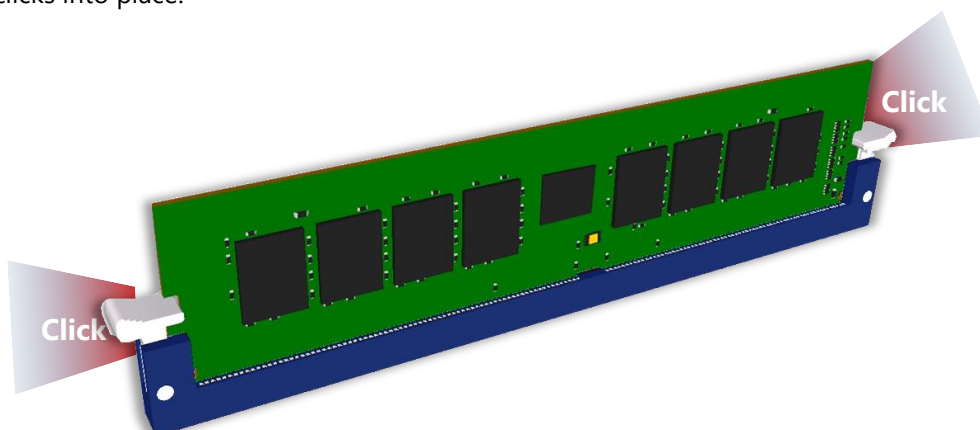
Memory Module Installation Instructions

Please follow the steps below to install the DIMM memory modules.

1. Power off the system.
2. Pull open the DIMM slot latches.
3. Align the notch of the module with the socket key in the slot and carefully insert the card into the slot.



4. Push the module down into the slot until it is firmly seated. Press vertically on both corners of the card until it clicks into place.



Installing the NIC Module

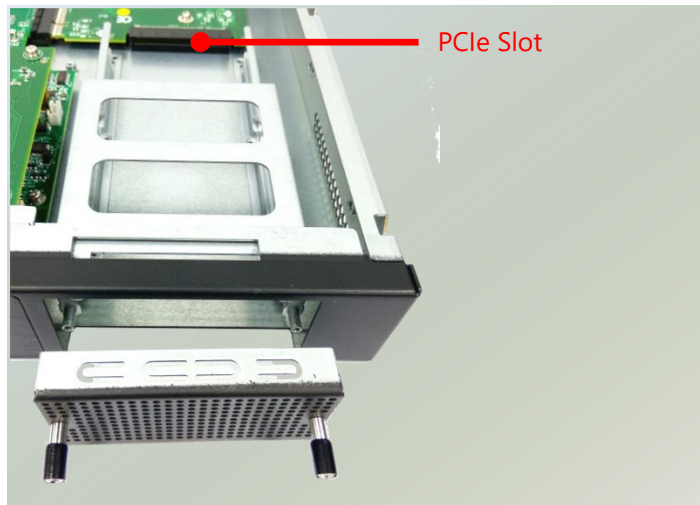
This system comes with 1 NIC Ethernet module slot for network bandwidth expansion. Please follow the steps for installation.



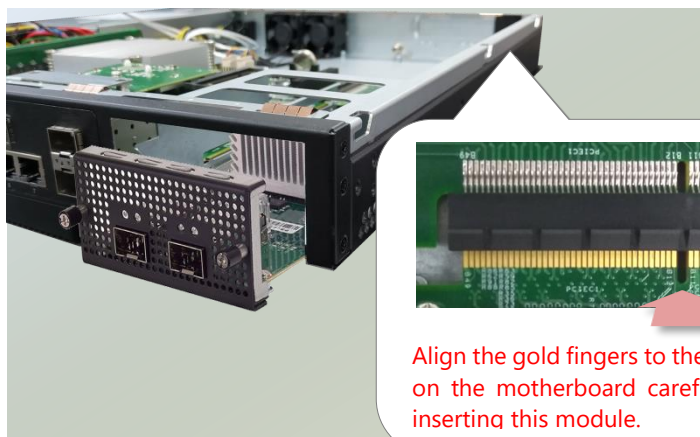
1. Rotate the two lock-screws counterclockwise and loosen them.



2. Remove the door and locate the PCIe slot for module insertion.



3. Insert your NIC Ethernet module. (The module shown in the image below is for reference only).

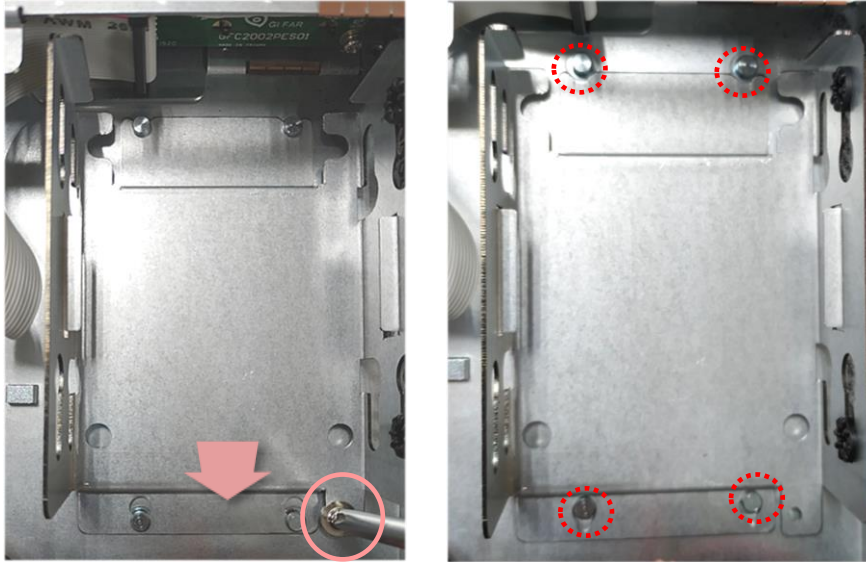


4. Once the module is firmly seated, rotate clockwise and tighten the two lock-screws.

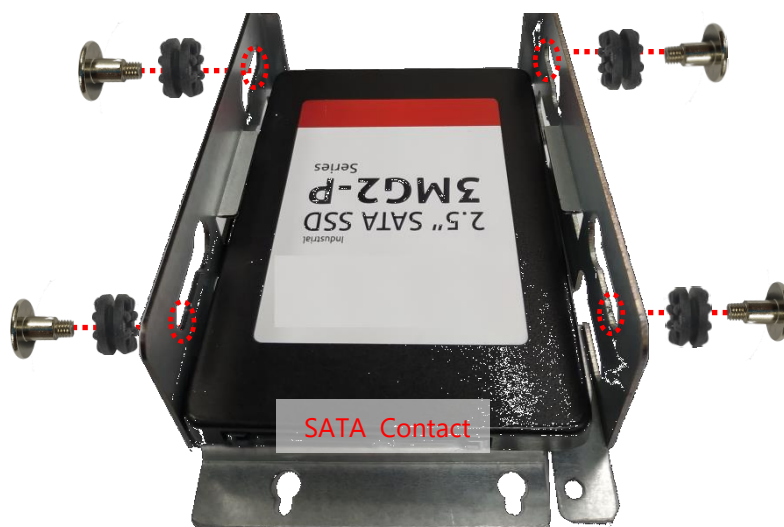
Installing Disk Drives

The system supports 2 x 2.5" SATA HDDs or SSDs as data storage. Please follow the steps below for installation.

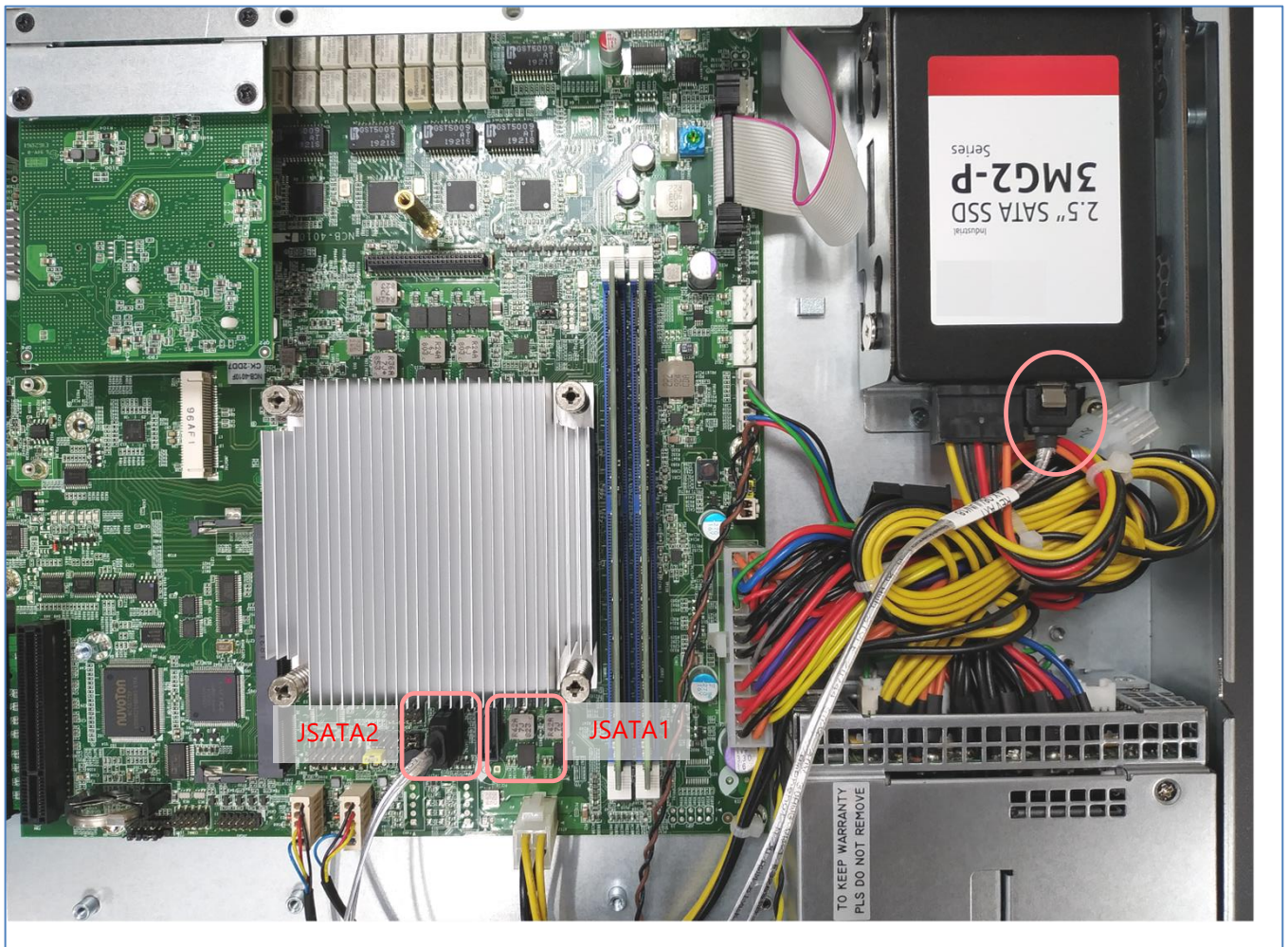
1. Locate the disk drive tray at the corner of the system. Loosen the screw indicated in the picture and slide the tray downwards to have it loosened from the four latching spots. Take the tray out and prepare to install SATA 2.5" disk drives.



