

Lanner

Industrial Communication Platforms

Energy Management and Industrial Cyber Security Solutions

LEC-3340 User Manual

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About this Document

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

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

The latest version of this document can be found on Lanner's official website, available either through the product pages or through the [Lanner Download Center](#) page with a login account and password. (Please be registered for a Lanner Account at <http://www.lannerinc.com/> to access published documents and downloadable resources)



Conventions & Icons

This document utilizes different font types and icons to make the selected text more transparent and explicable to users. Please note that this document contains the following conventions:

Font Conventions

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

Icon Descriptions

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

Online Resources

The listed websites are links to online product information.

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

Technical Support

In addition to contacting your distributor or sales representative, you could use other available methods to get support from Lanner:

Submitting a Ticket

Visit the **Lanner Technical Support** page at <http://www.lannerinc.com/technical-support> where you can fill in a support ticket to our technical support department.

Calling Us

Toll-Free phone support is offered to our customers in the United States and Canada:

+1-855-852-6637

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Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

- ▶ Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- ▶ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.



Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free during and after installation.
- ▶ Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- ▶ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- ▶ Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit; always check the circuit.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- ▶ Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- ▶ Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- ▶ Portez des lunettes de sécurité pour protéger vos yeux.
- ▶ N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- ▶ Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- ▶ Ne travaillez pas seul si des conditions dangereuses sont présentes.
- ▶ Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Lithium Battery Caution

- ▶ There is risk of Explosion if Battery is replaced by an incorrect type.
- ▶ Dispose of used batteries according to the instructions.
- ▶ Installation only by a skilled person who knows all Installation and Device Specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ Please conform to your local laws and regulations regarding safe disposal of lithium BATTERY.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.

- ▶ Leaving a battery in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

Avertissement concernant la pile au lithium

- ▶ Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- ▶ Jetez les piles usagées conformément aux instructions.
- ▶ L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- ▶ Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

Operating Safety

- ▶ Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- ▶ Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- ▶ Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- ▶ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- ▶ Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- ▶ L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- ▶ Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- ▶ Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du

retrait et du remplacement de composants.

- ▶ Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- ▶ Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation 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.

Electrical Safety Instructions

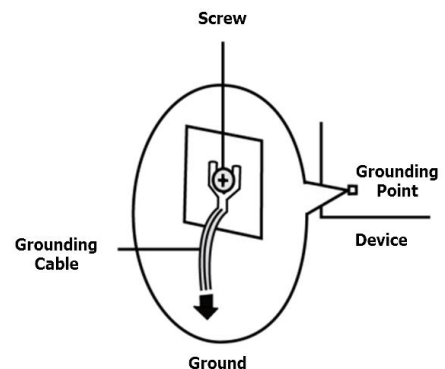
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

Consignes de sécurité électrique

- ▶ Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- ▶ Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- ▶ Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- ▶ Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm² ou 10 AWG.

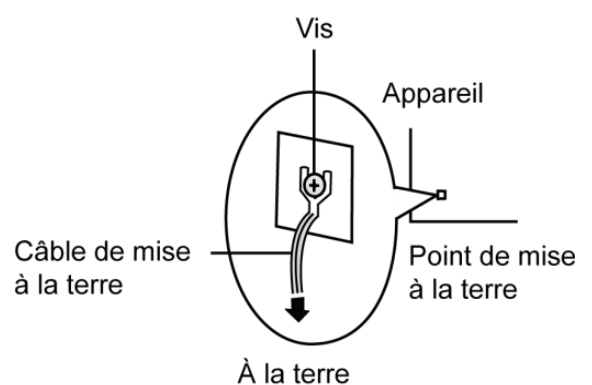
Grounding Procedure for Power Source

- ▶ Loosen the screw of the earthing point.
- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before power.
- ▶ The cable should be 16 AWG



Procédure de mise à la terre pour source d'alimentation

- ▶ Desserrez la vis du terminal de mise à la terre.
- ▶ Branchez le câble de mise à la terre à la terre.
- ▶ L'appareil de protection pour la source d'alimentation doit fournir 30 A de courant.
- ▶ Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation.
- ▶ Le câble doit être 16 AWG





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

注意：要断开电源，请将所有电源线从本机上拔下。

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

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

- ▶ This equipment must be grounded.
Cet équipement doit être mis à la terre.

- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

- ▶ The machine can only be used in a restricted access location and has installation instructions by a skilled person.
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

TABLE OF CONTENTS

Chapter 1: Product Overview 11

Key Features	11
Ordering Information	11
Package Content.....	11
System Specifications	12
Physical Overview.....	13
Motherboard Information.....	15

Chapter 2: Hardware Installation..... 21

Installing the PCIe Modules.....	21
Installing the Hard Disk.....	22

Chapter 3: BIOS Setup 23

Main.....	24
Advanced.....	25
Chipset Page	40
Security.....	45
Boot Menu.....	46
Save and Exit Menu	47

Appendix A: Installing Intel® LAN Controller Driver for Linux..... 49

Appendix B: Terms and Conditions 50

Warranty Policy	50
RMA Service.....	50
RMA Service Request Form	51

CHAPTER 1: PRODUCT OVERVIEW

LEC-3340, a 3U rackmount industrial edge consolidation server, is powered by Intel® Xeon® E3-1505L V6, or Core™ i5-7442EQ (formerly Kaby Lake-H) processor, to offer outstanding performance. Designed to be robust, LEC-3340 is IEC-61850 and IEEE 1613 compliant. This industrial-grade edge consolidation server provides rich I/O functions, including 4x PCIe slots, 4x RJ-45 GbE LAN ports, 5x USB 3.0 ports, 2x 2.5" swappable drive bays, DP/DVI display port and 2x isolated COM ports.

Key Features

- ▶ IEC 61850-3 and IEEE 1613 compliant
- ▶ Support Intel® Xeon® E3-1505L V6 or i5-7442EQ CPU (Codename Kaby Lake-H)
- ▶ Optional dual power supplies
- ▶ Rich I/O: 4x PCIe slots, 4x GbE RJ45 ports, 5x USB 3.0, 2x 2.5" Swappable Drive Bays
- ▶ Support DP and DVI display and 2x Isolated COM ports
- ▶ Wide temperature range (-40~70°C)
- ▶ Support 2x SO-DIMM DDR4 ECC memory up to 32GB
- ▶ Fanless design with corrugated aluminum
- ▶ Rack mountable 3U form factor
- ▶ Optional TPM 2.0 support

Ordering Information

SKU No.	Main Features
LEC-3340A	IEC 61850-3 Compliant Rackmount Controller System for Power Substation Support Intel® Xeon® E3-1505L V6 CPU, Dual PSU AC+DC
LEC-3340B	IEC 61850-3 Compliant Rackmount Controller System for Power Substation Support Intel® Xeon® E3-1505L V6 CPU, Dual PSU 2xDC
LEC-3340C	IEC 61850-3 Compliant Rackmount Controller System for Power Substation Support Intel® Core i5-7442EQ CPU, Dual PSU AC+DC



Note: If any component should be missing or damaged, please contact your dealer immediately for assistance.

Package Content

Your package contains the following items:

- ▶ 1x LEC- 3340

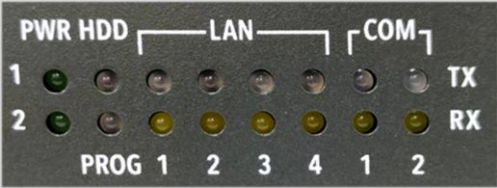
System Specifications

Processor System	Processor Options	Intel® Xeon® E3-1505L V6, or Core i5-7442EQ CPU
	Frequency	2.2 GHz or 2.9 GHz
	Core Number	Intel Xeon E3-1505L V6/Core i5-7442EQ: Quad core
	Chipset	Intel® CM238
	BIOS	AMI SPI Flash BIOS
Memory	Technology	DDR4 ECC
	Max. Capacity	32 GB
	Socket	2x 260-pin SODIMM
Ethernet	Controller	Intel® I210IT
	Speed	Either 1000 Mbps or 10/100 Mbps
	Interface	4x 1000Base-T GbE RJ45 ports
Power		Dual power: 2x DC or DC+AC AC: 100-240VAC, 47-63 Hz 2.5A DC: 16.6-160VDC, 6.95-0.69A
I/O Interface	Serial Port	<ul style="list-style-type: none"> ● 2x DB9 Male (COM1/COM2) on board with isolation supports software selectable RS-232/422/485 ● 1x TTL RS-232 (Reserved) ● Isolation Protection: 2KV Digital Isolation
	USB 3.0	5x type A
	Expansion	1x PCIe x16 slot, 3x PCIe x4 slots
	TPM	TPM 2.0 (Optional)
	LED	2x Power on for LED (Power1/Power2) 1x Storage access LED for mSATA/HDD1/HDD2 4x Double-stack LED for Ethernet 2x Double Stack LED for COM1/COM2 1x Failure LED(User Programmable)
Storage	SATA mSATA	2x 2.5" Swappable HDD/SSD drive bay support RAID0,1 1x mSATA socket
Watchdog Timer		Watchdog timer 256 level time interval system reset, software programmable
Graphics	Controller	Intel® Xeon® E3-1505L V6: HD Graphics P530 Core i5-7442EQ CPU: HD Graphics P630
	Display Interface	DP, DVI-D
Mechanical	Dimension (W x H x D)	438 x 131.8 x 300.1 mm
	Construction	Aluminum + Steel
	Weight	8.5 kg
	Mounting	Rackmount
Environmental	Operating Temperature	-40 ~ 70°C
	Certification temperature	40 °C
	Storage Temperature	-40 ~ 85°C
	Relative Humidity	5% ~ 95%, non-condensing
OS Support	Microsoft Windows	Windows 10 Embedded
	Linux	Kernel 2.6, Ubuntu
Certification	EMC	CE, FCC Class A, UL(compulsory)
	Compliance	EC 61850-3, IEEE 1613 (for power)
	ESD Protection	15KV ESD Protection

