Lanner

Network Appliance Platform

Hardware Platforms for Network Computing

LUNA-D125 User Manual

Version:1.2

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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 online 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

Copyright and Trademarks

Acknowledgment

Compliances and Certification

FCC Class A Certification

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.

Notice

(1) A 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 trained electrician or only by an electrically trained 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.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Mounting Installation Precaution

Environment:

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) 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.

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.

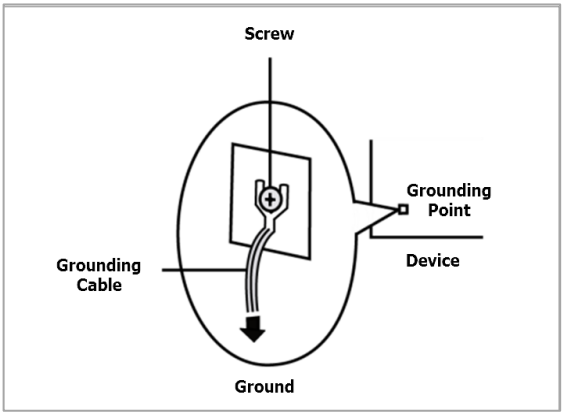
Sécurité de fonctionnement

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).

Grounding Procedure for DC Power Source

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

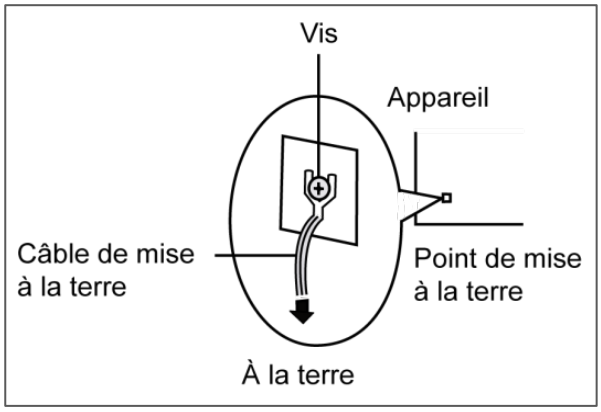


Electrical Safety Instructions

- 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.

Procédure de mise à la terre pour source d'alimentation CC

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



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.

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

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, such as labs or computer facilities with the proper authorization.
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

LUNA-D125 series is an Intel Rangeley (ATOM) based system desktop platform, based on 2-Core CPU with 4x GbE ports. This system is targeted at low cost desktop with ECC DDR3L Memory support.

Package Content

- Your package contains the following items:
- 1x LUNA-D125 Network Security Platform
- 1x Power cord
- 1x 36W power adaptor
- 1x Nameplate
- 4x Rubber foot

Ordering Information

SKU No.	Main Features
LUNA-D125A	Intel® Atom® C2316, 4x GbE, Intel® QuickAssist Technology

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

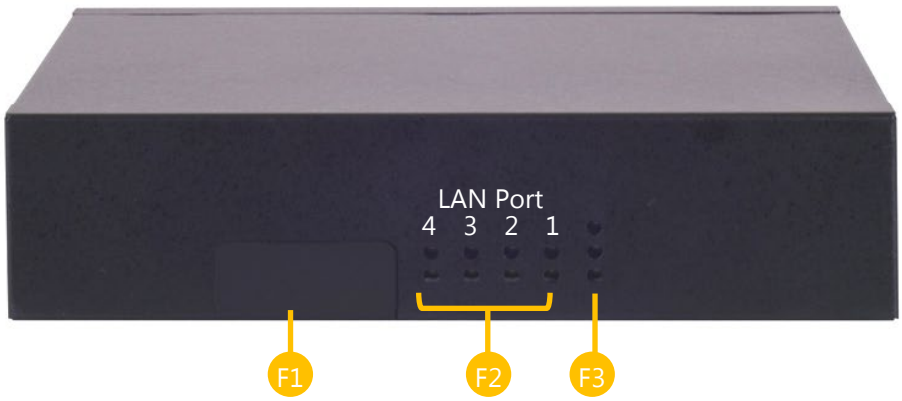
Optional Accessories

Model Name	Description
mini-PCIe Wifi Kit	1x mini-PCIe card + 2x Antennas + Accessories
M.2 3042 (B key) LTE Kit	1x M.2 card + 2x Antennas + Accessories
Rackmount Kit	2x Mounting Ears + Accessories
Adapter holder Kit	1x Adapter Holder Bracket

System Specifications

Form Factor		Desktop
Platform	Processor Options	Intel® Atom® C2316 (Rangeley)
	CPU Socket	Onboard
	Chipset	SoC
	Security Acceleration	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS
System Memory	Technology	DDR3L 1333MHz non-ECC SODIMM
	Max. Capacity	16 GB
	Socket	1x 204-pin SODIMM
Networking	Ethernet Ports	4x GbE RJ45
	Bypass	N/A
	NIC Module Slot	N/A
LOM	IO Interface	N/A
	OPMA slot	N/A
I/O Interface	Reset Button	1
	LED	Power/Status/Storage 2x LED per GbE ports
	Power Button	1
	Console	1x RJ45
	USB	2x USB 2.0
	LCD Module	N/A
	Display	N/A
	Power input	1x DC Jack
Storage	HDD/SSD Support	N/A
	Onboard Slots	8GB onboard storage, 1 x M.2 2242 (SATAIII)
Expansion	mini-PCIe	1x mini PCIe Connector (Support PCIe x1 signal)
	M.2	1x M.2 2242 B key socket (SATAIII signal) 1x M.2 3042 B key socket (PCIE/USB2.0/UIM)
	SIM card Slot	1x Nano SIM Card Connector for one of the 3042 M.2 slots
	Antenna hole	4x Antenna hole
Miscellaneous	Watchdog	Yes
	Internal RTC with Li Battery	Yes
	TPM	Infineon SLB9665
Cooling	Processor	Thermal Pad
	System	Fanless
Environmental Parameters	Temperature	0~40ºC Operating -20~70ºC Non-Operating
	Humidity (RH)	5~90% Operating 5~ 95% Non-Operating
System Dimensions	(WxDxH)	264 mm x 192 mm x 100 mm
	Weight	1.0 kg
Package Dimensions	(WxDxH)	312 mm x 140 mm x 280 mm
	Weight	1.3 kg
Power	Type/Watts	12V 3A 36W Power Adapter
	Input	AC 100~240V @47~63 Hz
Approvals and Compliance		RoHS, CE, FCC Class A, UL

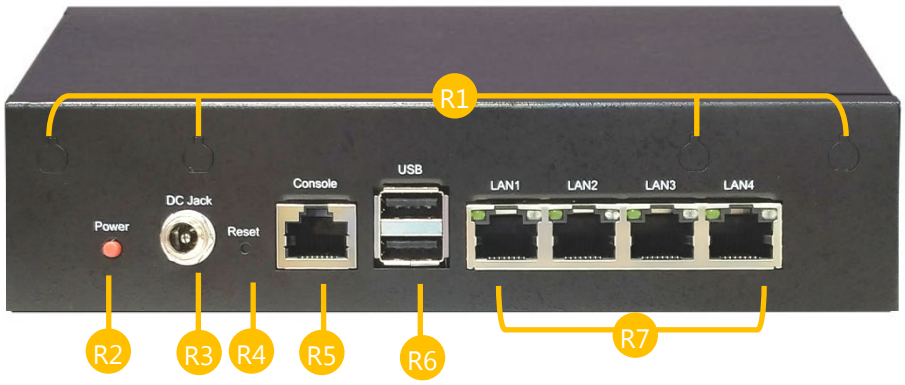
Front Panel



No.	Description	
F1	SIM Slot	For 1x Nano SIM card
F2	Data Connection LED Indicators	Data Speed Data Link
F3	System LED Indicators	System Power System Status HDD Activity

Note: Please refer to Appendix A: LED Indicator Explanations for descriptions of the LED Indicators

Rear Panel

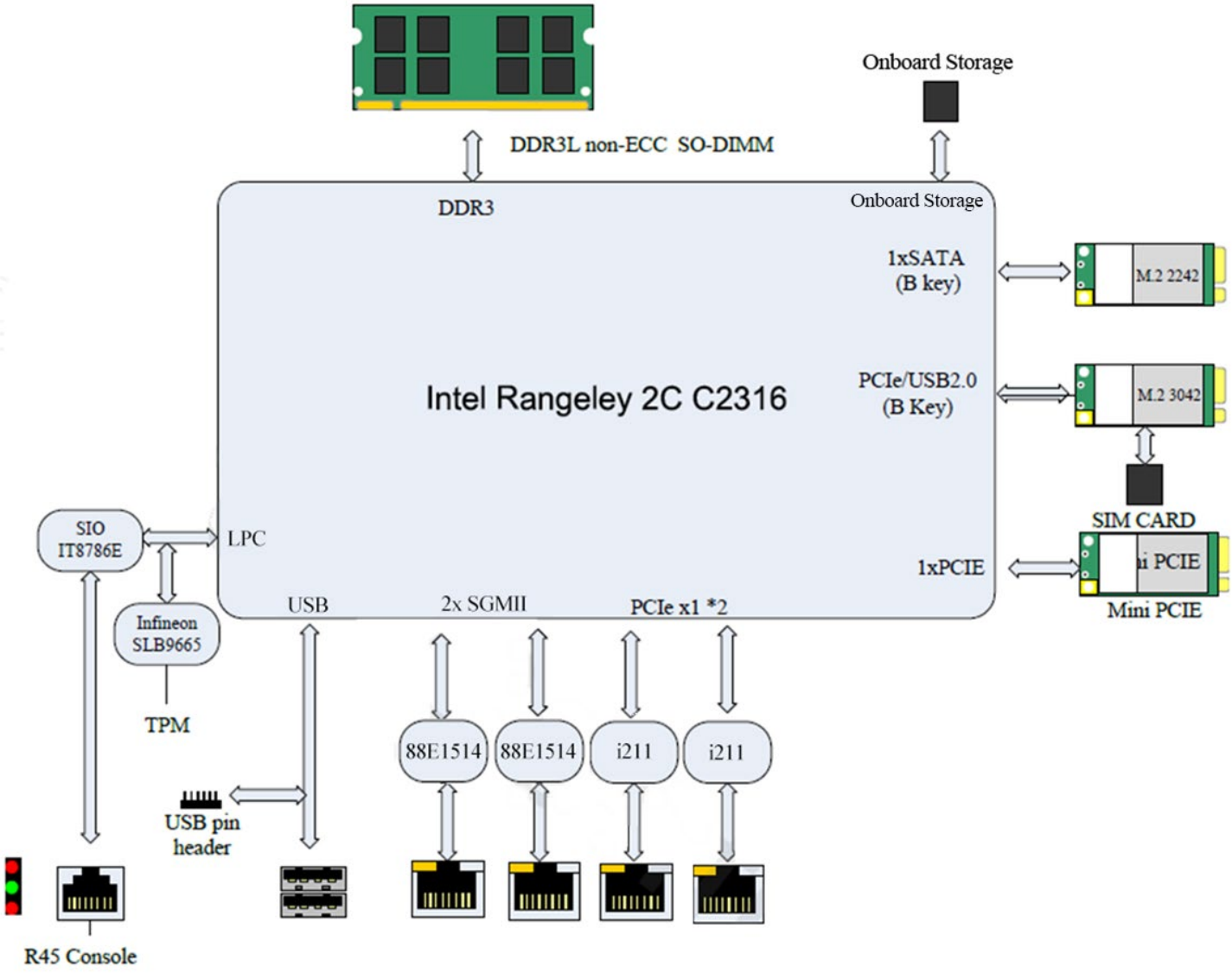


No.	Description	
R1	Antenna Port	4x Antennas (from left to right LTE→ Wi-fi→ Wi-fi→ LTE)
R2	Power Button	Push to power on/off the system
R3	DC-in Jack	For power supply
R4	Reset Button	Press to perform a system reset
R5	Console Port	1x RJ45 console port
R6	USB Ports	2x USB 2.0 port
R7	GbE Ports	4x RJ45 port with LED (**LAN1** for PXE Boot)

CHAPTER 2: MOTHERBOARD INFORMATION

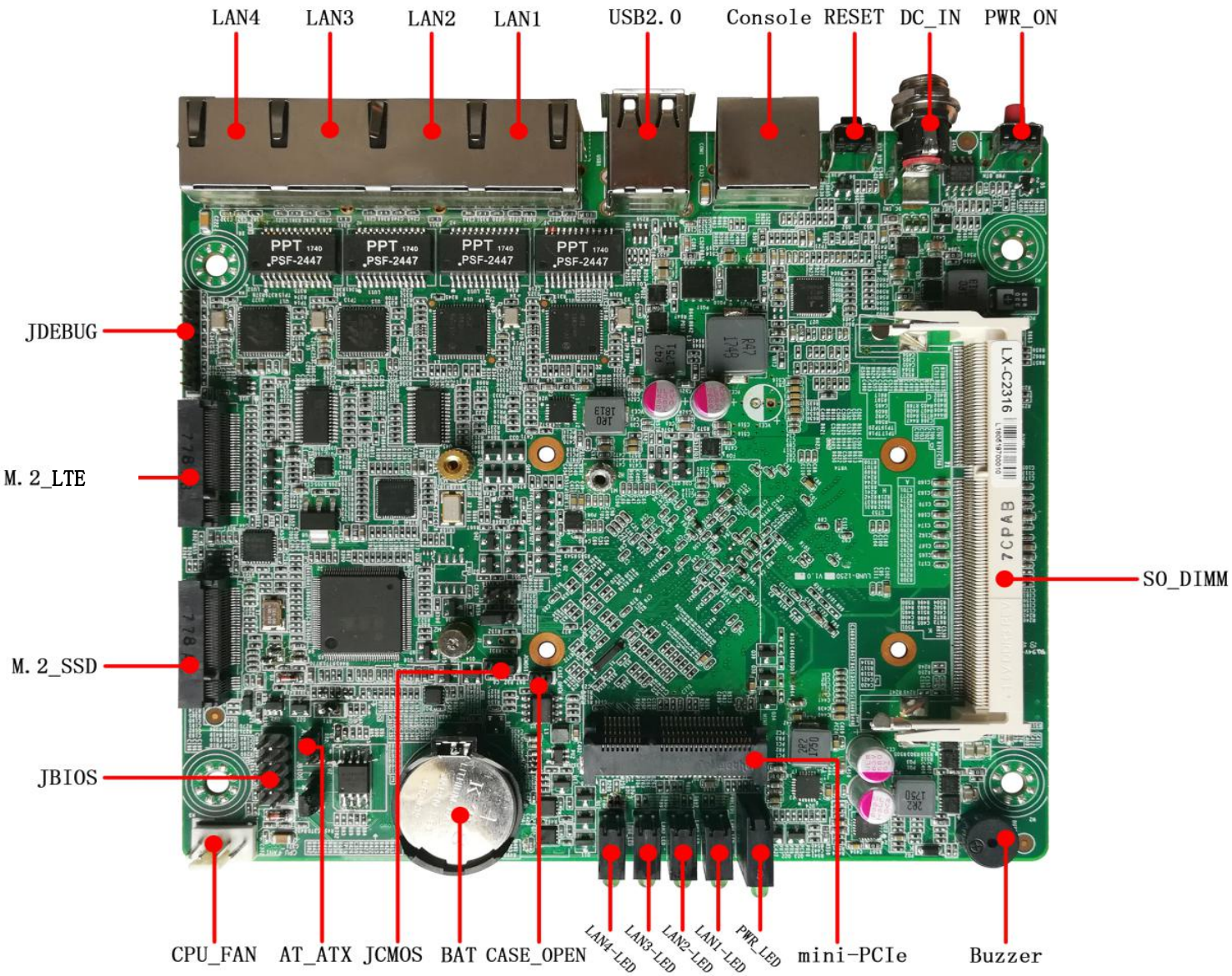
Block Diagram

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

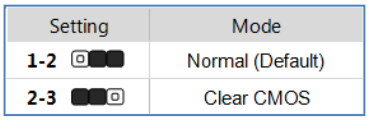
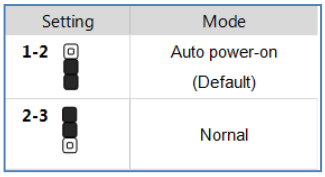


Motherboard Layout

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



Internal Jumper & Connectors

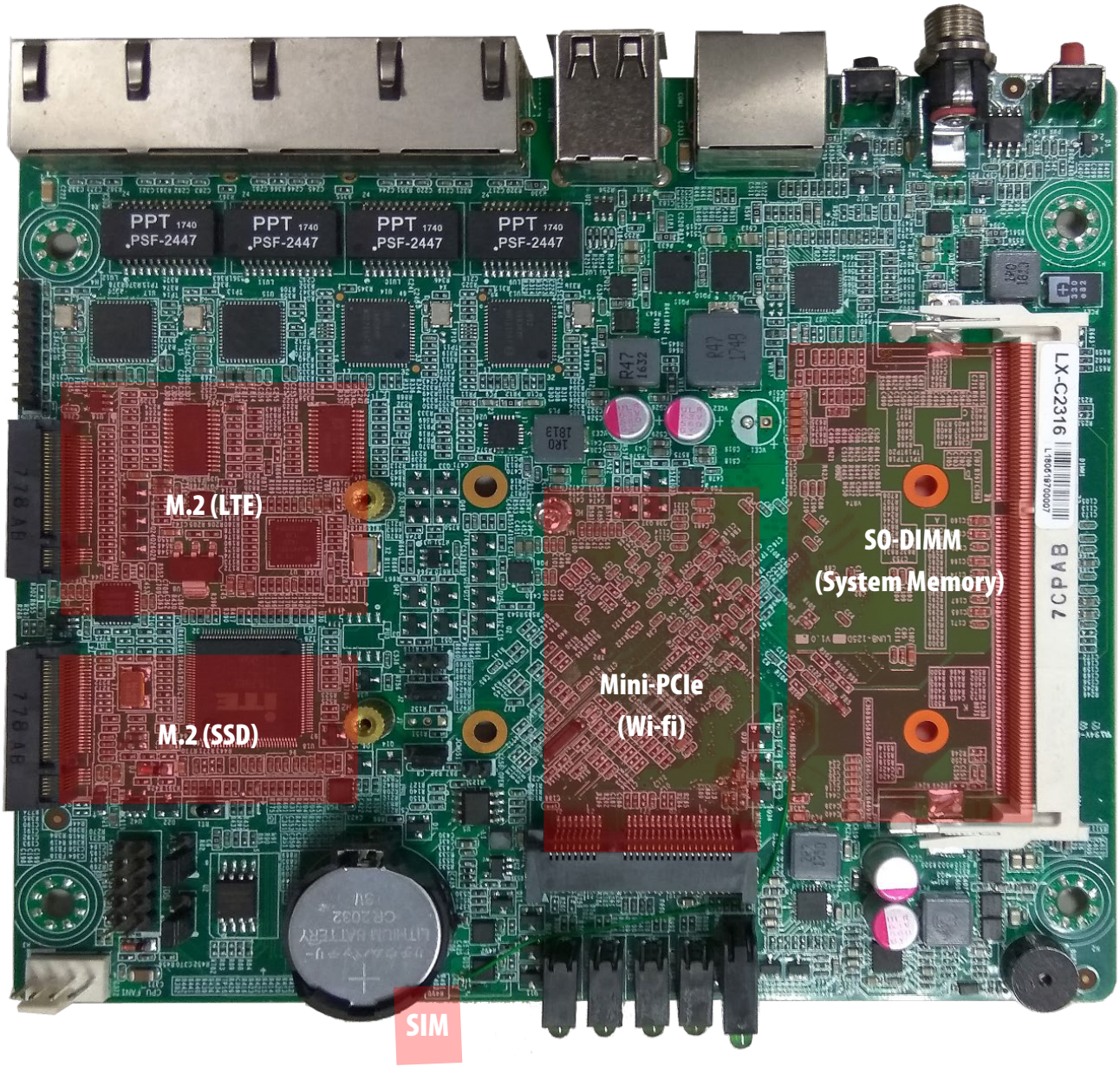
Jumper/Connector	Description
LAN1~LAN4	RJ45 GbE ports
USB1	Standard USB2.0 Type-A Connector
COM1	RJ45 Console Debug Port
DC_IN1	DC2.5V power supply
DIMM1	DDR3L 204-pin SO-DIMM Slot
BUZZ1	Buzzer
MINI-PCIE1	Mini-PCIe Slot
SIM1	Nano SIM Slot
SSD	M.2 2242 B-Key Socket, supporting SATA 2.0 signal for SSD module.
LTE	M.2 3042 B-Key Socket, supporting PCIe-X1 and USB2.0 signal with a SIM card for the 4G module.
BAT	3.3V RTC battery holder
CPU_FAN1	Reserved 4-pin system fan connector
PWRLED1	System LED indicator
LAN1_LED~ LAN4_LED	RJ45 Port data transmission status
PWR_BTN	Power button
RST_BTN	Reset button
JBIOS	Reserved BIOS Debug port
JDEBUG	Reserved LPC Debug port
CSAE_OPEN	Case-open pin header
JCMOS	Clear CMOS Jumper 
AT_ATX	Configures the automatic power-on function 
J1	Hardware debug pin1
J2	Hardware/Software Reset Jumper
J3	Hardware debug pin2
J4	BIOS ROM selection jumper

