

Lanner

Embedded Computing

Embedded Platforms for Industrial and Commercial Applications

NVA-3000 User Manual

Version: 1.2

Date of Release: 2019-09-26

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 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.

Lithium Battery Caution:

- ▶ Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- ▶ Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all English Installation and Device Specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ The machine can only be used in a fixed location such as labs or computer facilities.

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

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

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

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 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 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.

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CHAPTER 1: PRODUCT OVERVIEW

NVA-3000 is a cost-effective embedded system which adopts Intel® Pentium® Processor N4200 or Intel Atom® x7-E3950 Processor to provide a high performance with low power consumption structure and featured with 8-port PoE (power over Ethernet) Ethernet switch. NVA-3000, a compact design supports many integrated multimedia and IO features such as video, network, serial communication, PoE, especially for Network Video Recorder physical security applications.

- Onboard Intel® Pentium® Processor N4200
- Onboard 4GB LPDDR4 SDRAM 2400MHz
- 2x 10/100/1000Mbps Ethernet ports
- 8x 10/100Mbps PoE Ethernet switch ports
- 2x USB3.0
- 1x SATA 3.5" storage bay
- Support 54V_{DC} power input

Package Content

Your package contains the following items:

- ▶ 1x NVA-3000 Embedded Compact PC
- ▶ 1x Pack of Screws
- ▶ 1x Power Adapter



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

Ordering Information

SKU No.	Specification
NVA-3000A	Intel® Apollo Lake N4200 1.10GHz CPU + eMMC 8GB
NVA-3000B	Intel® Apollo Lake x7-E3950 1.6 GHz CPU + eMMC 64GB

System Specifications

Form Factor		Desktop
Processor System	CPU	Intel® Atom® N4200/x7-E3950
	Frequency	2GHz
	Core Number	4C
	BIOS	Intel® QuickAssist Technology
	Chipset	SOC
Fanless		No
Memory	Technology	LPDDR4 2400MHz
	Max. Capacity	4GB
	Socket	Onboard
Ethernet	Controller	Intel® I210IT, I210IS, Marvell 88E6390 Ethernet Switch, 88E1512 PHY
	Speed Interface	10/100/1000 Mbps 2x RJ45 + 8x RJ45 PoE+
LOM	IO Interface	N/A
	OPMA slot	N/A
I/O Interface	Serial Port	--
	Digital I/O	4x DI, 8x DO with +5V TTL
	USB 2.0	--
	USB 3.0	2x Type A
	Power-On/Reset Button	1x Reset
	Remote Power Switch	No
Storage	LED	Power/Storage/LAN/PoE
	Type	SATA III
	Installation	1x 3.5" HDD/SSD Drive Bay
Expansion Interface	Mini-PCIe	--
Watchdog Timer	Watchdog Timer 1~255 Level Time Interval System Reset, Software Programmable	
Power	Power Type	ATX
	Power Supply Voltage	+54 VDC
	Connector	2-pin Terminal Block
	Power Consumption (Idle)	TBD
	Power Consumption (Full Load)	TBD
Environment	Operating Temperature	0°C~40°C (with Industrial-grade Components)
	Storage Temperature	20°C~60°C
	Relative Humidity	0%~95% (Non-condensing)
	Vibration	IEC 60068-2-64, 0.5Grms, random 5 ~500 Hz, 40 mins/axis
Mechanical	Dimension (W x H x D)	310 x 44 x 220 mm
	Construction	SGCC
	Weight	TBD
	Mounting	Wallmount
Driver Support	Microsoft Windows	WES7, Win 7 Pro FES, WE 8.1 Industry Pro, Win 10 IoT
	Linux	Kernel 3.12
Graphic	Controller	Intel® HD Graphics
	HDMI	--
Certification	EMC	CE/FCC, Class B
	Safety	--

Front Panel



No.		
F1	Hard Disk Tray	A hard disk tray to hold a 3.5" HDD
F2	Reset Button	Short-press (<1 sec) to start a system reset Long-press (>10 sec) to start a system reset with recovery mode For the recovery mode to be started, make sure the Linux driver for this GPIO setting is provided.
F3	LED Indicators	<p>Power HDD LAN1 LAN2 PoE Port 1~8 Status Status Status Status</p>

Rear Panel

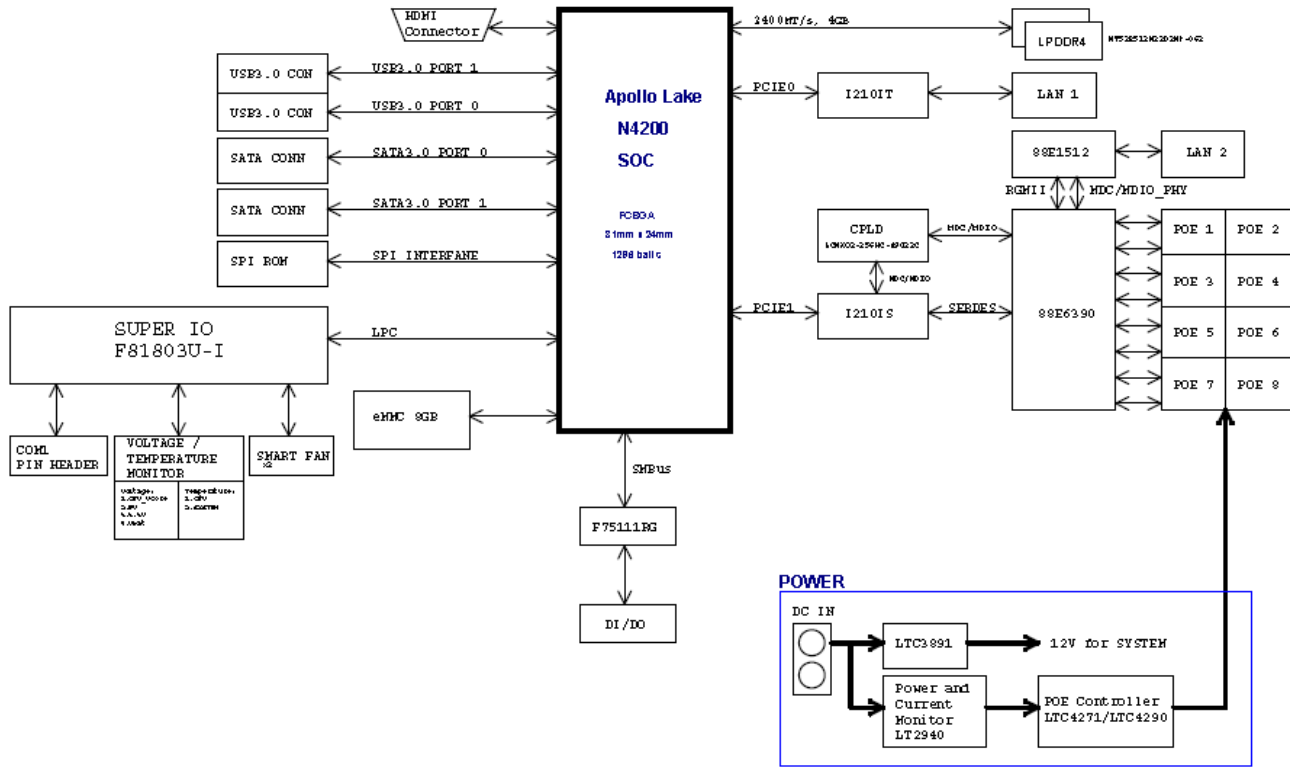


No.	Description																																	
R1	USB Port	2x USB 3.0 ports																																
R2	GbE Port	2x 10/100/1000Mbps Ethernet ports																																
R3	PoE Port	8x 10/100Mbps PoE+ ports (802.3af/802.3at) With the support for PoE+ standard, this system can offer the power of more than 15.4W (no more than 30W) to 4 connected devices simultaneously.																																
R4	DIO Connector	2x 8pin terminal block for 4DI/4DO Make sure the Linux driver for this GPIO setting is provided. Pinout <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>OUT</th> <th>OUT</th> <th>OUT</th> <th>OUT</th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> <td>5</td> <td>7</td> <td>9</td> <td>11</td> <td>13</td> <td>15</td> </tr> <tr> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> <td>14</td> <td>16</td> </tr> <tr> <td>IN</td> <td>IN</td> <td>IN</td> <td>IN</td> <td>GND</td> <td>GND</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table>	OUT	OUT	OUT	OUT					1	3	5	7	9	11	13	15	2	4	6	8	10	12	14	16	IN	IN	IN	IN	GND	GND	GND	GND
OUT	OUT	OUT	OUT																															
1	3	5	7	9	11	13	15																											
2	4	6	8	10	12	14	16																											
IN	IN	IN	IN	GND	GND	GND	GND																											
R5	Power Supply	54V DC-in Power Jack																																

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.



CHAPTER 3: BIOS SETUP

BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats. BIOS update for Dell PCs are available for download at

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

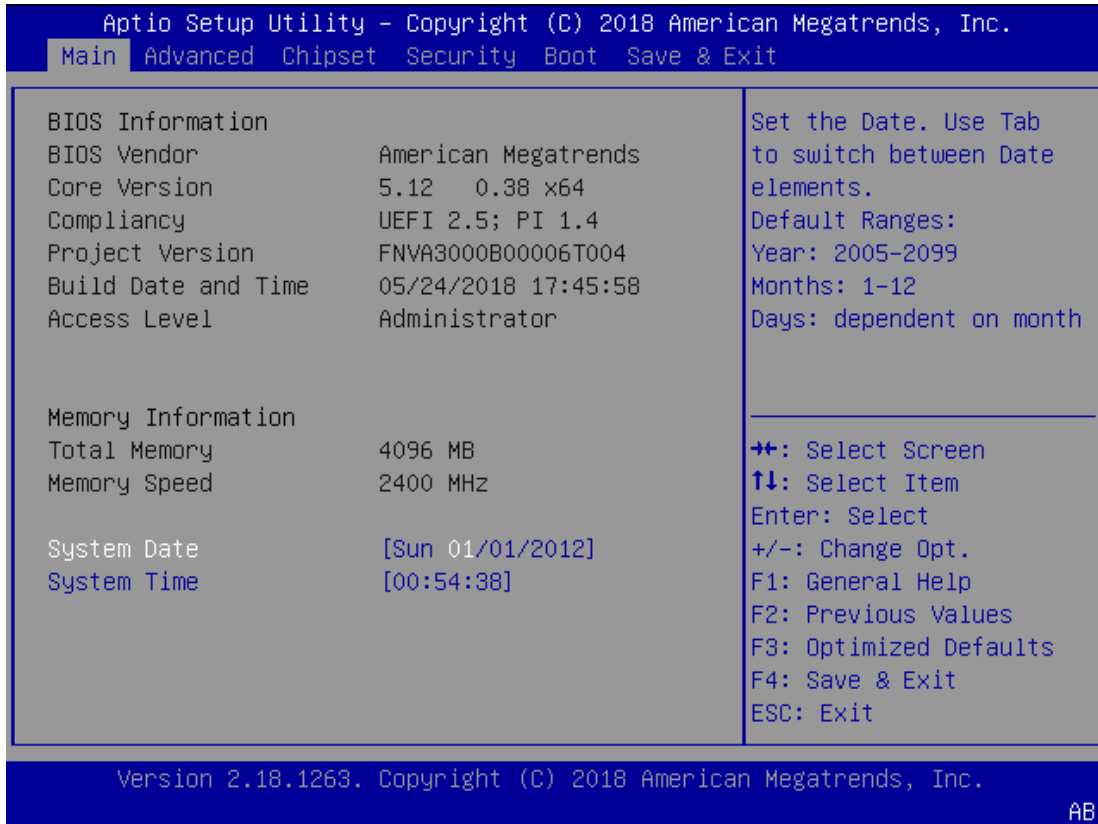
To enter the BIOS setup utility, simply follow the steps below:

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

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

Main

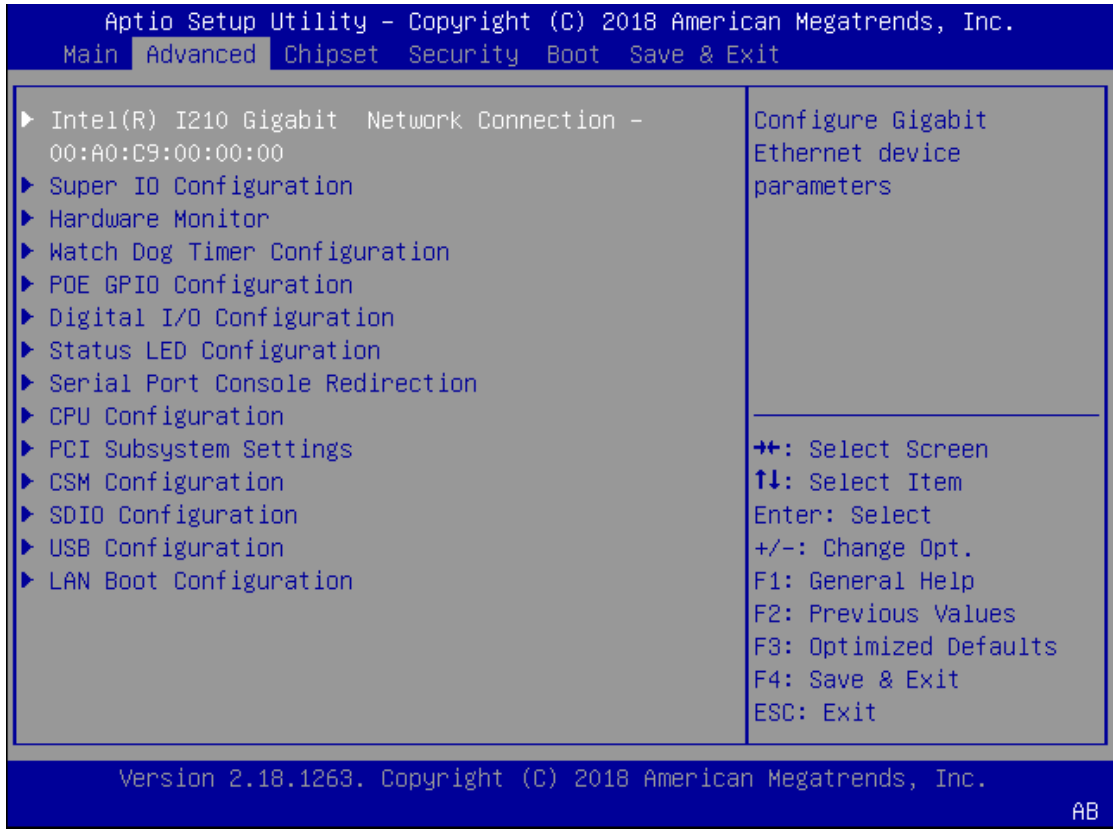
Setup main page contains BIOS information and project version information.



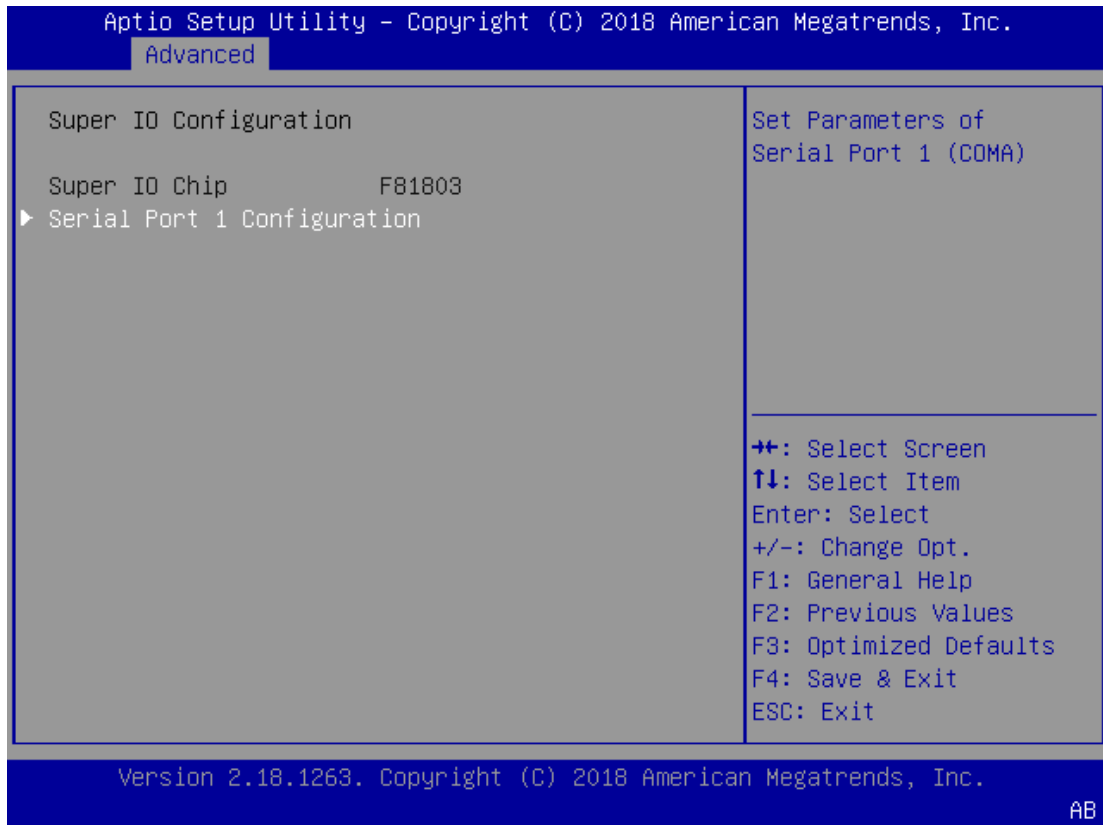
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use <Tab> 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

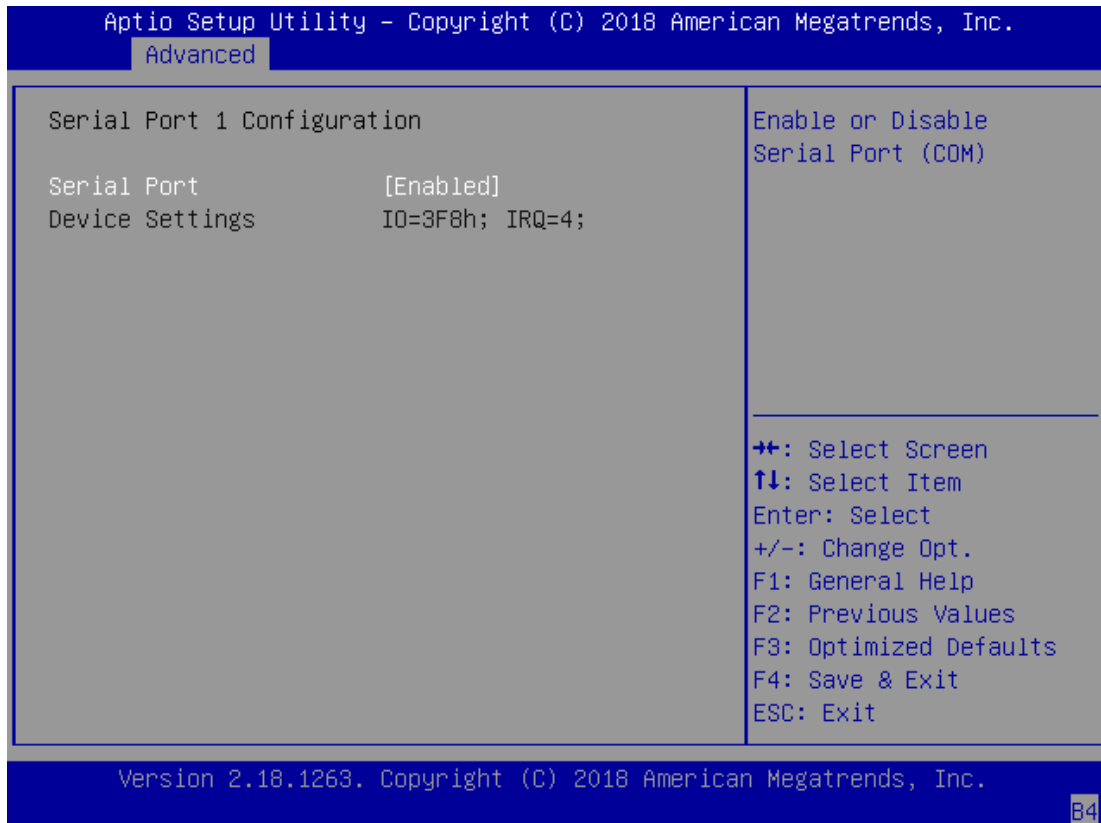
Select the **Advanced** menu item from the BIOS setup screen to enter the “Advanced” setup screen. Users can select any of the items in the left frame of the screen.



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

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

Advanced

Pc Health Status

SYS Temp1	: +36 C
SYS Temp2	: +29 C
Fan1 Speed	: N/A
Fan2 Speed	: N/A
CPU VCORE	: +0.768 V
VSB5V	: +4.961 V
VBAT	: +3.200 V
3.3V	: +3.312 V

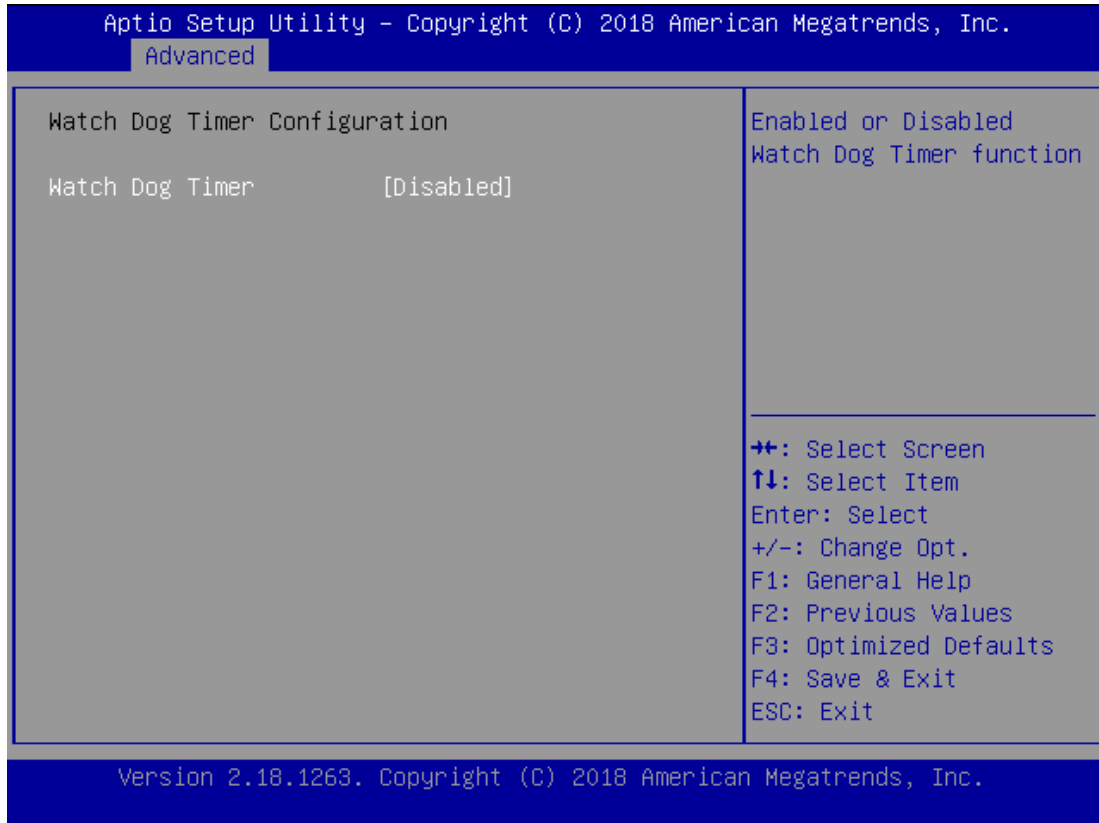
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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AB

