Lanner

Industrial Communication Platforms

Energy Management and Industrial Cyber Security Solutions

LEC-3034 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 or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the Lanner Download Center page with a login account and password.

Conventions & Icons

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

Font Conventions

Example	Convention	Usage
`iptables –F`	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
Readme.txt	In Italic	A filename or a file path
IPMI User Guide	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 special 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

To obtain additional documentation resources and software updates for your system, please visit the Lanner Download Center. As certain categories of documents are only available to users who are logged in, please be registered for a Lanner Account at http://www.lannerinc.com/ to access published documents and downloadable resources.

For troubleshooting the issues with your system, please check the Lanner Q&A page for a diagnostic procedure and troubleshooting steps.

Technical Support

In addition to contacting your distributor or sales representative, you could use submit a Ticket
To **Lanner Technical Support** page at http://www.lannerinc.com/technical-support where you can fill in a support ticket to our technical support department.

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Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to contact@lannerinc.com, Thank you for your time.

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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 a 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.

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 (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.

Electrical Safety Instructions

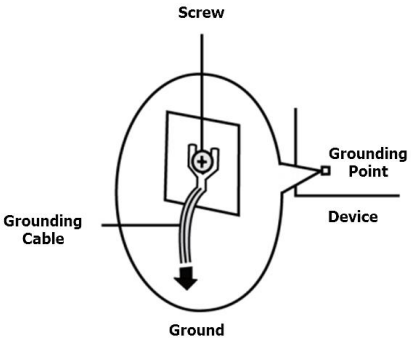
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect 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.

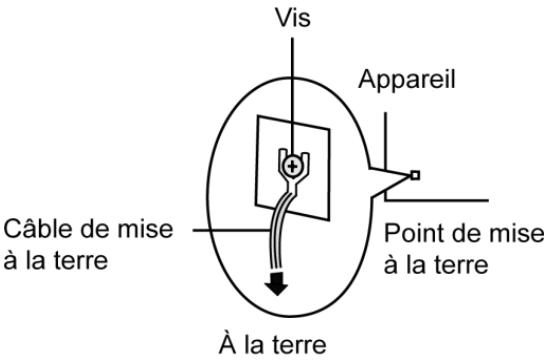
Grounding Procedure for DC Power Source

- 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.



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.



- This equipment must be grounded. The power cord for the product should be connected to a socket-outlet with earthing connection.
  Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée

- 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 (for Fan side).
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.

Table of Contents

CHAPTER 1: PRODUCT OVERVIEW

Lanner LEC-3034 Series is a wireless rugged fanless edge gateway featuring dual-core Intel® Atom E3825 (codenamed BayTrail), optional 4G-LTE Mobile Connectivity, DDR3L SO-DIMM memory up to 8GB, 1 x SATA connector with 2.5" drive bay, mSATA mini socket, VGA display, wide operating temperature, DIN Rail/Wall-mounting options and a variety of isolated protection serial COM/LAN configurations for various industrial IoT needs.

Key Features

- Fanless and compact design
- Onboard Intel® Atom™ E3825 CPU
- Optional 4G-LTE Mobile Connectivity
- Multiple Isolated RS-232/422/485 ports
- 4x or 2x 1.5KV Magnetic Isolated GbE LAN ports, 2x USB ports
- Wide operating temperature: -40 ~ 70ºC
- DIN rail or wall mount
- VGA output
- 1x or 3x USB 2.0 type A + 1x USB 3.0 Type A

Package Content

Your package contains the following items:

- 1x LEC-3034
- 1x Accessory Pack
- 1x Power Adapter

Ordering Information

SKU No.	Main Features
LEC-3034A	DIN rail Fanless Box PC with Intel Atom E3825 processor, 4x RS-232/422/485 COM, 4x GbE LAN ports, 1x USB 2.0 ports, 1xUSB 3.0 port
LEC-3034B	DIN rail Fanless Box PC with Intel Atom E3825 processor, 6x RS-232/422/485 COM, 4x GbE LAN ports, 1 x USB 2.0 ports, 1x USB 3.0 port
LEC-3034C	DIN rail Fanless Box PC with Intel Atom E3825 processor, 8x RS-232/422/485 COM ports, 2x GbE LAN ports, 1x USB 2.0 ports, 1 x USB 3.0 port
LEC-3034D	DIN rail Fanless Box PC with Intel Atom E3825 processor, 4x Isolated RS-485, 2x GbE LAN ports, 3x USB 2.0 ports, 1x USB 3.0 ports
LEC-3034E	DIN rail Fanless Box PC with Intel Atom E3825 processor, 2x GbE LAN ports, 2x Isolated RS-232/485, 8x Isolated RS-485, 3x USB 2.0 ports, 1x USB 3.0 port

Note

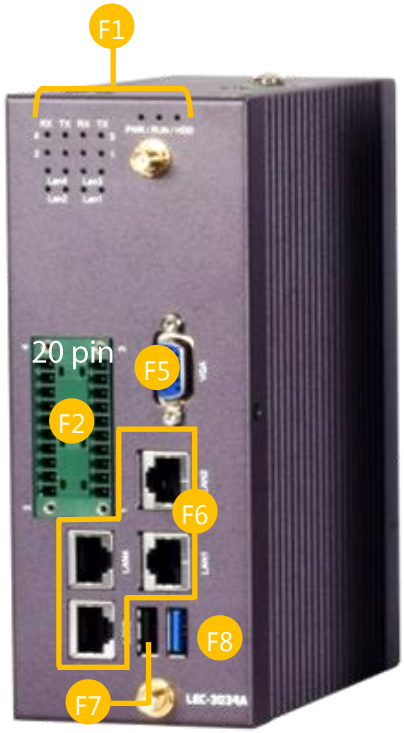
If any component is missing or damaged, please contact your dealer immediately for assistance.

System Specifications

Processor System	Processor Options	Intel® Atom™ Processor E3825 1.33 GHz CPU with Heat-sink fanless thermal solution
	Frequency	1.33 GHz
	Core Number	2
	Chipset	SoC
	BIOS	AMI SPI Flash BIOS
Memory	Technology	DDR3L 1067MHz
	Max. Capacity	8GB
	Socket	1x 204-pin SO-DIMM
Ethernet	Controller	Intel i210-IT
	Speed	10/100/1000 Mbps
	Interface	2 x RJ45
	Isolation Protection	1.5 KV magnetic protection ● Hi-Pot test, 1 KV pass ● Surge, 2KV pass ● Impulse, 2KV pass
Power	Power Supply Voltage	12 ~ 36 Vdc, Hi-Pot test with adapter,1KV pass
	Connector	Phoenix contact 2-pin connector with lock
	Power Consumption (Idle)	12V: 7.5W / 36V: 9.2W
	Power Consumption(Full Load)	12V: 10.1W / 36V: 11.2W
	Power Adaptor	Input 100~240Vac, Output 24V, 2.5A 60W
I/O Interface	Serial Port	4/6/8 x RS-232/422/485 COM(SKU A/B/C), 4x Isolated RS-485 (SKU D), 8x Isolated RS-485 + 2x isolated-232/485 (SKU E)
	Isolation Protection	● Hi-Pot test, 1 KV pass ● Surge, 2KV pass ● Impulse, 2KV pass
	ESD Protection	15KV ESD Protection (Contact:8KV, Air:15KV)
	USB	1x or 3x USB 2.0 type A + 1x USB 3.0 Type A
	Power-On/Reset Button	Internal reset button
	LED	PWR,RUN,HDD,L1~2, RX/TX 1~4
	Expansion Socket	1x m.2 connector with nano SIM slot
Storage	Type	SATA
	Installation	1x SATA connector with 2.5” drive bay
	Type	mSATA mini
	Installation	1x mSATA mini socket
Watchdog Timer		Watchdog timer 256 level time interval system reset, software programmable
Graphics	Controller	Intel HD Graphics
	VGA	1x VGA port
Mechanical	Dimension (W x H x D)	69 x 169.5 x 127 mm
	Fanless	Yes
	Construction	Aluminum + SGCC
	Weight	1.8 kg
	Mounting	DIN rail or Wall mount
Environmental	Operating Temperature	-40 ~ 70ºC
	Storage Temperature	-40 ~ 80ºC
	Relative Humidity	5% ~ 95%, non-condensing
Driver Support	Microsoft Windows	Windows 7
	Linux	Linux 2.6
Certification	EMC	CE/FCC Class A
	Safety	None

Physical Overview

Front Panel



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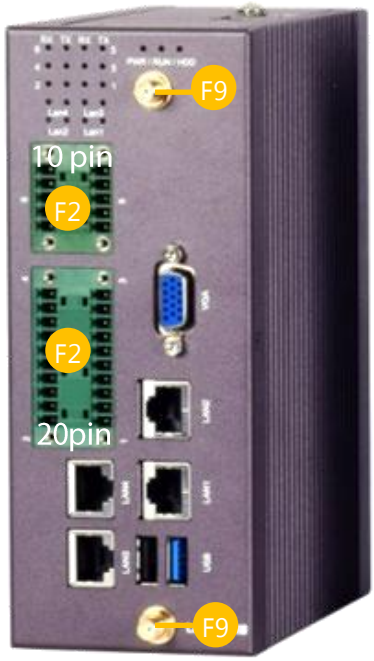

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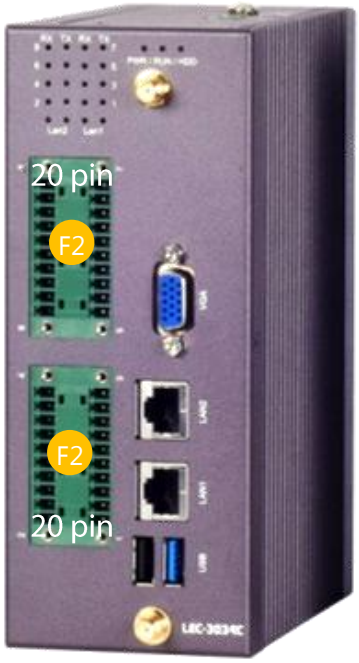
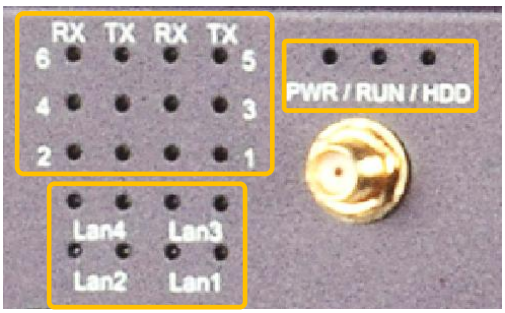


LEC-3034C

LEC-3034D

LEC-3034E

No.	Description	
F1	LED Indicators	COM Transmission Indicator System Status Indicator  Once powered, this system will then start running automatically with the PWR LED lit up. Wait for several minutes until System Status LED lights up to indicate that your system is up and running.
F2	COM Port	RS-232/422/485 COM Port
F3	COM Port	Isolated RS 485 COM Port
F4	COM Port	Isolated -232/ 485 COM Port
F5	Display Port	D-sub VGA Port
F6	RJ45 Port	10/100/1000Mbps Ethernet port
F7	USB Port	USB 3.0 Port
F8	USB Port	USB 2.0 Port
F9	Antenna Port	To connect antennas 

COM Port Pin-out

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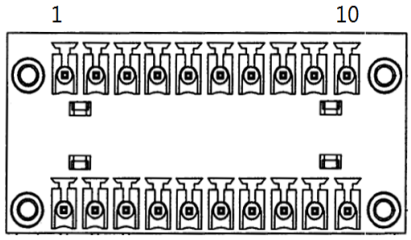
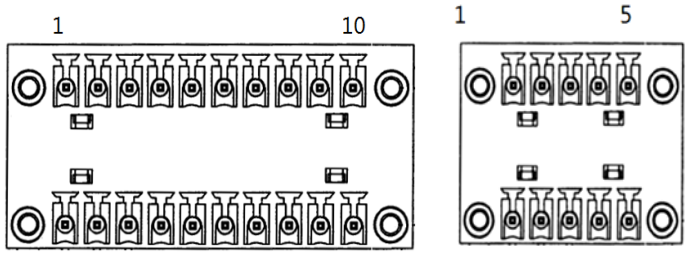


PIN	1	2	3	4	5	6	7	8	9	10
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND
PIN	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND

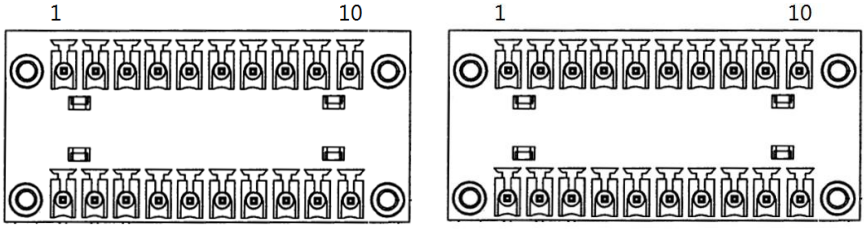
LEC-3034B



PIN	1	2	3	4	5	6	7	8	9	10
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND
PIN	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND

