

Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-1031 User Manual

Version: 1.0

Date of Release: 2018-09-28

Icon Descriptions

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



Note: This icon indicates that there is a note of interest and is something that you should pay special attention to while using the product.



Warning: This icon indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resources	URL
Lanner	http://www.lannerinc.com
Product Resource	http://www.lannerinc.com/download-center
RMA	http://eRMA.lannerinc.com

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Compliances and Certification

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a commercial area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 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 manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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 equipment and receiver.
- ▶ Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/television technician for help.
- ▶ Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.
- ▶ The machine can only be used in a restricted access location, such as labs or computer facilities with the proper authorization.

Lithium Battery Caution:

- ▶ Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- ▶ Installation only by a trained electrician or only by an electrically trained person who knows all English Installation and Device Specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.

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).

Mounting Installation Precaution

Environment:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ 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 (T_{ma}) specified by the manufacturer.
- ▶ Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow 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 created due to uneven mechanical loading.
- ▶ 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 over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable Earthing - Reliable earthing 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).
- ▶ Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the unit or use of inappropriate installation components.

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.

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.
- ▶ La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

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).

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.

This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.

Battery Precautions

- ▶ Lithium Battery Caution: There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type. Dispose of batteries according to manufacturer's instructions.
- ▶ 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 surrounding 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.

Revision History

Version	Date	Descriptions
1.0	2018/09/27	1 st Official release

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CHAPTER 1: PRODUCT OVERVIEW

NCA-1031 is a network appliance based on Intel Apollo Lake SoC. This appliance targets the market at entry level Network Security, gateway or CPE devices. The system offers maximum 6 x GbE RJ45 LAN and internal storage options.

Package Content

Your package contains the following items:

- ▶ 1x NCA-1031 Network Appliance
- ▶ 1x 36W Power adaptor + 1x Power Cable
- ▶ 1x Console Cable
- ▶ 4x Pad
- ▶ 1x Front Panel Nameplate





Note: If you should find any components missing or damaged, please contact your dealer immediately for assistance.

Ordering Information

SKU No.	Description
NCA-1031D	Apollo Lake N4200 5x LAN ports with 2 pairs bypass + full function mini PCIE (PCIe + USB interface)
NCA-1031E	Apollo Lake N3350 6x LAN ports with 2 pairs bypass + mini PCIE (USB interface)

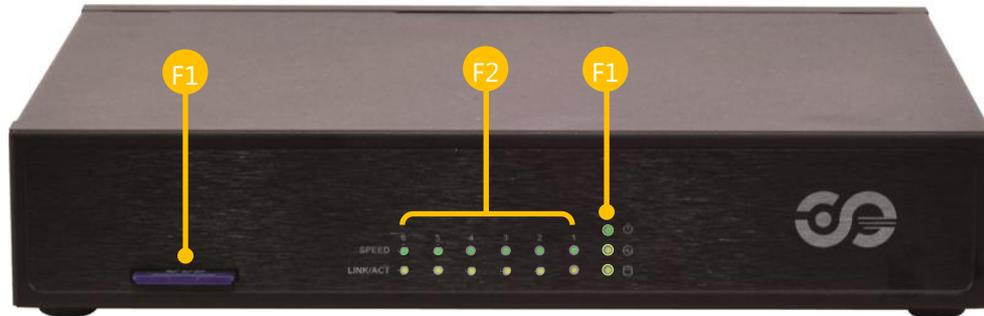
Optional Accessory

- ▶ HDD kit : 2.5" SSD or HDD (supported by project fanless condition supports SSD only, HDD support by project)
- ▶ Rackmount kit
- ▶ Adapter holder kit

System Specifications

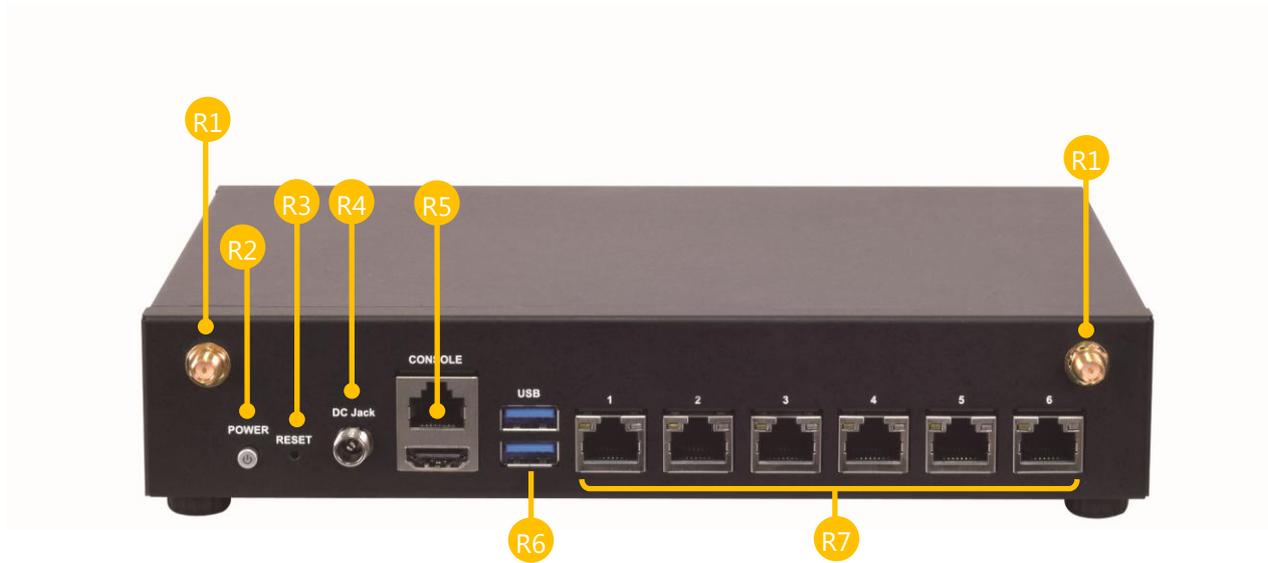
Form Factor		Desktop
Platform	Processor Options	Intel® Atom® N3350/N4200 (Apollo Lake)
	CPU Socket	Onboard
	Chipset	SoC
	Security Acceleration	N/A
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR3L 1866MHz UDIMM
	Max. Capacity	8 GB
	Socket	1x 204pin SODIMM
Networking	Ethernet Ports	6x GbE RJ45 Intel® i211 (By SKU)
	Bypass	2pairs Gen3
	NIC Module Slot	N/A
LOM	IO Interface	N/A
	OPMA slot	N/A
I/O Interface	Reset Button	1
	LED	Power/Status/Storage
	Power Button	1
	Console	1x RJ45
	USB	2x USB 3.0
	LCD Module	N/A
	Display	1x HDMI (HDMI audio support: Linux only)
	Power input	1x DC Jack
Storage	HDD/SSD Support	1x 2.5" Bay SSD (fanless) (HDD support by project)
	Onboard Slots	1 x mSATA, 1 x SD Card socket
Expansion	PCIe	N/A
	mini-PCIe	1x Mini-PCIe (PCIe-By SKU/USB2.0)
Miscellaneous	Watchdog	Yes
	Internal RTC with Li Battery	Yes
	TPM	Yes
Cooling	Processor	Passive CPU heatsink
	System	Fanless; 1 x cooling fan (by conf.)
Environmental Parameters	Temperature	0 to 40°C Operating -20 to 70°C Non-Operating
	Humidity (RH)	5 to 90% Operating 5 to 95% Non-Operating
System Dimensions	(WxDxH)	230 x 44 x 170 mm
	Weight	1.2 kg
Package Dimensions	(WxDxH)	518 x 264 x 391 mm
	Weight	10 kg (4 in 1)
Power	Type/Watts	12V 3A 36W Power Adapter
	Input	AC 100~240V @50~60 Hz
Approvals and Compliance		RoHS, CE/FCC Class B, UL

Front Panel



No.	Description	
F1	SD Card Slot	For 1x SD Card
F2	LED Indicators (System)	<ul style="list-style-type: none"> System Power System Status HDD Activity
F3	LED Indicators (Ethernet Ports)	<ul style="list-style-type: none"> Data Speed Data Link / Activity

Rear Panel



No.	Description	
R1	Antenna Port	2x SMA connector for the Main connector of LTE module
R2	Power Button	Press to power up the system
R3	Reset Button	Software reset
R4	DC-Jack	Power Supply
R5	Console Port	1x RJ-45 Console Port + 1x HDMI Port
R6	USB Ports	2x USB 3.0 ports
R7	GbE Ports	6x GbE RJ45 Ports



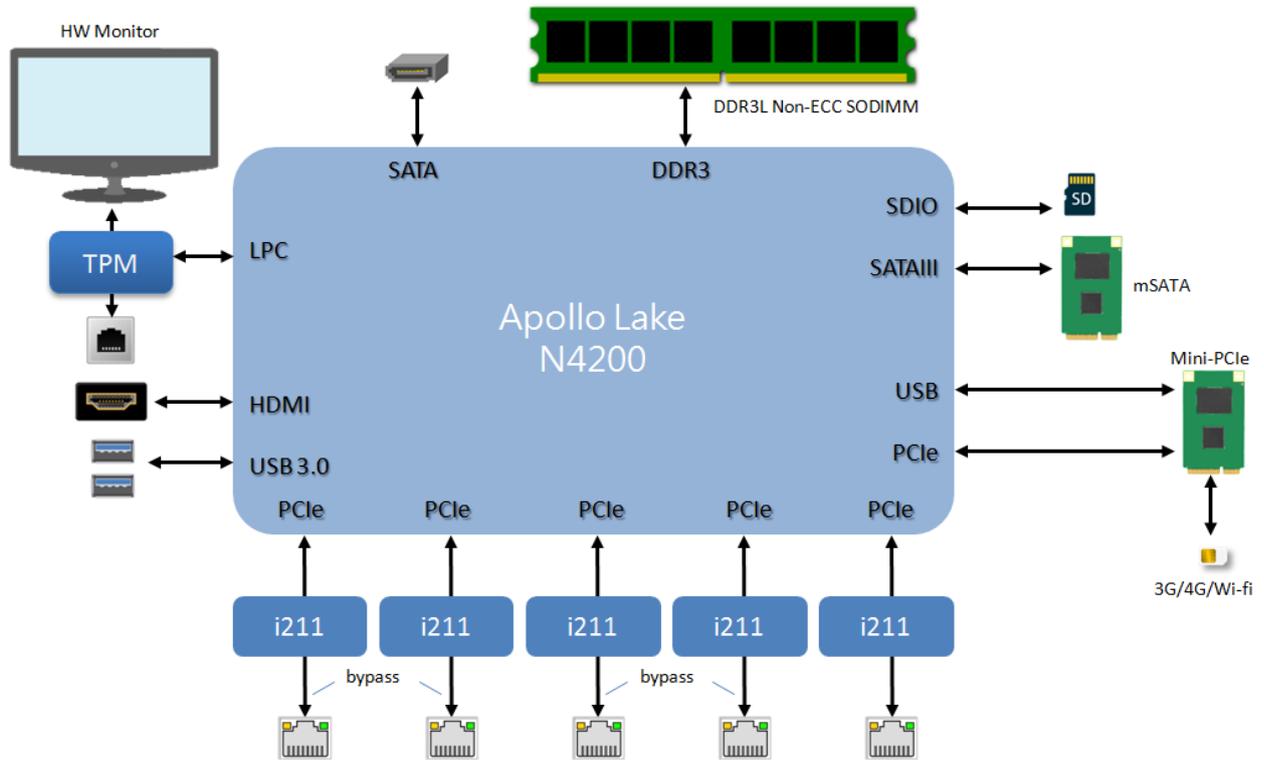
Note: Please refer to [Appendix A: LED Indicator Explanations](#) for description of the LED Indicators.