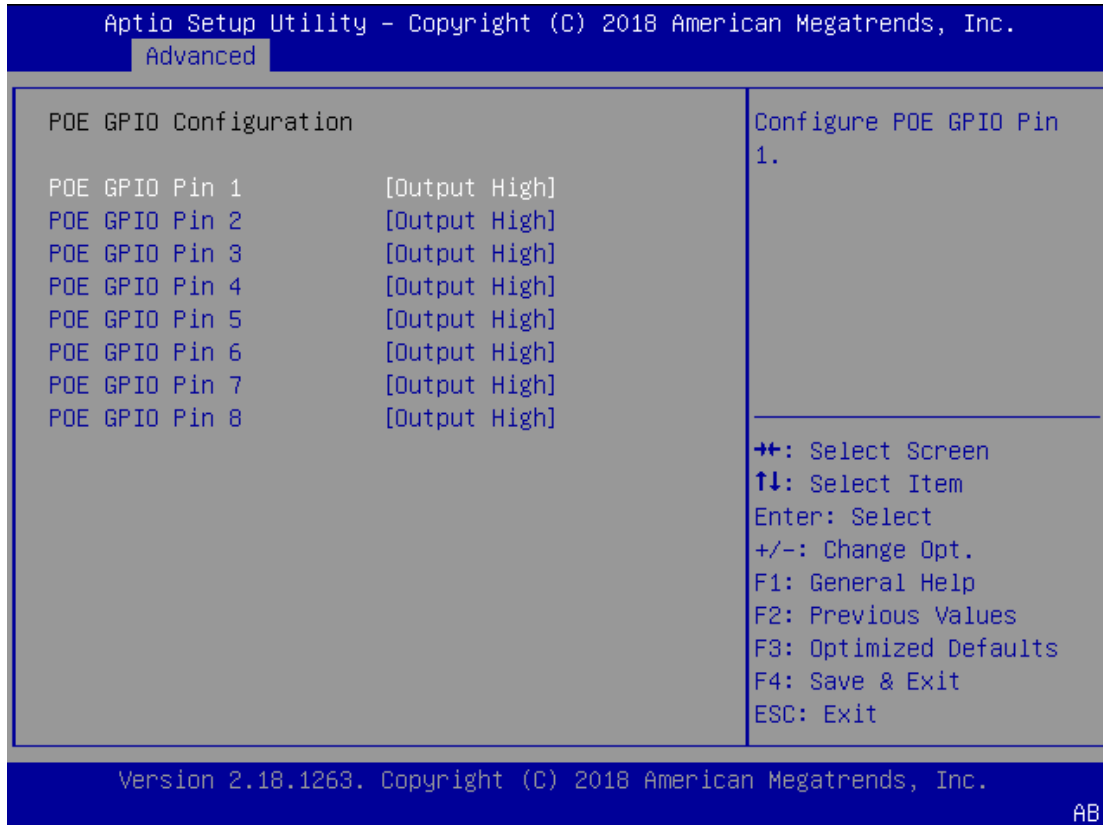
Feature	Description
CPU Temp	This value reports the CPU temperature.
SYS Temp	This value reports the System temperature.
CPU VCORE	This value reports the CPU VCORE.
VSB5V	This value reports the VSB5V Input voltage.
VBAT	This value reports the VBAT Input voltage.
3.3V	This value reports the 3.3V Input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

Watch Dog Timer Configuration



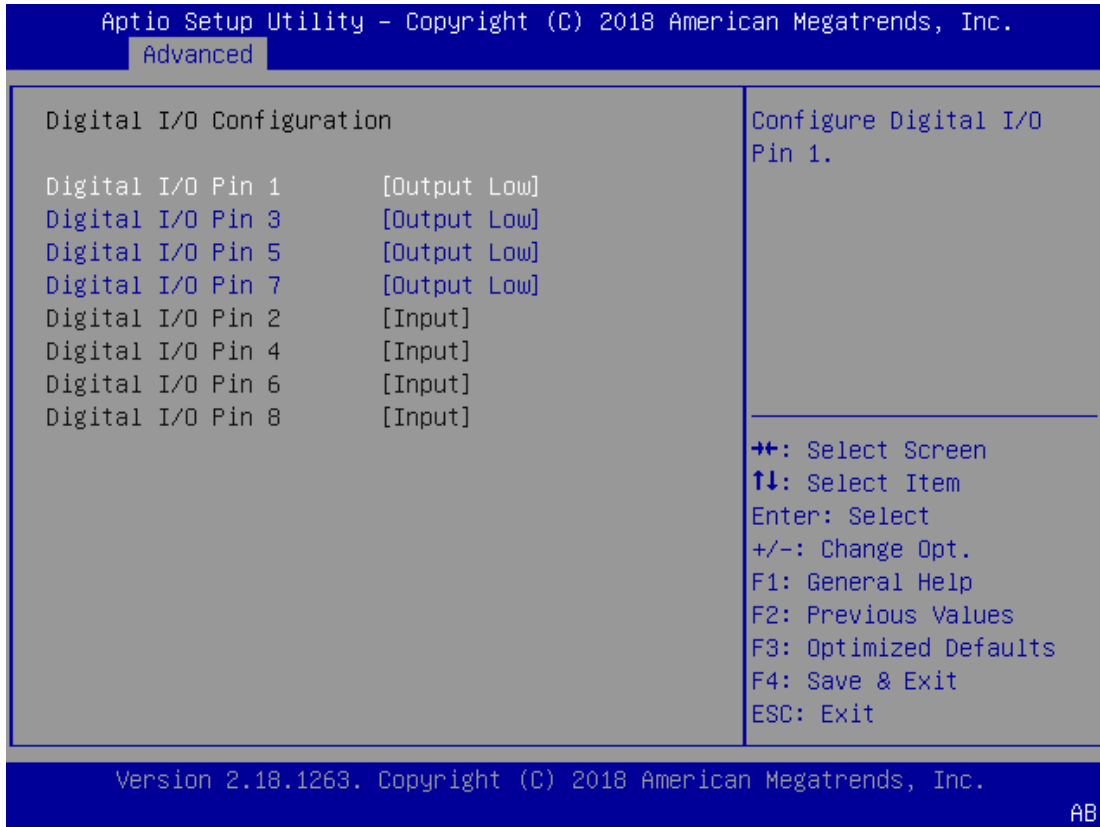
Feature	Options	Description
Watch Dog Timer	Enabled Disabled	Enable or Disable Watch Dog function
Timer Count Mode	Second Mode Minute Mode	Select Second Mode or Minute Mode
Timer out Value	60	Watch Dog Timer out Value 0-255

POE GPIO Configuration



Feature	Options	Description
POE GPIO Pin 1	Output Low Output High	Configure POE GPIO Pin 1.
POE GPIO Pin 2	Output Low Output High	Configure POE GPIO Pin 2.
POE GPIO Pin 3	Output Low Output High	Configure POE GPIO Pin 3.
POE GPIO Pin 4	Output Low Output High	Configure POE GPIO Pin 4.
POE GPIO Pin 5	Output Low Output High	Configure POE GPIO Pin 5.
POE GPIO Pin 6	Output Low Output High	Configure POE GPIO Pin 6.
POE GPIO Pin 7	Output Low Output High	Configure POE GPIO Pin 7.
POE GPIO Pin 8	Output Low Output High	Configure POE GPIO Pin 8.

Digital I/O Configuration



Feature	Options	Description
Digital I/O Pin 1	Output Low Output High	Configure Digital I/O Pin 1.
Digital I/O Pin 2	Output Low Output High	Configure Digital I/O Pin 2.
Digital I/O Pin 3	Output Low Output High	Configure Digital I/O Pin 3.
Digital I/O Pin 4	Output Low Output High	Configure Digital I/O Pin 4.
POE GPIO Pin 5	Input	Configure Digital I/O Pin 5.
POE GPIO Pin 6	Input	Configure Digital I/O Pin 6.
POE GPIO Pin 7	Input	Configure Digital I/O Pin 7.
POE GPIO Pin 8	Input	Configure Digital I/O Pin 8.