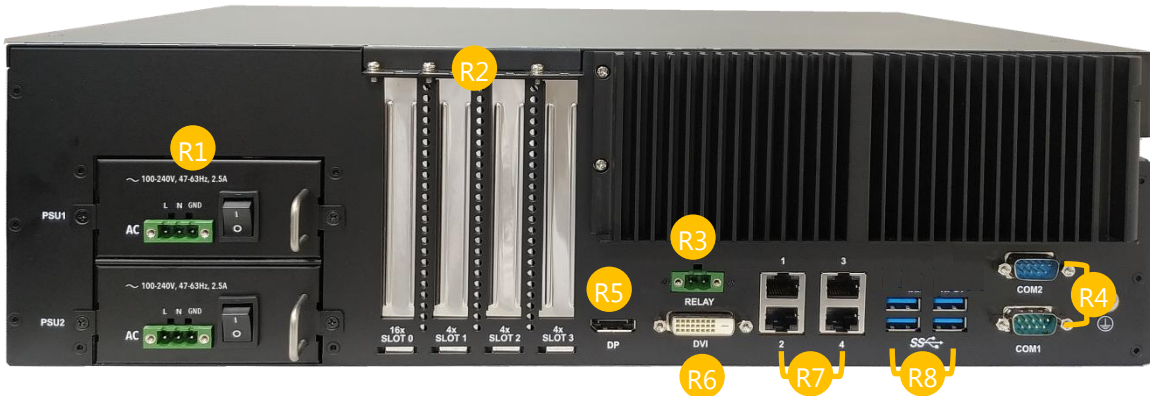
Physical Overview

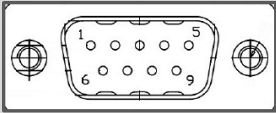
Front Panel



No.	Description																																									
F1	2x 2.5" SATA HDD/SSD Bay																																									
F2	Reset Button																																									
F3	LED Indicator	 <ul style="list-style-type: none"> ▶ PWR: indicates PSU power status <table border="1" data-bbox="598 1099 1193 1200"> <thead> <tr> <th></th> <th>1 (PSU1)</th> <th>2 (PSU2)</th> </tr> </thead> <tbody> <tr> <td>Solid Green</td> <td colspan="2">The system is powered on</td> </tr> <tr> <td>Off</td> <td colspan="2">The system is powered off</td> </tr> </tbody> </table> ▶ HDD: indicates mSATA/HHD1/HHD activities <table border="1" data-bbox="598 1249 1193 1317"> <tbody> <tr> <td>Blinking Green</td> <td>Data access activity</td> </tr> <tr> <td>Off</td> <td>No data access activity</td> </tr> </tbody> </table> ▶ PROG: Failure LED (User Programmable) <table border="1" data-bbox="598 1366 1193 1467"> <tbody> <tr> <td>Solid Green</td> <td>Defined by GPIO</td> </tr> <tr> <td>Solid Red</td> <td>Defined by GPIO</td> </tr> <tr> <td>Off</td> <td>Defined by GPIO</td> </tr> </tbody> </table> ▶ COM: COM1/COM2 status <table border="1" data-bbox="598 1516 1193 1617"> <thead> <tr> <th></th> <th>RX</th> <th>TX</th> </tr> </thead> <tbody> <tr> <td>Solid Yellow</td> <td>Signal Access</td> <td>--</td> </tr> <tr> <td>Solid Green</td> <td>--</td> <td>Signal Access</td> </tr> </tbody> </table> ▶ LAN <ul style="list-style-type: none"> Link <table border="1" data-bbox="598 1711 1369 1877"> <tbody> <tr> <td>Blinking Yellow</td> <td>Link has been established, and there is activity on this port</td> </tr> <tr> <td>Solid Yellow</td> <td>Link has been established, and there is no activity on this port</td> </tr> <tr> <td>Off</td> <td>No link is established</td> </tr> </tbody> </table> Speed <table border="1" data-bbox="598 1921 1369 2022"> <tbody> <tr> <td>Solid Yellow</td> <td>Operating as a Gigabit connection (1000 Mbps)</td> </tr> <tr> <td>Solid Green</td> <td>Operating as a 100-Mbps connection</td> </tr> <tr> <td>Off</td> <td>Operating as a 10-Mbps connection</td> </tr> </tbody> </table> 		1 (PSU1)	2 (PSU2)	Solid Green	The system is powered on		Off	The system is powered off		Blinking Green	Data access activity	Off	No data access activity	Solid Green	Defined by GPIO	Solid Red	Defined by GPIO	Off	Defined by GPIO		RX	TX	Solid Yellow	Signal Access	--	Solid Green	--	Signal Access	Blinking Yellow	Link has been established, and there is activity on this port	Solid Yellow	Link has been established, and there is no activity on this port	Off	No link is established	Solid Yellow	Operating as a Gigabit connection (1000 Mbps)	Solid Green	Operating as a 100-Mbps connection	Off	Operating as a 10-Mbps connection
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F4	1x USB 3.0 Port with key lock																																									

Rear Panel

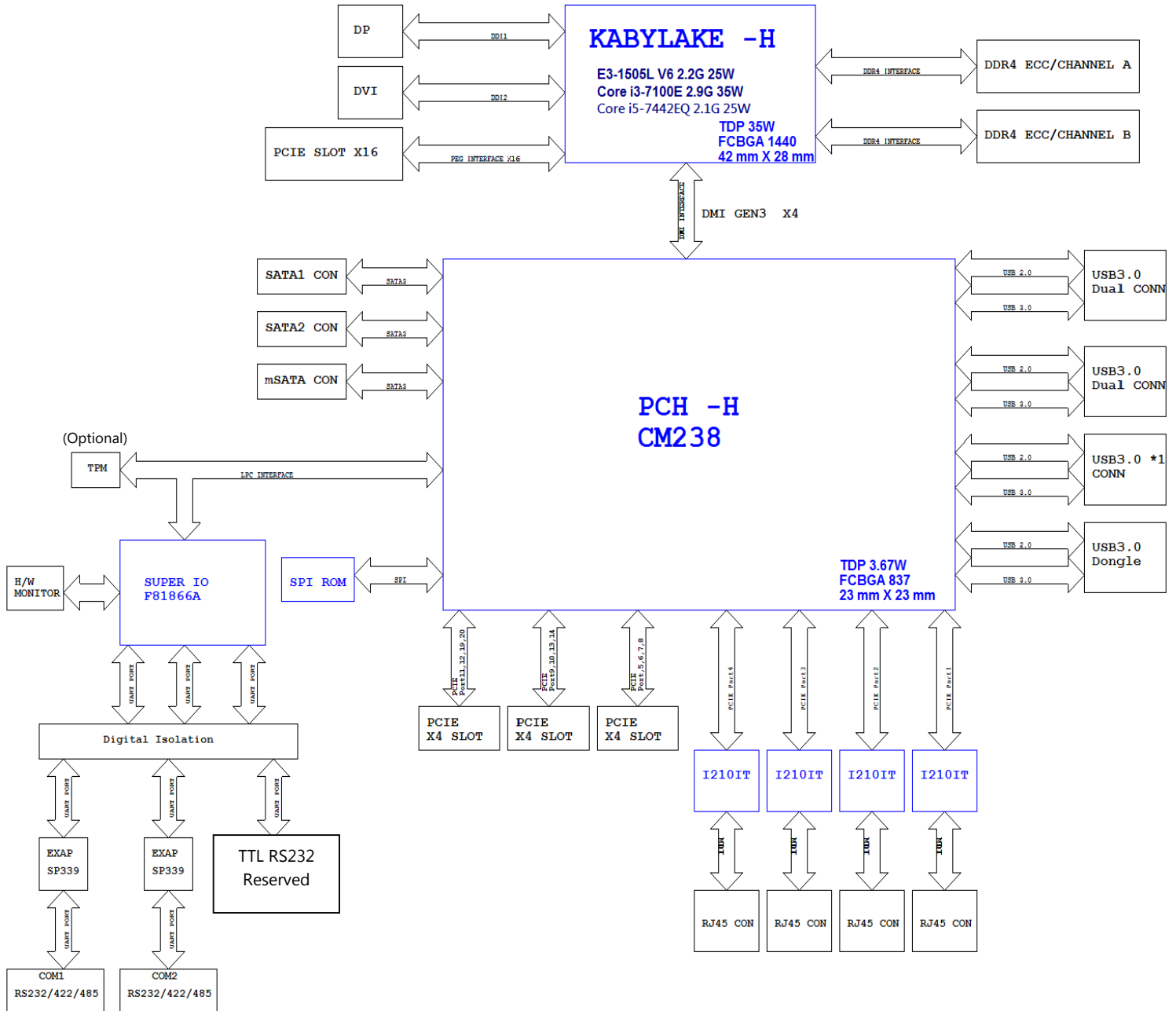


No.	Description																																											
R1	AC/DC Power Supply	2xAC PSU or 2x DC PSU																																										
R2	PCIe Slot	1x PCIe x16 slot + 3x PCIe x4 slot (from left to right: x16, x4, x4, x4) Note: The overall power consumption of all slots shall not exceed 35W																																										
R3	Relay Output	1x Relay out for power failure alarm																																										
R4	COM Port	<p>2x DB9 for RS-232/422/485 with isolation</p>  <table border="1"> <thead> <tr> <th>Pin No.</th> <th>Description</th> <th>Pin No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DCD#</td> <td>6</td> <td>DSR#</td> </tr> <tr> <td>2</td> <td>RXD</td> <td>7</td> <td>RTS#</td> </tr> <tr> <td>3</td> <td>TXD</td> <td>8</td> <td>CTS#</td> </tr> <tr> <td>4</td> <td>DTR#</td> <td>9</td> <td>RI#</td> </tr> <tr> <td>5</td> <td>GND</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Pin No.</th> <th>RS-422</th> <th>RS-485</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TXD-</td> <td>DATA-</td> </tr> <tr> <td>2</td> <td>TXD+</td> <td>DATA+</td> </tr> <tr> <td>3</td> <td>RXD+</td> <td></td> </tr> <tr> <td>4</td> <td>RXD-</td> <td></td> </tr> <tr> <td>5</td> <td>GND</td> <td>GND</td> </tr> </tbody> </table>	Pin No.	Description	Pin No.	Description	1	DCD#	6	DSR#	2	RXD	7	RTS#	3	TXD	8	CTS#	4	DTR#	9	RI#	5	GND			Pin No.	RS-422	RS-485	1	TXD-	DATA-	2	TXD+	DATA+	3	RXD+		4	RXD-		5	GND	GND
Pin No.	Description	Pin No.	Description																																									
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3	RXD+																																											
4	RXD-																																											
5	GND	GND																																										
R5	DP Port	Resolution: 4096x2304@60Hz																																										
R6	DVI-D Port	Resolution: 1920x1080@60Hz																																										
R7	RJ45 Port	4x RJ-45 GbE LAN port with i210IT																																										
R8	USB Port	4x USB3.0 Port																																										

Motherboard Information

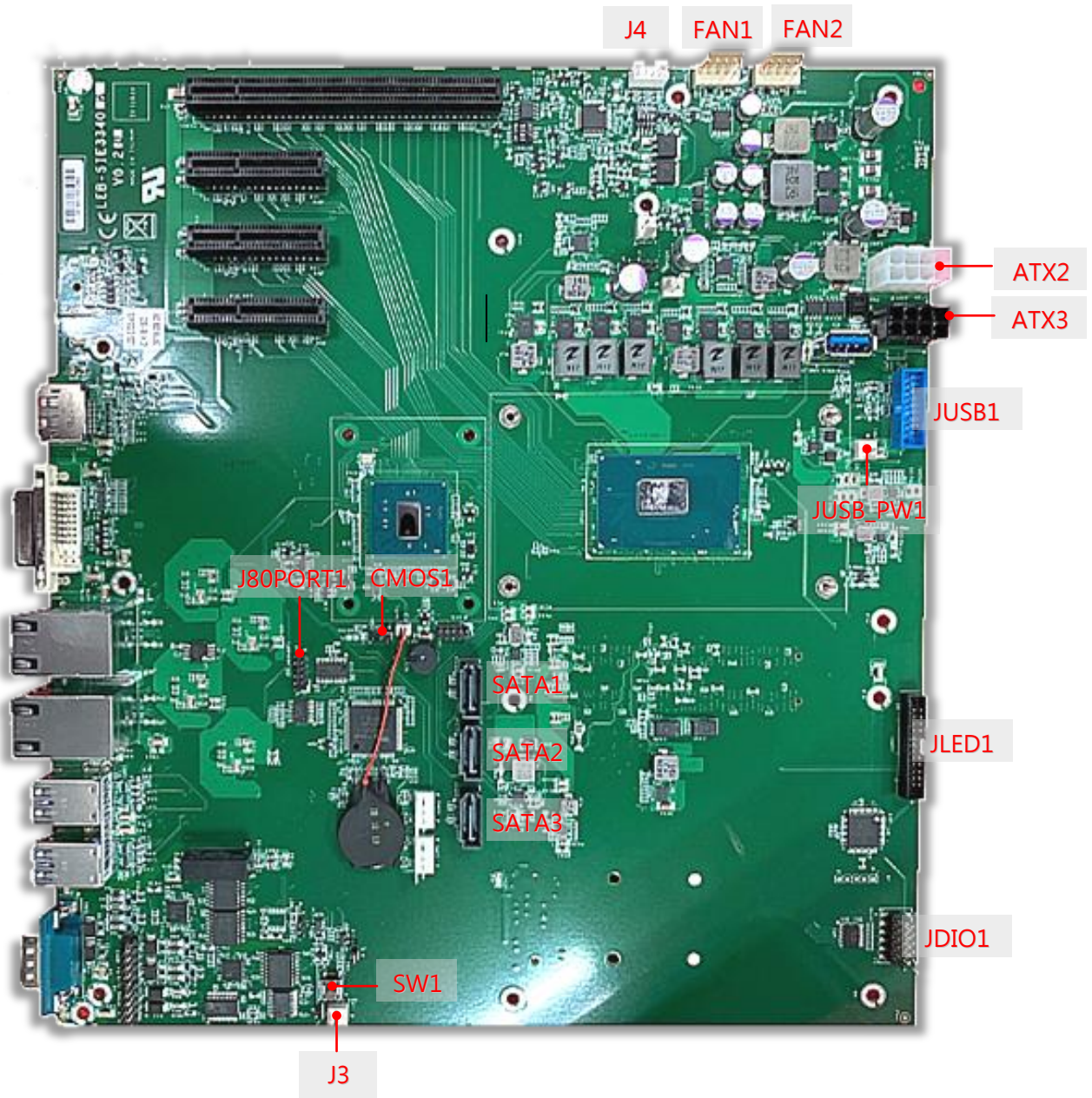
Block Diagram

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

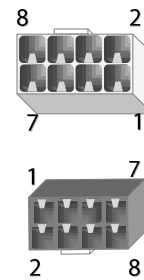
The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.