CHAPTER 2: MOTHERBOARD INFORMATION

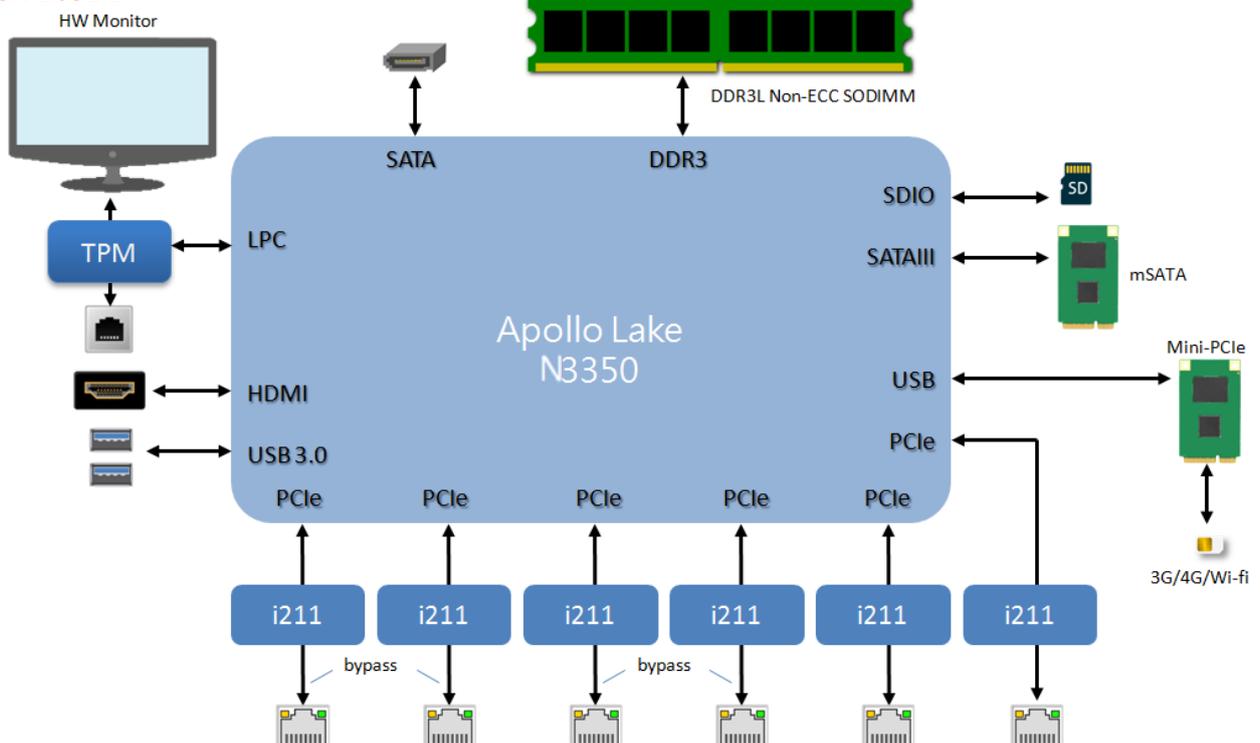
Block Diagram

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

NCA-1031D

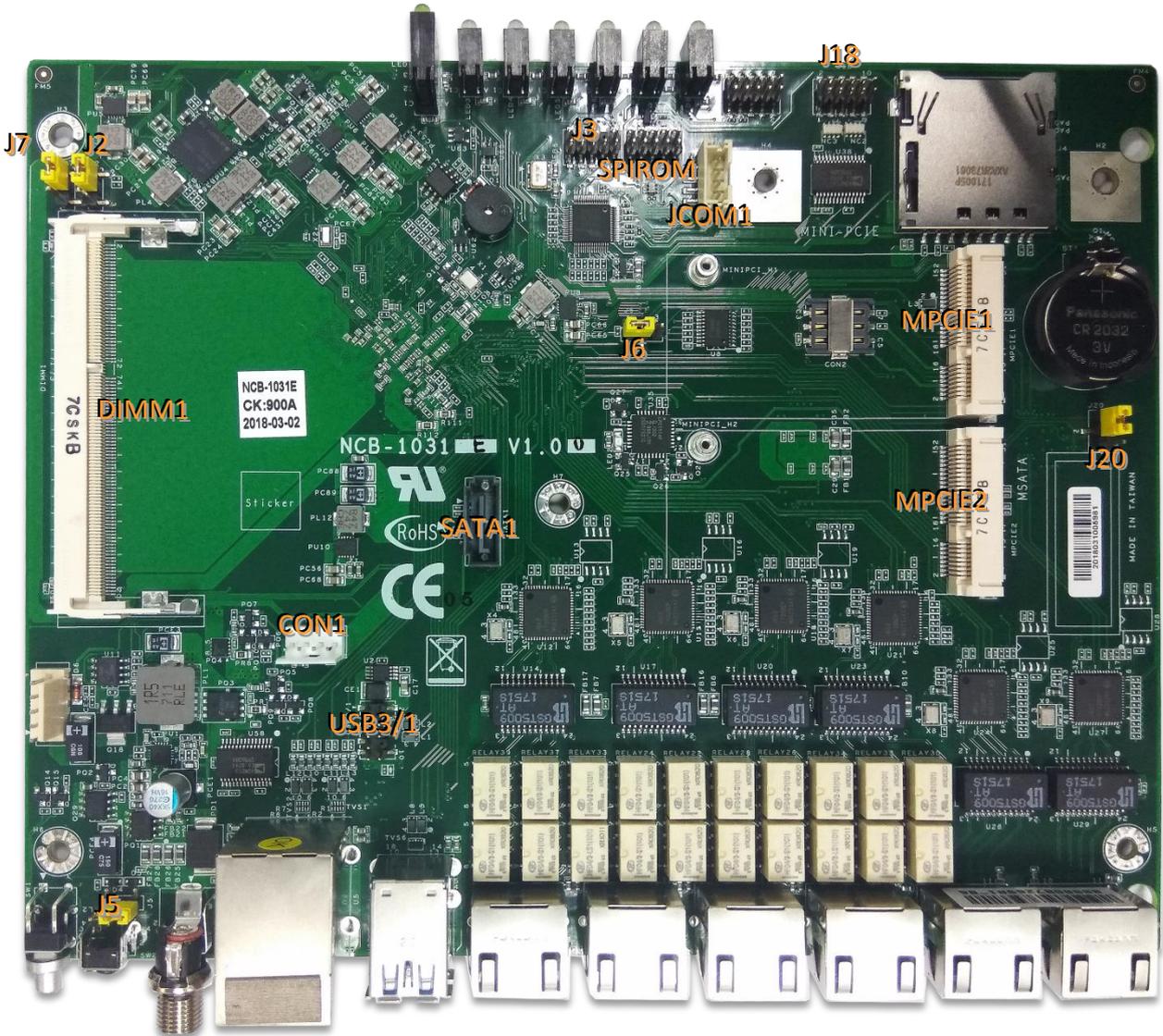


NCA-1031 E



Motherboard Layout

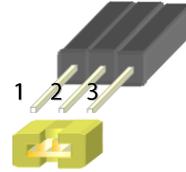
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



Internal Jumper & Connectors

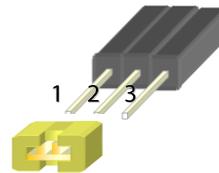
● **J5:** Reset Mode

Pin	Description
1	HW Reset
2	Switch input (default 1-2)
3	SW Reset



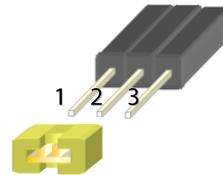
● **J7:** CMOS Clear

Pin	Description
1	VRTC
2	RTCTEST_N(default 1-2)
3	GND



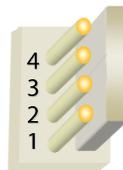
● **J6:** Flash Gen3 SW

Pin	Description
1	+V3P3_STBY
2	CPLD_LED3(default 1-2)
3	GND



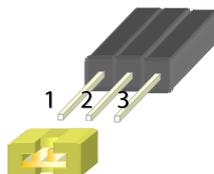
● **JCOM1:** Gen3 Bypass Flash Pin Header

Pin	Description
1	P3VSB
2	NXP_RXD
3	GND
4	NXP_TXD



● **J20:** Selrcy Mini-PCiE or LAN6

Pin	Description
1	+V3P3
2	SEL
3	GND



1-2 LAN6

2-3 MINI-PCIE

● **SATA1**: SATA Port

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



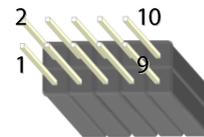
● **CON1**: SATA Port Power

Pin	Description
1	12V
2	GND
3	GND
4	5V



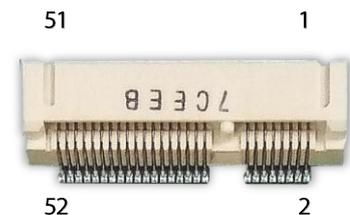
● **J18**: COM2

Pin	Description	Pin	Description
1	MDCDB_N	2	MDSRB_N
3	MSINB	4	MRTSB_N
5	MSOUTB	6	MCTSB
7	MDTRB_N	8	KEY PING
9	GND	10	KEY PING



● **MPCIE1/2** :MINIPCIE Socket

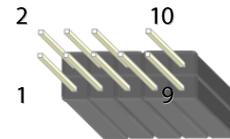
Pin	Description	Pin	Description
1	PMU_WAKE#	27	GND
2	VCC3	28	1.5V
3	NC_RSV1	29	GND
4	GND	30	SMB_CLK
5	NC_RSV2	31	MINI_PCIE_TXN0
6	1.5V	32	SMB_DATA
7	MINI_CLKREQ_N1	33	MINI_PCIE_TXP0
8	NC_UIM_PWR	34	GND
9	GND	35	GND
10	NC_UIM_DATA	36	USB_IO3_DN
11	MINIPCIE_REFCLKN	37	GND
12	NC_UIM_CLK	38	USB_IO3_DP



13	MINIPCIE_REFCLKP	39	VCC3
14	NC_UIM_RST	40	GND
15	GND	41	VCC3
16	NC_UIM_VPP	42	NC_LED_WWAN#
17	NC_RSV3	43	GND
18	GND	44	NC_LED_WLAN#
19	NC_RSV4	45	NC_RSV9
20	RF_KILL_N2_R	46	NC_LED_WPAN#
21	GND	47	NC_RSV10
22	PLTRST_MINIPCIE_N	48	1.5V
23	MINI_PCIE_RXN0	49	NC_RSV11
24	P3VSB	50	GND
25	MINI_PCIE_RXP0	51	NC_RSV12
26	GND	52	VCC3

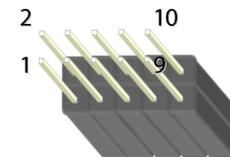
● **J3: 80PORT**

Pin	Description	Pin	Description
1	P80_25M_CLK	2	LPC_AD1
3	PLTRST_PORT80_N	4	LPC_AD0
5	LPC_FRAME_N	6	+V3P3
7	LPC_AD3	8	KEY PING
9	LPC_AD2	10	GND



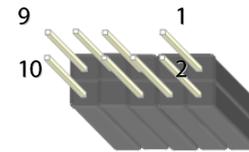
● **SPIROM**

Pin	Description	Pin	Description
1	KEY PING	2	KEY PING
3	SPI_CS0_N	4	+V1P8_SPI
5	SPI_MISO	6	SPI_HOLD_N
7	NC	8	SPI_CLK
9	GND	10	SPI_MOSI



●USB3/1

Pin	Description	Pin	Description
1	V5USB1	2	GND
3	KEY PING	4	USB4_P
5	USB3_N	6	USB4_N
7	USB3_P	8	KEY PING
9	GND	10	V5USB1

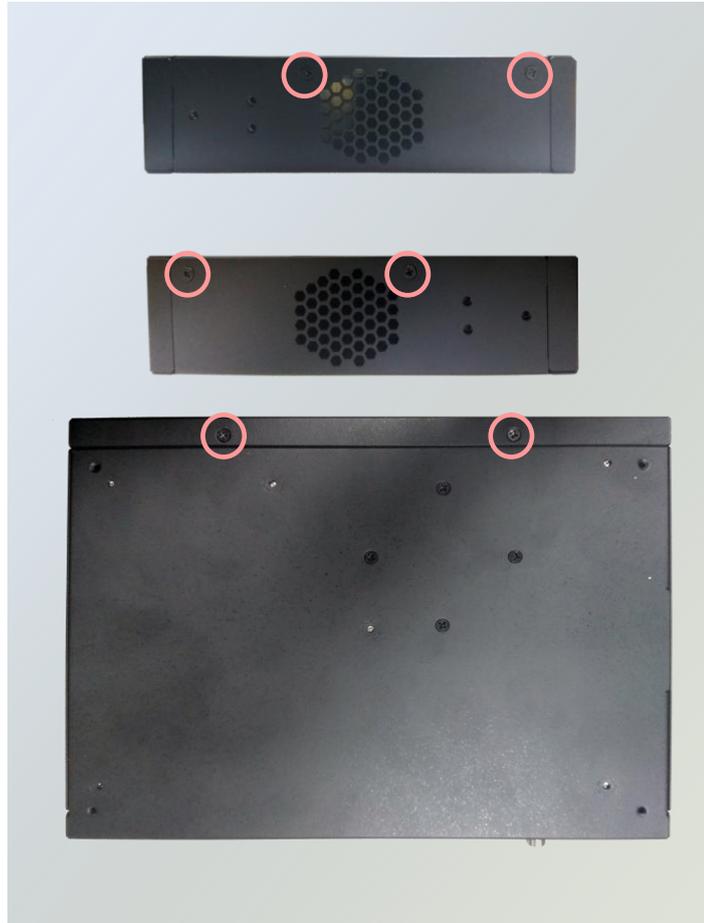


CHAPTER 3: HARDWARE SETUP

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

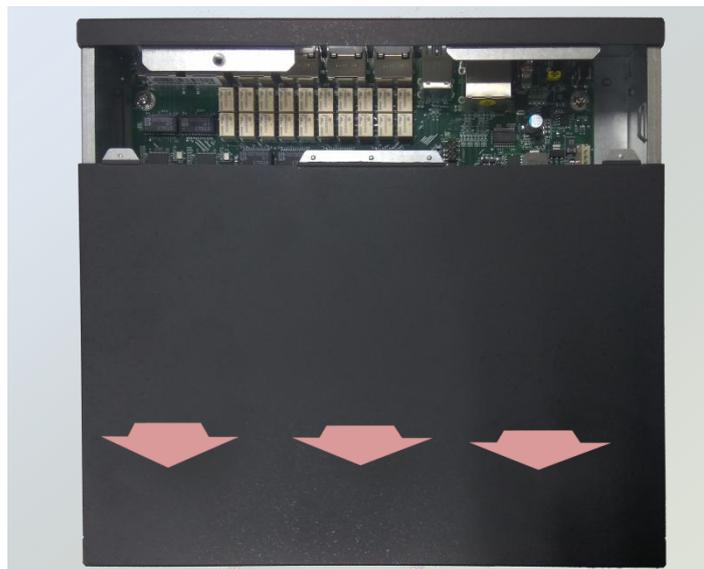
Opening the Chassis

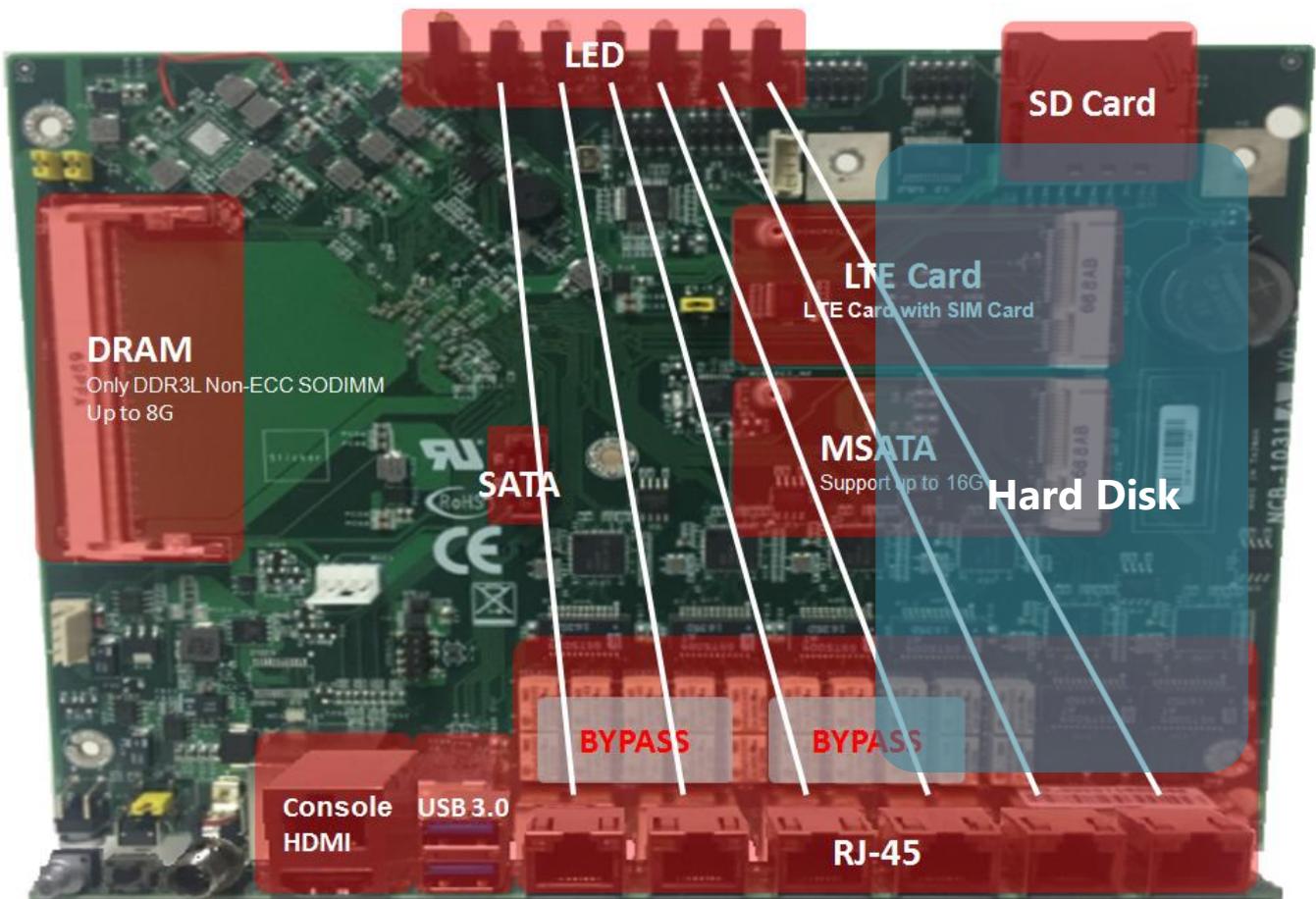
1. Loosen the screws from both side panels as shown in the picture.



Loosen the screws from the bottom panel.