2. Place the disk drive as shown in the image below. Apply two disk screws with two rubber washers for each side of the disk drive. If you are going to install two disks, always start by installing the disk in the lower slot.



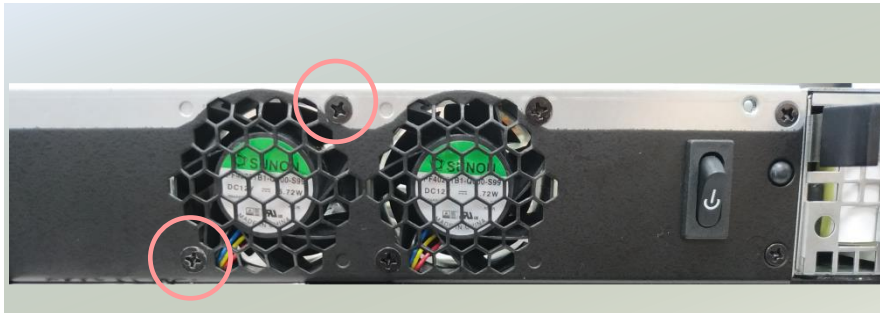
3. Place the tray with HDD/SSD installed back to its original spot inside the system. Remember to aim the four latching holes. Then slide the tray upwards to get it locked and secure it with the original screw.
4. Establish SATA cable connection between the disk drive and the motherboard.



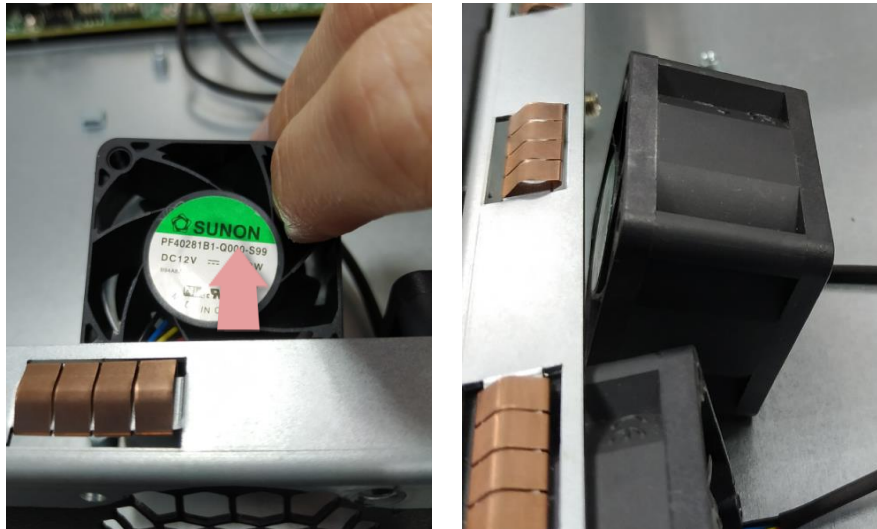
Replacing Cooling Fans

This system supports two cooling fans. To replace a worn-down fan, please follow the steps below.

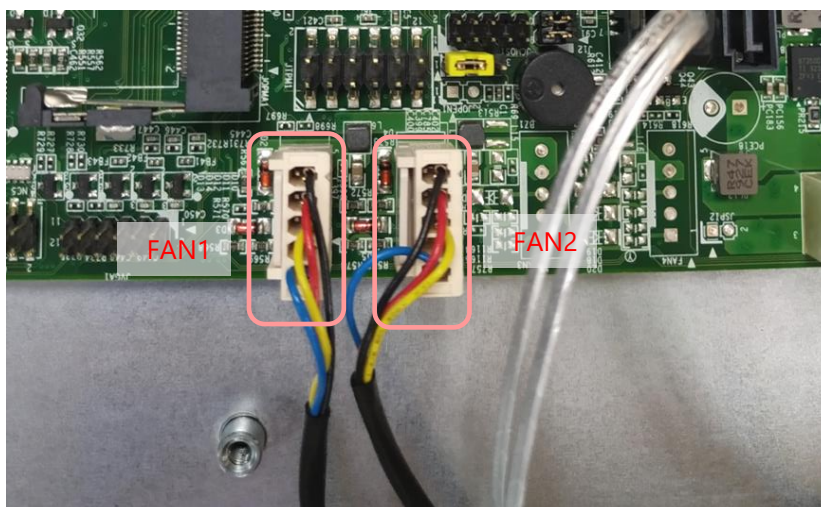
1. Remove the screws circled below.



2. Apply some force and pull the fan out of its original place.

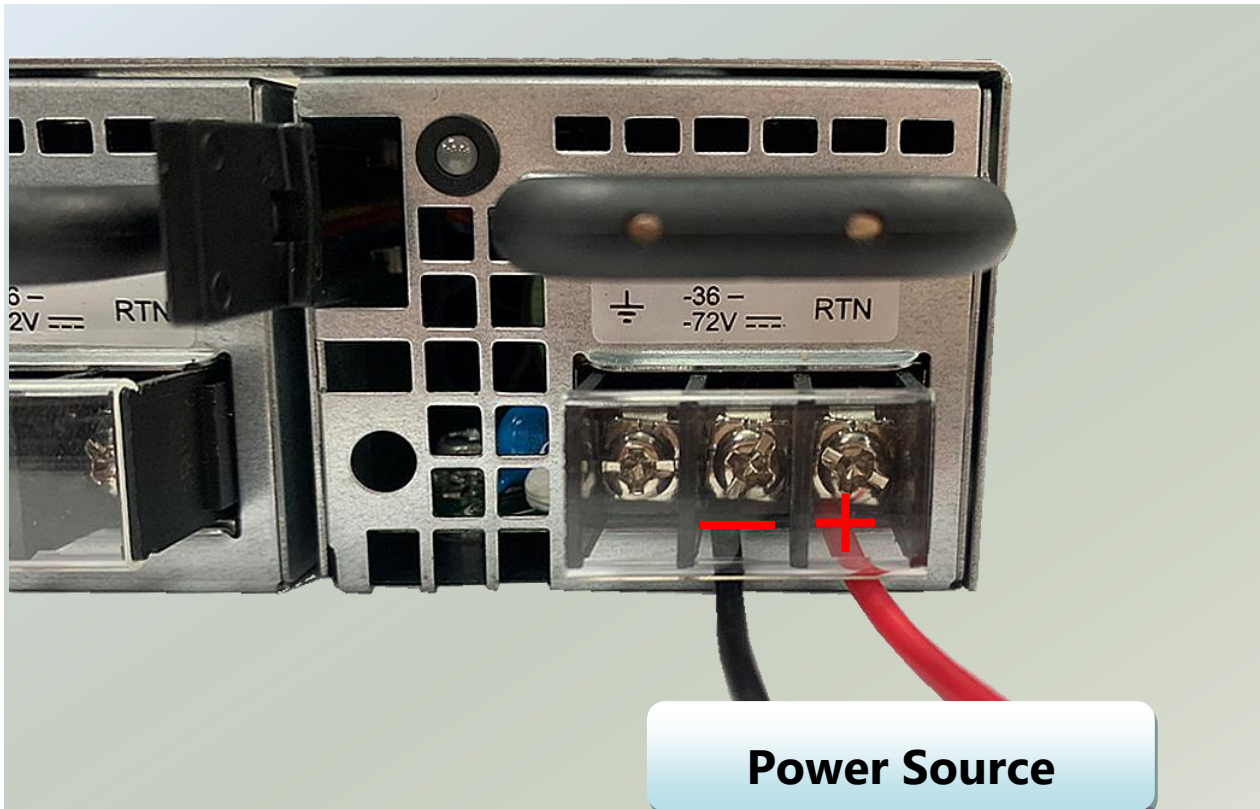


3. To install a new one, just place the new fan to the original place and apply two screws.
4. Connect the other end of the fan power cable to **FAN1** or **FAN2** connector.



Installing DC Power Supply

Follow the instructions below to connect the DC power cord to the connector on the PSU.



- ▶ This product is intended to be supplied by a UL Listed DC power source, rated -36- -72Vdc, 12-6A minimum, Tma = 40 degrees C, and the altitude of operation = 5000m.
- ▶ The cable should be 16AWG (12A minimum, 72V minimum).

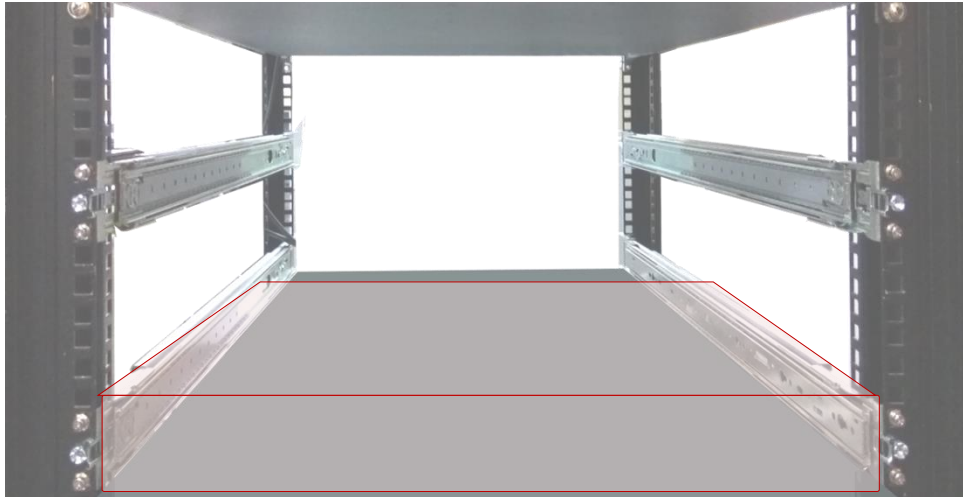
If you need further assistance with purchasing the power source, please contact Lanner Electronics Inc. for further information.

