Lanner

Industrial Communication Platforms

Energy Management and Industrial Cyber Security Solutions

LEC-7233
User Manual

Version: 1.7

Date of Release:2021-11-17

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.

Copyright and Trademarks

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.

Contact Information

Taiwan Corporate Headquarters

Lanner Electronics Inc.

7F, No.173, Sec.2, Datong Rd.

Xizhi District, New Taipei City 22184,

Taiwan

立端科技股份有限公司

221 新北市汐止區

大同路二段 173 號 7 樓

T: +886-2-8692-6060

F: +886-2-8692-6101

E: contact@lannerinc.com

China

Beijing L&S Lancom Platform Tech. Co., Ltd.

Guodong LOFT 9 Layer No. 9 Huinan Road,

Huilongguan Town, Changping District, Beijing

102208 China

T: +86 010-82795600

F: +86 010-62963250

E: service@ls-china.com.cn

USA

Lanner Electronics Inc.

47790 Westinghouse Drive

Fremont, CA 94539

T: +1-855-852-6637

F: +1-510-979-0689

E: sales_us@lannerinc.com

Canada

Lanner Electronics Canada Ltd

3160A Orlando Drive

Mississauga, ON

L4V 1R5 Canada

T: +1 877-813-2132

F: +1 905-362-2369

E: sales_ca@lannerinc.com

Europe

Lanner Europe B.V.

Wilhelmina van Pruisenweg 104

2595 AN The Hague

The Netherlands

T: +31 70 701 3256

E: sales_eu@lannerinc.com

Acknowledgment

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

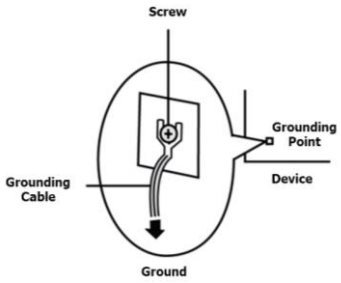
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect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

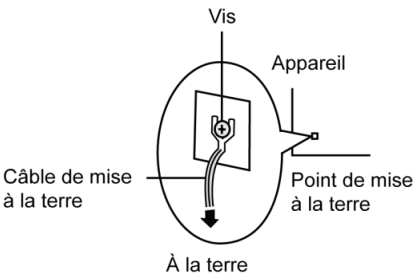
Grounding Procedure for DC Power Source

- 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

The LEC-7233, an industrial embedded system is empowered by Intel® Bay Trail CPU, with the option of Celeron N2807 or J1900. LEC-7233 provides the necessary performance with low power consumption, ideal as industrial embedded gateway. Regarding I/O features, LEC-7233 supports 3x LAN ports, 2x USB 2.0 ports, 1x USB 3.0 port, 2x COM ports and 1x HDMI port. As an industrial gateway, the system provides internal TPM for security purpose.

.

Key Features

- Intel® Celeron N2807 CPU
- 1x DDR3L SO-DIMM socket up to 4GB
- USB: 2x USB 2.0 Type-A ports and 1x USB 3.0 Type-A port
- COM: 2x RS-232 / 485 in D-Sub9 connectors
- DIO: 4x DI and 4x DO
- LAN: 3x 10/100/1000 Mbps RJ-45 ports
- Storage: 1x mSATA socket
- Display: 1x HDMI port
- TPM pin header
- PCIe: 1x mini-PCIe with SIM card reader (full-size) and 1x mini-PCIe (half-size)

Optional Accessories

SKU No.	Description
0TAW0ZU202Z01	u-blox ZU202, 3.7G and Quad-band GSM/GPRS/EDG/UMTS/HSPA/WCDMA Network
0TAW000022000	WPEA-251N (BT), Dual Band 802.11b/g/n Half Mini Card, Atheros AR9462, 2T2R, up to 300Mbpas Data Rate

Ordering Information

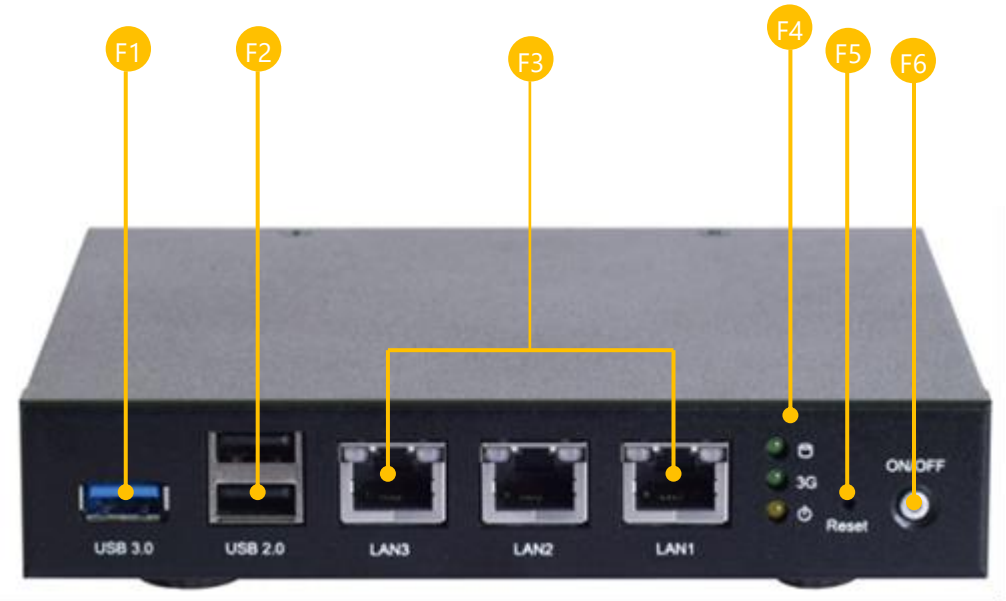
SKU No.	Main Features
LEC-7233-C11A	Fanless Industrial PC with Intel® Celeron® N2807, 1.58GHz, 2 Cores

System Specifications

Processor System	Processor Options Frequency Core Number	Intel® Bay Trail Celeron® N2807 1.58GHz 2C
	BIOS	AMI SPI Flash BIOS
Fanless		Yes
Memory	Technology Max. Capacity Socket	DDR3L 1333MHz 4 GB 1x 204-pin SODIMM
Ethernet	Controller Speed Interface	Intel® i211 10/100/1000Mbps 3x RJ45
Power	Power Type Power Supply Voltage	ATX +12V DC (+/- 5% input)
	Connector	DC Jack with Lock
	Power Consumption (Idle)	7W (TBC)
	Power Consumption (Full Load)	11W (TBC)
	Power Adaptor	AC to DC: AC 90-240V AC Input, DC 12V DC / 3A 36W
I/O Interface	Serial Port Digital I/O USB 2.0	2x RS-232 / 485, D-Sub9 Male 4x DI, 4x DO 2x USB 2.0 Type A
	USB 3.0	1x USB 3.0 Type A
	Power-On/Reset Button	1x Power On/Off, 1x Reset
	LED	Power, Storage Access, 3G Status
	Antenna Hole	2x SMA Antenna Holes
Expansion Interface	Mini-PCIe	1x Full-sized Socket with SIM Card Reader, 1x Half-sized Socket
Storage	Type	SATA
	Installation	1x mSATA Socket
Watchdog Timer		Yes, 1~255 Level Time Interval System Reset, Software Programmable
Graphics	Controller	Intel® HD Graphics
	HDMI	1x HDMI, 1920x1080
Mechanical	Dimension (W x H x D) Construction Weight Mounting	164.5 x 30 x 143mm SGCC 0.9kg Wallmount, VESA mount
Environmental	Operating Temperature Storage Temperature Relative Humidity Vibration	0°C ~ 50°C (for N2807 CPU with industrial grade storage and memory) -20°C ~ 70°C 5% ~ 95% Non-condensing IEC 60068-2-64, 0.5Grms, Random 5-500Hz, 40 Mins/Axis
Driver Support	Microsoft Windows Linux	WES7E, Win7 Pro FES, WE 8.1 Industry Pro, Win 10 IoT Kernal 3.12
Certification	EMC Compliance	CE/FCC Class A RoHS

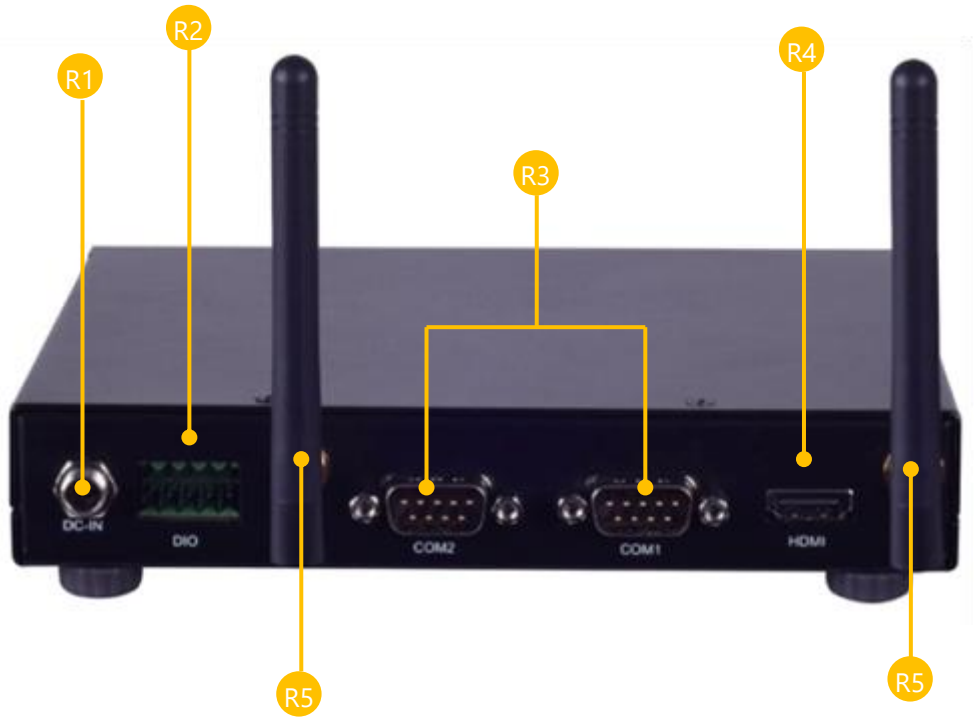
Physical Overview

Front Panel



No.	Description	
F1	USB 3.0	1x USB3.0 Type-A port
F2	USB 2.0	2x USB2.0 Type-A ports
F3	LAN	3x 10/100/1000 mbps RJ-45 LAN ports
F4	LEDs	• Green: power-on/off status • Green: wireless network status • Yellow: storage access
F5	Reset	1x Reset button
F6	Power Switch	1x power on/off switch

Rear Panel



No.	Description	
R1	DC-IN	1x DC input jack
R2	DIO	5-pin terminal block supporting 4xDI and 4xDO
R3	COM	2x D-sub COM ports with RS-232/485 signals
R4	HDMI	1x HDMI port
R5	SMA Antenna (optional)	2x SMA antenna holes (the antennas are NOT included by default)

WARNING: Improper installation can cause injury or property damage.