1	2	3	4	5
COM6_C_DP_TP	COM6_C_DN_TN	COM6_C_RXD_RN	COM6_C_TXD_RP	GND
6	**7**	**8**	**9**	**10**
COM5_C_DP_TP	COM5_C_DN_TN	COM5_C_RXD_RN	COM5_C_TXD_RP	GND

LEC-3034C



PIN	1	2	3	4	5	6	7	8	9	10
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND
PIN	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
RS-232			SIN	SOUT	GND			SIN	SOUT	GND
RS-422	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	TX+	TX-	RX-	RX+	GND	TX+	TX-	RX-	RX+	GND
RS-485	D+	D-			GND	D+	D-			GND

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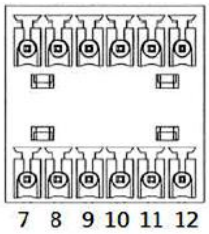
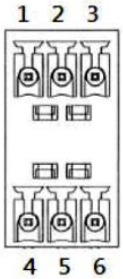
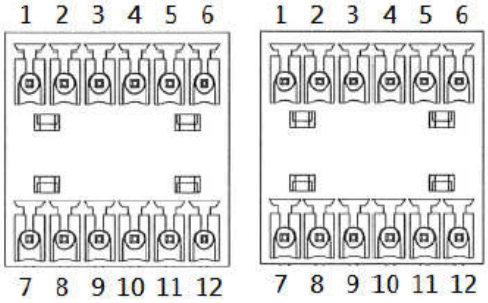


PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM4_D+	7	COM3_D+
2	COM4_D-	8	COM3_D-
3	GND	9	GND
4	COM6_D+	10	COM5_D+
5	COM6_D-	11	COM5_D-
6	GND	12	GND

LEC-3034E



PIN	1	2	3	4	5	6
RS-232	COM2_TX	COM2_RX	GND	COM1_TX	COM1_RX	GND
RS-485	COM2_D+	COM2_D-	GND	COM1_D+	COM1_D-	GND



PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM4_D+	7	COM3_D+
2	COM4_D-	8	COM3_D-
3	GND	9	GND
4	COM6_D+	10	COM5_D+
5	COM6_D-	11	COM5_D-
6	GND	12	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	COM8_D+	7	COM7_D+
2	COM8_D-	8	COM7_D-
3	GND	9	GND
4	COM10_D+	10	COM9_D+
5	COM10_D-	11	COM9_D-
6	GND	12	GND

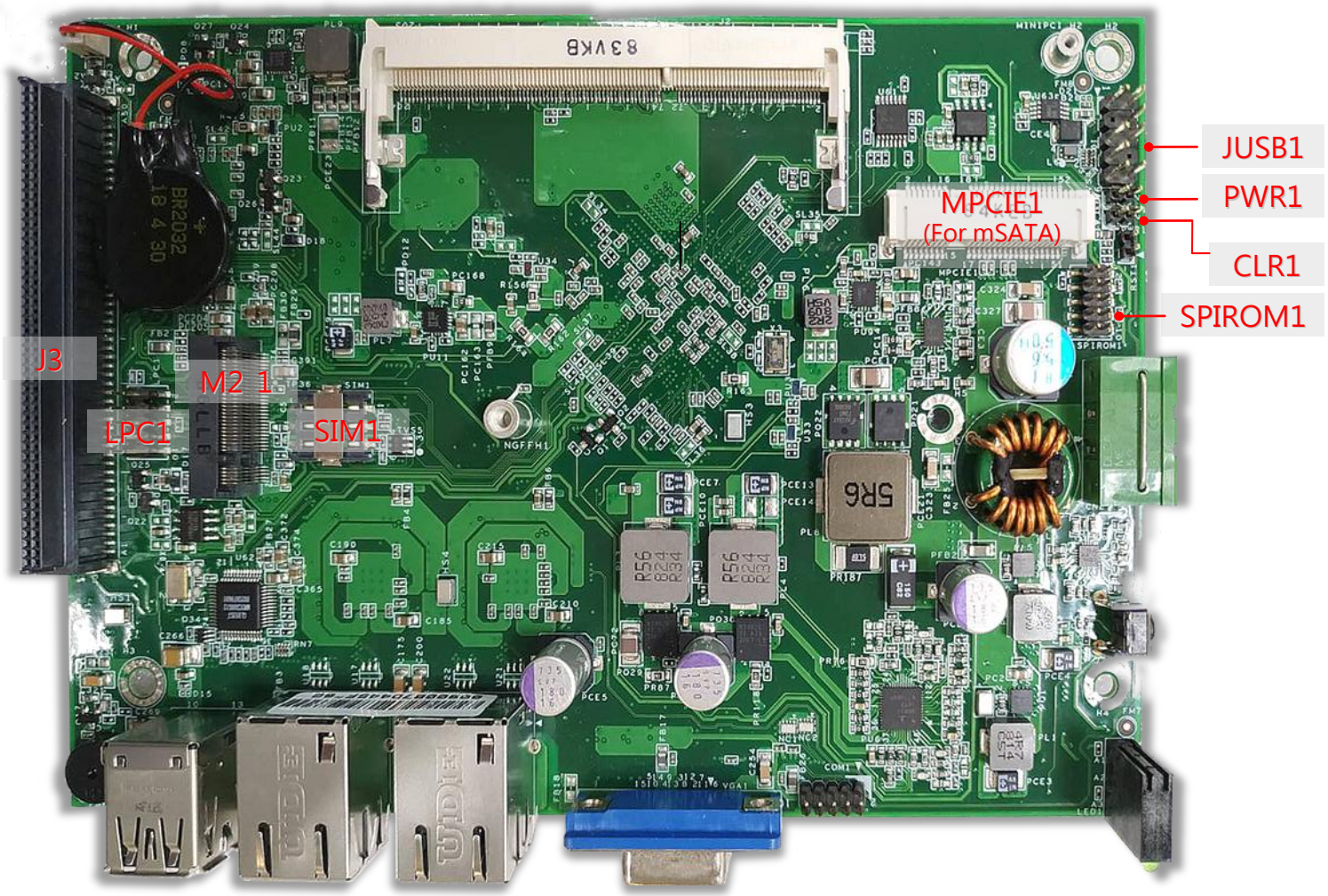
Side Panel

No.	Description	
S1	Reset Button	Use a pin to reset the system
S2	DC Input	For power supply
S3	Grounding Point	For a proper cable to connect the ground

Motherboard Information

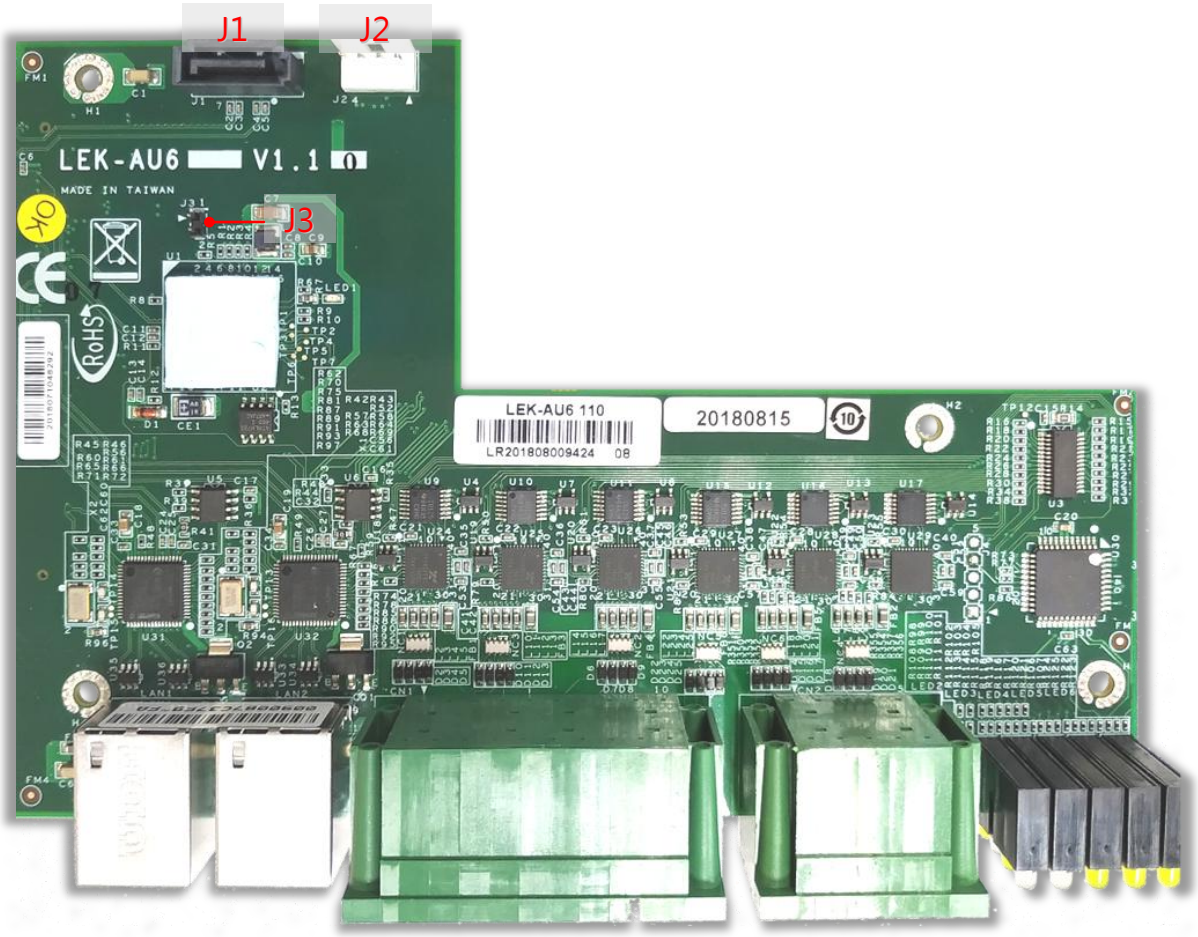
Motherboard Layout

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.



Daughterboard Layout

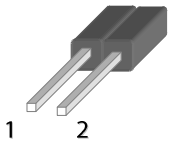
The daughterboard carries SATA port and serial COM ports, the pin definition of which can be found in COM Port Pin-out.



Jumper Settings

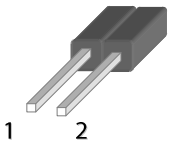
PWR1: Power Button

Jumper	Description
1-2	Power ON/OFF system
NC (Default)	Normal



CLR1: Clear CMOS

Jumper	Description
1-2	Clear CMOS
NC (Default)	Normal



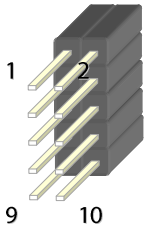
J3 (Daughterboard):RS485 Switch

Pin No.	Description
1-2 (Default)	RS485 Enable
NC	

Connector Pin Assignment

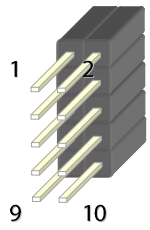
SPIROM1: SPI ROM Connector (For RD debug)

Pin	Description	Pin	Description
1	SPI_HOLD_N	**2**	SPI_CS1_R_N
3	SPI_CS0_R_N	**4**	V_3P3_SPI_R
5	SPI_MISO_R	**6**	SPI_HD0_N
7	NC	**8**	SPI_CLK
9	GND	**10**	SPI_MOSI_R

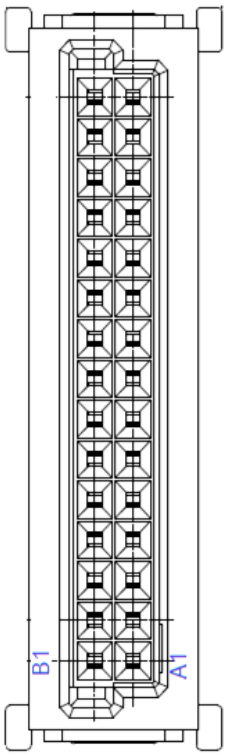


LPC1: LPC Connector (For RD debug)

Pin	Description	Pin	Description
1	LPC_CLK_1	**2**	LPC_AD1
3	PLTRST_P80_N	**4**	LPC_AD0
5	LPC_FRAME_N	**6**	P3V3
7	LPC_AD3	**8**	GND
9	LPC_AD2	**10**	GND