Mounting the System

There are two methods for installing this system into a rack. Please contact Lanner's sales representative to purchase the mounting kits mentioned below:

- ▶ With **Mounting Ear Brackets** only

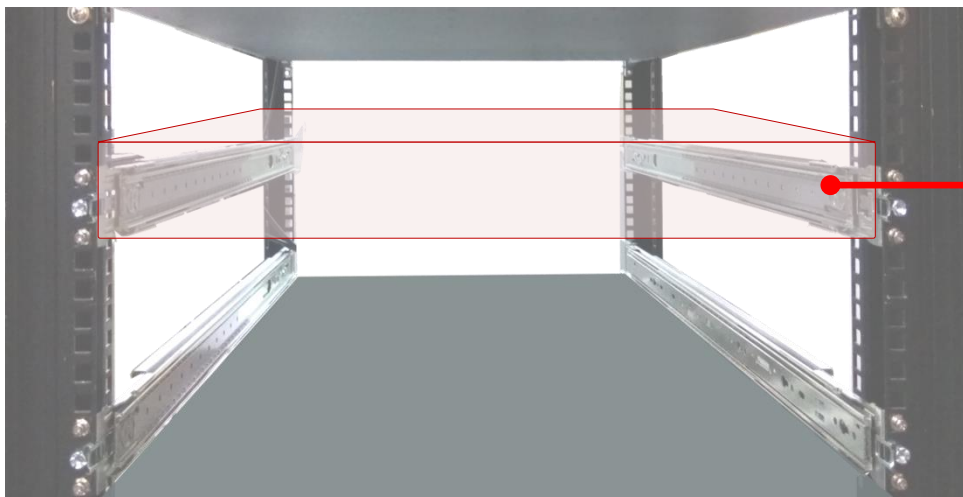
This method is quick and easy by fixing this system to the front posts of the rack, but it also makes servicing the system more difficult. Please note that the use of these brackets must go with a rack shelf or slide rails to prevent the chassis from falling over, for the bracket assembly alone cannot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



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

- ▶ With **Slide Rail Kit + Mounting Ear Brackets**

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



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

Installing the System Using Mounting Ear Brackets Only

1. Check the accessory pack for the following items:

- ▶ 1x Screw Pack



- ▶ 2x Ear Brackets



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



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

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



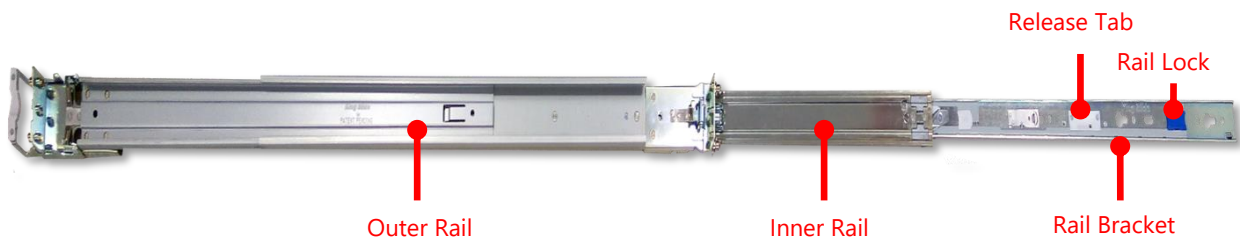
Installing the System Using the Slide Rail Kit (with Mounting Ear Brackets)

1. Check the package contents of the Slide Rail Kit. The kit shall include the following items:

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



A rail consists of the following parts:

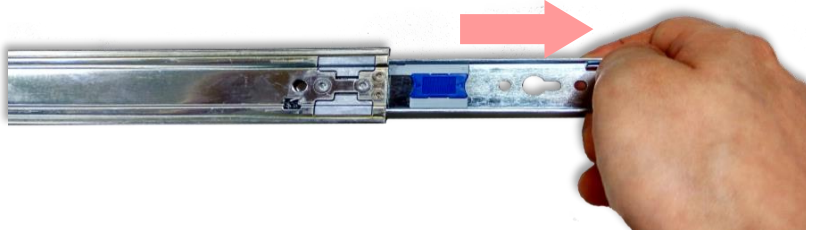


2. Unpack a slide rail and slide the Inner Rail all the way to the end.



3. Stretch the bracket to the fullest.

4. Remove the bracket from the Inner Rail by pushing the Release Tab on the bracket outwards while sliding it out.




-

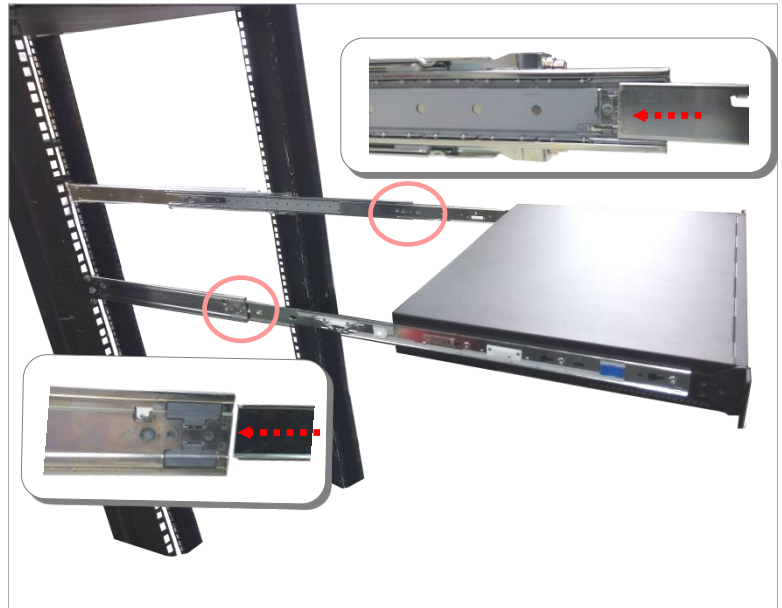
6. Repeat Steps 2~5 to attach the bracket to the other side of the chassis.
7. Follow the instructions in Installing the System Using Mounting Ear Brackets Only to attach the Mounting Ear Brackets.

Use this clamp to fix the front end of the rail onto the post.

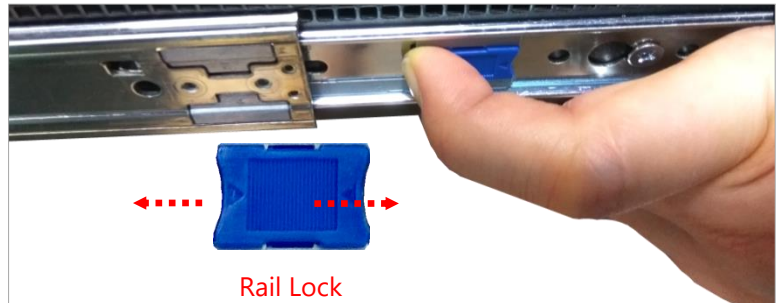
-

- 
- The Inner Rail will click when it is fully stretched.

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



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



Push the system all the way in until it stops.



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.

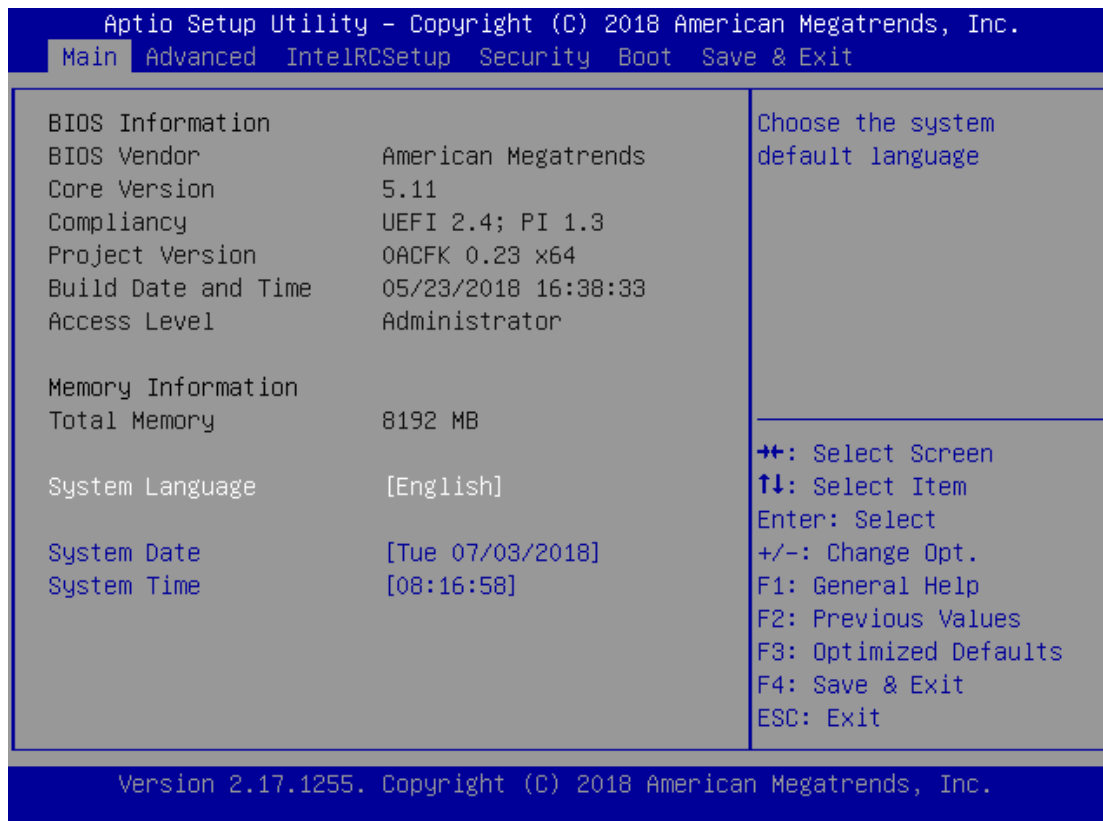
Main Setup

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

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

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

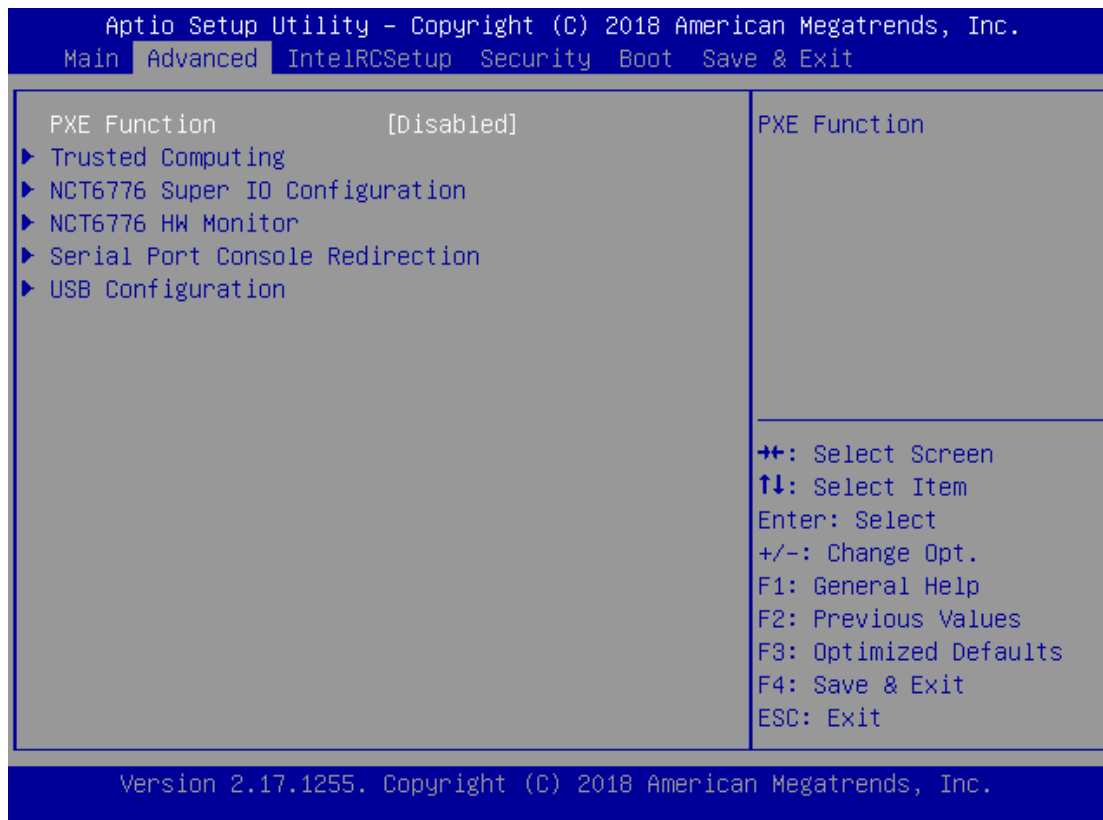
Setup main page contains BIOS information and project version information.