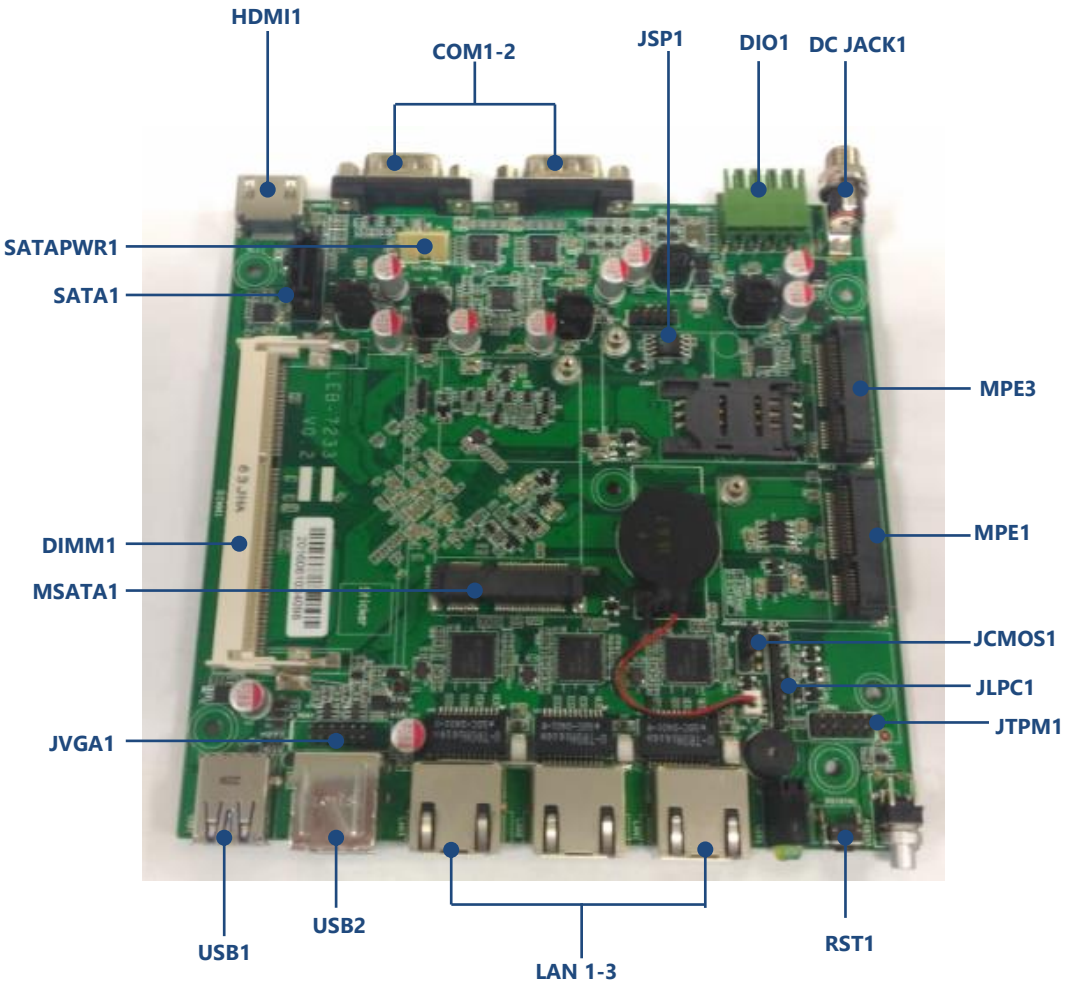
For proper and safe operation use in field site with AC Power, please follow these instructions:

1. Securely plugged and locked the DC-Jack to the machine
2. Connect the AC adapter power cord into a standard 110v/220v AC outlet

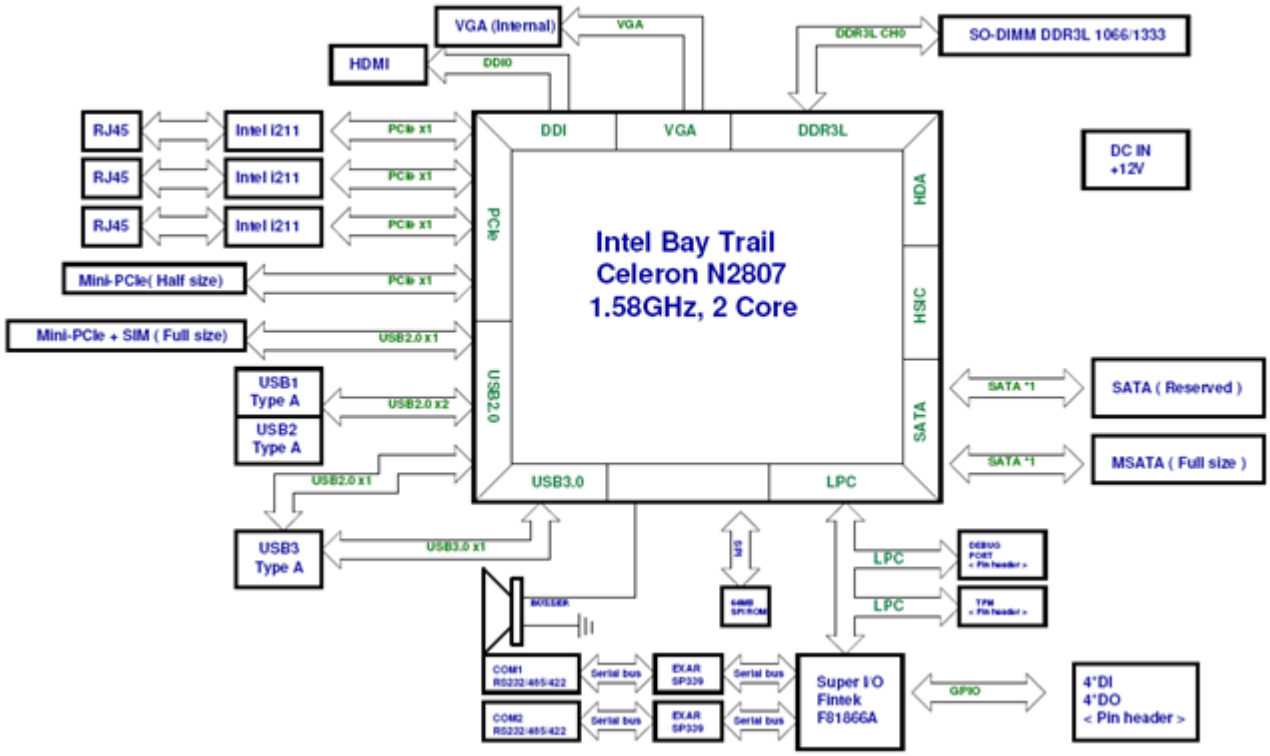
Motherboard Information

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.

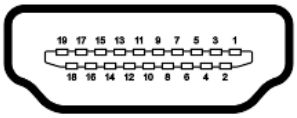


Block Diagram



Jumper Settings & Connector Pinout

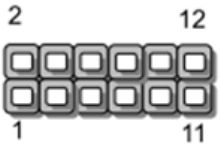
HDMI1: High-Definition Multimedia Interface connector



Pin	Description	Pin	Description
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	N.C	14	N.C
15	DDC CLK	16	DDC DAT
17	GND	18	HDMI_VCC
19	HPD		

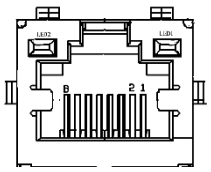
JVGA1: 12-pin internal VGA pin header

Pin	Description	Pin	Description	Pin	Description
1	CRT_R	2	GND	3	CRT_G
4	GND	5	CRT_B	6	GND
7	HSYNC_1	8	GND	9	VSYNC_1
10	GND	11	D2DAT	12	D2CLK



LAN1/2/3: LAN Connector (RJ-45 connector with LED)

Pin	Description	
1	TXD+	MD0+
2	TXD-	MD0-
3	RXD+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RXD-	MD1-
7	T78	MD3+
8	T78	MD3-
9	10-/100-/1000+	
10	10+/100+/1000-	
11	NC	
12	NC	
13	Active LED- (yellow)	
14	Active LED+	

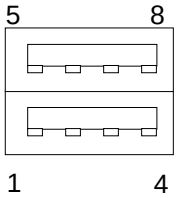


USB1: USB3.0 Type-A Connector

Pin	Description	Pin	Description
1	USB_VCC1	2	USB1_D-
3	USB1_D+	4	GND
5	USB1_RX-	6	USB1_RX+
7	GND	8	USB1_TX-
9	USB1_TX+		

USB2/USB3: USB2.0 Type-A Connectors in double-stacked form

Pin	Description
1	USB_VCC1
2	-USB
3	+USB
4	GND
5	USB_VCC2
6	-USB
7	+USB
8	GND



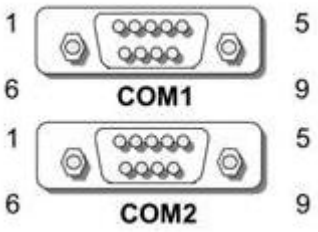
USBB2/3

DIO: 2x5-pin Digital I/O terminal block with 4 x DI and 4 x DO

Pin	Signal	Pin	Signal
1	DI_0	2	DO_0
3	DI_1	4	DO_1
5	DI_2	6	DO_2
7	DI_3	8	DO_3
9	V5S	10	GND

COM1/COM2: 2x DB9 Serial COM ports with RS-232/422/485

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCDA#)	2	Received Data (RXDA)
3	Transmit Data (TXDA)	4	Data Terminal Ready (DTRA#)
5	Ground (GND)	6	Data Set Ready (DSRA#)
7	Request To Send (RTSA#)	8	Clear To Send (CTSA#)
9	Ring Indicator (RIA#)		



Pin	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RXD	TX+	DATA+
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

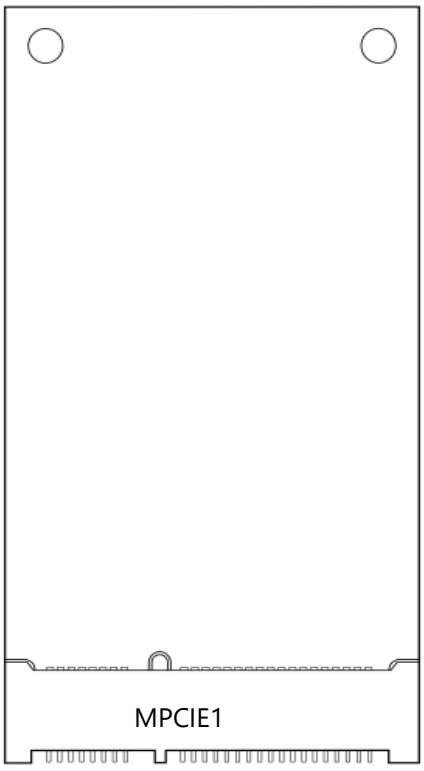
JTPM1: TPM module pin header for security and protection

Pin	Signal	Pin	Signal
1	LPC_SERIRQ_H	2	V3P3A
3	LPC_AD0	4	V3P3A
5	LPC_AD1	6	GND
7	LPC_FRAM#	8	--
9	PLTRST#_LS	10	PLTRST#
11	LPC_AD3	12	LPC_AD2

LPC1: LPC (low pin count) pin header for debug purpose

Pin	Description	Pin	Description
1	LPC_CLK	2	LAD1
3	PLTRST	4	LAD0
5	LFRAME#	6	3.3V
7	LAD3	8	GND
9	LAD2	10	GND

