

Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

NCA-1510 User Manual

Version: 1.2

Date of Release: 2018-08-28

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



Warning: This mark 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

Compliances

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 Cecompliant 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.

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.
- ▶ 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.

- ▶ Installation of the equipment (especially in a rack) should consider the ventilation of the system's intake (for taking chilled air) and exhaust (for emitting hot air) openings so that the amount of air flow required for safe operation of the equipment is not compromised.
- ▶ To avoid a hazardous load condition, be sure the mechanical loading is even when mounting.
- ▶ 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 should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installation & Operation:

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

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).

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 danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type. Dispose 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	2018/08/01	1 st release
1.1	2018/08/13	Modified Ordering Information
1.2	2018/08/28	Modified Specification

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CHAPTER 1: PRODUCT OVERVIEW

The NCA-1510 series unit is an entry level Desktop network security system utilizing the cutting edge capabilities of the Intel Denverton SoC, supporting up to 6x GbE RJ45 or 4x GbE RJ45 plus 2x GbE SFP. Powered by Intel® Atom® C3000 (codenamed Denverton) CPU, the NCA-1510 features robust performance and Intel's QuickAssist Technology, offering cryptographic acceleration and commercial-grade LAN functions in a 231mm x 200mm x 44mm form factor. It is the ideal fan-less desktop network security appliance for managing edge security at small and medium enterprises.

Package Content

Your package contains the following items:

- ▶ 1x NCA-1510 Network Appliance
- ▶ 1x Power Adapter
- ▶ 1x Power Cable (the provided plug type will vary by region)
- ▶ 1x Mini-USB Console Cable



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-1510A	C3558, 6x GbE RJ45 w/ 1 Pair Bypass, 60W adapter
NCA-1510B	C3558, 4x GbE RJ45 w/ 1 Pair Bypass & 2x GbE SFP w/ LED, 60W adapter
NCA-1510C	C3308, 4x GbE RJ45 w/o 1 Pair Bypass, 36W adapter
NCA-1510D	C3758, 6x GbE RJ45 w/ 1 Pair Bypass, 60W adapter



Note: Intel® Atom® C3000 processor supports only 2400Mhz RAM. (To use memory with lower frequencies, please check with your sales representative)

Optional Accessories

Model Name	Description
Rackmount kit with PSU Bracket	A set of Rackmount kit along with PSU Bracket
Wall-mount kit	A set of Wallmount kit
Wi-Fi/LTE module w/ Antenna	Wi-Fi/LTE module card with Antenna and cable
SATA Cable	Serial ATA Power Data Cable for SATA HDD +SATA Power Cable

System Specifications

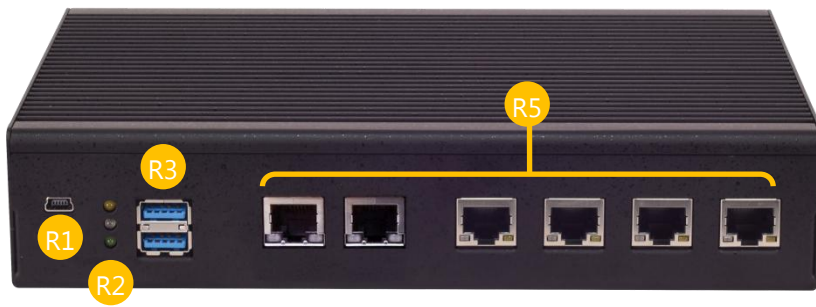
Form Factor		Desktop
Platform	Processor Options	Intel® Atom® C3000 (Denverton)
	CPU Socket	Onboard
	Chipset	SoC
	Security Acceleration	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR4 2400 MHz ECC DIMM
	Max. Capacity	16GB
	Socket	1x 260-pin SODIMM
Networking	Ethernet Ports	4x GbE RJ45 Intel® SoC Integrated MAC 2x GbE RJ45 Intel® i210 (By SKU) or 2x GbE SFP Intel i210 (By SKU)
	Bypass NIC Module Slot	1 pair (By SKU) 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 Mini USB
	USB	2x USB 3.0
	LCD Module	N/A
	Display	N/A
Power input	1x DC Jack	
Storage	HDD/SSD Support	1x 2.5" Bay (Optional)
	Onboard Slots	1x EMMC 8GB
Expansion	PCIe	N/A
	mini-PCIe	1x Mini-PCIe (PCIe), 1 x M.2 2242 B/B+M (USB3.0/SATA)
	SIM card slot	1x Nano-SIM
Miscellaneous	Watchdog	Yes
	Internal RTC with Li Battery	Yes
	TPM	Yes
Cooling	Processor	Passive CPU heatsink
	System	Fanless
Environmental Parameters	Temperature	0 to 50°C Operating (SKU A/B/C SSD only) 0 to 40°C Operating (SKU A/B/C SSD+HDD, SKU D SSD only) -20 to 70°C Non-Operating
	Humidity (RH)	5 to 90% Operating 5 to 95% Non-Operating
System Dimensions	(WxDxH)	275 x 44 x 310 mm
	Weight	3 kg
Package Dimensions	(WxDxH)	231 x 200 x 44 mm
	Weight	1.2 kg
Power	Type/Watts	36W or 60W Power Adapter (By SKU)
	Input	AC: 100-240V~, 50-60 Hz
Approvals and Compliance		RoHS, CE/FCC Class B, UL

Front Panel



No.	Description	
F1	Antenna Port (LTE)	2x SMA port for 3G/4G LTE module
F2	Antenna Port (Wi-Fi)	2x SMA port for Wi-Fi module
F3	Power Button	Push to power on this device
F4	Power Supply	DC Jack
F5	Reset Button	Press to perform a reset

Rear Panel





NCA-1510A
NCA-1510D



NCA-1510B



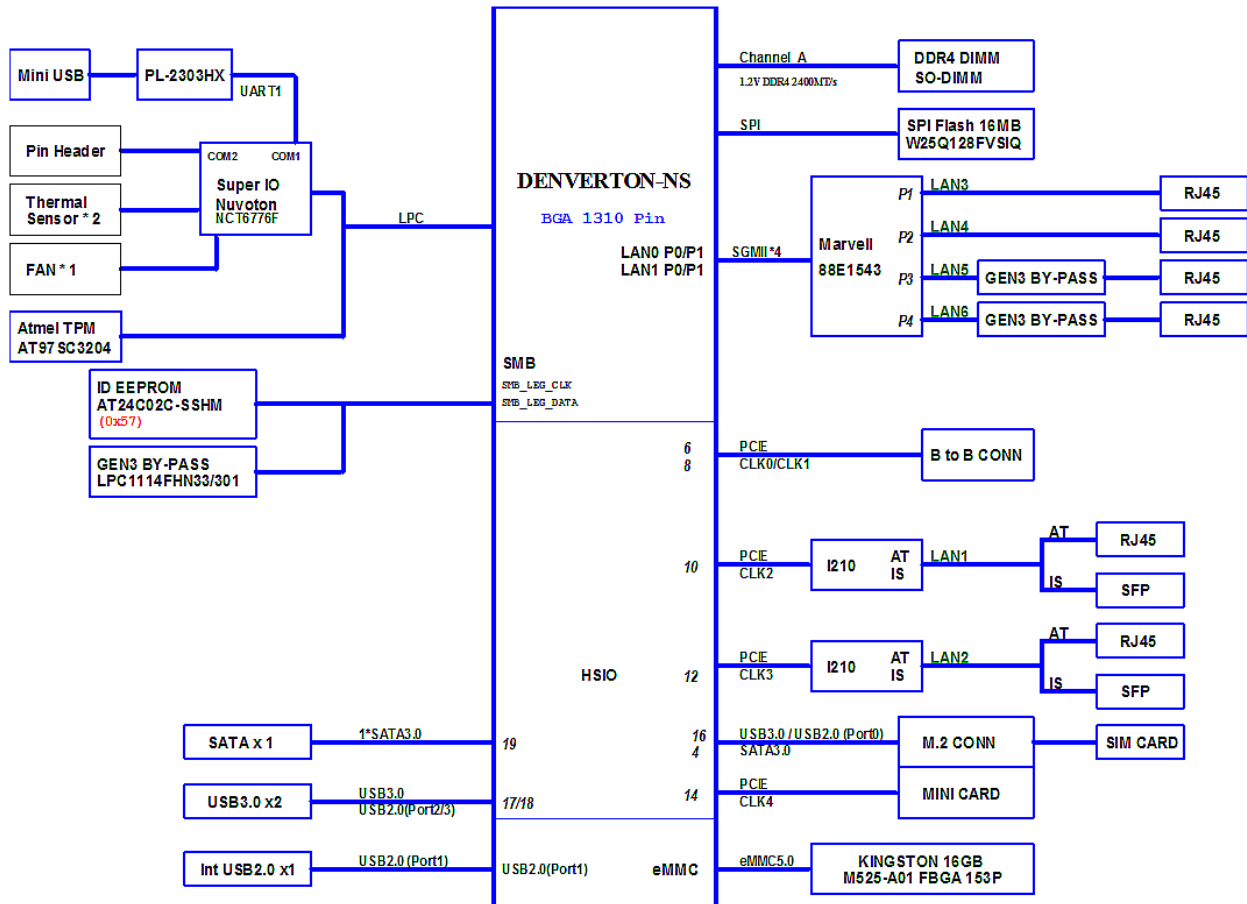
NCA-1510C

No.	Description	
R1	Mini USB Port	1x Console Port
R2	LED Indicators (System)	 <ul style="list-style-type: none"> — HDD Activity — System Status — System Power <p>Please refer to Appendix A: LED Indicator Explanations</p>
R3	USB Port	2x USB 3.0 ports
R4	LED Indicators (Data Connection NCA-1510B only)	 <ul style="list-style-type: none"> — Fiber Connection Status (SFP1) — Fiber Connection Status (SFP2) <p>Please refer to Appendix A: LED Indicator Explanations</p>
R5	GbE Port	GbE RJ45 (NCA-1510A/D: 6Ports; NCA-1510B/C: 4Ports)
R6	SFP Port (NCA-1510B only)	2x SFP ports

CHAPTER 2: MOTHERBOARD INFORMATION

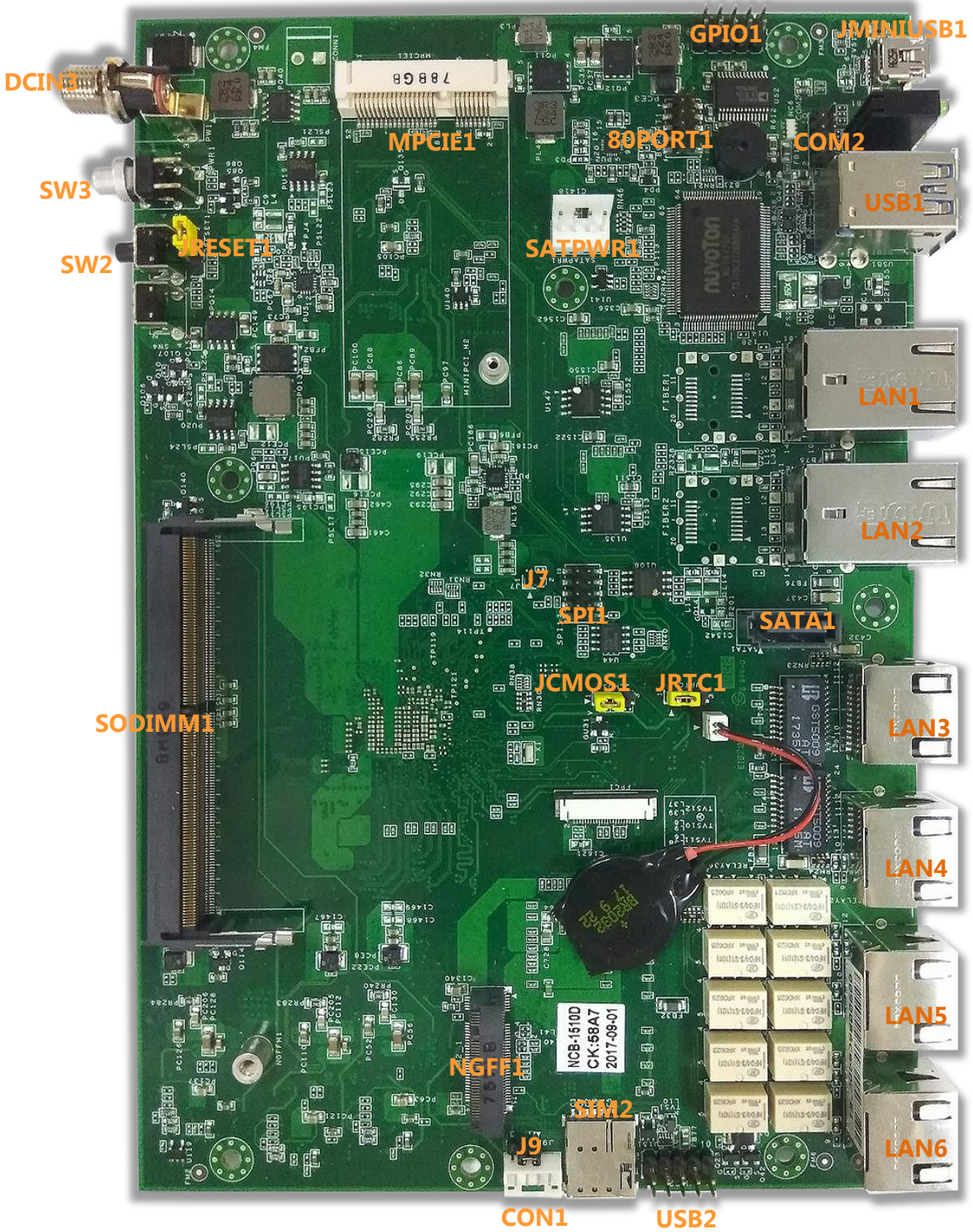
Block Diagram

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



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 & Connectors

USB2: USB2.0



Pin No.	Description	Pin No.	Description
1	P5V_USB2	2	NC
3	USB20_N1_L	4	NC
5	USB20_P1_L	6	NC
7	USBGND1	8	NC
9	USBGND1	10	NC

80PORT1: Debug Conn

Pin No.	Description	Pin No.	Description
1	LPC_CLKOUT0	2	LPC_LAD1
3	80PORT_RST#	4	LPC_LAD0
5	LPC_FRAME_N	6	P3V3_S
7	LPC_LAD3	8	
9	LPC_LAD2	10	GND



JRTC1: Clear RTC

Pin No.	Description
1	NC
2	SOC_SRTCST_N
3	GND

Setting	Mode
1-2 	Normal (Default)
2-3 	Clear CMOS

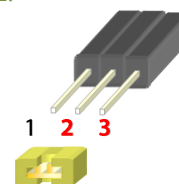
JCMOS1: Clear CMOS

Pin No.	Description
1	NC
2	SOC_RTEST_N
3	GND

Setting	Mode
1-2 	Normal (Default)
2-3 	Clear CMOS



Note: For Clear CMOS function to work, please make sure you have configured both the jumper settings of **JCMOS1** and **JRTC1**.



GPIO1: EXT GPIO header:

Pin No.	Description	Pin No.	Description
1	GPO_B_1	2	GPI_B_1
3	GPO_B_2	4	GPI_B_2
5	GPO_B_3	6	GPI_B_3
7	GPO_B_4	8	GPI_B_4
9	GND	10	GND

SPI1: Flash BIOS:

Pin No.	Description	Pin No.	Description
1	SPI_HD1#	2	NC
3	SOC_SPI_CS0_R	4	P3V3_SB_SPI
5	SOC_SPI_MISO_R	6	SOC_SPI_IO3_R
7		8	SOC_SPI_CLK_R
9	GND	10	SOC_SPI_MOSI_R

JRESET1: Reset:

Pin No.	Description
1-2	HW Reset
2-3	SW Reset

COM2: COM Port:

Pin No.	Description	Pin No.	Description
1	NDCD2-	2	NDSR2-
3	NRXD2	4	NRTS2-
5	NTXD2	6	NCTS2-
7	NDTR2-	8	NRI2-
9	GND	10	

J9:

Pin No.	Description
1	P3V3_AUX
2	PIO0_1
3	GND

CON1:

Pin No.	Description
1	P3V3_AUX
2	PIO1_6_RXD
3	GND
4	PIO1_7_TXD

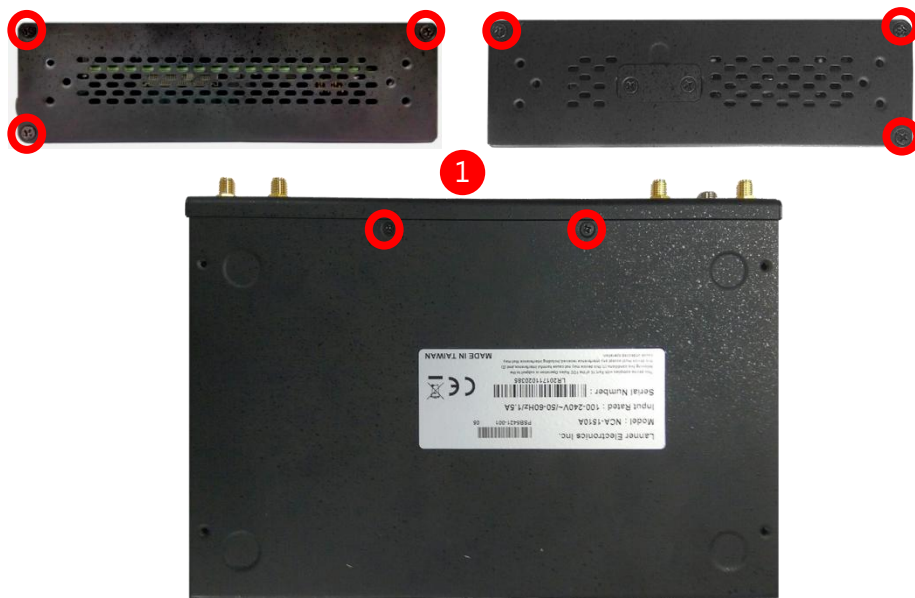
CHAPTER 3: HARDWARE SETUP

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

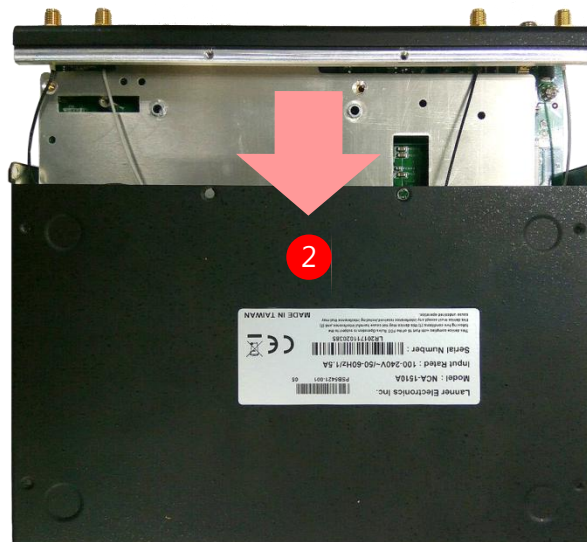
In light of the motherboard layout arrangement, the installation of the M.2 card, DDR4 memory, and Wireless module should be prior to that of the 2.5" hard disk.