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

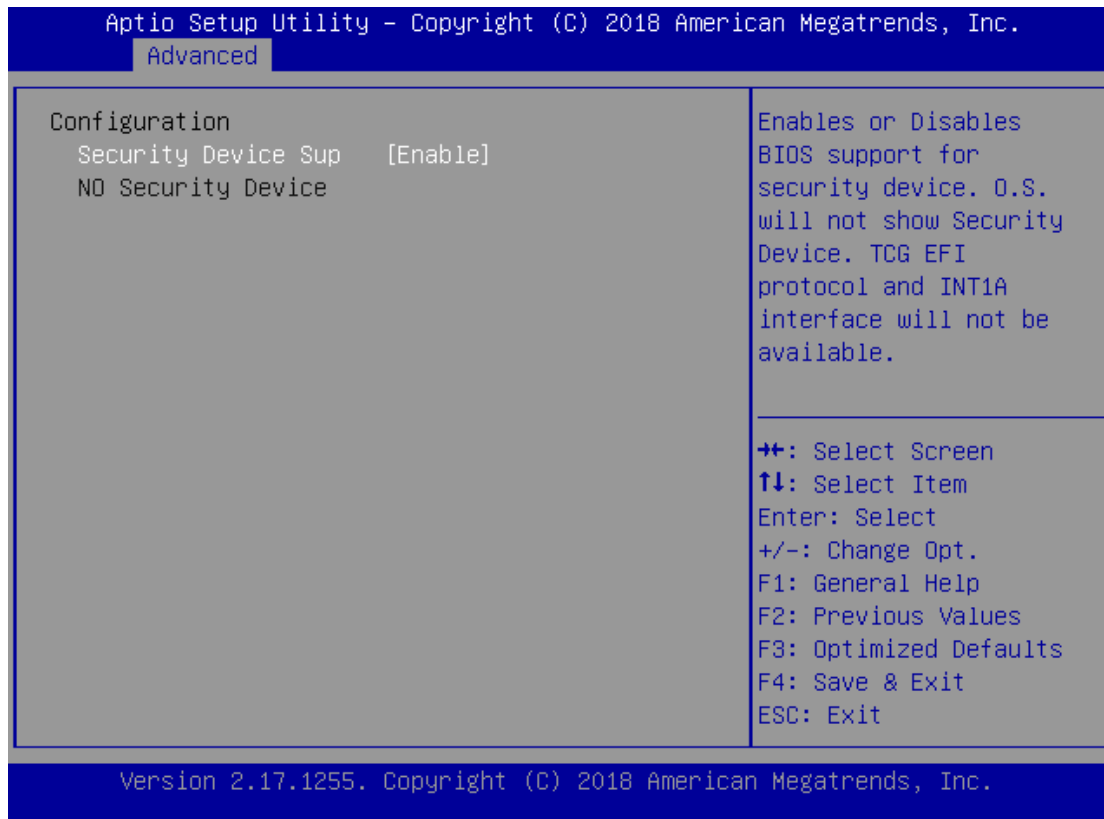
Advanced Page

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



Feature	Options	Description
PXE Function	Disabled Enable Lan2 Enable Lan3 Enable Lan4 Enable Lan5 Enable Lan6 Enable Lan7 Enable Lan8	PXE Function

Trusted Computing (TPM1.2)



Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for a security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

NCT6776 Super IO Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.	
Advanced	
<div>NCT6776 Super IO Configuration</div> <div>Super IO Chip NCT6776</div> <div>▶ Serial Port 1 Configuration</div> <div>▶ Serial Port 2 Configuration</div> <div>▶ Parallel Port Configuration</div>	<div>Set Parameters of Serial Port 1 (COMA)</div> <div>↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</div>
Version 2.17.1255. Copyright (C) 2018 American Megatrends, Inc.	

Serial port 1 Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.

Advanced

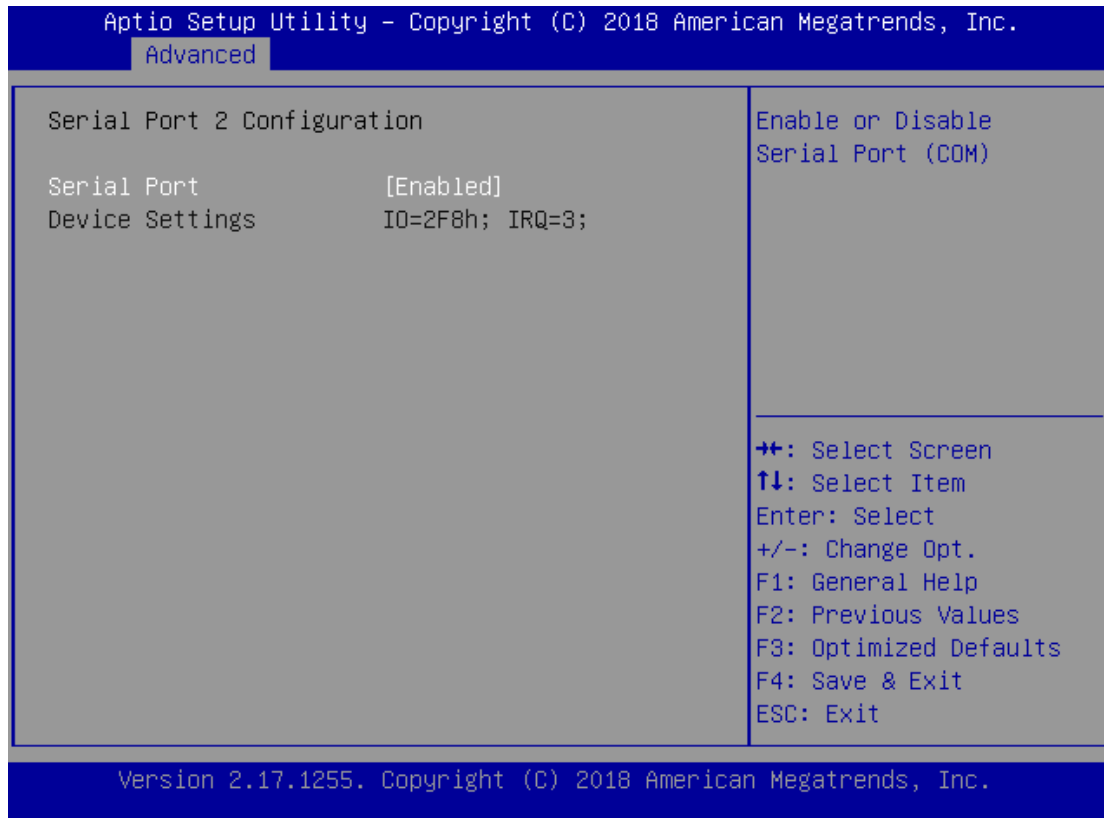
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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

Serial port 2 Configuration



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

Parallel Port Configuration

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Advanced

Parallel Port Configuration		Enable or Disable Parallel Port (LPT/LPTE)
Parallel Port	[Enabled]	
Device Settings	IO=378h; IRQ=5;	

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Feature	Options	Description
Parallel Port	Enabled Disabled	Enable or Disable Parallel Port (LPT/LPTE)
Device Settings	NA	IO=378h; IRQ = 5

NCT6776 HW Monitor

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.

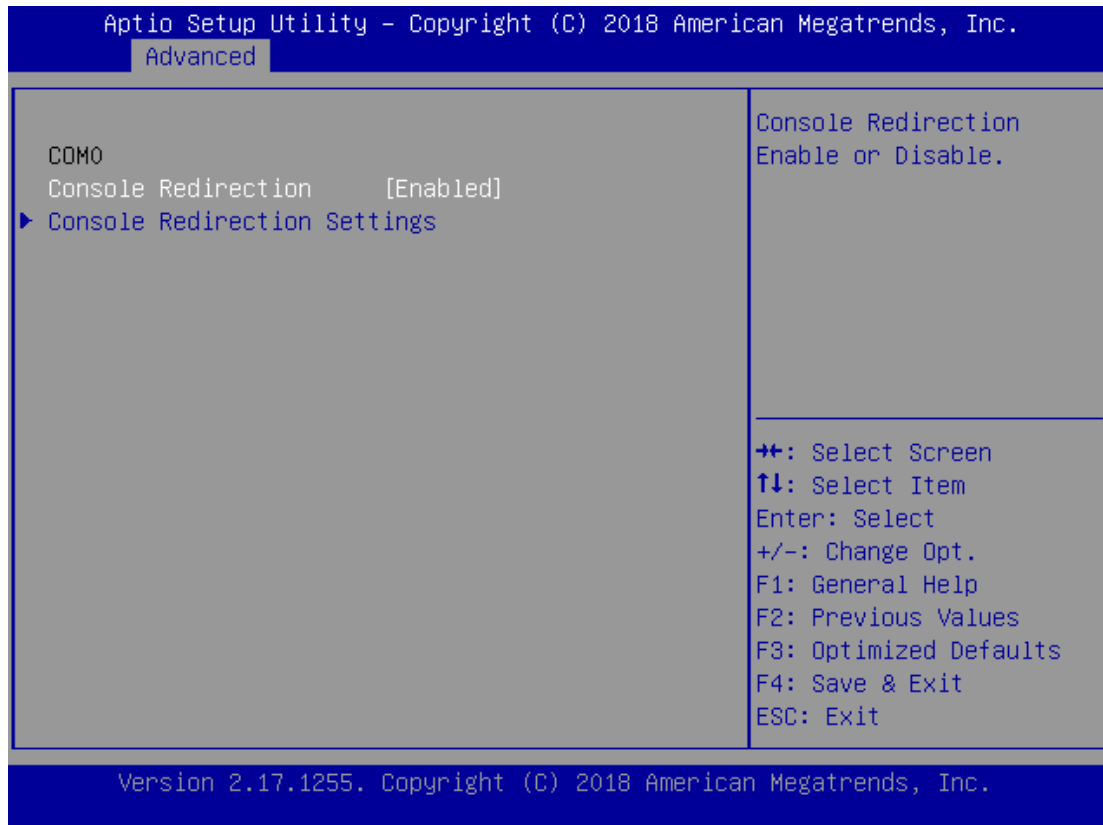
Advanced

Pc Health Status	
Agent0 Temperature	: +59 %
System temperature1	: +37 %
System temperature2	: +39 %
Fan1 Speed	: 6521 RPM
Fan2 Speed	: N/A
VCORE	: +1.736 V
P5V_A	: +4.920 V
P12V	: +12.000 V
P1V2_VDDQ	: +1.128 V
VACC	: +3.248 V
VCC3V	: +3.248 V
VSBB3V	: +3.248 V
VBAT	: +2.992 V