Pin Definitions

JP/CN	Pin#	Signal	Pin#	Signal	Remark
COM1	1	RTS			RJ45 Console Debug Port
	2	DTR			
	3	TXD			
	4	GND			
	5	GND			
	6	RXD			
	7	DSR			
	8	CTS			
JP/CN	pin#	Signal	pin#	Signal	Remark
CPU_FAN1	1	GND			Reserved 4-pin connector for Smart Fan
	2	+12V			
	3	FAN_TAC			
	4	FAN_PWM			
JP/CN	pin#	Signal	pin#	Signal	Remark
JBIOS	1	HOLD#	2		Reserved BIOS debug port
	2	SPI_CS_J	4	+3.3V	
	3	SPI_MISO	6		
	4		8	SPI_CLK	
	5	GND	10	SPI_MOSI	
JP/CN	pin#	Signal	pin#	Signal	Remark
JDEBUG	1	L_FRAM			LPC debug port
	2	LAD3			
	3	LAD2			
	4	LAD1			
	5	LAD0			
	6	GND			
	7	BUF_PLT_RET#			
	8	CLK_PCH_24M			
	9	+3.3V			
JP/CN	pin#	Signal	pin#	Signal	Remark
CASE_OPEN	1	GND			Case open pin header: 1-2 detects and sends out signal when the chassis cover is removed.
	2	CASEOPEN#			
JP/CN	pin#	Signal	pin#	Signal	Remark
J4	1	SPI_CS0_IC			Selects BIOS ROM 1-2：Select on-board BIOS chip 2-3：Select external BIOS chip
	2	SPI_CS0			
	3	SPI_CS0_J			

CHAPTER 3: HARDWARE SETUP

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



Opening the Chassis

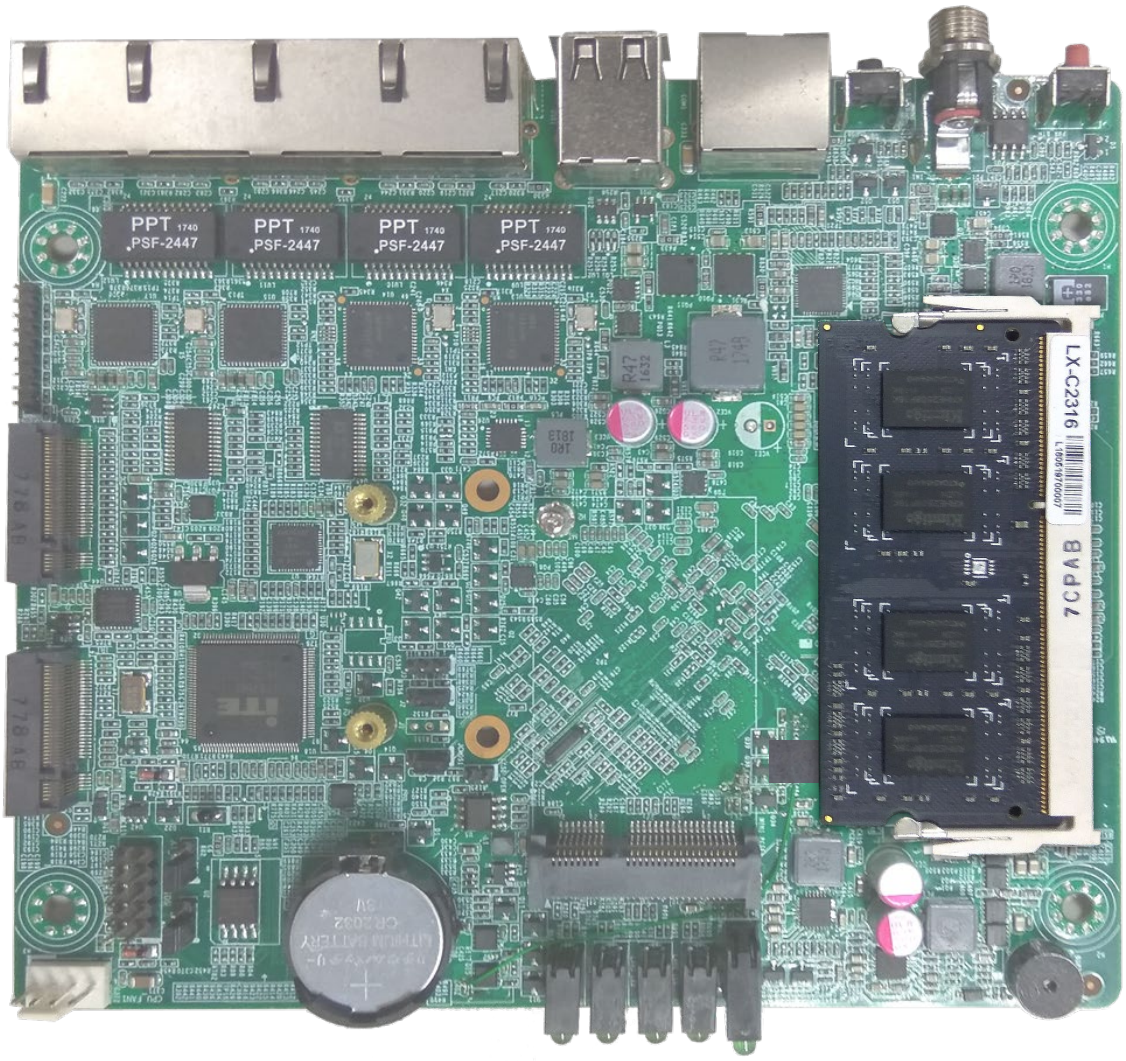
1. Loosen the **four** screws (indicated in the photos) that fix this unit's side panels.

2. Loosen the screw that fixes the SIM Slot cover, and then pull open the bottom panel.

Replacing the System Memory

The motherboard supports DDR3L memory that features data transfer rates of 1333 MHz to meet the higher bandwidth requirements of the latest operating system and Internet applications. To replace the memory:

1. Open the DIMM slot latches.
2. Replace the default DIMM with a new one.



Note: The system requires DDR3L 1333 memory. Do not install memories with different specifications. The system can support up to 16 GB in maximum.

Installing M.2 Card (SSD)

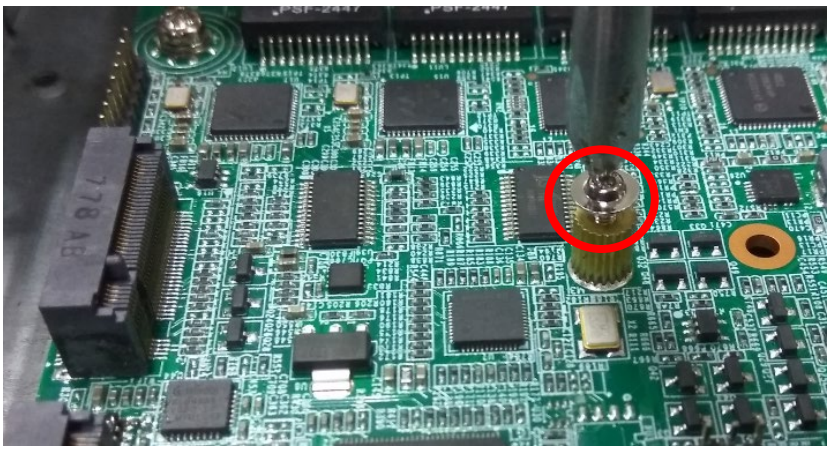
1. Remove the screw located across from the slot.

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

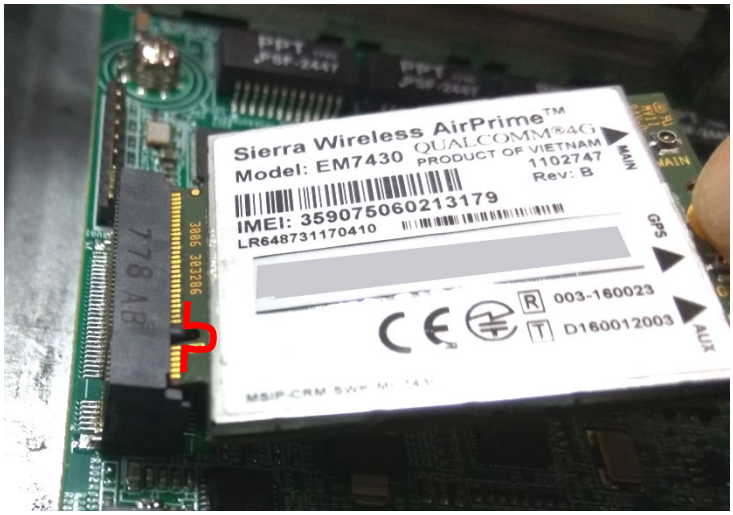
3. Fix the card with the screw you loosened earlier.

Installing LTE Kit (M.2 LTE Card with Antenna)

1. Remove the screw located across from the slot.



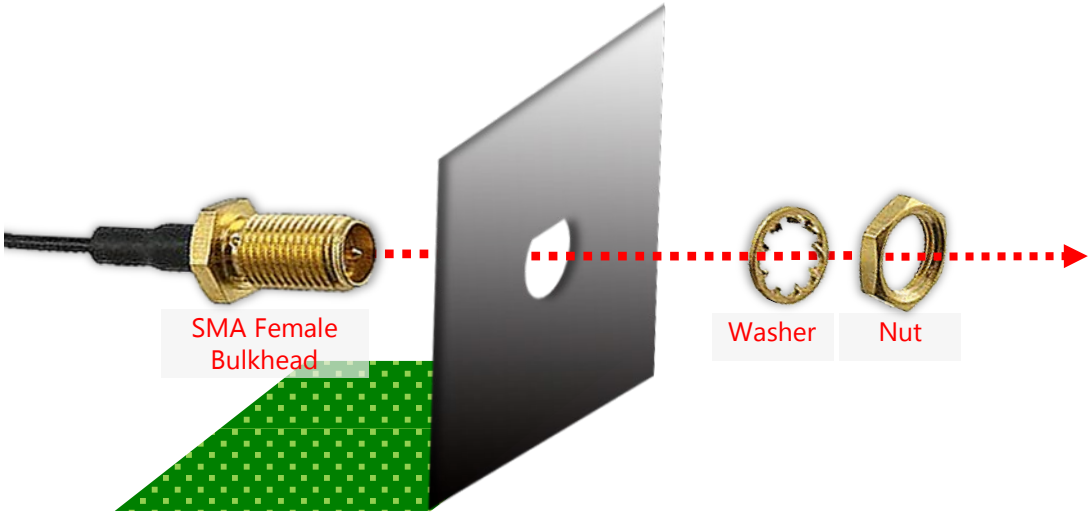
2. Align the notch of the M.2 card with the socket key in the slot. Tilt the end of the gold fingers down while carefully inserting the card into the slot.



3. Fix the card with the screw you loosened earlier.

4. Assemble the LTE Antenna cables using the Lock Nut and Washer onto the front panel.

(1) Take out the antenna pigtail cable from the Antenna Kit. From inside the chassis, insert the SMA Female Bulkhead through the antenna hole on the panel.

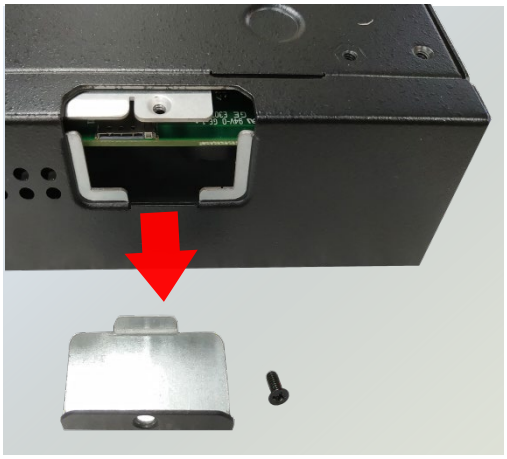


(2) From outside the panel, attach the Washer and Nut, and tighten the Nut using an SMA Torque Wrench.

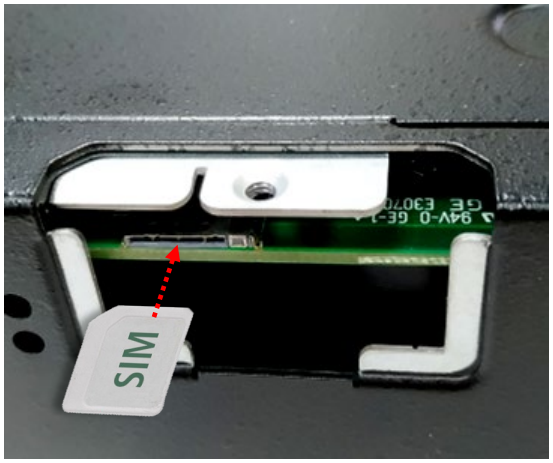
Warning: Do not use any tool other than an SMA Torque Wrench to fasten the Nut. For example, general pliers or tweezers without limited twisting force are very likely to cause the distortion of SMA connector.

(3) Snap one LTE antenna cable onto the U.FL connector for **MAIN**, and the other one onto the U.FL connector for **AUX**.

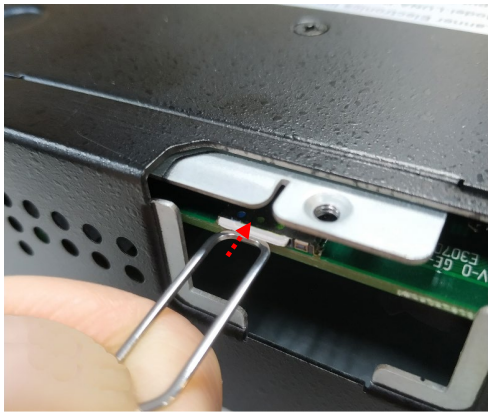
5. Flip over the system, and loosen the screw that fixes the slot cover.



6. Push the SIM card all the way in until it clicks into place. Make sure the angled corner of the card is positioned as shown in this picture, with its gold contact facing down.



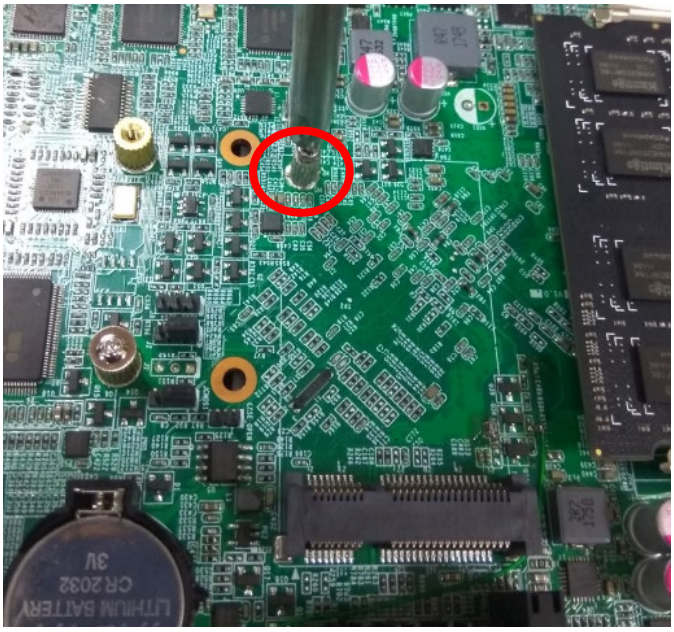
The SIM socket supports push-push mechanism, allowing the SIM card ejection to be as easy as one push. To remove the card, push the card with your fingertip or a paperclip to have it bounce out automatically.



7. Attach the LTE antennas onto the front panel. Make sure the antenna cables (Main and Aux) go through the right holes as indicated in the picture.

Installing Wi-Fi Kit (Mini PCIe Wi-Fi Card with Antenna)

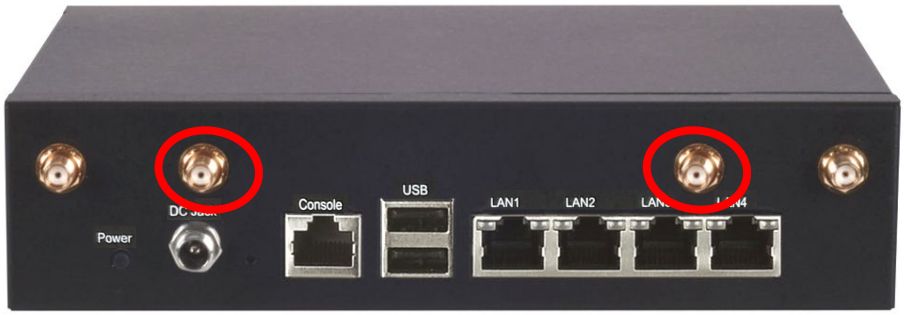
1. Remove the screw located across from the slot.



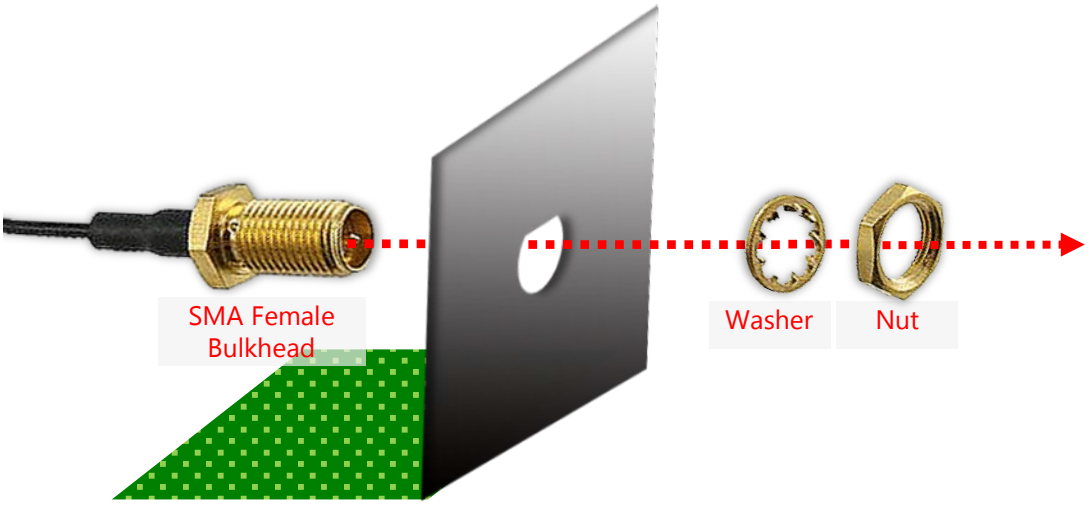
2. Align the notch of the MPCIe card with the socket key in the slot. Tilt the end of the gold fingers down while carefully inserting the card into the slot.

3. Fix the card with the screw you loosened earlier.

4. Assemble the Wi-Fi Antenna cables using the Lock Nut and Washer onto the front panel.



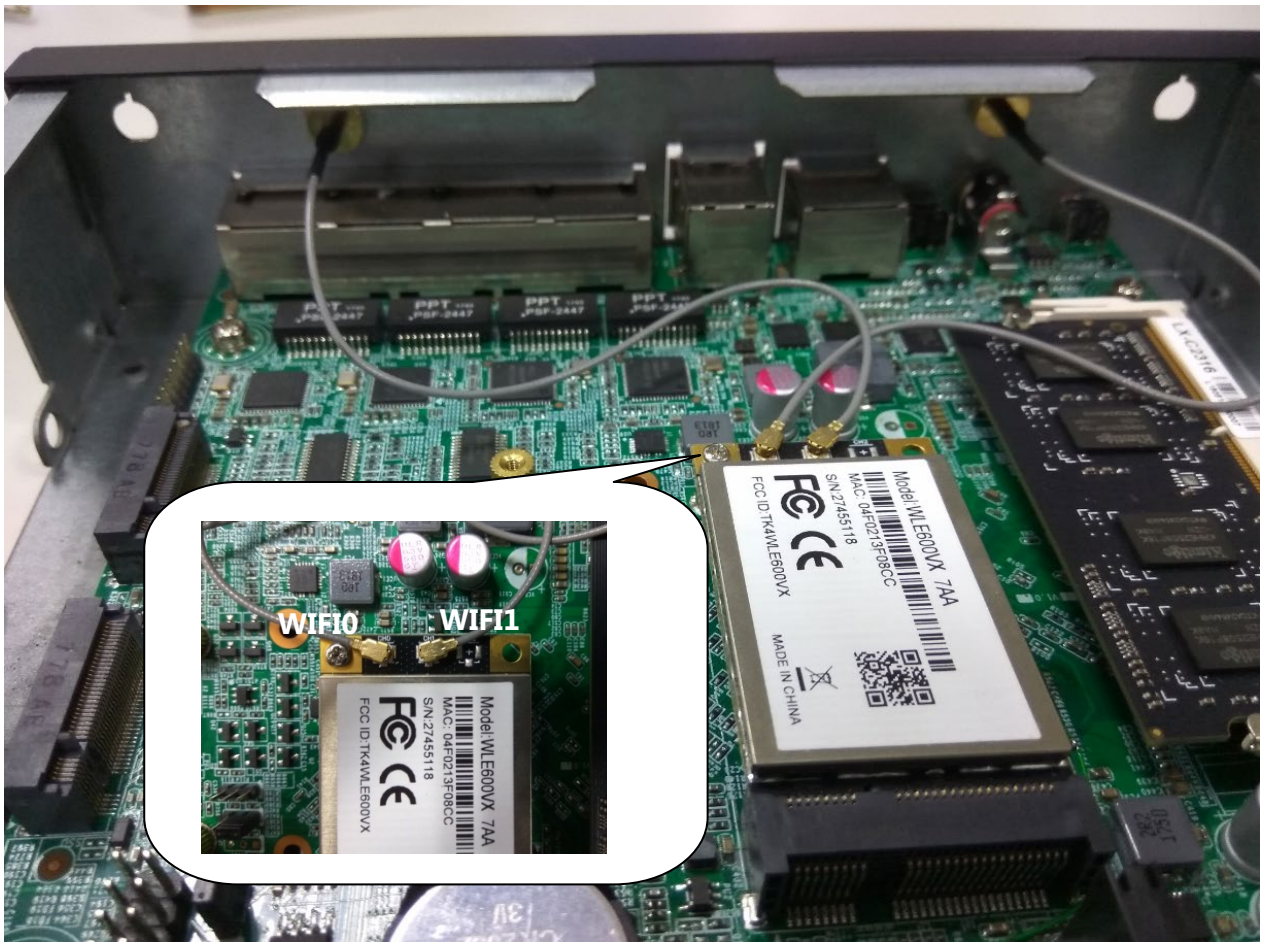
(1) Take out the antenna pigtail cable from the Antenna Kit. From inside the chassis, insert the SMA Female Bulkhead through the antenna hole on the panel.