Opening the Chassis

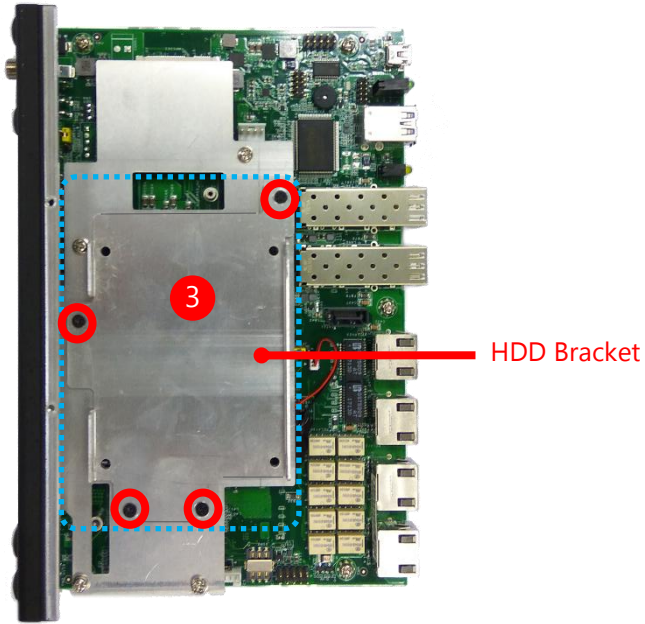
1. Loosen **eight** screws (indicated in the photos) that fix this unit's side panels and the bottom panel.



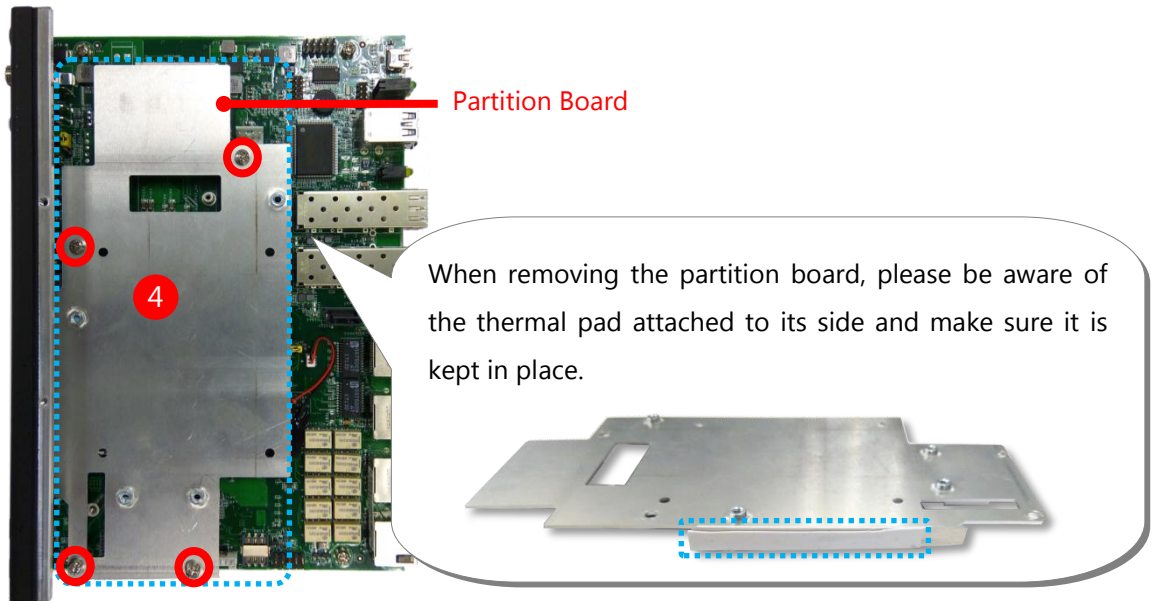
2. Pull the bottom panel open horizontally, and then remove it.

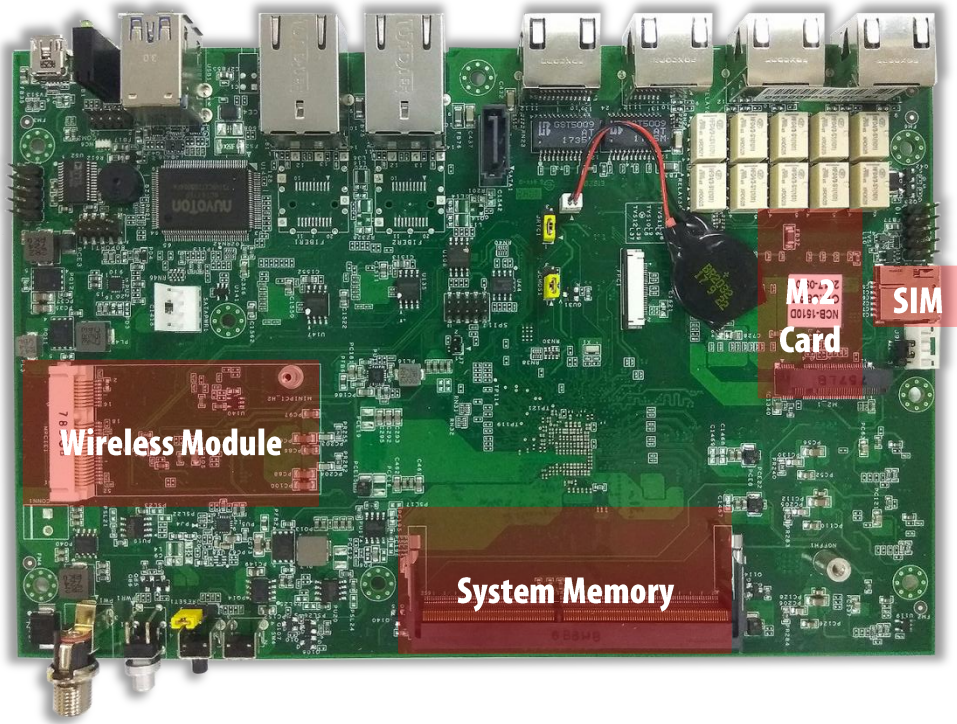


3. Remove the HDD bracket by loosening **four** screws that fix it to the partition board.



4. Remove the partition board by loosening **four** screws that fix it to the motherboard. After the partition board is removed, the motherboard will be revealed.