2. Flip over the system, slide the cover open and remove it.



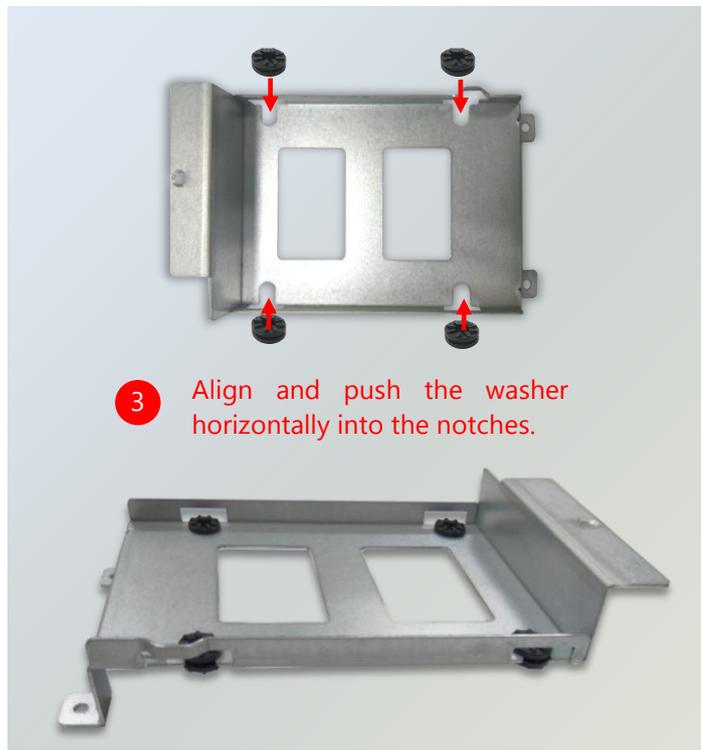


Installing the SSD/HDD

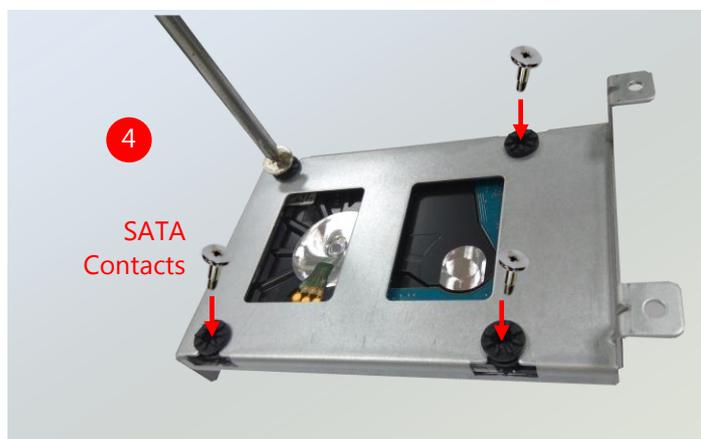
1. Locate the disk area in the chassis.
2. Loosen the two screws on the screw holes shown in the picture.



3. Insert the four rubber washers into the four notches of the tray.



4. Install the disk into the tray and secure it with the provided disk screws. Make sure the SATA connector faces outwards as shown in the picture.

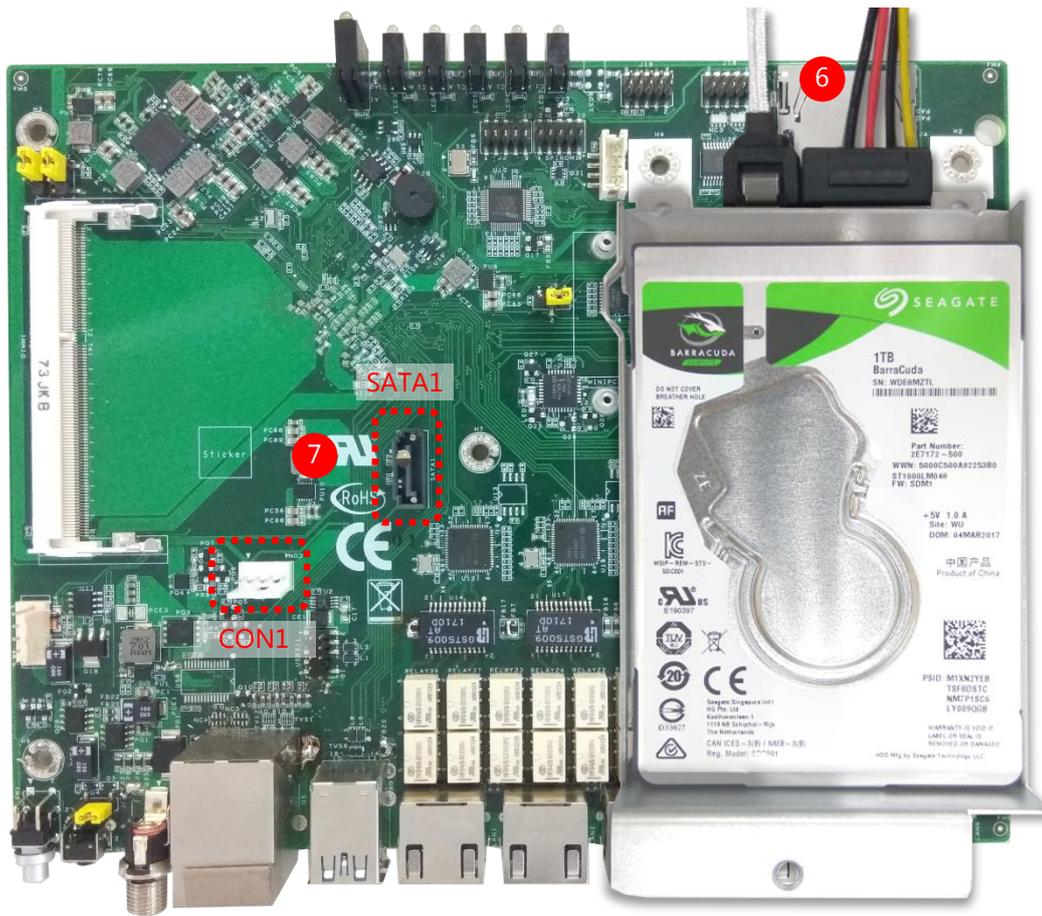


Chapter 3: Hardware Setup

- Secure the tray on the motherboard with three provided screws.



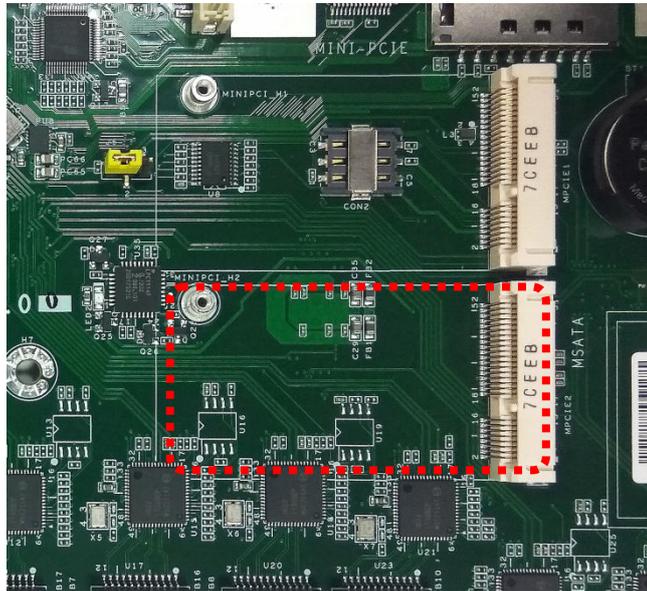
- Connect the SATA Data cable and the SATA Power cable to the disk.
- Insert the other end of the SATA data cable to **SATA1** port on the motherboard, and the end of the SATA power cable to **CON1** port. Arrange the cables and route them neatly to avoid them from getting tangled.



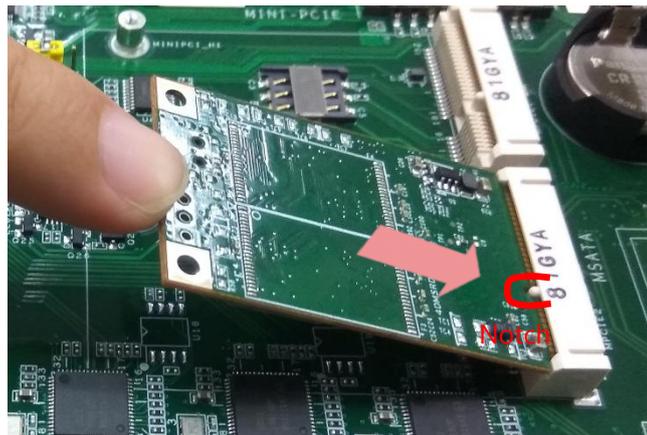
Installing the mSATA Module

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

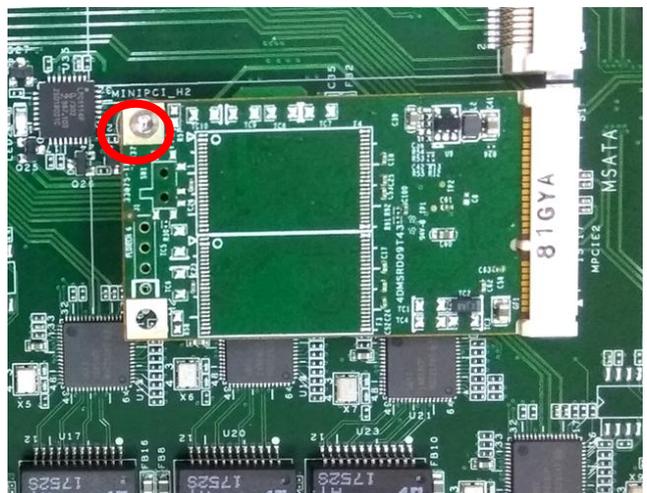
1. Locate MPCIE2 slot.



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

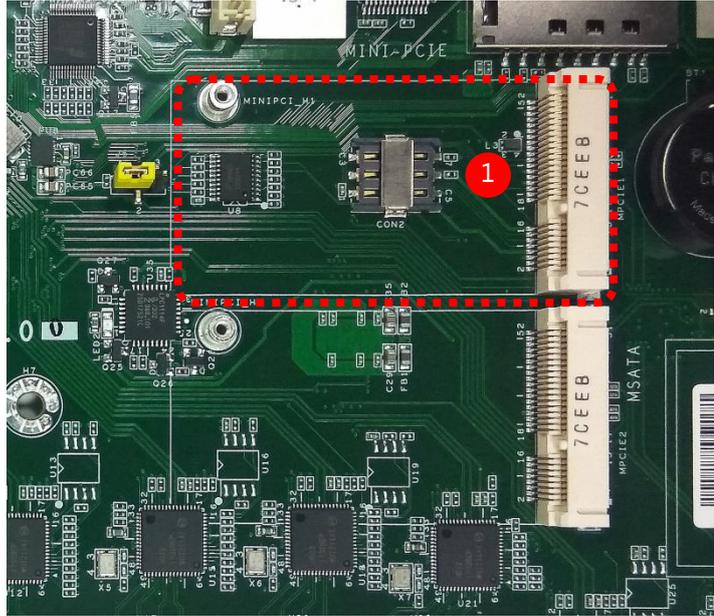


3. Fix the module to the motherboard with a screw.



Installing the LTE Module

1. Locate MPCIE1slot.



2. Insert the Nano-SIM card. Make sure the card's gold contacts face downwards and the angled corner of the card is positioned correctly as shown in the picture.



3. Follow the procedures for installing a mSATA module in the previous section to install your LTE module.



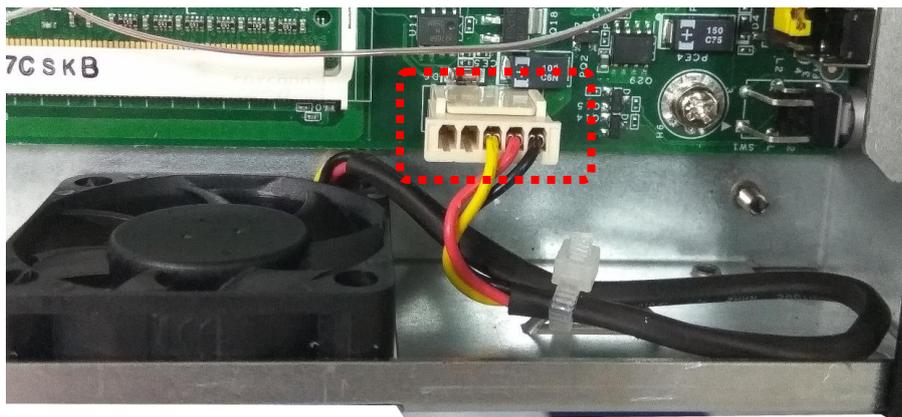
Replacing Cooling Fans

The system supports one cooling fan. To replace a worn-down fan, please follow the steps below:

1. Make sure the system power is completely off and unplugged.
2. Remove the screws circled below.



3. Remove the fan connector.



4. Take the fan out and install a new one.

Rackmounting the System (with the Adapter Holder)

With the Rackmount Kit, this system can be fixed onto rack post along with the system's power adapter. Please contact Lanner's sales representative for purchasing these kits.

What's in the Rackmount Kit

Check the kit contents for the following items:

- ▶ 1x pair of Ear Brackets
- ▶ Screws for the fixture of the ear brackets



What's in the Adapter Holder Kit

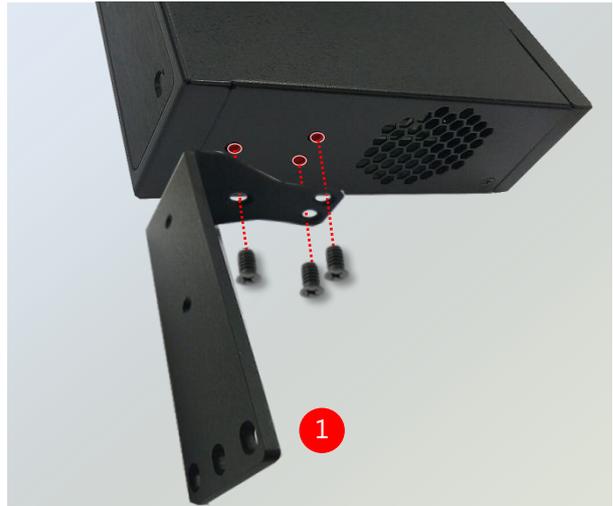
Check the kit contents for the following items:

- ▶ 1x Adapter Holder
- ▶ 1x Clamp
- ▶ Screws for the fixture of the adapter holder and the clamp.

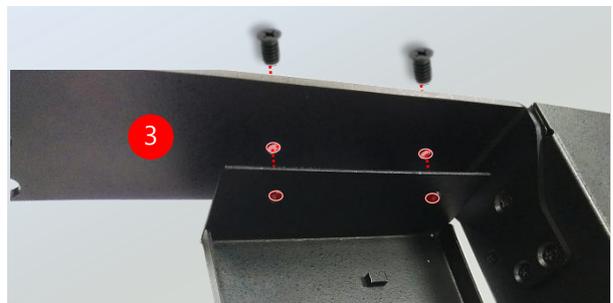


Attaching the Rackmount Assembly to the Chassis

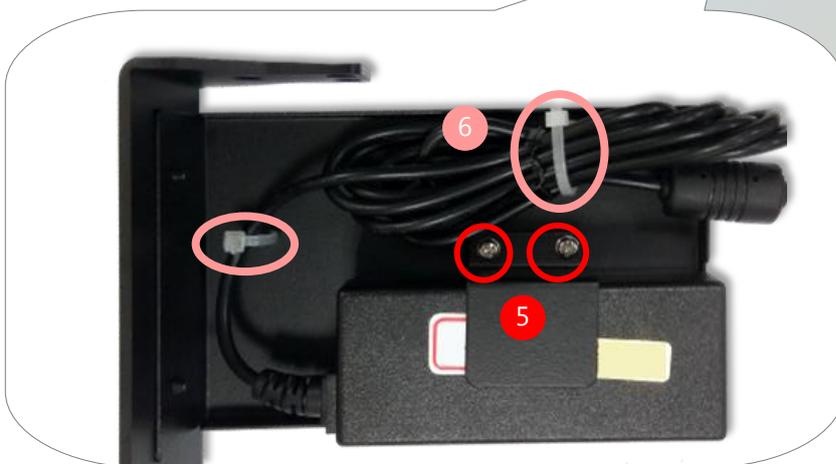
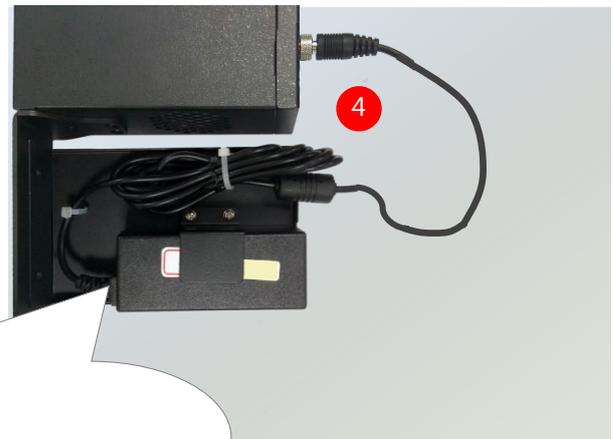
1. On one side of the system, align the ear bracket to the screw holes on the side panel and fix it using three screws.
2. Secure the other ear bracket to the other side of the system.