(2) From outside the panel, attach the Washer and Nut, and tighten the Nut using an SMA Torque Wrench.

Warning: Do not use any tool other than an SMA Torque Wrench to fasten the Nut. For example, general pliers or tweezers without limited twisting force are very likely to cause the distortion of SMA connector.

(3) Snap one Wi-Fi antenna cable onto the U.FL connector for **WIFI0**, and the other one onto the U.FL connector for **WIFI1**.



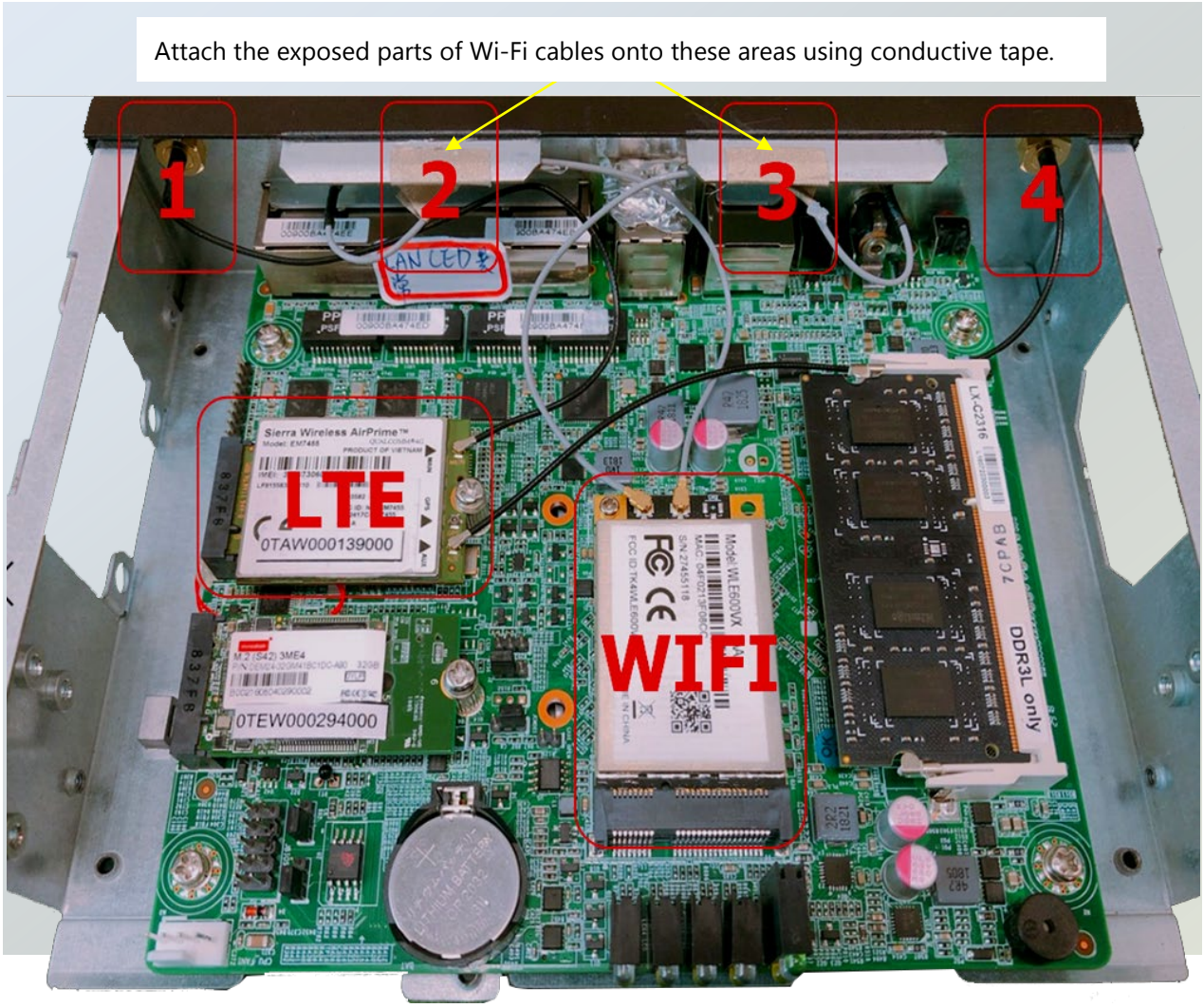
5. Attach the WI-FI antennas onto the front panel. Make sure the antenna cables (WIFI0 and WIFI1) go through the right holes as indicated in the picture.

WiFi/LTE Cable Routing Example

Please make sure your Wi-Fi/LTE module is connected with the right antenna holes as shown in the picture.

Important Notice

Please avoid the exposed parts of stripped Wi-Fi cables from being in contact with the circuit board by fixing them onto the indicated areas (2 and 3) lest a short circuit should occur.



Antenna Hole	Connector
1	LTE Main
2	WIFI 0
3	WIFI 1
4	LTE Aux

Rackmounting the System (with the Adapter Holder)

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

What's in the Rackmount Kit

Check the kit contents for the following items:

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

What's in the Adapter Holder Kit

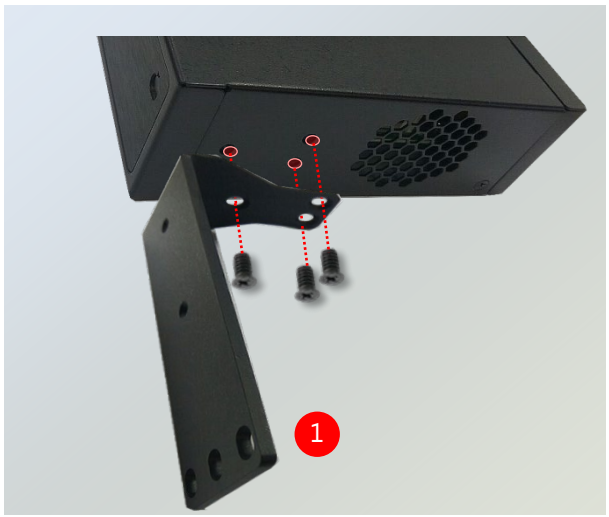
Check the kit contents for the following items:

- 1x Adapter Holder
- 1x Adapter Bracket
- Screws for the fixture of the adapter holder and the adapter bracket.

,

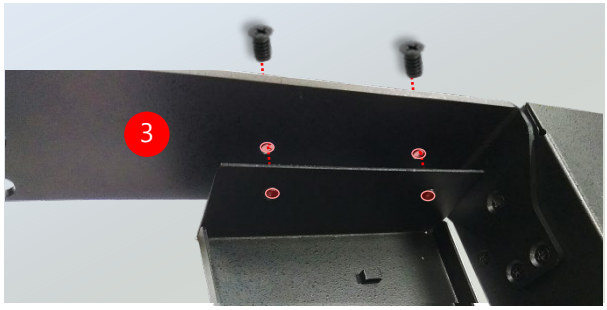
Attaching the Rackmount Assembly to the Chassis

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



2. Secure the other ear bracket to the other side of the system.

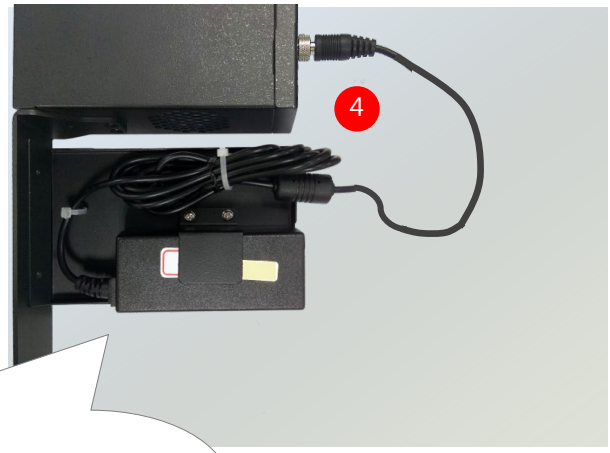
3. Fix the adapter holder to the left bracket using two screws.



4. Attach the power adapter's connector to the power supply jack on the rear panel and fasten the screw lock.

5. Secure the adapter with the adapter bracket using two screws.

6. Use the cable ties to fix the adapter's cable on the bracket.



Installing the System to the Rack

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

CHAPTER 4: BIOS SETUP

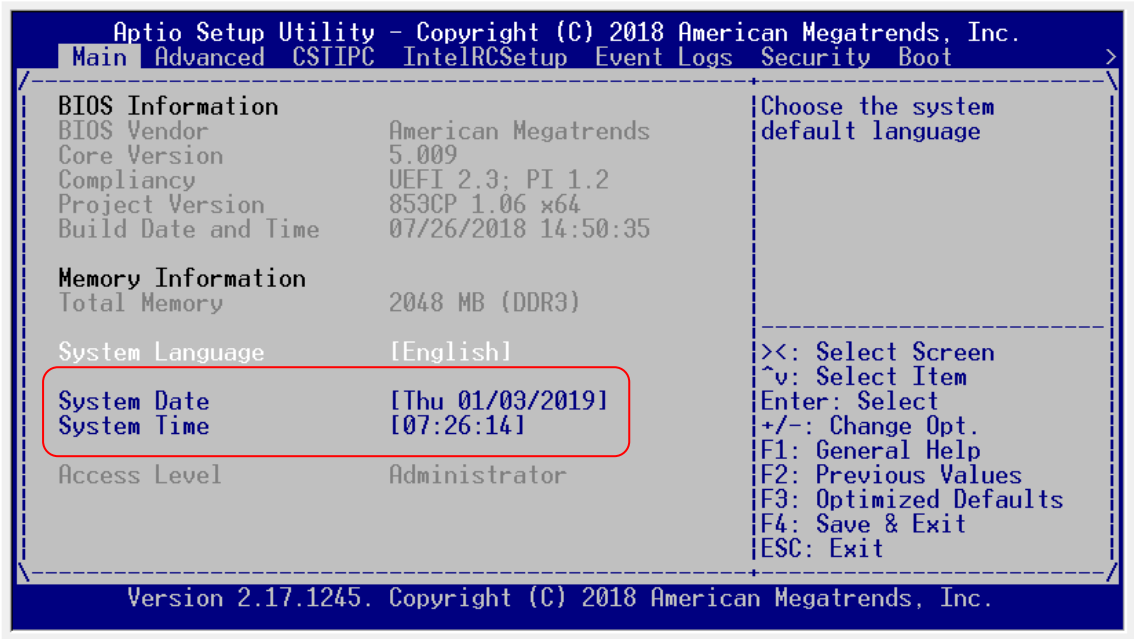
Main Setup

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

1. Boot up the system.
2. Pressing the **<Esc>** key immediately allows you to enter the Setup utility.

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

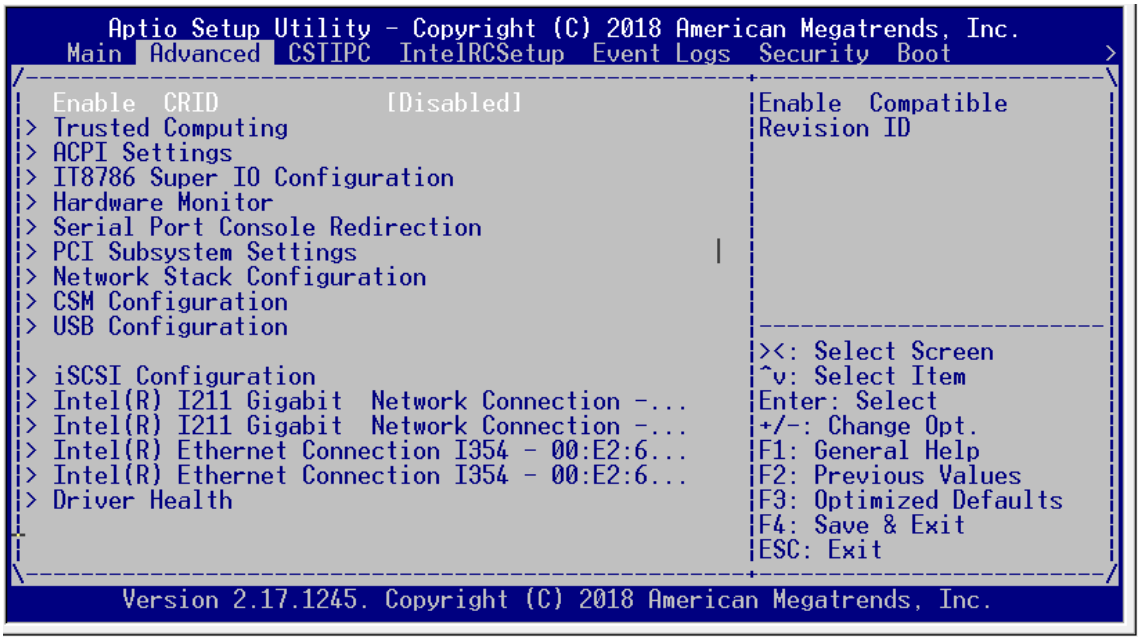
On **Main** Setup screen, you can configure the following two settings:



Item	Description
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 Setup

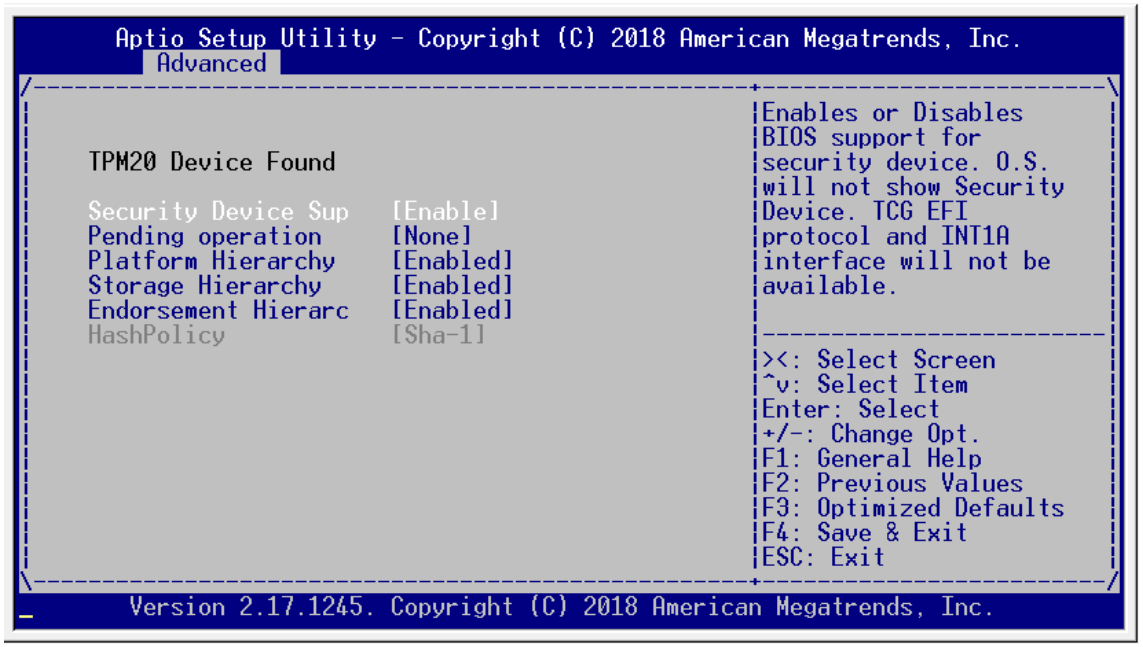
Use [→] or [←] to select **Advanced** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.



Item	Option	Description
Enable CRID	Disabled Enabled	Enable Compatible Revision ID
Trusted Computing	None	Trusted Computing Settings
AC Power Loss Setting	None	System ACPI Parameters
IT8786 Super IO Configuration	None	System Super IO Chip Parameters
Hardware Monitor	None	Monitor hardware status
Serial Port Console Redirection	None	Serial Port Console
PCI Subsystem Settings	None	PCI, PCI-X and PCI Express Settings
Network Stack Configuration	None	Network Stack Settings
CSM Configuration	None	CSM configuration: Enable/Disable, Option ROM execution settings,etc.
USB Configuration	None	USB Configuration Parameters
iSCSI Configuration	None	Configure the iSCSI parameters
Intel(R) I211 Gigabit Network Connection	None	Configure Gigabit Ethernet device 1 parameters
Intel(R) I211 Gigabit Network Connection	None	Configure Gigabit Ethernet device 2 parameters
Intel(R) Ethernet Connection I354	None	Configure Gigabit Ethernet device 3 parameters
Intel(R) Ethernet Connection I354	None	Configure Gigabit Ethernet device 4 parameters
Driver Health	None	Provides Health Status for the Drivers/Controllers

Trusted Computing

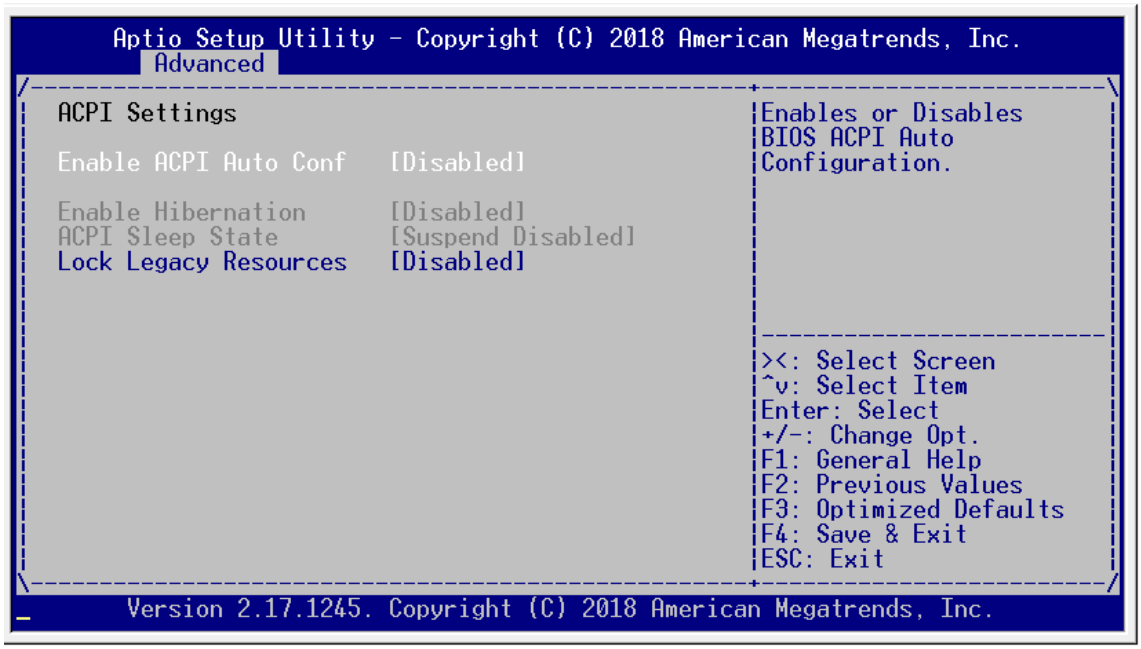
On **Advanced** Setup screen, select and enter "**Trusted Computing**".



Item	Option	Description
Security Device Sup	Disable Enable	Enables or Disables BIOS support for security device O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Pending operation	None TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	Disabled Enabled	Platform Hierarchy HELP
Storage Hierarchy	Disabled Enabled	Storage Hierarchy HELP
Endorsement Hierarc	Disabled Enabled	Endorsement Hierarchy HELP

ACPI Settings

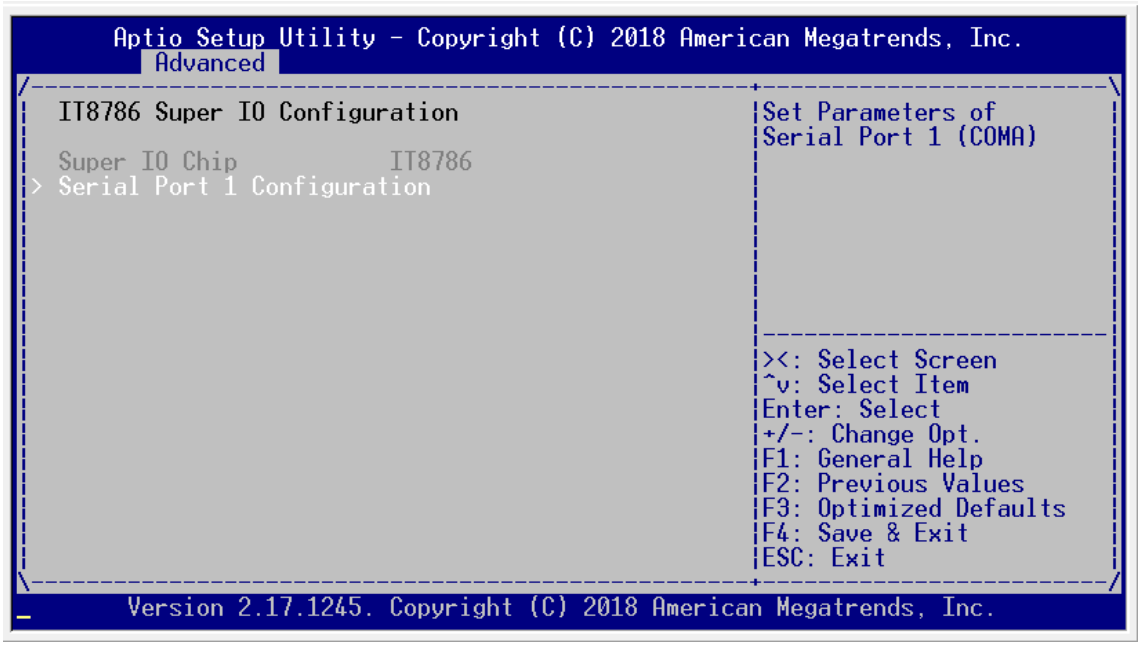
On **Advanced** Setup screen, select and enter "**ACPI Settings**".