MPCIE1: mini-PCIe Slot /w SIM (Full Size)



Pin	Description	Pin	Description
1	WAKE#	2	+3.3v
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	REFCLK+	12	NC
13	REFCLK-	14	NC
15	GND	16	NC
KEY			
17	SUSCLK	18	GND
19	NC	20	NC
21	GND	22	PERST#
23	PER_N0	24	+3.3V
25	PER_P0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PET_N0	32	SMB_DAT
33	PET_P0	34	GND
35	GND	36	NC

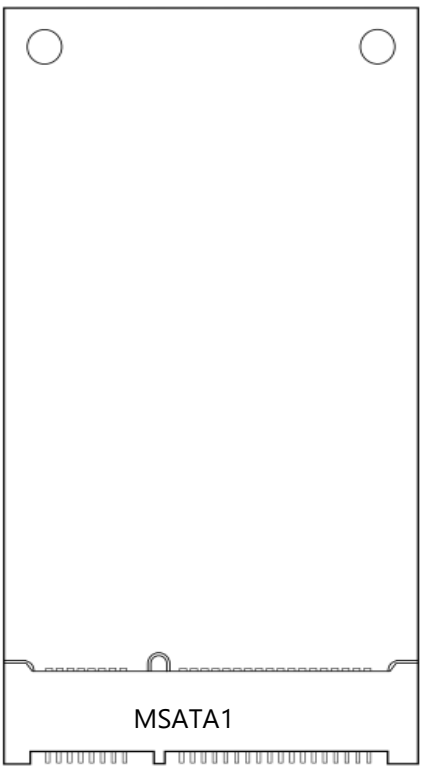
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	LED_WLAN#
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	+3.3V

MPCIE3: mini-PCIe Slot /w SIM (Half Size)

Pin	Description	Pin	Description
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	PWR_UIM1
9	GND	10	DAT_UIM1
11	NC	12	CLK_UIM1
13	NC	14	RST_UIM1
15	GND	16	VPP_UIM1
KEY			
17	NC	18	GND
19	NC	20	NC
21	GND	22	PERST#
23	NC	24	+3.3V
25	NC	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	NC	32	SMB_DAT
33	NC	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	LED_WWAN#
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	+3.3V

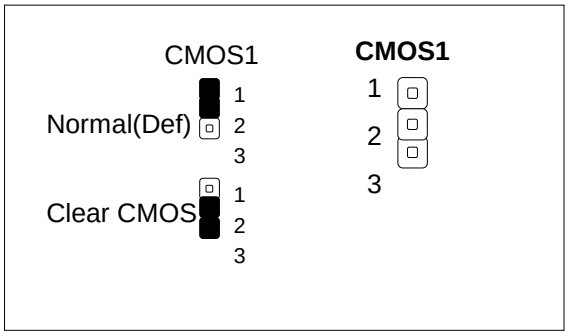
MSATA1: mSATA slot for storage device (full-sized form)

Pin	Description	Pin	Description
1	N.C	2	+3.3V
3	N.C	4	GND
5	N.C	6	N.C
7	N.C	8	N.C
9	GND	10	N.C
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	N.C
KEY			
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	N.C
23	SATA_RXp	24	+3.3V
25	SATA_RXn	26	GND
27	GND	28	N.C
29	GND	30	N.C
31	SATA_TXn	32	N.C
33	SATA_TXp	34	GND
35	GND	36	N.C
37	GND	38	N.C
39	+3.3V	40	GND
41	+3.3V	42	N.C
43	GND	44	N.C
45	N.C	46	N.C
47	N.C	48	N.C
49	N.C	50	GND
51	N.C	52	+3.3V



DCIN1: DC Power Jack

Pin	Description
1	DC_IN (12V)
2	DC_IN (-)



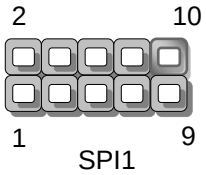
CMOS1: Clear CMOS

Short Pins	Description
1-2	Normal (Default)
2-3	Clear CMOS

J_RST1: 2-pin reset pin header

Pin	Description
1	Ground
2	Reset

SPI1: SPIROM pin header for debug purpose



Pin	Description	Pin	Description
1	SPI_HOLD	2	N.C
3	SPI_CS#	4	SPI_VCC
5	SPI_MO	6	N.C
7	N.C	8	SPI_CLK
9	GND	10	SPI_MI

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. To access some components and perform certain service procedures, you must perform the following procedures first.

Opening the Chassis

1. Power off LEC-7233 and remove power cord.
2. Remove the screws from all sides and the rear, as circled in the image below. Please remove the four rubber pads as well. It is recommended to use screwdriver sized 3 for these M3 dimensions nails.

3. Slide and open the chassis.

Installing SO-DIMM Memory

The system is designed with a SO-DIMM socket supporting up to 4GB DDR3L 1333MHz. Please follow the steps below for proper installations.

1. Locate the SO-DIMM socket on the motherboard.
2. Align the memory module's key with the SO-DIMM socket's key.
3. Insert the SO-DIMM module.

4. Press the module down until it is locked by the two clips at each side.

Installing mSATA and Mini-PCIe Module

The system provides a mSATA and a mini-PCIe sockets for internal storage. Please follow the steps below for installations.

1. Locate the mSATA and the mini-PCIe socket, the system includes one mSATA (MSATA1), one half-sized mini-PCIe (MPE1) and one full-sized mini-PCIe (MPE3) sockets. The system will detect no mSATA or mini-PCIe card if put the wrong location.
2. Align the mechanical notches between the module and the socket.
3. Insert the module into the socket.
4. Secure the installed module with two screws.

CHAPTER 3: SOFTWARE SETUP

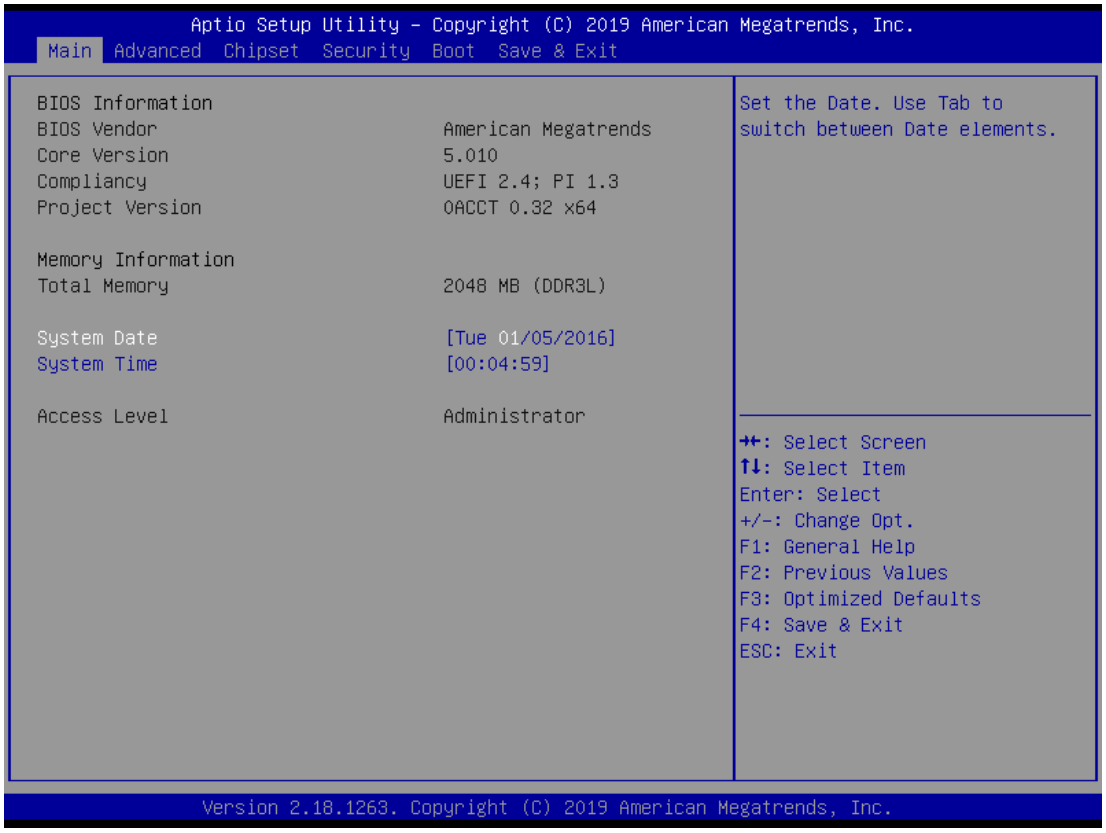
BIOS Setup

LEC-7233 has AMI BIOS built-in, with a Setup utility that allows users to configure required settings or to activate certain system features. Pressing the **<Tab>** or **<Del>** key immediately allows you to enter Setup utility.

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced], [Chipset], [Security], [Boot], and [Save & Exit]
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	to adjust values for the selected setup item/option
F1	to display General Help screen
F2	to retrieve previous values, such as the parameters configured the last time you had entered BIOS.
F3	to load optimized default values
F4	to save configurations and exit BIOS
<Esc>	to exit the current screen

Main Page

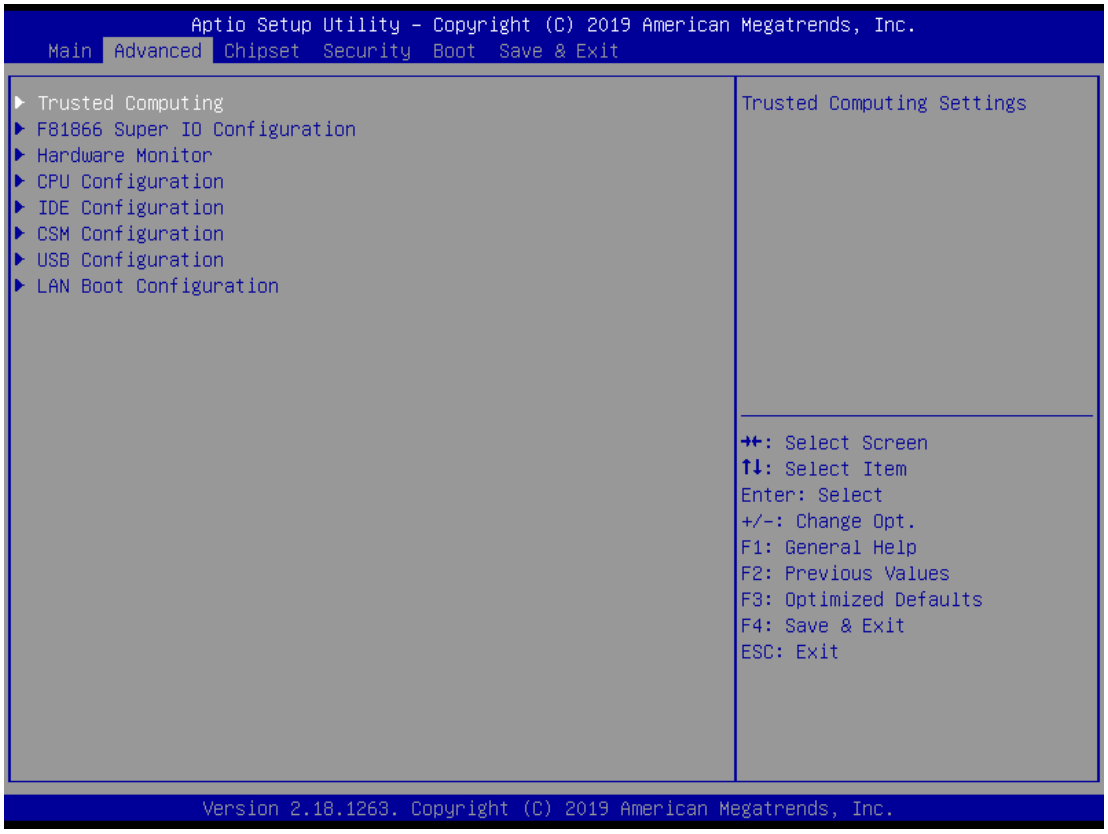
Setup main page contains BIOS information and project version information.