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Serial Port Console Redirection



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

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

Console Redirection Settings

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Advanced

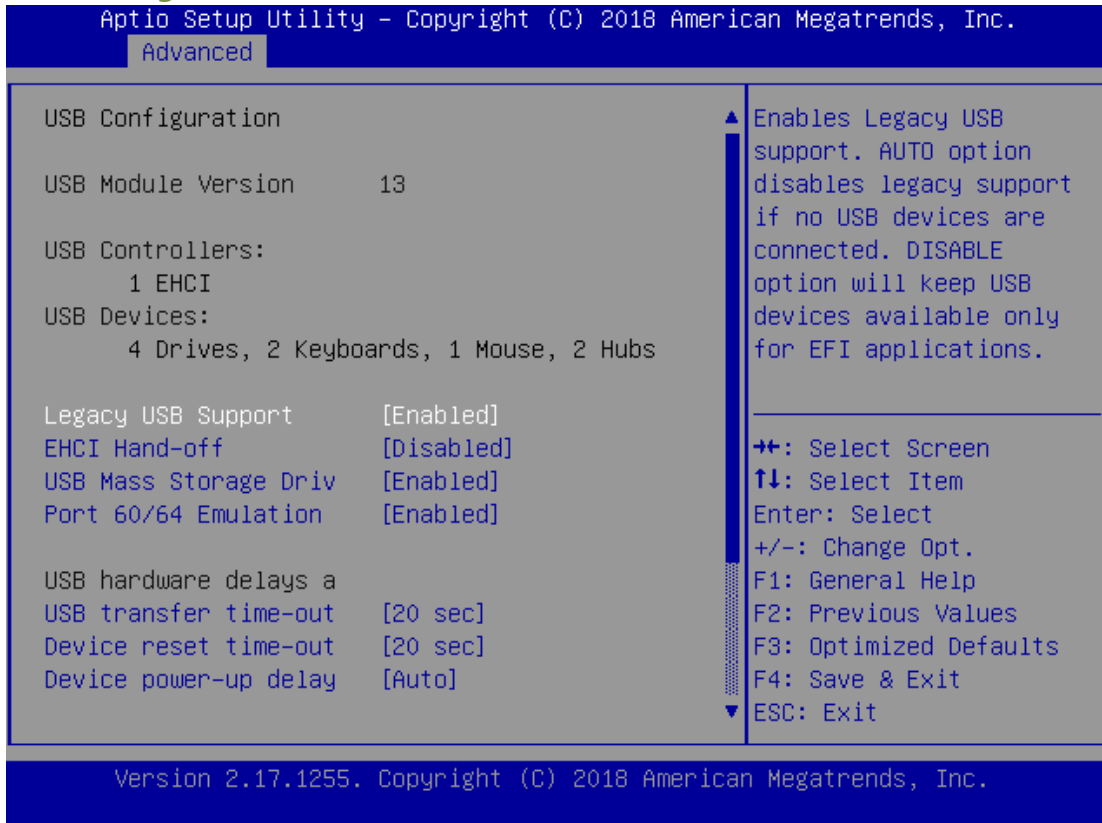
COM0 Console Redirection Settings		Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more
Terminal Type	[VT100+]	++ : Select Screen ↑↓ : Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Bits per second	[115200]	
Data Bits	[8]	
Parity	[None]	
Stop Bits	[1]	
Flow Control	[None]	
VT-UTF8 Combo Key Sup	[Enabled]	
Recorder Mode	[Disabled]	
Resolution 100x31	[Disabled]	
Legacy OS Redirection	[80x24]	
Putty KeyPad	[VT100]	
Redirection After BIO	[Always Enable]	

Version 2.17.1255. Copyright (C) 2018 American Megatrends, Inc.

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

	RTS/CTS	
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Legacy OS Redirection Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty.
Redirection After BIOS POST	Always Enable BootLoader	The Settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy console Redirection is enabled for Legacy OS.

USB Configuration

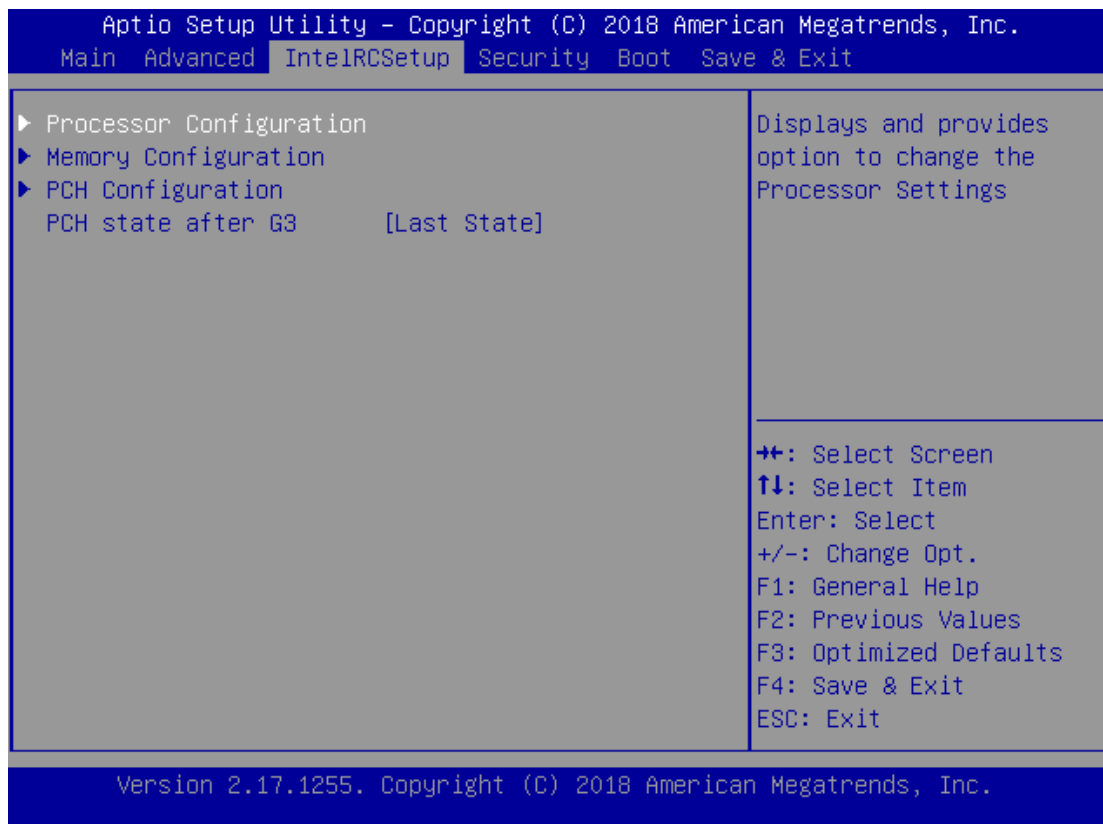


Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. Auto option disables legacy support if no USB devices are connected; Disabled option will keep USB devices available only for EFI applications.
EHCI Hand-off	Enabled Disabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
Port 60/64 Emulation	Enabled Disabled	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	10 sec 20 sec	USB mass storage device Start Unit command time-out

	30 sec 40 sec	
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. Auto uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

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.



Feature	Options	Description
PCH state after G3	S0 S5 Last State	Select S0/S5 for ACPI state after a G3

Processor Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.

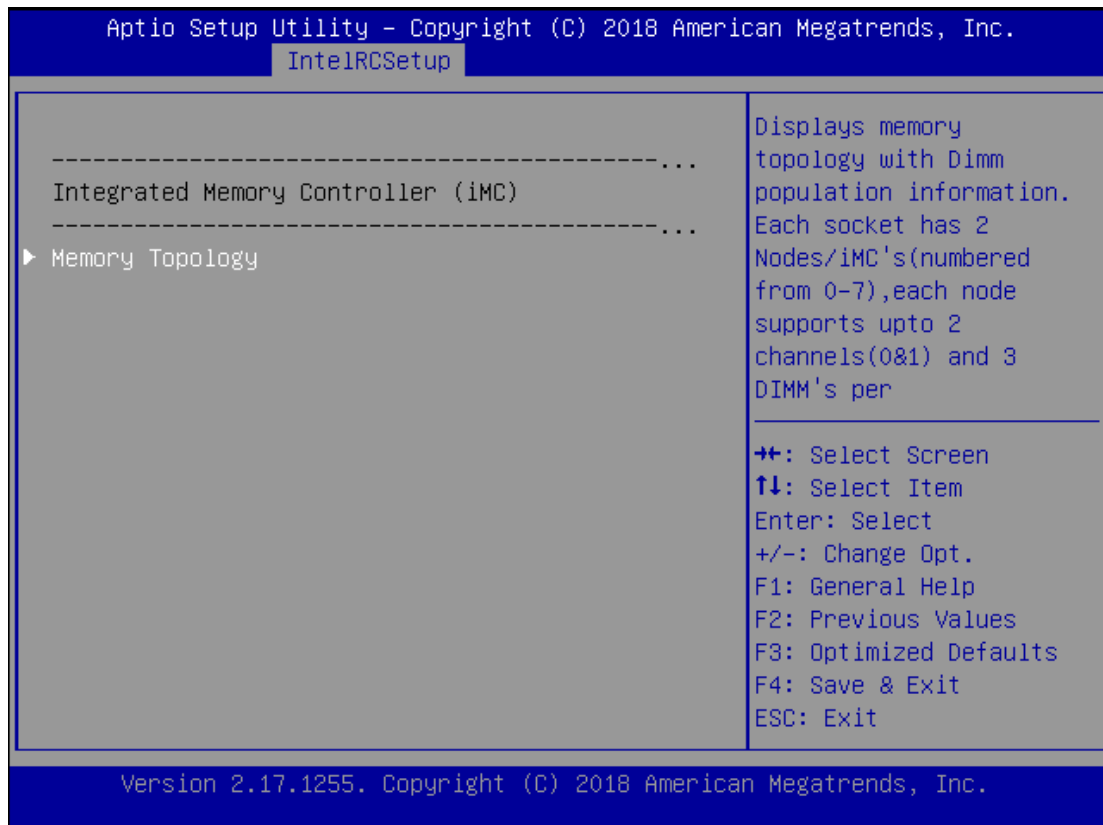
IntelRCSetup

Processor Configuration -----... Processor Socket Socket 0 Processor ID 00050663* Processor Frequency 2.200GHz Processor Max Ratio 16H Processor Min Ratio 08H Microcode Revision 07000009 L1 Cache RAM 256KB L2 Cache RAM 1024KB L3 Cache RAM 6144KB Processor 0 Version Intel(R) Xeon(R) CPU D-1518 @ 2.20GHz Hyper-Threading [ALL] [Enable] Execute Disable Bit [Enable] AES-NI [Enable]		Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads. ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
--	--	---