Connector Pin Assignment

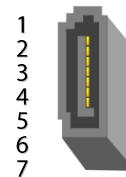
ATX2&ATX3: 8 pin Power Connector

Pin	Description	Pin	Description
1	Ground	2	12V
3	Ground	4	12V
5	Ground	6	12V
7	Ground	8	12V



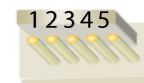
SATA1 & SATA2 & SATA3: 180° SATA Connector (with SATA DOM)

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



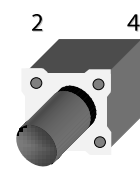
FAN1~2: FAN Connector

Pin	Description	Pin	Description
1	GND	2	12V
3	RPM Sense	4	RPM Sense
5	PWM Status		



SW1: PSON power switch for debug

Pin	Description	Pin	Description
1	GND	2	GND
3	FP_SWIN_R	4	FP_SWIN_R



JUSB_PW1: JUSB1 Power

Pin	Description	Pin	Description
1	USB5_PW	2	USB_POWER



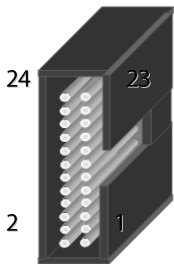
J3: PSON power switch for debug

Pin	Description	Pin	Description
1	GND	2	FP_SWIN_R



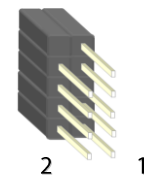
JLED1: Led

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	3V	2	3V	3	HDD_LED_N	4	PCH_SYS_RESET_N
5	STATUS_GLED#	6	STATUS_RLED#	7	LAN1_L1000_N_R	8	LAN1_L100_N_R
9	LAN2_L1000_N_R	10	LAN1_ACTLED_N	11	LAN3_L1000_N_R	12	LAN2_L100_N_R
13	LAN4_L1000_N_R	14	LAN2_ACTLED_N	15	RX_COM1	16	LAN3_L100_N_R
17	TX_COM1	18	LAN3_ACTLED_N	19	RX_COM2	20	LAN4_L100_N_R
21	TX_COM2	22	LAN4_ACTLED_N	23	GND	24	GND



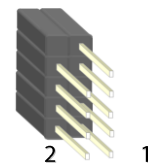
COM3: COM2 PORT

Pin	Description	Pin	Description
1	NDCD	2	NDSR
3	NRXD	4	NRTS
5	NTXD	6	NCTS
7	NDTR	8	NRI
9	GND		



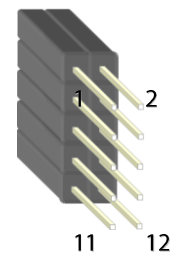
COM2: RS-232 Port

Pin	Description	Pin	Description
1		2	
3	NRXD	4	NRTS
5	NTXD	6	NCTS
7		8	
9	GND		





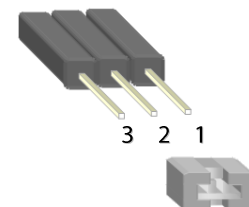
JDIO1 : IO power

Pin	Description	Pin	Description
1	5V	2	5V(S5)
3	GPO_B_0	4	GPI_B_0
5	GPO_B_1	6	GPI_B_1
7	GPO_B_2	8	GPI_B_2
9	GPO_B_3	10	GPI_B_3
11	Ground	12	Ground



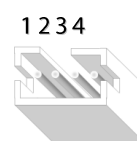
CMOS1: CLEAR CMOS

Pin	Description	Pin	Description
1.2		2.3	
	Normal (Default)		Clear CMOS
3 2 1		3 2 1	



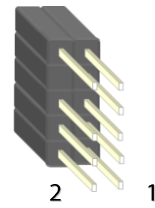
J4: MCU Firmware Update

Pin	Description	Pin	Description
1	GND	2	TX_P
3	TX_M	4	GND



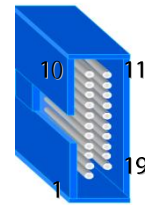
J80PORT1: 80Port Debug

Pin	Description	Pin	Description
1	CLK	2	LAD1
3	RST-	4	LAD0
5	LRAME-	6	POWER
7	LAD3	8	
9	LAD2	10	GND



JUSB1: USB 3.0

Pin	Description	Pin	Description
1	5V	11	NC
2	RX-	12	NC
3	RX+	13	GND
4	GND	14	NC
5	TX-	15	NC
6	TX+	16	GND
7	GND	17	NC
8	D-	18	NC
9	D+	19	NC
10	NC	20	NC



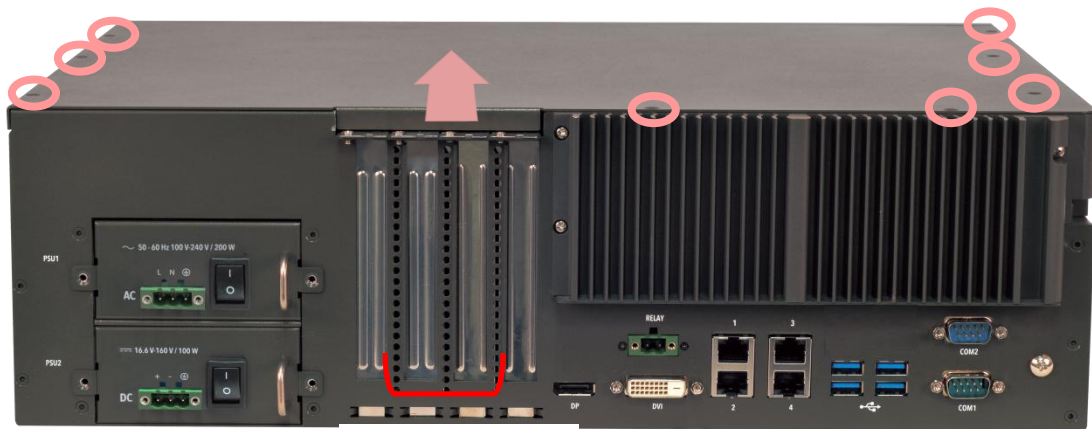
CHAPTER 2: HARDWARE INSTALLATION

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

Installing the PCIe Modules

To install your PCIe modules into the slots on the system's front panel:

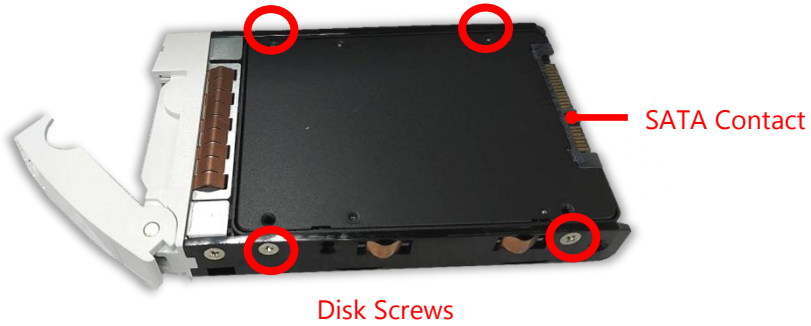
1. Remove the 8 screws that secure the top cover and lift the cover up to remove it.
2. Remove the PCIe Slot cover
3. Insert the PCIe module and make sure it seats well into the socket on the motherboard.
4. Secure the module onto the chassis with a screw.
5. Replace the top cover and secure it with the original 8 screws.



PCIe Slot Cover

Installing the Hard Disk

1. Pull out a hard disk tray, and mount the disk onto the empty tray with 4 disk screws. Please mind the direction of the SATA port, which should be facing outward.



2. To install the mounted disk tray, push the tray into position in the chassis. Press on the hinge tab to close it.



3. After installing the tray, slide down the lock key to lock the tray door.



CHAPTER 3: BIOS SETUP

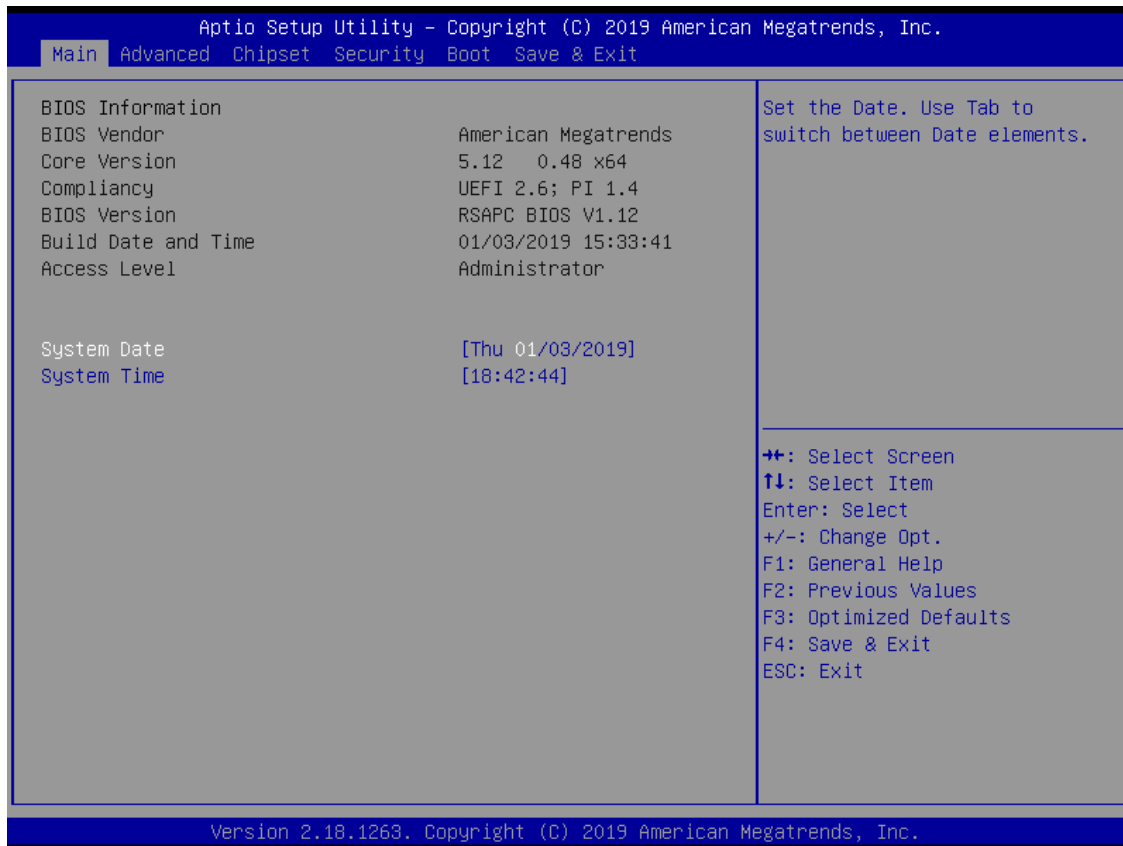
To enter the BIOS setup utility, follow the steps below:

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.