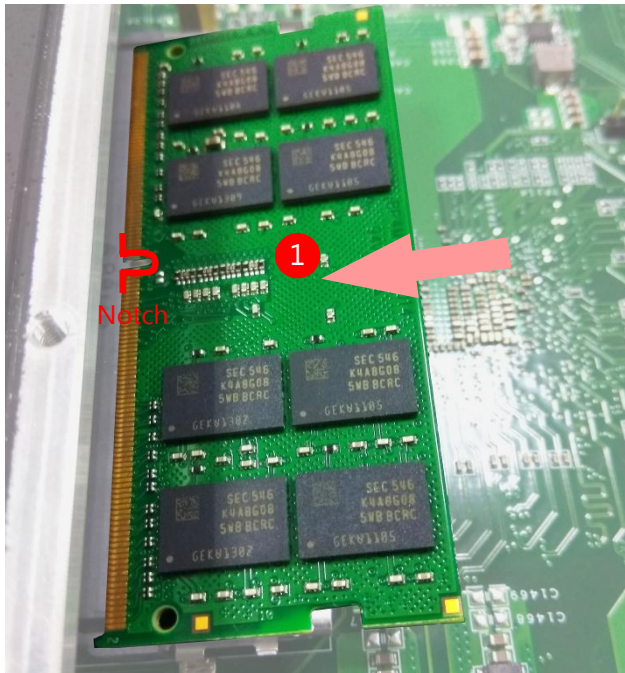




Installing System Memory

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

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

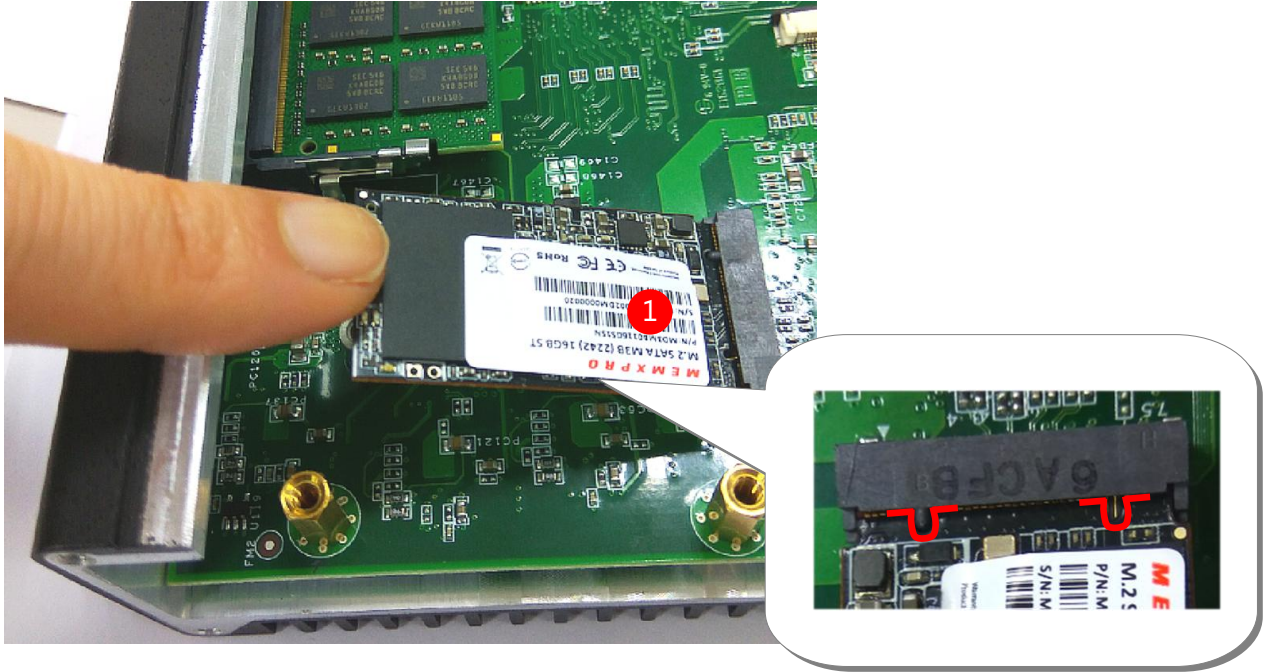


2. Press vertically on the other end of the card until it clicks into place.

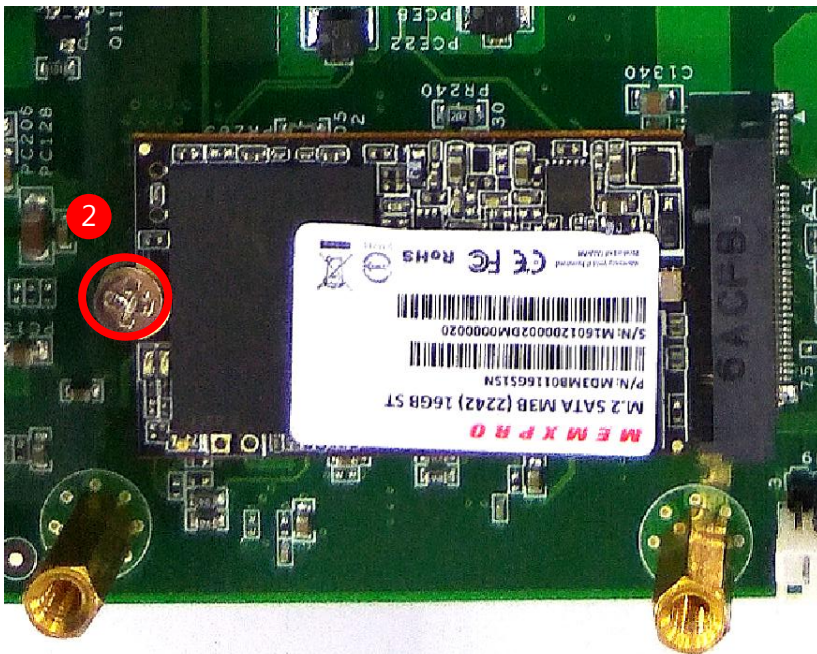


Installing M.2 Card

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

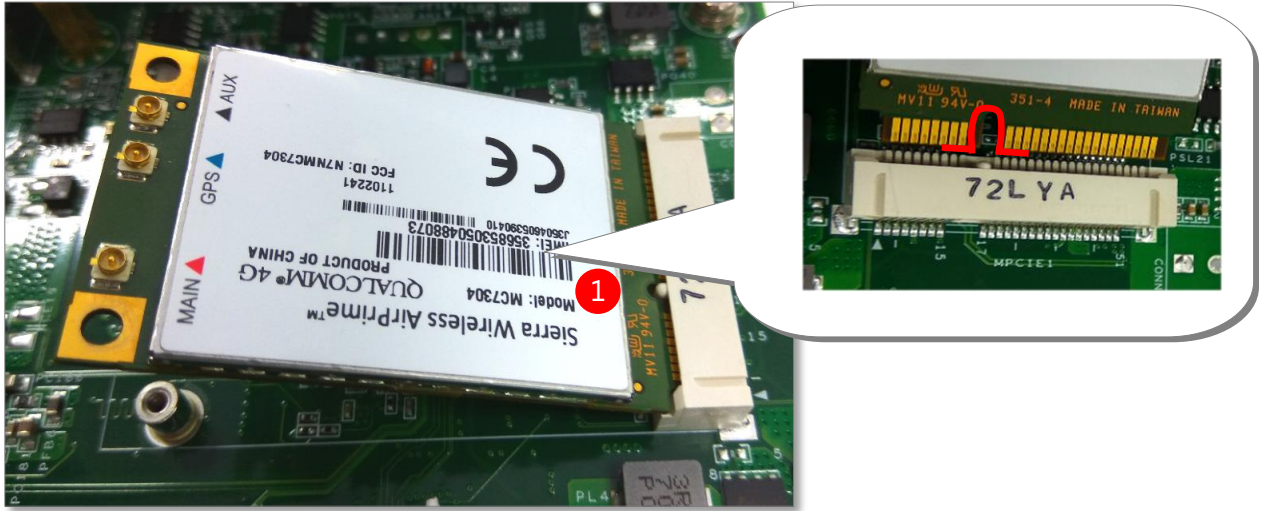


2. Fix the card with the dedicated screw provided in the accessory pack.



Installing Wireless Module

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

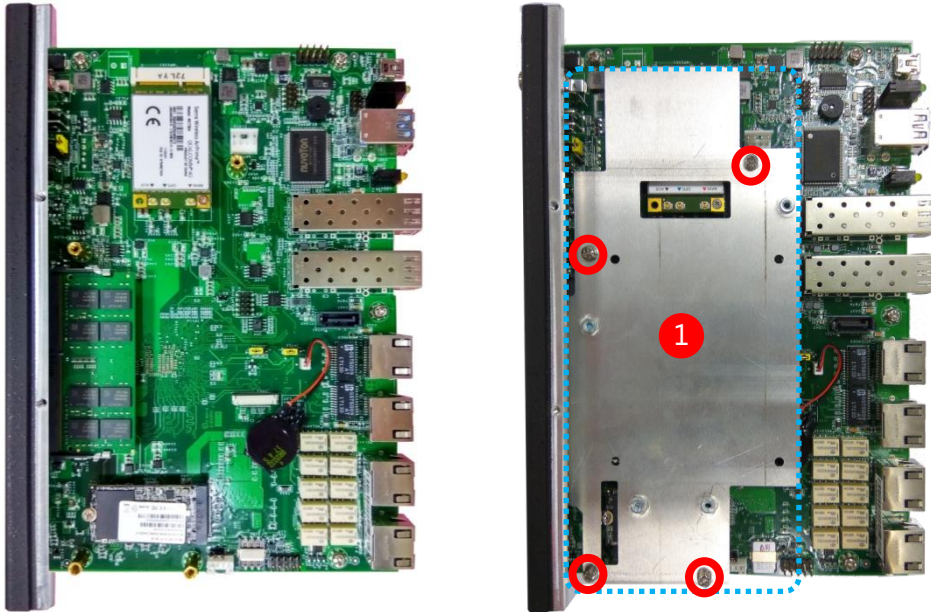


2. Fix the module with the screw provided in the accessory pack.

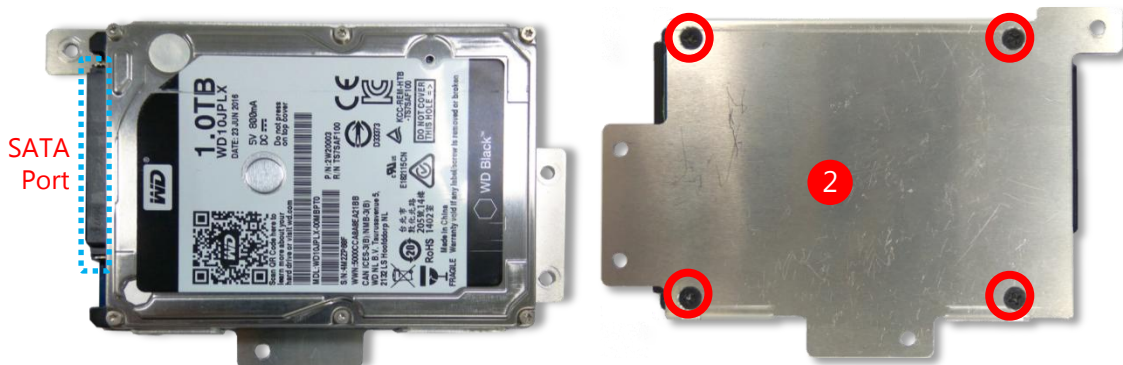


Installing 2.5" Hard Disk

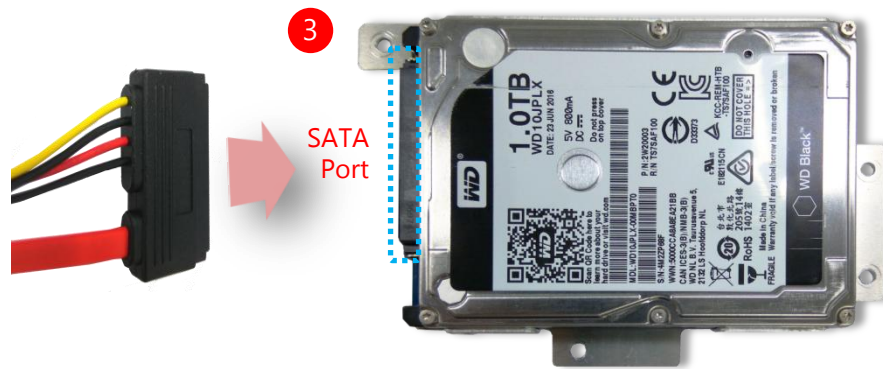
1. Replace and fix the partition board using **four** screws.



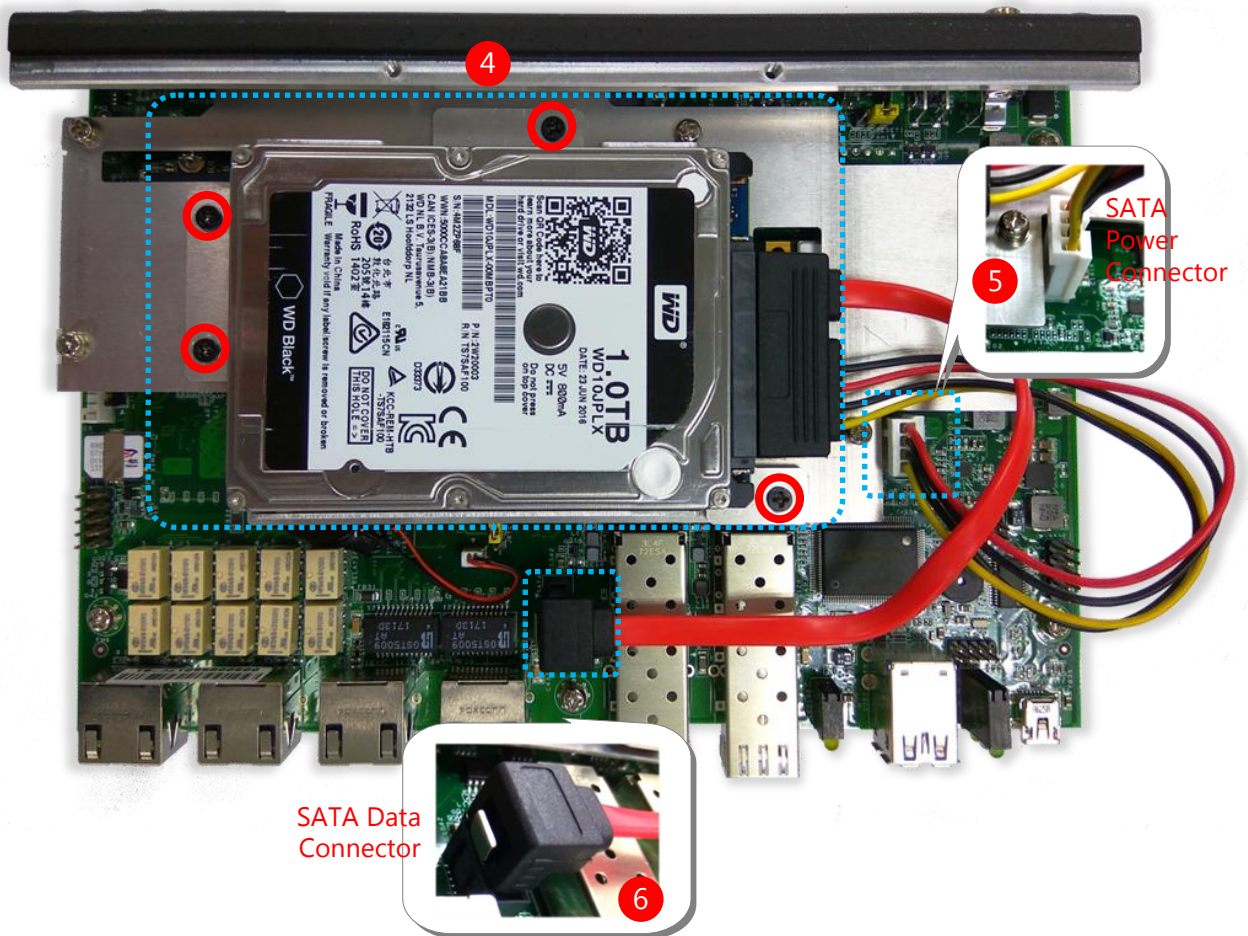
2. Mount the disk onto the empty bracket with the provided disk screws. Please mind the direction of the SATA port, which should be handled as shown in the photo.



3. Connect the SATA cable to the hard disk.



4. Secure the HDD bracket along with the mounted disk onto the partition board with **four** screws.
5. Plug the power connector of the SATA cable into the corresponding port on the motherboard.
6. Plug the data connector of the SATA cable into the corresponding port on the motherboard.



Mounting the System

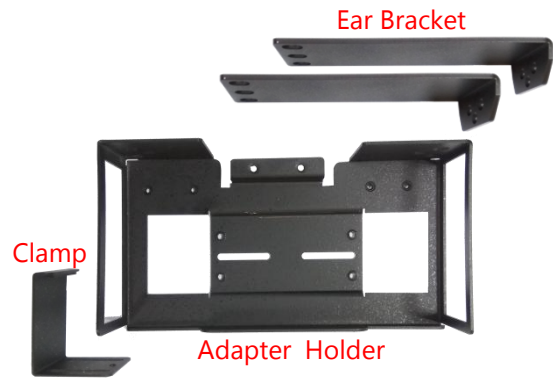
Rackmounting

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 this kit.

What's in the Rackmount Kit

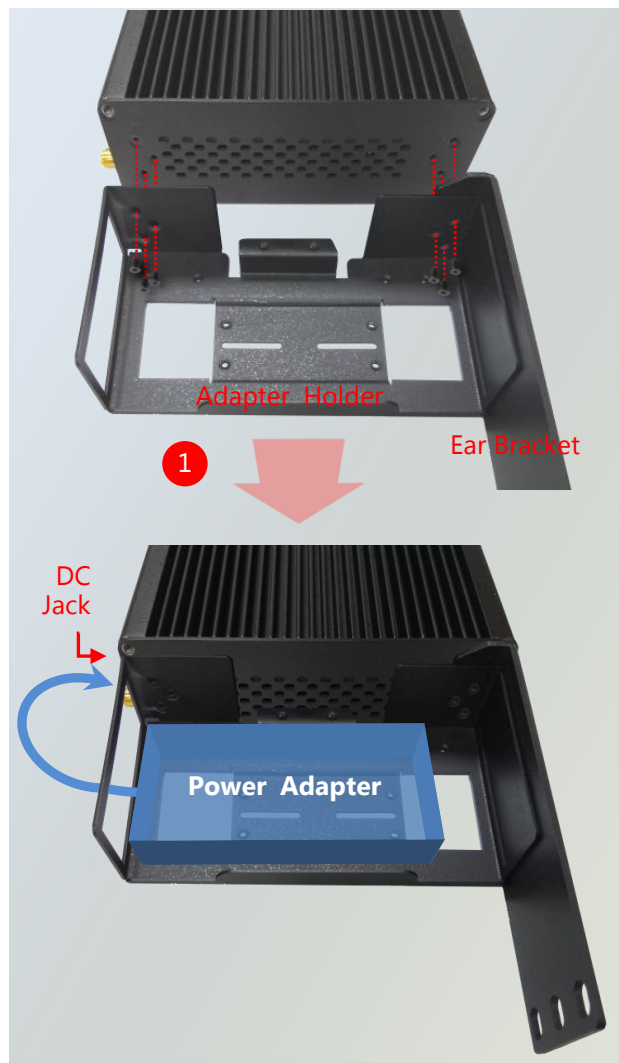
Check the kit contents for the following items:

- ▶ 1x pair of Ear Brackets
- ▶ 1x Adapter Holder
- ▶ 1x Clamp
- ▶ 1x Accessory Pack including 6 screws for the fixture of the ear brackets and 2 screws for the fixture of the clamp.



1. On the right side of the system, align the ear bracket and the adapter holder with the screw holes on the side panel and then assemble them using six screws.

Make sure the adapter holder is assembled close to the DC Jack on the rear panel in order for the power adapter's connection.

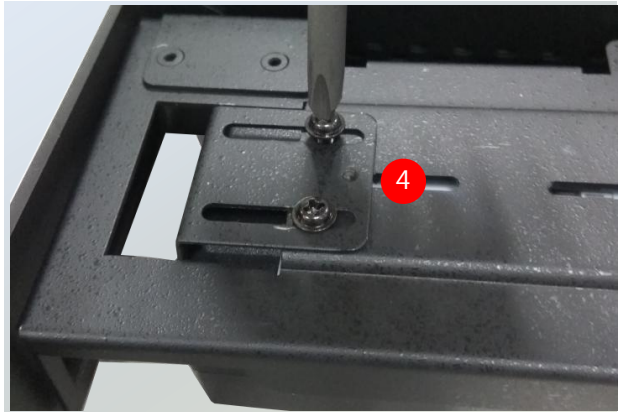


2. Get the power adapter's cable through the back of the holder.



3. Use the clamp to fix the other side of the power adapter.

4. Secure the adapter with the clamp using two screws.



5. Attach the other ear bracket to the left side of the system.



6. In the rack, install a shelf to support the system.

7. Hold the system with its front facing you, lift and carefully insert the system into the rack.

8. Attach the brackets to the rail rack using screws and appropriate round-hole/square-hole retainer nuts.



Wall mounting

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

What's in the Wallmount Kit

Check the kit contents for the following items:

- ▶ 1x pair of Wall Brackets



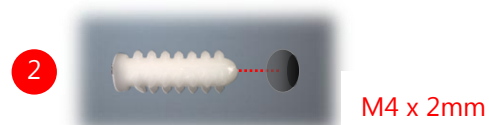
- ▶ 1x Screw Pack including four screws to lock the brackets on the system.



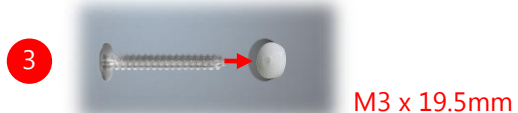
1. Flip over the system; fix both wall brackets onto the bottom with four screws as shown in the picture.



2. On the wall, measure the exact place where you want to hang the system, and drill four holes.



3. Insert the wall plugs into the holes, and then insert the long screws into the wall screws.

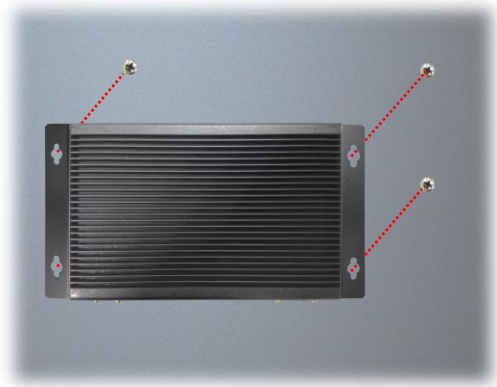


(The demonstrated screw type can fit in general drywall or shelves. Please identify the wall type yourself and determine the suitable fixing.)

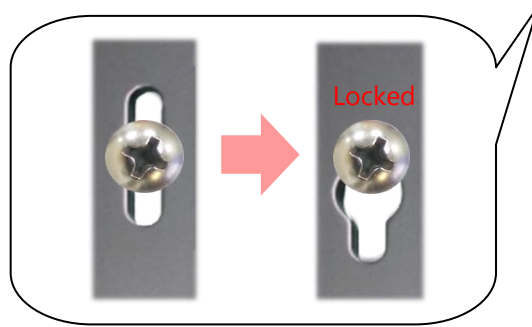


Note: Due to the variety of wall types, the screw and the wall plug mentioned in Step 3-4 are not included in the kit. Please select the suitable fixing you need to fix this system to the wall, and consult a qualified tradesperson if you are unsure.

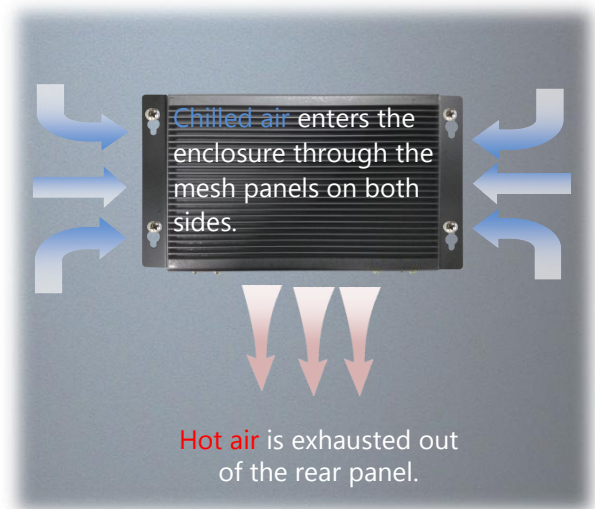
4. Align the four screw holes on the system's wall brackets with the four long screws you just installed on the wall.



After the four screws are engaged in the bracket holes, push the system downwards to lock the screws into position.



Make sure you make enough room for airflow ventilation of the system's intake (side panels) and exhaust (rear panel) openings by removing as many obstructions as possible or through proper cable management.