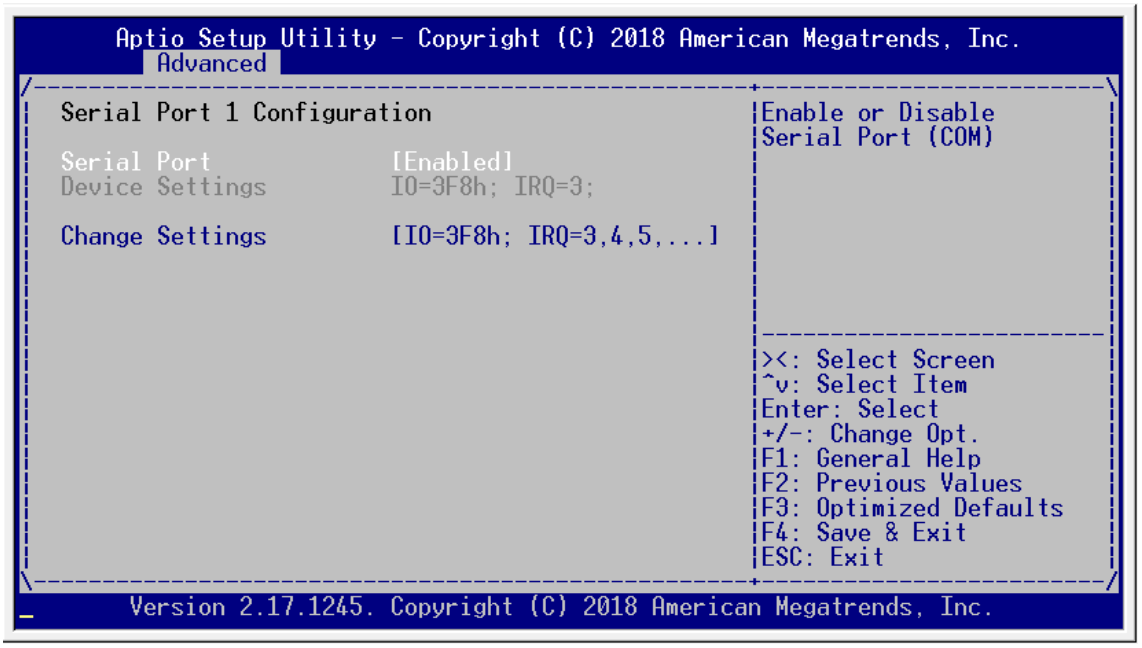
Item	Option	Description
Enable ACPI Auto Conf	Disabled Enabled	Enables or Disables BIOS ACPI Auto Configuration
Lock Legacy Resources	Disabled Enabled	Enables or Disables Lock of Legacy Resources

COM Settings

On **Advanced** Setup screen, select and enter "**IT8786 Super IO Configuration**" for COM settings.



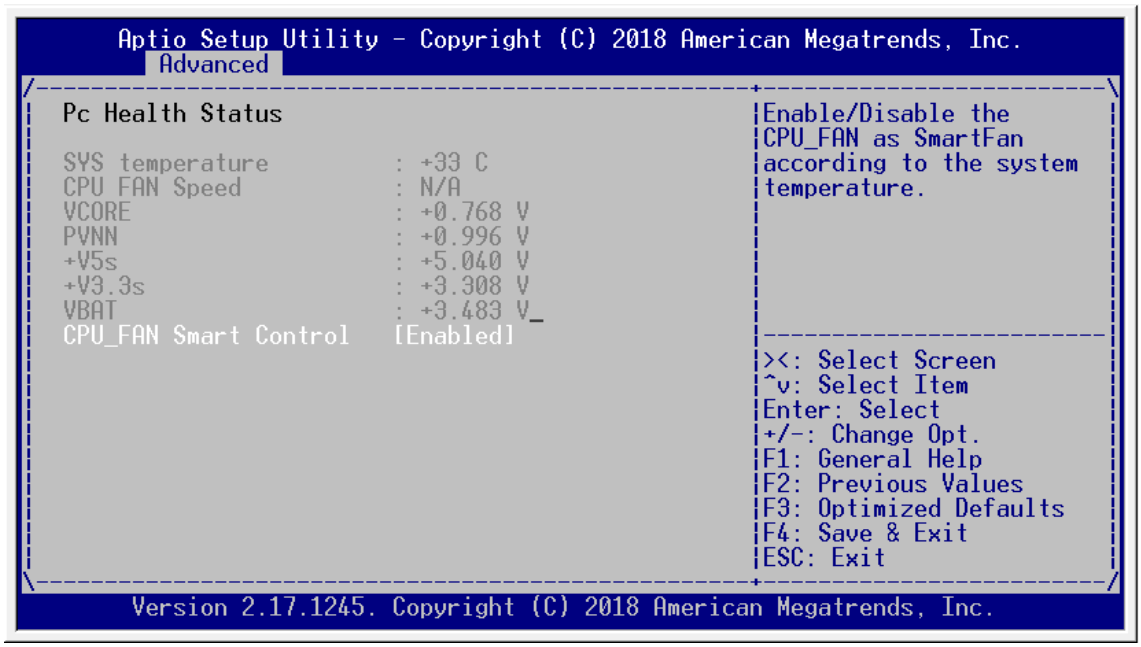
Select and enter "**Serial Port 1 Configuration**."



Item	Option	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Change Settings	Auto IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

H/W Monitor & Smart Fan Settings

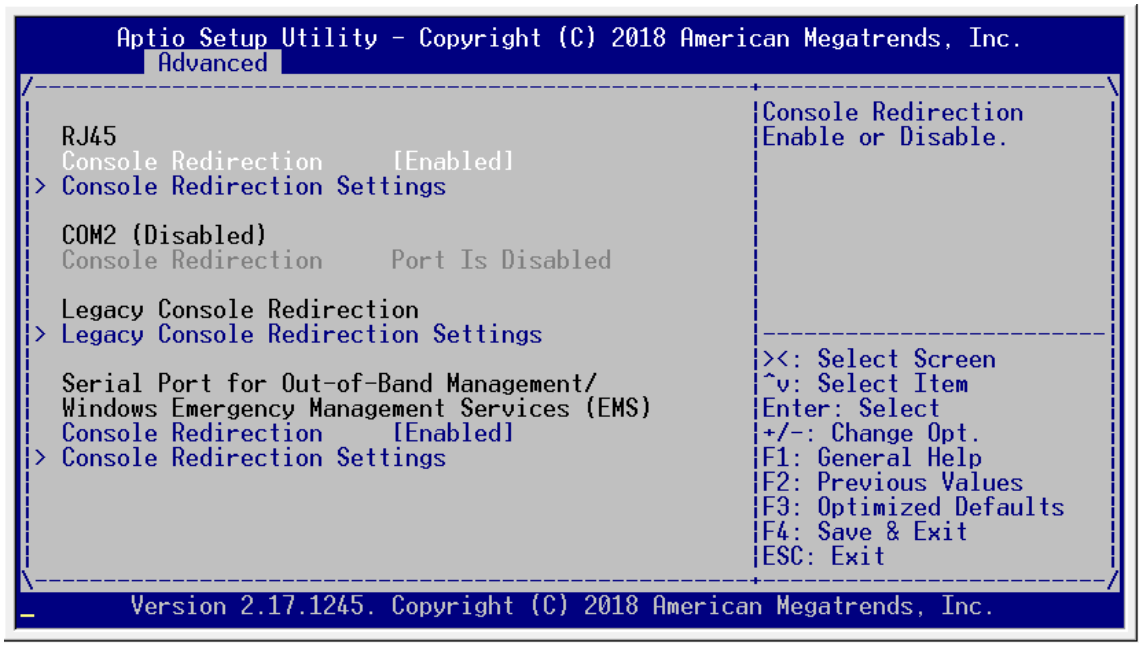
On **Advanced** Setup screen, select and enter "**Hardware Monitor**" to check information of current system temperature, voltage and CPU fan speed, or enable the "CPU_FAN Smart Control" to utilize smart fan control function.



Item	Option	Description
CPU_FAN Smart Control	Disabled Enabled	Enable/Disable the CPU_FAN as SmartFan according to the system temperature

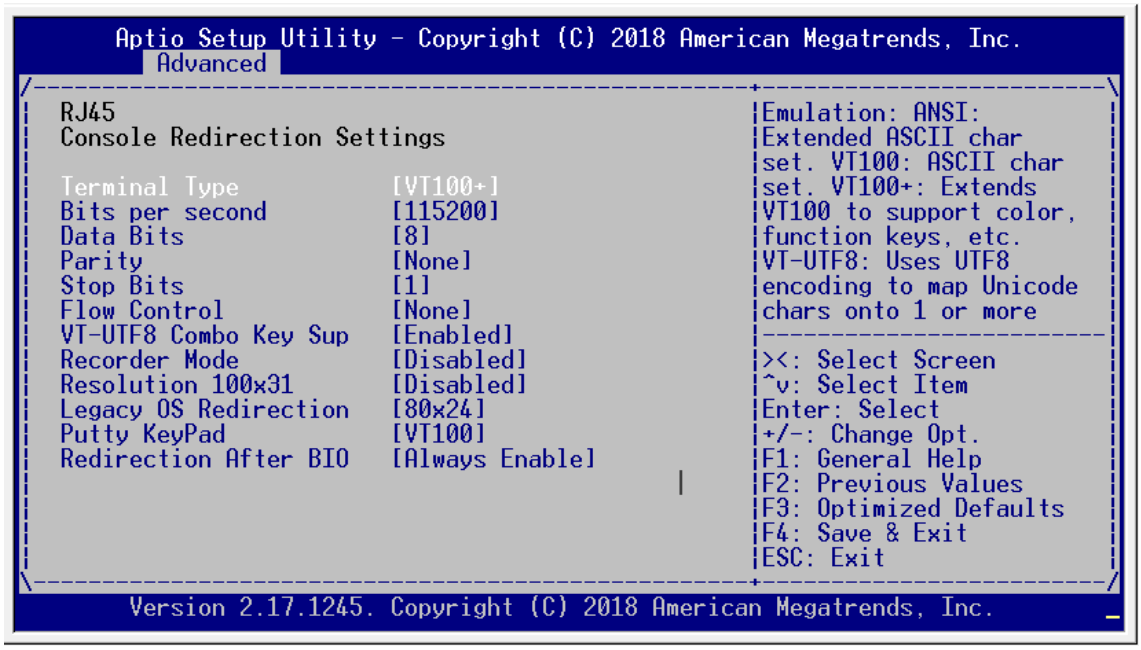
Console Redirection Settings

On **Advanced** Setup screen, select and enter "**Serial Port Console Redirection.**"



Item	Option	Description
Console Redirection	Disabled Enabled	Console Redirection Enable or Disable.
Console Redirection Settings	None	The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
Legacy Console Redirection Settings	None	Legacy Console Redirection Settings

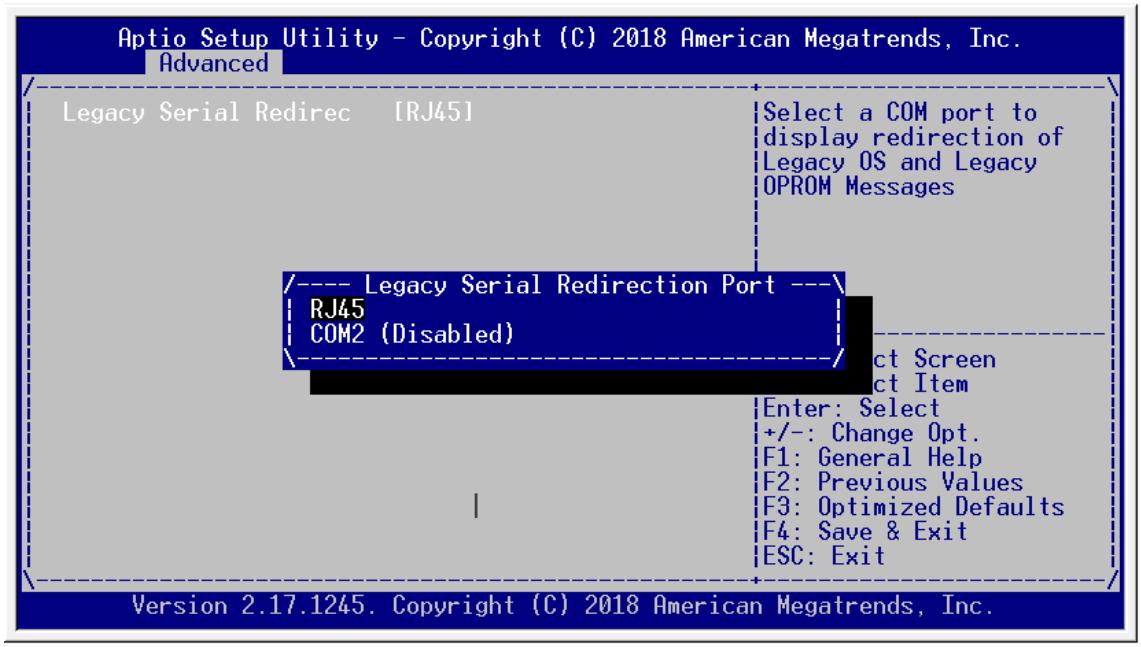
Select and enter "**Console Redirection Settings**" for more advanced settings.



Item	Option	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more
Bits per second	9600 19200 38300 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. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data
Stop Bits	1 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1
Flow Control	None Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
VT-UTF8 Combo Key Sup	Disabled Enabled	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals
	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	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
Putty KeyPad	VT100 LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.
Redirection After BIO	Always Enable BootLoader	The Settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy console Redirection is enabled for Legacy OS.

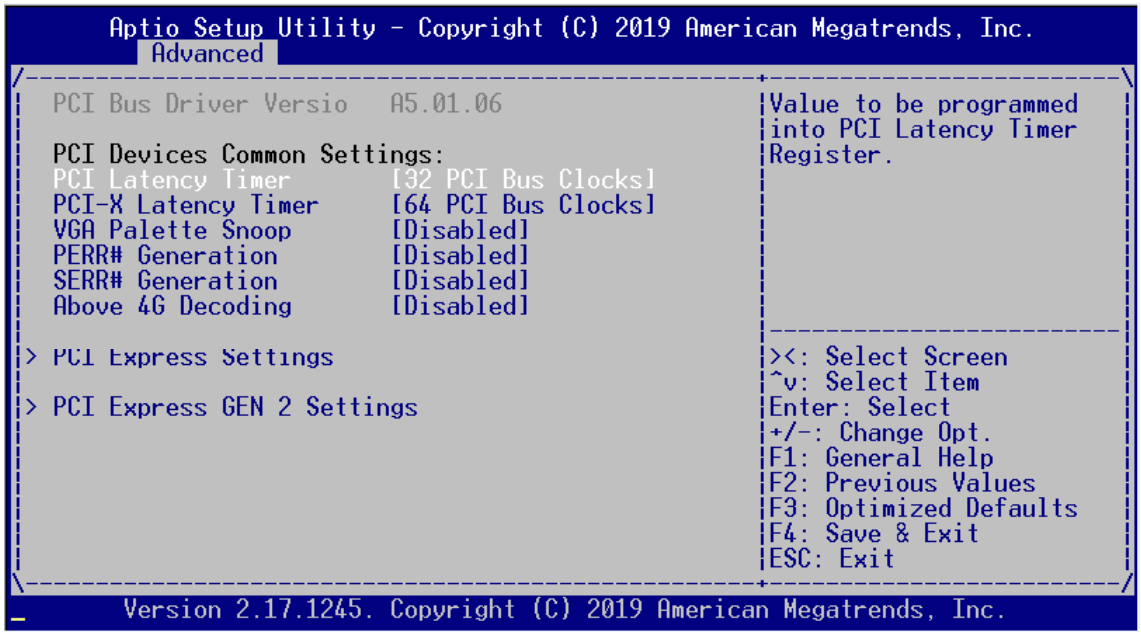
Select and enter **"Legacy Console Redirection Settings**" to select the port.



Item	Option	Description
Legacy Serial Redirection Port	RJ45 COM2 (Disabled)	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages

PCI Subsystem Settings

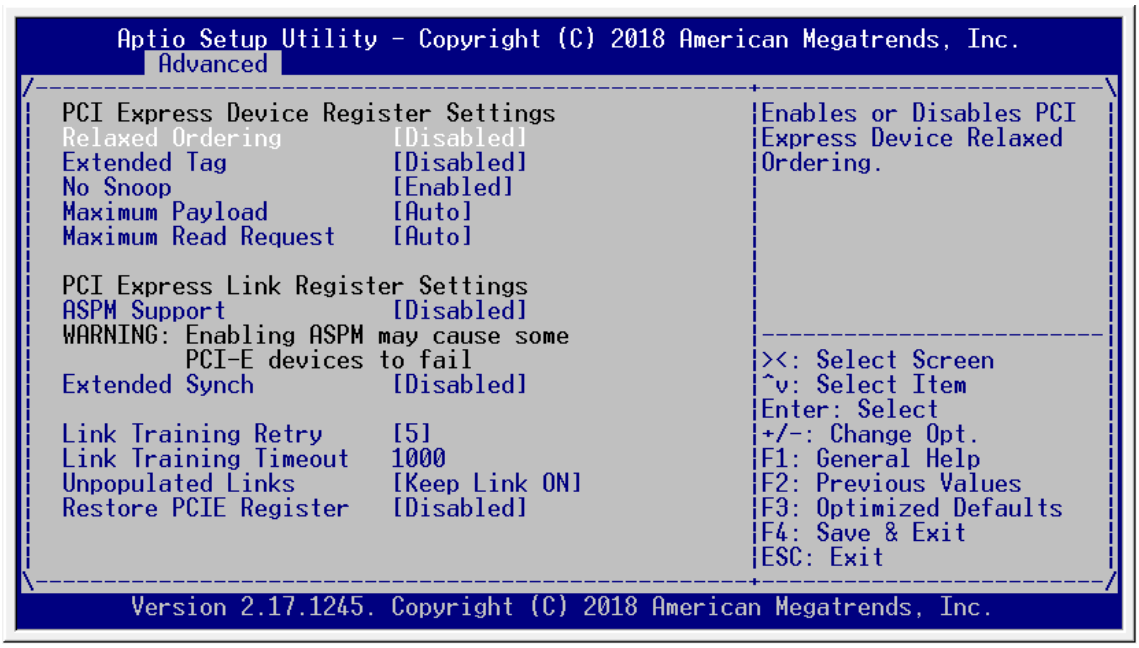
On **Advanced** Setup screen, select and enter "**PCI Subsystem Settings**"



Item	Option	Description
PCI Latency Timer	32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	Value to be programmed into PCI Latency Timer Register
PCI-X Latency Timer	32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	Value to be programmed into PCI Latency Timer Register
VGA Palette Snoop	Disabled Enabled	Enables or Disables VGA Palette Registers Snooping
PERR# Generation	Disabled Enabled	Enables or Disables PCI Device to Generate PERR#
SERR# Generation	Disabled Enabled	Enables or Disables PCI Device to Generate SERR#

Above 4G Decoding	Disabled Enabled	Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64bit PCI Decoding)
PCI Express Settings	None	Change PCI Express Devices Settings
PCI Express GEN 2 Settings	None	Change PCI Express GEN Devices Settings

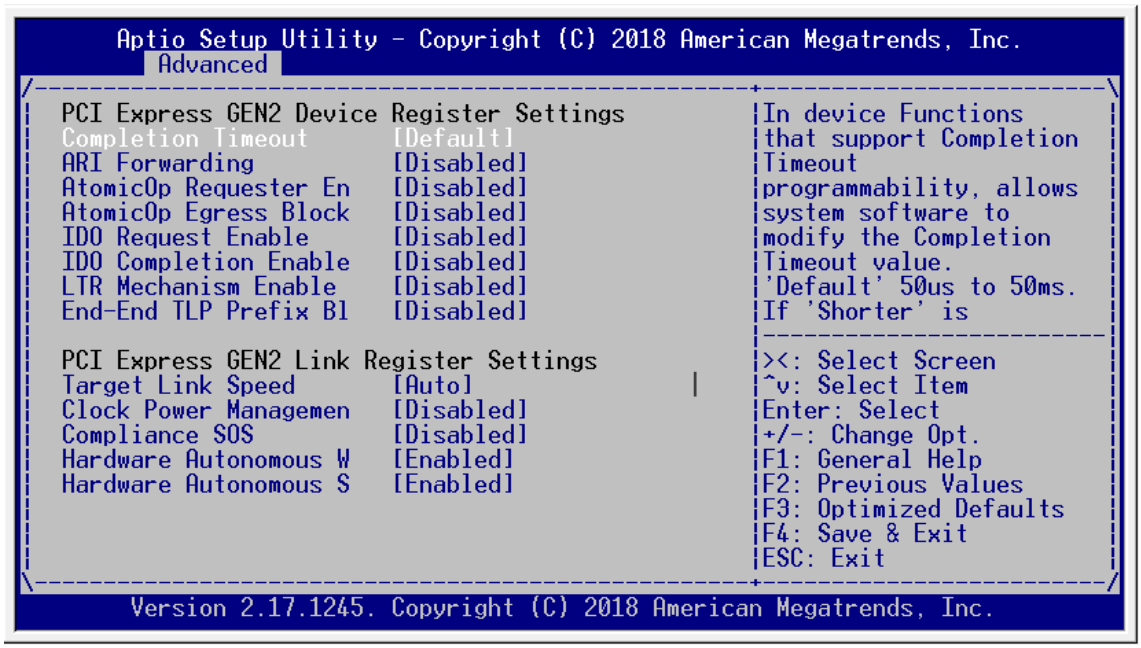
Select and enter "**PCI Express Settings**" for PCI Express devices settings:



Item	Option	Description
Relaxed Ordering	Disabled Enabled	Enables or Disables PCI Express Device Relaxed Ordering
Extended Tag	Disabled Enabled	If ENABLED allows Device to use 8-bit Tag field as a requester
No Snoop	Disabled Enabled	Enables or Disables PCI Express Device No Snoop option
Maximum Payload	Auto 128 Bytes 256 Bytes 512 Bytes 1024 Bytes 2048 Bytes 4096 Bytes	Set Maximum Payload of PCI Express Device or allow System BIOS to select the value
Maximum Read Request	Auto 128 Bytes 256 Bytes 512 Bytes 1024 Bytes 2048 Bytes 4096 Bytes	Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value
ASPM Support	Disabled Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
Extended Synch	Disabled Enabled	If ENABLED, it allows for generation of Extended Synchronization patterns
Link Training Retry	Disabled 2 3 5	Defines number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.