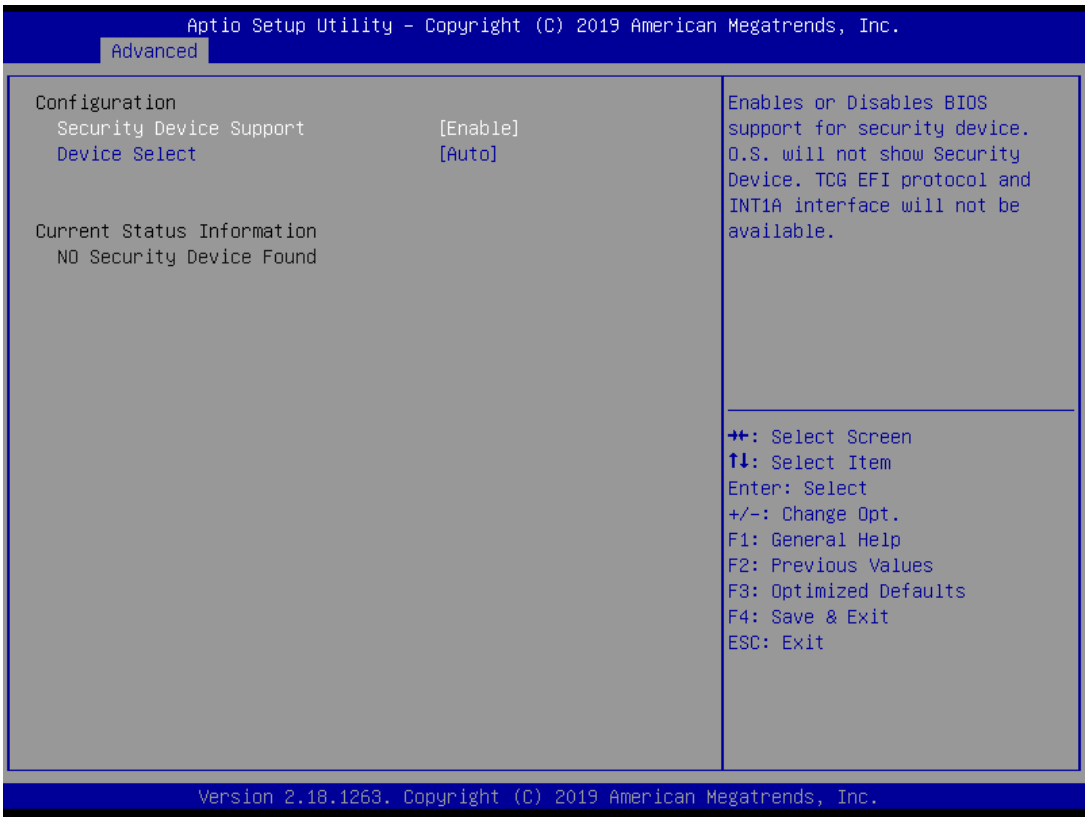
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version Compliancy: UEFI version, PI version Project Version: BIOS release version
System Date	To set the Date, use **<Tab>** to switch between Date elements.
System Time	To set the Date, use **<Tab>** to switch between Date elements.
Access Level	Administrator / User

Advanced Page

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

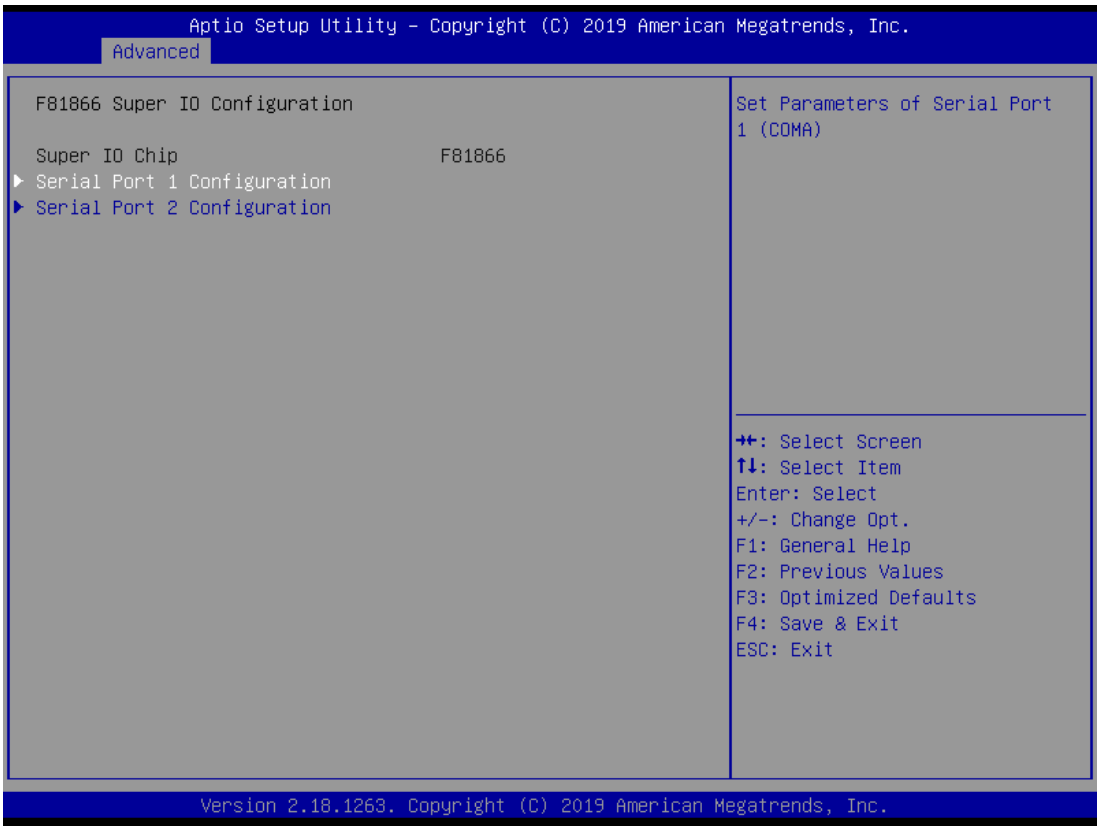


Trusted Computing

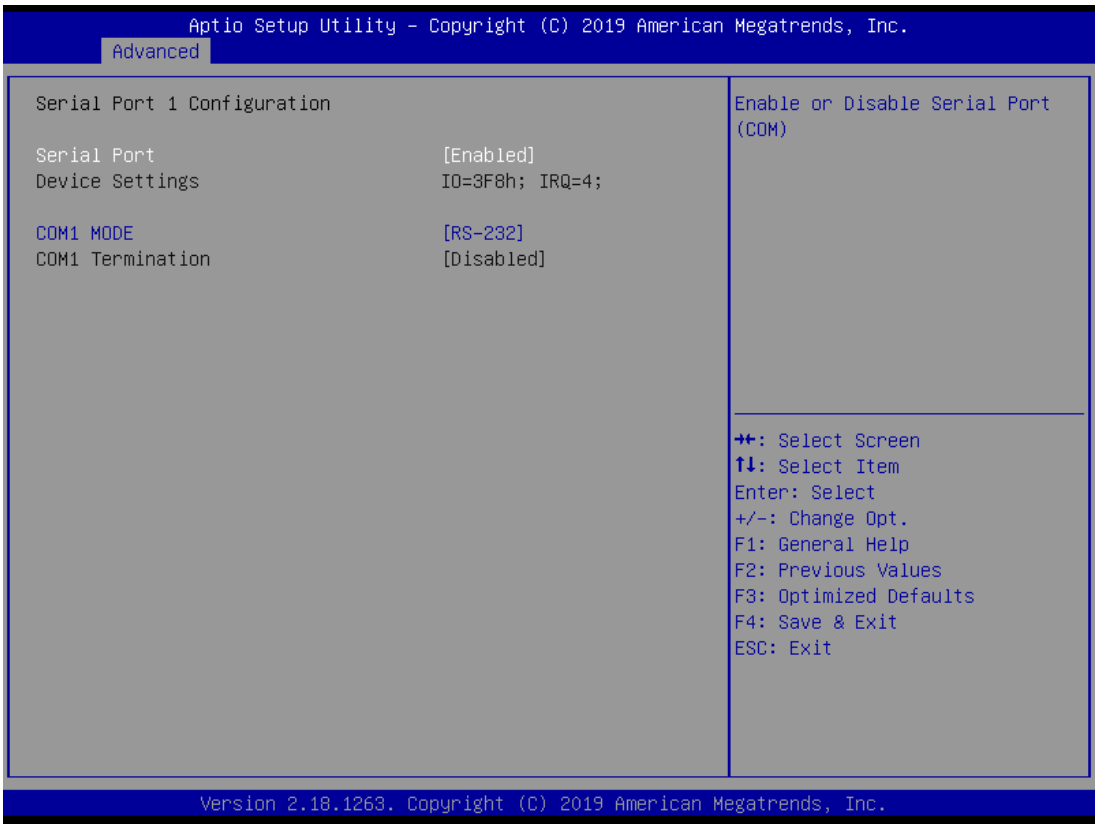


Feature	Options	Description
Security Device Support	Disable Enable	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Device Select	TPM 1.2 TPM 2.0 Auto	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices If not found, TPM 1.2 devices will be enumerated