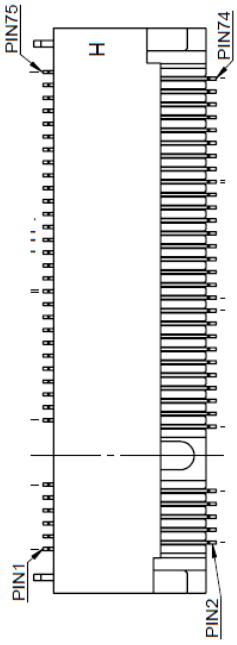


J3 (Motherboard): Board to Board Connector 2x50P



PIN	Description	PIN	Description	PIN	Description	PIN	Description
A1	LAN2_L1000_N_R	**A26**	GND	**B1**	COM4_RXD	**B26**	GND
A2	LAN2_ACTLED_N	**A27**	SW3_PCIE_TX_DN	**B2**	COM4_TXD	**B27**	SWLAN_PCIE_TX_DN
A3	LAN1_L100_N_R	**A28**	SW3_PCIE_TX_DP	**B3**	COM4_RTS#	**B28**	SWLAN_PCIE_TX_DP
A4	LAN1_L1000_N_R	**A29**	GND	**B4**	COM4_CTS#	**B29**	GND
A5	LAN1_ACTLED_N	**A30**	SW3_PCIE_RX_DN	**B5**	COM3_RXD	**B30**	SWLAN_PCIE_RX_DN
A6	LAN1_L100_N_R	**A31**	SW3_PCIE_RX_DP	**B6**	COM3_TXD	**B31**	SWLAN_PCIE_RX_DP
A7	SMB_SOC_CLK_3P3	**A32**	GND	**B7**	COM3_RTS#	**B32**	GND
A8	SMB_SOC_DATA_3P3	**A33**	CLK_SWCOM_PCIE_DN	**B8**	COM3_CTS#	**B33**	CLK_100M_PCIE2_DN
A9	COM5_DSR#	**A34**	CLK_SWCOM_PCIE_DP	**B9**	COM2_RXD	**B34**	CLK_100M_PCIE2_DP
A10	COM5_DTR#	**A35**	GND	**B10**	COM2_TXD	**B35**	GND
A11	COM5_RI#	**A36**	SWCOM_PCIE_TX_DN	**B11**	COM2_RTS#	**B36**	PCIE2_TX_DN
A12	COM5_DCD#	**A37**	SWCOM_PCIE_TX_DP	**B12**	COM2_CTS#	**B37**	PCIE2_TX_DP
A13	COM5_RXD	**A38**	GND	**B13**	COM1_RXD	**B38**	GND
A14	COM5_TXD	**A39**	SWCOM_PCIE_RX_DN	**B14**	COM1_TXD	**B39**	PCIE2_RX_DN
A15	COM5_RTS#	**A40**	SWCOM_PCIE_RX_DP	**B15**	COM1_RTS#	**B40**	PCIE2_RX_DP
A16	COM5_CTS#	**A41**	GND	**B16**	COM1_CTS#	**B41**	GND
A17	GND	**A42**	P3V3	**B17**	GND	**B42**	GND
A18	USB_P1_DN	**A43**	P3V3	**B18**	SATA_TX1_DN	**B43**	GND
A19	USB_P1_DP	**A44**	NC	**B19**	SATA_TX1_DP	**B44**	GND
A20	GND	**A45**	P5V	**B20**	GND	**B45**	GND
A21	USB_P0_DN	**A46**	P5V	**B21**	SATA_RX1_DN	**B46**	PE_RST_OUT_82
A22	USB_P0_DP	**A47**	P5V	**B22**	SATA_RX1_DP	**B47**	NC
A23	GND	**A48**	NC	**B23**	GND	**B48**	NC
A24	CLK_SW3_PCIE_DN	**A49**	P12V	**B24**	CLK_SWLAN_PCIE_DN	**B49**	NC
A25	CLK_SW3_PCIE_DP	**A50**	P12V	**B25**	CLK_SWLAN_PCIE_DP	**B50**	NC

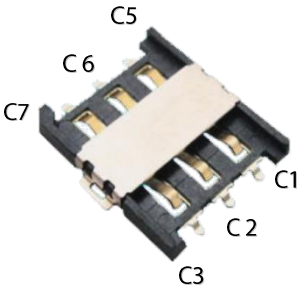
M2_1: M.2 NGFF Connector (B Key)

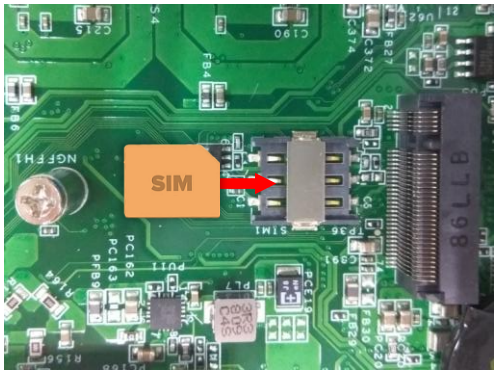


Pin No.	Description	Pin No.	Description
1	NC	**2**	P3V3SB_M2
3	GND	**4**	P3V3SB_M2
5	GND	**6**	PWROFF#
7	USB_P0_DP	**8**	NC
9	USB_P0_DN	**10**	NC
11	GND	**12**	NC
13	NC	**14**	NC
15	NC	**16**	NC
17	NC	**18**	NC
19	NC	**20**	NC
21	NC	**22**	NC
23	NC	**24**	NC
25	NC	**26**	NC
27	GND	**28**	NC
29	NC	**30**	UIM1_RST1
31	NC	**32**	UIM1_CLK1
33	GND	**34**	UIM1_DAT1
35	NC	**36**	UIM1_PWR
37	NC	**38**	NC
39	GND	**40**	NC
41	NC	**42**	NC
43	NC	**44**	NC
45	GND	**46**	NC
47	NC	**48**	NC
49	NC	**50**	NC
51	GND	**52**	NC
53	NC	**54**	NC
55	NC	**56**	NC
57	GND	**58**	NC
59	NC	**60**	NC
61	NC	**62**	NC
63	NC	**64**	NC
65	NC	**66**	NC
67	NC	**68**	NC
69	NC	**70**	P3V3SB_M2
71	GND	**72**	P3V3SB_M2
73	GND	**74**	P3V3SB_M2
75	NC		

SIM1: Nano SIM Card Reader

Pin	Description	Pin	Description
C1	UIM_PWR	**C5**	GND
C2	UIM_RST#	**C6**	NC
C3	UIM_CLK	**C7**	UIM_DATA

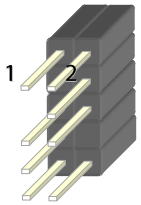




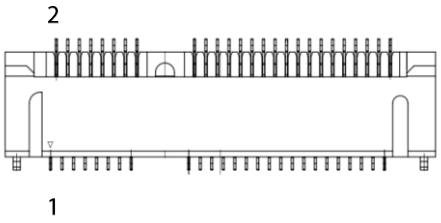
Please insert the SIM card into the socket as shown in the picture. Its golden contacts should face down.

JUSB1: USB2.0 pin header

Pin	Description	Pin	Description
1	VCC_USB5	**2**	GND
3	NC	**4**	NC
5	USBDN5	**6**	NC
7	USBDP5	**8**	NC
9	GND	**10**	NC



MPCIE1: MSATA Connector (Half Size)



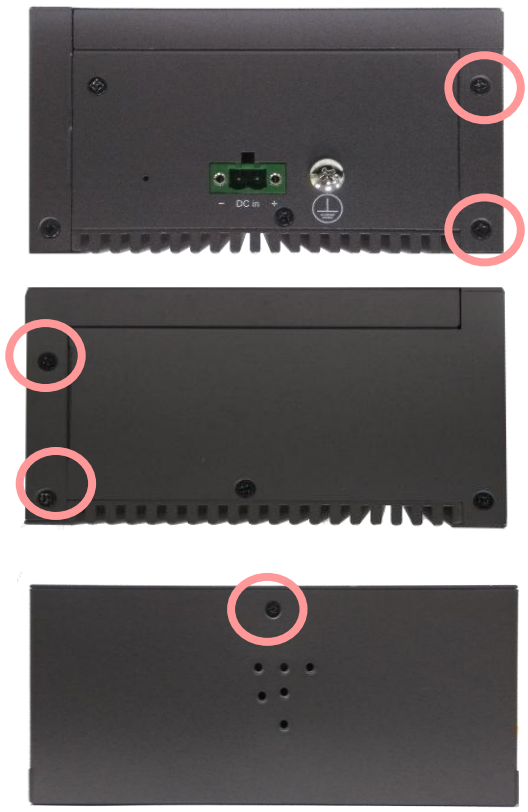
Pin No.	Description	Pin No.	Description
1	RSVD	2	VCC3
3	RSVD	4	GND
5	RSVD	6	RSVD
7	RSVD	8	RSVD
9	GND	10	RSVD
11	RSVD	12	RSVD
13	RSVD	14	RSVD
15	GND	16	RSVD
Mechanical Key			
17	RSVD	18	GND
19	RSVD	20	RSVD
21	GND	22	RSVD
23	SATA RX+	24	VCC3
25	SATA RX-	26	GND
27	GND	28	RSVD
29	GND	30	RSVD
31	SATA TX-	32	RSVD
33	SATA TX+	34	GND
35	GND	36	RSVD
37	GND	38	RSVD
39	VCC3	40	GND
41	VCC3	42	RSVD
43	GND	44	RSVD
45	RSVD	46	RSVD
47	RSVD	48	RSVD
49	RSVD	50	GND
51	RSVD	52	VCC3

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.

Opening the Chassis

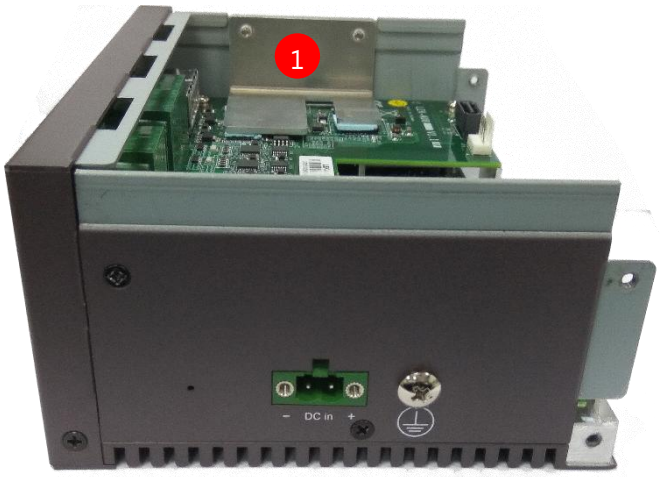
1. Unscrew the five screws on the system's side panels and back panel.

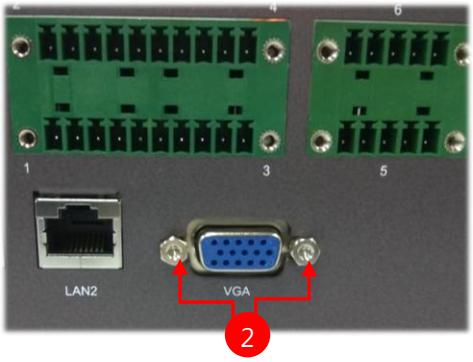


2. Lift the cover to remove it.

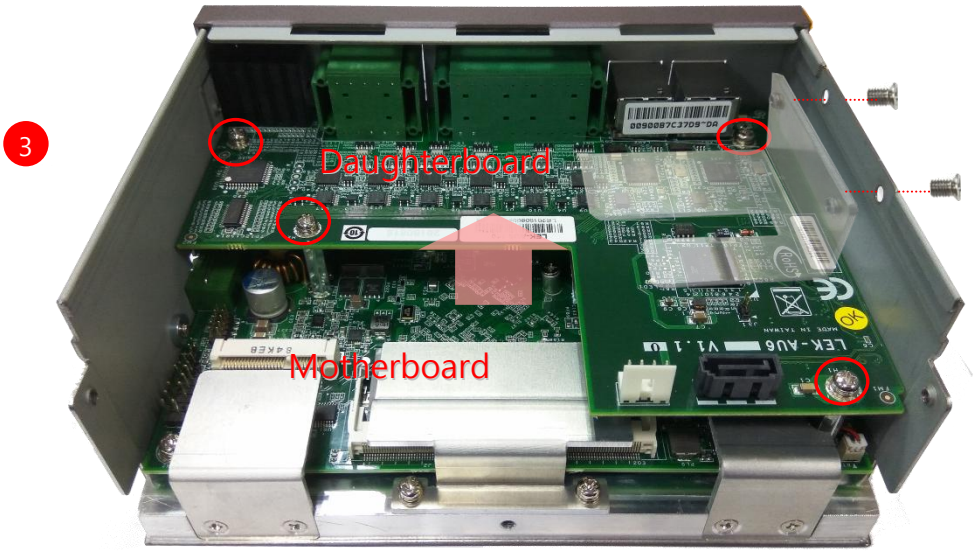
Installing the Key Components

In order to install the key components including **M.2 card**, **mSATA card**, the **Nano SIM card** and **memory module**, please remove (1) the heat sink that secures the daughter board, (2) the screws that secure the VGA connector on front panel and (3) the screws that secure the daughterboard on the standoffs.