CHAPTER 4: BIOS SETUP

Enter BIOS Setup

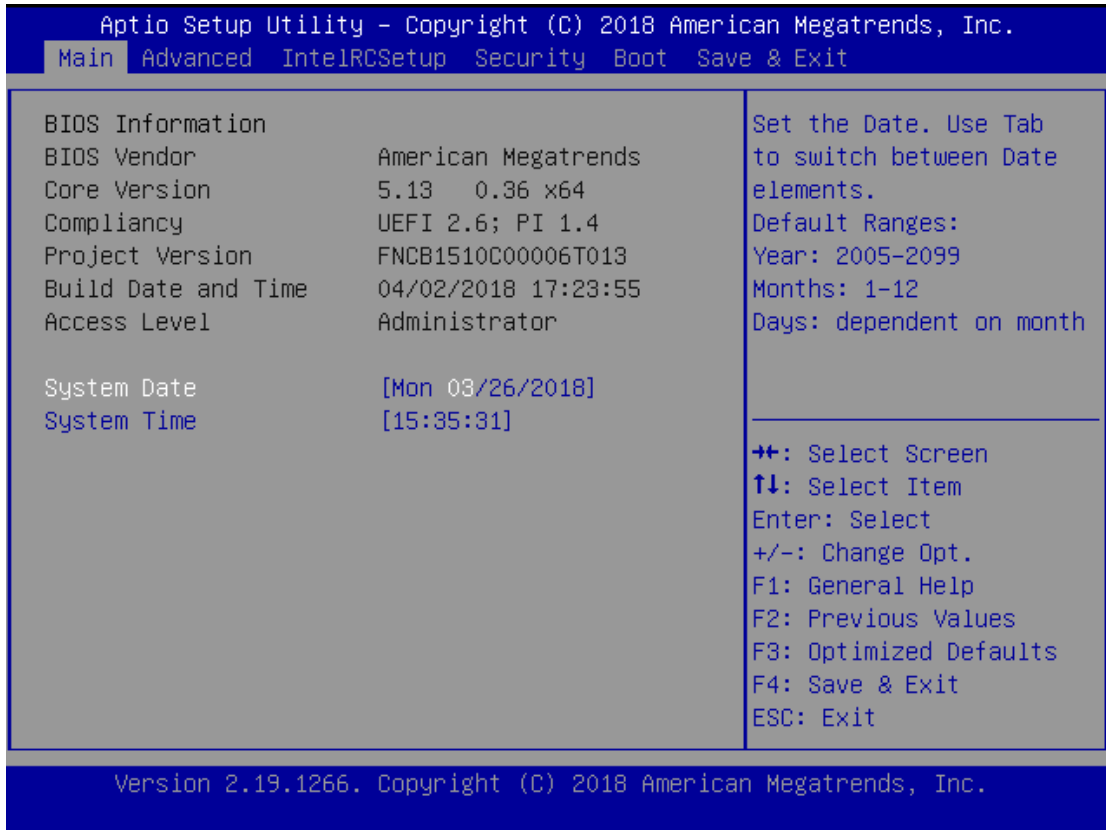
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. The system has AMI BIOS built-in, with a SETUP utility that allows users to configure required settings or to activate certain system features. Pressing the **<Tab>** or **** key immediately allows you to enter the Setup utility.

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced],[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>	to exit the current screen

Main Page

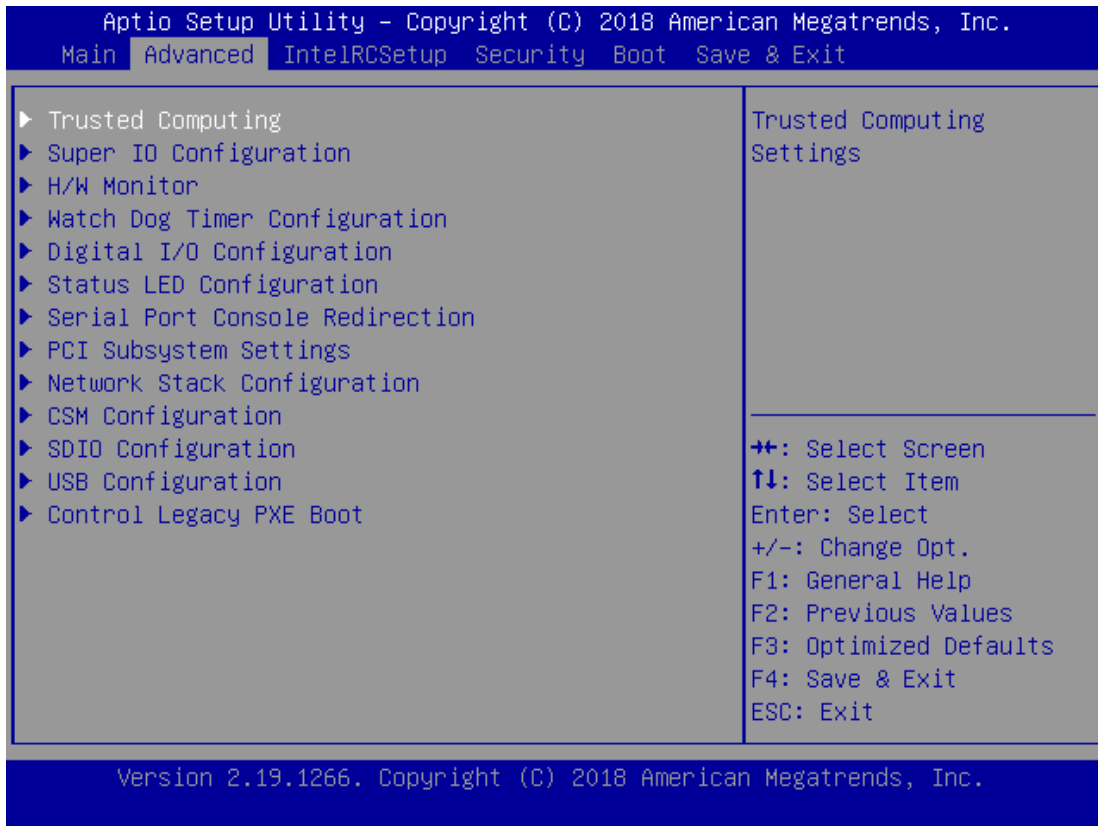
Setup main page contains BIOS information and project version information.



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



Trusted Computing

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Advanced

TPM20 Device Found Vendor: NTC Firmware Version: 1.3		▲ Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Security Device Support [Enable]		
Active PCR banks SHA-1,SHA256 Available PCR banks SHA-1,SHA256		⇐+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
SHA-1 PCR Bank [Enabled] SHA256 PCR Bank [Enabled]		
Pending operation [None] Platform Hierarchy [Enabled] Storage Hierarchy [Enabled] Endorsement Hierarchy [Enabled]		

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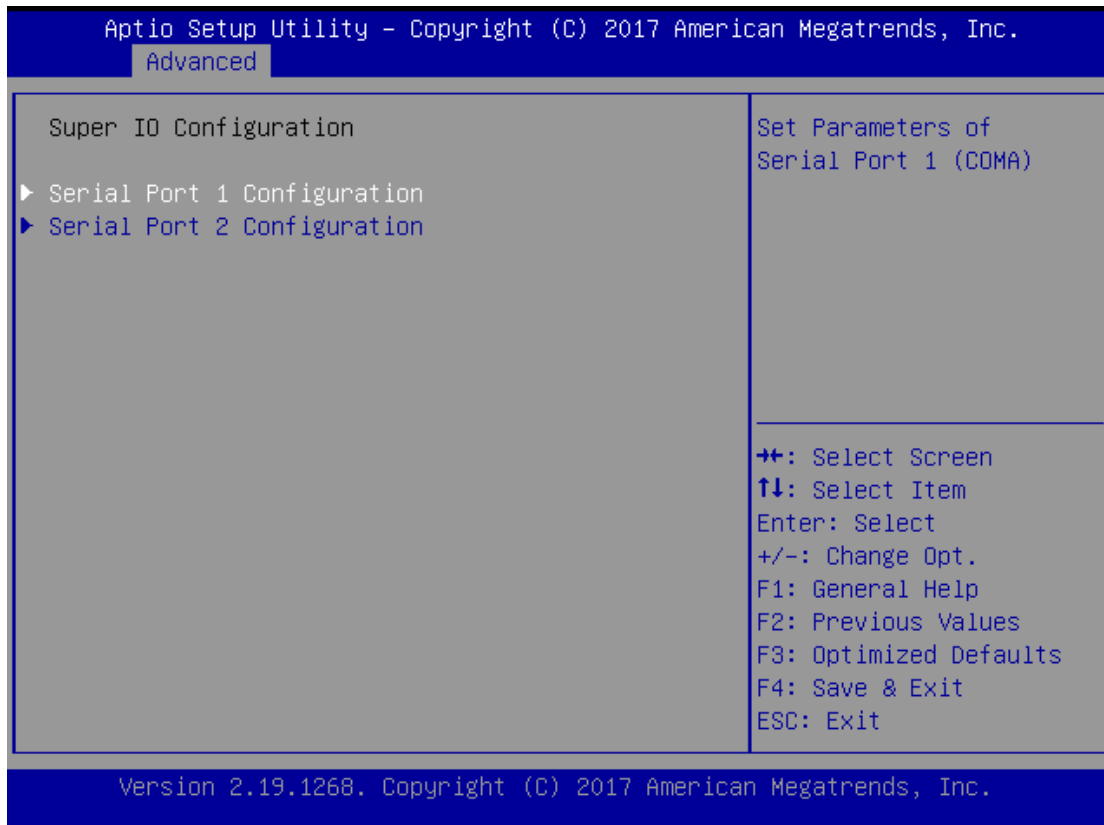
Advanced

Active PCR banks SHA-1,SHA256 Available PCR banks SHA-1,SHA256		▲ TPM 1.2 will restrict support to TPM 1.2 devices, 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,
SHA-1 PCR Bank [Enabled] SHA256 PCR Bank [Enabled]		
Pending operation [None] Platform Hierarchy [Enabled] Storage Hierarchy [Enabled] Endorsement Hierarchy [Enabled]		⇐+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
TPM2.0 UEFI Spec [TCG_2] Version [1.3] Physical Presence Spec Version [TIS] TPM 20 InterfaceType [Auto]		

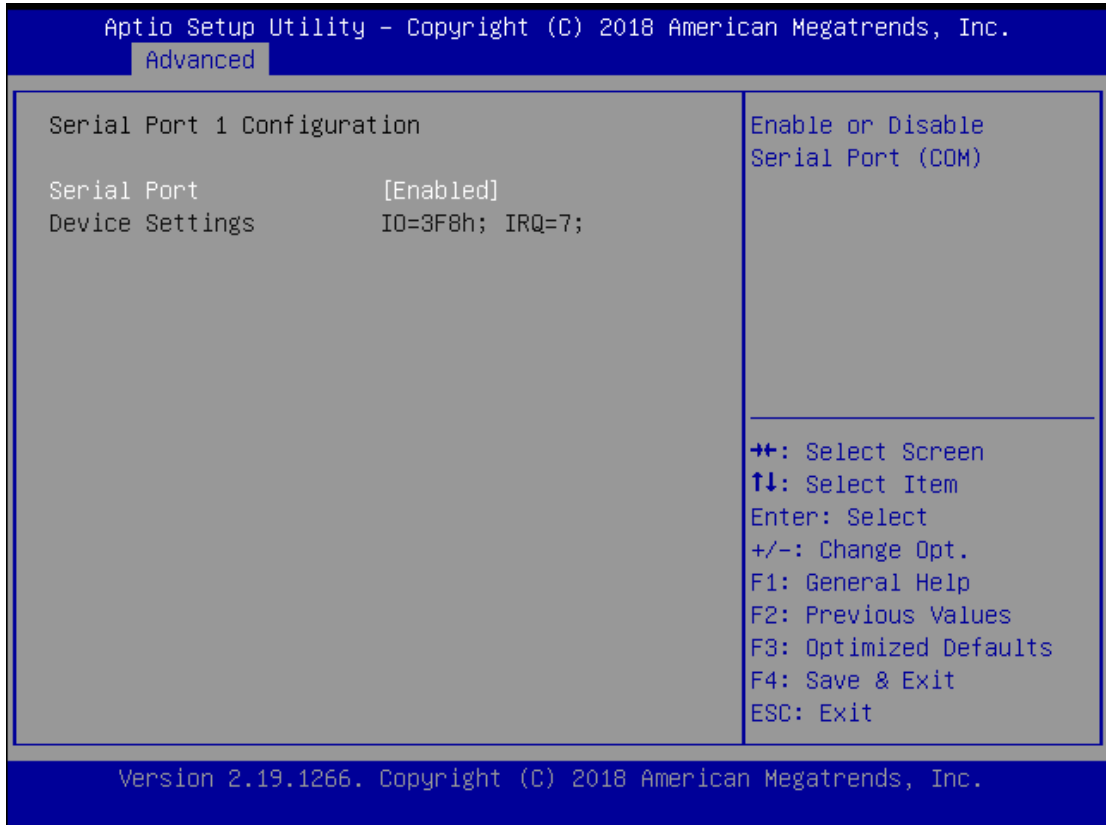
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Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for the security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA-1 PCR Bank	Enabled Disabled	Enables or disables SHA-1 PCR Bank.
SHA256 PCR Bank	Enabled Disabled	Enables or disables SHA256 PCR Bank.
Pending operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during a restart in order to change State of Security Device.
Platform Hierarchy	Enabled Disabled	Enables or disables Platform Hierarchy.
Storage Hierarchy	Enabled Disabled	Enables or disables Storage Hierarchy.
Endorsement Hierarchy	Enabled Disabled	Enables or disables Endorsement Hierarchy.
TPM2.0 UEFI Spec Version	TCG_1_2 TCG_2	Select the TCG2 Spec Version, TCG_1_2: Supports the Compatible mode for Win8/Win10 TCG_2: Supports new TCG2 protocol and event format for Win10 or later.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE: Some HCK tests might not support 1.3.
TPM 20 InterfaceType	TIS	Select TPM 20 Device for the Communication Interface.
Device Select	TPM 1.2 TPM 2.0 Auto	TPM 1.2 will restrict support to TPM 1.2 devices; while TPM 2.0 will restrict support to TPM 2.0 devices; Auto will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

Super IO Configuration

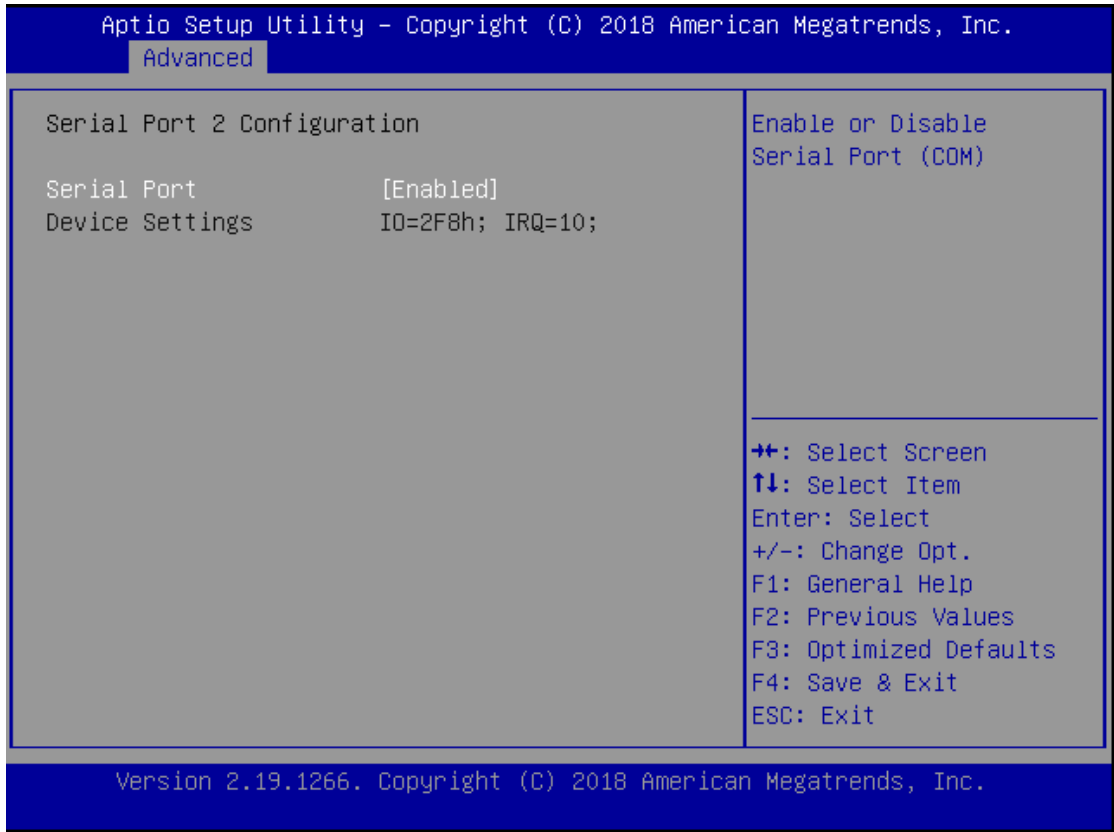


Serial port 1 Configuration



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

Serial port 2 Configuration



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

H/W Monitor

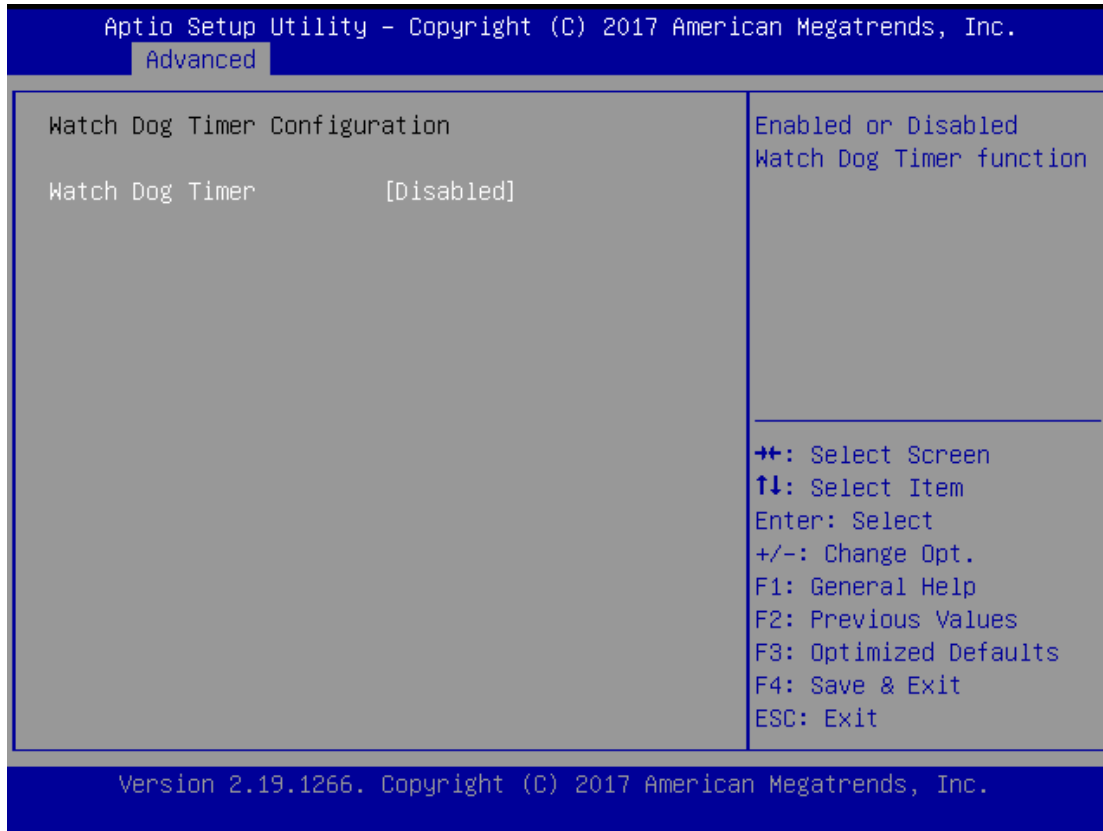
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Advanced