F81866 Super IO Configuration

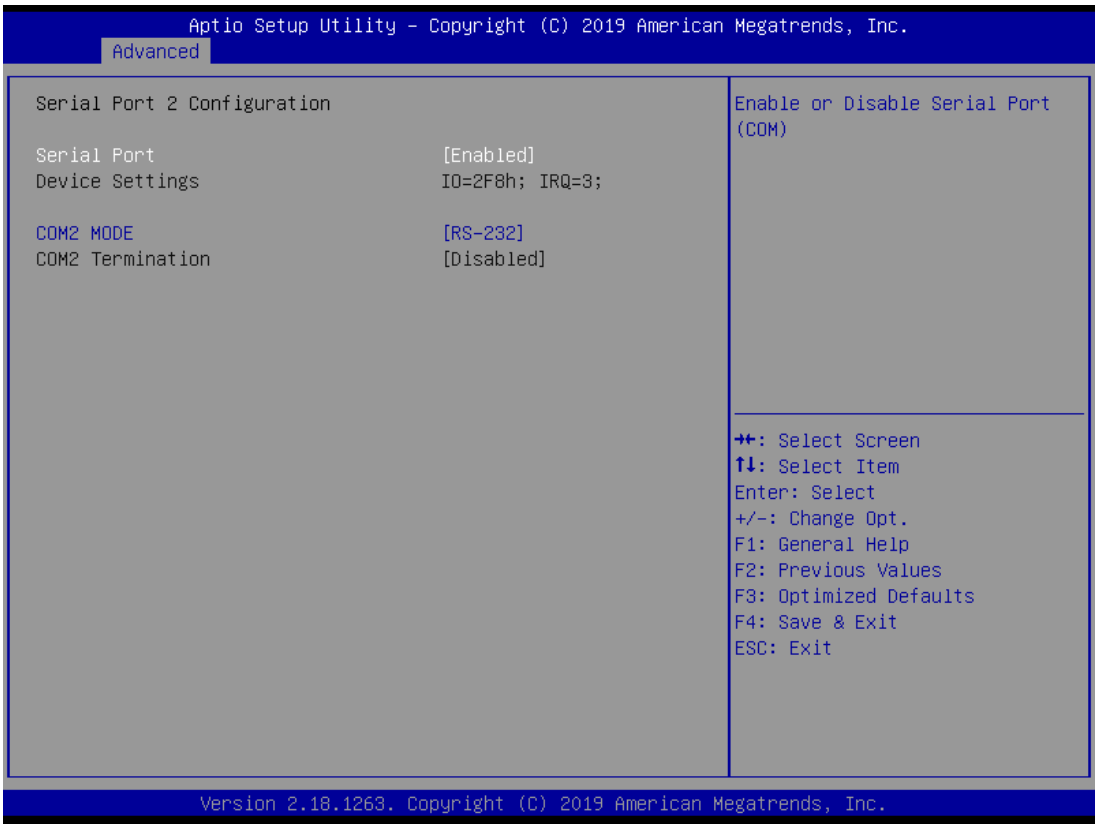


Serial port 1 Configuration



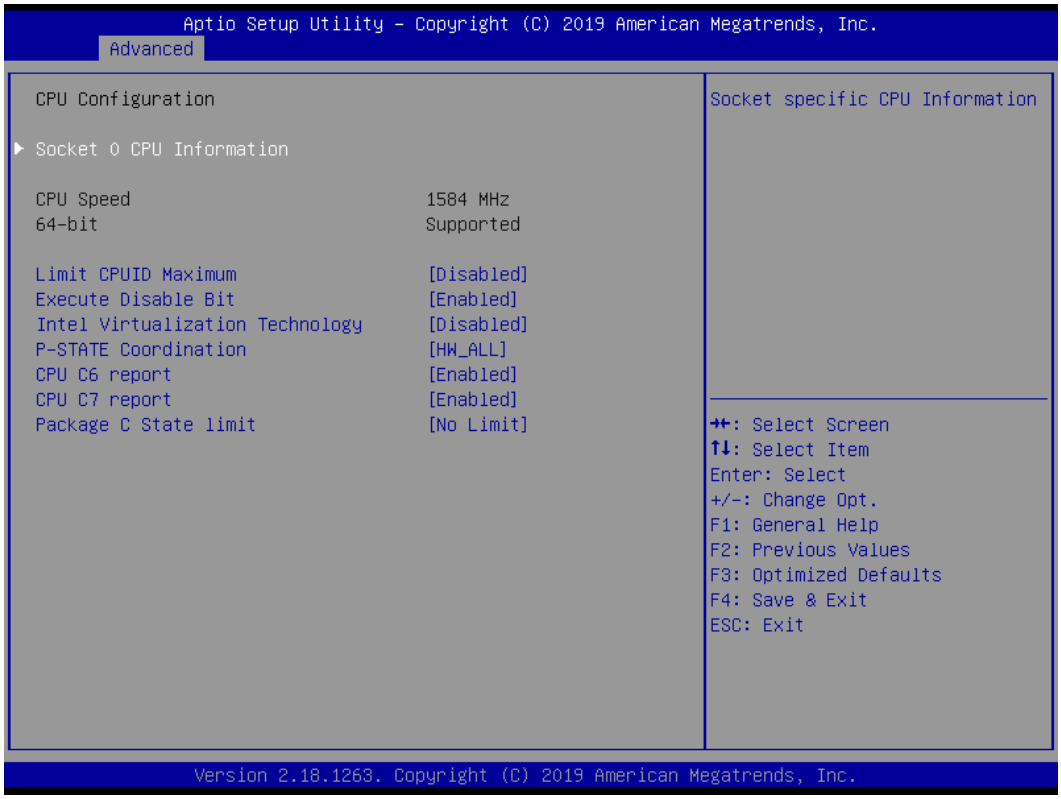
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4;
COM1 MODE	Loopback RS-232 RS-485 RS-422	Select Com Mode as RS-232/RS485/RS422

Serial port 2 Configuration



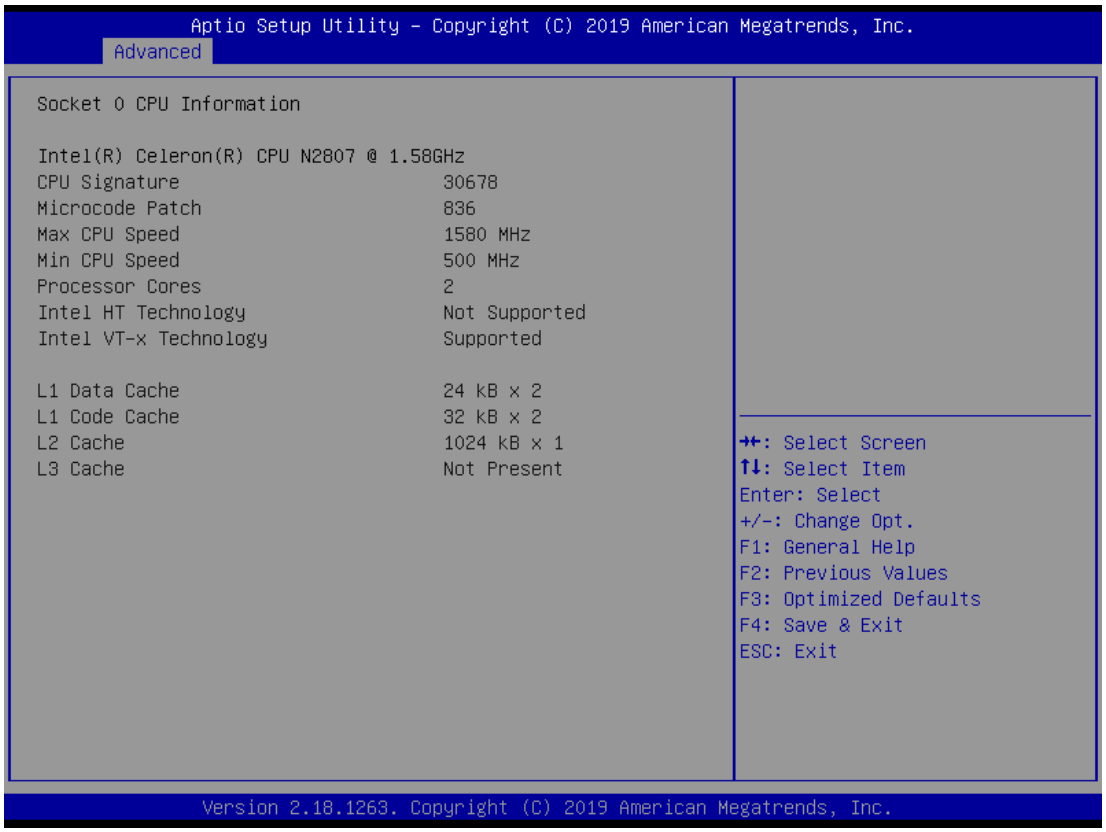
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO=3F8h; IRQ = 4;
COM2 MODE	Loopback RS-232 RS-485 RS-422	Select Com Mode as RS-232/RS485/RS422

CPU Configuration

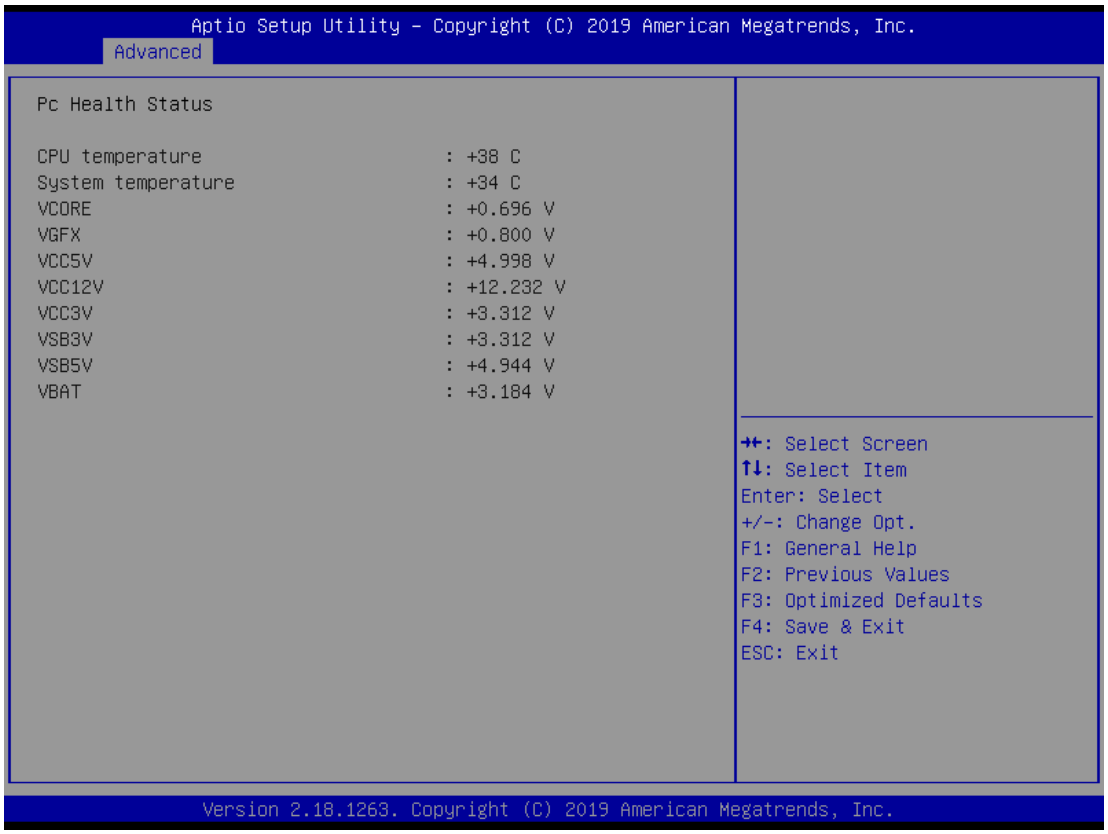


Feature	Options	Description
Limit CPUID Maximum	Disabled Enabled	Disabled for Windows XP
Execute Disable Bit	Disabled Enabled	XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)
Intel Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology
P-STATE Coordination	HW_ALL SW_ALL SW_ANY	Change P-STATE Coordination type
CPU C6 report	Disabled Enabled	Enable/Disable CPU C6(ACPI C3) report to OS
CPU C7 report	Disabled Enabled	Enable/Disable CPU C7(ACPI C3) report to OS
Package C State limit	C0 C1 C3 C6 C7 No Limit	Package C State limit