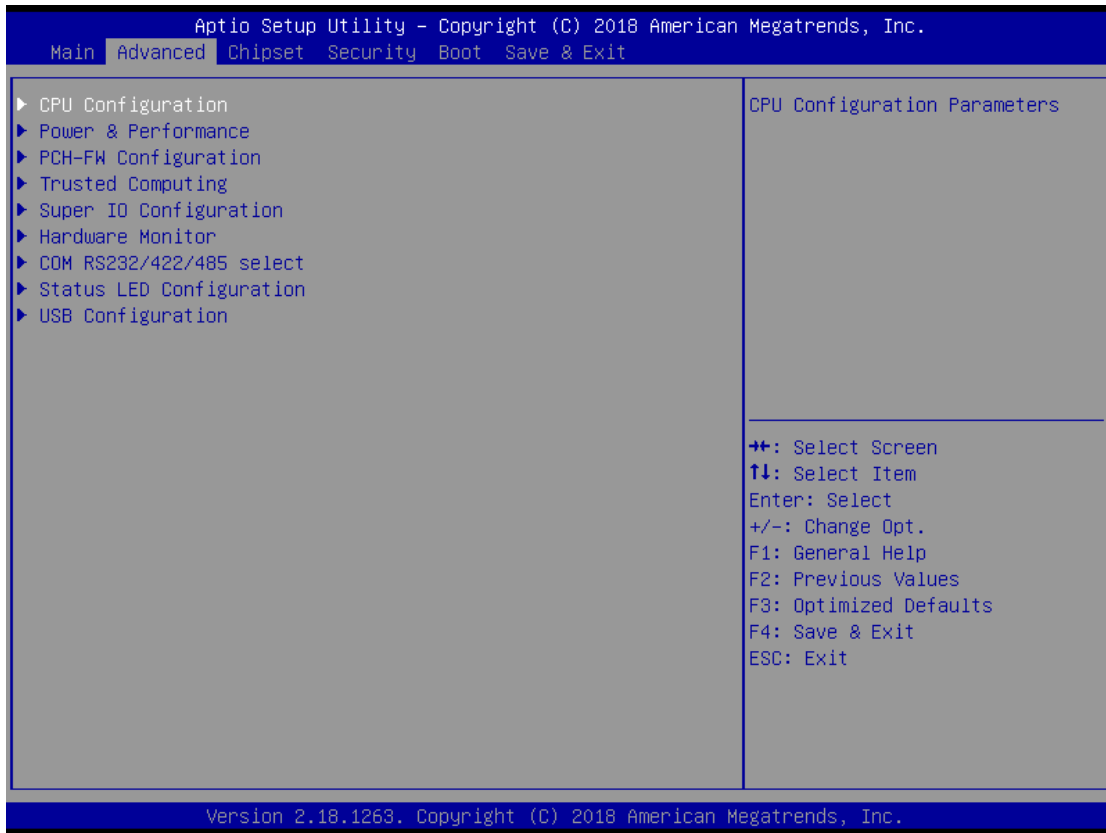


(The screenshots presented in this section are for reference only)

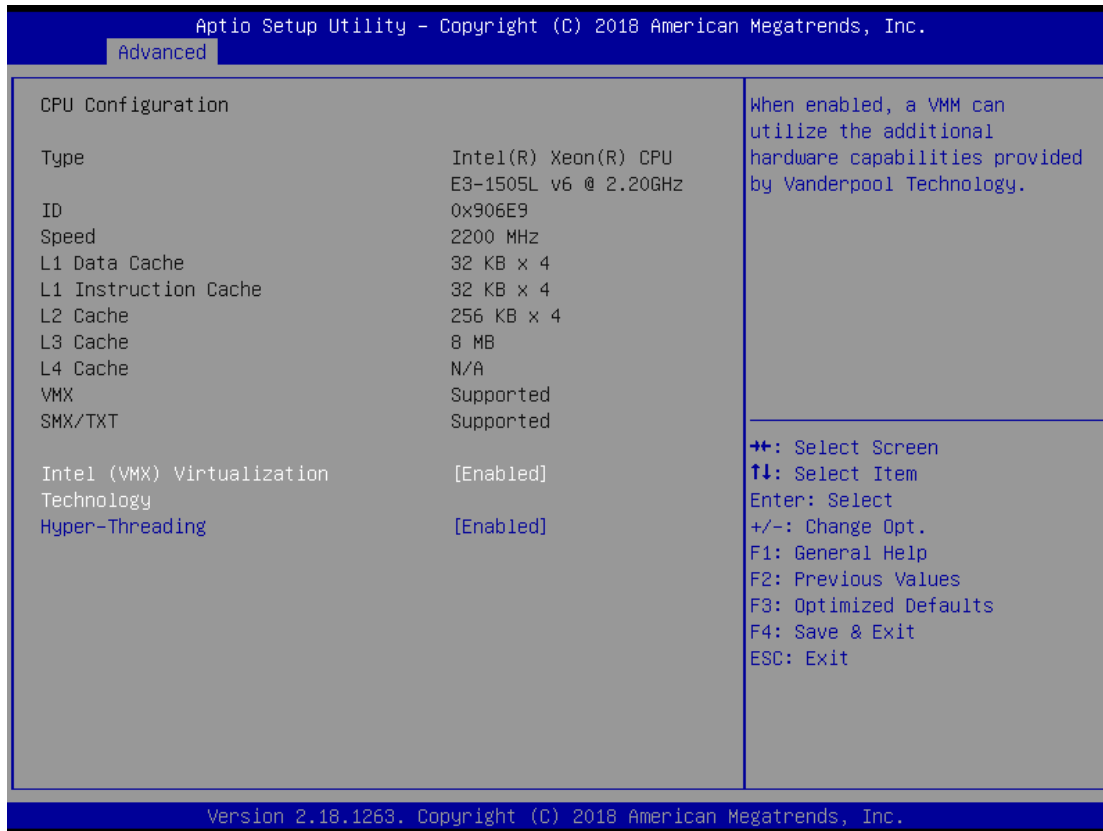
Item	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use <Tab>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

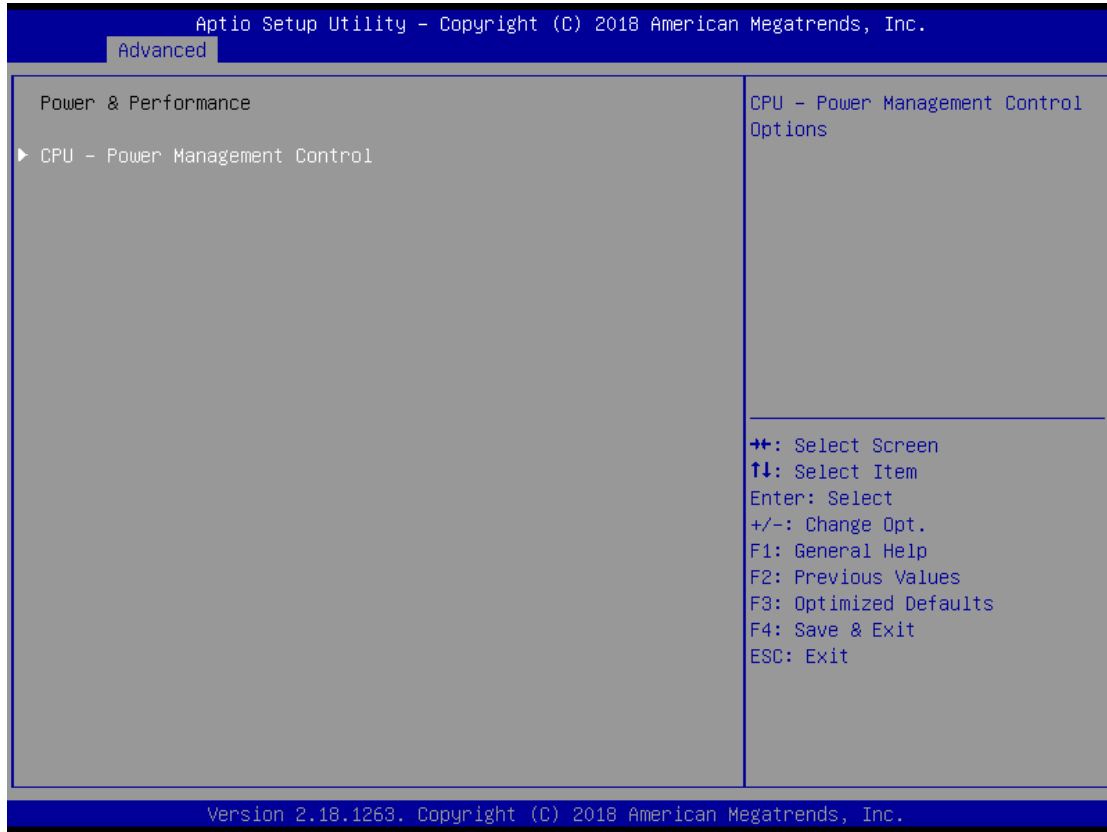


CPU Configuration



1.Feature	2.Options	3.Description
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Hyper-Threading	Disabled Enabled	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).