Pc Health Status	
System temperature2	: +26 %
System temperature1	: +27 %
VCORE	: +1.048 V
12V	: +12.384 V
VIN1	: +5.040 V
VIN2	: +1.208 V
VIN3	: +5.560 V
VCC3V	: +3.328 V
VBAT	: +3.104 V

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

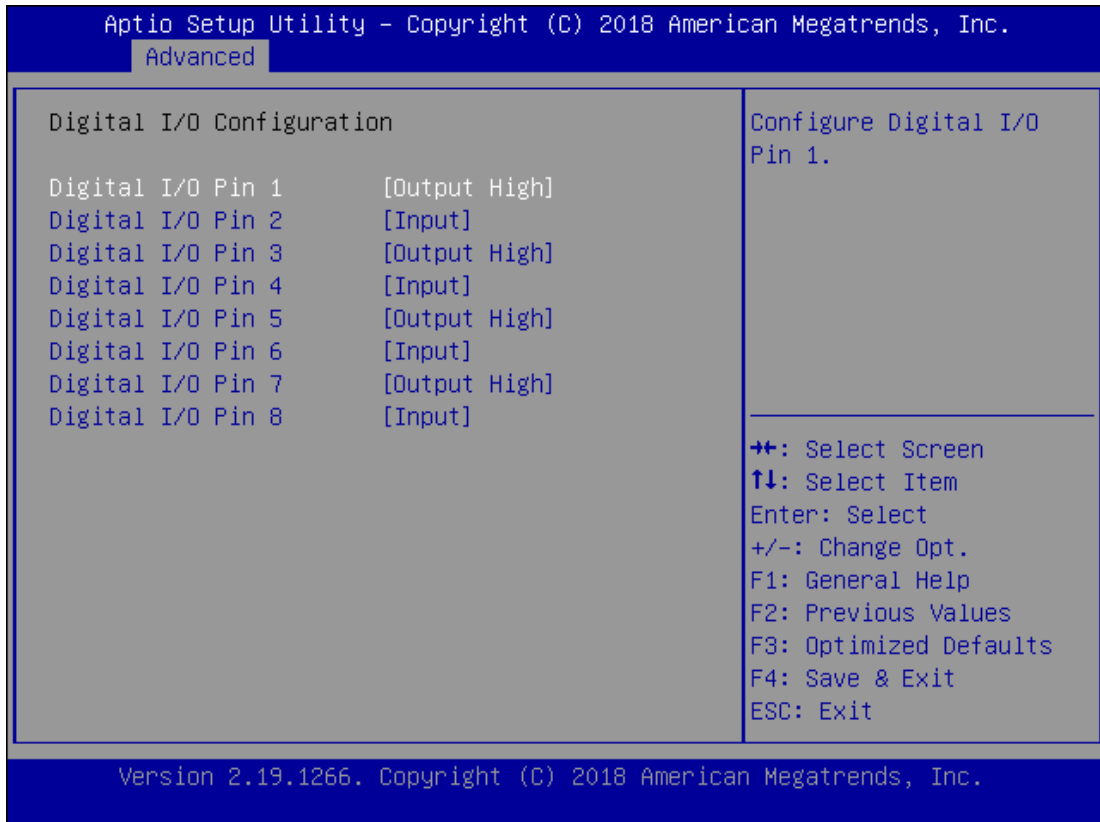
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Watch Dog Timer Configuration



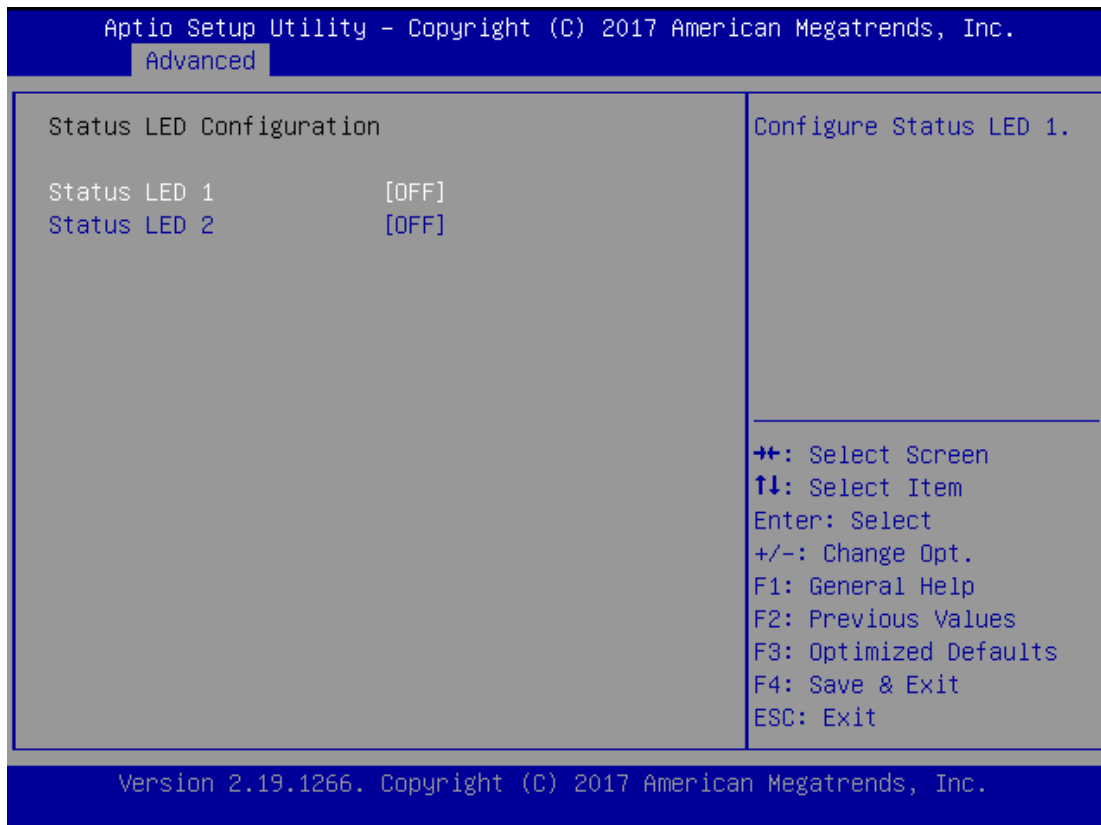
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enables or disables Watch Dog Timer function

Digital I/O Configuration



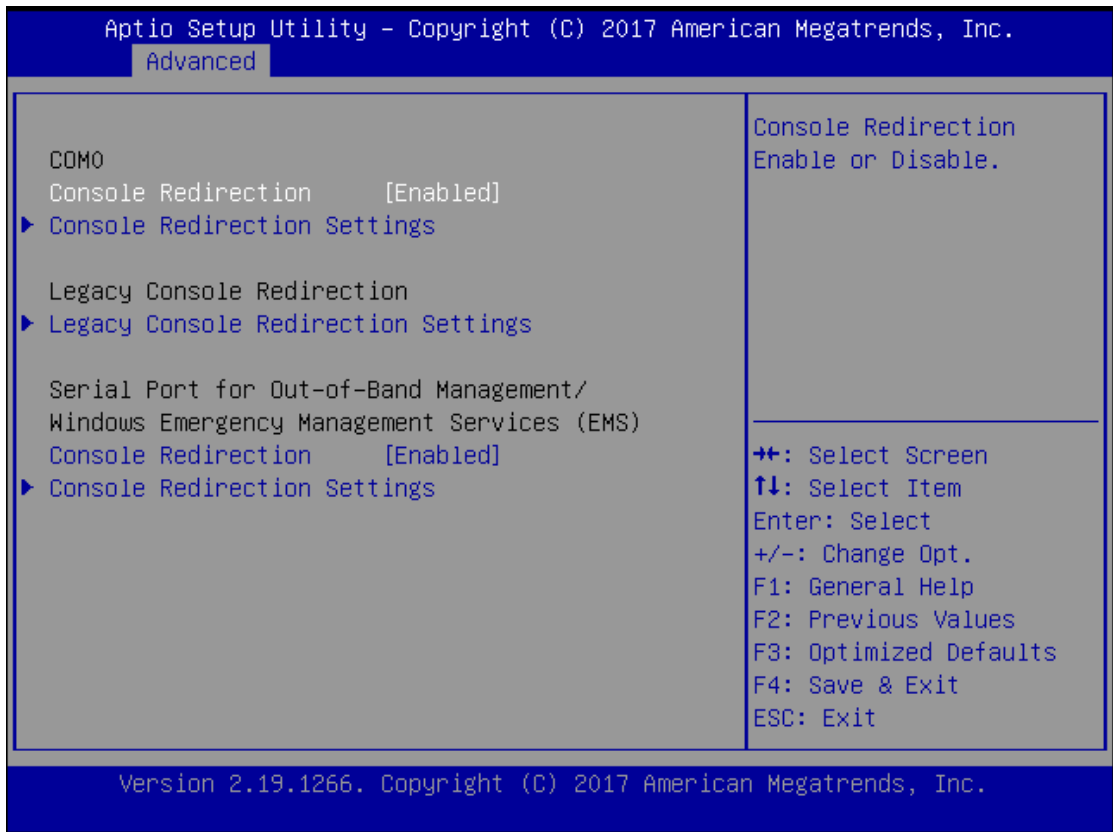
Feature	Options	Description
Digital I/O Output 1	Output Low Output High	Configure Digital I/O Pin1
Digital I/O Output 3	Output Low Output High	Configure Digital I/O Pin3
Digital I/O Output 5	Output Low Output High	Configure Digital I/O Pin5
Digital I/O Output 7	Output Low Output High	Configure Digital I/O Pin7

Status LED Configuration



Feature	Options	Description
Status LED 1	OFF ON	Configure Status LED 1.
Status LED 2	OFF ON	Configure Status LED 2.

Serial Port Console Redirection



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

Console Redirection Settings

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Advanced

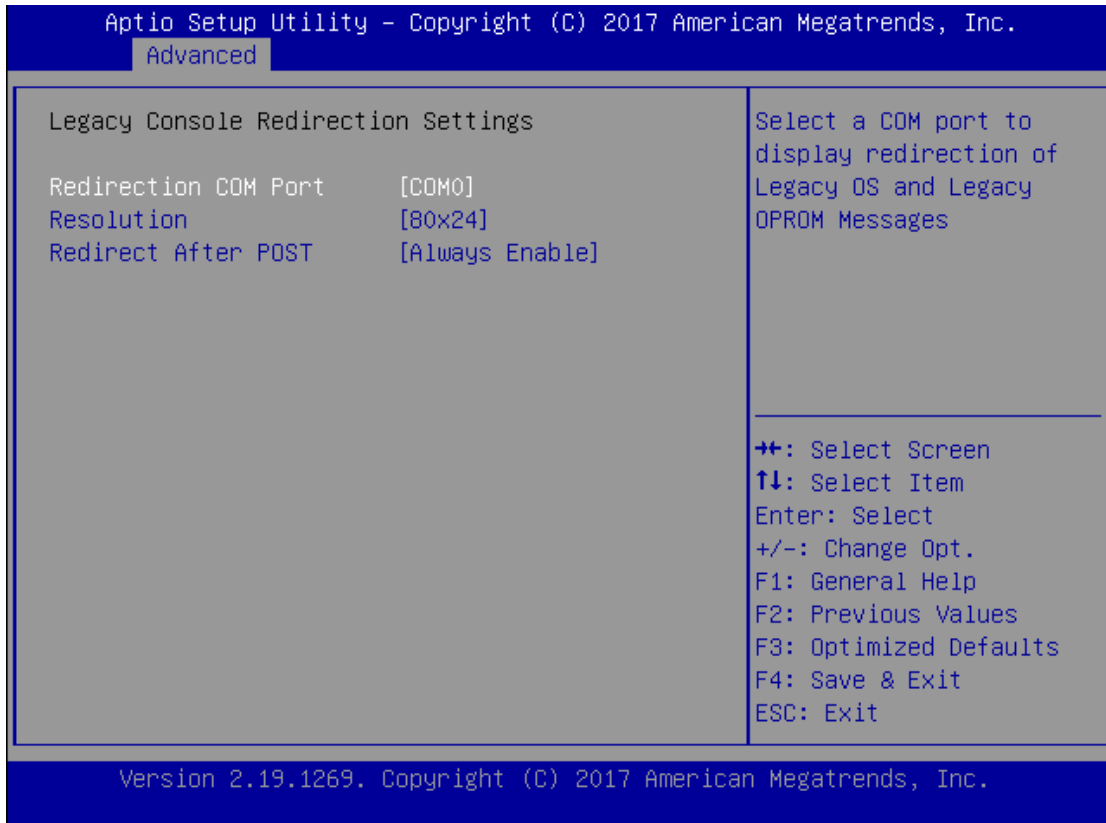
Console Redirection Settings		Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode
Terminal Type	[VT100+]	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help 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 Support	[Enabled]	
Recorder Mode	[Disabled]	
Putty KeyPad	[VT100]	

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

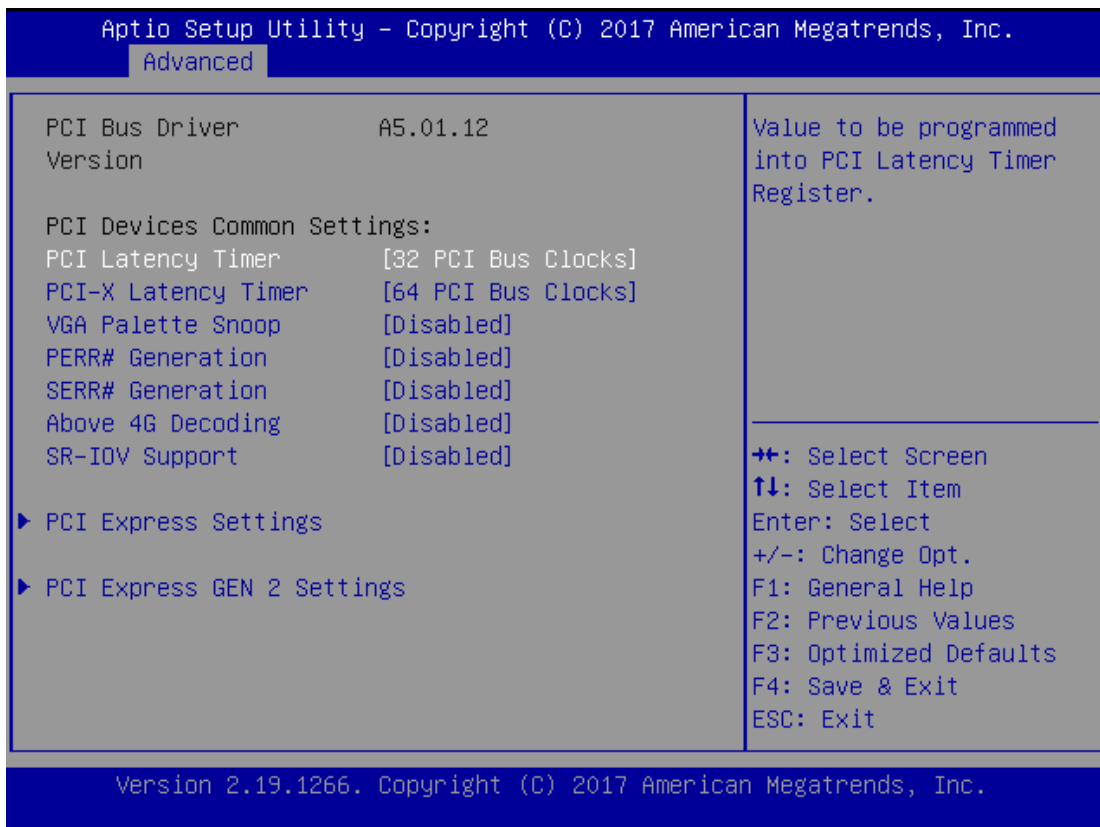
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal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

Legacy Console Redirection Settings



Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPRM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When Bootloader is selected, 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 .