Link Training Timeout	1000	Defines number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Value ranges from 10 to 10000 uS.
Unpopulated Links	Keep Link ON Disable Link	In order to save power, software will disable unpopulated PCI Express links, if this option set to 'Disable Link'.
Restore PCIE Register	Enabled Disabled	On non-PCI Express aware OS's (Pre Windows Vista) some devices may not be correctly reinitialized after S3. Enabling this restors PCI Express device configurations on S3 resume. Warning: Enabling this may cause issues with other hardware after S3 resume.

Select and enter "**PCI Express GEN 2 Settings**" for PCI Express GEN devices settings:

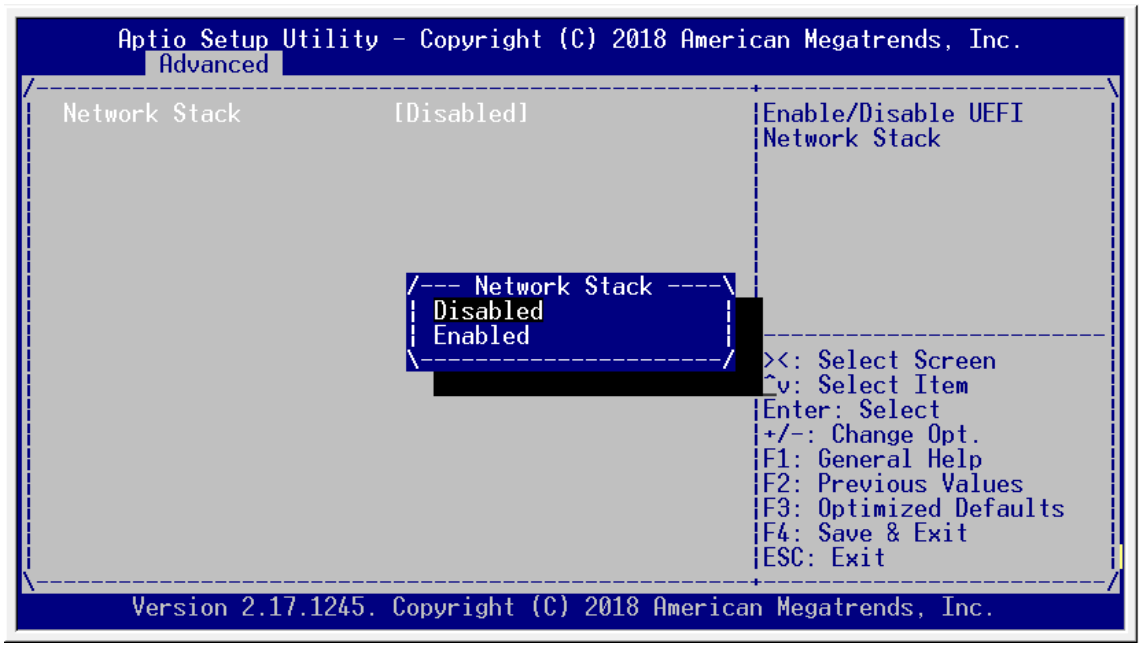


Item	Option	Description
Completion Timeout	Default Shorter Longer Disabled	In-device Functions that support Completion Timeout programmability, allowing the system software to modify the Completion Timeout value. 'Default' is 50us to 50ms. If 'Shorter' is selected, software will use shorter timeout ranges supported by hardware. If 'Longer' is selected, software will use longer timeout ranges.
ARI Forwarding	Disabled Enabled	If supported by hardware and set to 'Enabled', the Downstream Port disables its traditional Device Number field being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port.
AtomicOp Requester En	Disabled Enabled	If supported by hardware and set to 'Enabled', this function initiates AtomicOp Requests only if Bus Master Enable bit is in the Command Register Set.
AtomicOp Egress Block	Disabled Enabled	If supported by hardware and set to 'Enabled', outbound AtomicOp Requests via Egress Ports will be blocked.
IDO Request Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated
IDO Completion Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated

LTR Mechanism Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this enables the Latency Tolerance Reporting (LTR) Mechanism
End-End TLP Prefix Bl	Disabled Enabled	If supported by hardware and set to 'Enabled', this function will block forwarding of TLPs containing End-End TLP Prefixes.
Target Link Speed	Auto Force to 2.5 GT/s Force to 5.0 GT/s	If supported by hardware and set to 'Force to 2.5 GT/s' for Downstream Ports, this sets an upper limit on Link operational speed by restricting the values advertised by the Upstream component
Clock Power Managemen	Disabled Enabled	If supported by hardware and set to 'Enabled', the device is permitted to use CLKREQ# signal for power management of Link clock in accordance to protocol defined in appropriate form factor specification.
Compliance SOS	Disabled Enabled	If supported by hardware and set to 'Enabled', this will force LTSSM to send SKP Ordered Sets between sequences when sending Compliance Pattern or Modified Compliance Pattern
Hardware Autonomous W	Disabled Enabled	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link width except width size reduction for the purpose of correcting unstable link operation.
Hardware Autonomous S	Disabled Enabled	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link speed except speed rate reduction for the purpose of correcting unstable link operation.

Network Stack Settings

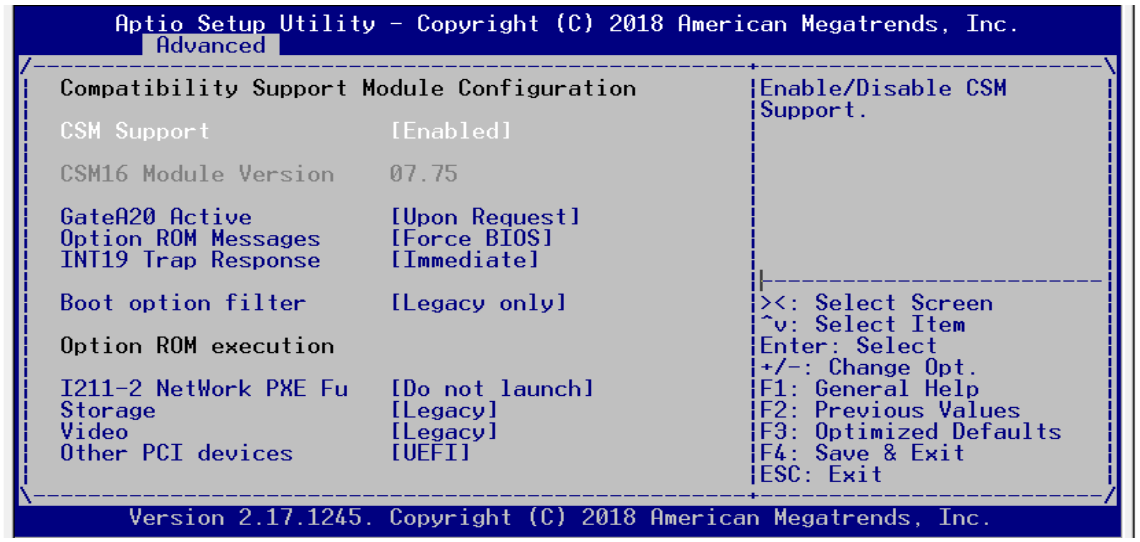
On **Advanced** Setup screen, select and enter "**Network Stack Settings**"



Item	Option	Description
Network Stack	Disabled Enabled	Enable/Disable UEFI Network Stack

CSM Configuration Settings

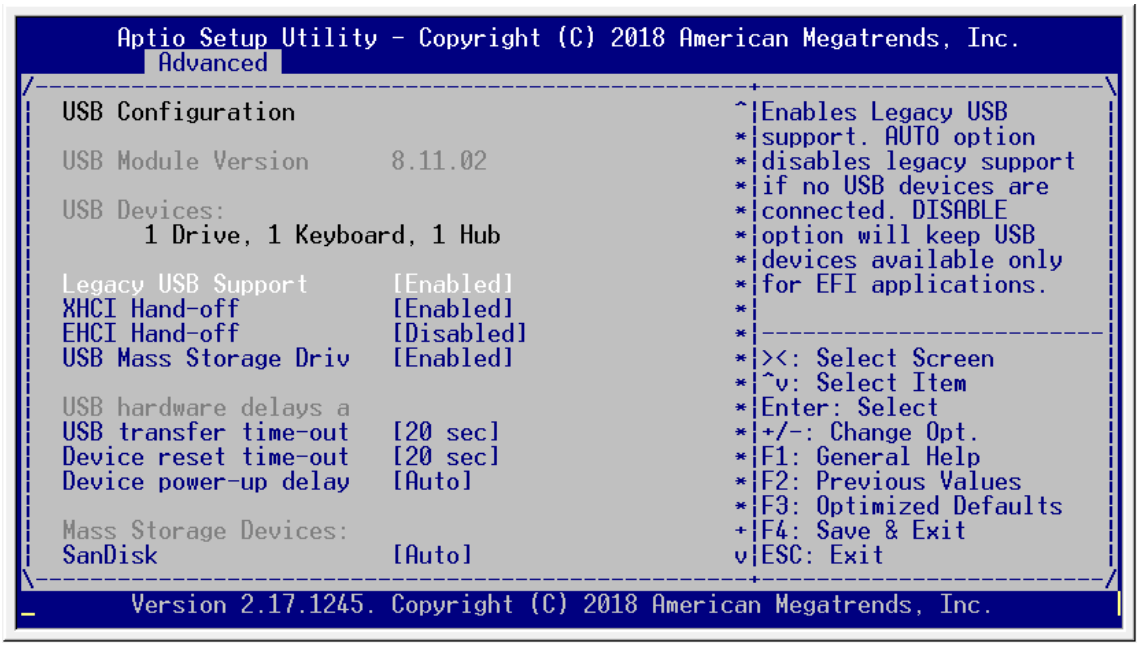
On **Advanced** Setup screen, select and enter "**CSM Configuration Settings**"



Item	Option	Description
CSM Support	Disabled Enabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request Always	UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM
INT19 Trap Response	Immediate Postponed	BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the rap during legacy boot.
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority
I211-2 NetWork PXE Fu	Do not launch Legacy	Controls the execution of i211 Lan 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 devices	UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

USB Configuration Settings

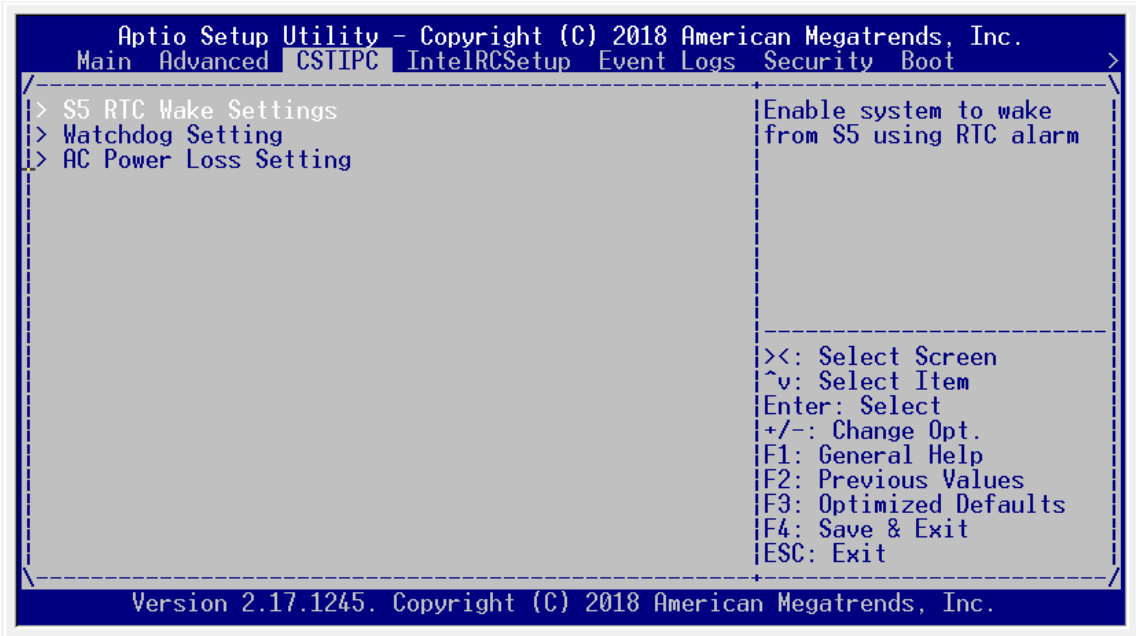
On **Advanced** Setup screen, select and enter "**USB Configuration Settings**"



Item	Option	Description
Legacy USB Support	Disabled Enabled	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.
XHCI Hand-off	Disabled Enabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
EHCI Hand-off	Disabled Enabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driv	Disabled Enabled	Enable/Disable 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	10 sec 20 sec 30 sec 40 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.

CSTIPC Setup

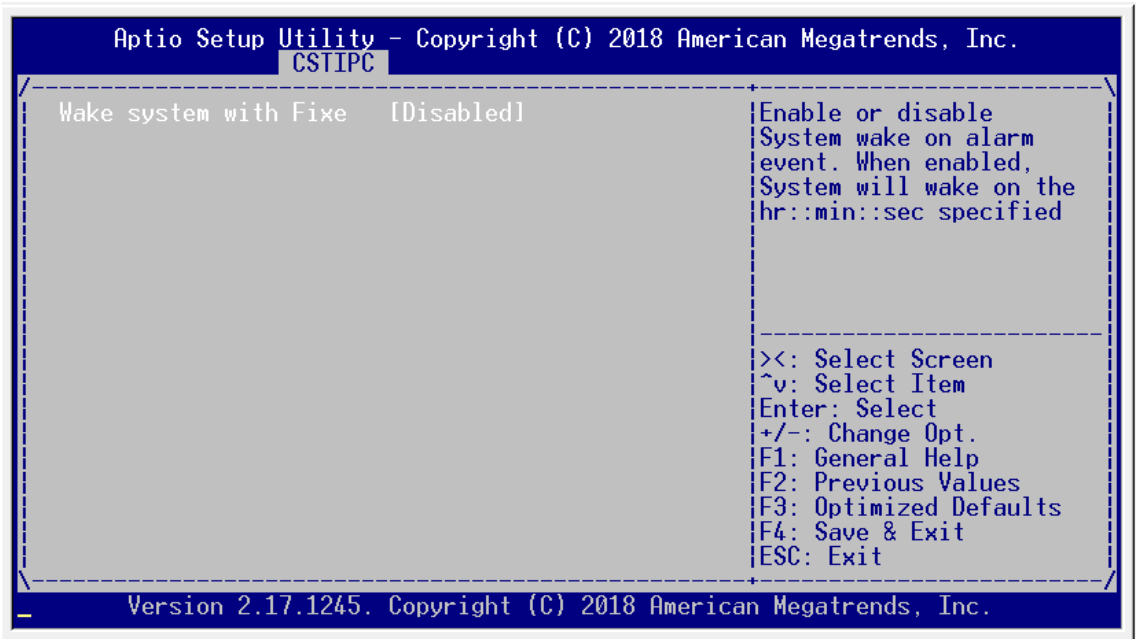
Use [→] or [←] to select **CSTIPC** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

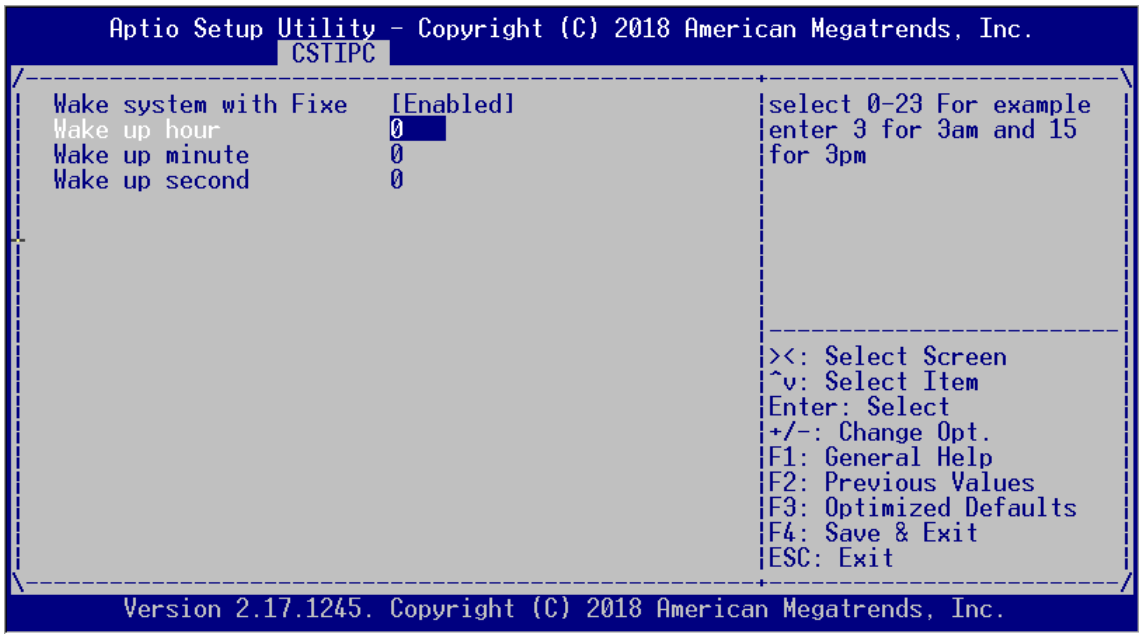


Item	Option	Description
S5 RTC Wake Settings	None	Enable system to wake from S5 using RTC alarm
Watchdog Setting	None	Watchdog Setting
AC Power Loss Setting	None	AC Power Loss Setting

System Wakeup Settings

On **CSTIPC** Setup screen, select and enter "**Wake system with Fixe**"