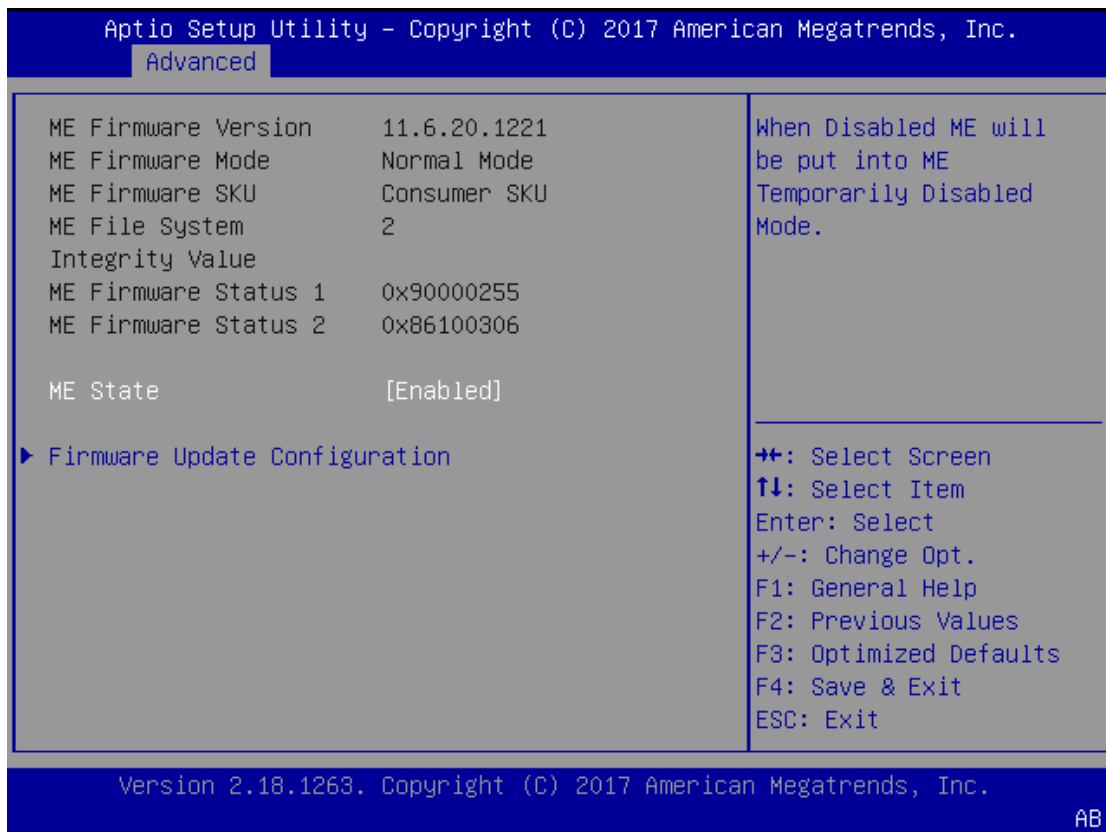
Power & Performance



CPU – Power Management Control

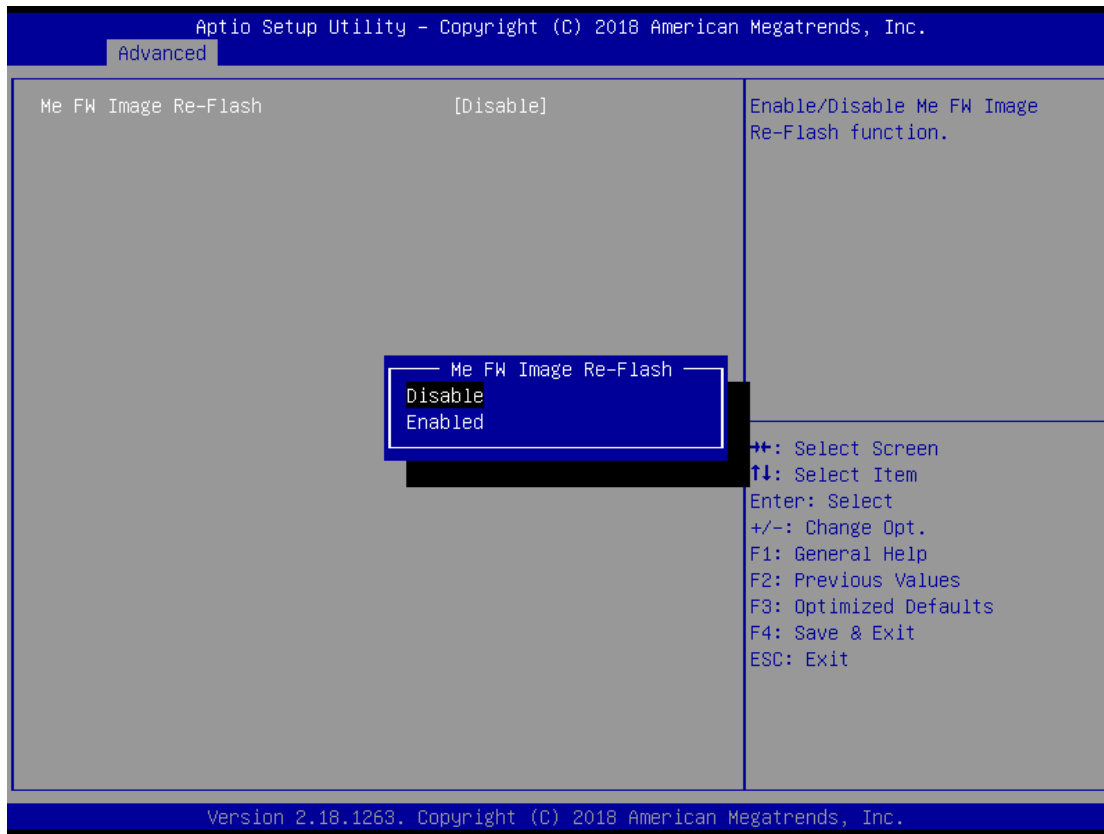
Feature	Options	Description
Intel(R) SpeedStep(tm)	Disabled Enabled	Allows more than two frequency ranges to be supported.
C states	Disabled Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

PCH-FW Configuration



Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode.

Firmware Update Configuration



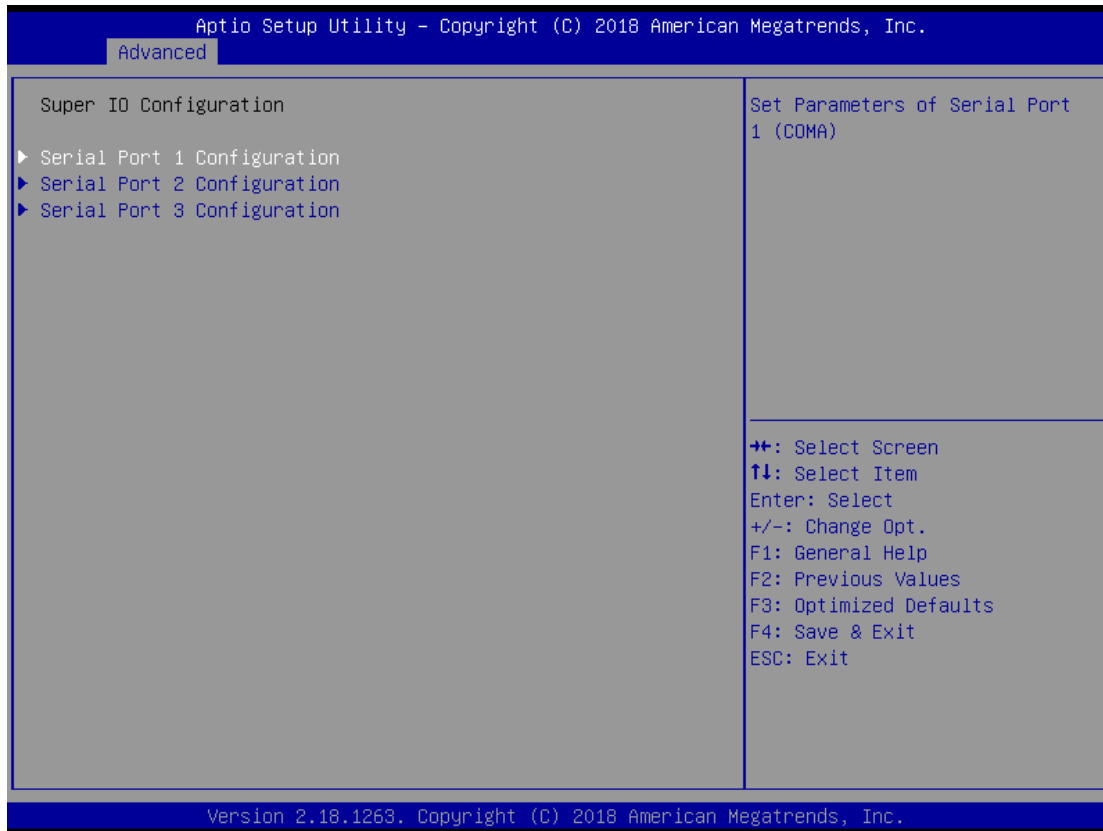
Feature	Options	Description
ME FW Image Re-Flash	Disabled Enabled	Configure Management Engine Technology Parameters

Trusted Computing

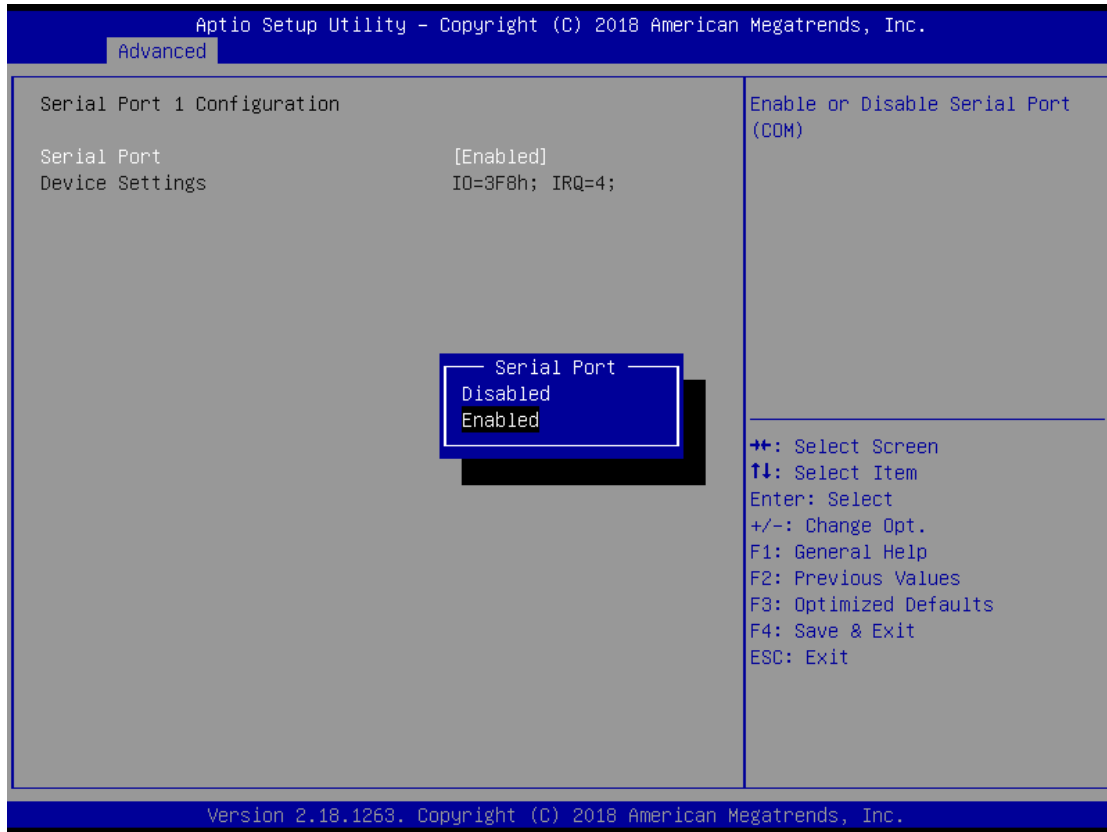


Feature	Options	Description
Security Device Support	Disable Enable	Enables or Disables BIOS support for security device.
SHA-1 PCR Bank	Disabled Enabled	Enable or Disable SHA-1 PCR Bank
SHA256 PCR Bank	Disabled Enabled	Enable or Disable SHA256 PCR Bank
Pending operation	None TPM Clear	Schedule an Operation for the Security Device.
Platform Hierarchy	Disabled Enabled	Enable or Disable Platform Hierarchy
Storage Hierarchy Support	Disabled Enabled	Enable or Disable Storage Hierarchy
Endorsement Hierarchy	Disabled Enabled	Enable or Disable Endorsement Hierarchy
TPM2.0 UEFI Spec Version	TCG_1_2 TCG_2	Select the TCG2 Spec Version Support. TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later
Physical Presence Spec Version	1.2 1.3	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3.
Device Select	TPM 1.2 TPM 2.0 Auto	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, TPM 1.2 devices will be enumerated