3. Fix the adapter holder to the left bracket using two screws.



4. Attach the power adapter's connector to the power supply jack on rear panel and fasten the screw lock.
5. Secure the adapter with the clamp using two screws.
6. Use the cable ties to fix the adapter's cable on the bracket.



Installing the System to the Rack

7. In the rack, install a shelf to support the system (recommended).
8. Hold the system with its front facing you, lift and carefully insert the system into the rack. Attach the brackets to the rail rack using screws and round-hole/square-hole retainer nuts.



CHAPTER 4: BIOS SETUP

Enter BIOS Setup

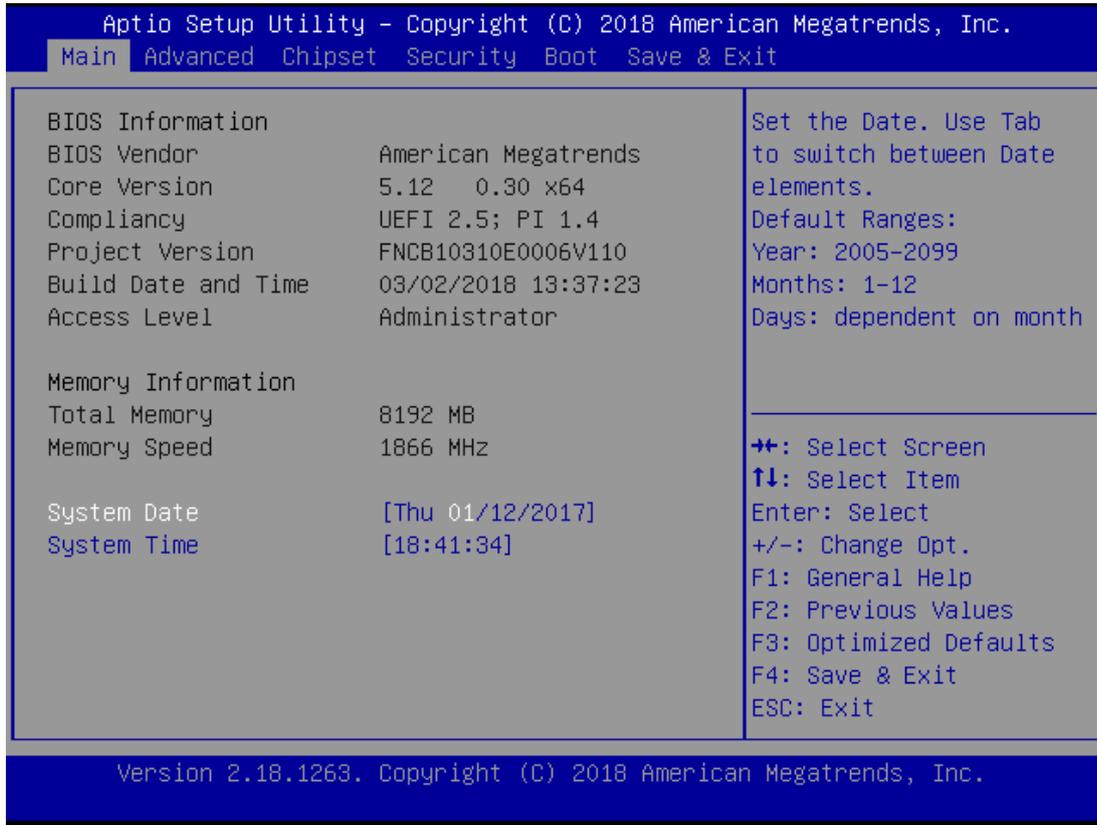
To enter the BIOS setup utility, simply follow the steps below:

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

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

Main

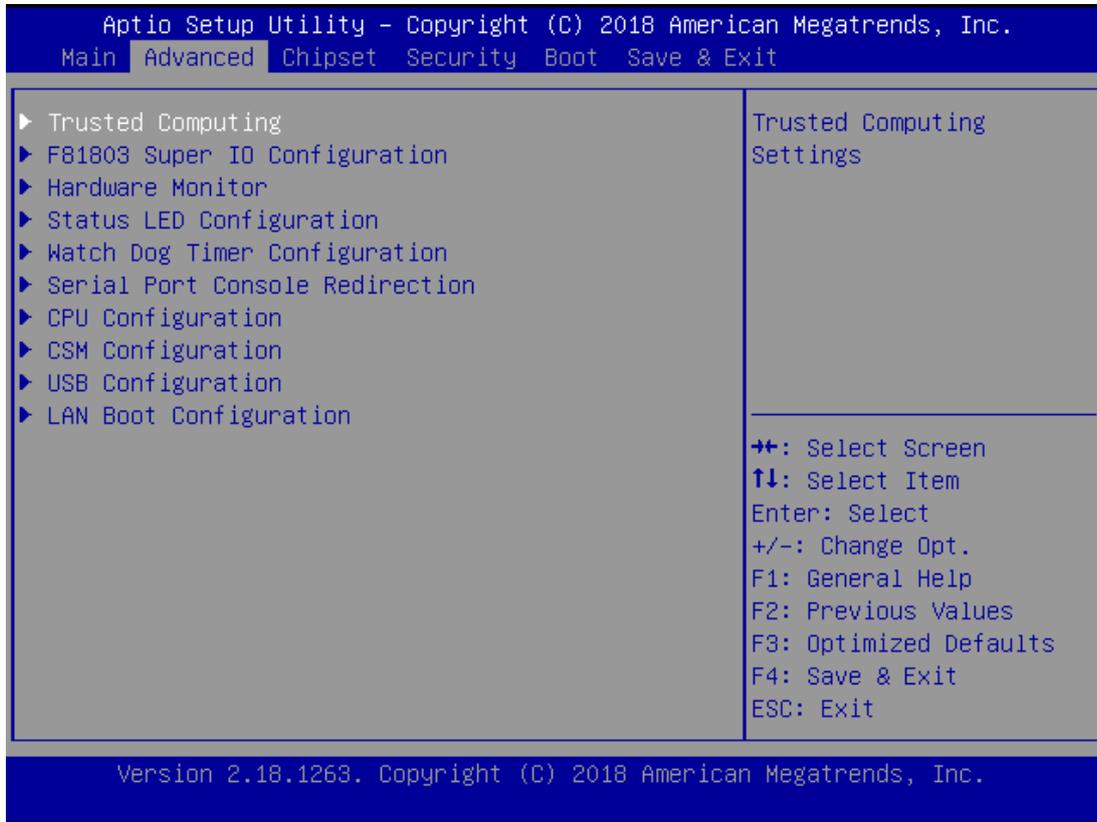
Setup main page contains BIOS information and project version information.



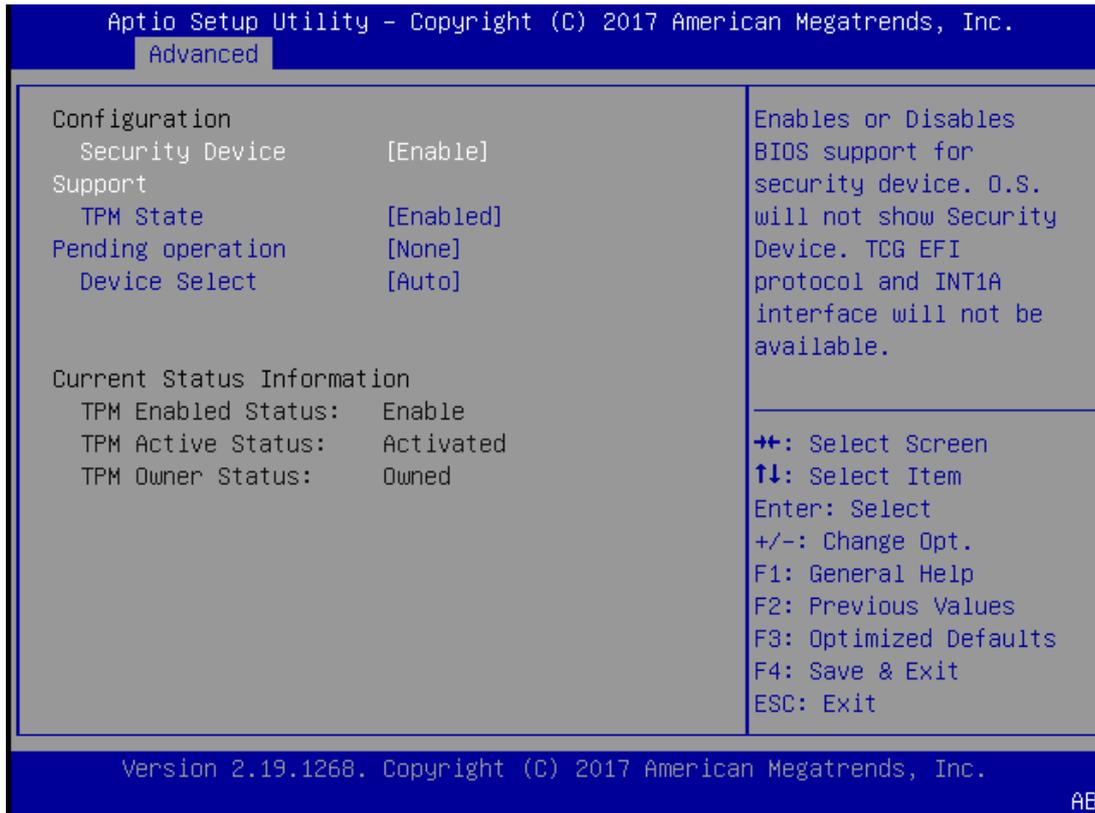
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliance: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use <Tab>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

Advanced

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

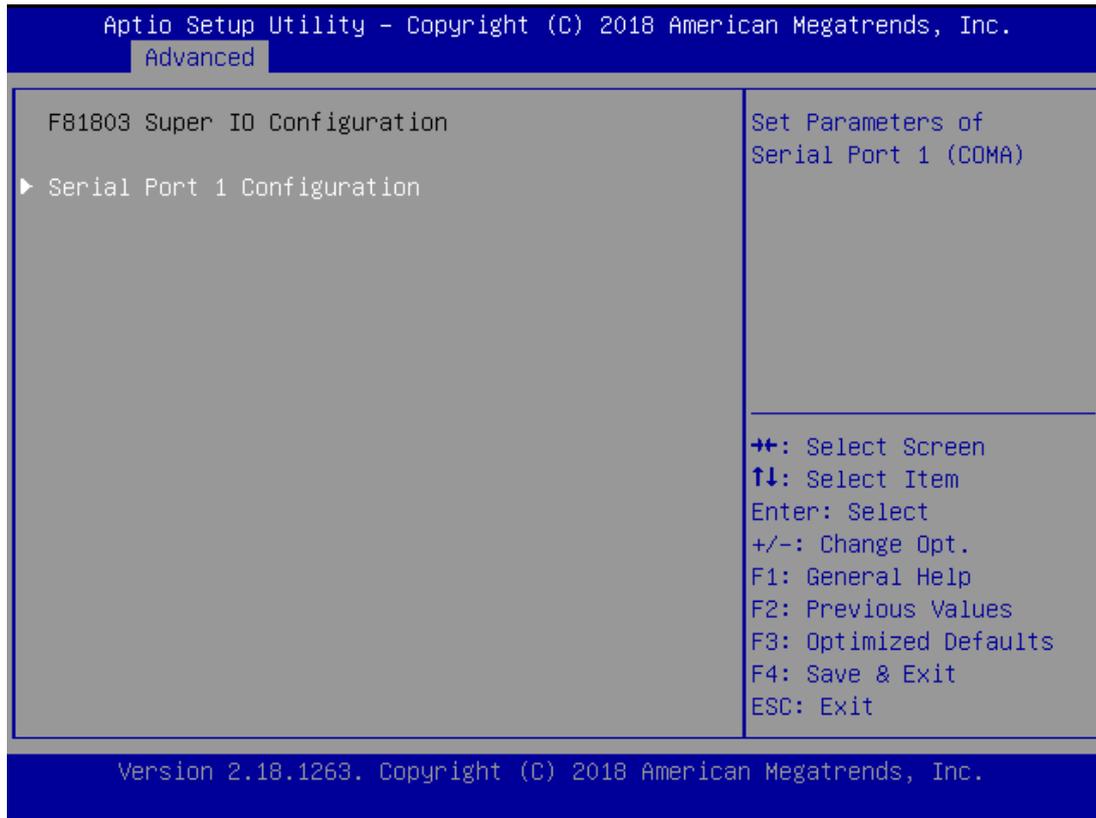


Trusted Computing

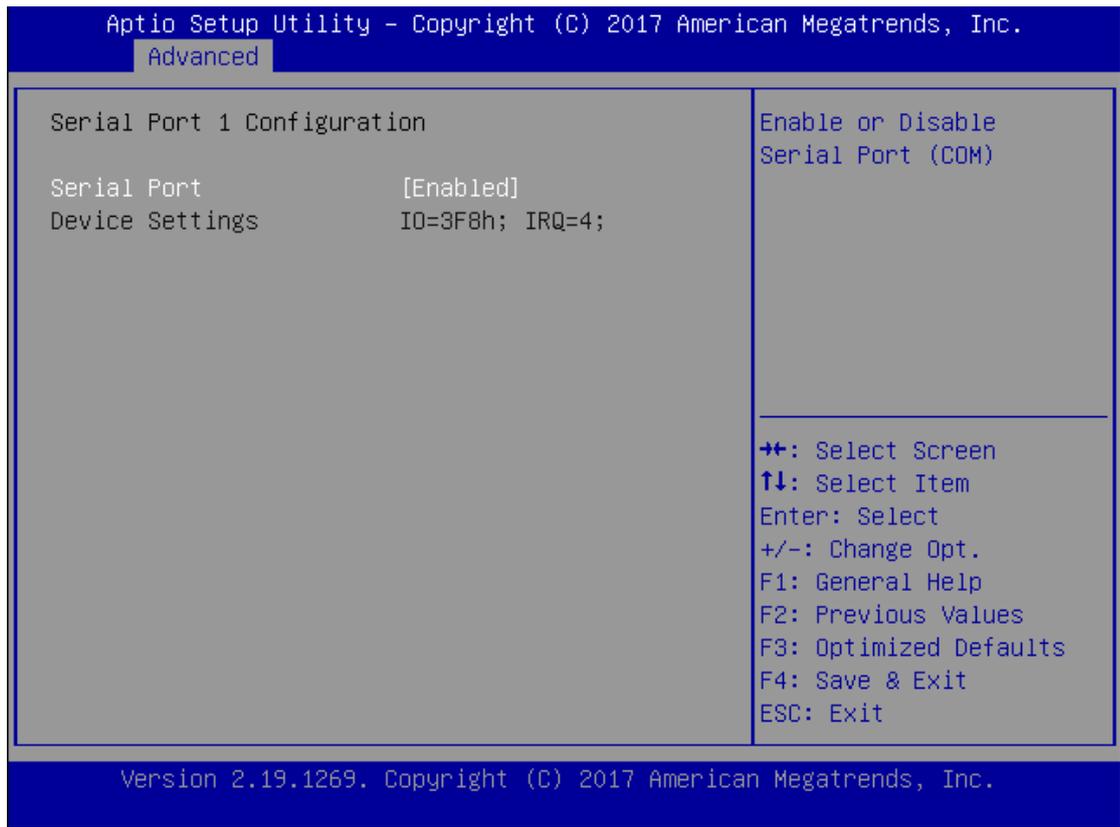


Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
TPM State	Enabled Disabled	Enables or disables Security Device. NOTE: Your computer will reboot during restart in order to change State of the Device.
Pending operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Device Select	TPM 1.2 TPM 2.0 Auto	TPM 1.2 will restrict support to TPM 1.2 devices; while TPM 2.0 will restrict support to TPM 2.0 devices; Auto will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