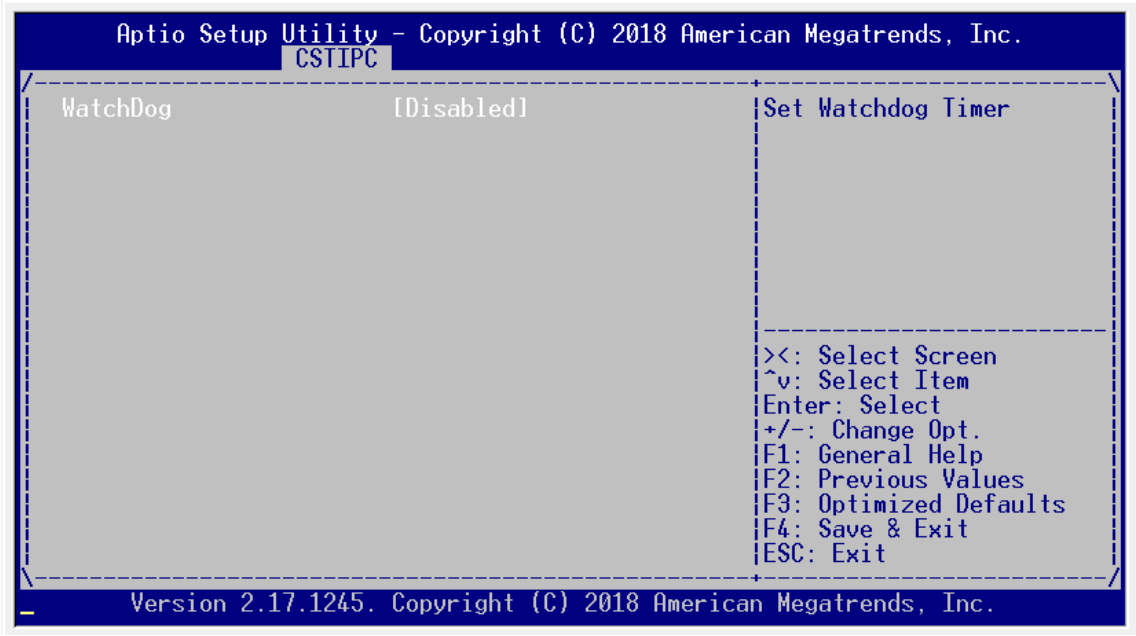


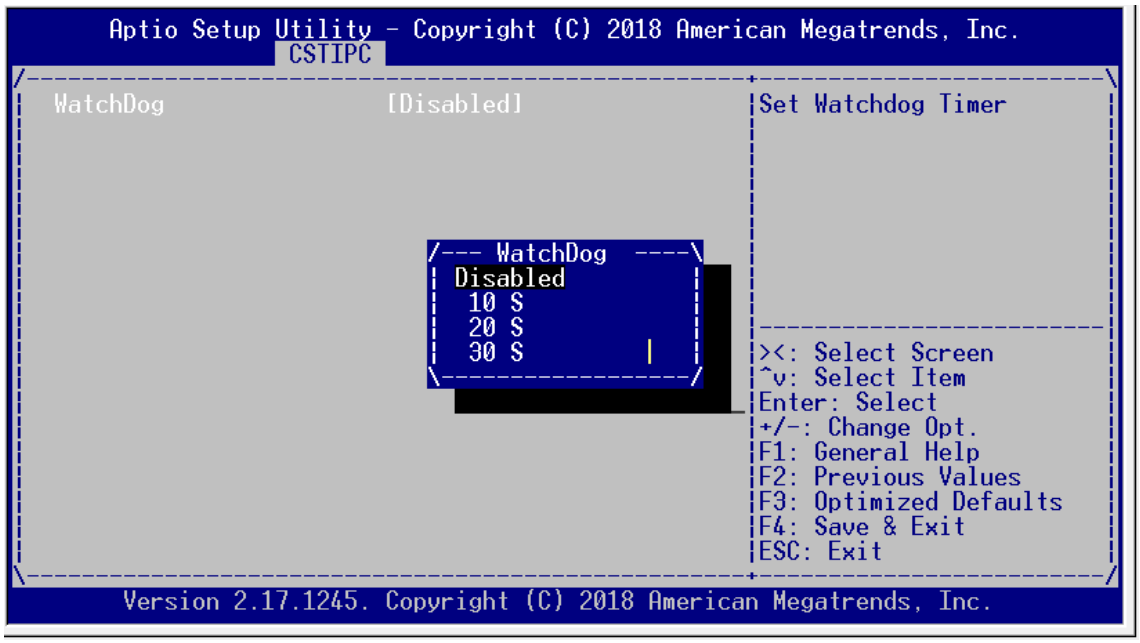


Item	Option	Description
Wake system with Fixe	Disabled Enabled	Enable system to wake from S5 using RTC alarm
Wake up hour	0-23	Wake up hour setting
Wake up minute	0-59	Wake up minute setting
Wake up second	0-59	Wake up second setting

Watchdog Settings

On **CSTIPC** Setup screen, select and enter "**Watchdog**"

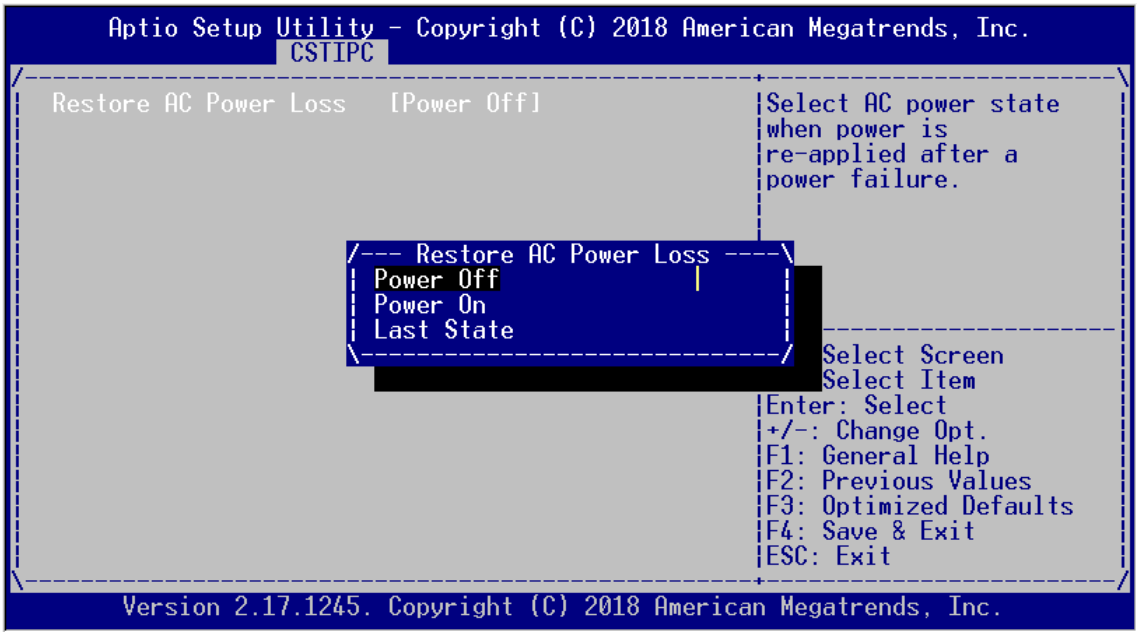




Item	Option	Description
WatchDog	Disabled 10S 20S 30S	Set Watchdog Timer

AC Power Loss Settings

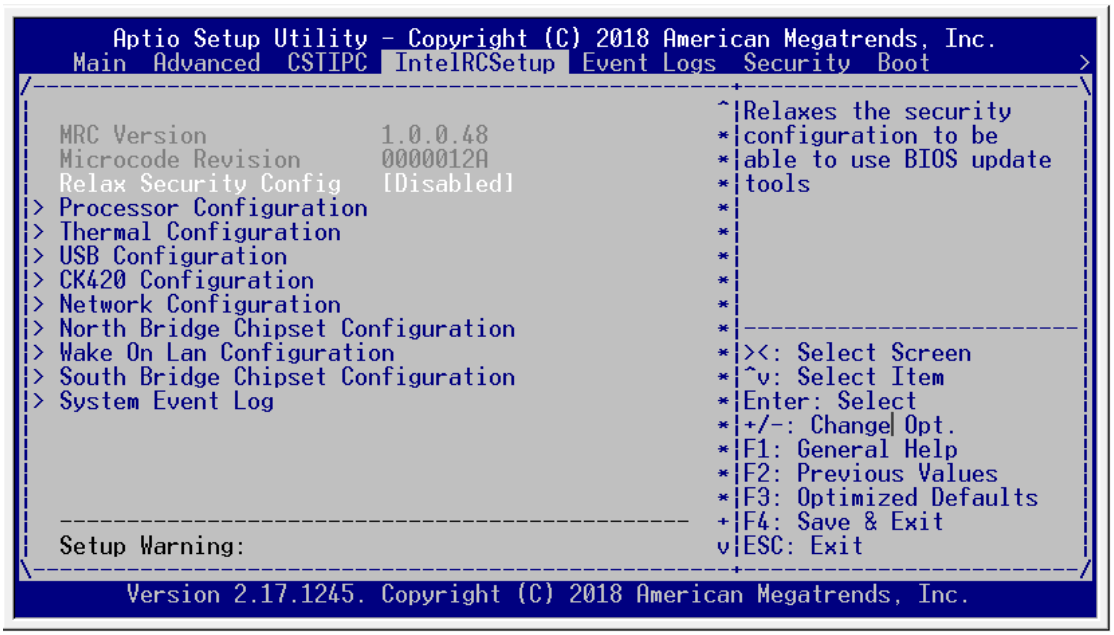
On **CSTIPC** Setup screen, select and enter "**AC Power Loss Setting**"



Item	Option	Description
Restore AC Power Loss	Power off Power On Last State	Select AC power state when power is re-applied after a power failure: ● Power off: Motherboard will stay off after power is back. ● Power On: Motherboard will be powered-on right after power is back. ● Power On: Motherboard will restore the last state before the power failure.

IntelRCSetup

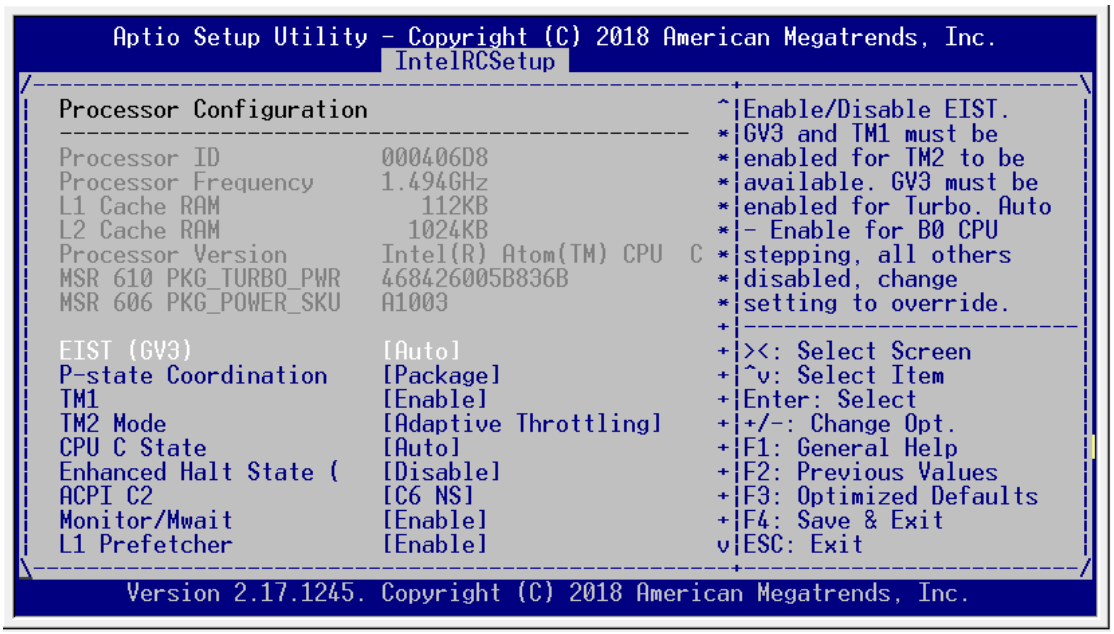
Use [→] or [←] to select **IntelRCSetup** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

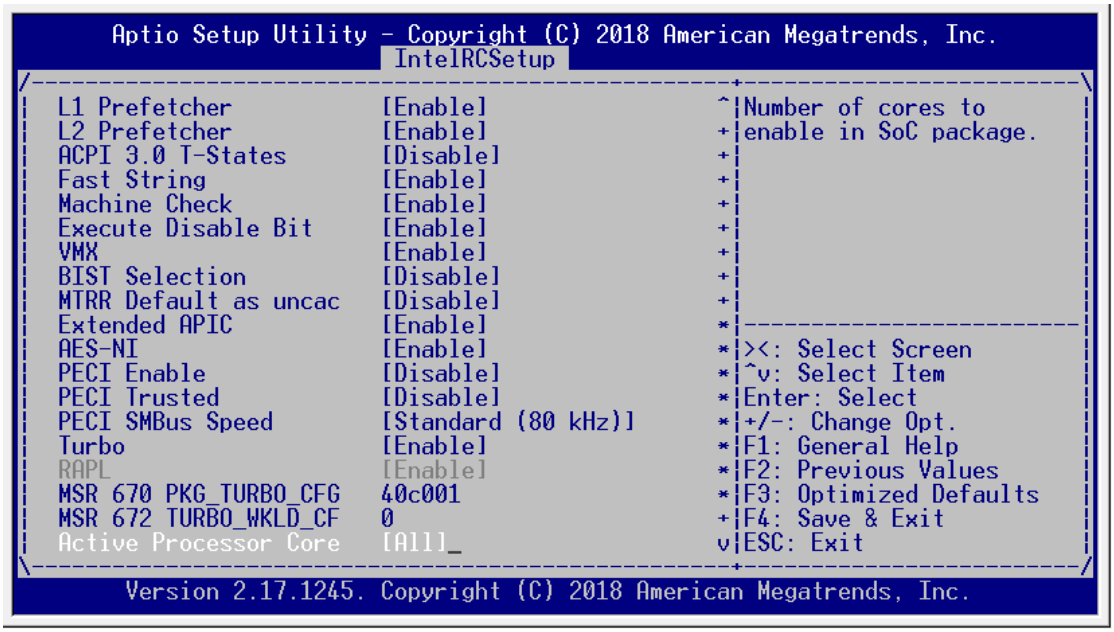


Item	Option	Description
Relax Security Config	Enabled Disabled	Relaxes the security configuration to be able to use BIOS update tools
Processor Configuration	None	Displays and provides option to change the Processor Settings
Thermal Configuration	None	Thermal Configuration Parameters
USB Configuration	None	USB Configuration Parameters
CK420 Configuration	None	CK420 Configuration
Network Configuration	None	Network Configuration
North Bridge Chipset Configuration	None	North Bridge Chipset Configuration
Wake On Lan Configuration	None	Wake On Lan Configuration settings
South Bridge Chipset Configuration	None	South Bridge Parameters

Processor Configuration

On **IntelRCSetup** screen, select and enter "**Processor Configuration**."





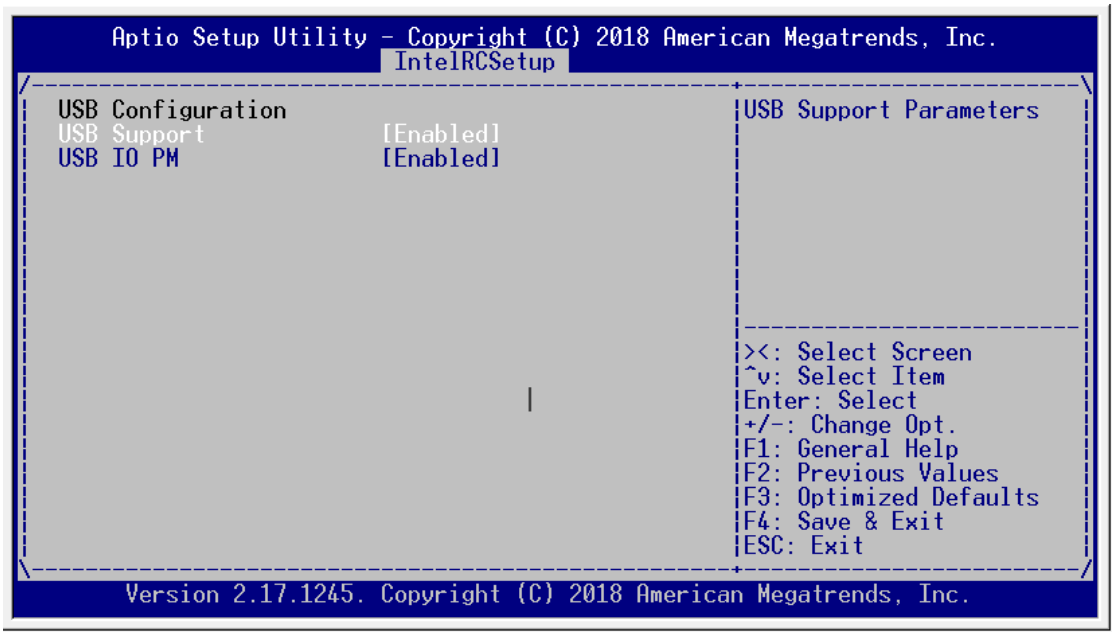
Item	Option	Description
EIST (GV3)	Disable Enable Auto	Enable/Disable EIST. GV3 and TM1 must be enabled for TM2 to be available. GV3 must be enabled for Turbo. Auto- Enable for B0 CPU stepping, all others disabled, change setting to override.
P-state Coordination	Hardware Package Module	Choose Package or Module level P-state Ratio coordination. VID always resolves to the highest P-state VID of any core in the SoC.

Item	Option	Description
TM1	Disabled Enabled	Enable/Disable TM1. TM1 and GV3 must be enabled in order to support TM2
TM2 Mode	LFM Throttling Adaptive Throttling	Select LFM throttling or adaptive throttling for TM2 mechanisms.
CPU C State	Disabled Enabled Auto	Enables the Enhanced Cx state of the CPU, takes effect after reboot. Auto - Enable for B0 CPU stepping, all others disabled, change setting to override.
Enhanced Halt State	Disabled Enabled	Enables the Enhanced C1E state of the CPU, takes effect after reboot.
ACPI C2	Disable C6 NS C6 FS	Configure CPU (ACPI C2) reported to OS, C6 No Shrink or C6 Full Shrink
Monitor/Mwait	Disabled Enabled	Enable or Disable the Monitor/Mwait instruction
L1 Prefetcher	Enable Disable	Enable/Disable L1 Prefetch
L2 Prefetcher	Enable Disable	Enable/Disable L2 Prefetch
ACPI 3.0 T-States	Disabled Enabled	Enable/Disable ACPI 3.0 T-States.
Fast String	Disabled Enabled	When enabled, enable fast strings for REP MOVS/STOS
Machine Check	Disabled Enabled	Enable or Disable the Machine Check
Execute Disable Bit	Disabled Enabled	When disabled, forces the XD feature flag to always return 0.
VMX	Disabled Enabled	Enables the Vanderpool Technology, takes effect after reboot.
BIST Selection	Disabled Enabled	Enables BIST, takes effect after reboot.
MTRR Default as uncac	Disabled Enabled	EFI_CACHE_IA32_MTRR_DEF_TYPE msr(2FF) as uncacheable
Extended APIC	Disabled Enabled	Enable/disable extended APIC support

AES-NI	Disabled Enabled	Enable/disable AES-NI support
PECI Enable	Enable Disable	Enable/disable Punit PECI support
PECI Trusted	Disabled Enabled	Enable/disable Punit Trusted PECI support
PECI SMBus Speed	Standard (80 kHz)Standard Standard (100 kHz) Fast Mode (400 kHz) Fast Mode Plus (1 MHz)	PECI SMBus Speed: Value to indicate what speed physical bus must operate.
Turbo	Disabled Enabled	Enable or Disable CPU Turbo capability. This option only applies to ES2 and above.
MSR 670 PKG_TURBO_CFG	40c001	Specifies various parameters used for Turbo, Min Energy [28:16], SoC TDP Policy [11:9], ICCMax Control [4:3], Turbo Mode [2:0] and others
MSR 672 TURBO_WKLD_CF	0	Specifies ICCMax Throttle Ratio for C6 exits when PKG_TURBO_CFG1[4:3] ==10y
Active Processor Core	All 4 2	Number of cores to enable in SoC package.
CPU Flex Ratio Overri	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming

USB Configuration

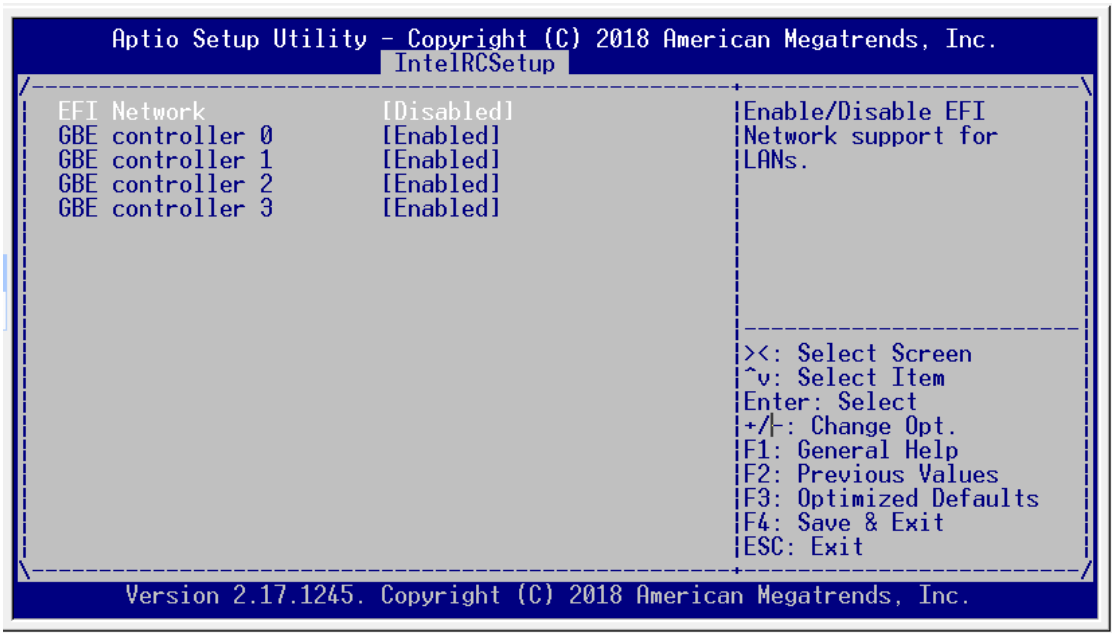
On **IntelRC** Setup screen, select and enter "**USB Configuration**"



Item	Option	Description
USB Support	Disabled Enabled	USB Support Parameters
USB IO PM	Disabled Enabled	Enable/Disable IO PM