Super IO Configuration

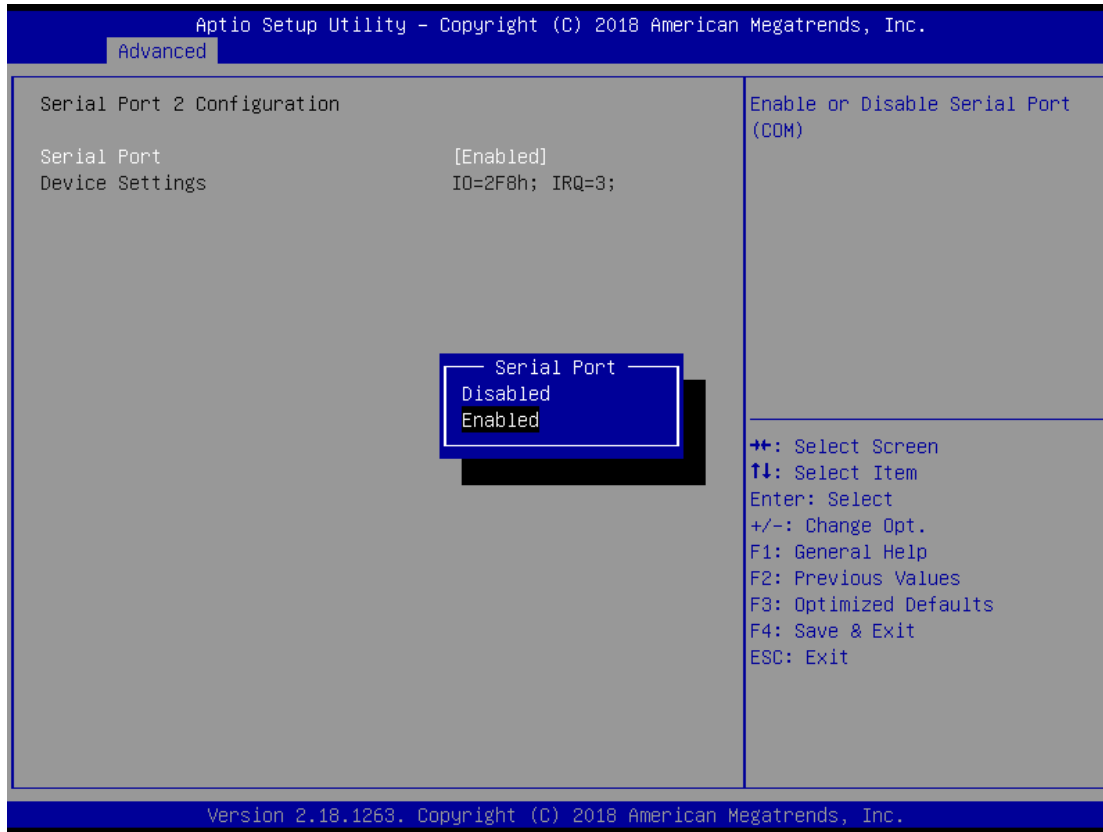


Serial port 1 Configuration



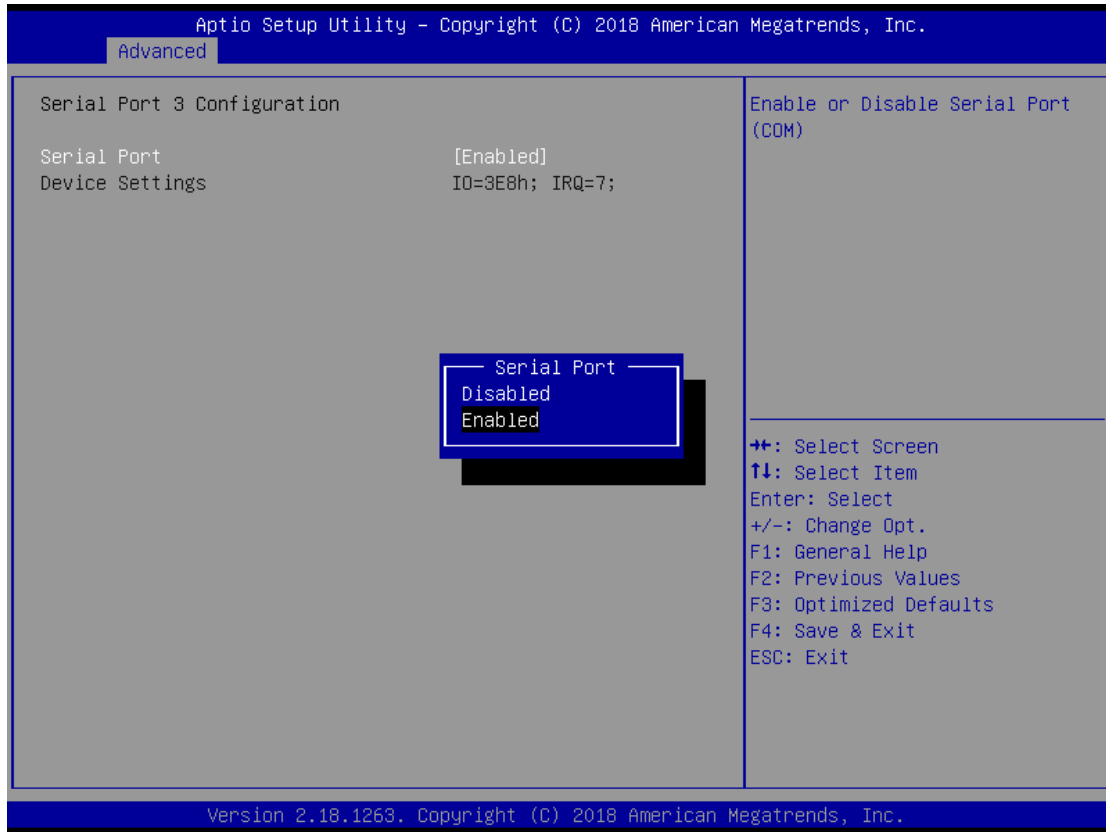
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial port 2 Configuration



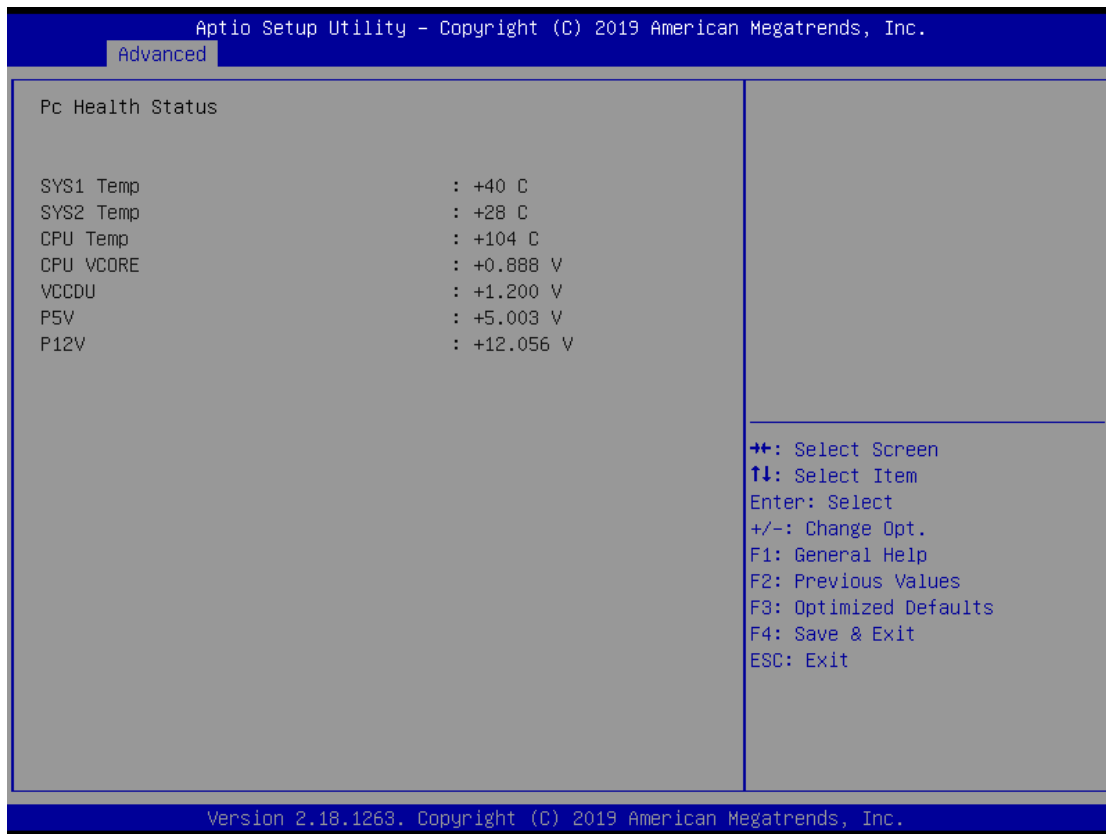
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port 2.
Device Settings	NA	IO=2F8h; IRQ = 3

Serial port 3 Configuration



Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port 3.
Device Settings	NA	IO=3E8h; IRQ = 7

Hardware Monitor



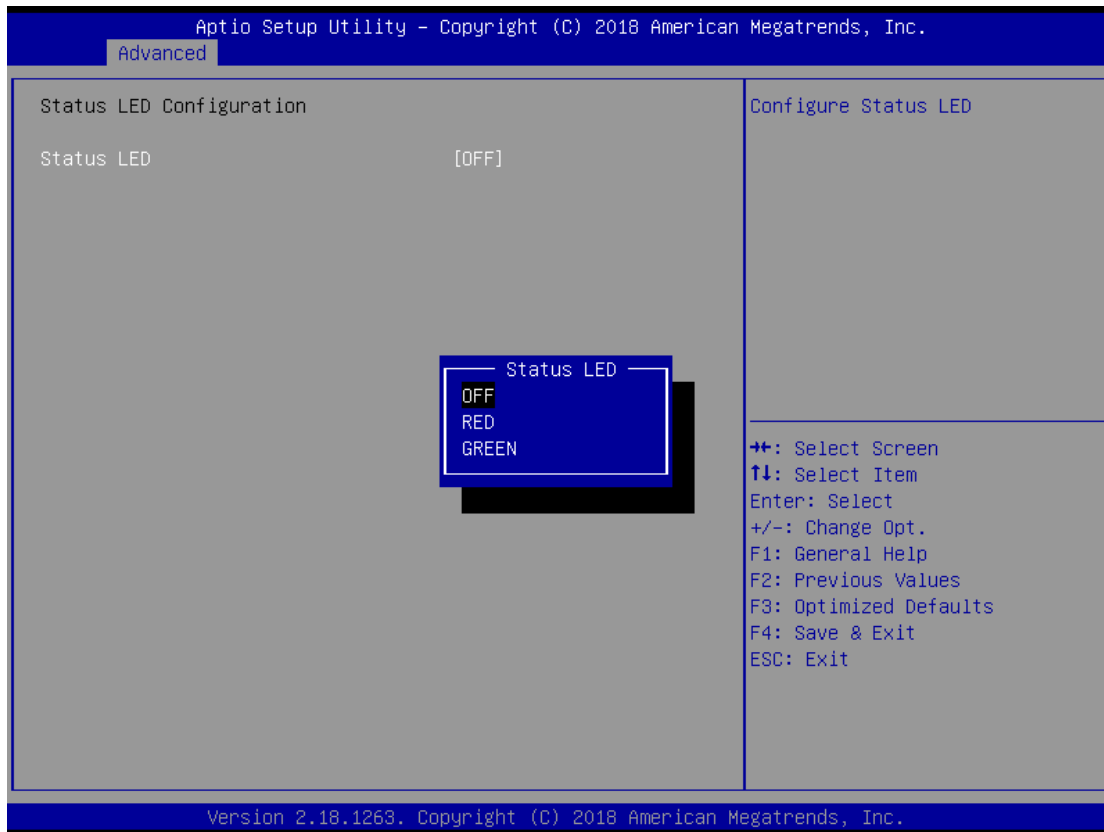
4. Feature	5. Description
SYS1 Temp	This value reports the System1 temperature.
SYS2 Temp	This value reports the System2 temperature.
CPU Temp	This value reports the CPU temperature.
CPU VCORE	This value reports the CPU VCORE.
VCCDU	This value reports the VCCDU.
P5V	This value reports the 5V Input voltage.
P12V	This value reports the 12V Input voltage.

COM RS232/422/485 select



Feature	Options	Description
COM1 MODE	232 485 422	Select COM1 mode as RS232/422/485
COM1 Termination	Enabled Disabled	It can be selected on RS422/485 mode.
COM2 MODE	232 485 422	Select COM2 mode as RS232/422/485
COM2 Termination	Enabled Disabled	It can be selected on RS422/485 mode.