Status LED Configuration

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Advanced

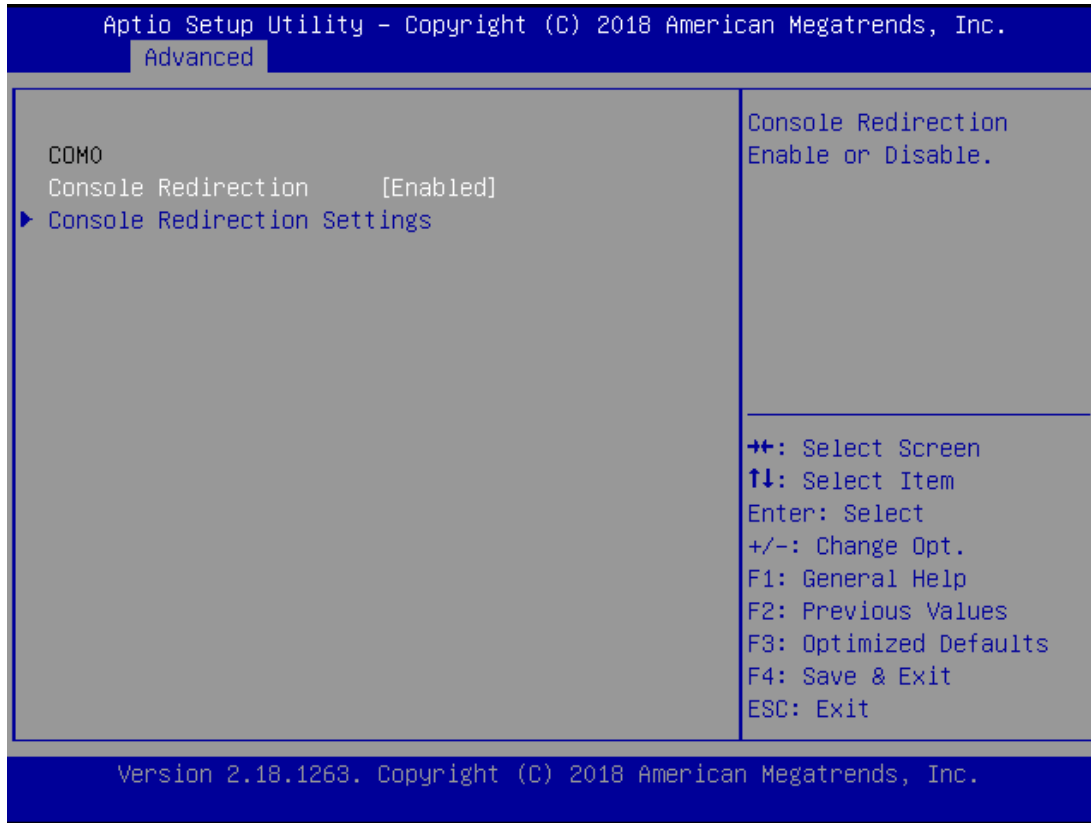
<p>Status LED Configuration</p> <p>POWER LED [GREEN]</p> <p>CAMERA1 LED [OFF]</p> <p>CAMERA2 LED [OFF]</p> <p>CAMERA3 LED [OFF]</p> <p>CAMERA4 LED [OFF]</p> <p>CAMERA5 LED [OFF]</p> <p>CAMERA6 LED [OFF]</p> <p>CAMERA7 LED [OFF]</p> <p>CAMERA8 LED [OFF]</p> <p>POE OUTPUT LED [OFF]</p>	<p>Configure Status POWER LED.</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F8: Optimized Defaults F4: Save & Exit ESC: Exit</p>
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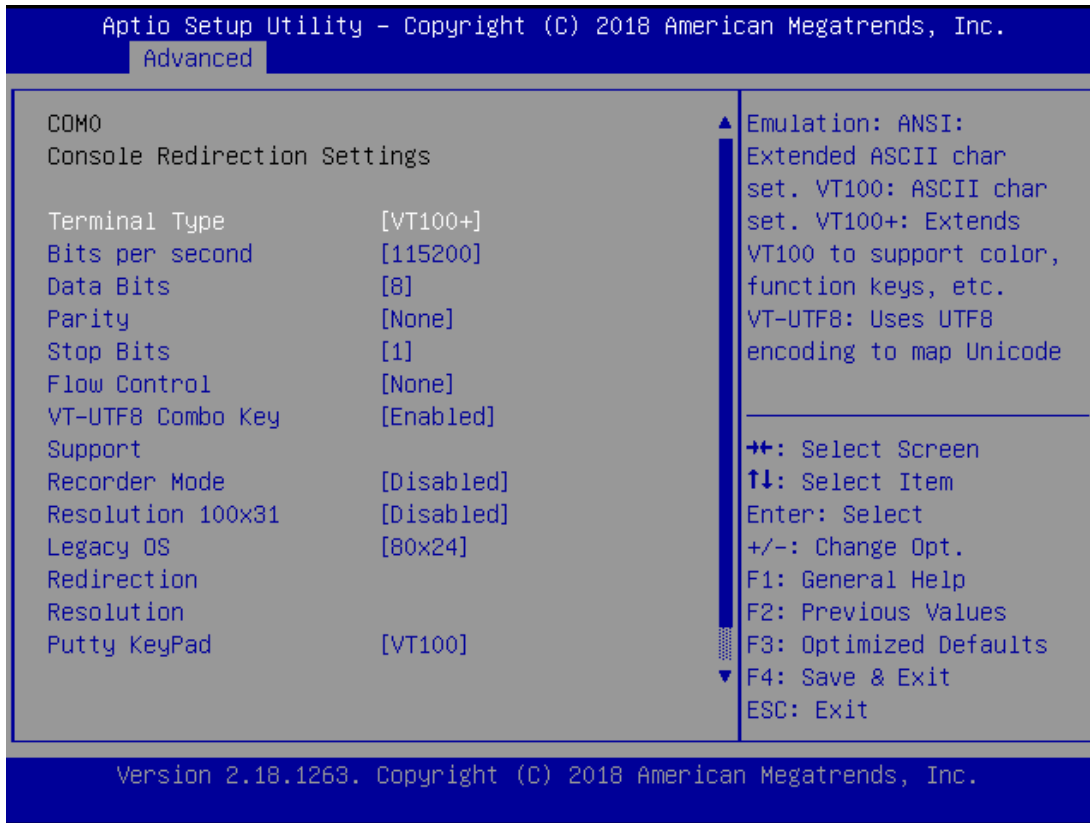
Feature	Options	Description
Power LED	OFF ORANGE GREEN	Configure Status POWER LED.
CAMERA1 LED	OFF ORANGE	Configure CAMERA1 LED .
CAMERA2 LED	OFF ORANGE	Configure CAMERA2 LED.
CAMERA3 LED	OFF ORANGE	Configure CAMERA3 LED .
CAMERA4 LED	OFF ORANGE	Configure CAMERA4 LED.
CAMERA5 LED	OFF ORANGE	Configure CAMERA5 LED .
CAMERA6 LED	OFF ORANGE	Configure CAMERA6 LED.
CAMERA7 LED	OFF ORANGE	Configure CAMERA7 LED.
CAMERA8 LED	OFF ORANGE	Configure CAMERA8 LED.
POE OUTPUT LED	OFF ORANGE	Configure OUTPUT LED.

Serial Port Console Redirection



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

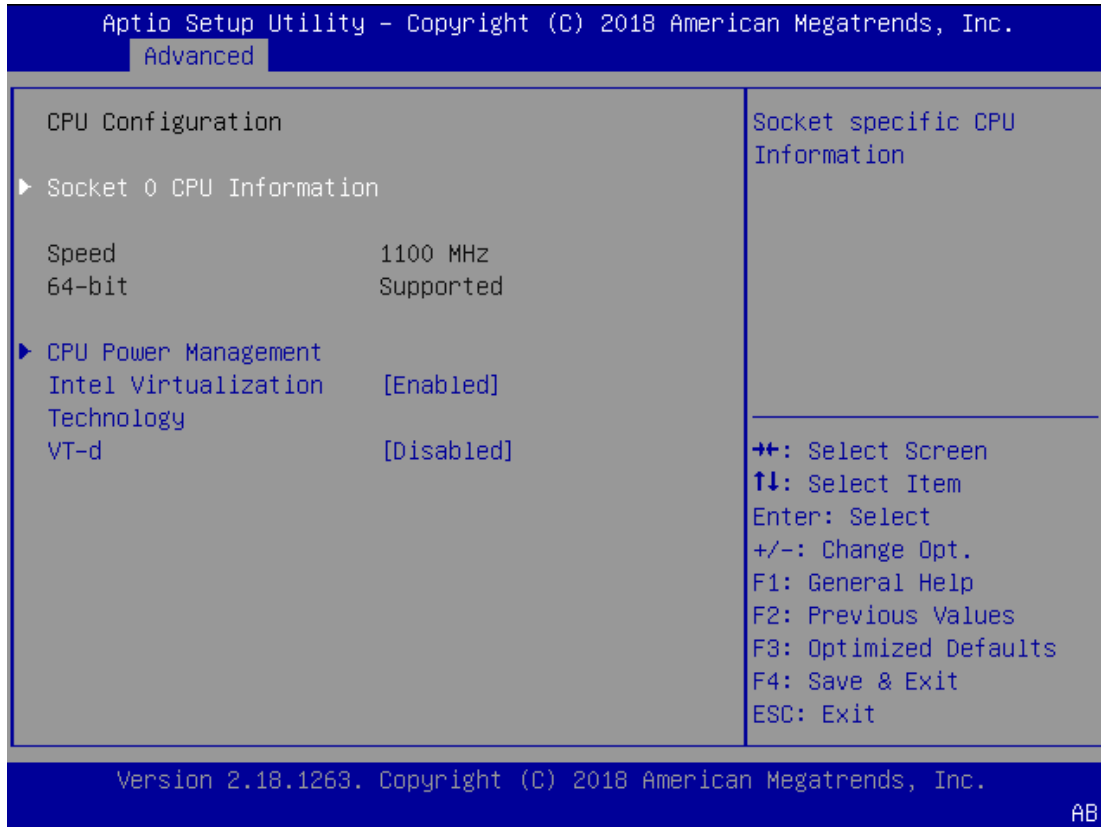
Console Redirection Setting



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
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	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

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  Advanced

Socket 0 CPU Information

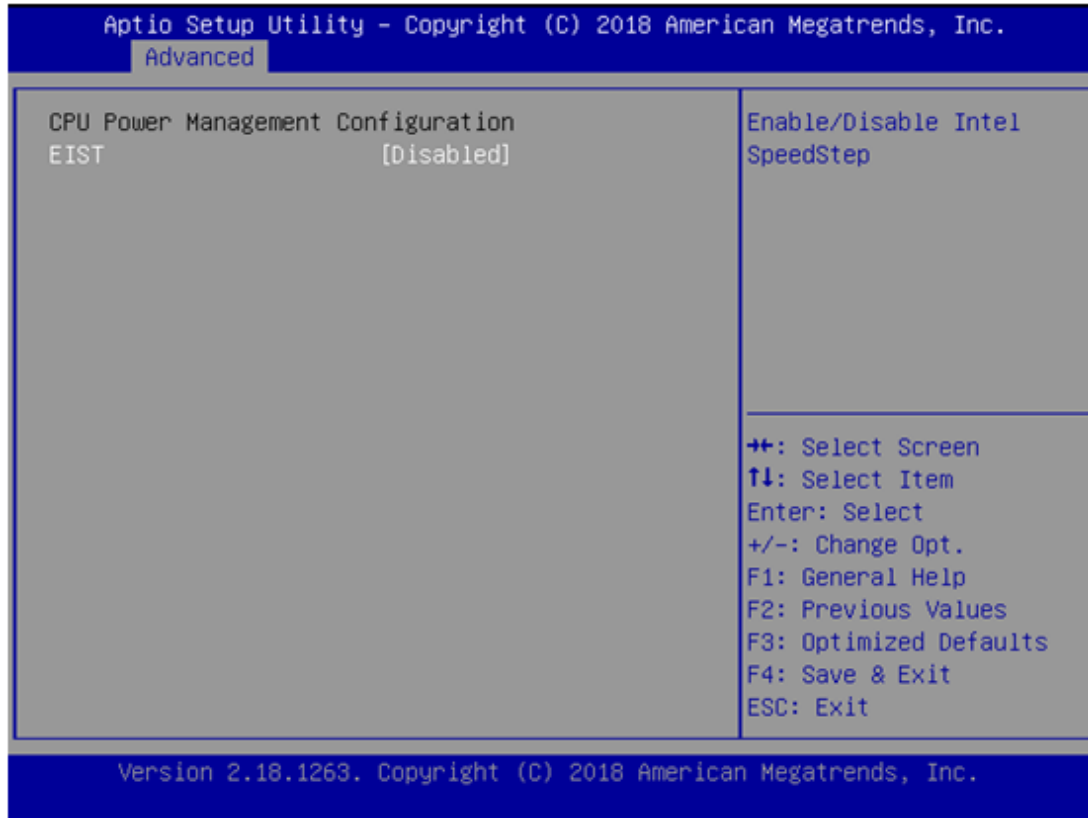
Intel(R) Pentium(R) CPU N4200 @ 1.10GHz
CPU Signature           506C9
Microcode Patch        2C
Max CPU Speed          1100 MHz
Min CPU Speed          800 MHz
Processor Cores        4
Intel HT Technology    Not Supported
Intel VT-x Technology  Supported