PCI Subsystem Setting



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

PCI Express Settings

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Advanced	
PCI Express Device Register Settings Relaxed Ordering [Enabled] Extended Tag [Disabled] No Snoop [Enabled] Maximum Payload [Auto] Maximum Read Request [Auto]	Enables or Disables PCI Express Device Relaxed Ordering.
PCI Express Link Register Settings ASPM Support [Disabled] WARNING: Enabling ASPM may cause some PCI-E devices to fail Extended Synch [Disabled]	
Link Training Retry [5] Link Training 1000 Timeout (uS) Unpopulated Links [Keep Link ON]	++: 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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PCI Express GEN 2 Settings

```

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  Advanced
-----
Completion Timeout      [Default]
ARI Forwarding          [Disabled]
AtomicOp Requester     [Disabled]
Enable
AtomicOp Egress        [Disabled]
Blocking
IDO Request Enable     [Disabled]
IDO Completion Enable  [Disabled]
LTR Mechanism Enable   [Disabled]
End-End TLP Prefix    [Disabled]
Blocking

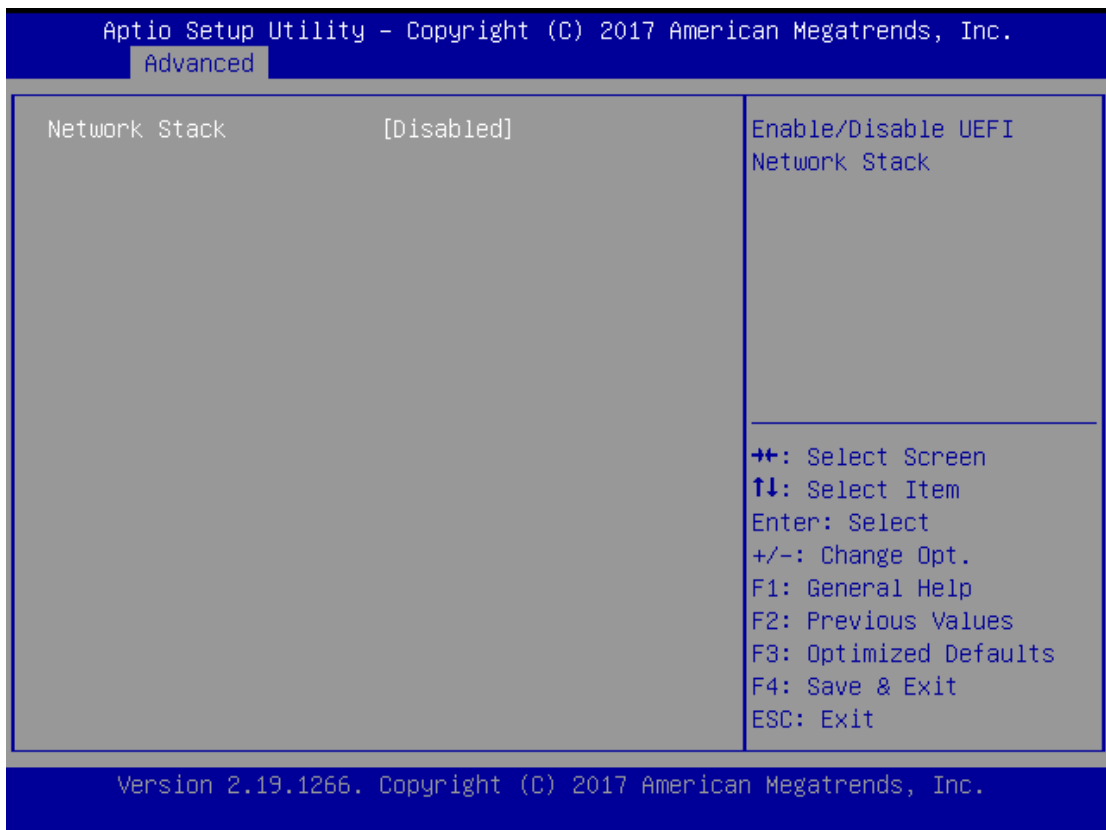
PCI Express GEN2 Link Register Settings
Target Link Speed      [Auto]
Clock Power            [Disabled]
Management
Compliance SOS        [Disabled]

In device Functions
that support Completion
Timeout
programmability, allows
system software to
modify the Completion
Timeout value.
'Default' 50us to 50ms.

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

Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
    
```

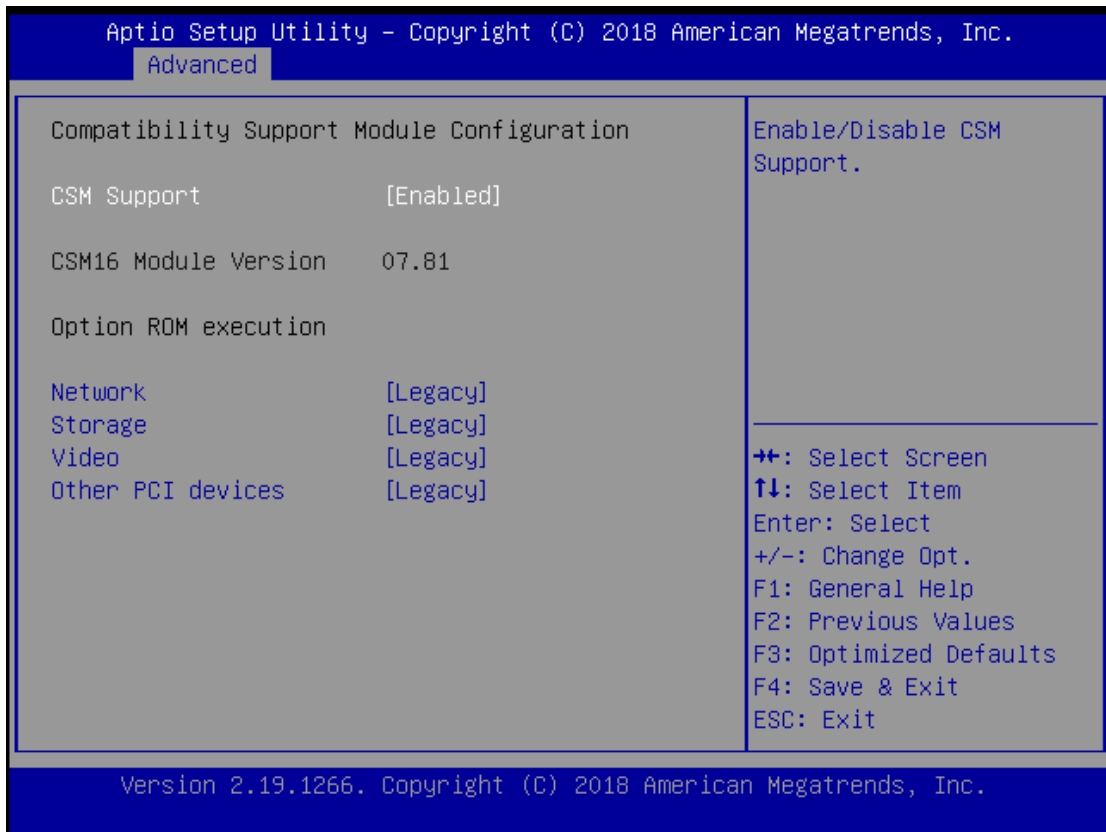
Network Stack Configuration



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

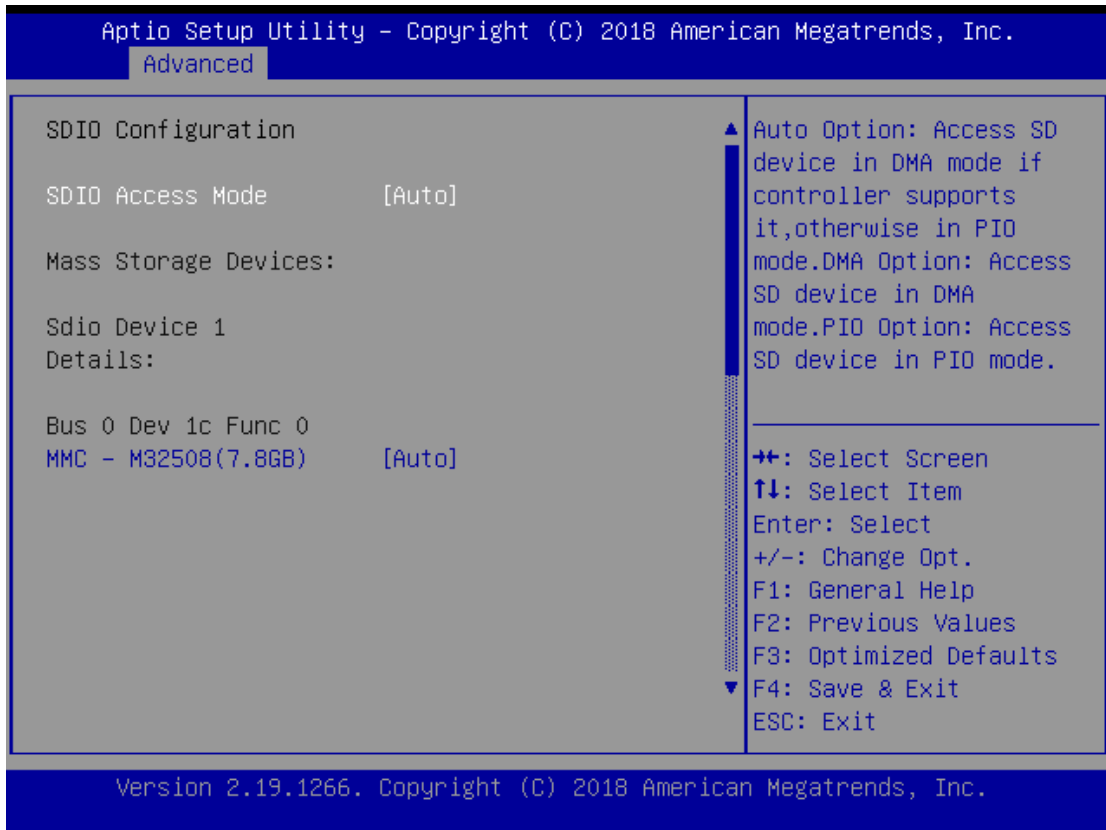
Media detect count	1	Number of times the presence of media will be checked
Feature	Options	Description
Network Stack	Disabled Enabled	Enable/Disable UEFI Network Stack.

CSM Configuration



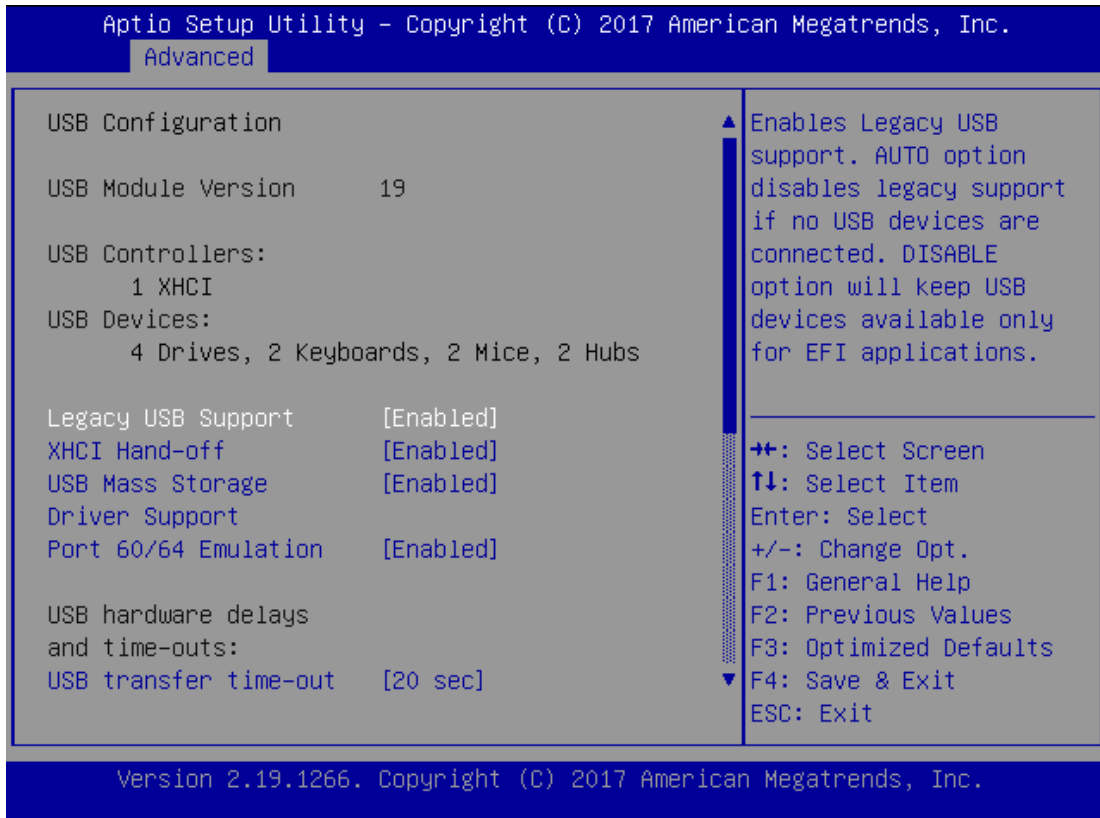
Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls 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

SDIO Configuration



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

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 20 sec	USB mass storage device Start Unit command time-out

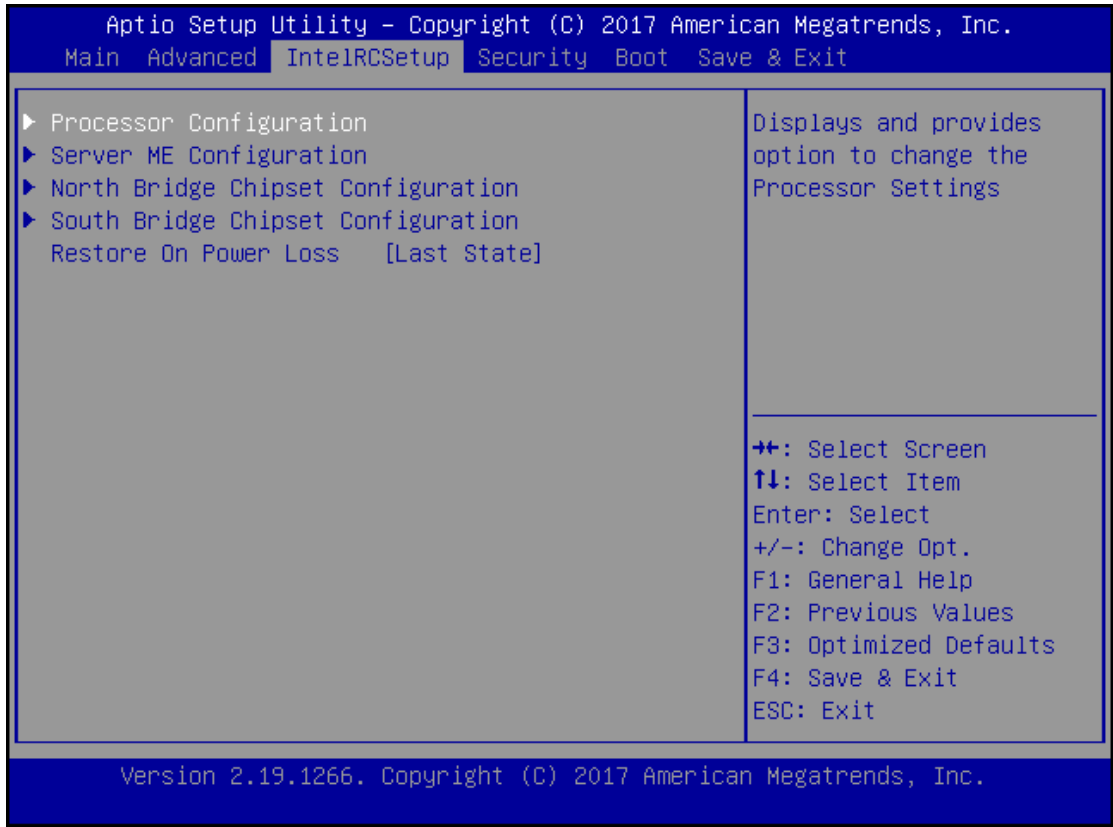
<p>Device power-up delay</p>	<p>Auto Manual</p>	<p>Maximum time the device will take before it properly reports itself to the Host Controller. Auto uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.</p>
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Control Legacy PXE Boot



Feature	Options	Description
Control Legacy PXE Boot From	Disabled Enabled	Control Legacy PXE Boot from which Lan.

IntelRCSetup



Feature	Options	Description
Restore On 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).