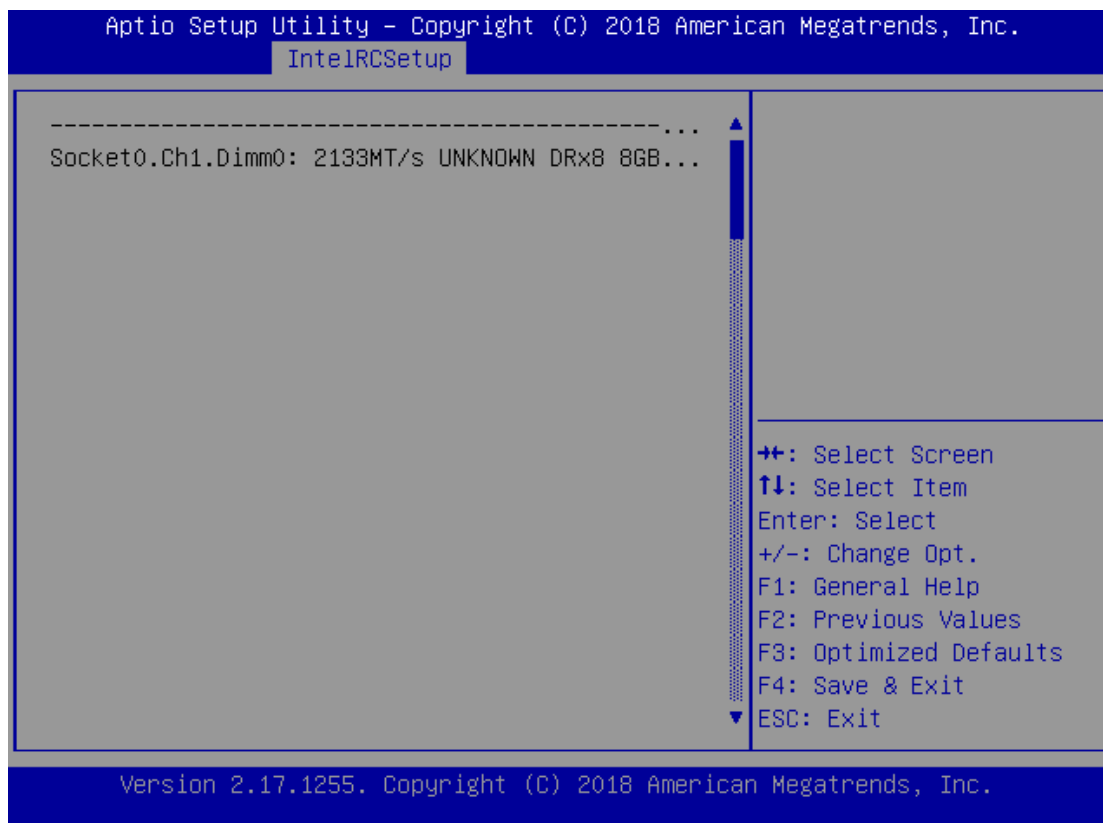
Version 2.17.1255. Copyright (C) 2018 American Megatrends, Inc.

Feature	Options	Description
Hyper-Threading [ALL]	Disabled Enabled	Enables Hyper Threading (Software Method to Enable/Disable Logical Processor threads.
Execute Disable Bit	Disabled Enabled	When disabled, forces the XD feature flag to always return 0.
AES-NI	Disabled Enabled	Enable/disable AES-NI support