L1 Data Cache          24 kB x 4
L1 Code Cache          32 kB x 4
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

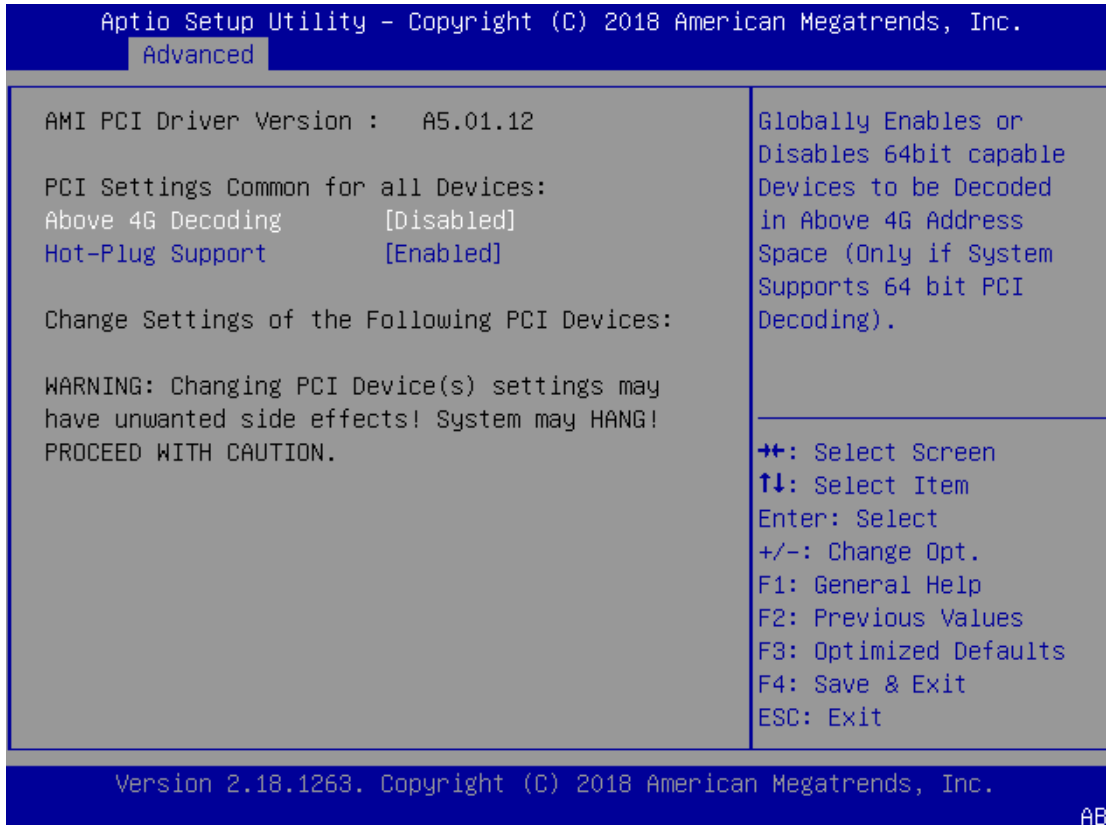
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
  AB
    