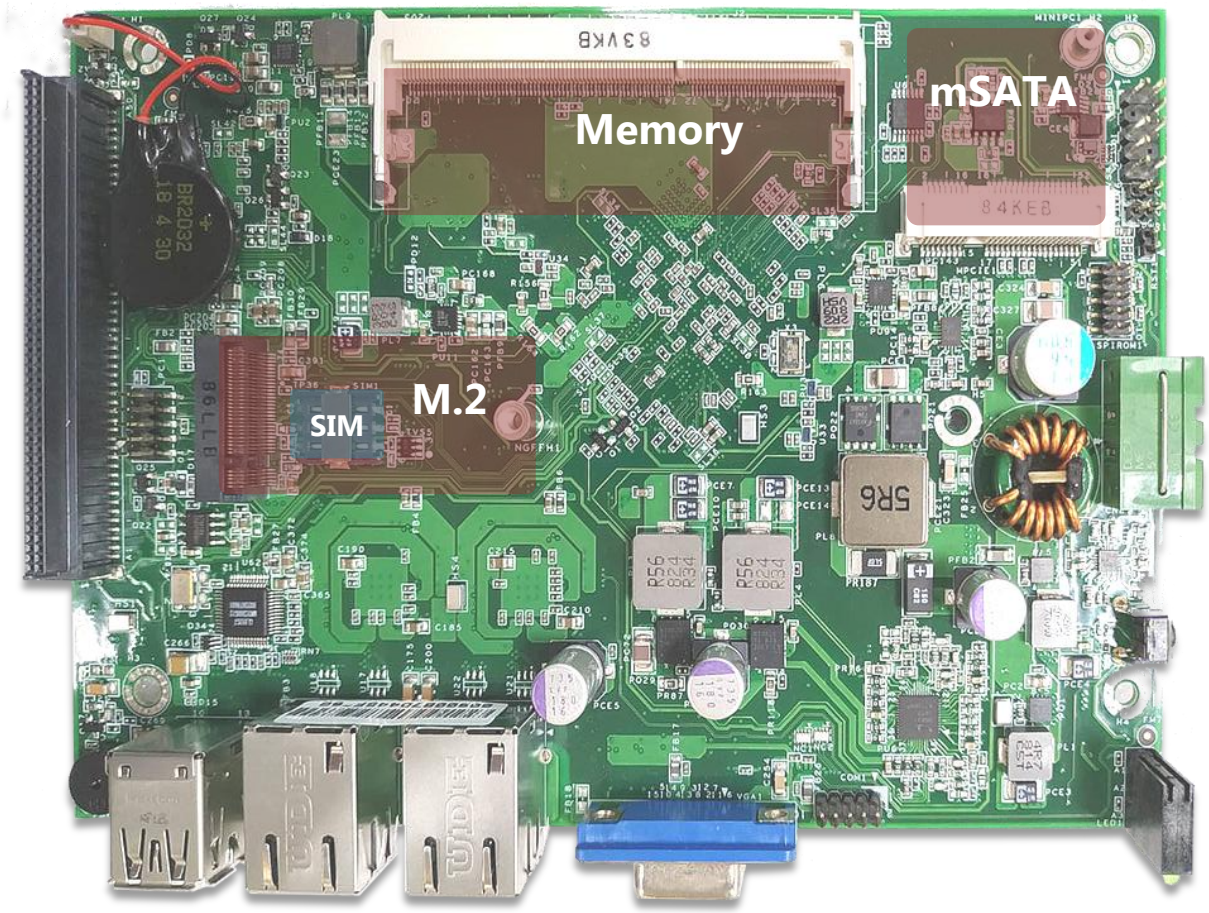




Carefully lift up the daughterboard to have it disconnected from the board-to-board connector (J3).



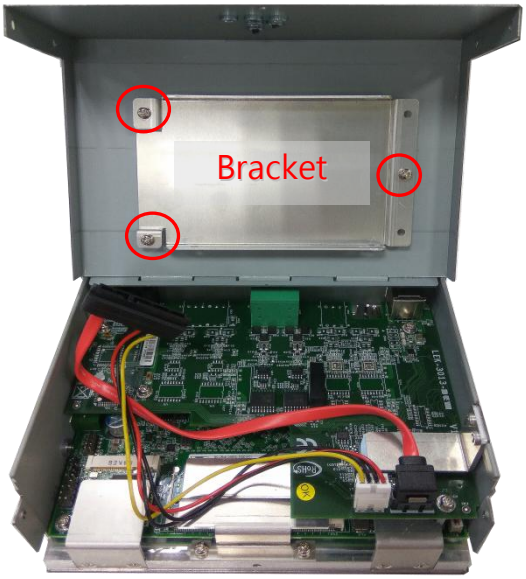
Install the key parts and make sure you replace the heatsink originally attached to the sockets



Installing the SSD

1. Remove the SSD bracket originally attached to the top cover and install the SSD onto it. Make sure you secure the disk onto the bracket with four disk screws.

2. Fix the bracket with SSD loaded onto the top cover, and connect the SATA cable and SATA power cable as shown in the picture.



CHAPTER 3: BIOS SETUP

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

1. Boot up the system.
2. Pressing the **<Tab>** or **<Del>** 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

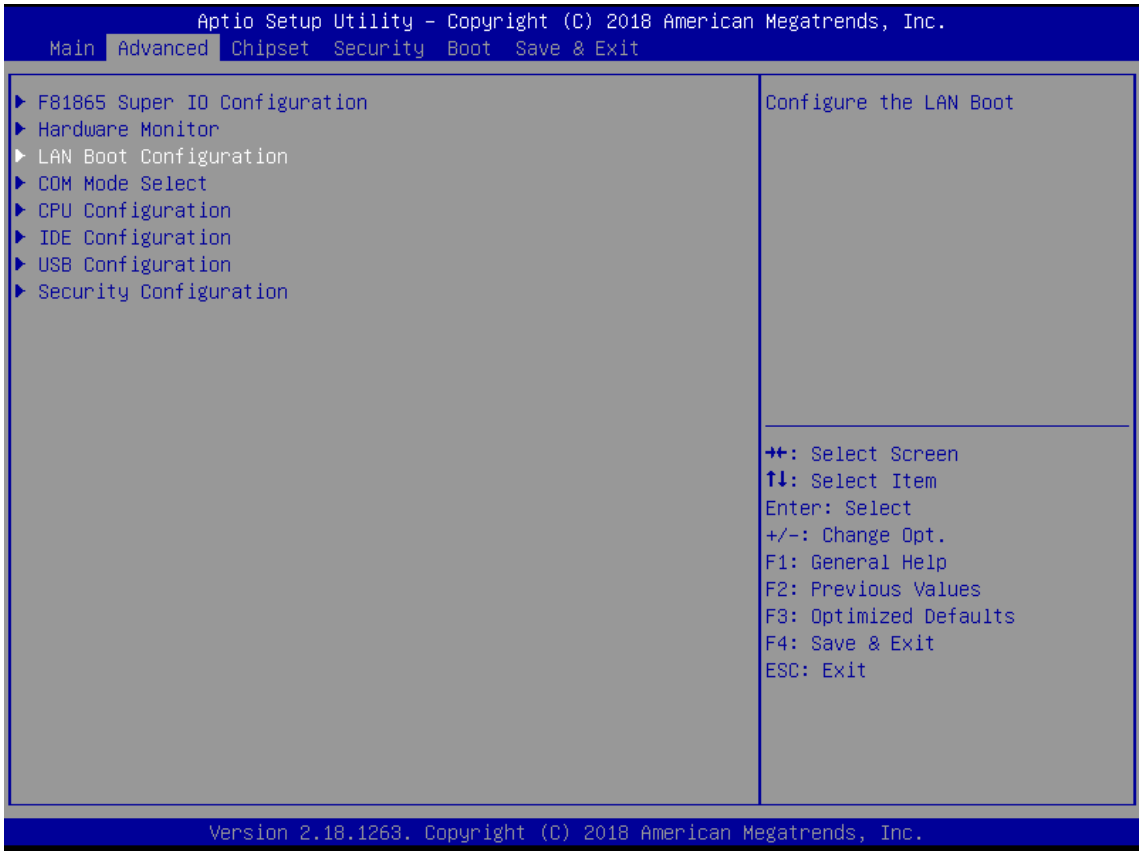
Setup main page contains BIOS information and project version information.

(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

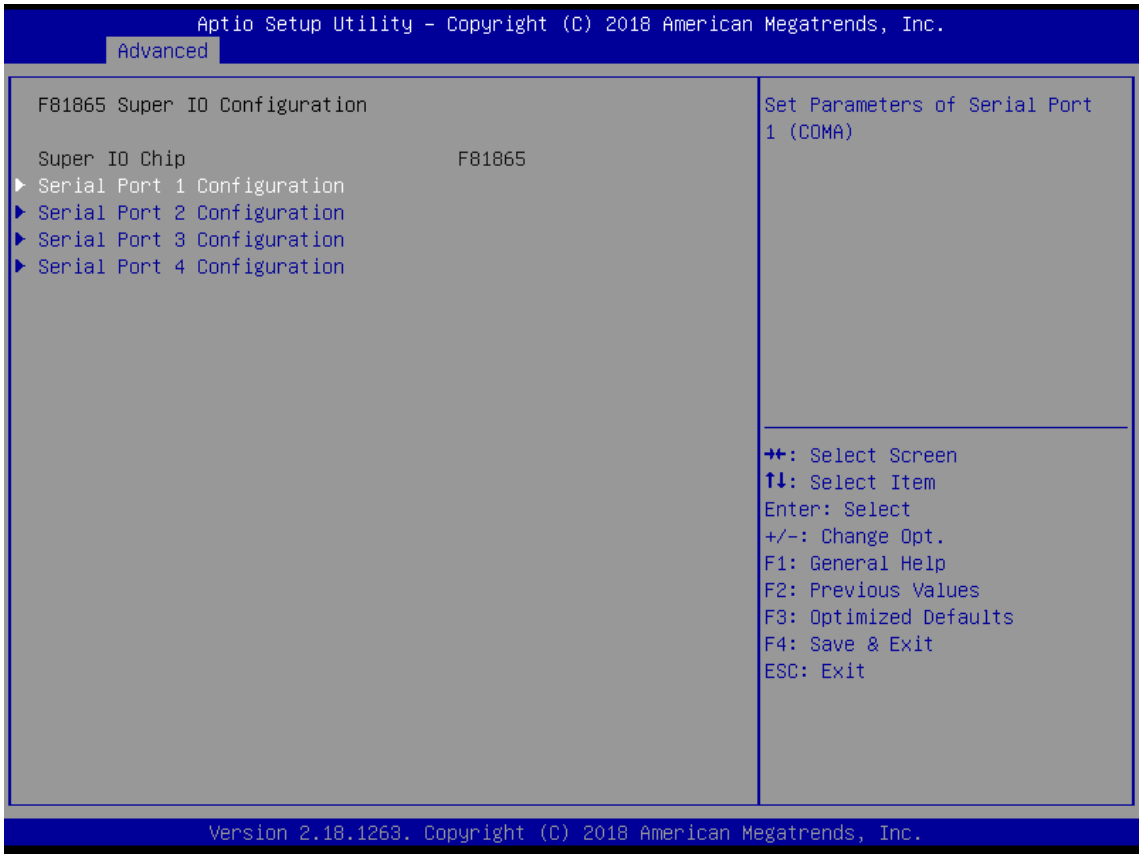
Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



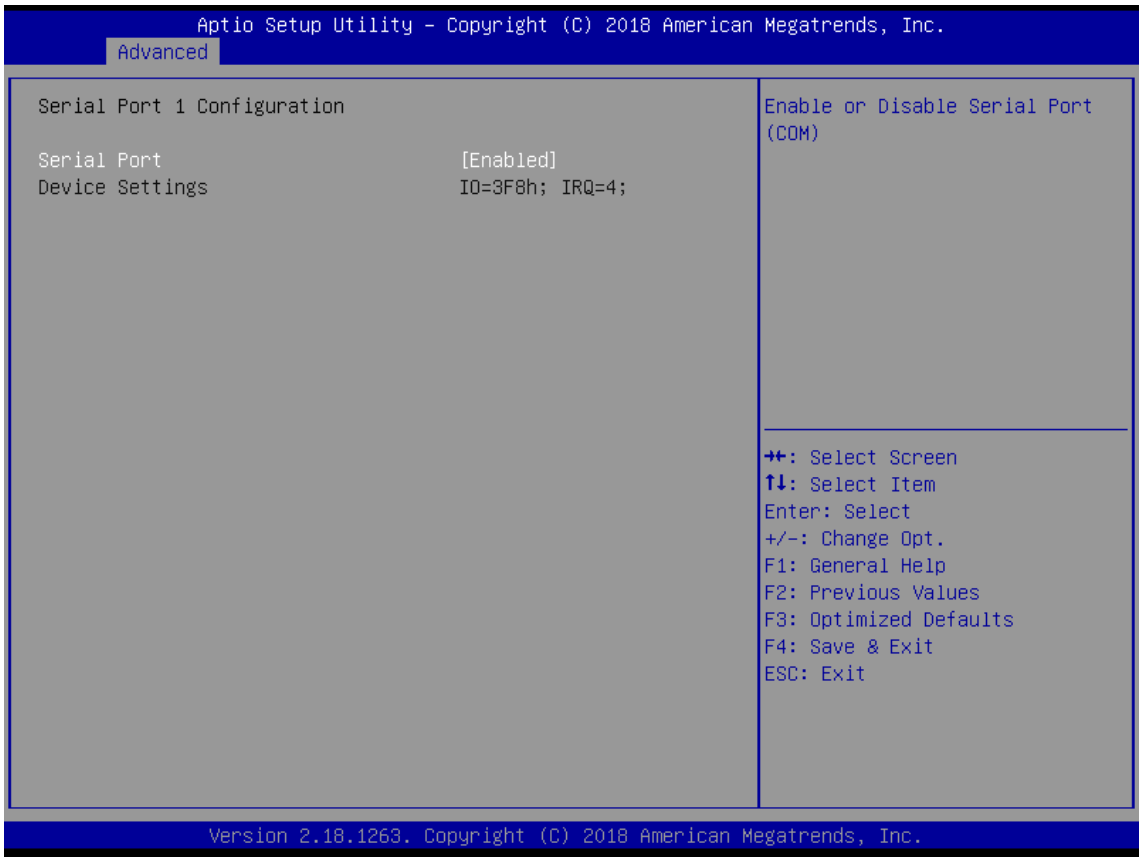
Super IO Configuration

This option allows you to configure parameters about Super IO Chip. Press <**Enter**> to access the submenu.