Socket 0 CPU Information

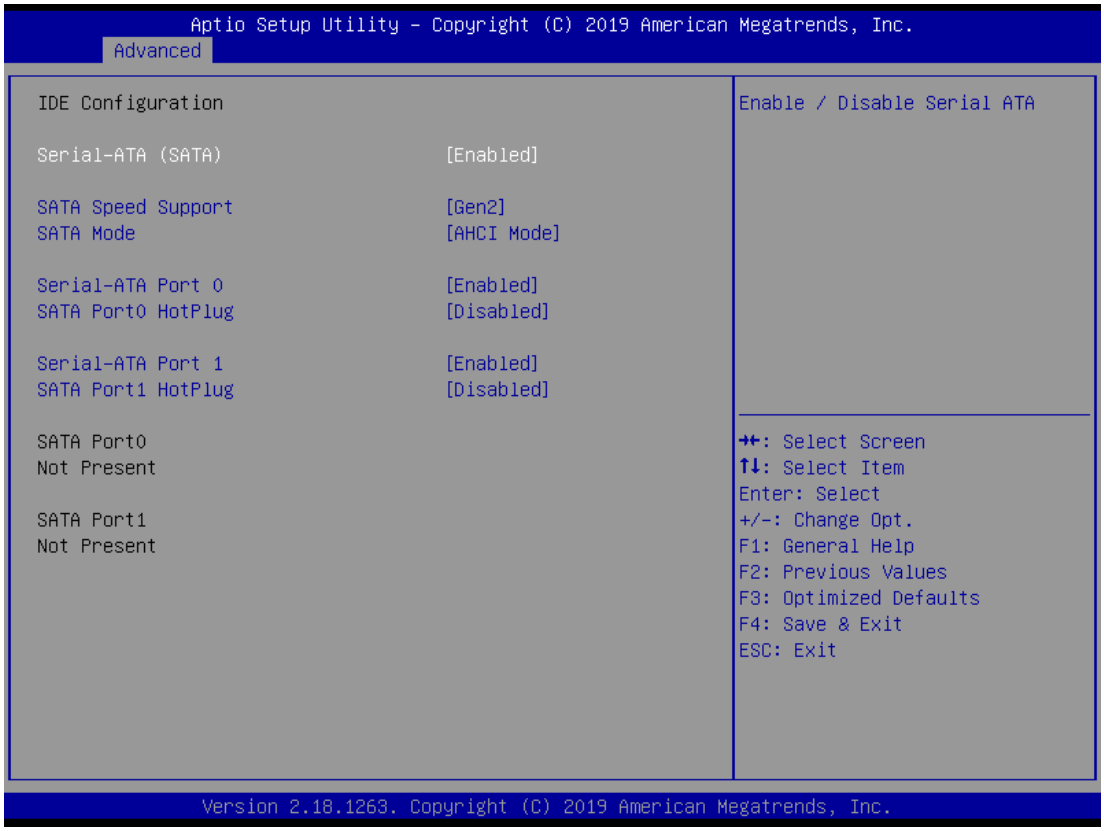


Hardware Monitor



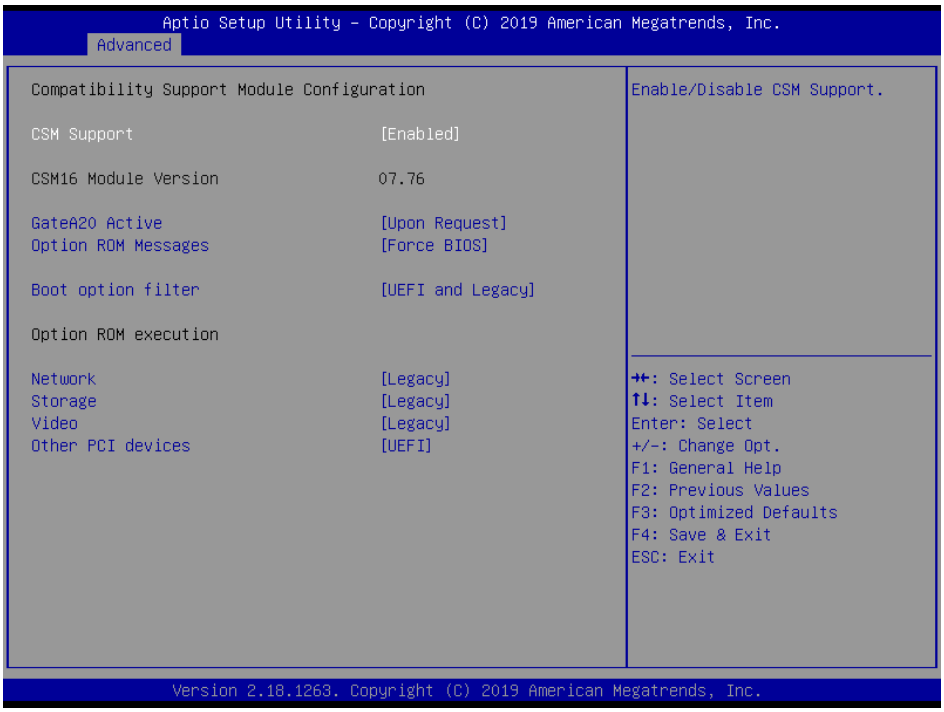
Feature	Description
CPU temperature	This value reports the CPU temperature.
System temperature	This value reports the System temperature.
VCORE	This value reports the CPU VCORE.
VGFX	This value reports the VGFX.
VCC5V	This value reports the VCC5V Input voltage.
VCC12V	This value reports the VCC12V Input voltage.
VCC3V	This value reports the VCC3V Input voltage.
VSB3V	This value reports the VSB3V Input voltage.
VSB5V	This value reports the VSB5V Input voltage.
VBAT	This value reports the VBAT Input voltage.

IDE Configuration



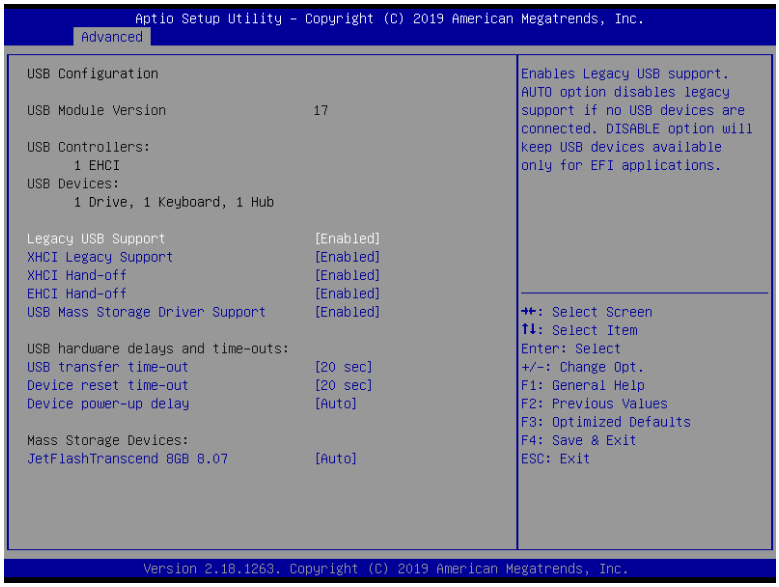
Feature	Options	Description
Serial-ATA (SATA)	Enabled Disabled	Enable / Disable Serial ATA
SATA Speed Support	Gen1 Gen2	SATA Speed Support Gen1 or Gen2
SATA Mode	IDE Mode AHCI Mode	Select IDE / AHCI
Serial-ATA Port 0	Enabled Disabled	Enable / Disable Serial ATA Port 0
STAT Port0 HotPlug	Enabled Disabled	Enable / Disable SATA Port1 HotPlug
Serial-ATA Port 1	Enabled Disabled	Enable / Disable Serial ATA Port 1
STAT Port1 HotPlug	Enabled Disabled	Enable / Disable SATA Port1 HotPlug

CSM Configuration



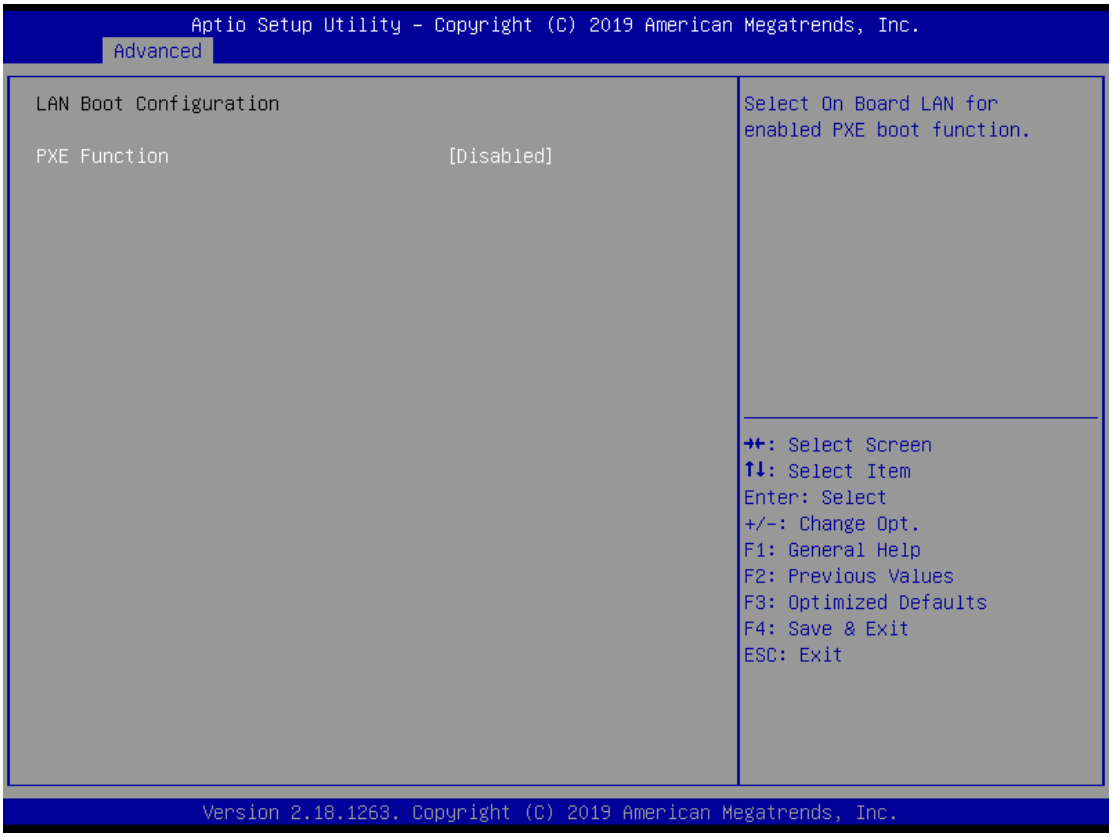
Feature	Options	Description
CSM Support	Disabled Enabled	Enable/Disable CSM Support.
GateA20 Active	Upon Request Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority
Network	Do not launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do not launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not launch UEFI Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device	Do Not launch UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