Status LED Configuration



Feature	Options	Description
Status LED	OFF RED GREEN	Configuration Status LED.

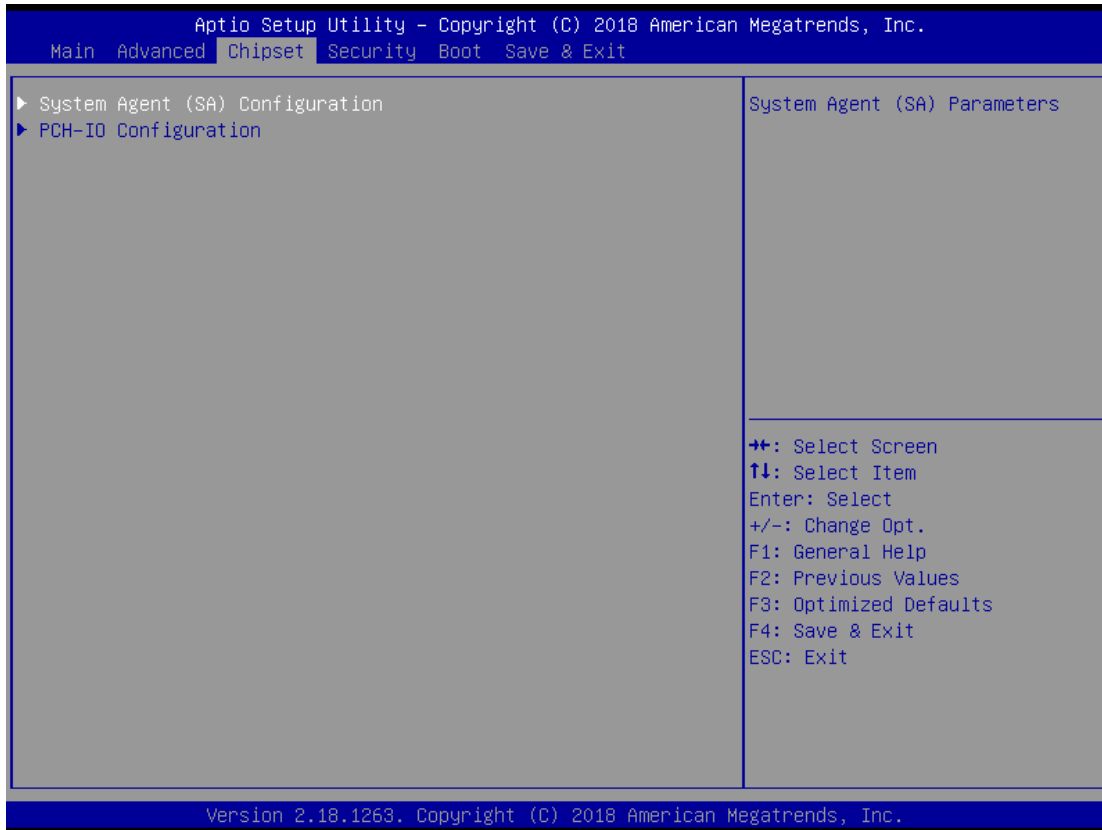
USB Configuration



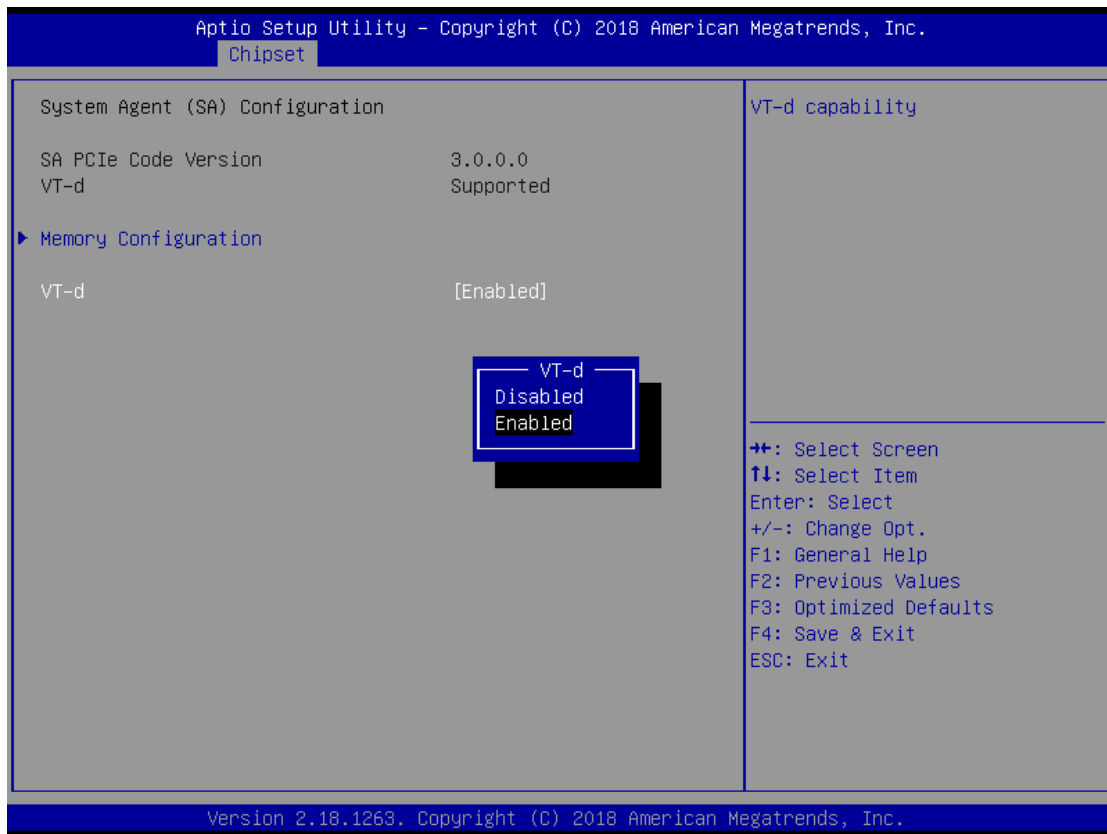
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
USB Mass Storage Driver Support	Enabled Disabled	Enable/Disable USB Mass Storage Driver Support.

Chipset Page

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.



System Agent (SA) Configuration



Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability

Memory Configuration

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

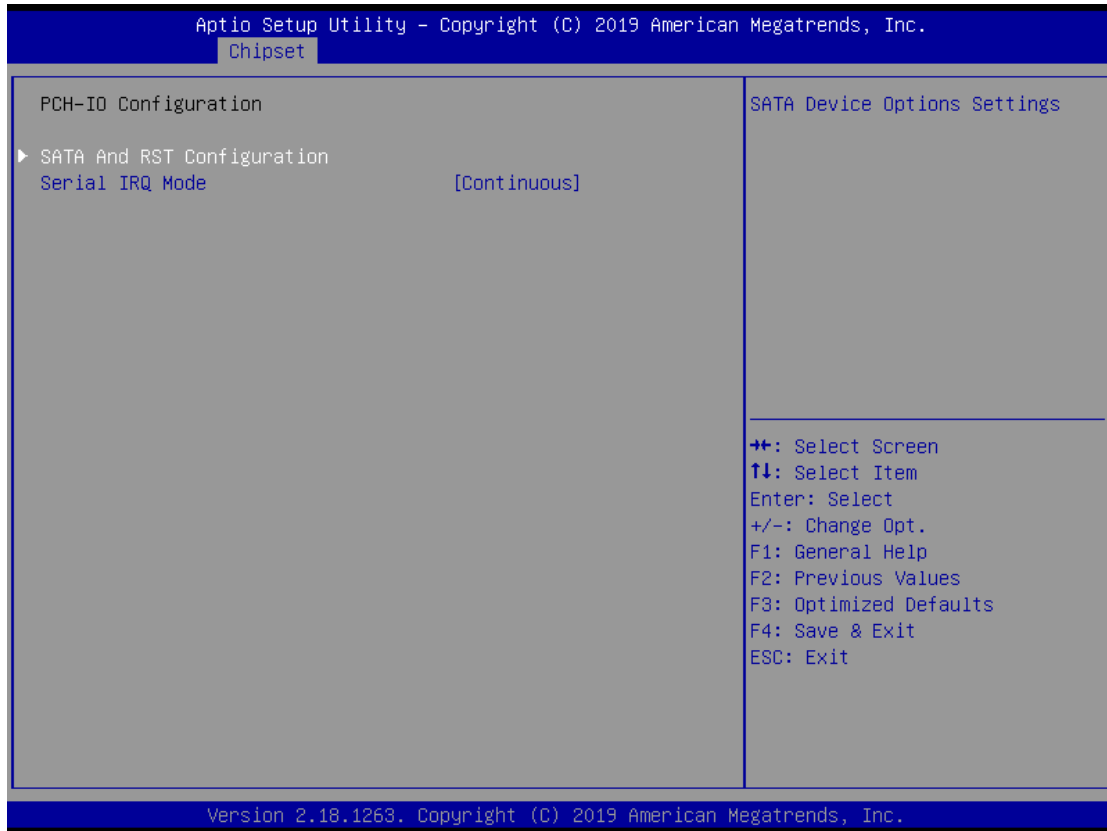
Chipset

Memory Configuration	
Memory RC Version	3.0.0.0
Memory Frequency	2400 MHz
Memory Timings (tCL-tRCD-tRP-tRAS)	17-17-17-39
Channel 0 Slot 0	Not Populated / Disabled
Channel 0 Slot 1	Not Populated / Disabled
Channel 1 Slot 0	Populated & Enabled
Size	8192 MB (DDR4)
Number of Ranks	2
Manufacturer	UnKnown
Channel 1 Slot 1	Not Populated / Disabled

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

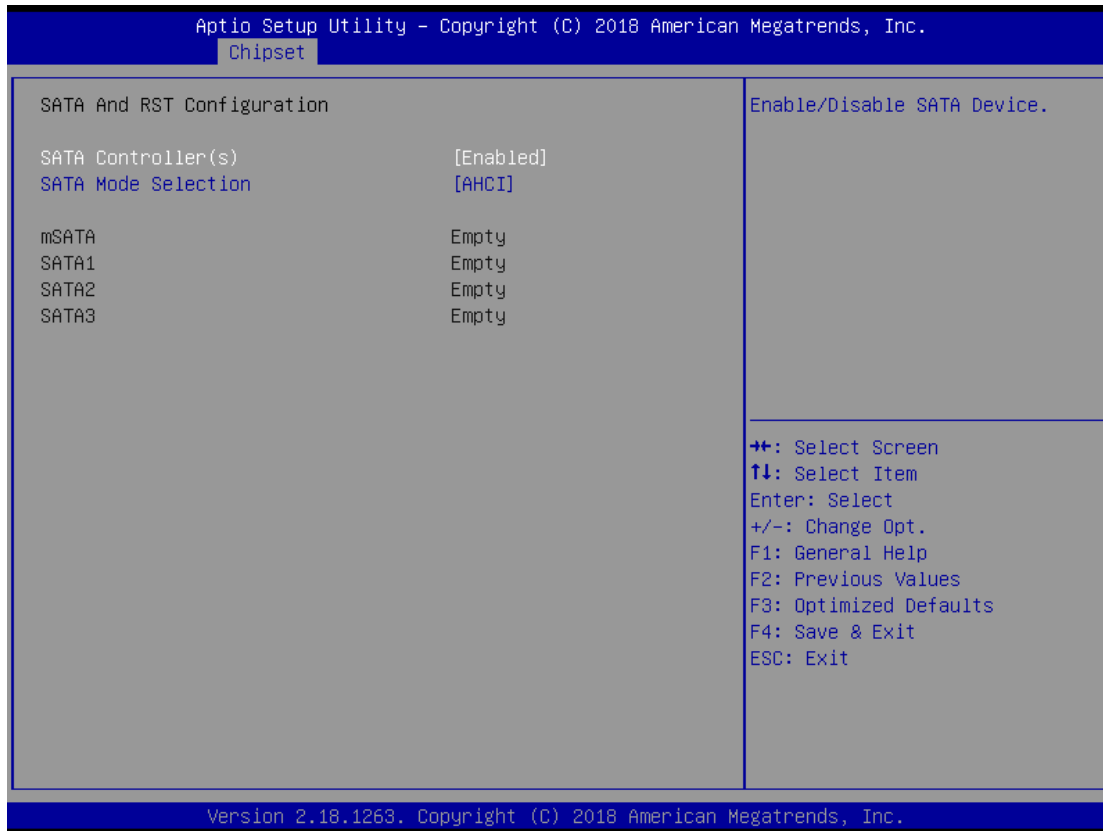
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

PCH-IO Configuration



Feature	Options	Description
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ Mode.