Select the desired Serial Port Configuration item to enter sub setting screen.

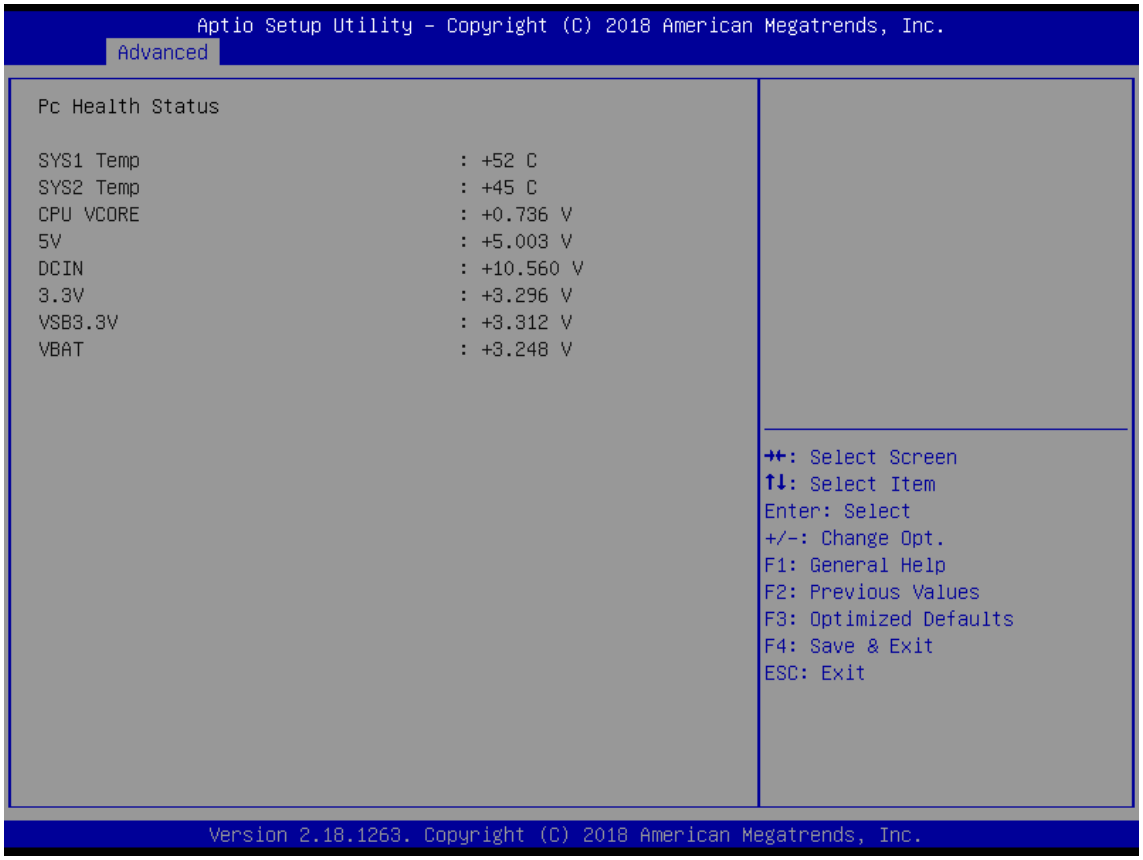


Serial port 1 Configuration



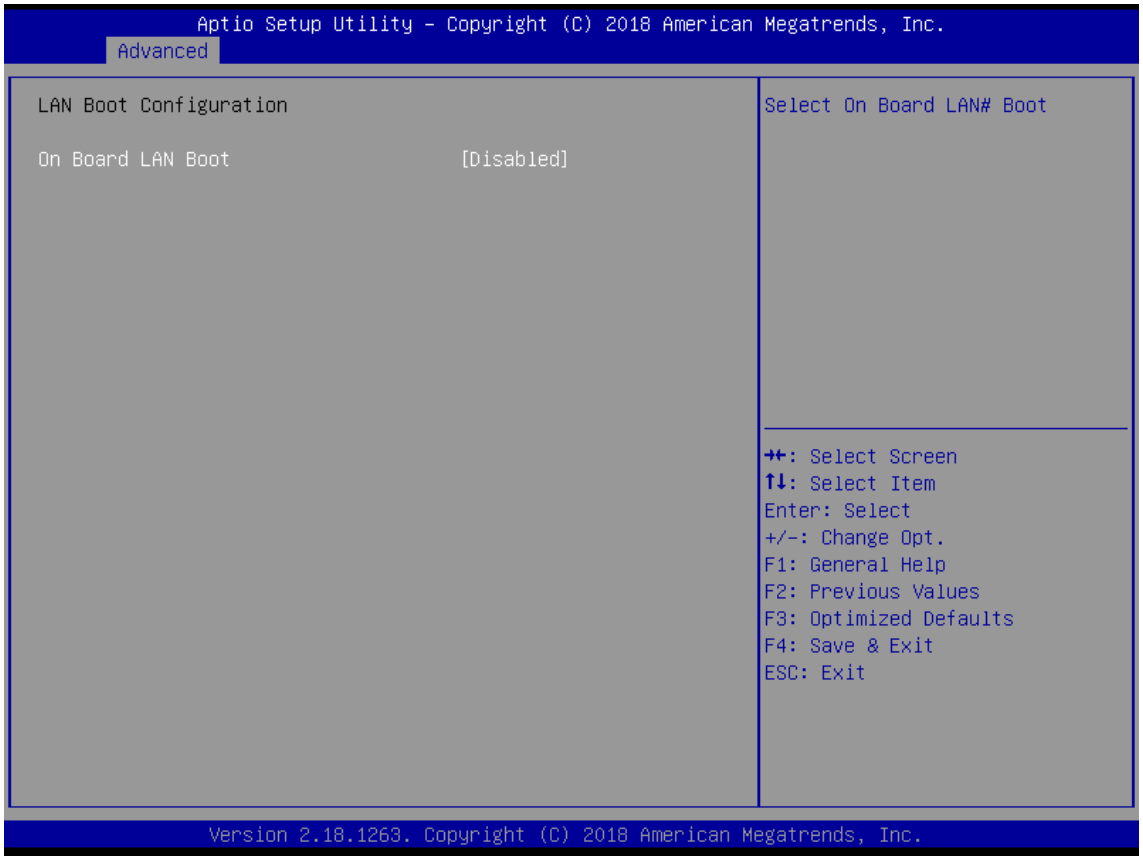
Item	Option	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Hardware Monitor



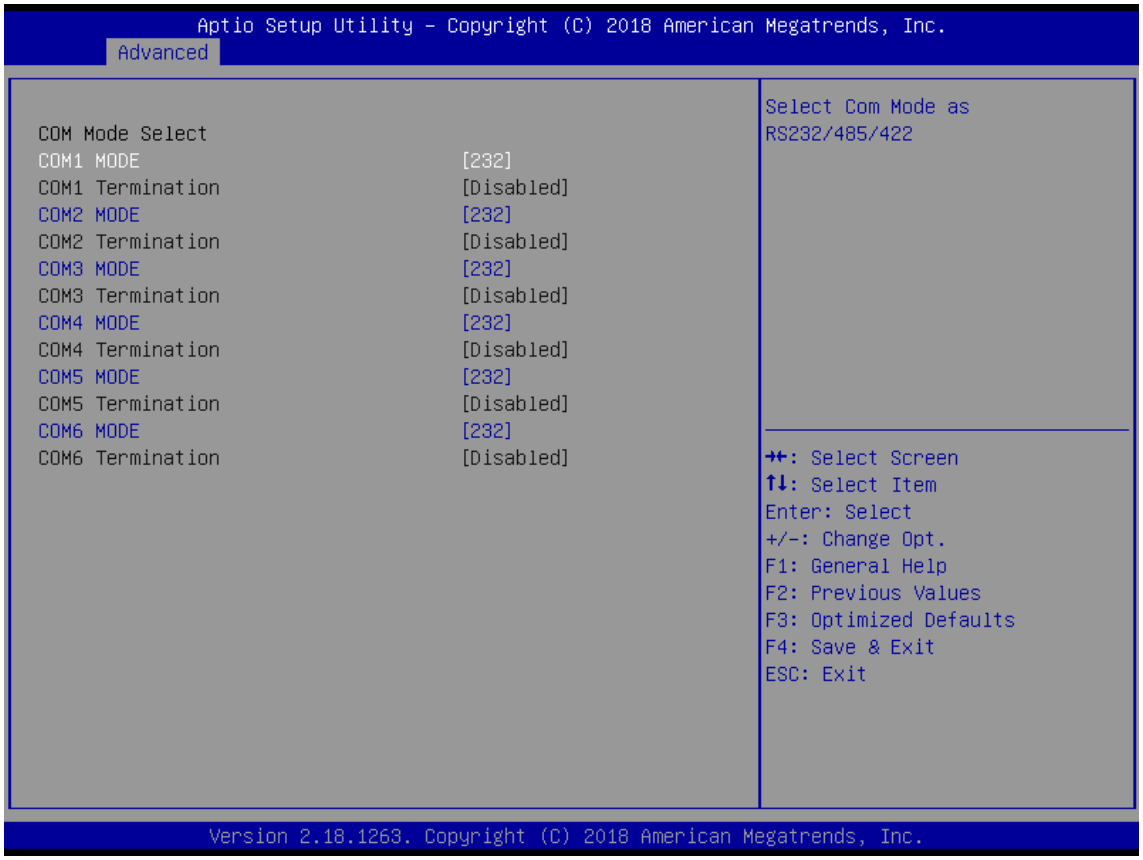
Item	Description
SYS1 Temp	This value reports the CPU temperature.
SYS2 Temp	This value reports the System temperature.
CPU VCORE	This value reports the CPU VCORE.
5V	This value reports the 5V Input voltage.
DCIN	This value reports the DC Input voltage.
VBAT	This value reports the VBAT Input voltage.
3.3V	This value reports the 3.3V Input voltage.
VSB3.3V	This value reports the VSB3.3V Input voltage.
VBAT	This value reports the VBAT Input voltage.

LAN Boot configuration



Item	Description	
On Board LAN Boot	Disabled LAN1 LAN2	Select On Board LAN # boot

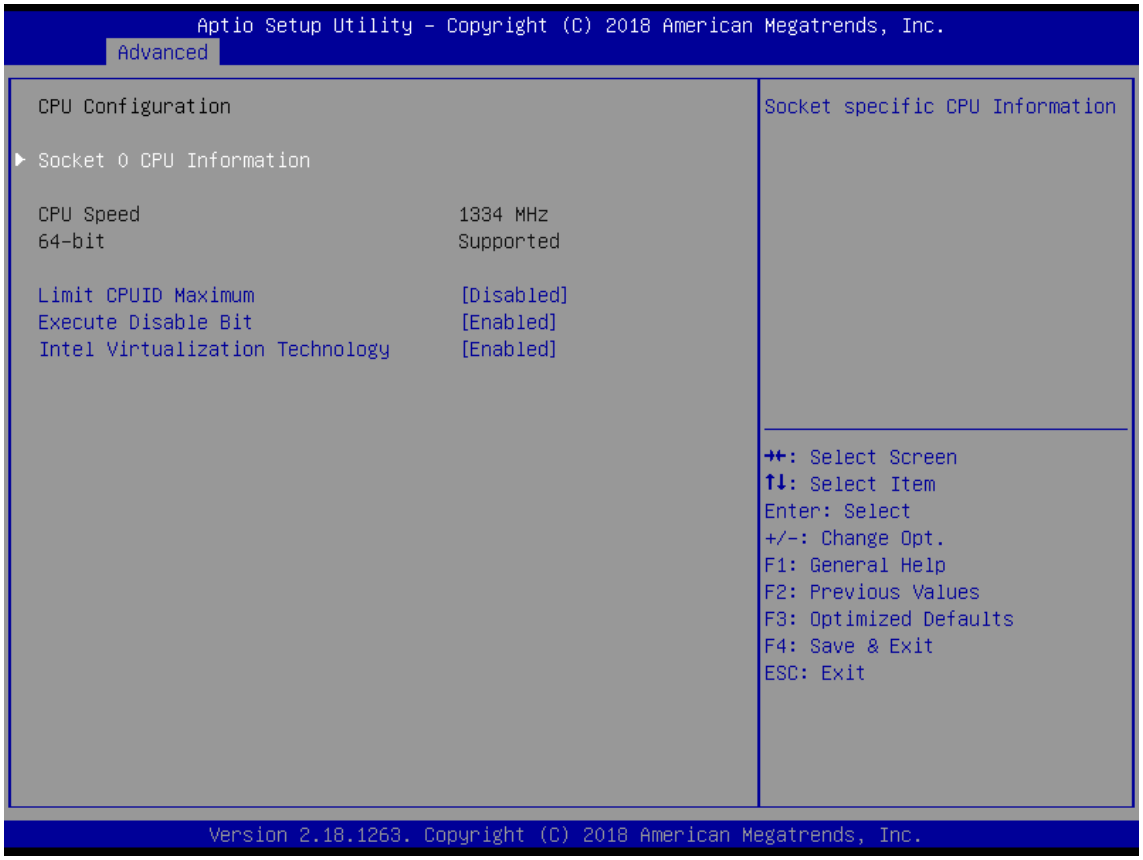
Com mode Configuration



Feature	Options	Description
COM1 Mode	232 485 422	Select Com Mode as RS-232/485/422
COM1 Termination	Disabled Enabled	COM RS-485/422 Receiver Termination
COM2 Mode	232 485 422	Select Com Mode as RS-232/485/422
COM2 Termination	Disabled Enabled	COM RS-485/422 Receiver Termination
COM3 Mode	232 485 422	Select Com Mode as RS-232/485/422
COM3 Termination	Disabled Enable	COM RS-485/422 Receiver Termination
COM4 Mode	232 485 422	Select Com Mode as RS-232/485/422