```

CPU Power Management



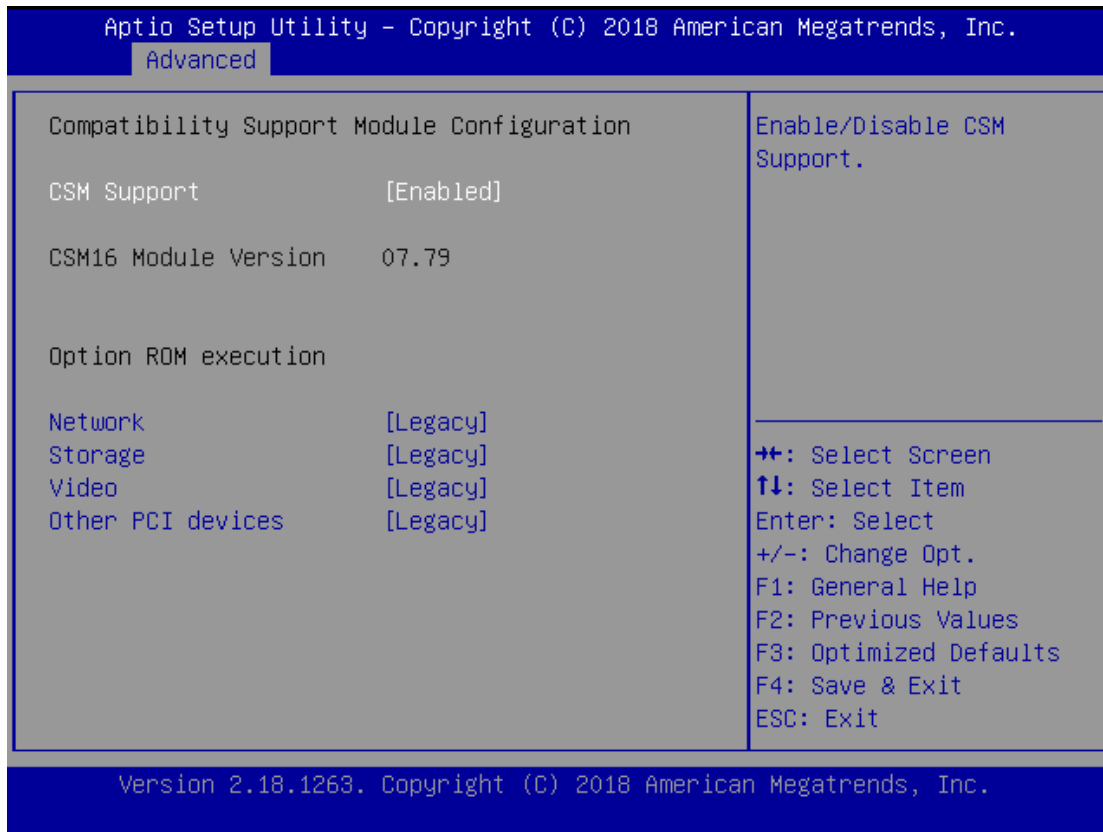
Feature	Options	Description
EIST	Disabled Enabled	Enable/Disable Intel SpeedStep

PCI Subsystem Settings



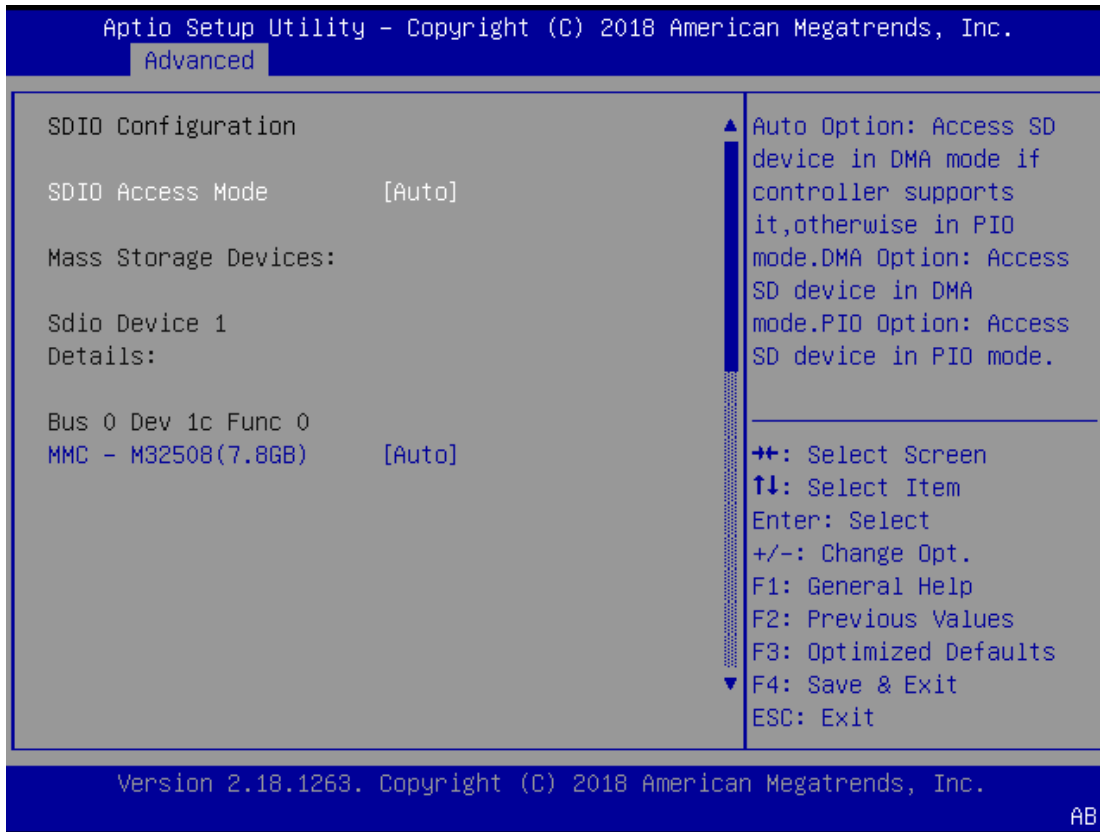
Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).
Hot-Plug Support	Enabled Disabled	Globally Enables or Disables Hot-Plug support for the entire System. If System has Hot-Plug capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug.

CSM Configuration



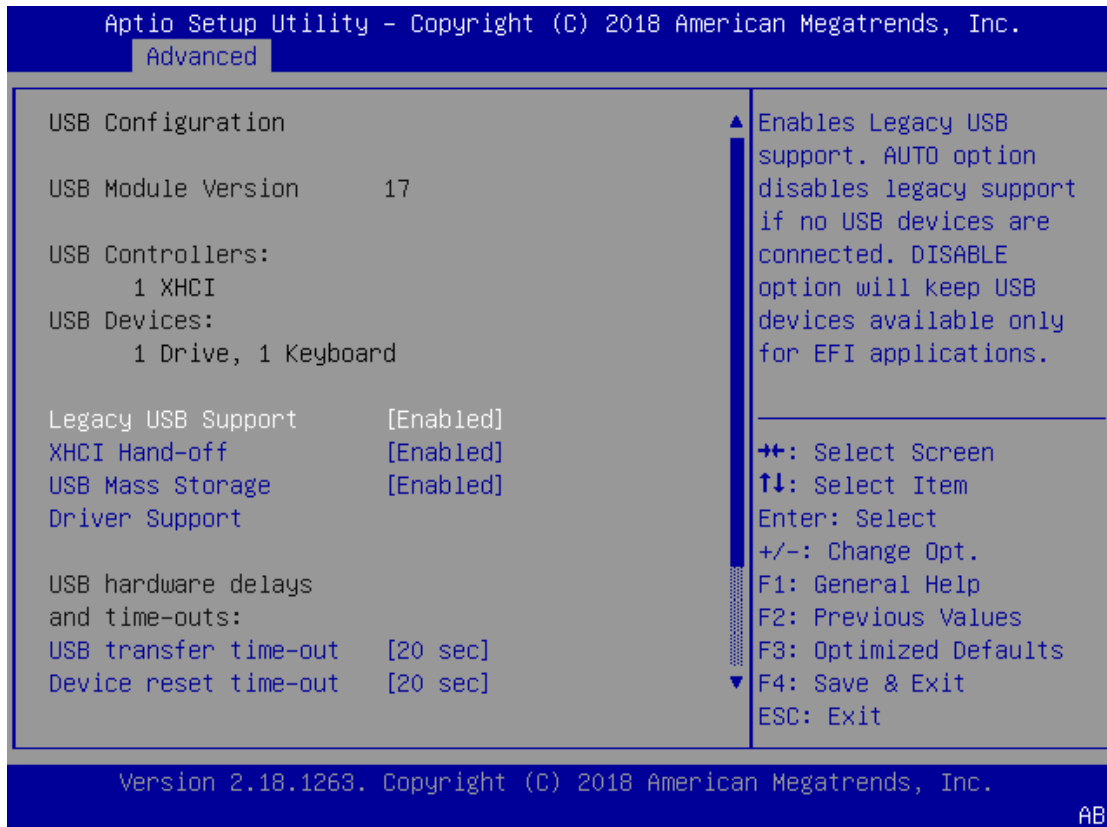
Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls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



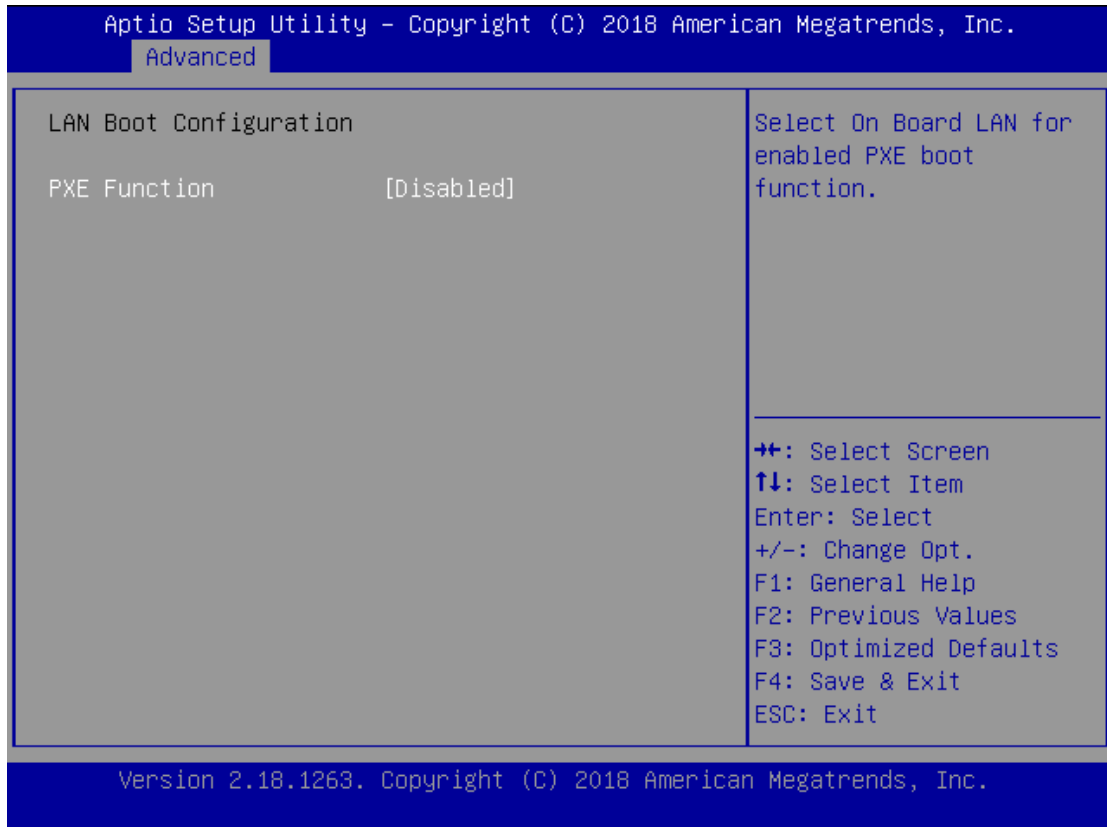
Feature	Options	Description
SDIO Access Mode	AUTO ADMA SDMA PIO	Auto: Access SD device in DMA mode if controller supports it, otherwise in PIO mode. DMA: Access SD device in DMA mode. PIO: Access SD device in PIO mode.

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