SATA Configuration

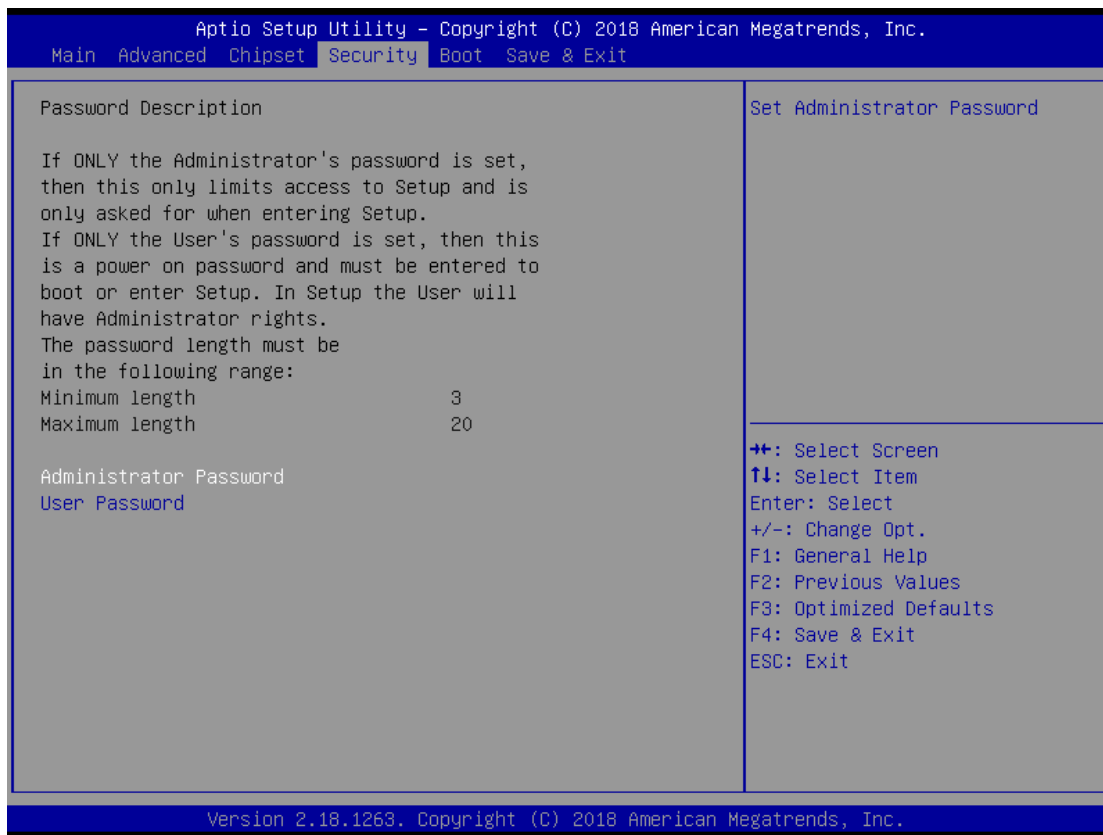


Feature	Options	Description
SATA Controller(s)	Disabled Enabled	Enable/Disable SATA Device.
SATA Mode Selection	AHCI Intel RST Premium	Determines how SATA controller(s) operate. AHCI or RAID mode

Security

Select the Security menu item from the BIOS setup screen to enter the Security Setup screen.

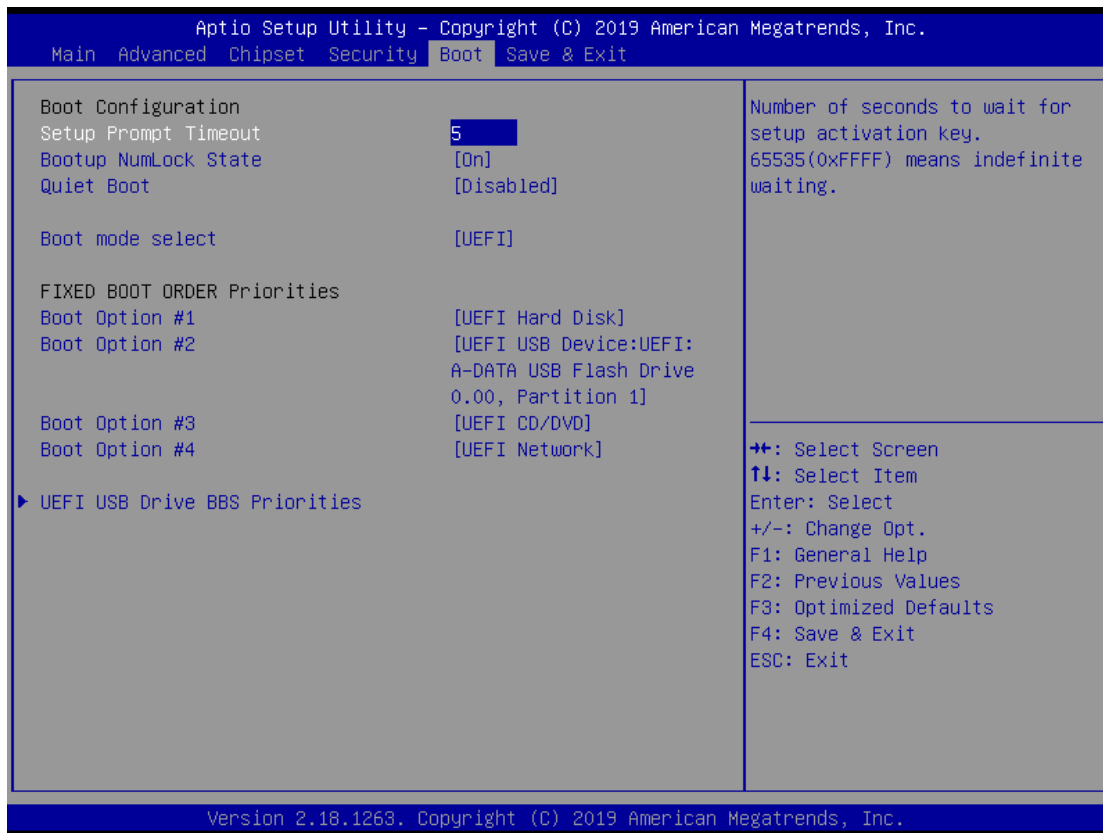
Users can select any of the items in the left frame of the screen.



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

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

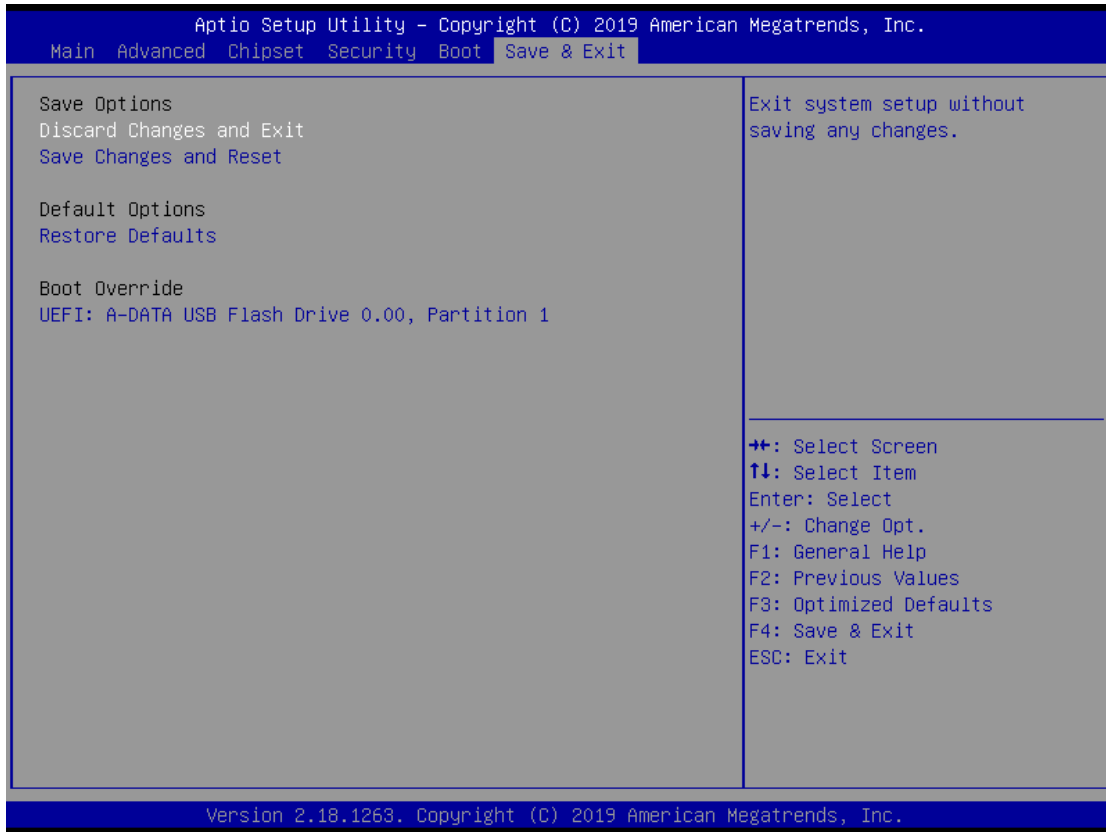


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option
Boot mode select	LEGACY UEFI DUAL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

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

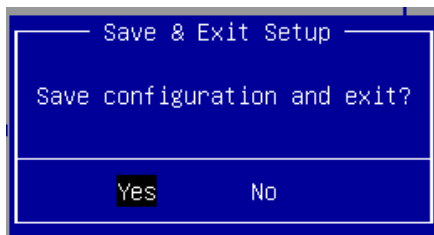
Save and Exit Menu

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.



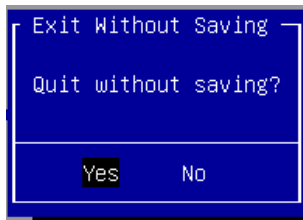
■ Save Changes and Exit

When Users have completed the system configuration changes, select this option to save the changes and Exit from BIOS Setup, so the new system configuration parameters can take effect. The following window will appear after selecting the 'Save Changes and Exit' option selected. Select **YES** to Save Changes and Exit Setup.



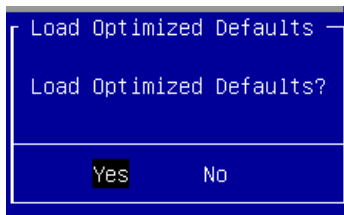
■ Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after selecting the 'Discard Changes and Exit' option selected. Select **YES** to Discard changes and Exit Setup.



■ Restore Defaults

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



APPENDIX A: INSTALLING INTEL® LAN CONTROLLER DRIVER FOR LINUX

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

Product Name	I210-IT
Keyword	
Download Type	Drivers
Operating System	Linux*
Product page	Downloads for Intel® Ethernet Controller I210-IT

APPENDIX B: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for 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, 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