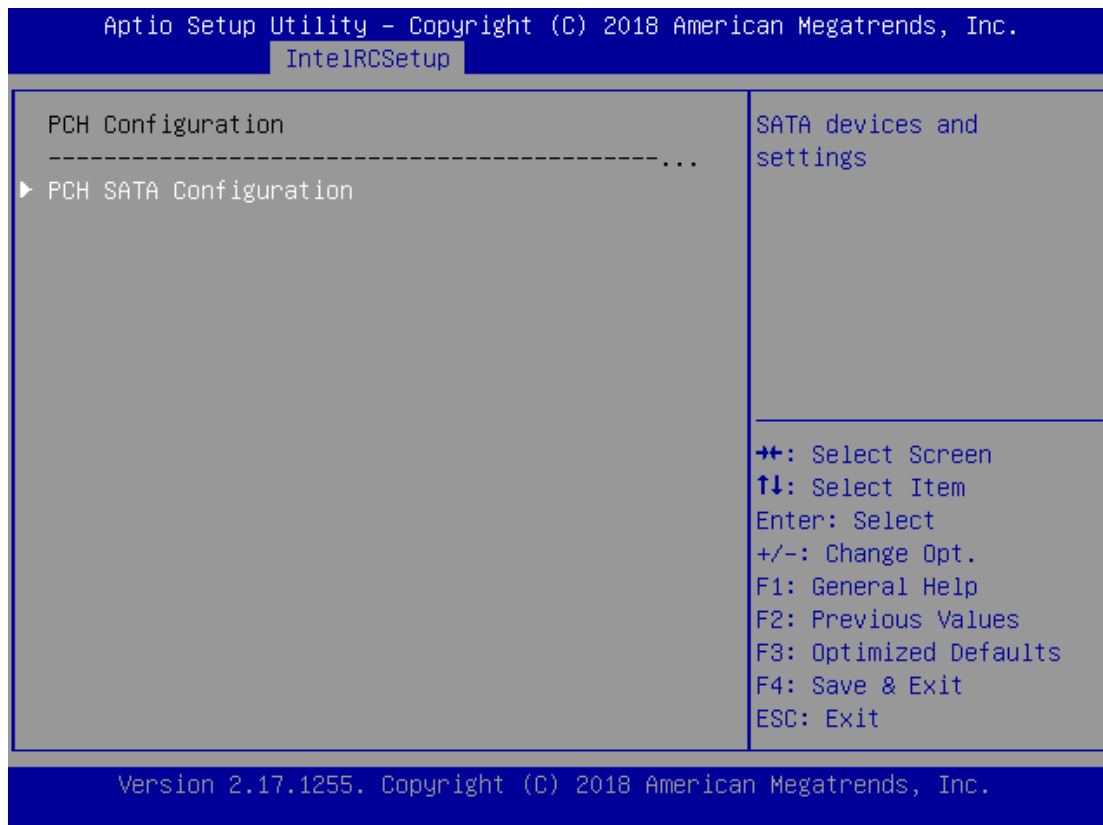
Memory Configuration



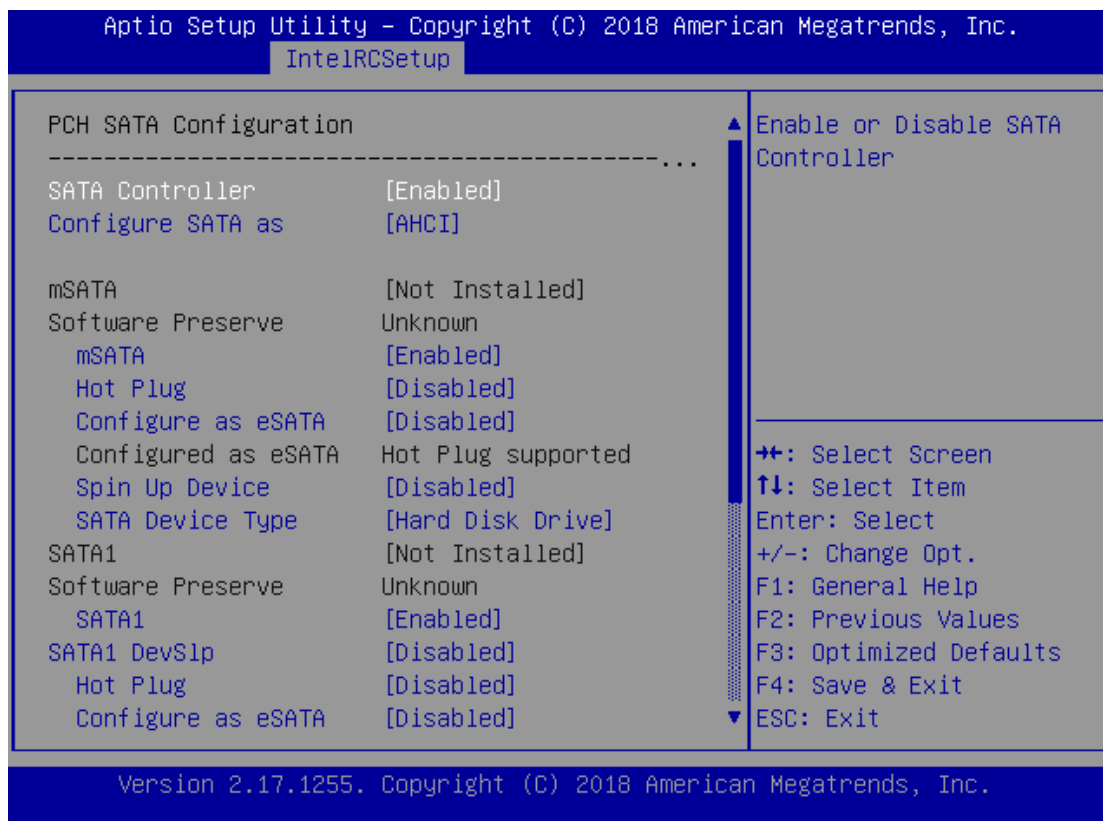
Memory Topology

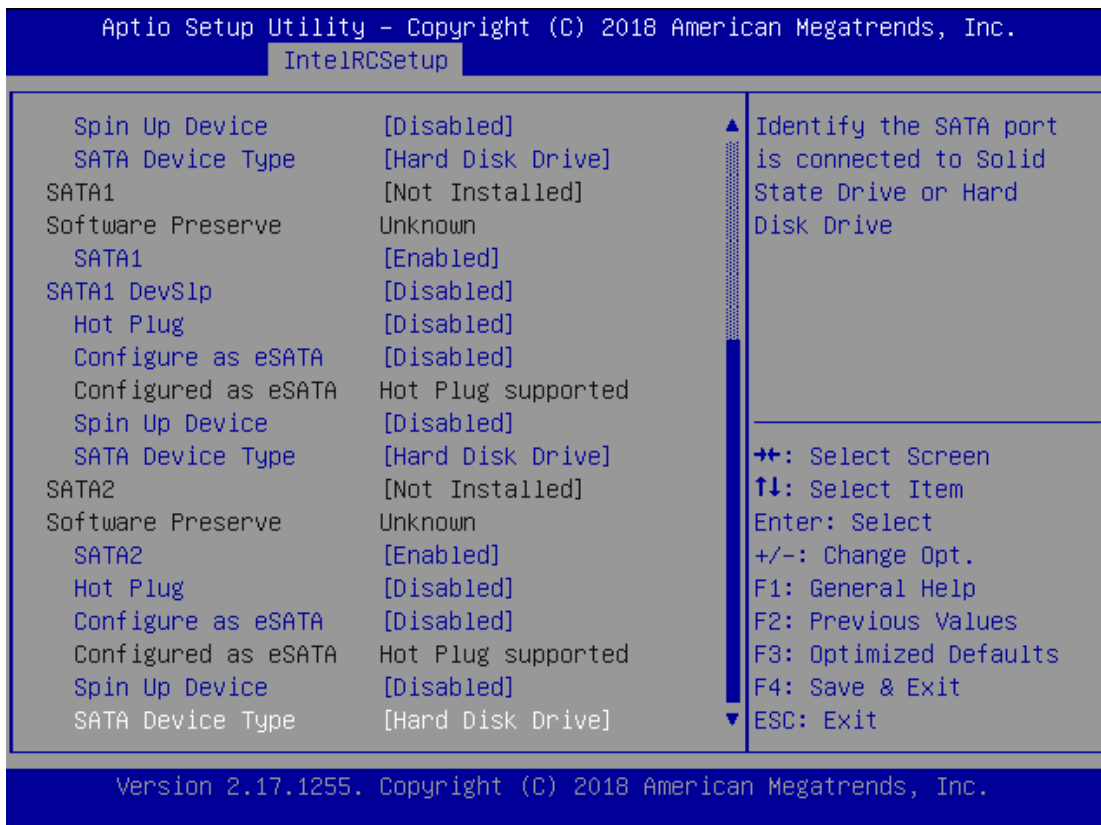


PCH Configuration



PCH SATA Configuration

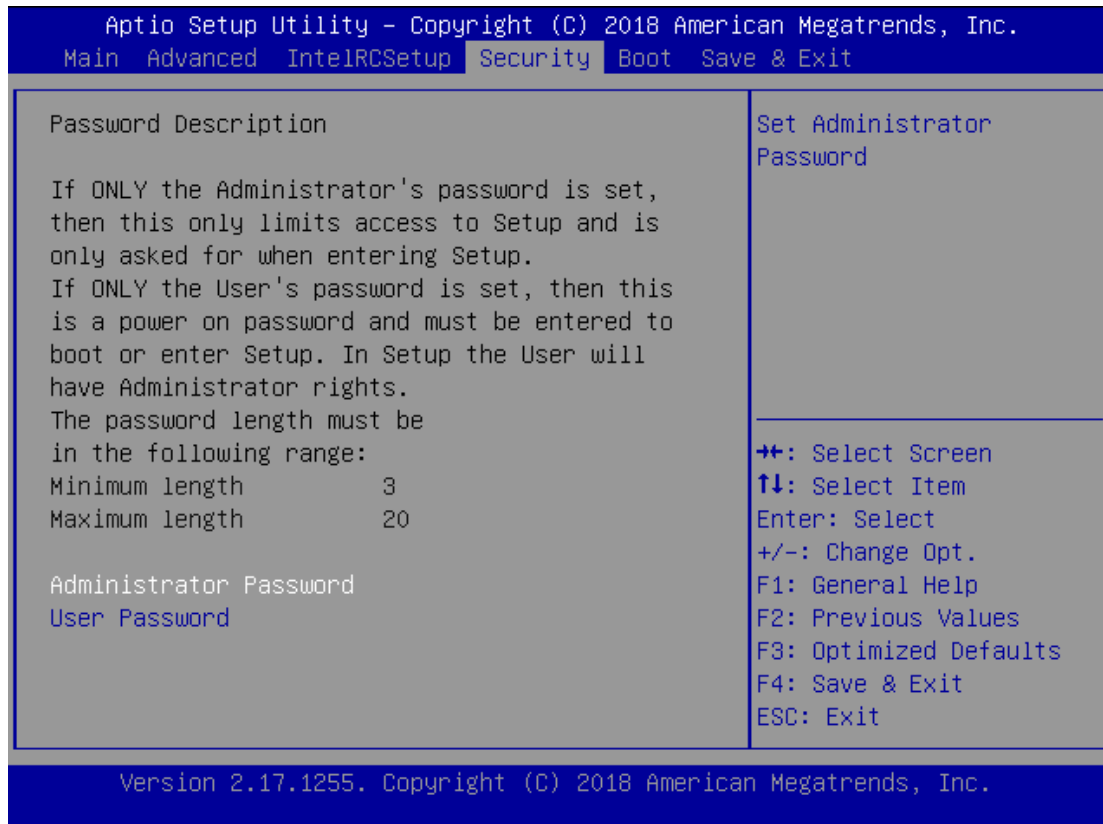




Feature	Options	Description
SATA Controller	Disabled Enabled	Enable or Disable SATA Controller
Configure SATA as	IDE AHCI RAID	This will configure SATA as IDE ,RAID or AHCI.
Msata/SATA1/SATA2	Disabled Enabled	Enable or Disable SATA Port
Hot Plug	Disabled Enabled	Designates this port as Hot Pluggable.
Configured as eSATA	Disabled Enabled	Configures port as External SATA (eSATA)
Spin Up Device	Disabled Enabled	If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise, all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

Security

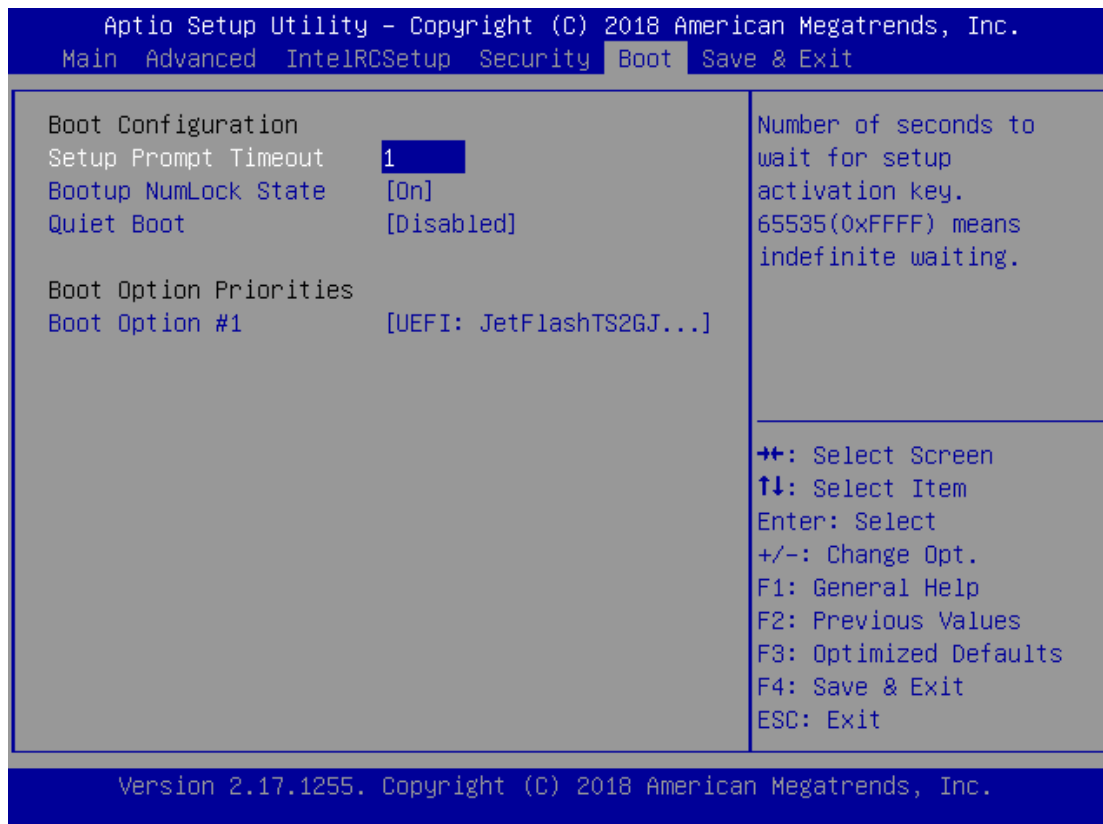
Select the Security menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.



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.

Boot

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.

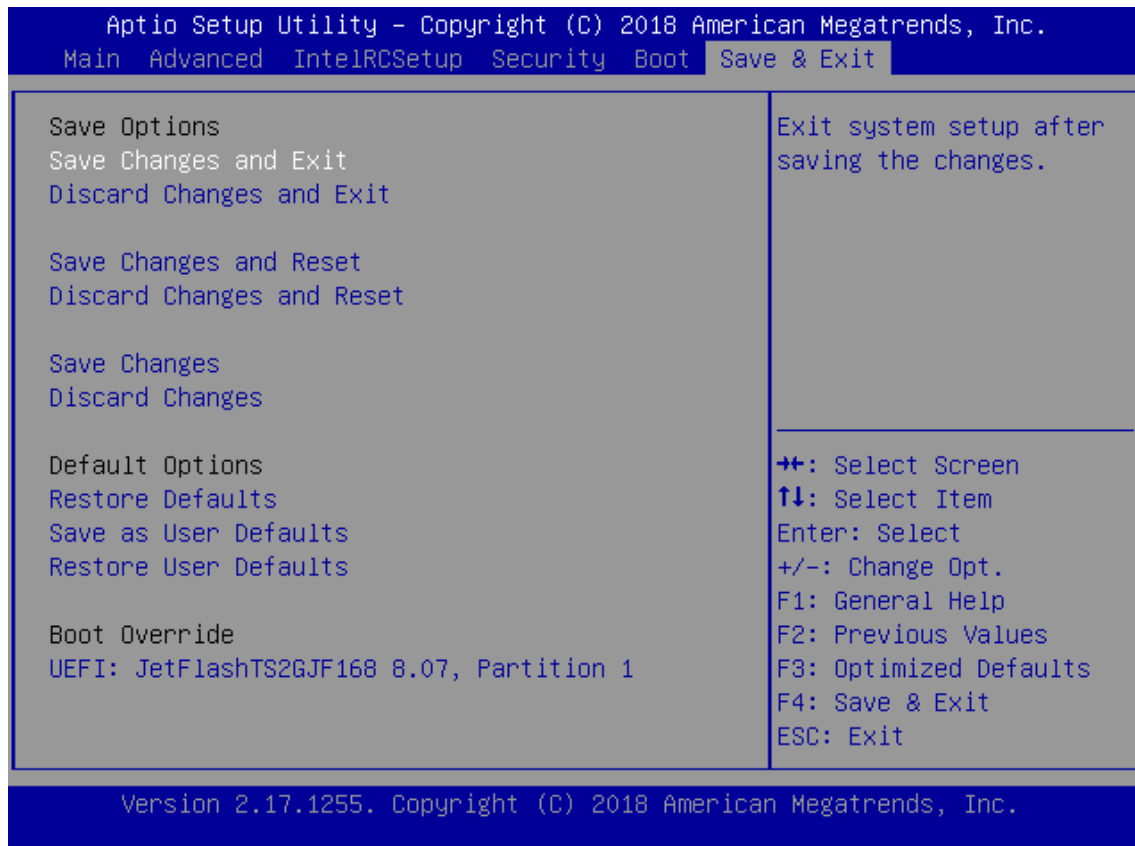


Feature	Options	Description
Setup Prompt Timeout	1	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.

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

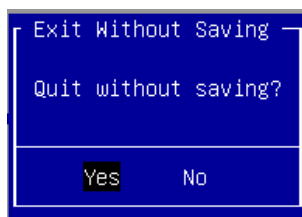
Save and Exit

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



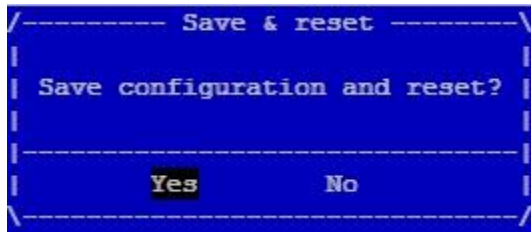
■ Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the **“Discard Changes and Exit”** option is selected. Select **“Yes”** to Discard changes and Exit Setup.