F81803 Super IO Configuration

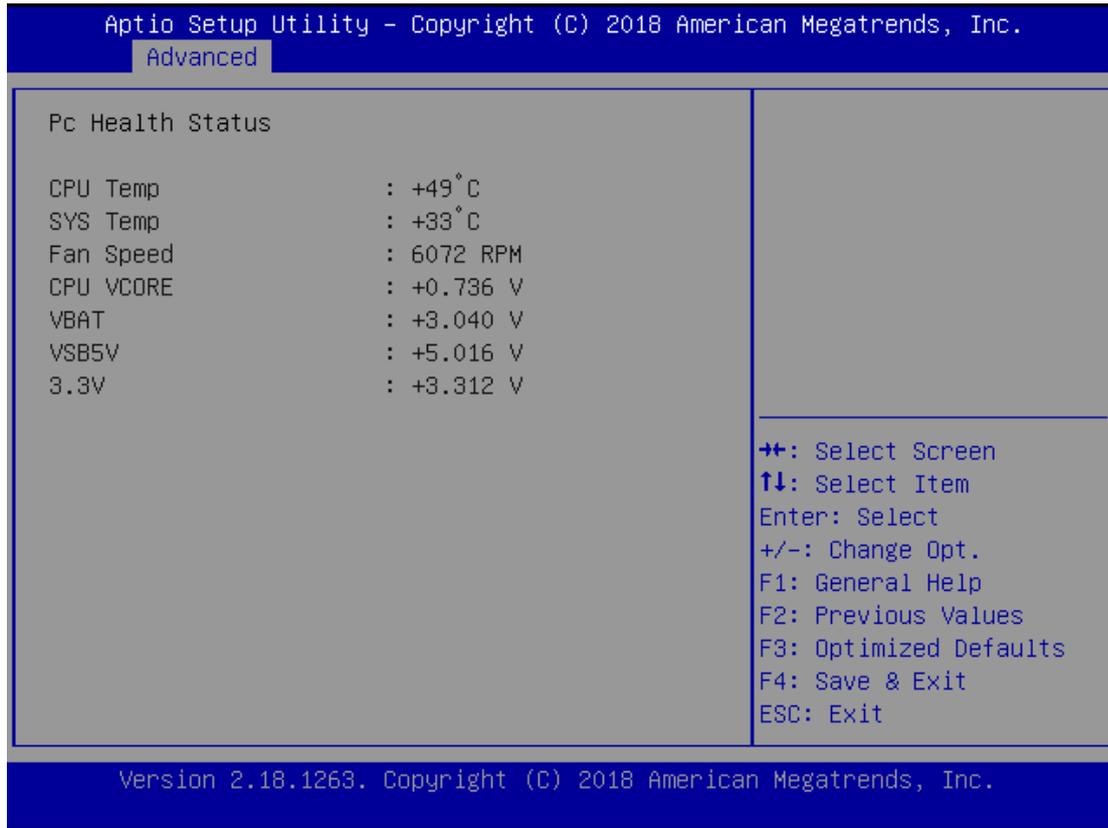


Serial port 1 Configuration



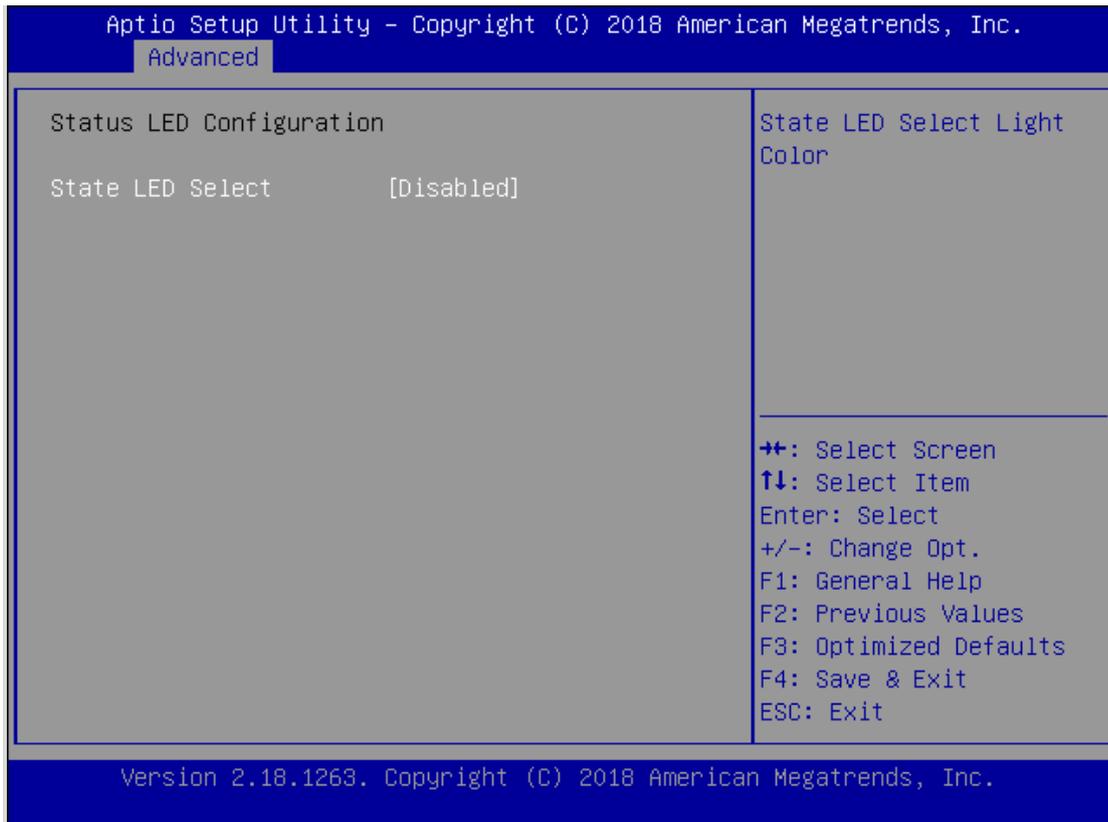
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Hardware Monitor



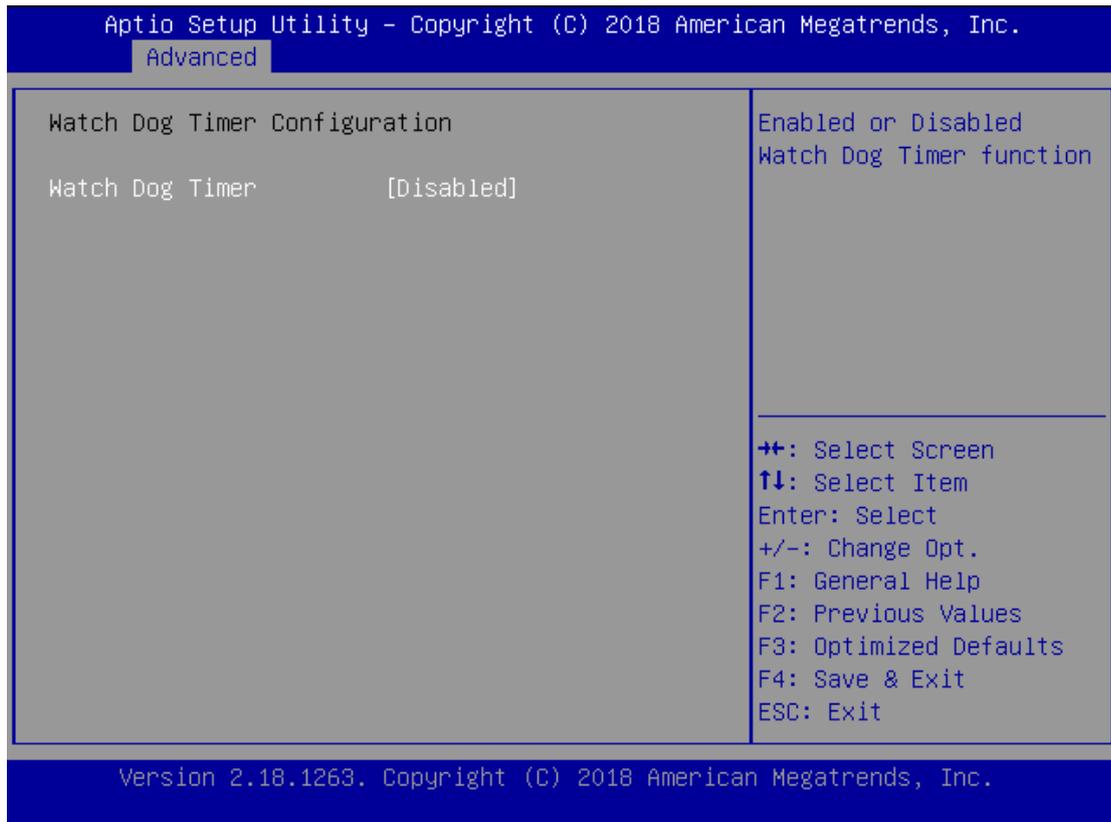
Feature	Description
CPU Temp	This value reports the CPU temperature.
SYS Temp	This value reports the System temperature.
Fan Speed	This value reports the FAN speed.
CPU VCORE	This value reports the CPU VCORE.
VBAT	This value reports the VBAT Input voltage.
VSB5V	This value reports the VSB5V Input voltage.
3.3V	This value reports the 3.3V Input voltage.

Status LED Configuration



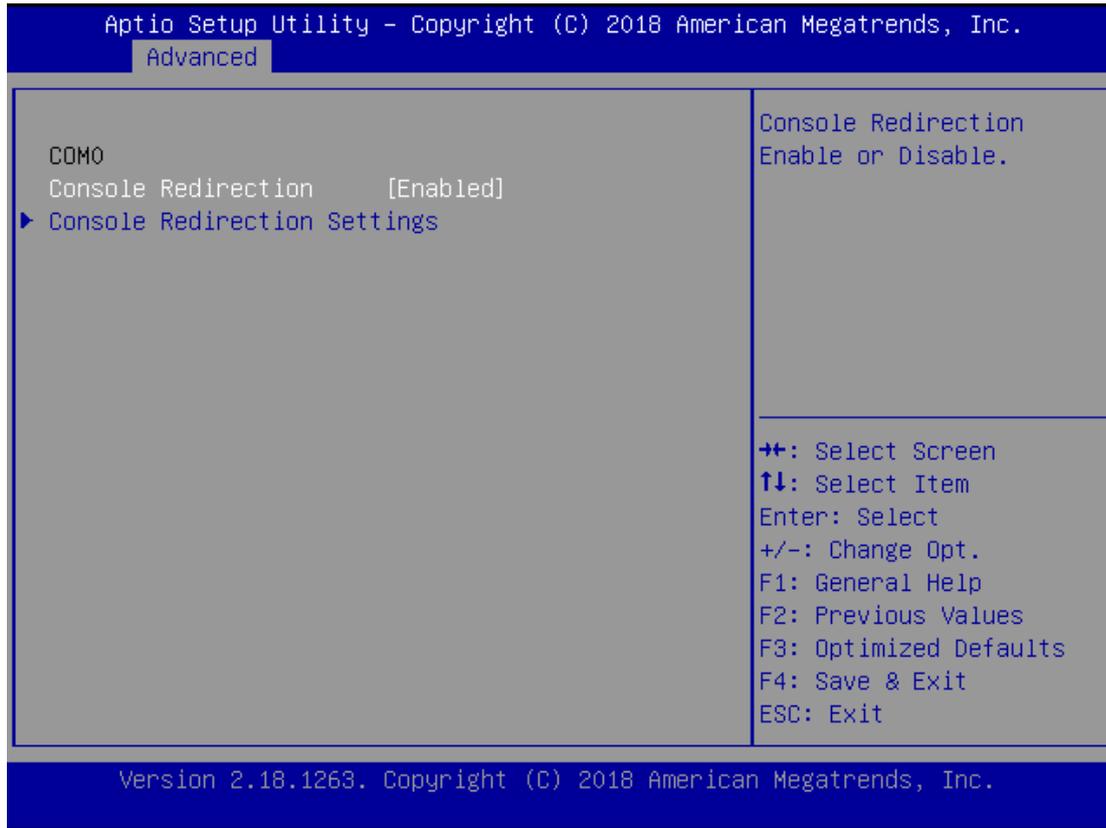
Feature	Options	Description
Status LED Select	<p>Disabled</p> <p>LED: Green Light</p> <p>LED: Red Light</p>	Configures Status LED color

Watch Dog Timer Configuration



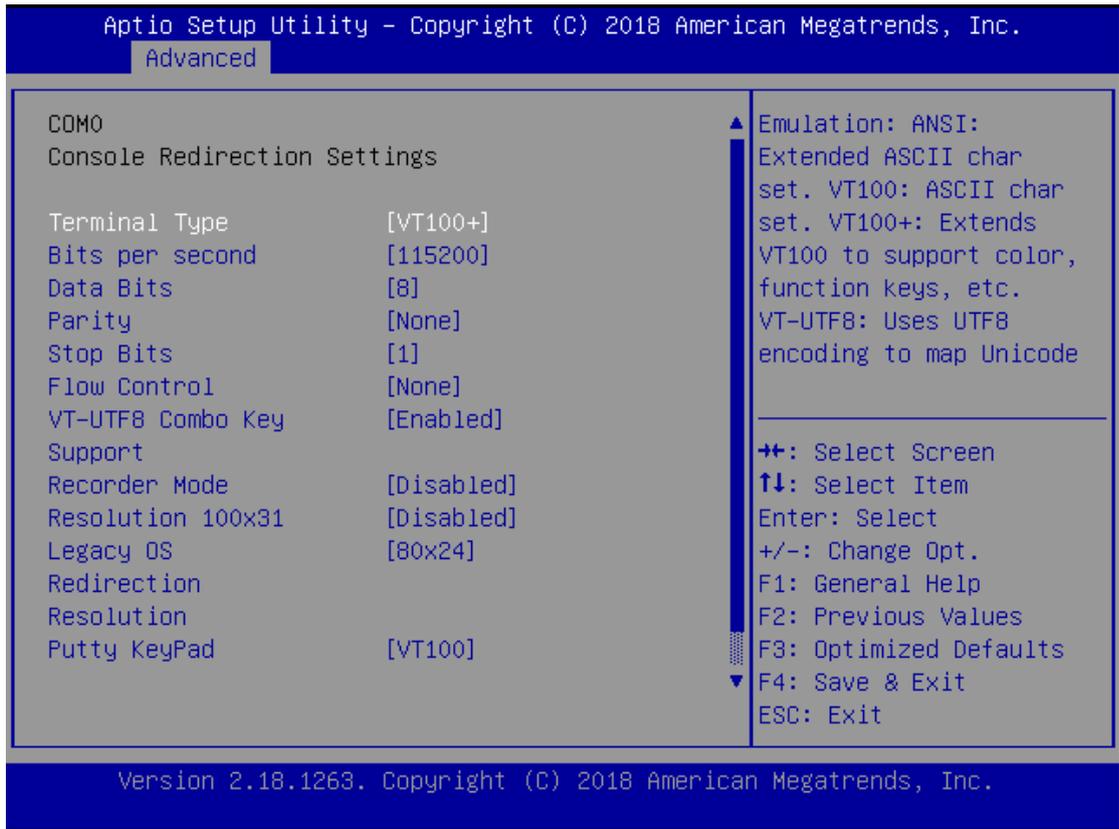
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enable or Disable Watch Dog function
Timer Count Mode	Second Mode Minute Mode	Select Second Mode or Minute Mode
Timer out Value	60	Watch Dog Timer out Value 0-255

Serial Port Console Redirection



Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Console Redirection Enable or Disable.