Processor Configuration

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IntelRCSetup

Processor Configuration		▲ Enable/Disable EIST. GV3 and TM1 must be enabled for TM2 to be available. GV3 must be enabled for Turbo. Auto - Enable for B0 CPU stepping, all others disabled, change
Processor ID	000506F1	⇄: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Processor Frequency	2.200GHZ	
CPU BCLK Frequency	100MHz	
Microcode Revision	00000020	
L1 Cache RAM	56KB	
L2 Cache RAM	2048KB	
Processor Version	Intel(R) Atom(TM) CPU C3758 @ 2.20GHZ	
EIST (GV3)	[Disable]	
BIOS Request Frequency	[Enable]	
Turbo	[Enable]	
TM1	[Enable]	
TM2 Mode	[Adaptive Throttling]	
CPU C State	[Disable]	
Package C State limit	[No Limit]	

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IntelRCSetup

TM1		▲ Enable/Disable CPU Flex Ratio Programming
TM2 Mode	[Adaptive Throttling]	⇄: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
CPU C State	[Disable]	
Package C State limit	[No Limit]	
Max Core C-State	[C6]	
Enhanced Halt State (C1E)	[Enable]	
Monitor/Mwait	[Enable]	
L1 Prefetcher	[Enable]	
L2 Prefetcher	[Enable]	
Machine Check	[Enable]	
Execute Disable Bit	[Enable]	
VMX	[Enable]	
Active Processor Cores	0	
CPU Flex Ratio Override	[Disable]	
CPU Core Ratio	24	

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Feature	Options	Description
EIST(GV3)	Disable Enabled	Enable/Disable EIST. GV3 and TM1 must be enabled for TM2 to be available. GV3 must be enabled for <u>Turbo</u> . Auto - Enable for B0 CPU stepping, all others disabled, change setting to override.
CPU C State	Disable Enable	"Enables the Enhanced Cx state of the CPU, takes effect after reboot. Auto - Enable for B0 CPU stepping, all others disabled, change setting to override.
Machine Check	Disable Enable	Enable or Disable the Machine Check.
Active Processor Cores	0	Set the number of Active Processor Cores in the SoC. A 0 indicates all Existing Processor Cores are Active.
CPU Flex Ratio Override	Disable Enable	Enable/Disable CPU Flex Ratio Programming.

Server ME Configuration

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IntelRCSetup

General ME Configuration		
Operational Firmware Version	0B:4.0.4.143	
ME Firmware Type	SPS	
Backup Firmware Version	N/A	
Recovery Firmware Version	0B:4.0.4.143	
ME Firmware Status #1	0x000F0345	
ME Firmware Status #2	0x8811C820	
Current State	Operational	
Error Code	No Error	

++: 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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North Bridge Chipset Configuration

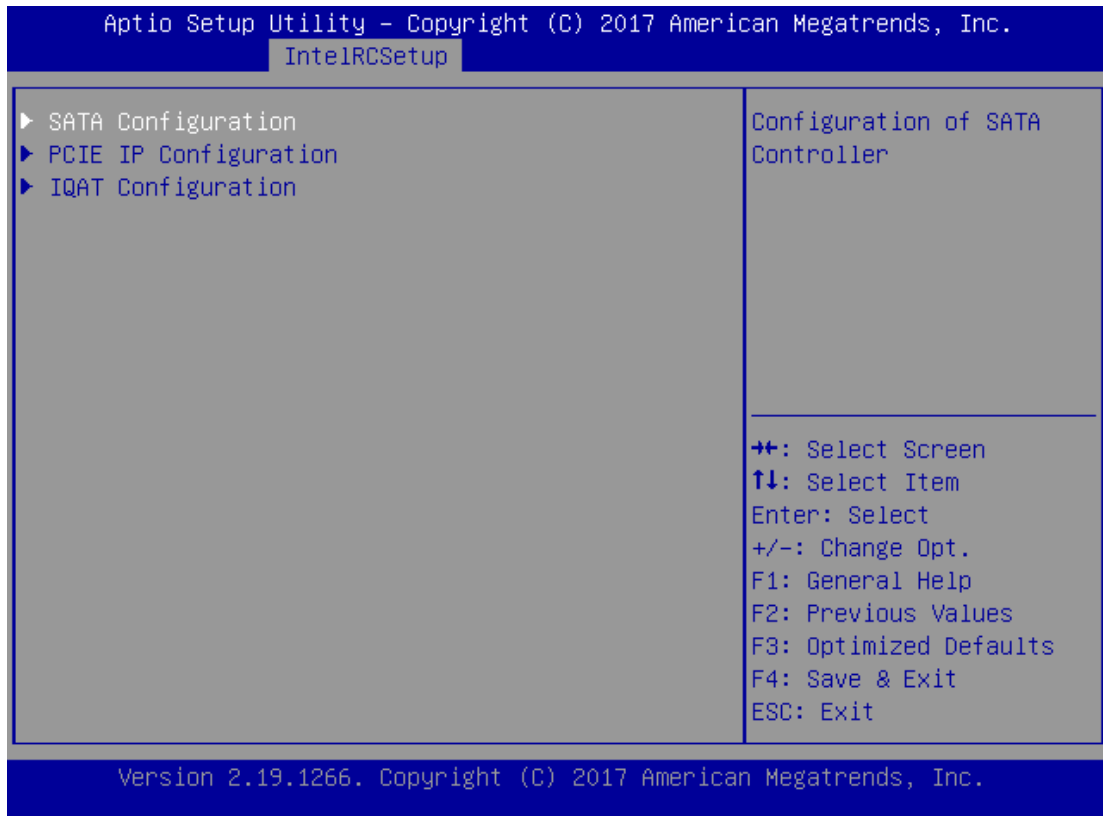
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
IntelRCSetup

<p>North Bridge Chipset Configuration</p> <p>Memory Information</p> <p>MRC Version 0.149.4.43</p> <p>Total Memory 8192 MB</p> <p>Memory Frequency DDR4 - 2400 MHz</p> <p>Fast Boot [Enabled]</p> <p>Memory Frequency [DDR-2400]</p> <p>VT-d [Enabled]</p>	<p>Enables/Disables fast boot which skips memory training and attempts to boot using last known good configuration.</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>
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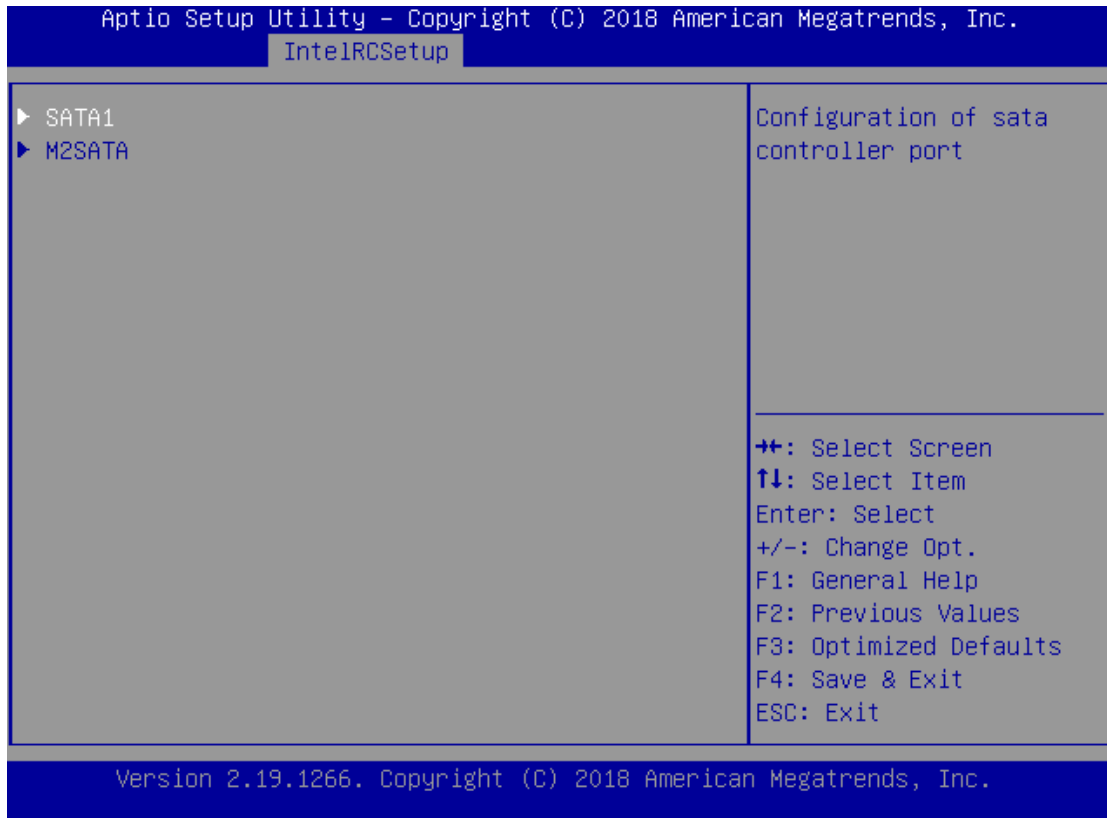
Version 2.19.1266. Copyright (C) 2018 American Megatrends, Inc.

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

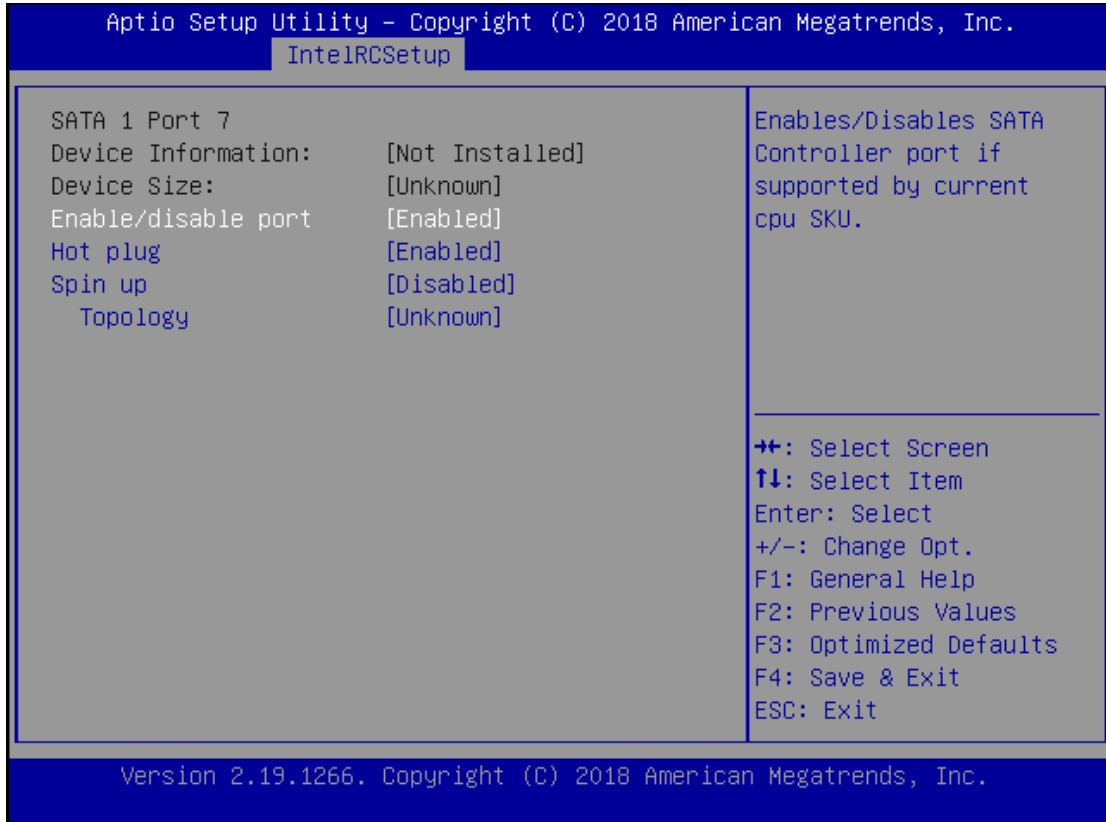
South Bridge Chipset Configuration



SATA Configuration



SATA1 Configuration



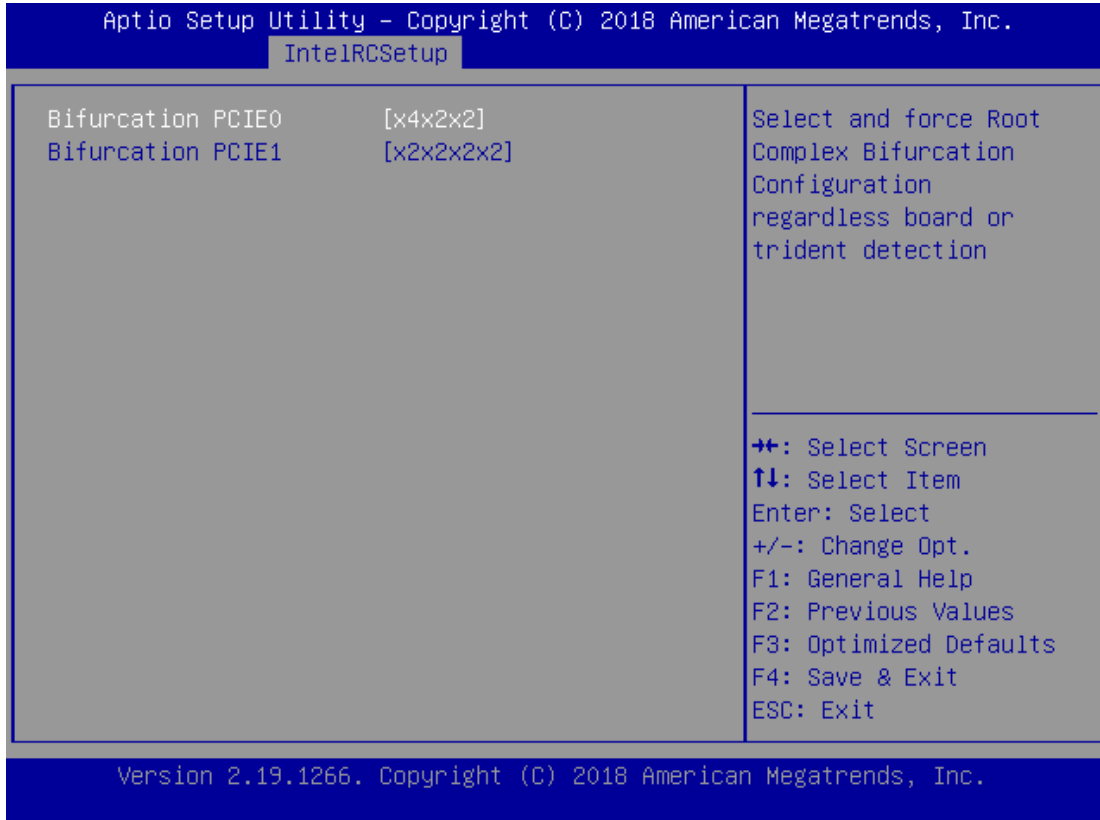
Feature	Options	Description
Enable/disable port	Enabled Disabled	Enables/Disables SATA Controller port if supported by current cpu SKU.
Hot plug	Enabled Disabled	Hot plug
Spin up	Enabled Disabled	Spin up
Topology	Unknown ISATA Direct Connect Flex M2	Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2

M2SATA1 Configuration



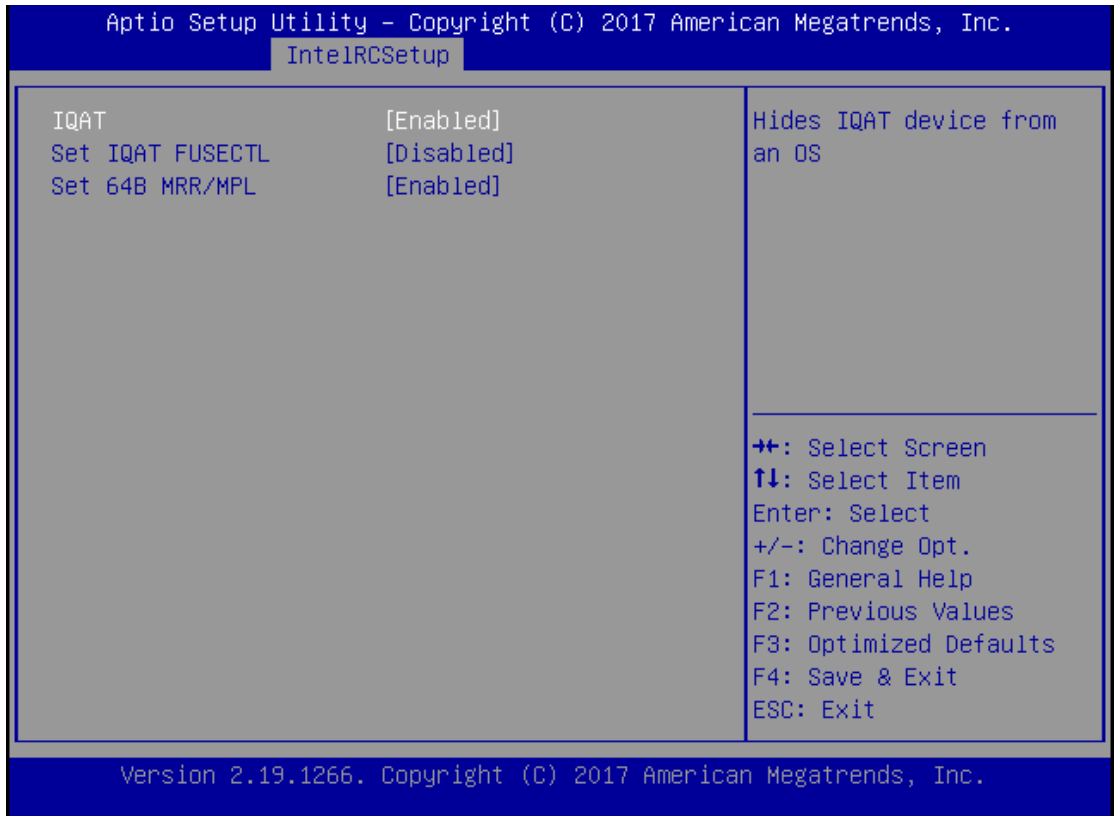
Feature	Options	Description
Enable/disable port	Enabled Disabled	Enables/Disables SATA Controller port if supported by current cpu SKU.
Hot plug	Enabled Disabled	Hot plug
Spin up	Enabled Disabled	Spin up
Topology	Unknown ISATA Direct Connect Flex M2	Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2