Network Configuration

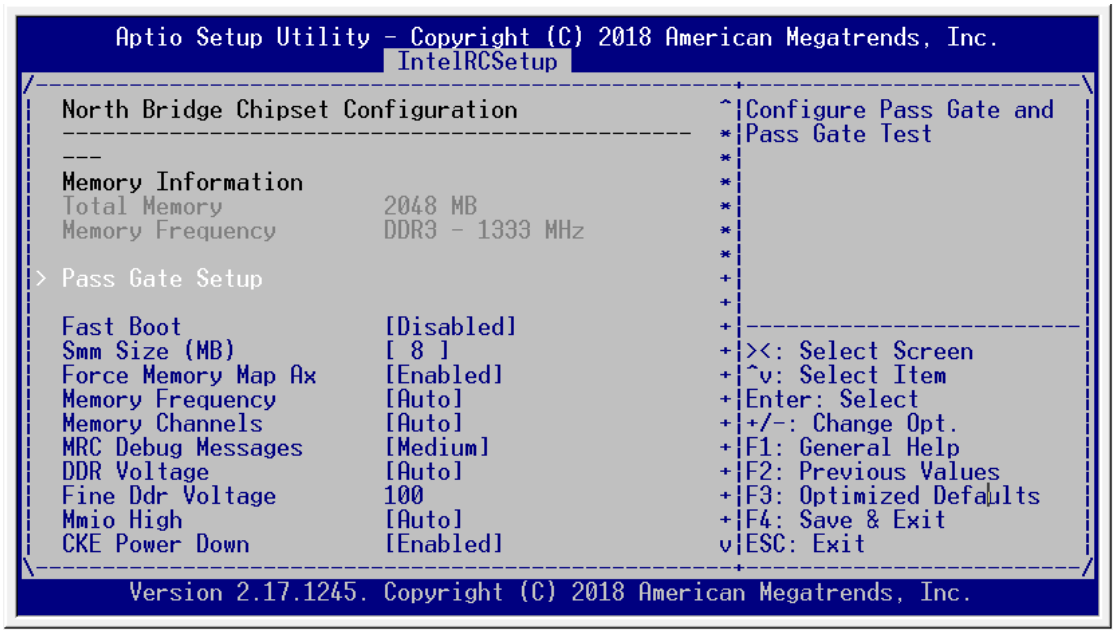
On **IntelRCSetup** screen, select and enter "**Network Configuration**"

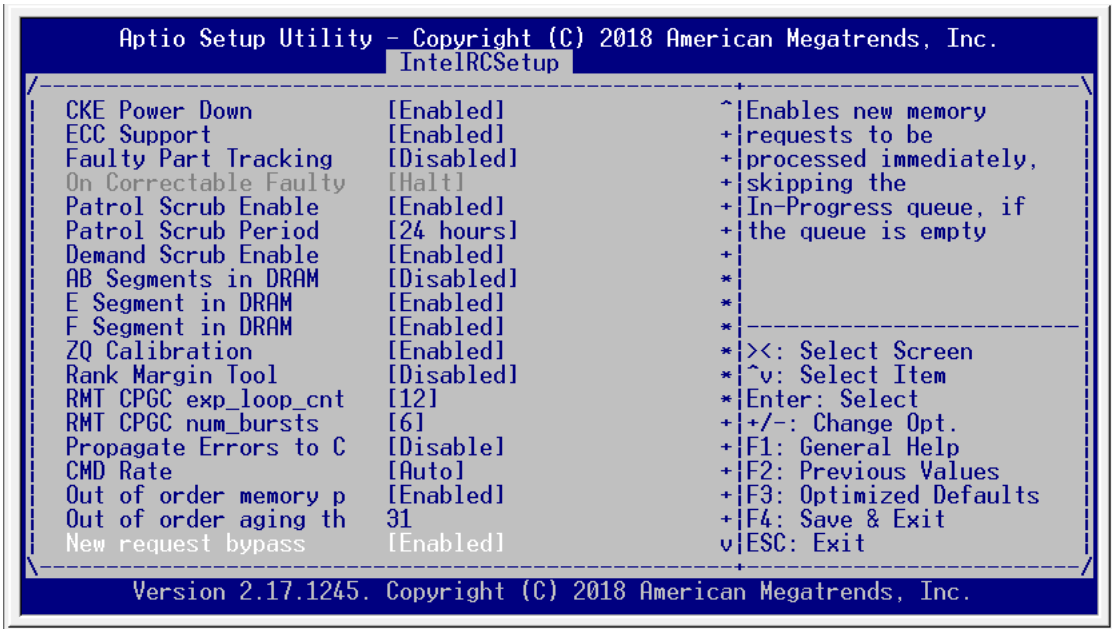


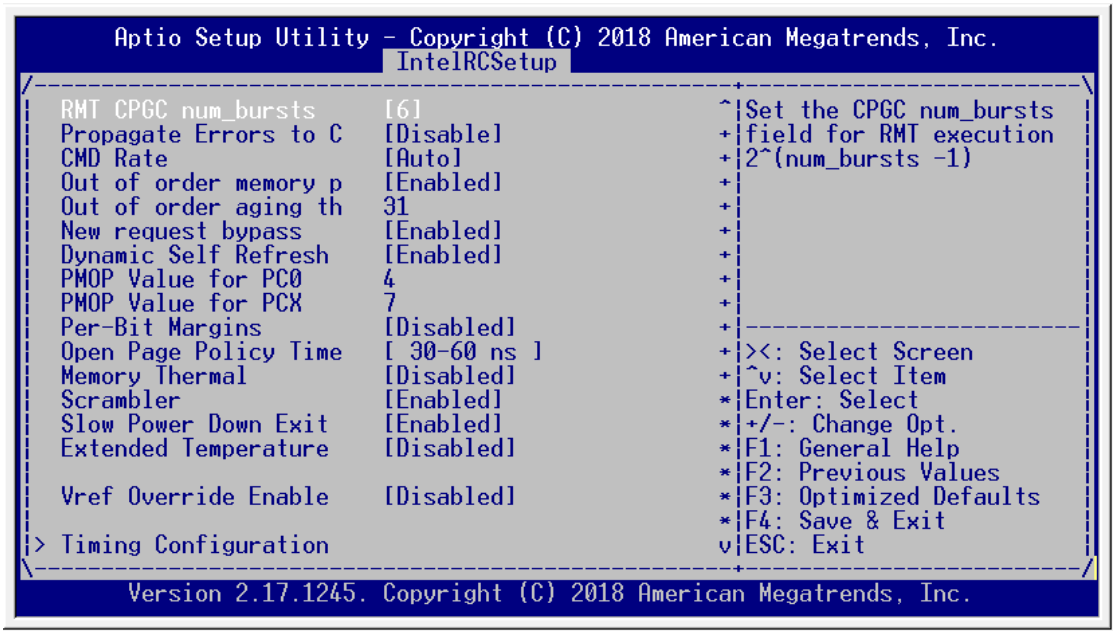
Item	Option	Description
EFI Network	Enabled Disabled	Enable/Disable EFI Network support for LANs.
GBE controller 0	Enabled Disabled	Enable/Disable the GBE hardware controller if supported by SKU
GBE controller 1	Enabled Disabled	Enable/Disable the GBE hardware controller if supported by SKU
GBE controller 2	Enabled Disabled	Enable/Disable the GBE hardware controller if supported by SKU
GBE controller 3	Enabled Disabled	Enable/Disable the GBE hardware controller if supported by SKU

North Bridge Chipset Configuration

On **IntelRCSetup** screen, select and enter "**North Bridge Chipset Configuration**".







Item	Option	Description
Pass Gate Setup	None	Configure Pass Gate and Pass Gate Test
Fast Boot	Disabled Enabled	Enables/Disables fast boot which skips memory training and attempts to boot using last known good configuration.
Smm Size (MB)	2 4 8 16	Specify the size of the SMM/TSEG region 1 MB aligned
Force Memory Map Ax	Auto Enabled	Force Memory Map for Ax parts
Memory Frequency	Auto DDR3-1333 DDR3-1600	DDR3 memory frequency
Memory Channels	Auto Single Channel	DDR3 memory channels enabled
MRC Debug Messages	Disabled Minimum Medium Maximum	Enable to display debug output in MRC
DDR Voltage	Auto 1.25V 1.35V 1.50V	Select the desired DDR voltage
Fine Ddr Voltage	100	Select between -100 to 100 mV in steps of 5mv. 0 -> -100mV :: 100 ->0mV :: 200 -> 100mV

Item	Option	Description
Mmio High	Auto 256MB 512MB 1024MB 2048MB 4096MB 8192MB	Configure the MMIO High. AUTO: will leave the MMIOH according with the total memory installed in the system
CKE Power Down	Disabled Enabled	Enables/Disables the CKE Power Down
ECC Support	Disabled Enabled	Select to enable/disable ECC Support
Faulty Part Tracking	Disabled Enabled	Select to enable/disable faulty part tracking
Patrol Scrub Enable	Disabled Enabled	Select to enable/disable Patrol Scrub Support
Patrol Scrub Period	24 hours 10 hours 4 hours 1 hour	Select the Patrol Scrub Period
Demand Scrub Enable	Disabled Enabled	Select to enable/disable Demand Scrub Support
AB Segments in DRAM	Disabled Enabled	When this bit is set reads and writes targeting AorB-segments are routed to DRAM
E Segment in DRAM	Disabled Enabled	When this bit is set reads and writes targeting E segment are routed to DRAM
F Segment in DRAM	Disabled Enabled	When this bit is set reads and writes targeting F segment are routed to DRAM
ZQ Calibration	Disabled Enabled	Enables ZQ Calibration.
Rank Margin Tool	Disabled Enabled	Enable Rank Margin Tool support
RMT CPGC exp_loop_cnt	1 2 3 4 5 6	Set the CPGC exp_loop_cnt field for RMT execution 2^(exp_loop_cnt -1)

	7 8 9 10 11 12	

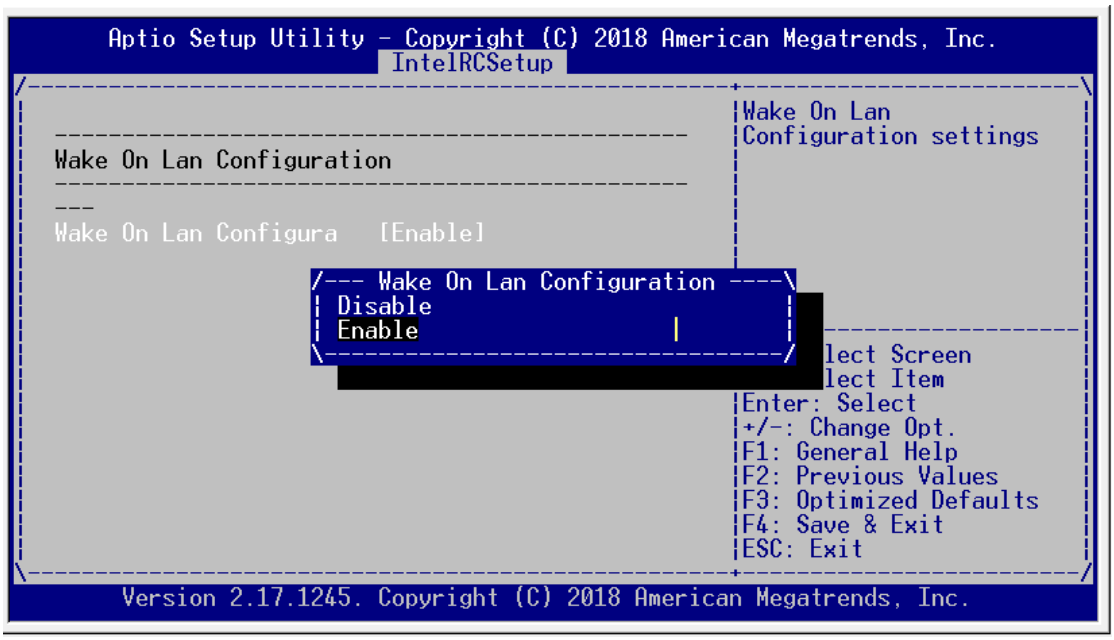
Item	Option	Description
RMT CPGC num_bursts	1 2 3 4 5 6 7 8 9 10 11 12	Set the CPGC num_bursts field for RMT execution 2^(num_bursts -1)
Propagate Errors to C	Enable Disable	To configure the Bunit Machine Check Mode to propagate errors to cores
CMD Rate	Auto 1N 2N 2N	Set CMD Rate to Auto /1N / 2N / 3N
Out of order memory p	Disabled Enabled	Enables out of order memory processing, improving performance
Out of order aging th	31	Specifies the number of requests that can be processed ahead of another request sitting in the In-Progress request queue before OOO is disabled
New request bypass	Disabled Enabled	Enables new memory requests to be processed immediately, skipping the In-Progress queue, if the queue is empty
Dynamic Self Refresh	Disabled Enabled	Enable/Disable dynamic self refresh in memory controller
PMOP Value for PC0	4	Power Mode Opcode for PC0
PMOP Value for	7	Power Mode Opcode for PCX

PCX		
Per-Bit Margins	Disabled Enabled	Enable to show per-bit margins in MRC training
Open Page Policy Time	Disabled Inmediate 30-60 ns 60-120 ns 120-240 ns 240-480 ns 480-960 ns 1-2 us	Set Page Closure Timer to Disabled / Immediate / 30-60 ns / 60-120ns / 120-240ns / 240-480ns / 480-960ns / 1-2us

Item	Option	Description
Memory Thermal	Disabled Enabled	Enable/Disable Memory Thermal Management mode
Scrambler	Disabled Enabled	Enable / Disable the scrambler
Slow Power Down Exit	Disabled Enabled	Enable / Disable Slow Power Down Exit from pre-charge
Extended Temperature	Disabled Enabled	Enable / Disable Extended Temperature Range
Vref Override Enable	Disabled Enabled	Enables/Disables Vref Override Enable
Timing Configuration	None	Configures the timing for the memory

Wake On Lan Configuration

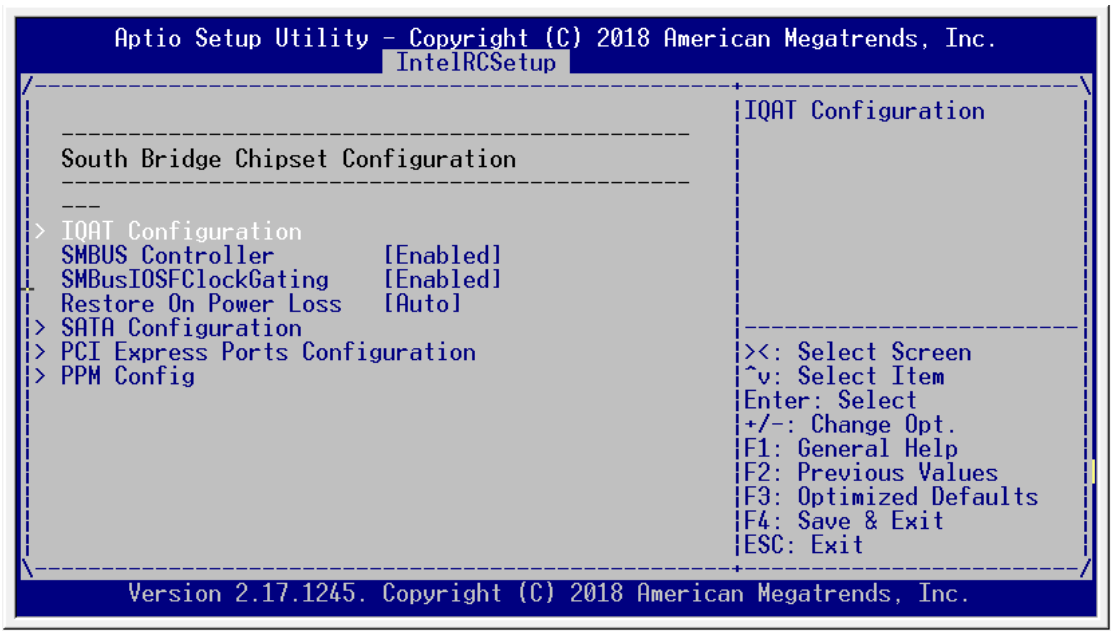
On **IntelRC** Setup screen, select and enter "**Wake On Lan Configuration**".



Item	Option	Description
Wake On Lan Configura	Disabled Enabled	Wake On Lan Configuration settings

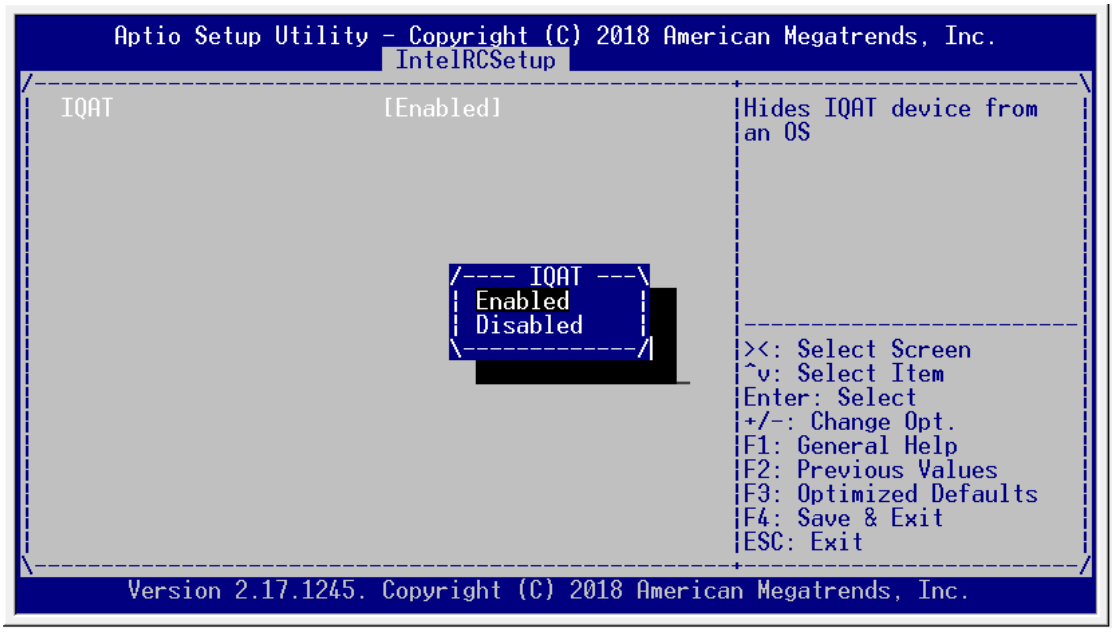
South Bridge Chipset Configuration

On **IntelRC** Setup screen, select and enter "**South Bridge Chipset Configuration**".



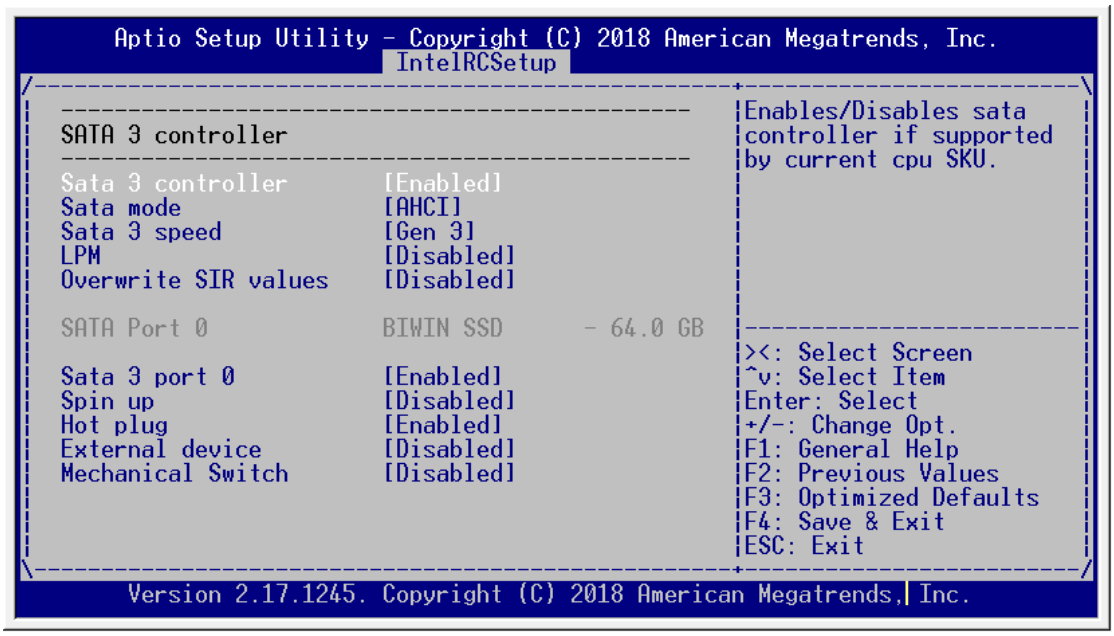
Item	Option	Description
IQAT Configuration	None	IQAT Configuration
SMBUS Controller	Disabled Enabled	SMBUS Controller options
SMBusIOSFClock Gating	Disabled Enabled	SMBusIOSFClockGating
Restore On Power Loss	Auto Power On Power Off	Restore On AC Power Loss Options
SATA Configuration	Disabled Enabled	SATA Configuration
PCI Express Ports Configuration	None	Enable or Disable the PCI Express Ports in he Chipset.
PPM Config	None	PPM Config

Select "**IQAT Configuration**"for IQAT settings:



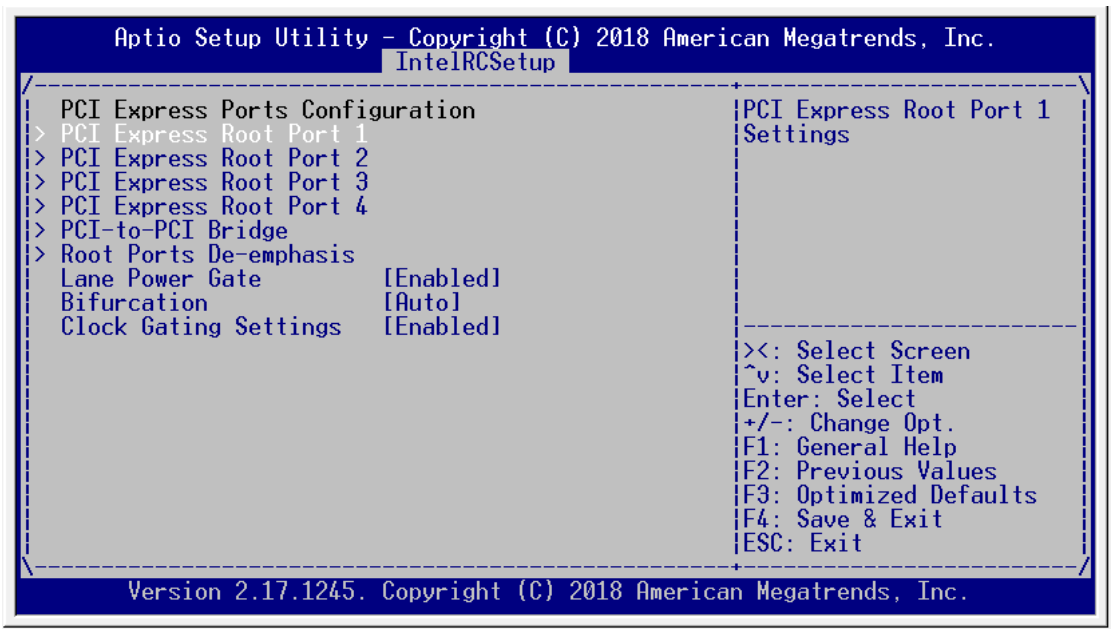
Item	Option	Description
IQAT	Enabled Disabled	Hides IQAT device from an OS

On **South Bridge Chipset Configuration** Setup screen, select and enter "**SATA Configuration**".