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 LAN2	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

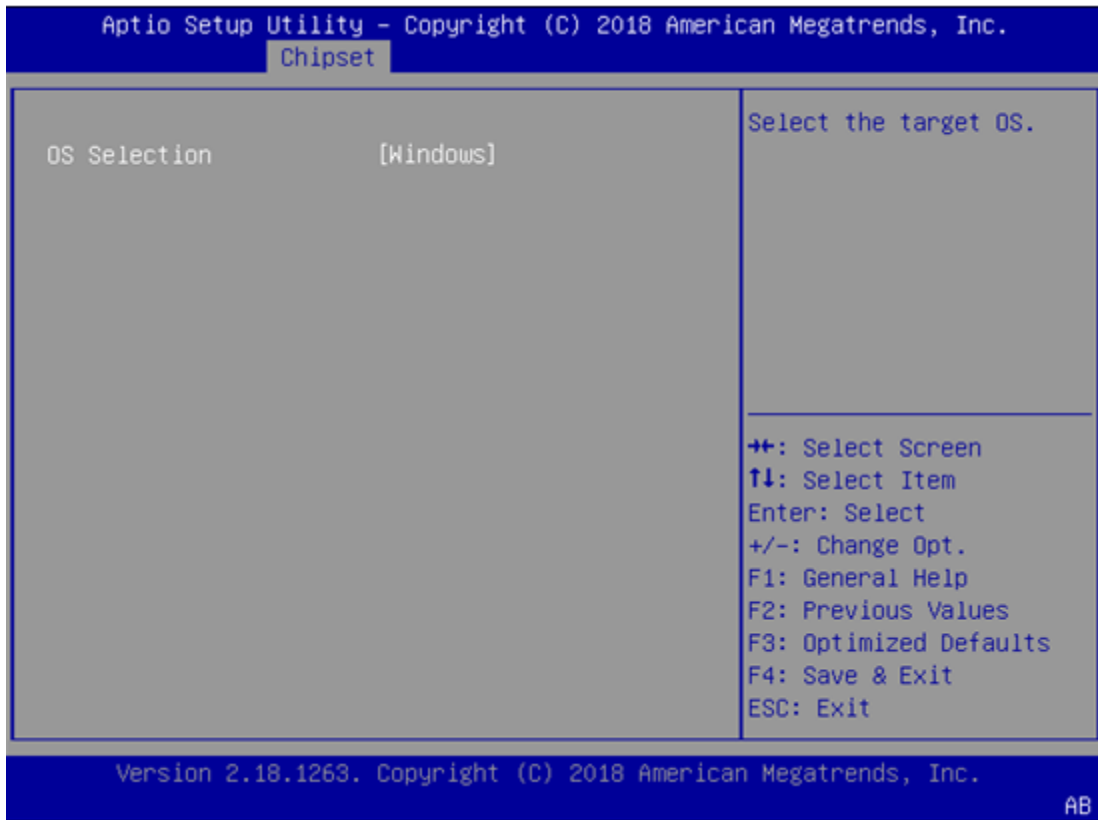
<p>Memory Information</p> <p>Total Memory 8192 MB</p> <p>Memory Slot0 8192 MB (DDR3L)</p> <p>Max TOLUD [2 GB]</p>	<p>Maximum Value of TOLUD.</p> <hr/> <p>→→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit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

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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.

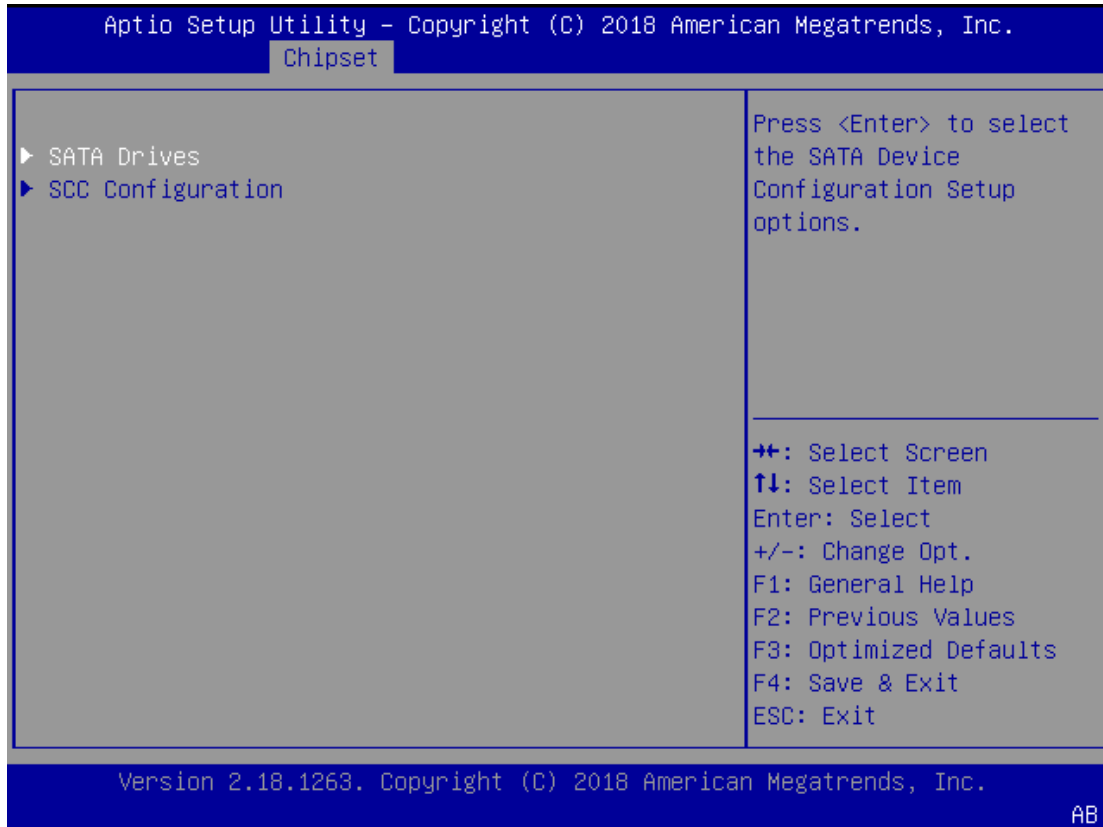
South Bridge

The **OS Selection** setting is linked to the status of **CSM Support** under **Advanced > CSM Configuration**. Please make sure you select the right option based on the OS used.

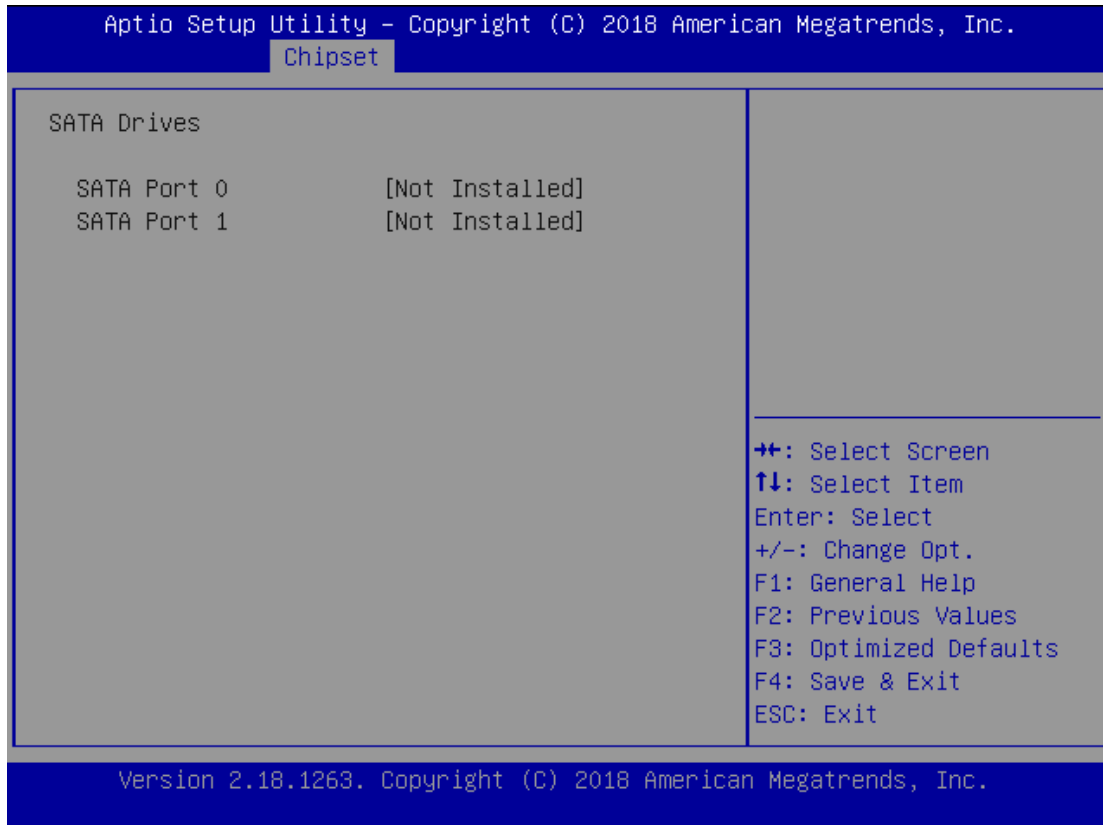


Feature	Options	Description
OS Selection	Windows Android Win7 Intel Linux	Select the target OS

South Cluster Configuration



SATA Drivers



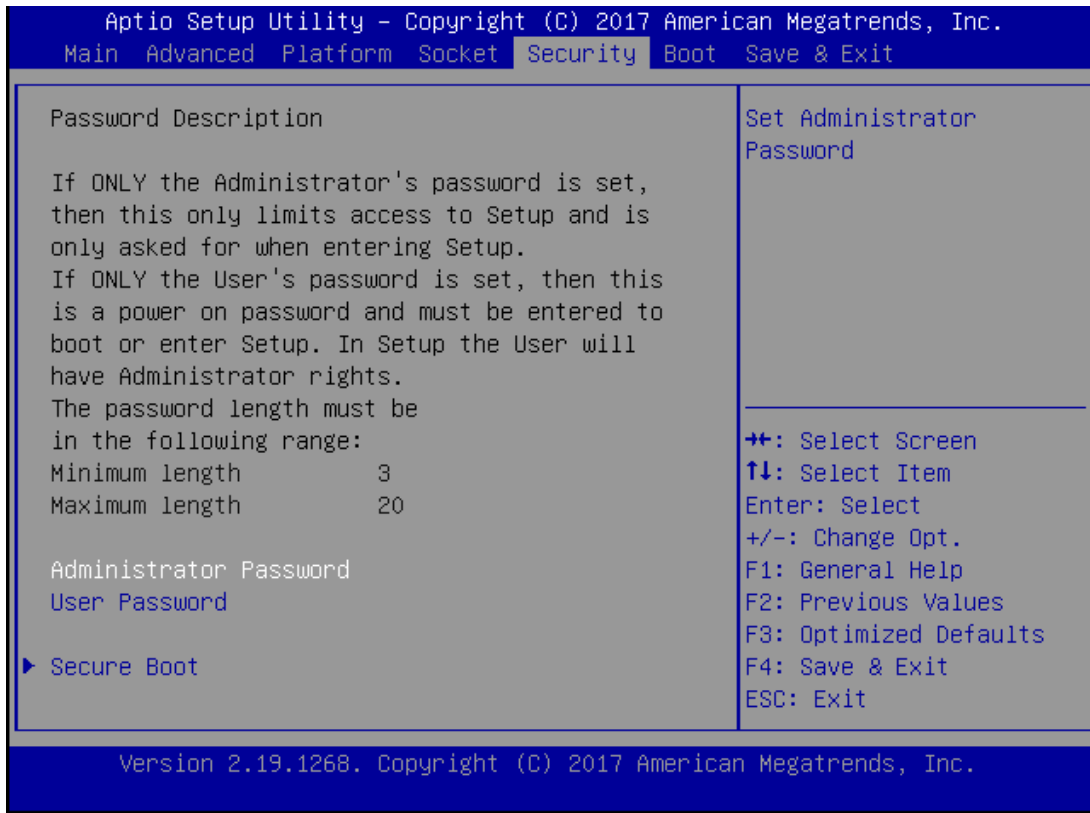
SCC Configuration