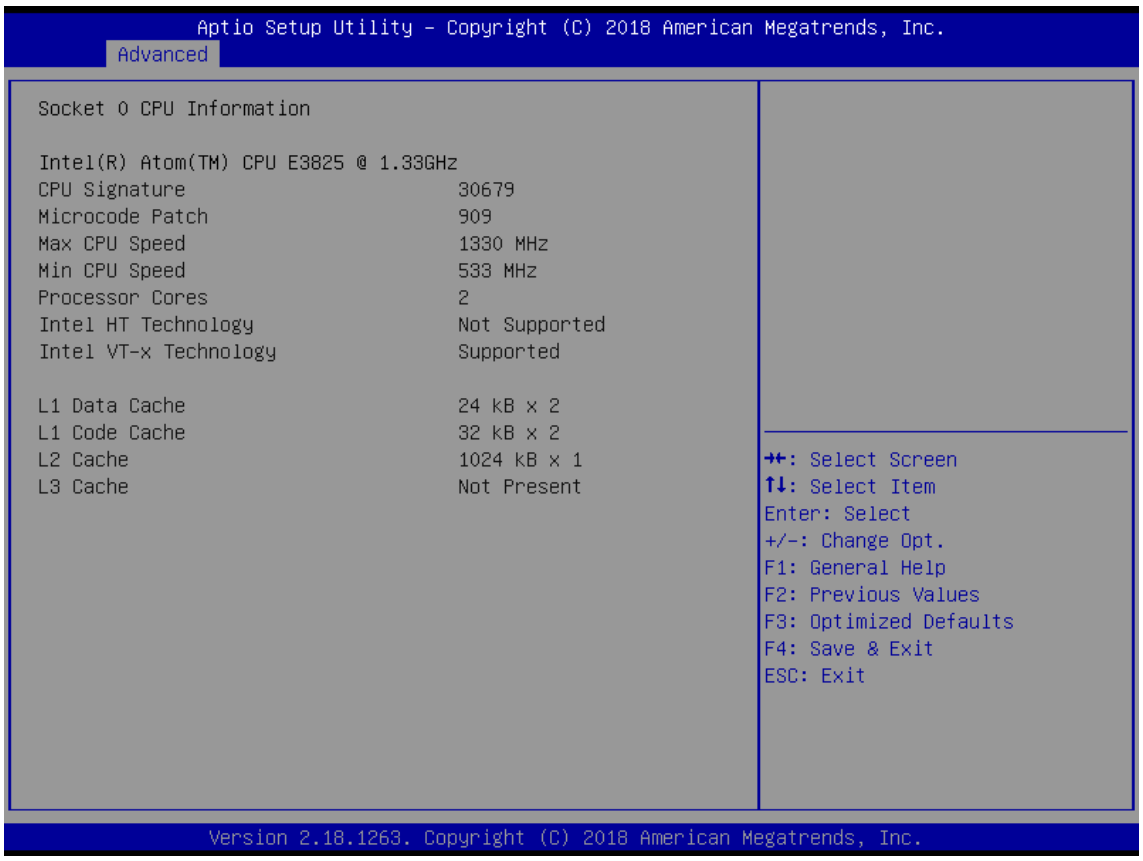
COM4 Termination	Disabled Enabled	COM RS-485/422 Receiver Termination
COM5 Mode	232 485 422	Select Com Mode as RS-232/485/422
COM5 Termination	Disabled Enabled	COM RS-485/422 Receiver Termination
COM6 Mode	232 485 422	Select Com Mode as RS-232/485/422
COM6 Termination	Disabled Enabled	COM RS-485/422 Receiver Termination

CPU Configuration

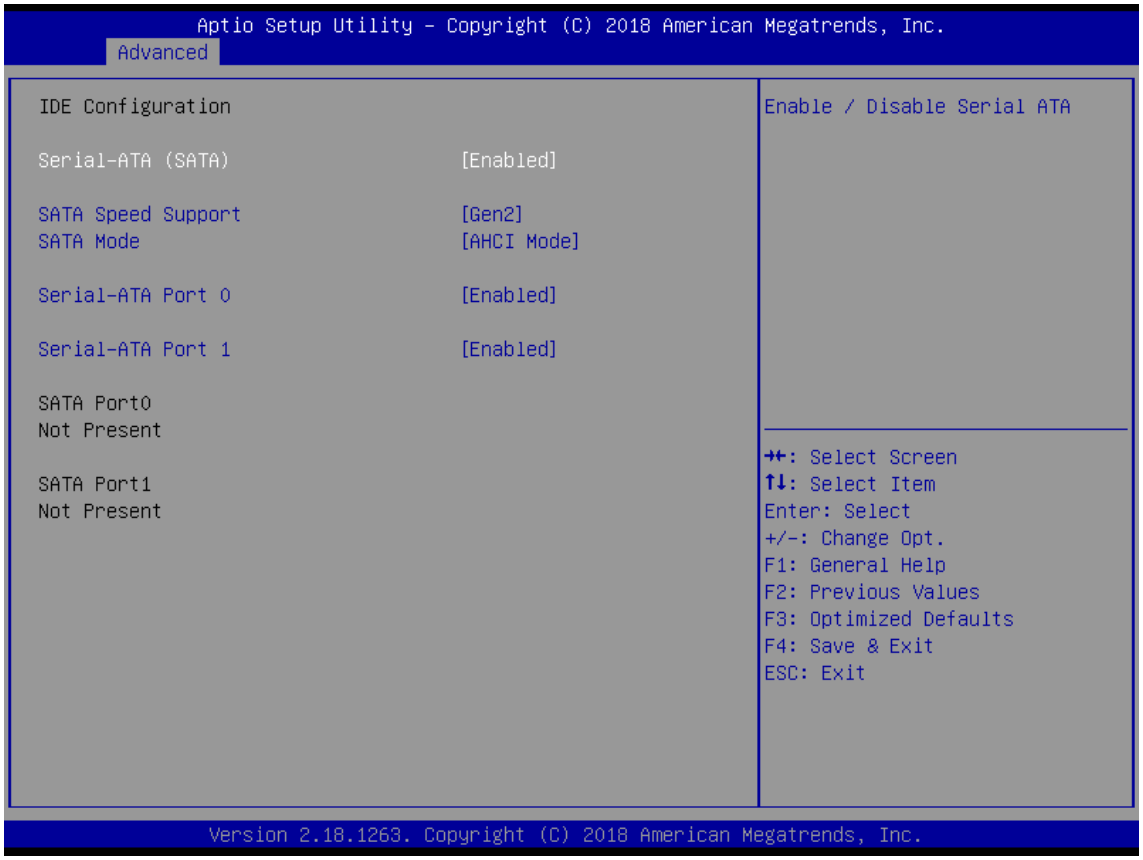


Item	Description	
Limit CPUID Maximum	Disabled Enabled	Disable for Windows XP
Execute Disable Bit	Disabled Enabled	Execute Disable Bit
Intel Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

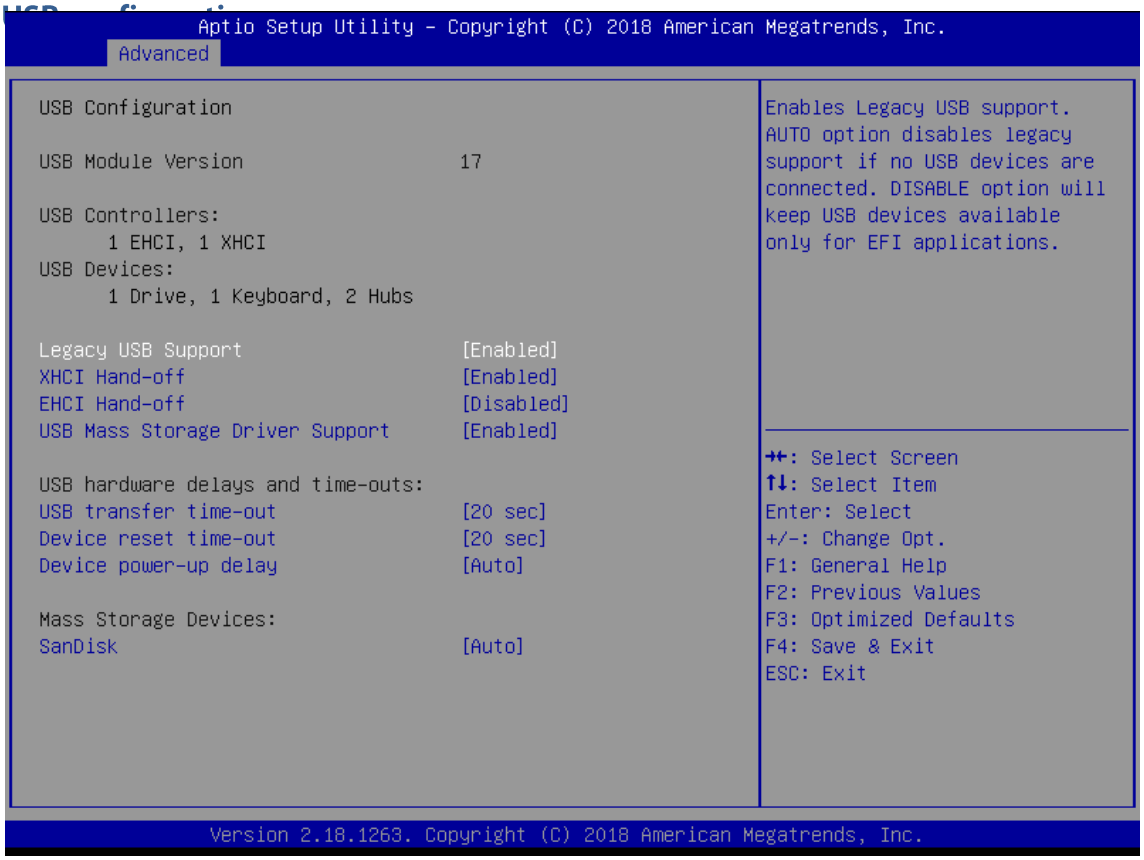
Socket 0 CPU Information



IDE Configuration



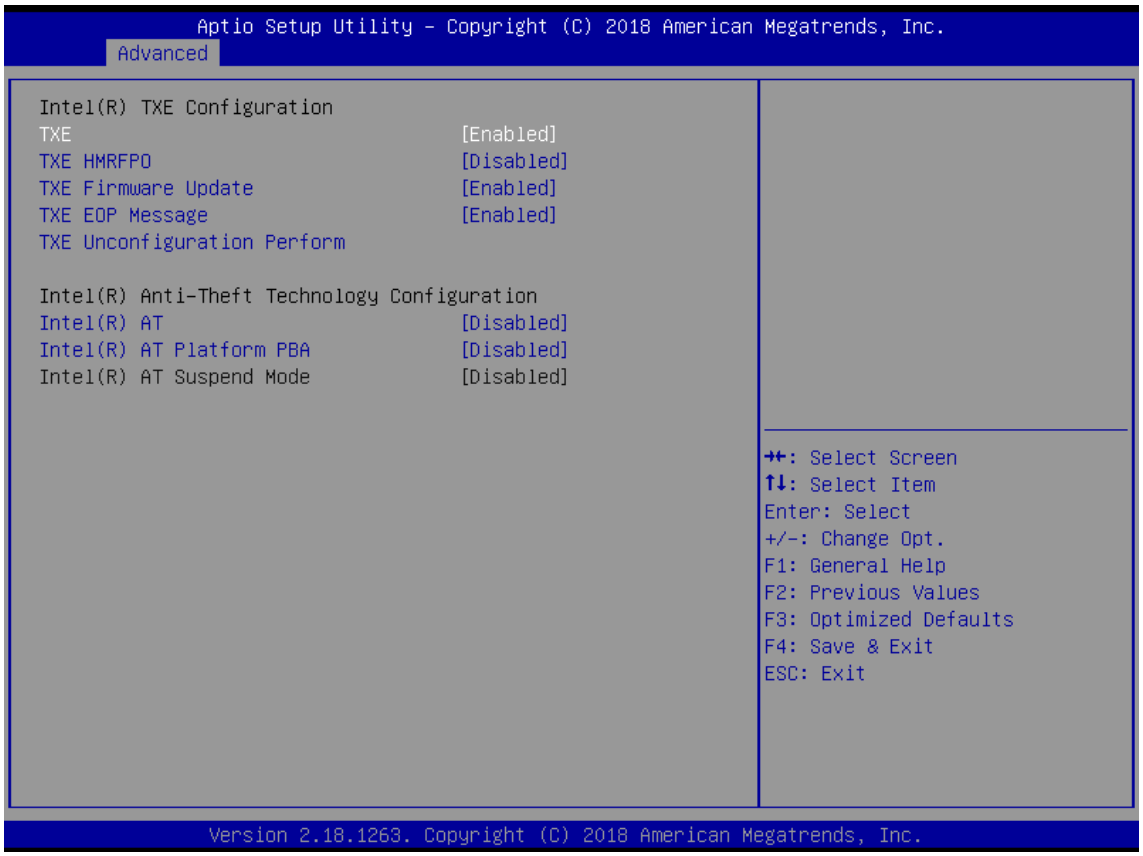
Feature	Options	Description
Serial-ATA (SATA)	Disabled Enabled	Enable/Disable Serial ATA
SATA Speed Support	Gen1 Gen2	SATA Speed Support Gen1 or Gen2
SATA MODE	IDE Mode AHCI Mode	Select EDE/AHCI
Serial-ATA Port 0	Disabled Enabled	Enable/Disable Serial ATA PORT 0
Serial-ATA Port 1	Disabled Enabled	Enable/Disable Serial ATA PORT 1