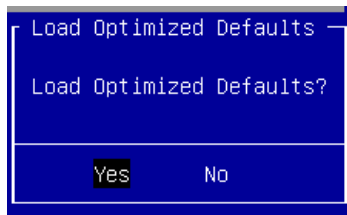
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and reset from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the **“Save Changes and Reset”** option is selected. Select **“Yes”** to Save Changes and reset.



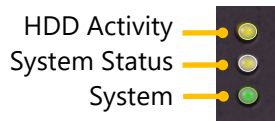
■ Restore Defaults

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



APPENDIX A: LED INDICATOR EXPLANATIONS

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



► HDD Activity Status

<i>Blinking Amber</i>	<i>Data access activities</i>
<i>Off</i>	<i>No data access activities</i>

► System Status

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

<i>Solid Green</i>	<i>Defined by GPIO</i>
<i>Solid Red</i>	<i>Defined by GPIO</i>
<i>Off</i>	<i>Defined by GPIO</i>

► System Power

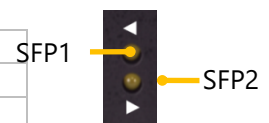
<i>Solid Green</i>	<i>The system is powered on</i>
<i>Off</i>	<i>The system is powered off</i>

► RJ45 LAN Status

Left LED (Link Status)	<i>Solid Amber</i>	<i>Link has been established and there is no activity on this port</i>
	<i>Blinking Amber</i>	<i>Link has been established and there is activity on this port</i>
	<i>Off</i>	<i>No link has been established</i>
Right LED (Speed)	<i>Solid Green</i>	<i>Operating as a 100 Mbps connection</i>
	<i>Solid Amber</i>	<i>Operating as a Gigabit connection (1000 Mbps)</i>
	<i>Off</i>	<i>No link has been established</i>

► SFP+ Port

<i>Solid Amber</i>	<i>Link has been established and there is no activity on this port</i>
<i>Blinking Amber</i>	<i>Link has been established and there is activity on this port</i>
<i>Off</i>	<i>No link has been established</i>



APPENDIX B: 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. 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.
3. 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 for server.

APPENDIX C: PROGRAMMING GENERATION 3 LAN BYPASS

The bypass function is used to link two independent Ethernet ports when the system crashes or powers off. This means if your system is equipped with a LAN Bypass function, a condition in your system will not interrupt your network traffic. Different from the previous two generations (Gen1 and Gen2), the Lanner Bypass Gen 3 employs a programming method to control the bypass function by software. There are typically two types of communication status for the bypass function, one is "**Normal**" and another is "Bypass " status. Furthermore, the Lanner Bypass software is capable of controlling the bypass status in the following 3 instances.

- ▶ When the system powers off, it can be forced to enable the LAN Bypass function.
- ▶ When the system is in the just-on state which is a brief moment when it powers up.

The Lanner bypass possesses the following features:

1. Communication through SMBUS (I2C)
2. Independent bypass status control for each pair up to a total of 4 pairs
3. Lanner Bypass Modules can bypass systems Ethernet ports on a host system during three instances: Just-on (Just-on is the brief moment when the internal power supply turns on and booting process starts), system off, or upon software request (during run-time).
4. Software programmable bypass or normal mode
5. Software programmable timer interval:
 - **JUST-ON** watchdog timer, used during JUST-ON, has timer setting of 5~1275 seconds of timer interval.
 - **Run-Time** watchdog timer, used during run-time, with of 1~255 seconds of timer interval.
6. Multiple Watchdog Timers:
 - **Two for run-time:** It is designed to give you a more variety of controls of the bypass on port basis. By using dedicated watchdogs for different pairs of the bypass, you have the flexibility to manage the bypass status for them differently.
 - **One for just-on:** It is designed to give you the precise control of the bypass during this phase. You can use this timer to delay enabling the bypass in just-on state.

APPENDIX D: PROGRAMMING THE LCM

The LCD panel module (LCM) is designed to provide real-time operating status and configuration information for the system. For sample LCM code, see *LCM* folder in the *Driver and Manual CD*. The driver and the program library can also be found in the folder.

The system supports the following 2 kinds of LCM:

- ▶ **Parallel Text-based LCM:** The LCM connects to the motherboard's parallel port. The LCD screen can display 2 lines, 16 (or 20) characters per line.
- ▶ **USB and Serial Text or Graphic-based LCM:** Our next generation LCM. Lanner engineers design a common source code to be deployed on these two differently interfaced LCM modules. Jumpers are used to select between text and graphic types. See next section.

For Parallel Text-based LCM

Build

To build program source code on Linux platform, please use the following steps as a guideline:

1. Extract the source file:

```
# tar -xvzf plcm_drv_v0XX.tgz
```

(0XX is the version of the program.)

2. Change directory to the extracted folder:

```
# cd plcm_drv_v0XX
```

(0XX is the version of the program.)



Note

Apply our Parallel Text-based LCM to the environment of virtualization, please use the version 013 or above of the program.

3. Type "make" to build source code:

```
# make
```

After compiling, the executable programs (plcm_test, plcm_cursor_char, ppdev_test, Test) and the driver (plcm_drv.ko) will appear in the program's folder.



Note

The OS supported by Parallel Text-based LCM function includes platforms based on Linux Kernel series 2.4.x, Linux Kernel series 2.6.x and Linux Kernel series 3.0.x or above.

Install

Install the driver and create a node in the /dev directory by:

```
#insmod plcm_drv.ko
```

```
#mknod /dev/plcm_drv c 248 0
```



Note

If you cannot install the driver, check whether you have enabled the parallel port in the BIOS setting . Once the message of “insmod”: error inserting ‘plcm_drv.ko’: -1 Input/output error” appears, please check that whether the major number is repeated or not. The major number needed with the “mknod” command varies with different software versions; please look up the Readme file for this value.

Execute

This section contains sample executable programs that you could test on your platform. It demonstrates some useful functionality that the LCM provides. Note that the installation needs to be completed before proceeding with these executions.

To execute, run the command:

```
#./plcm_test
```

Backlight Off/On turning off/on the backlight of the LCM display

Display Off turning off the LCM display

Cursor Off/On NOT showing/showing the cursor on the LCM display

Blinking off/On turning off/on the cursor blinking

Writing “Lanner@Taiwan” displaying the specific sentences

Reading “Lanner@Taiwan” reading the specific sentence

CGram Test displaying the user-stored characters

Keypad Testing Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down)

Corresponding Commands for “plcm_test”

You can directly input the specific command to have its corresponding function worked on your LCM. This will be much more convenient once you would like to merely execute the keypad testing.

-On

— Turn on the backlight of the LCM display.

— To execute, please type:

```
#./plcm_test -On
```

-Off

— Turn off the backlight of the LCM display.

— To execute, please type:

```
#./plcm_test -Off
```

-LCM1

— Writing “Lanner@Taiwan” in line1.

— To execute, please type:

#./plcm_test -LCM1

-LCM2

— Writing “2013-11-05” in line 2.

— To execute, please type:

#./plcm_test -LCM2

Keypad

— Get the keypad input: the 1st button is read in as Left, the 2nd button is read in as Up, the 3rd button is read in as Right, and the 4th button is read in as Down.

— To execute, please type:

#./plcm_test -Keypad

Commands for plcm_cursor_char

This Run this command for cursor shift & single text update

./plcm_cursor_char

Please read the options below

Insert line select Item 1 to set the starting line as either line 1 or line 2

Move cursor right select Item 2 to move the cursor to the right

Move cursor left select Item 3 to move the cursor to the left

Add a char select Item 4 to display a character on the
LCM screen

Clean display select Item 5 to clear up the LCM display

Leave select Item 6 to exit the program

Test

This program is a testing script and runs through the following procedures in sequence:

— **rmmod plcm_drv** (remove the kernel mode driver module)

— **insmod plcm_drv.ko** (install the kernel mode driver module)

— **./plcm_test** (execute the driver testing program)

— **./plcm_test -stop** (stop executing the driver testing program)

— **rmmod plcm_drv** (remove the kernel mode driver module)

To execute, please type:

#./Test

Virtualization Implemented by Parallel

Port Pass Through

By the utilization of the parallel port pass through, the Parallel Text-based LCM implements the following three kinds of virtualization in the Guest OS.

- QEMU/KVM
- Xen
- VMWare Player

Here, we take the Fedora 20 x86_64 operation system for instance to explain 3 virtualization respectively for parallel port pass through. Use the procedures listed below for step-by-step instructions separately based on your case.

In case of QEMU/KVM or Xen, please use the following steps as a guideline to implement the virtualization :

(1) Make sure that the Guest OS has been installed.

(2) Add the following 4 lines into the xml file (for example, add to /etc/libvirt/qemu/<yourvirtualmachine>.xml in linux KVM):

```
<parallel type='dev'>
<source path='/dev/parport0'>
<target port='0'>
</parallel>
```

(3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.

```
# modprobe parport
# modprobe parport_pc
# modprobe ppdev
```

(4) Check that whether the /dev/parport0 exists or not. You may not find proper /dev/parport0 in the device list, please reconfirm the setup of xml file in the Guest OS.

(5) Reboot the Guest OS.

In case of VMWare Player, please use the following steps as a guideline to implement the virtualization:

(1) Make sure that the Guest OS has been installed.

(2) To set up the parallel port pass through, please enter VMWare Player's --> Virtual Machine Setting --> VMWare Player's setting page to select /dev/parport0 as parallel port device.

(3) Open a terminal in the Guest OS and then issue the following commands to install Linux Kernel drivers.

```
# modprobe parport
# modprobe parport_pc
# modprobe ppdev
```

4) Check that whether the /dev/parport0 exists or not. You may not find proper "/dev/parport0" in the device list, please reconfirm the setup of VMWare Player's setting page described in Step 2.

(5) Reboot the Guest OS.



Note

Note: It is still necessary for you to install "insmod parport.ko", "parport_pc.ko" and "ppdev.ko" Linux Kernel drivers in virtualization environment before executing the "ppdev_test" testing program.

APPENDIX E: INSTALLING INTEL® LAN CONTROLLER DRIVER FOR LINUX

To install the Intel® LAN controller base driver for the Red Hat® and Linux operating system, please visit <http://www.lannerinc.com/support/download-center/drivers>, enter the product category and download the utility package.

For the latest driver update, please visit Intel® download center at <https://downloadcenter.intel.com/>, use the keyword search or the filter to access the driver's product page, and then download the latest controller driver as well as the ReadMe document.

Product Name	I210-AT/I210-IS
Download Type	Drivers
Operating System	Linux*
Product page	https://downloadcenter.intel.com/product/64400/Intel-Ethernet-Controller-I210-AT https://downloadcenter.intel.com/product/64401/Intel-Ethernet-Controller-I210-IS

APPENDIX F: TERMS AND CONDITIONS

Warranty Policy

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

RMA Service

Requesting an RMA#

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



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

RMA Service Request Form

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

RMA No:		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details)	
		<input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

***Problem Code:**

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date