USB configuration



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

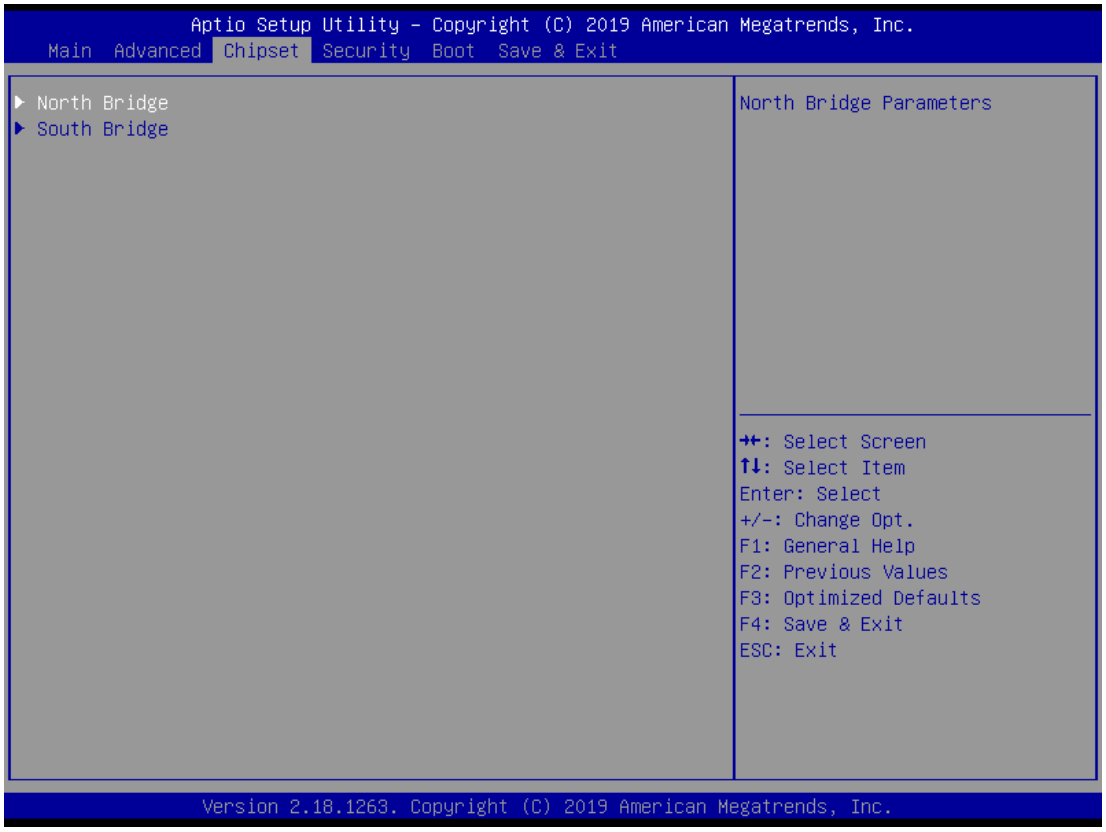
LAN Boot Configuration



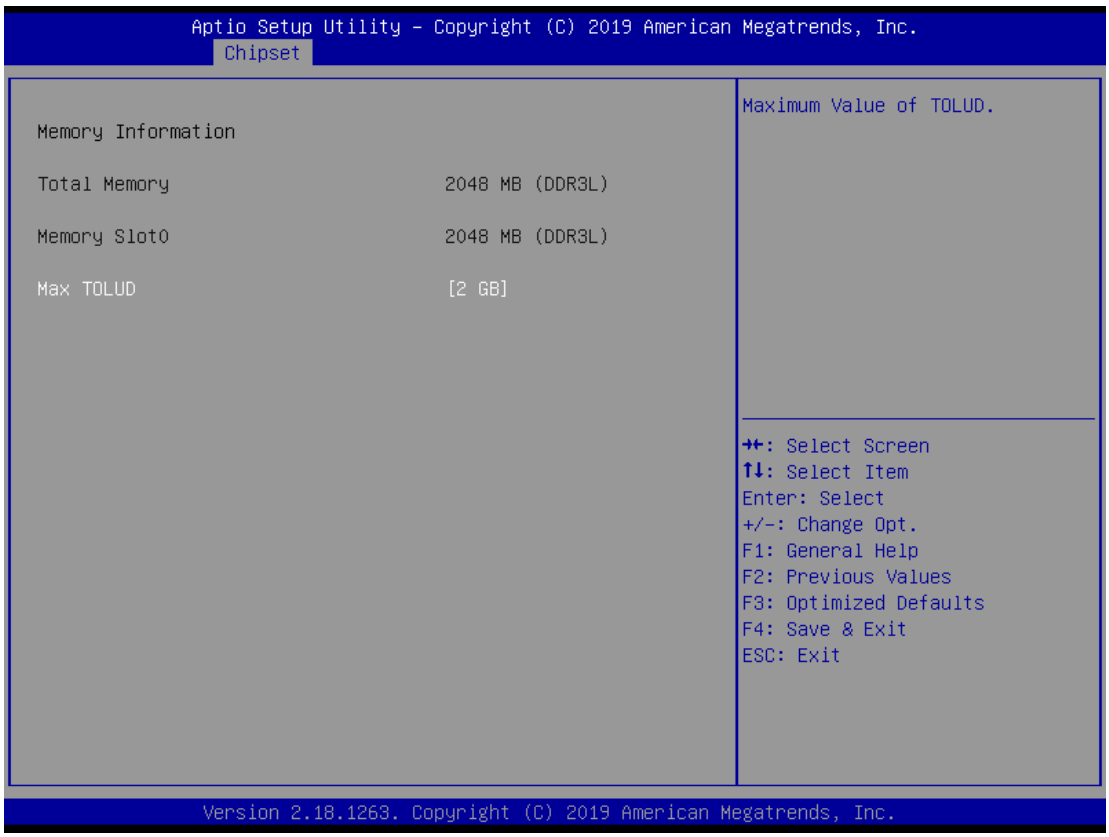
Feature	Options	Description
PXE Function	Disabled LAN1 LAN2 LAN3	Select On Board LAN for enable PXE boot function.

Chipset

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

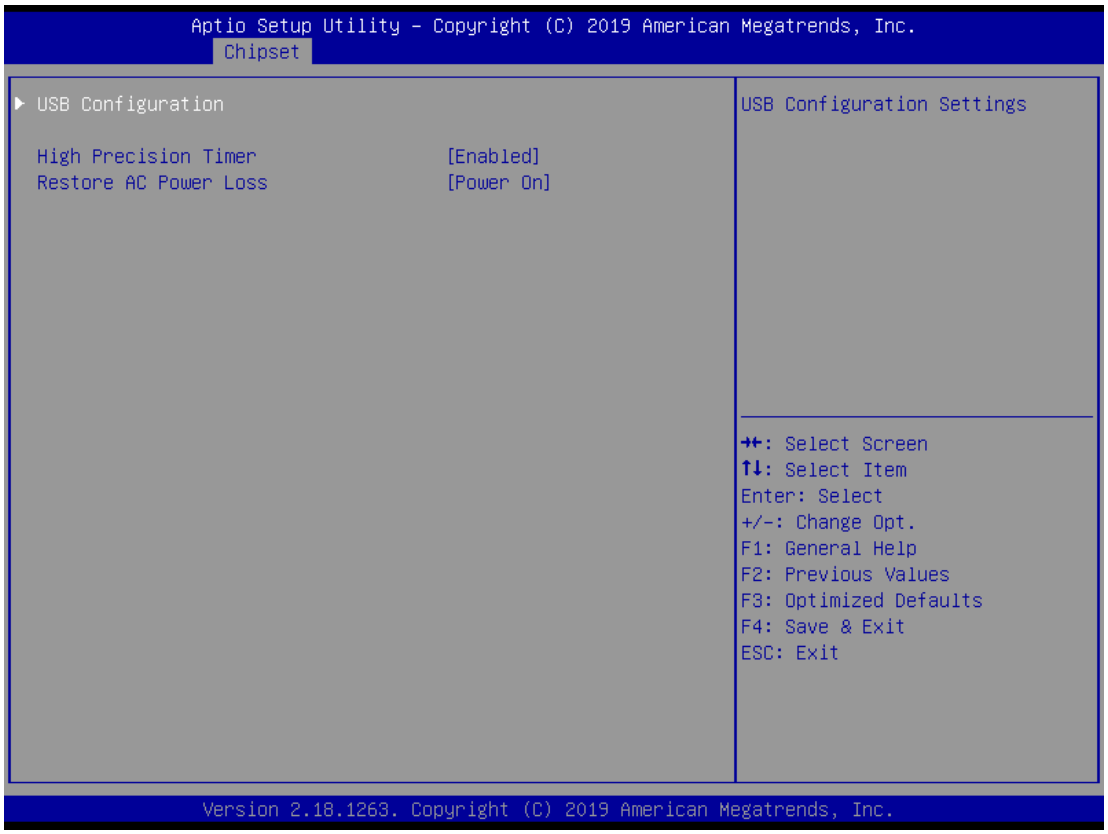


North Bridge



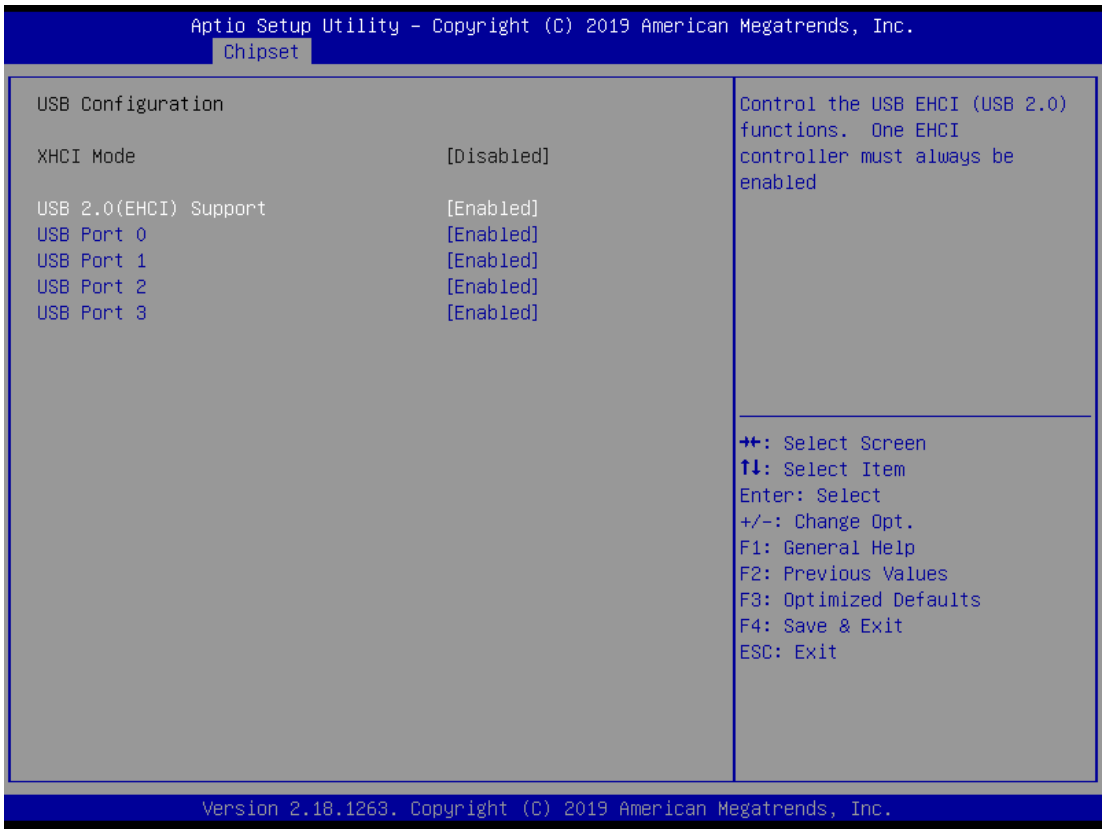
Feature	Options	Description
Max TOLUD	2 GB 2.25 GB 2.5 GB 2.75 GB 3 GB	Maximum Value of TOLUD.