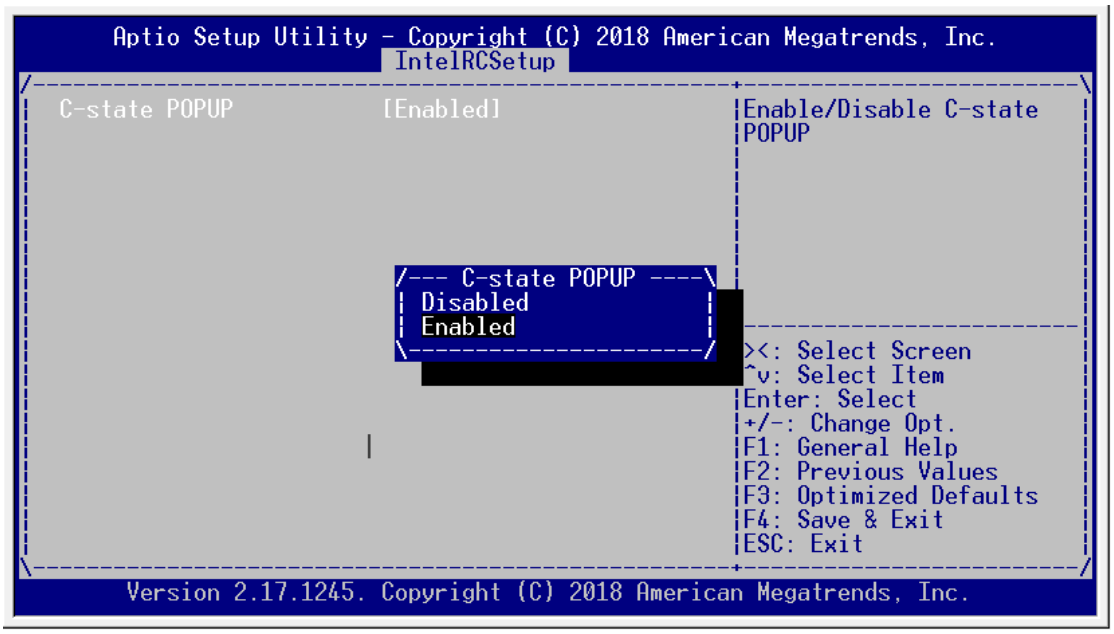
Item	Option	Description
Sata 3 controller	Enabled Disabled	Enables/Disables sata controller if supported by current cpu SKU.
Sata mode	IDE AHCI	Sata mode
Sata 3 speed	Gen 1 Gen 2 Gen 3	Indicates the highest allowable speed of the interface
LPM	Enabled Disabled	Enables/Disables Link Power Management
Overwrite SIR values	Disabled Enabled	Overwrite SIR values
Sata 3 port 0	Enabled Disabled	Enables/Disables sata device if supported by current cpu SKU.
Spin up	Enabled Disabled	Spin up
Hot plug	Enabled Disabled	Hot plug
External device	Enabled Disabled	External SATA device
Mechanical Switch	Enabled Disabled	Mechanical Switch

On **South Bridge Chipset Configuration** Setup screen, select and enter **PCI Express Ports Configuration**.



Item	Option	Description
PCI Express Root Port 1	None	PCI Express Root Port 1 Settings
PCI Express Root Port 2	None	PCI Express Root Port 2 Settings
PCI Express Root Port 3	None	PCI Express Root Port 3 Settings
PCI Express Root Port 4	None	PCI Express Root Port 4 Settings
PCI-to-PCI Bridge	None	P2P Controls Settings
Root Ports De-emphasis	None	Selectable De-emphasis (SD)
Lane Power Gate	Disabled Enabled	Power Gate for PCIe Root Ports
Bifurcation	Auto ------P0 X16 --P2--P0 X8X8 --P2P1P0 X8X4X4 P3P2--P0 X4X4X8 P3P2P1P0 X4X4X4X4	Select Root Complex Bifurcation Config
Clock Gating Settings	Disabled Enabled	Enable/Disable CL for PCIe Devices

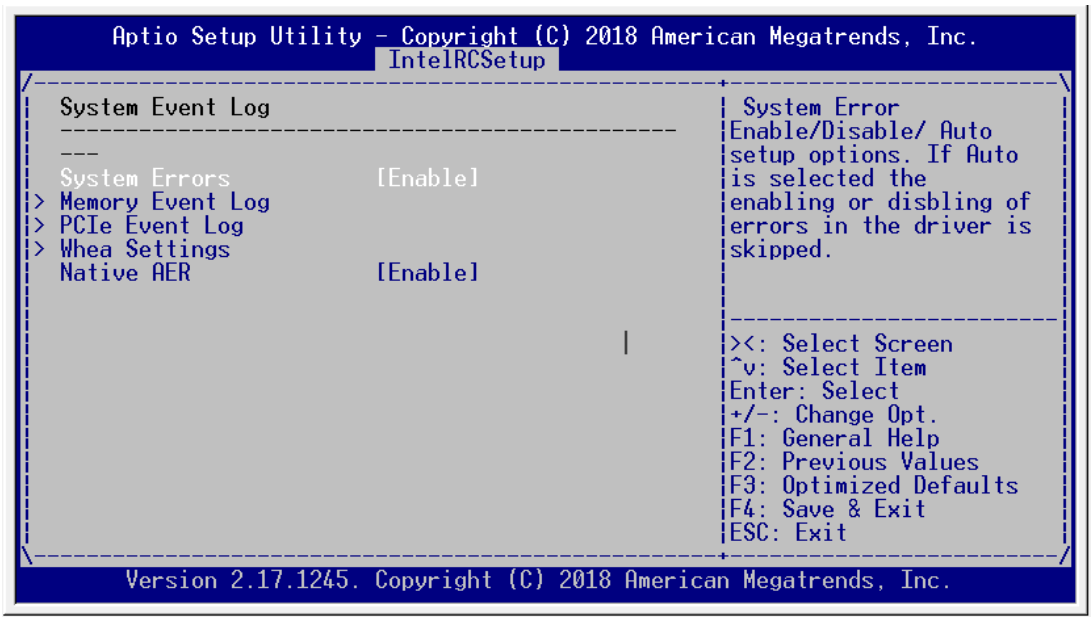
On **South Bridge Chipset Configuration** Setup screen, select and enter "**PPM Config**".



Item	Option	Description
C-state POPUP	Disabled Enabled	Enable/Disable C-state POPUP

System Event Log Setup

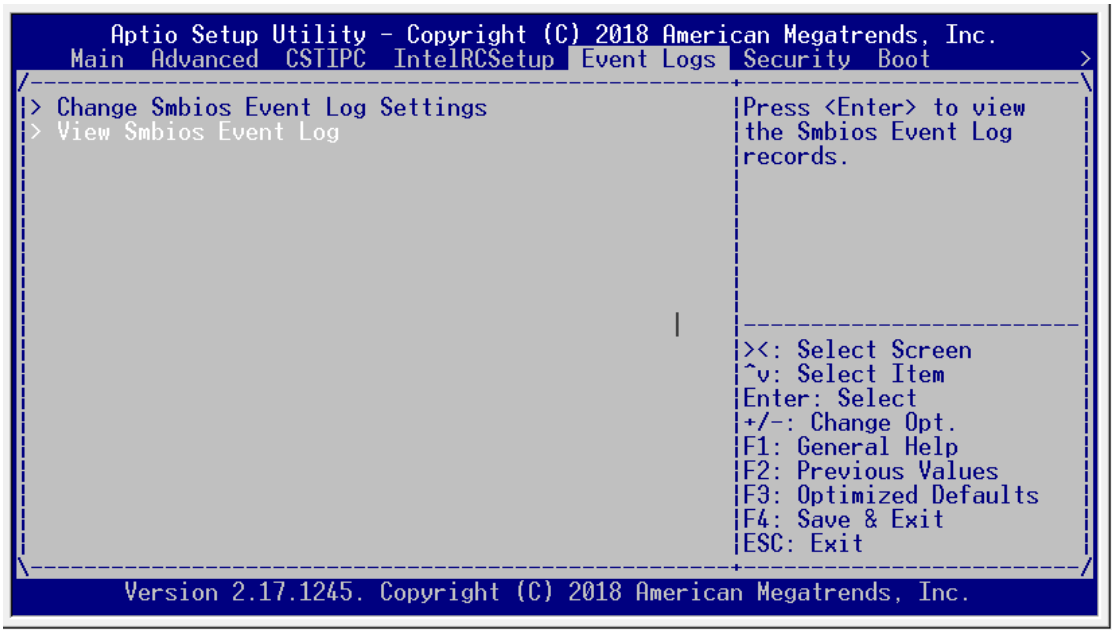
On **System Event Log** Setup screen, select and enter "**System Event Log**".



Item	Option	Description
System Errors	Disabled Enabled Auto	System Error Enable/Disable/Auto Setup options. If Auto is selected the enabling or disabling of errors in the drive is skipped
Memory Event Log	None	
PCIe Event Log	None	
Whea Settings	None	Press <Enter> to view or change the WHEA configuration.
Native AER	Disabled Enabled	Enable/Disable Native Advanced Error reporting capability.

Event Logs Setup

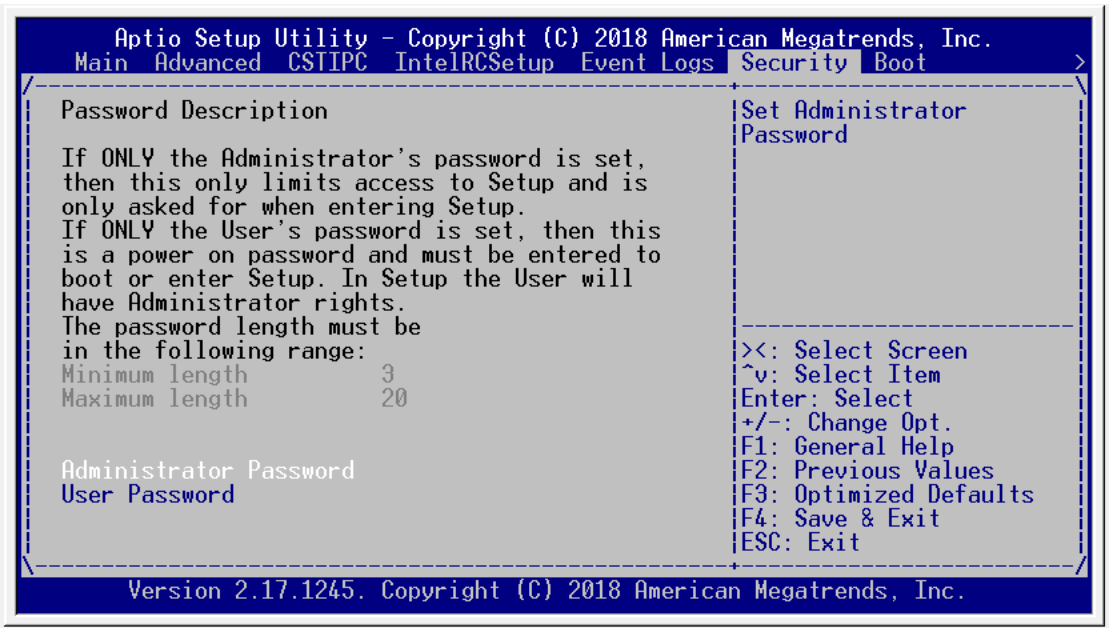
Use [→] or [←] to select **Event Logs** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.



Item	Option	Description
Change Smbios Event Log Settings	None	Press <Enter> to change the Smbios Event Log configuration.
View Smbios Event Log	None	Press <Enter> to view the Smbios Event Log records.

Security Setup

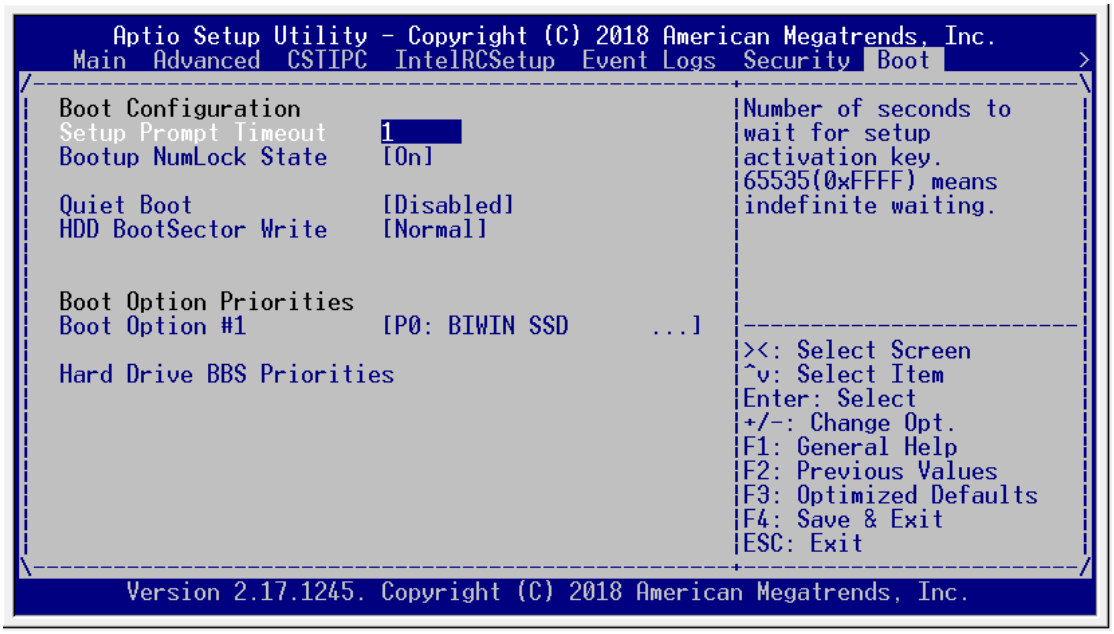
Use [→] or [←] to select **Security** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.



Item	Option	Description
Administrator Password	None	If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
View Smbios Event Log	None	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 Setup

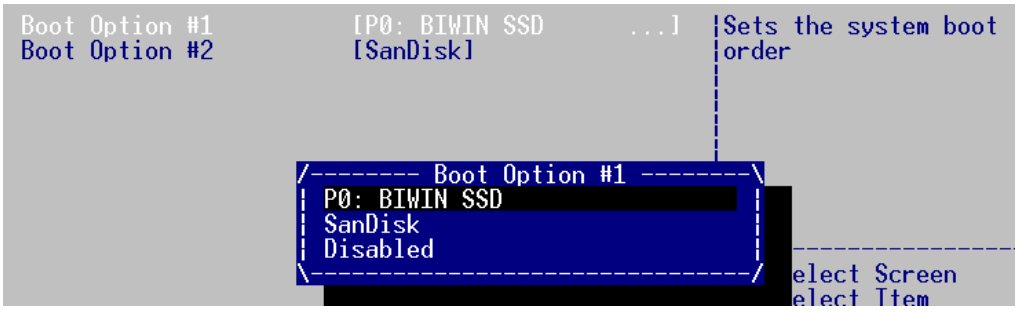
Use [→] or [←] to select **Boot** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.



Item	Option	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option
HDD BootSector Write	Normal Write Protect	Enables or disables writes to Hard Disk Sector 0
Hard Drive BBS Priorities	None	Set the order of the legacy devices in this group

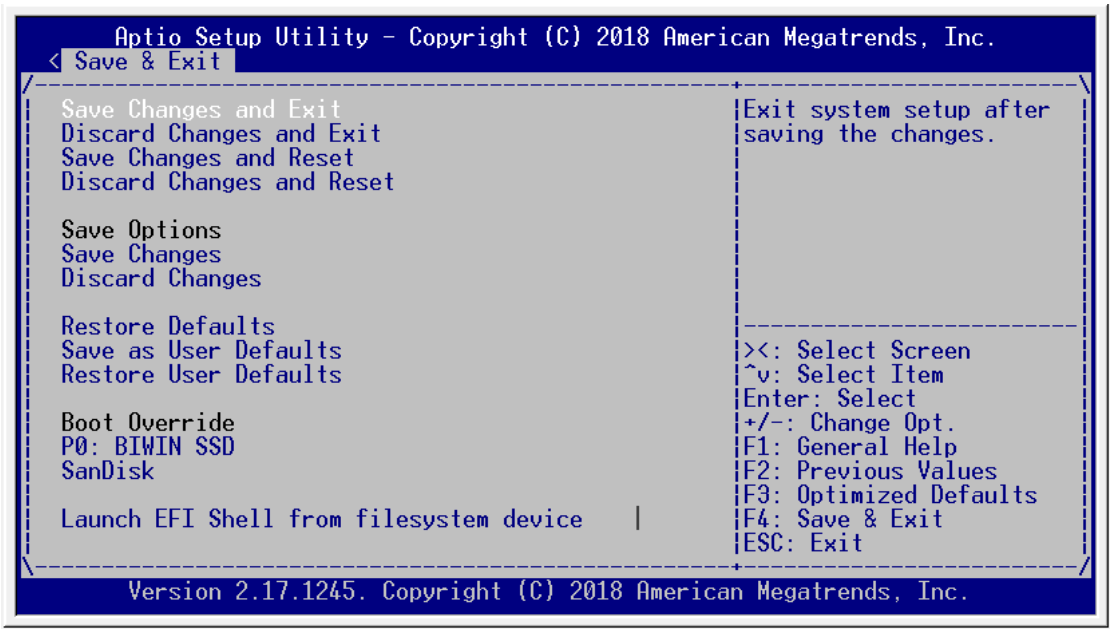
Note：

Please configure "**Boot Option #1**" for "**Hard Drive BBS Priorities**".



Save & Exit Setup

Use [→] or [←] to select **Save & Exit** setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.



Item	Option	Description
Save Changes and Exit	None	Exit system setup after saving the changes.
Discard Changes and Exit	None	Exit system setup without saving any changes.
Save Changes and Reset	None	Reset the system after saving the changes.
Discard Changes and Reset	None	Reset system setup without saving any changes.
Save Changes	None	Save Changes done so far to any of the setup options.
Discard Changes	None	Discard Changes done so far to any of the setup options.
Restore Defaults	None	Restore/Load Default values for all the setup options.
Save as User Defaults	None	Save the changes done so far as User Defaults.
Restore User Defaults	None	Restore the User Defaults to all the setup options.
Launch EFI Shell from filesystem device	None	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices

APPENDIX A: LED INDICATOR EXPLANATIONS

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

- **System Power**

Solid Green	*The system is powered on*
Off	*The system is powered off*

- **System Status**

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

Solid Green	*Defined by GPIO*
Solid Red	*Defined by GPIO*
Off	*Defined by GPIO*

- **HDD Activity**

  If this LED blinks, it indicates data access activities; otherwise, it remains off.

Blinking Amber	*Data access activity*
Off	*No data access activity*

- **Link Activity**

Blinking Amber	*Link has been established and there is activity on this port*
Solid Amber	*Link has been established and there is no activity on this port*
Off	*No link is established*

- **Speed**

Solid Amber	*Operating as a Gigabit connection (1000 Mbps)*
Solid Green	*Operating as a 100-Mbps connection*
Off	*Operating as a 10-Mbps connection*

APPENDIX B: 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, enter the product category and download the utility package of this system.

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

APPENDIX C: 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 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: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____ Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ 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
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date