Console Redirection Setting

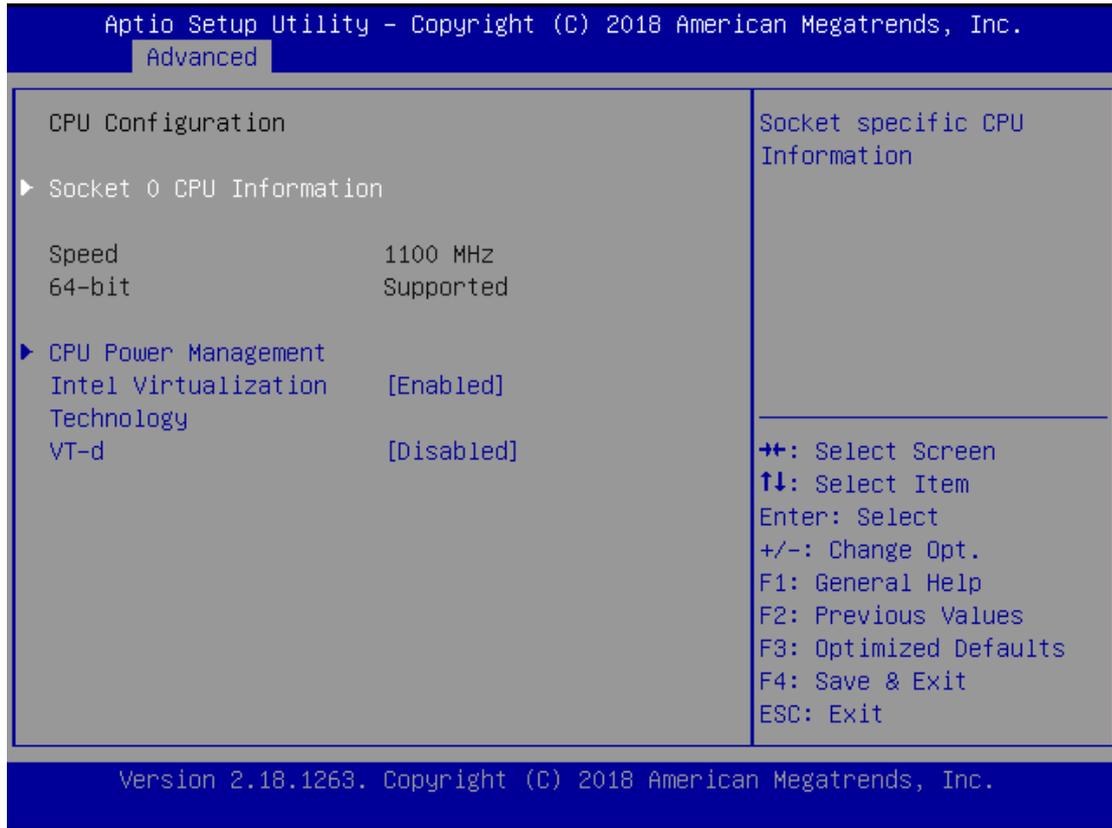


Feature	Options	Description
Terminal Type	VT100	ANSI: Extended ASCII char set.
	VT100+	VT100: ASCII char set.
	VT-UTF8	VT100+: Extends VT100 to support color, function keys, etc.
	ANSI	VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600	Selects serial port transmission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

Chapter 4: BIOS Setup

	Space	
Stop Bits	1 2	Stop bits indicate the end of a serial data packet.
Flow Control	None Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enable 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	Select FunctionKey and KeyPad on Putty.
Redirection After BIOS POST	Always Enable BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

CPU Configuration



Feature	Options	Description
Intel Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology
VT-d	Disabled Enabled	Enable/Disable CPU VT-d

Socket 0 CPU Information

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

Socket 0 CPU Information

Intel(R) Celeron(R) CPU N3350 @ 1.10GHZ
CPU Signature           506C9
Microcode Patch        2E
Max CPU Speed          1100 MHz
Min CPU Speed          800 MHz
Processor Cores        2
Intel HT Technology    Not Supported
Intel VT-x Technology  Supported

L1 Data Cache          24 kB x 2
L1 Code Cache          32 kB x 2
L2 Cache               1024 kB x 2
L3 Cache               Not Present

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

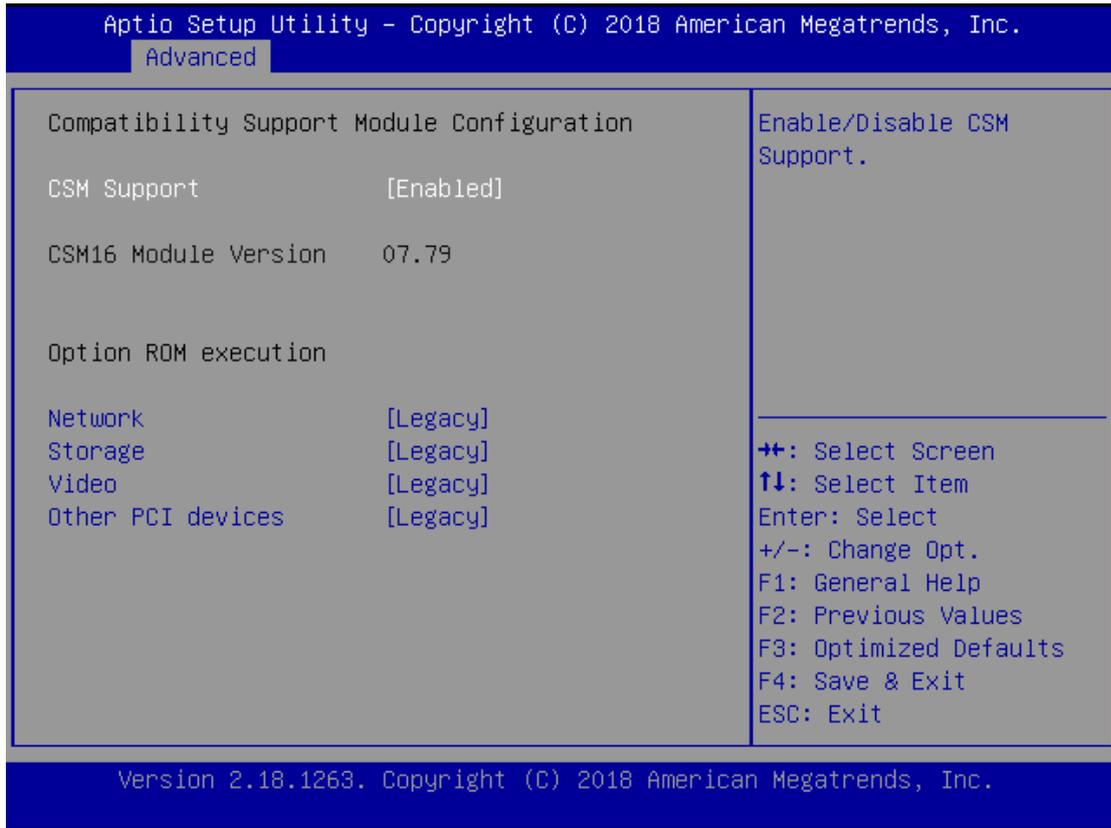
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
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CPU Power Management



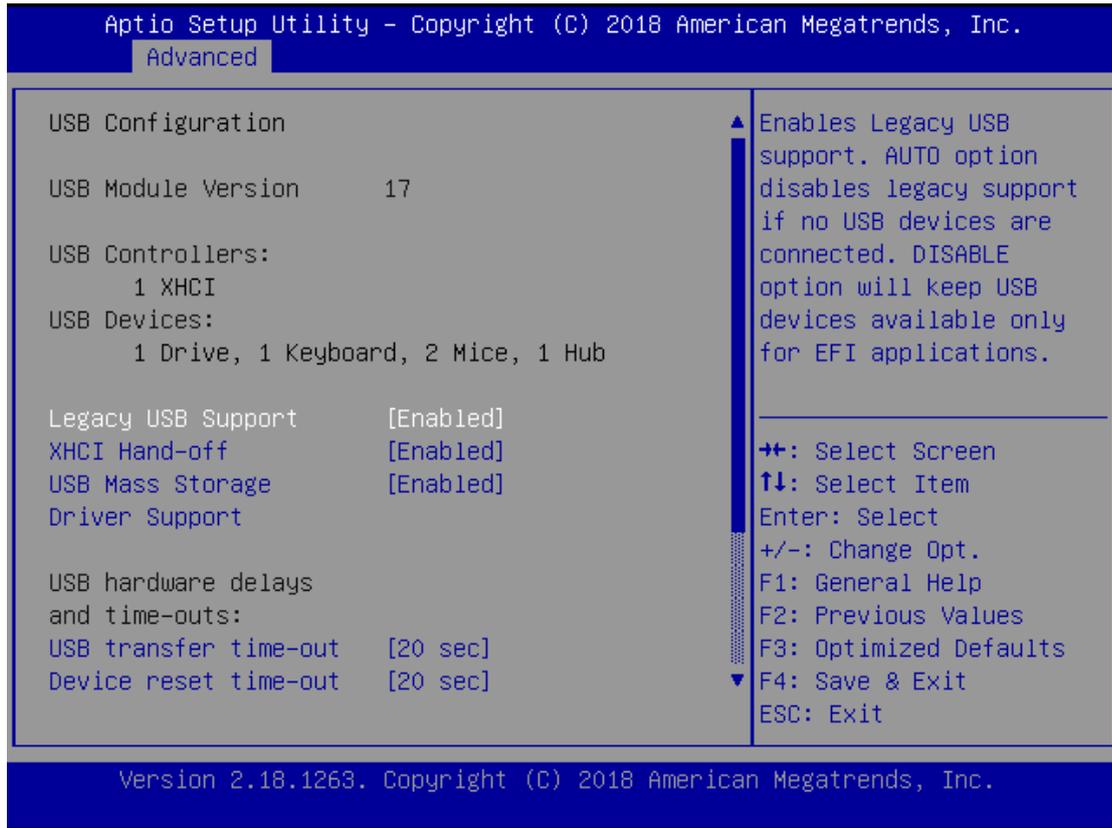
Feature	Options	Description
EIST	Disabled Enabled	Enable/Disable Intel SpeedStep

CSM Configuration



Feature	Options	Description
CSM Support	Disabled Enabled	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 Legacy	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 Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

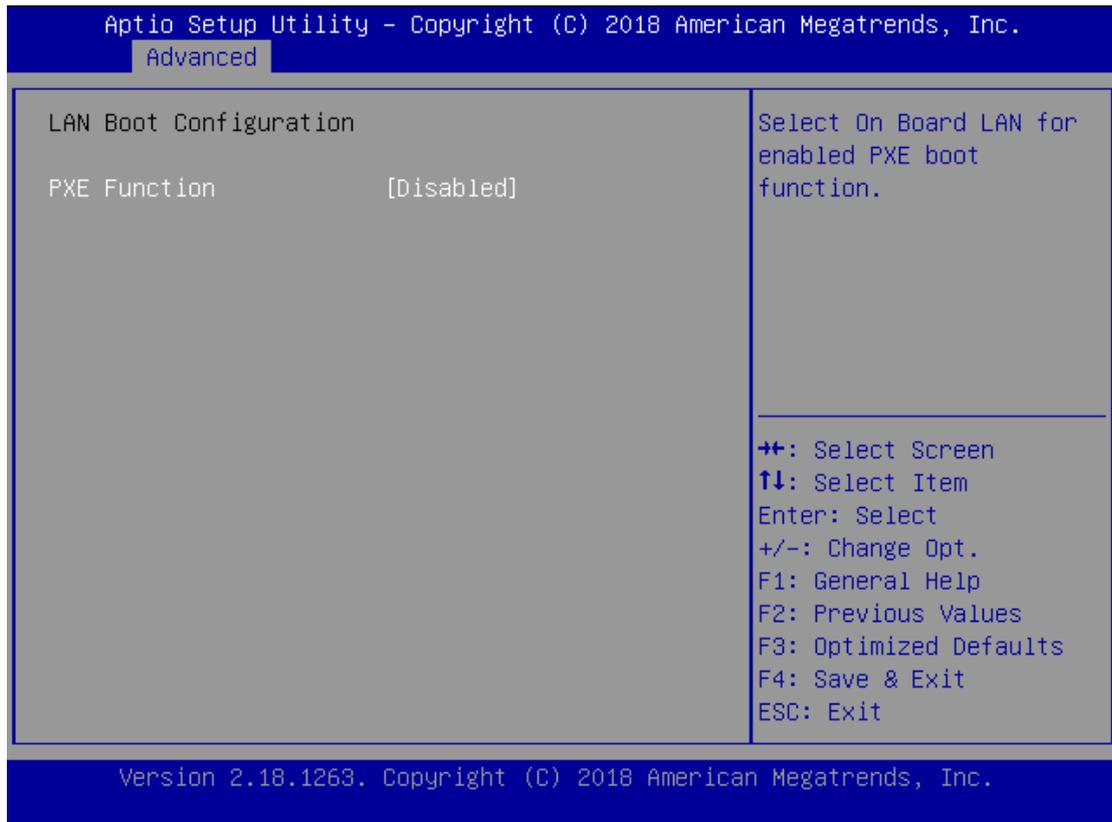
USB configuration



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

	20 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.