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

	10 sec 20 sec	
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. **Auto** uses default value: for a Root port, it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

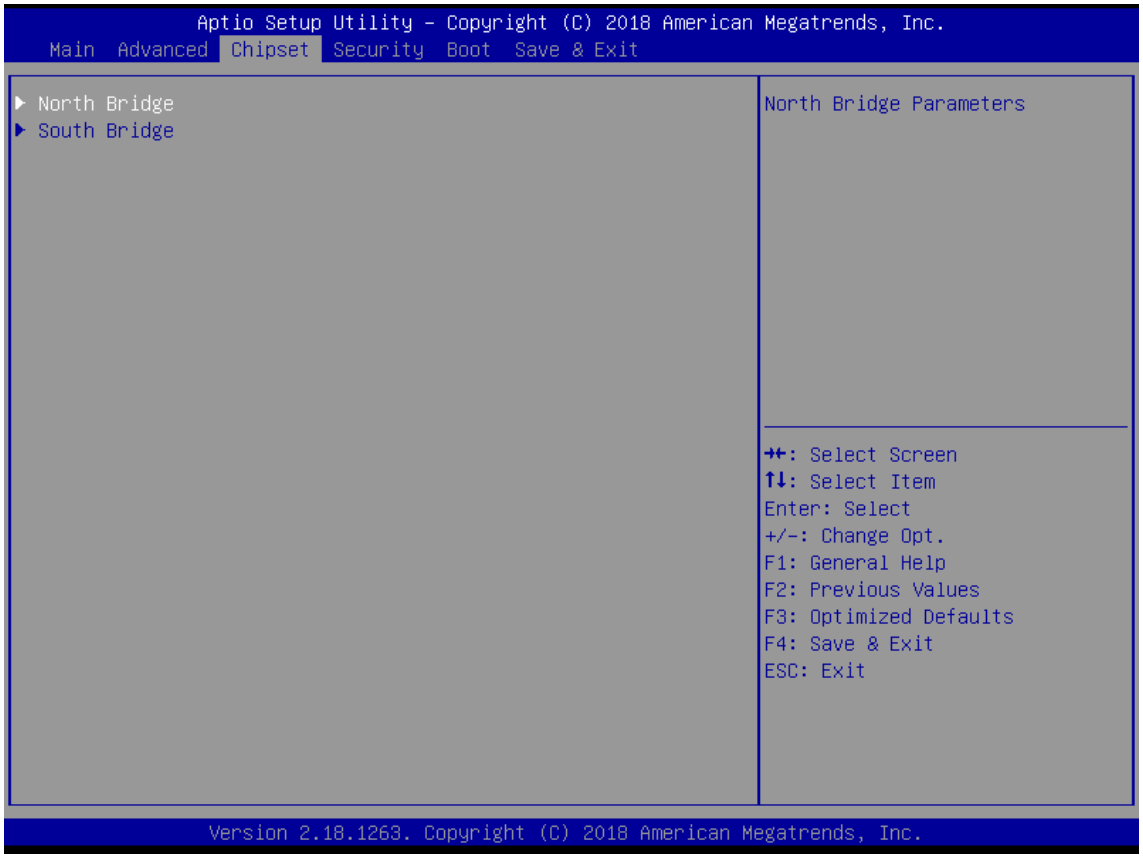
Security Configuration



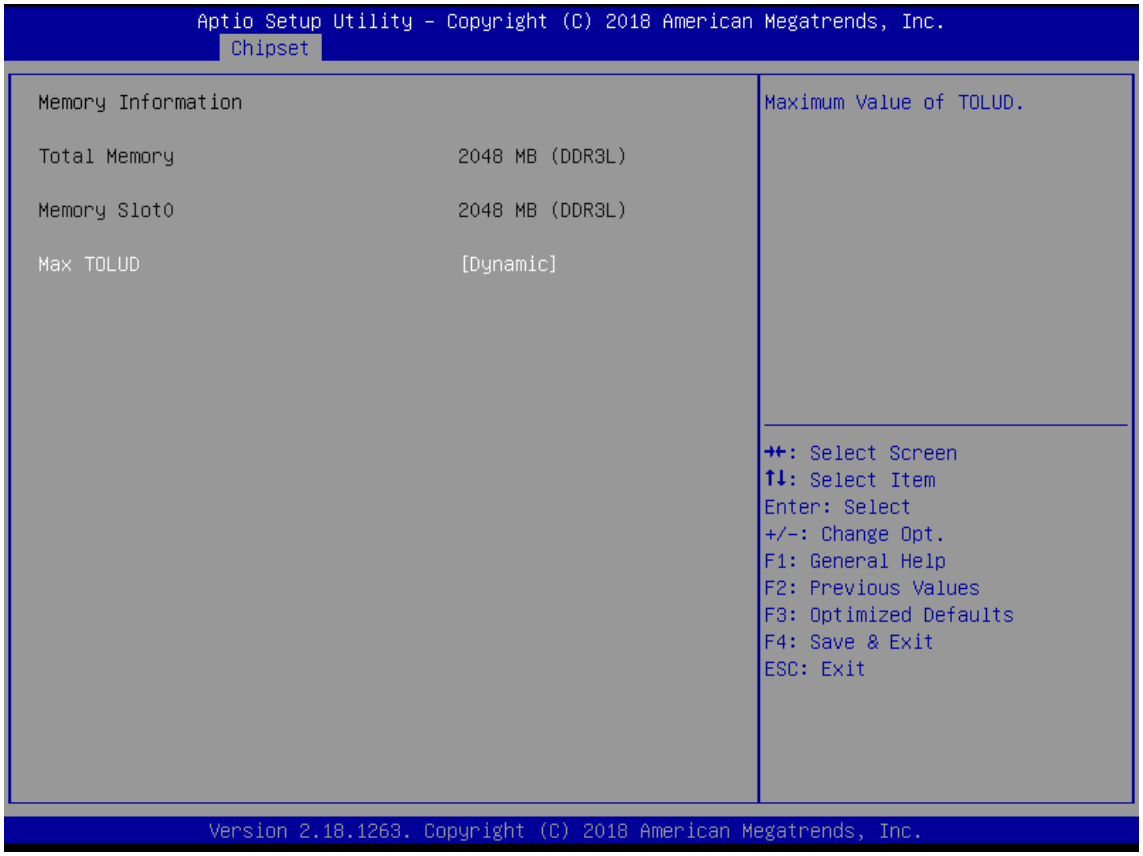
Feature	Options	Description
TXE	Enabled Disabled	Enables TXE function.
TXE HMRFPO	Enabled Disabled	When user wants to update TXE to set this item to enable, but this item only can active once.
TXE firmware Update	Enabled Disabled	TXE firmware update
TXE EOP Message	Enabled Disabled	Send EOP Message Before Enter OS.
INTEL(R) AT	Enable Disable	Intel Anti-Theft Technology.
INTEL(R) AT platform PBA	Enable Disable	Intel Anti-Theft Technology platform PBA function.

Chipset

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

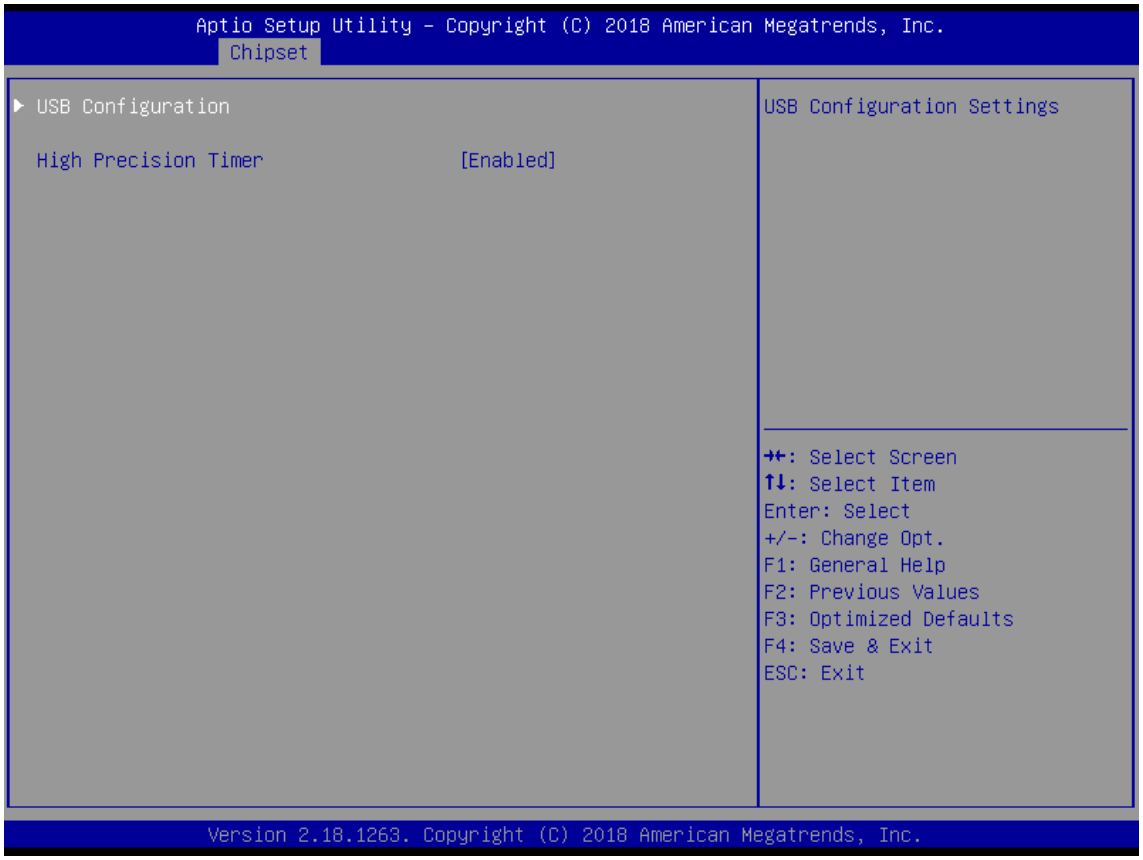


North Bridge

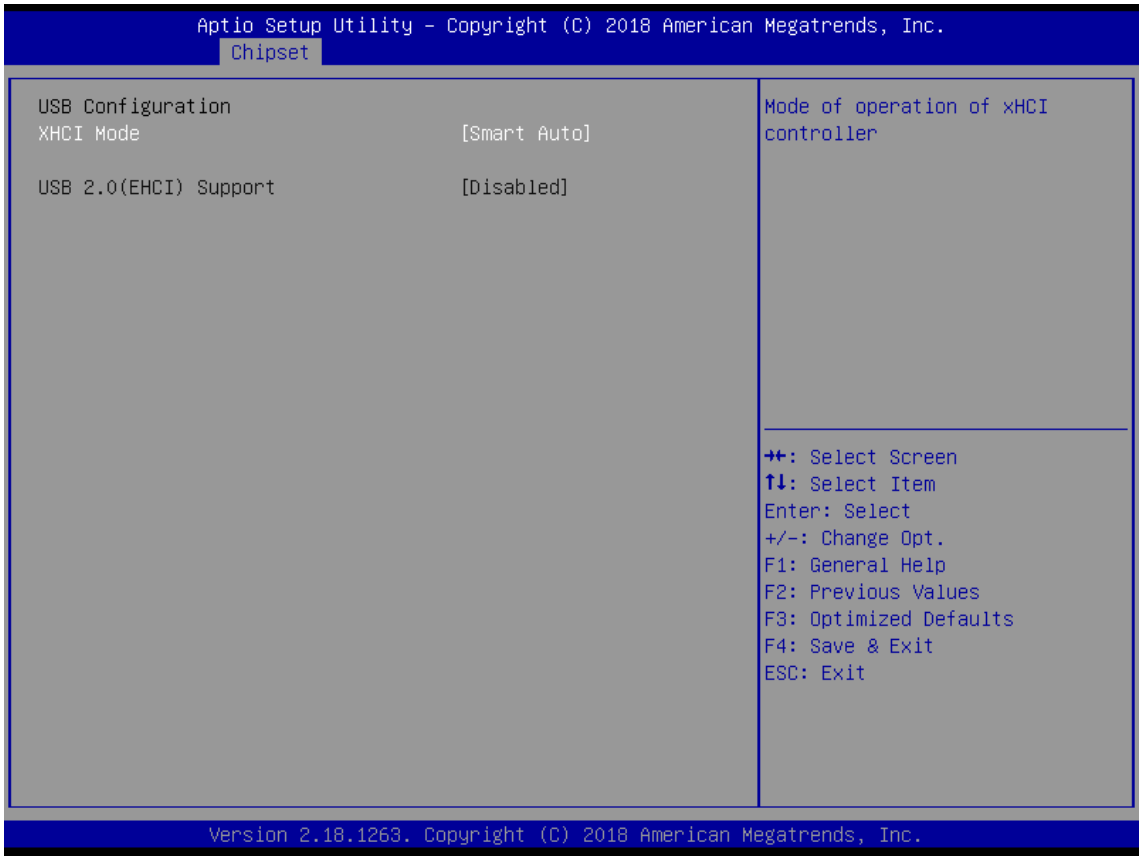


Feature	Options	Description
Max TOLUD	Dynamic 2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB	Maximum Value of TOLUD.