PCIE IP Configuration



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

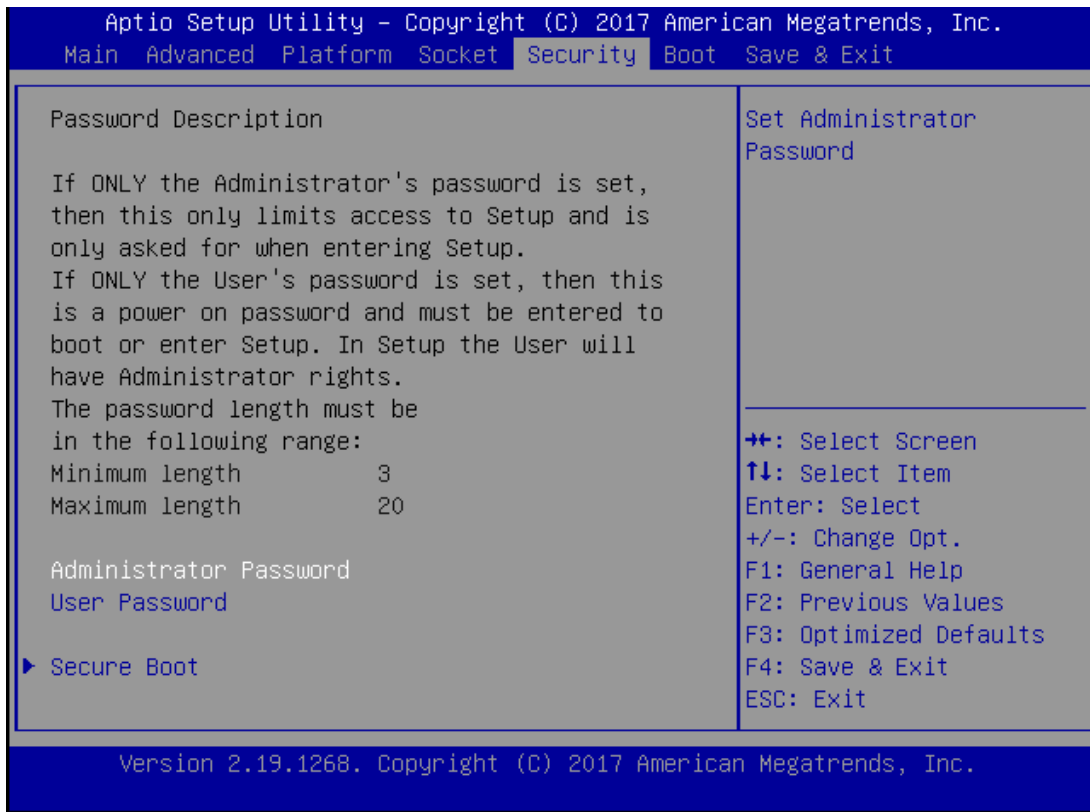
IQAT Configuration



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

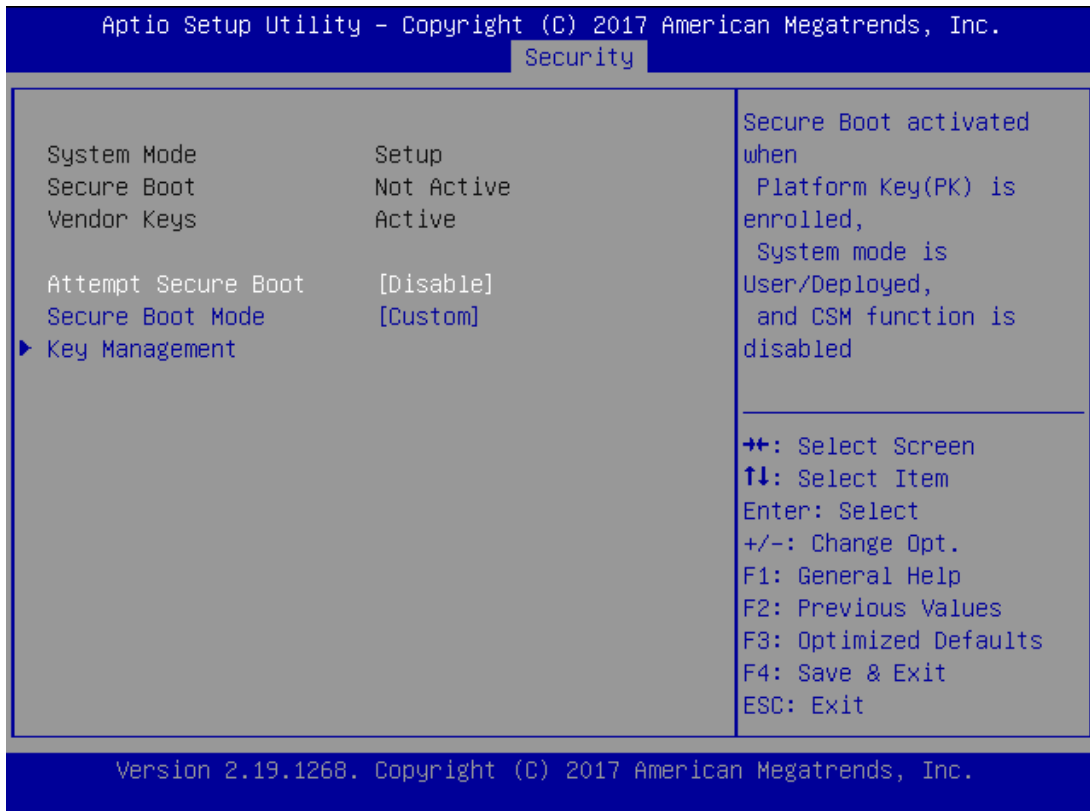
Security

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



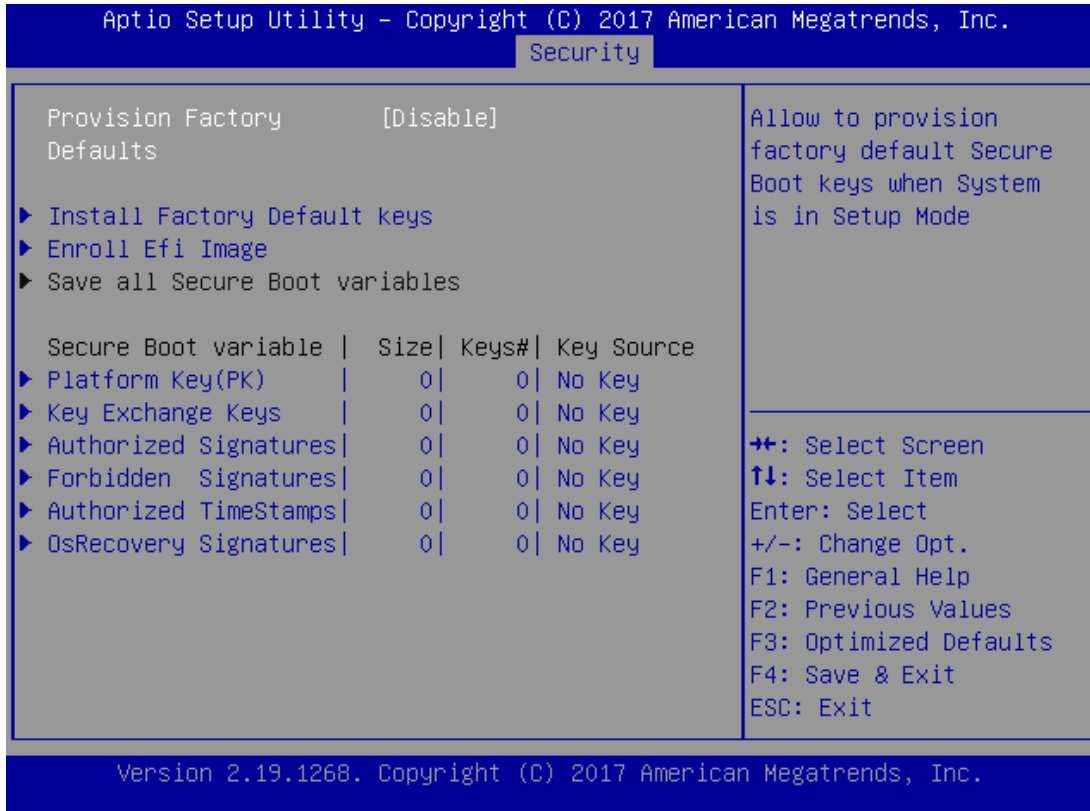
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

Secure Boot



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

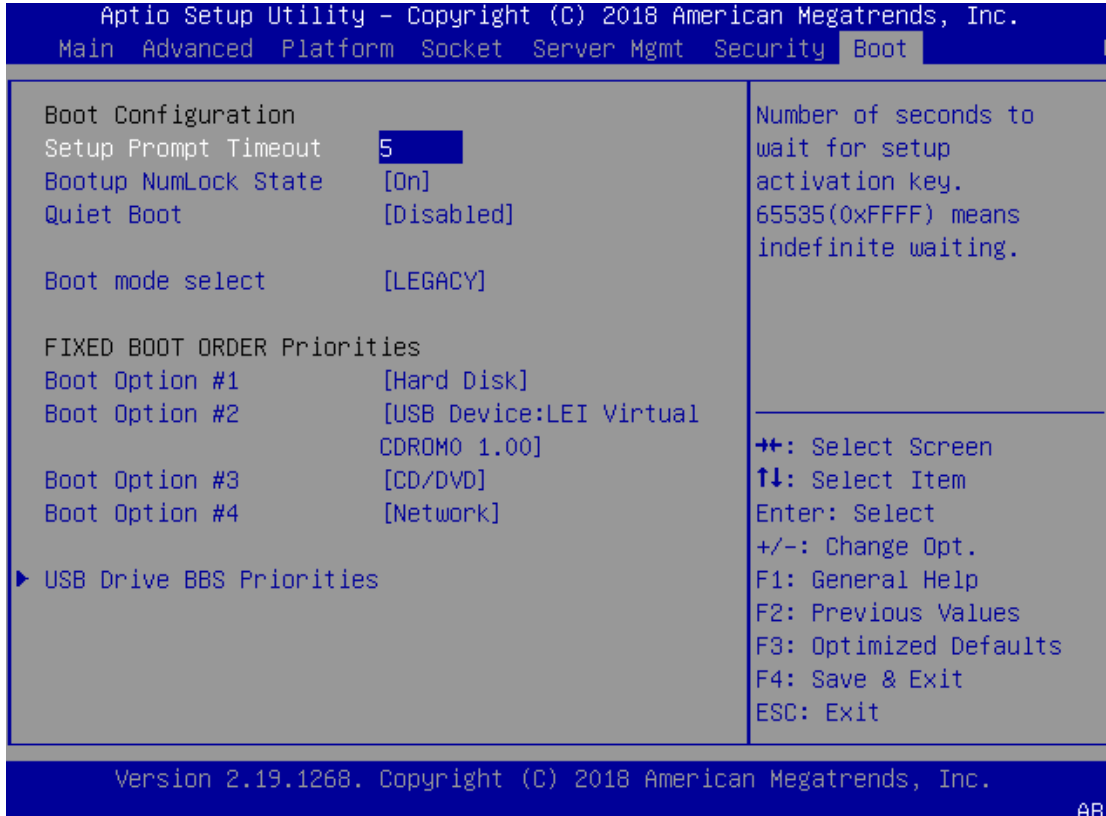
Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Provision factory default keys on next re-boot only when System in Setup Mode.
Restore Factory keys	None	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Enroll Efi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db)

Boot Menu

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

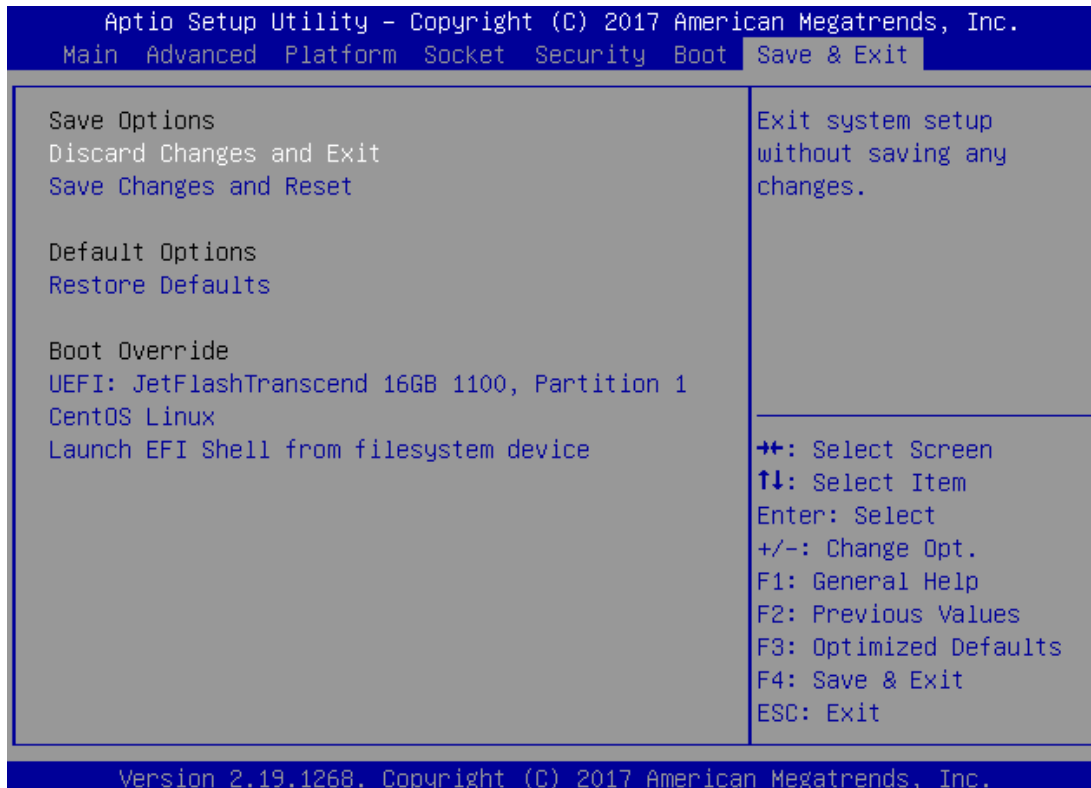


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL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

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

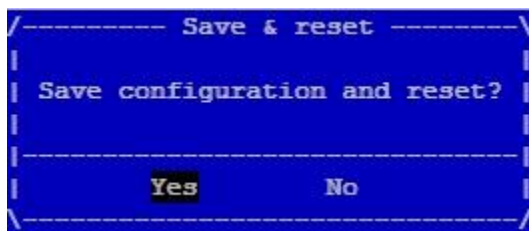
Save and Exit Menu

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.



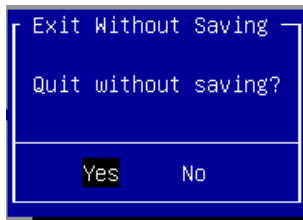
■ Save Changes and Reset

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.



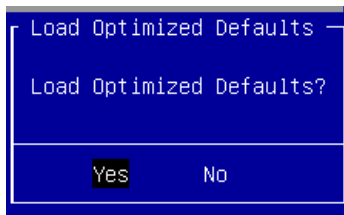
■ Discard Changes and Exit

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.

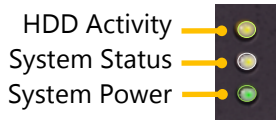


■ Boot Override

The items shown under Boot Override are not the actual ones; what is shown depends on devices connected with the system.

APPENDIX A: LED INDICATOR EXPLANATIONS

The status explanations of LED indicators on 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>

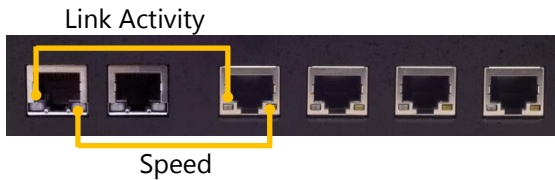
▶ System Status

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>

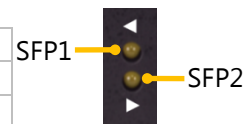


▶ RJ45 LAN Status

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 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 C: 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 Keyword	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 D: TERMS AND CONDITIONS

Warranty Policy

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

RMA Service

Requesting an RMA#

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



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

RMA Service Request Form

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

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