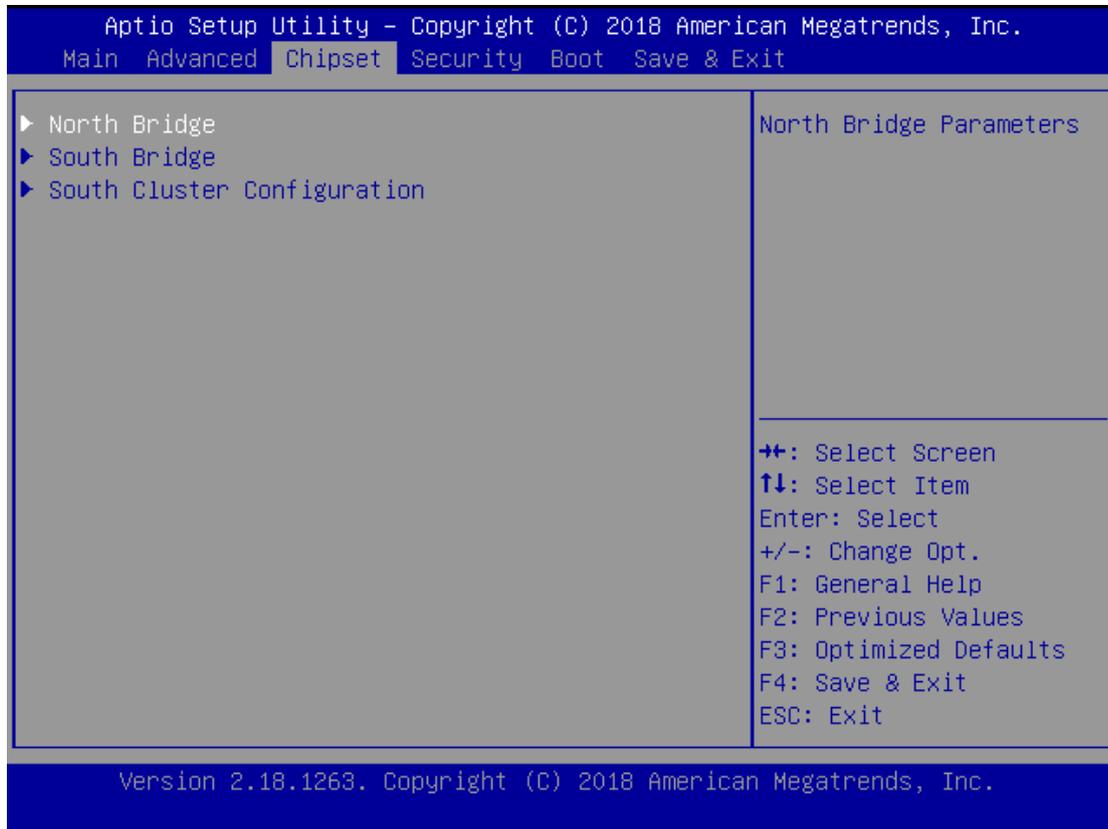
LAN Boot configuration



Feature	Options	Description
PXE Function	Disabled LAN1	Select On Board LAN for enabled PXE boot function.

Chipset

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



North Bridge

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

Chipset

<p>Memory Information</p> <p>Total Memory 8192 MB</p> <p>Memory Slot0 8192 MB (DDR3L)</p> <p>Max TOLUD [2 GB]</p>	<p>Maximum Value of TOLUD.</p> <hr/> <p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
--	--

Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

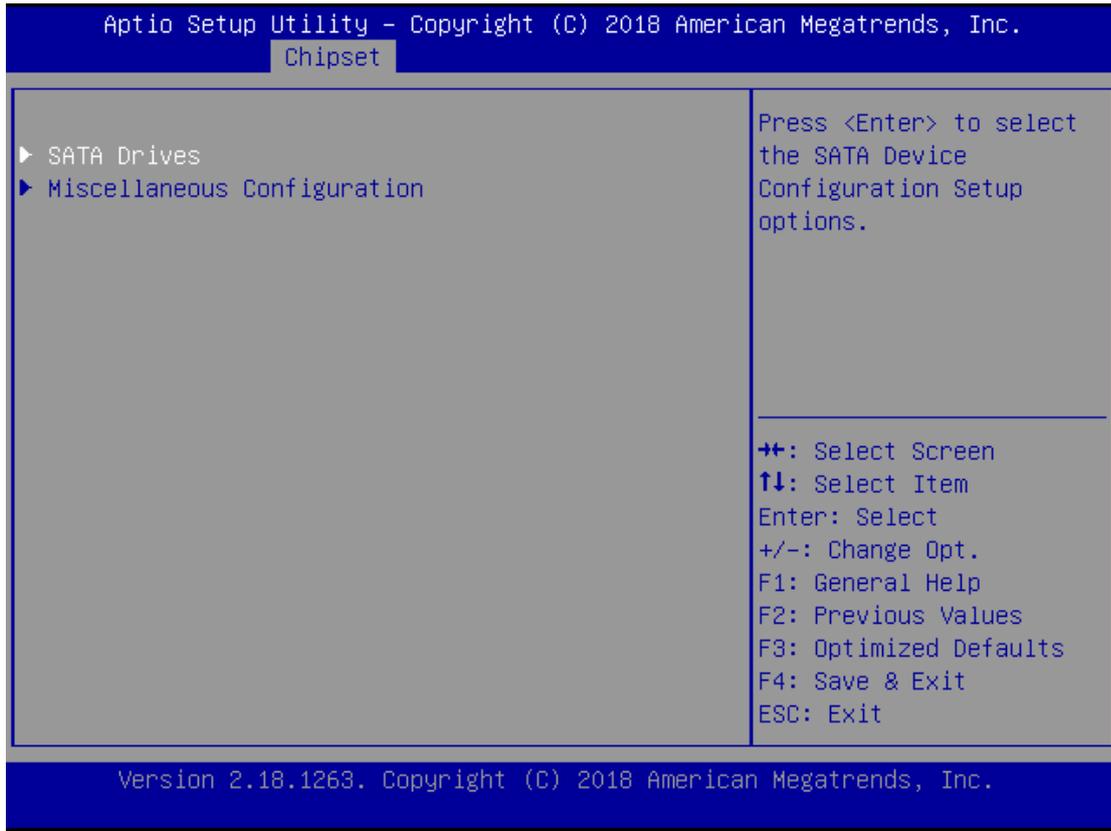
Feature	Options	Description
Max TOLUD	<p style="color: red;">2 GB</p> 2.25 GB 2.5 GB 2.75 GB 3 GB	Maximum Value of TOLUD.

South Bridge

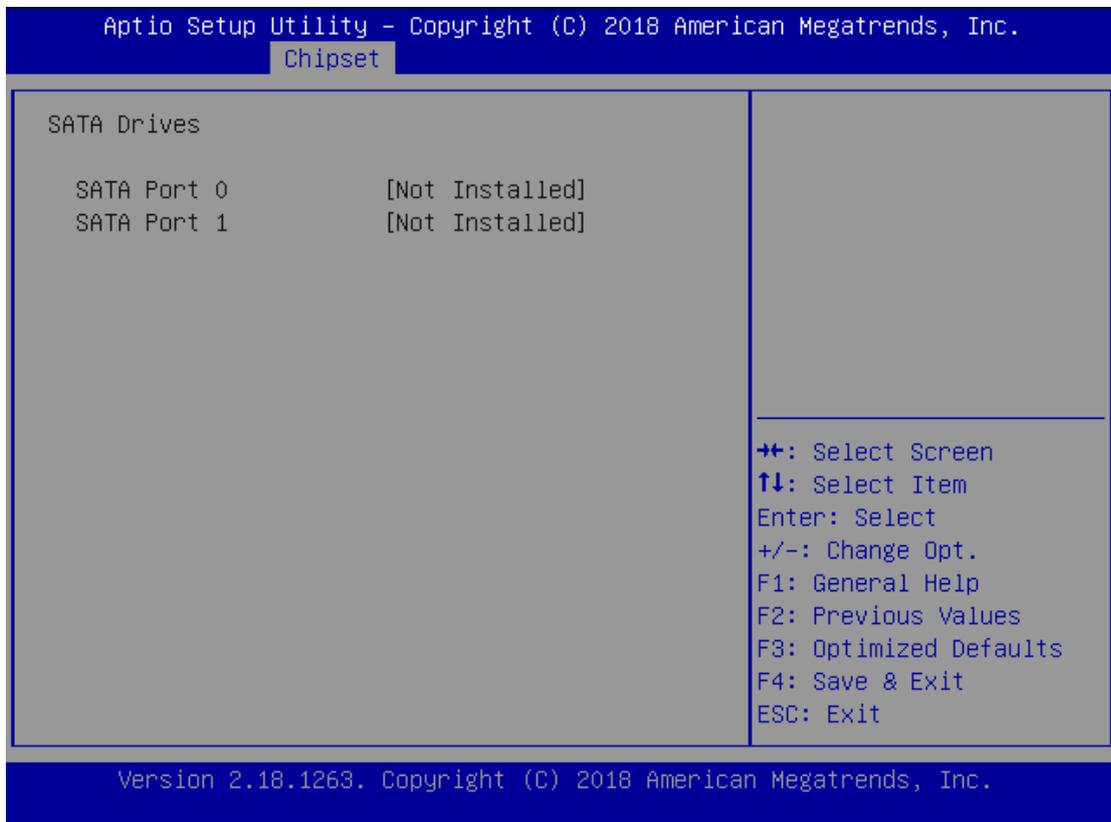


Feature	Options	Description
OS Selection	Windows Android Win7 Intel Linux	Select the target OS

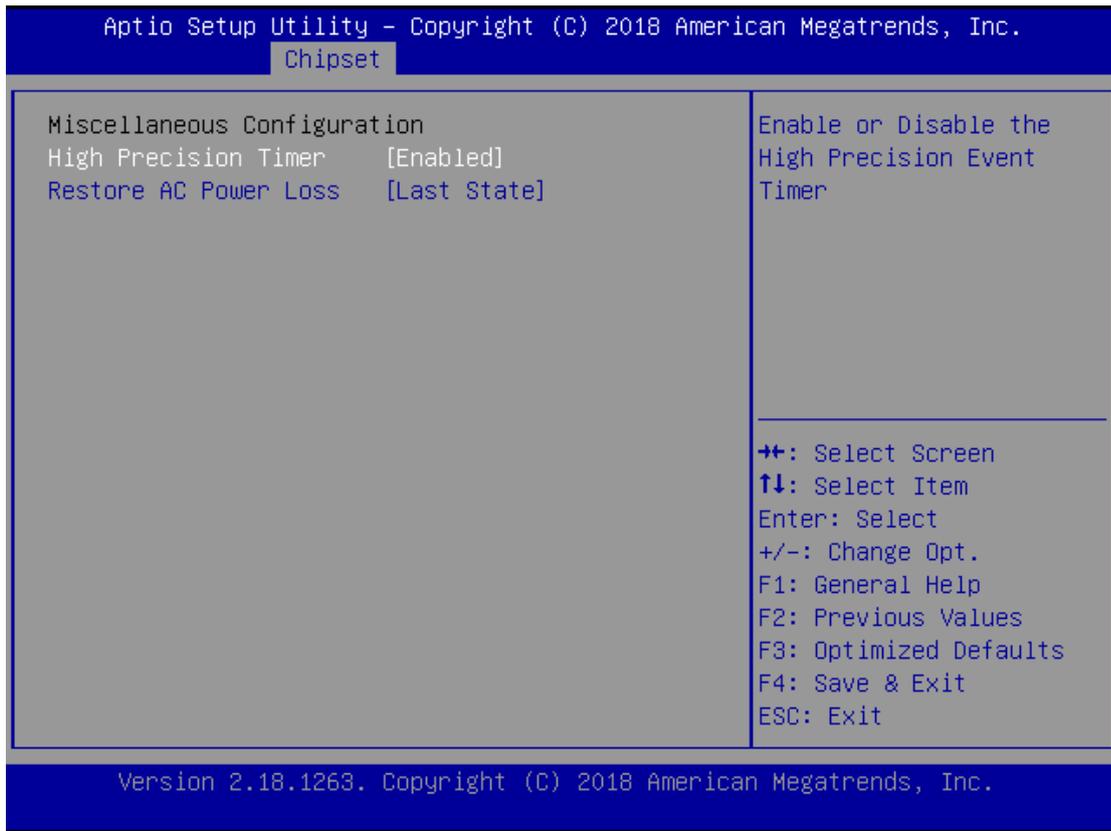
South Cluster Configuration



SATA Drivers



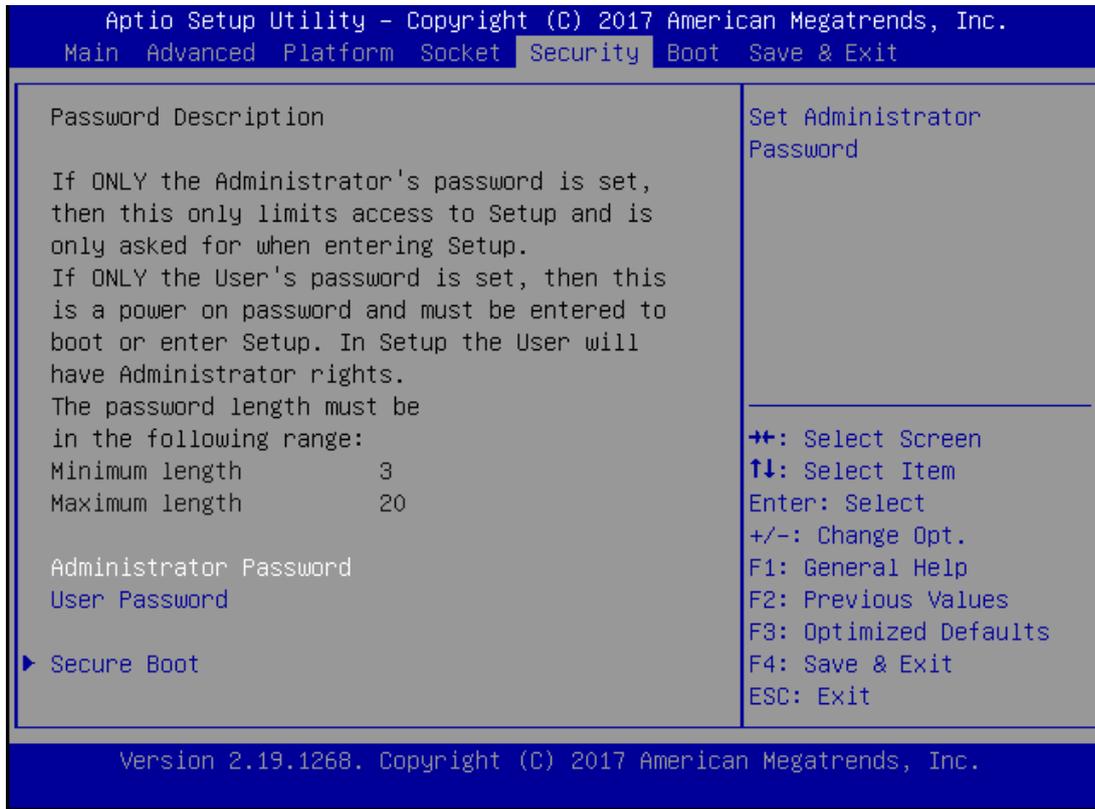
Miscellaneous Configuration



Feature	Options	Description
High Precision Timer	Disabled Enabled	Enable or Disable the High Precision Event Timer
Restore AC Power Loss	Power On Power Off Last State	Specify what state to go to when power is re-applied after a power failure (G3 state). S0 State: System will boot directly as soon as power applied. S5 State: System keeps in power-off state until power button is pressed.