South Bridge



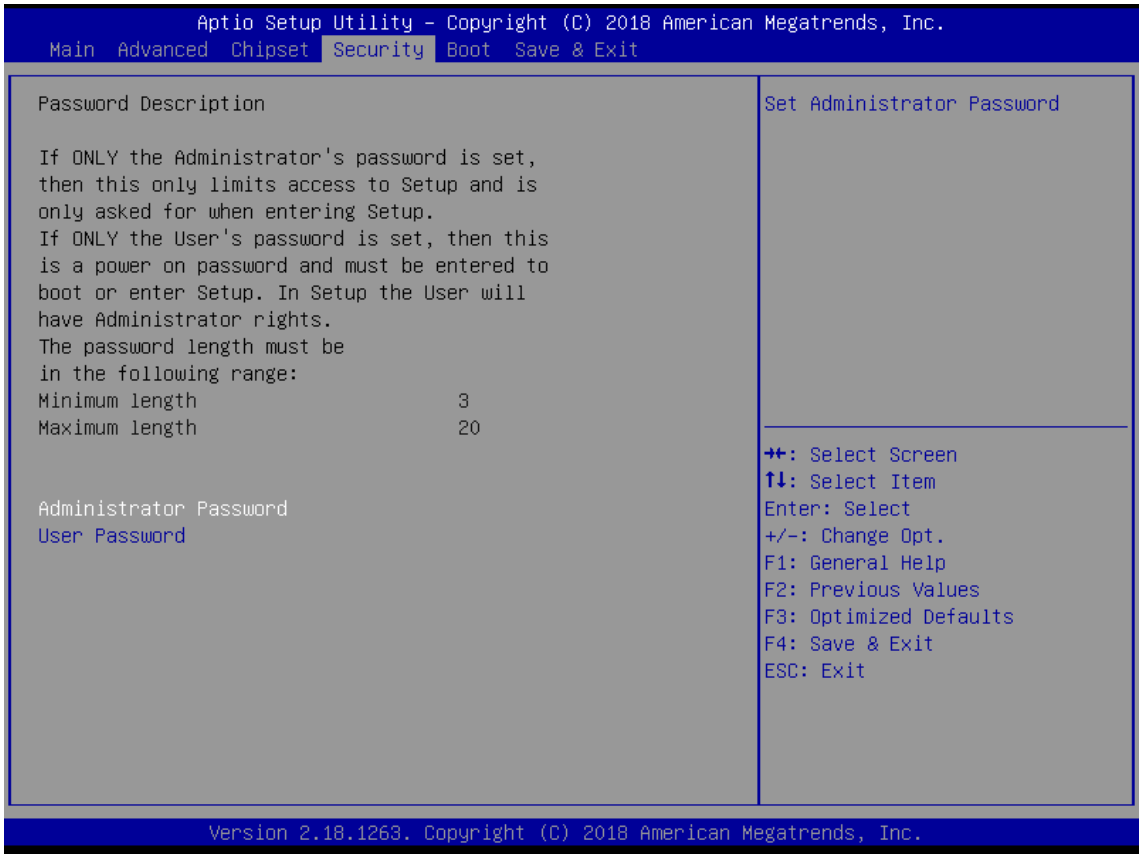
USB Configuration



Feature	Options	Description
XHCI Mode	Enabled Disabled Auto Smart Auto	Mode of operation of xHCI controller.

Security

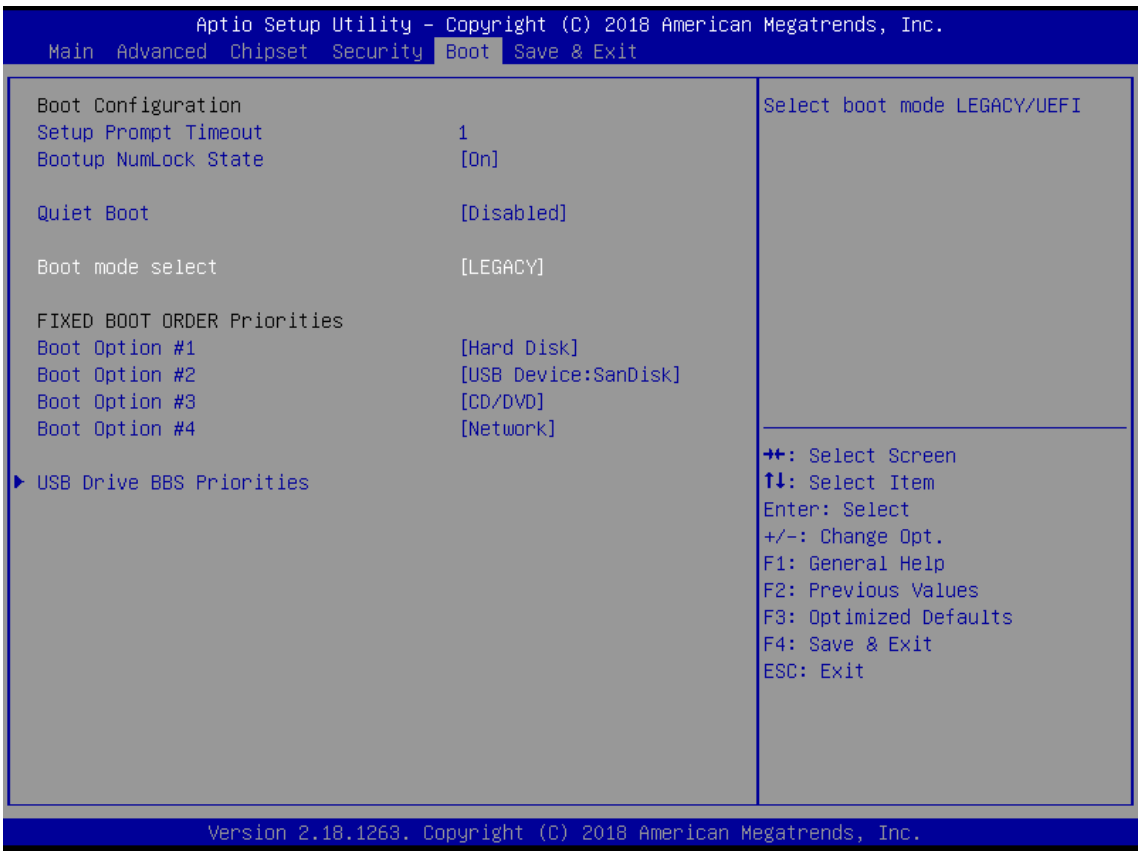
Select the Security menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.



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

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.

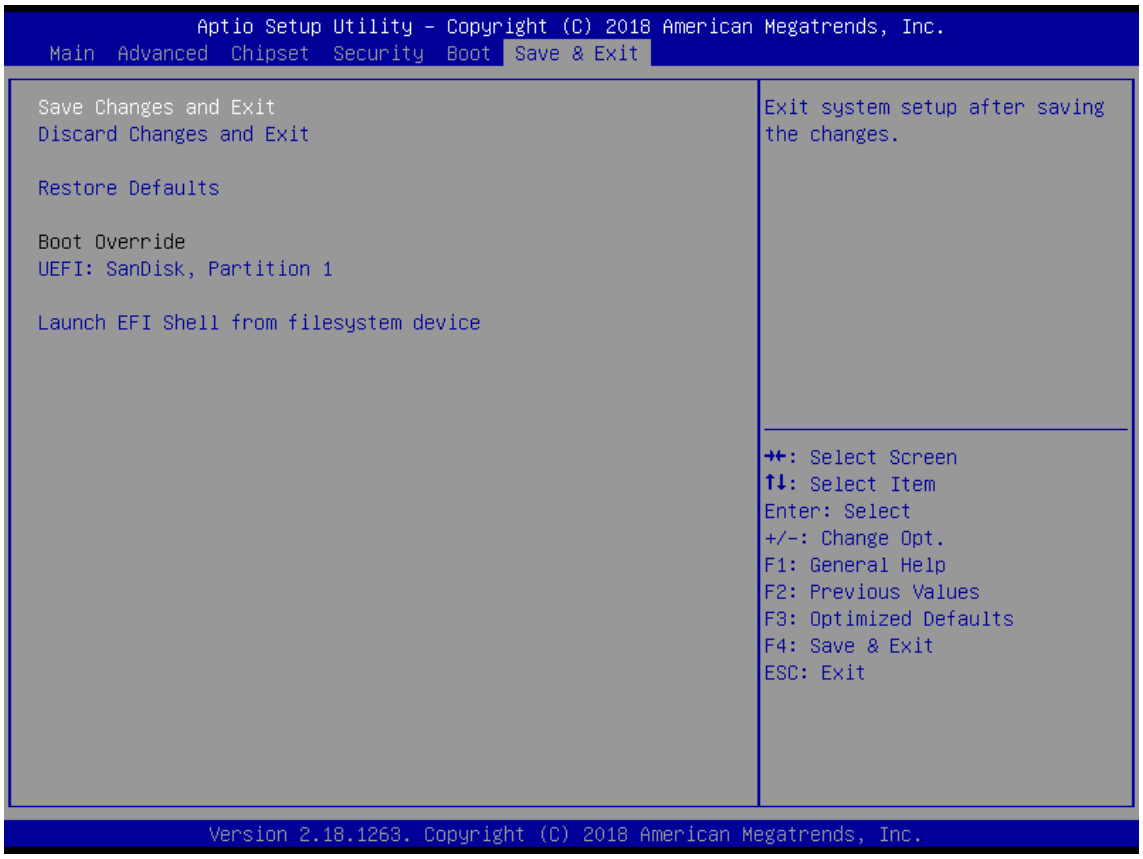


Feature	Options	Description
Setup Prompt Timeout	1	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Quiet Boot	Disabled Enabled	Enable or disables Quiet Boot option.
Boot mode select	LEGACY UEFI DUAL	Select boot mode for LEGACY or UEFI.

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

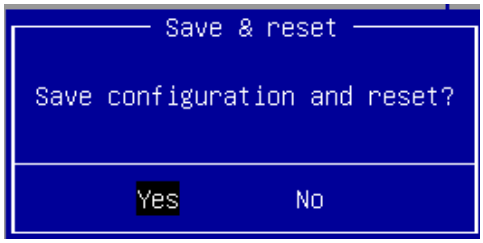
Save and Exit Menu

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



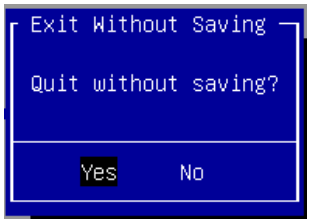
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and exit from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the "**Save Changes and Exit**" option is selected. Select "**Yes**" to Save Changes and Exit Setup.



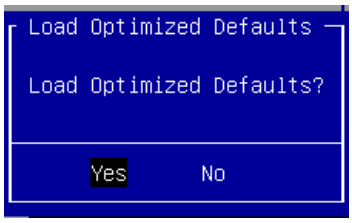
■ Discard Changes and Exit

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



■ **Restore Defaults**

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



Note

The items listed under Boot Options will depend on the devices connected to this system.

APPENDIX A: INSTALLING INTEL® LAN CONTROLLER DRIVER FOR LINUX

To install the Intel® LAN controller base driver for the Red Hat® and Linux operating system, please visit http://www.lannerinc.com/support/download-center/drivers, enter the product category and download the utility package 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	I210
Download Type	Drivers
Operating System	Linux*
Product page	Downloads for Intel® Ethernet Controller I210 Series

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: ▫ 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