```

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
Chipset
-----
SCC eMMC Support      [Enable]      Enable/Disable SCC eMMC
(D28:F0)                                     Support
eMMC Max Speed       [HS400]
-----
++: 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.
AB
    
```

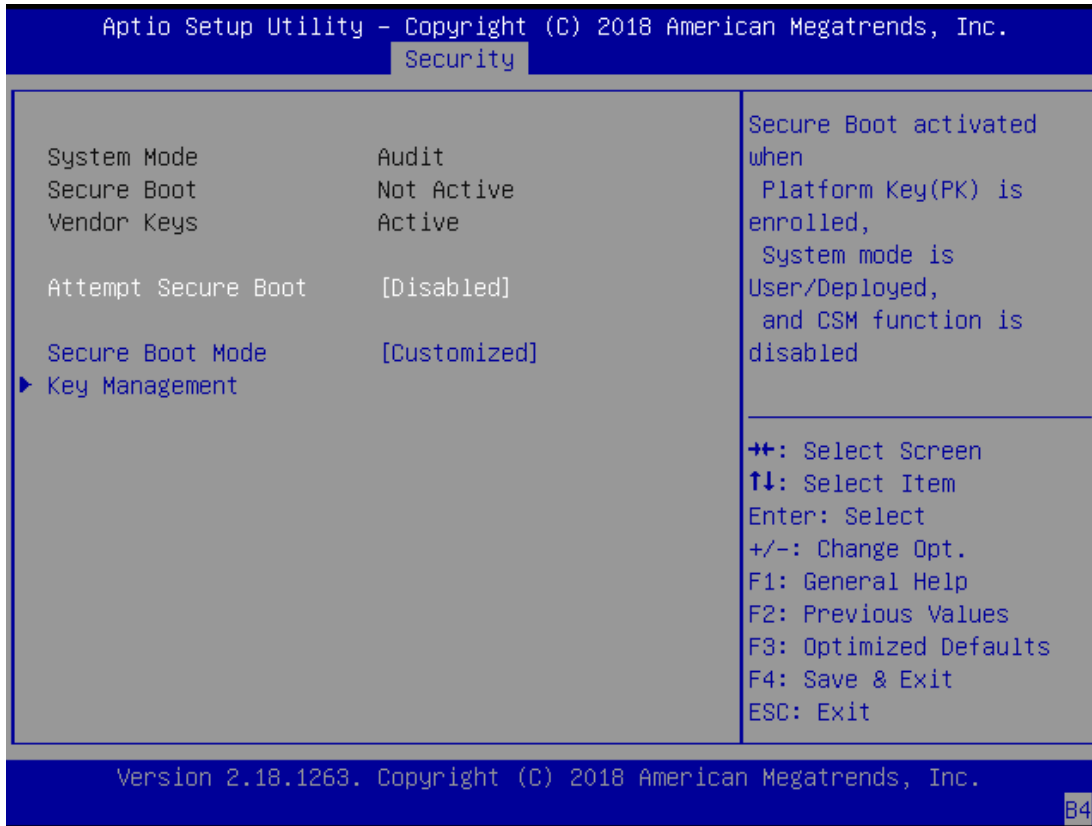

Security

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.



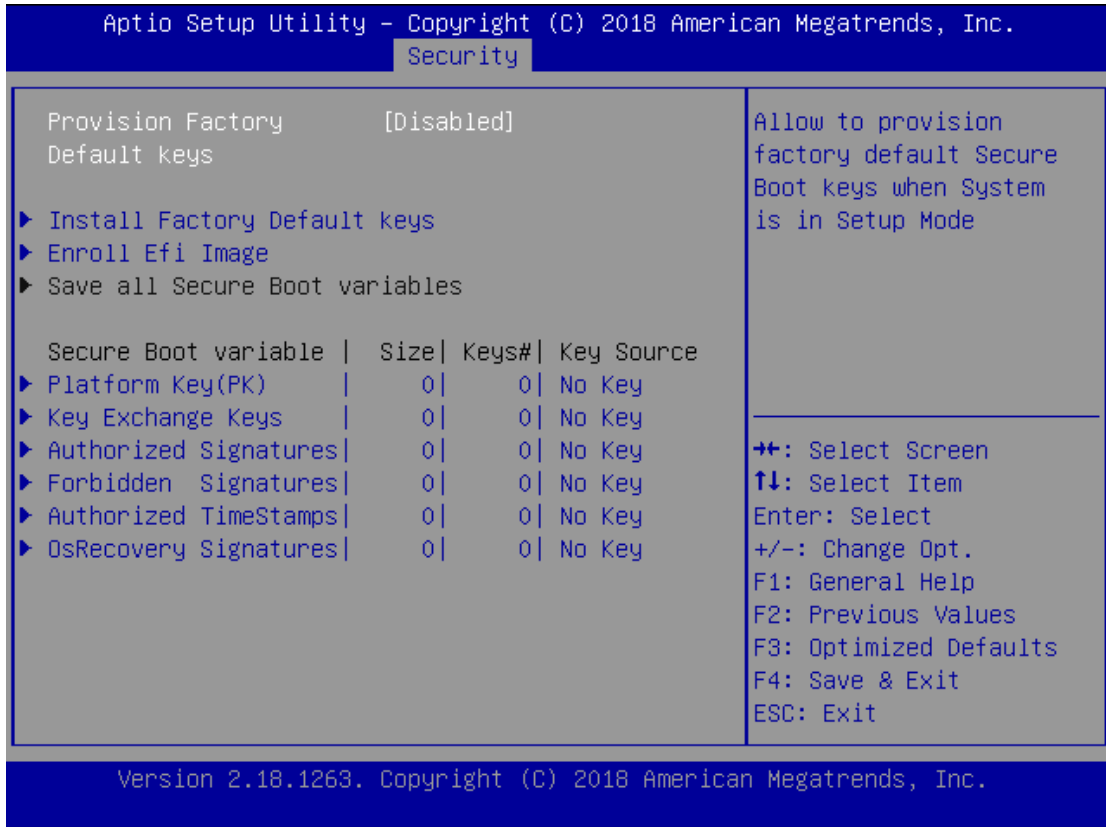
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the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

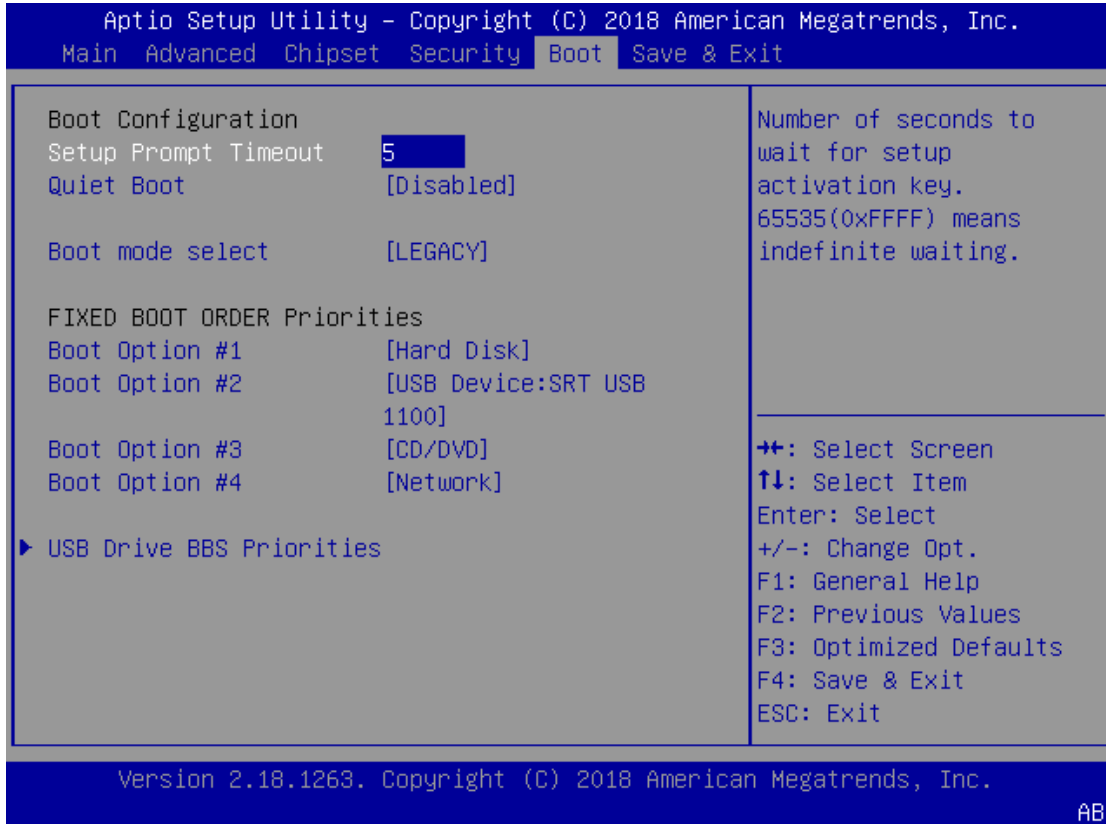
Key Management



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.



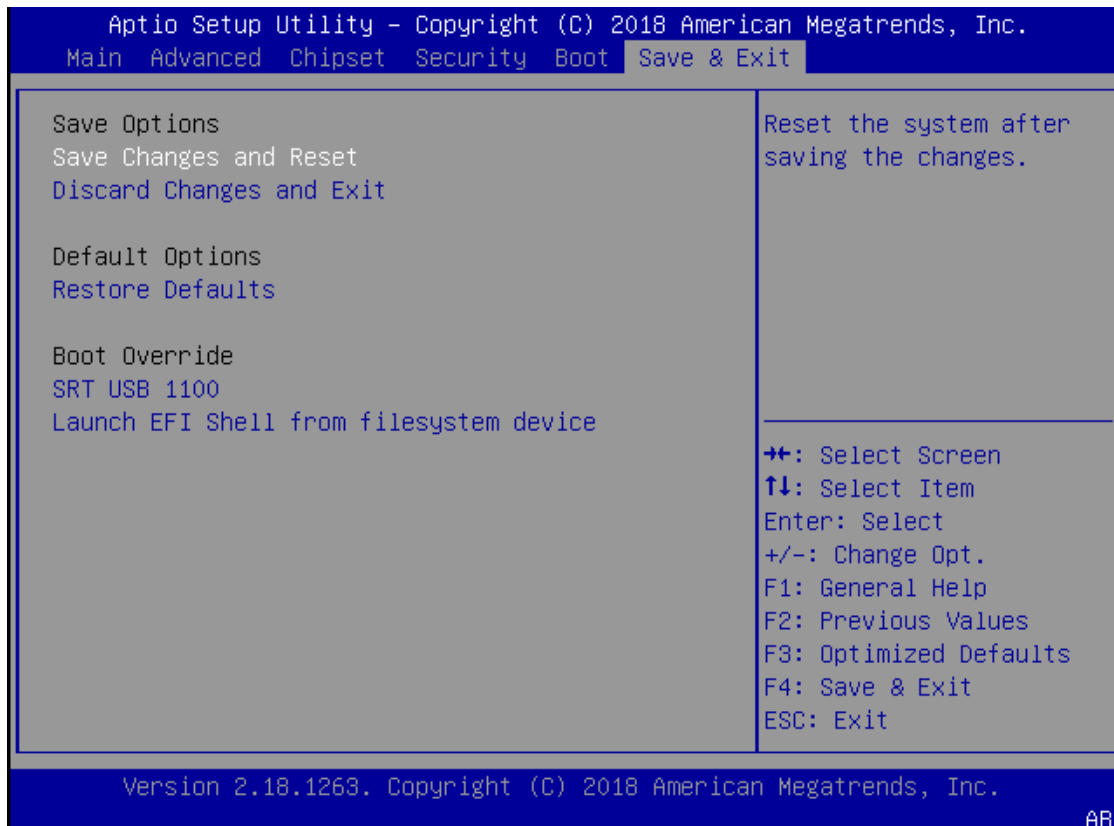
Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Quiet Boot	Disabled Enabled	Enable or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL	Select boot mode for LEGACY or UEFI.

Choose boot priority from boot option group.

Choose specifies boot device priority sequence from available Group device.

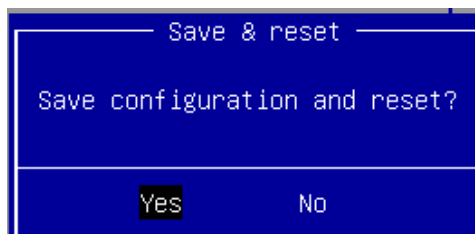
Save and Exit Menu

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.



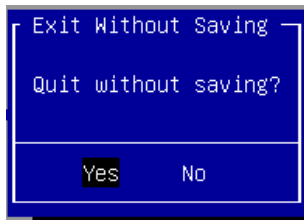
■ Save Changes and Reset

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.



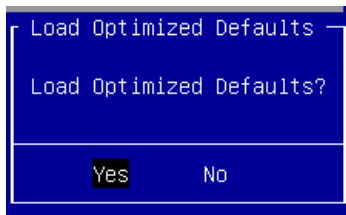
■ Discard Changes and Exit

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 items under Boot Override were not same with image. It should depend on devices connect on system.

PS: The items under Boot Override were not same with image. It should depend on devices connect on system.

CHAPTER 4: 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.

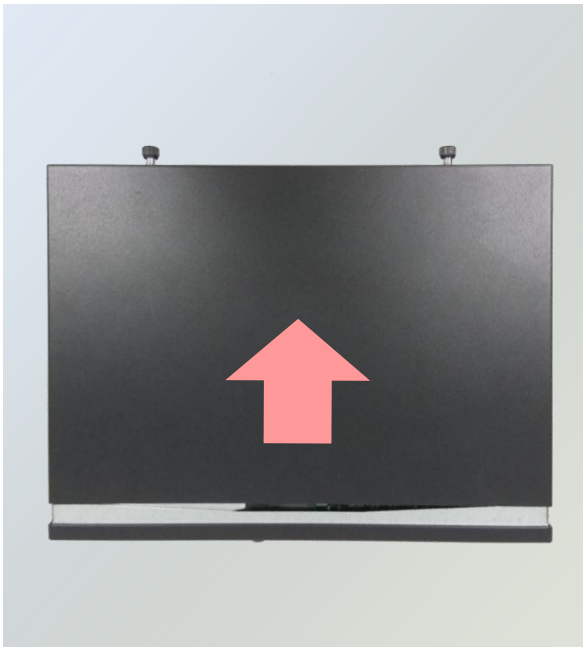
In light of the motherboard layout arrangement, the installation of the M.2 card, DDR4 memory, and Wireless module should be prior to that of the 3.5" hard disk.

Opening the Chassis

1. Loosen the **TWO** screws (indicated in the photos) that fix this unit's top cover and the rear panel.



2. Pull the top cover panel open horizontally, and then lift to remove it.

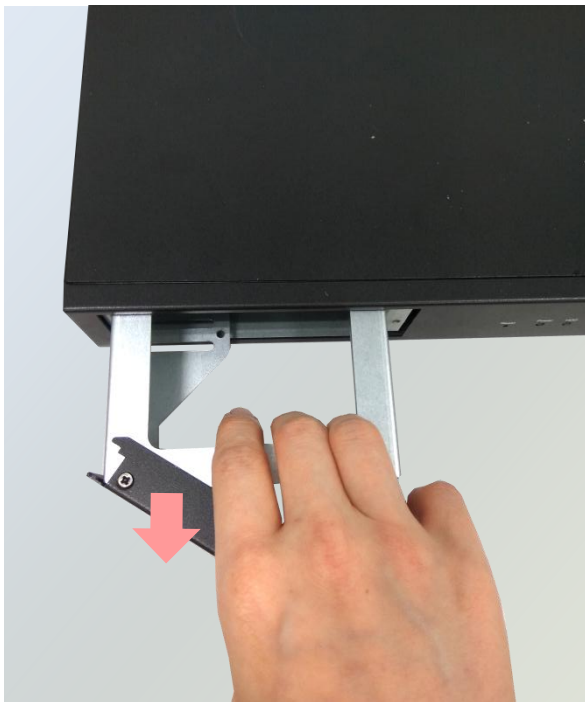


Installing 3.5" Hard Disk

1. Loosen the screw that fixes the hard disk tray latch on the front panel.



2. Pull the tray out.



3. Secure the hard disk on the tray with **three** screws on each side. Make sure the SATA Connector faces outward.

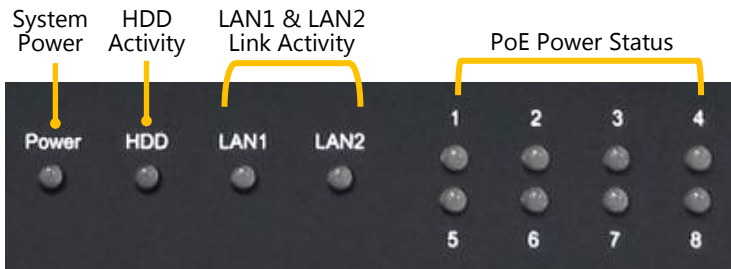


4. Insert the tray into the bay and fasten the screw that fixes the hard disk tray on the front panel.



APPENDIX A: LED INDICATOR EXPLANATIONS

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



► **System Power**

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

► **HDD Activity**

Green	A hard disk is detected
Red	Hard disk error
Off	No hard disk is detected

► **LAN1 & LAN2 Link Activity**

Blinking Green	Operating as a Gigabit connection (1000 Mbps)
Orange	Operating as a 100-Mbps connection
Off	No link has been established

► **PoE Power Status**

Blinking Green	The port is providing PoE power
Orange	Controlled by GPIO
Off	No power is being drawn from this port

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 in Step 2 for the 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	I210IT / I210IS
Download Type	Drivers
Operating System	Linux*
Product page	https://downloadcenter.intel.com/product/64402/Intel-Ethernet-Controller-I210-IT 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