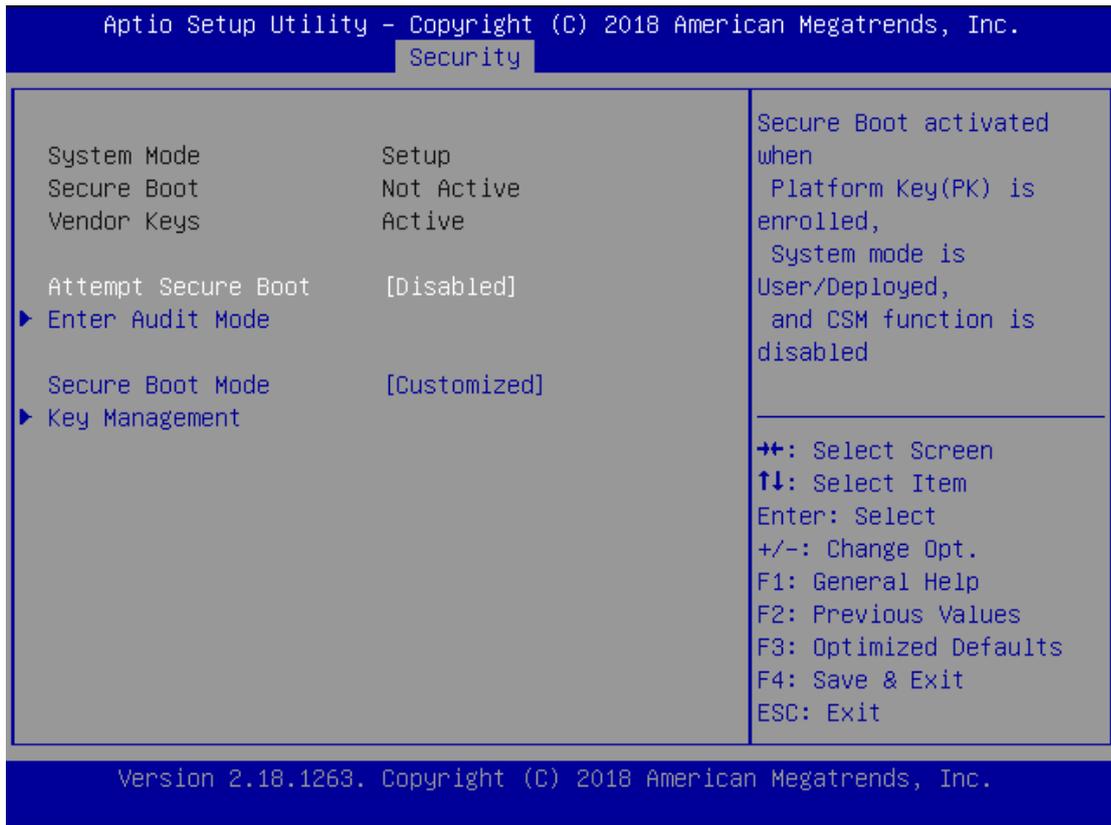
Security

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



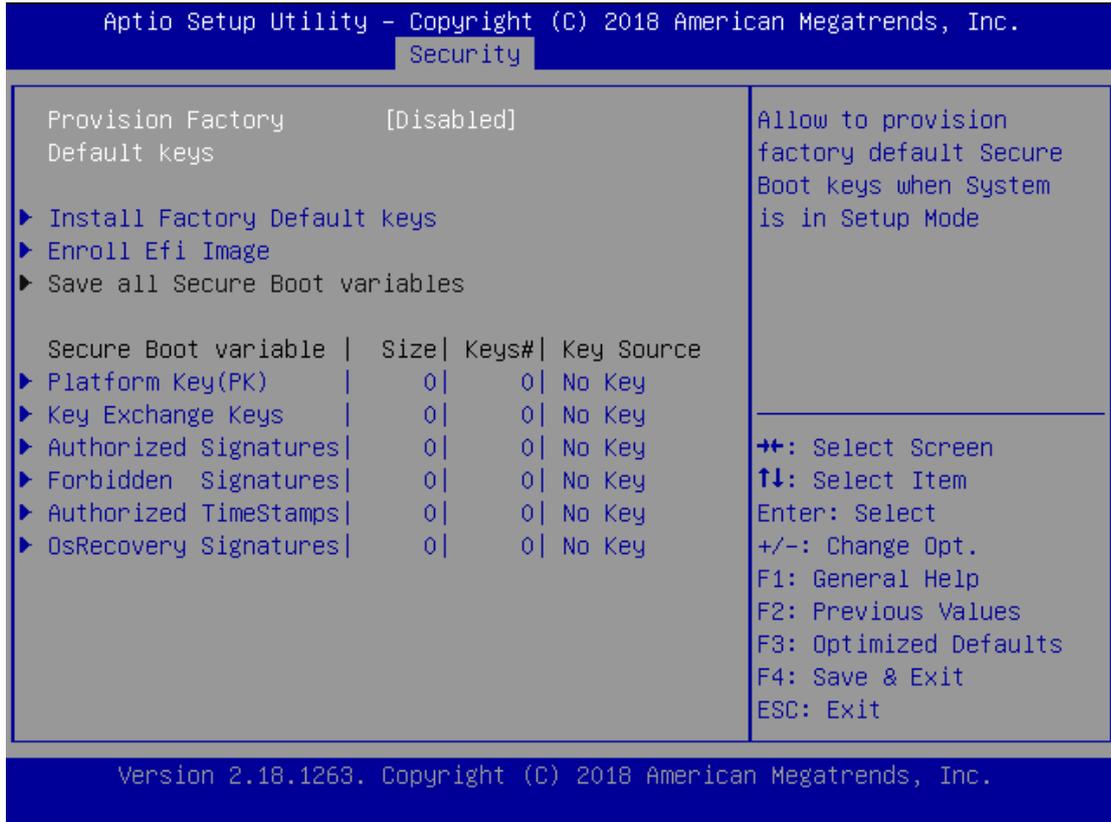
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

Secure Boot



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

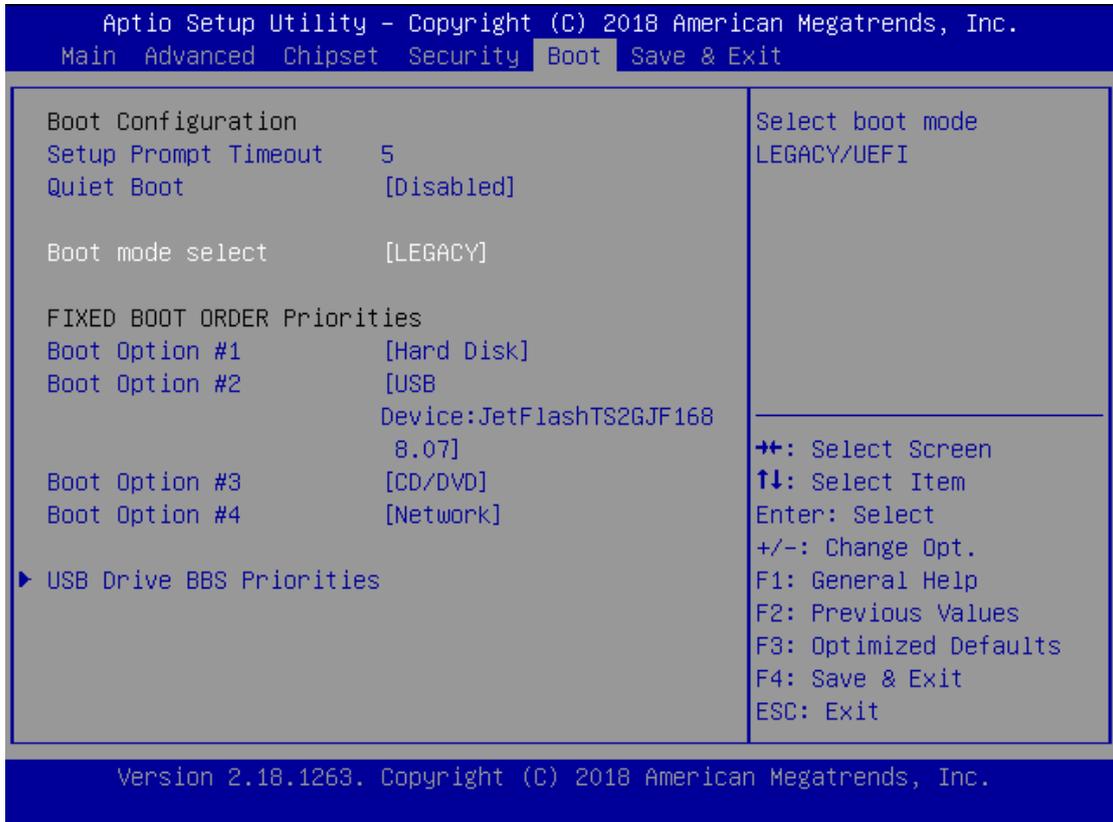
Key Management



Feature	Options	Description
Provision Factory Default keys	Disabled Enabled	Allow to provision factory default Secure Boot keys when System is in Setup Mode
Install Factory Default keys	None	Force System to User Mode - install all Factory Default keys
Enroll Efi Image	None	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash Certificate of the Image into Authorized Signature Database (db)

Boot Menu

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

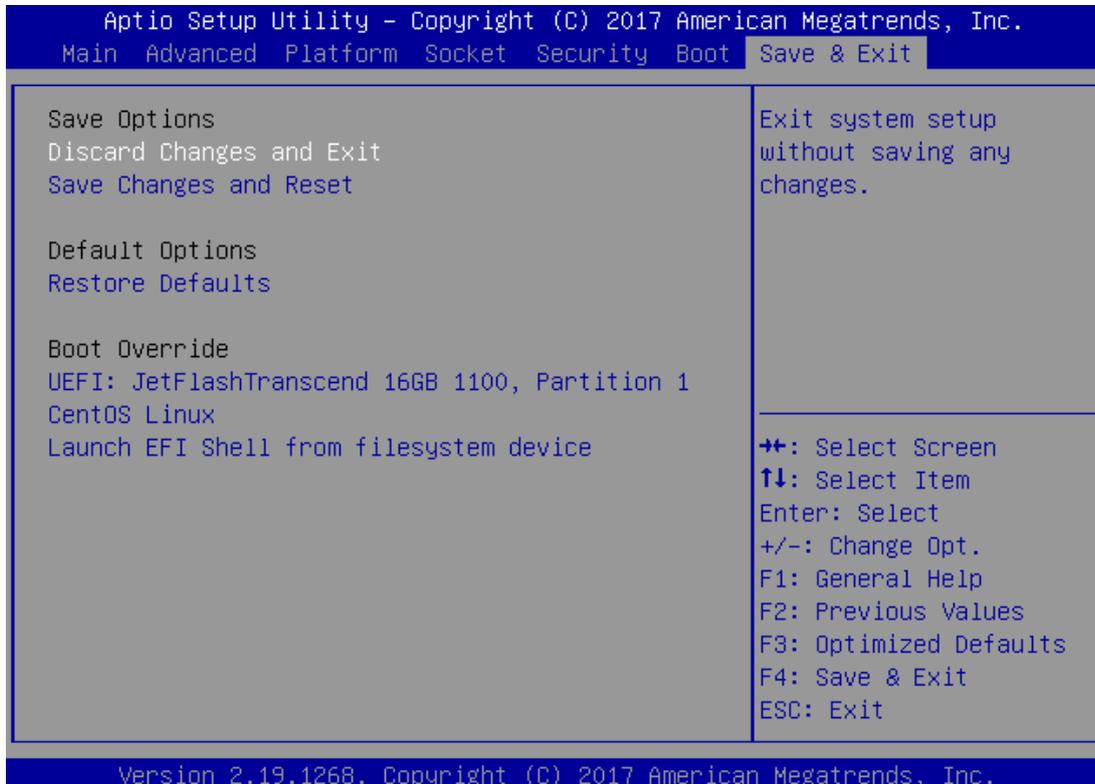


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Quiet Boot	Disabled Enabled	Enable or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL	Select boot mode for LEGACY or UEFI.

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

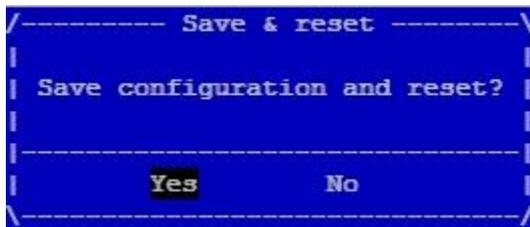
Save and Exit Menu

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



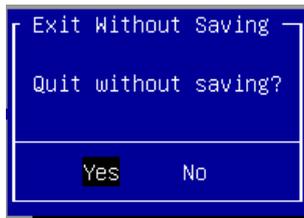
■ Save Changes and Reset

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 is selected. Select **“Yes”** to Save Changes and Exit Setup.



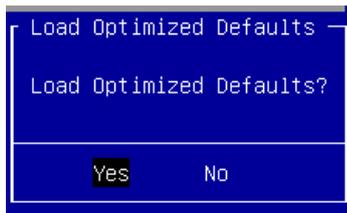
■ Discard Changes and Exit

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



■ **Restore Defaults**

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



PS: The actual items displayed under Boot Override will vary by the devices connected to the system.

APPENDIX A: LED INDICATOR EXPLANATIONS

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



► **System Power**

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

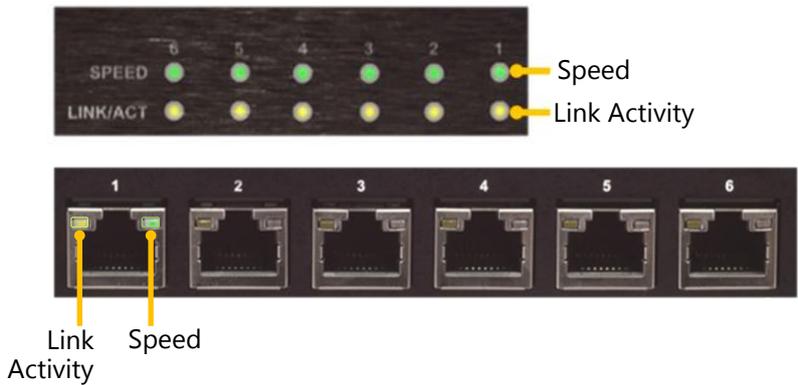
► **System Status**

This LED indicator is programmable. You could program it to display the operating status with 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>

► **HDD Activity**

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



► **Link Activity**

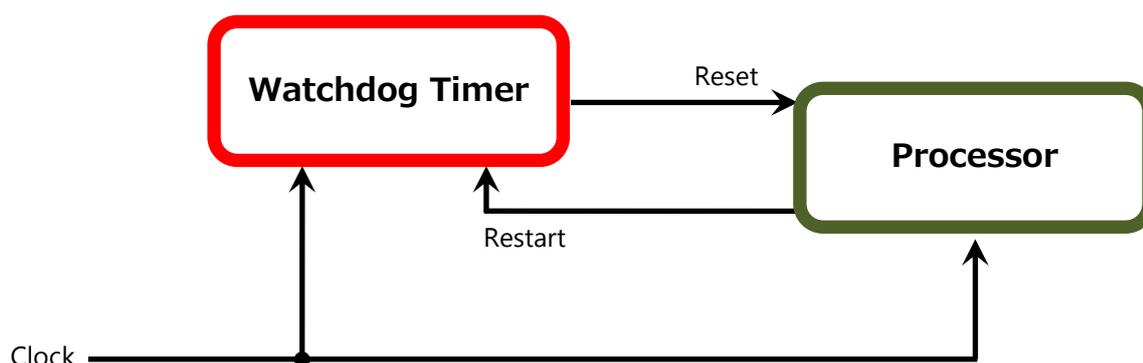
<i>Blinking Amber</i>	<i>Link has been established and there is activity on this port</i>
<i>Solid Amber</i>	<i>Link has been established and there is no activity on this port</i>
<i>Off</i>	<i>No link has been established</i>

► **Speed**

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

APPENDIX B: PROGRAMMING WATCHDOG TIMER

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is resumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.



To execute the utility: enter the number of seconds to start countdown before the system can be reset. Press **start** to start the counter and stop to stop the counter.

```
wd_tst -swt xxx (Set Watchdog Timer 1-255 seconds)
```

```
wd_tst[*] -start (Start Watchdog Timer)
```

```
wd_tst -stop (Stop Watchdog Timer)
```

APPENDIX C: SETTING UP CONSOLE REDIRECTIONS

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing 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 D: 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 to 1275 seconds of timer interval.
 - **Run-Time** watchdog timer, used during run-time, with of 1 to 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 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.
- ▶ For a full introduction on implementation of Lanner Bypass functionalities. download *Lanner Bypass Watchdog module userguide* from <http://www.lannerinc.com/category/1202-network-appliances>.

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	I211-AT
Keyword	
Download Type	Drivers
Operating System	Linux*
Product page	https://downloadcenter.intel.com/product/64404/Intel-Ethernet-Controller-I211-AT

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