South Bridge



Feature	Options	Description
High Precision	Enabled Disabled	Enable or Disable the High Precision Event Timer.
Restore AC Power Loss	Power Off Power On Last State	Select AC power state when power is re-applied after a power failure.

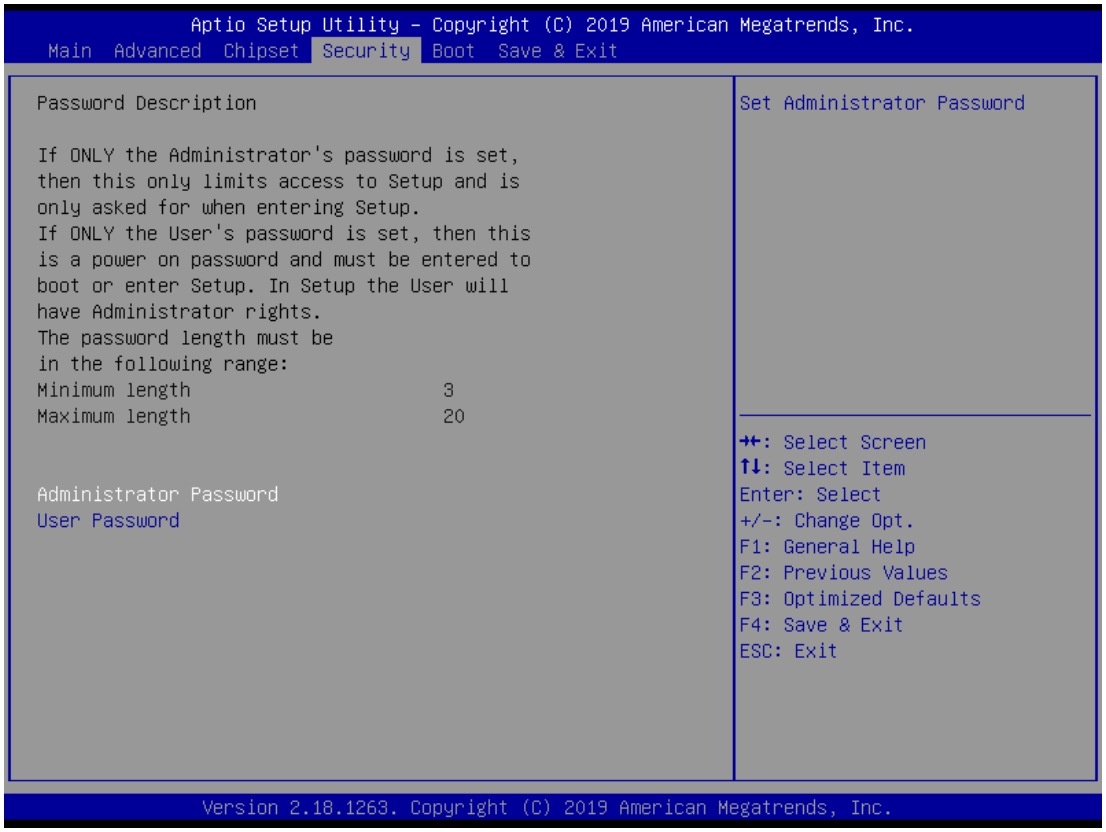
USB Configuration



Feature	Options	Description
USB 2.0(EHCI) Support	Enabled Disabled	Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled
USB Port 0	Enabled Disabled	Enable / Disable USB Port 0
USB Port 1	Enabled Disabled	Enable / Disable USB Port 1
USB Port 2	Enabled Disabled	Enable / Disable USB Port 2
USB Port 3	Enabled Disabled	Enable / Disable USB Port 3

Security

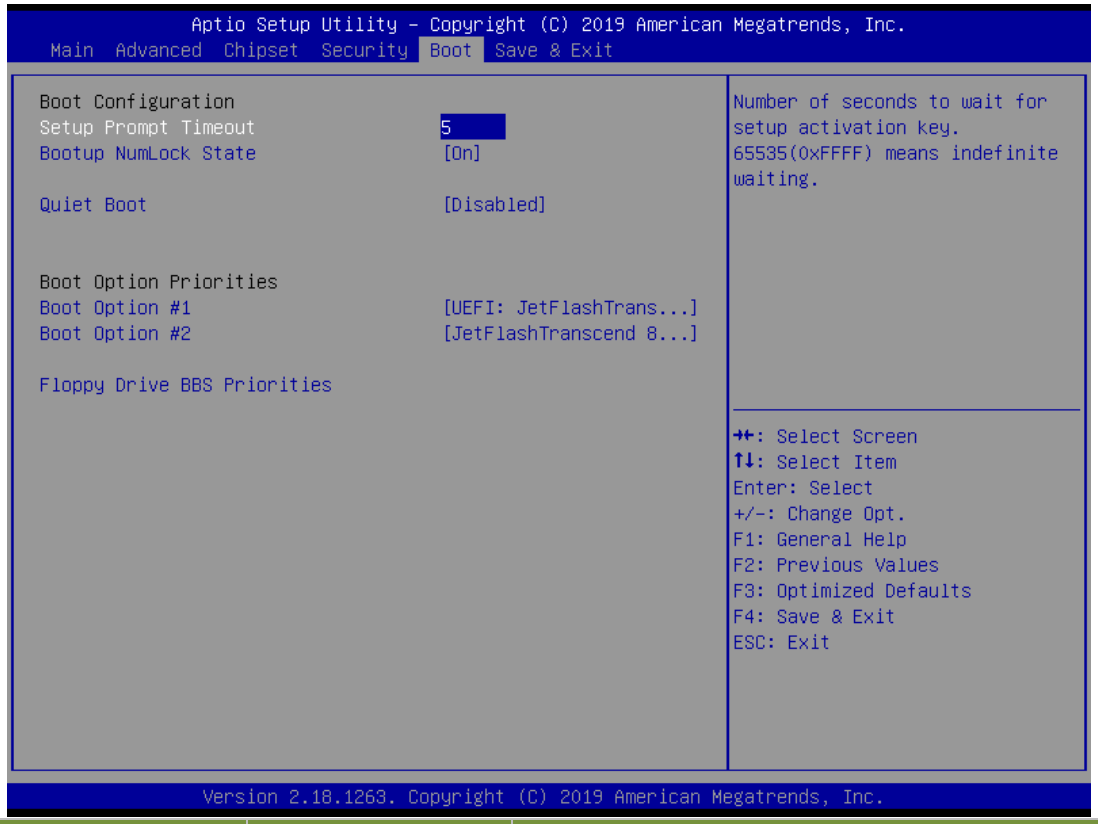
Select the Security menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.



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

Boot Menu

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

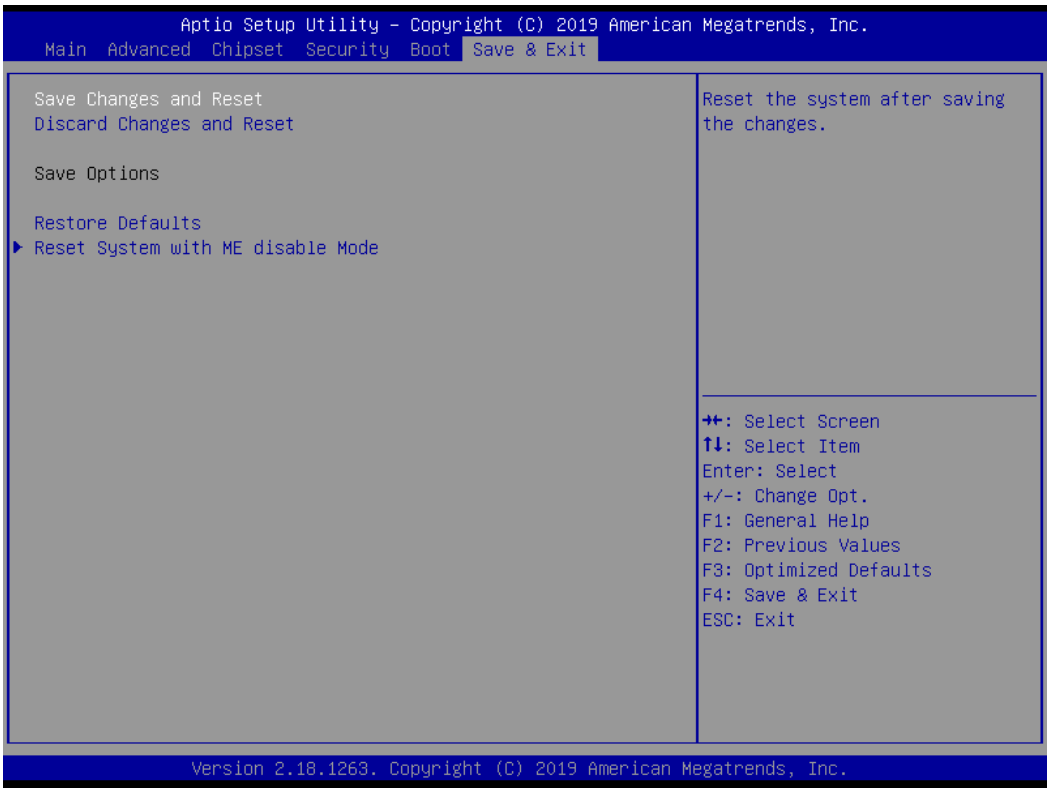


Feature	Options	Description
Setup Prompt Timeout	5	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or Disables Quiet Boot option

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

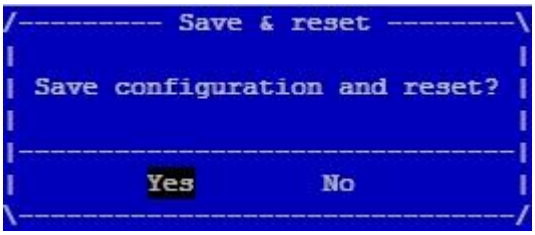
Save and Exit Menu

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.



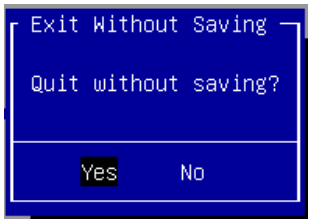
■ Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and reset 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 Reset**" option is selected. Select "**Yes**" to Save Changes and reset.



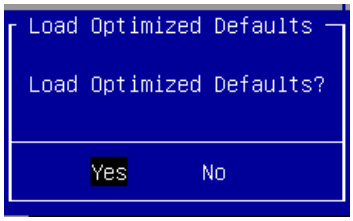
■ Discard Changes and Exit

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.



■ Reset System with ME disable Mode

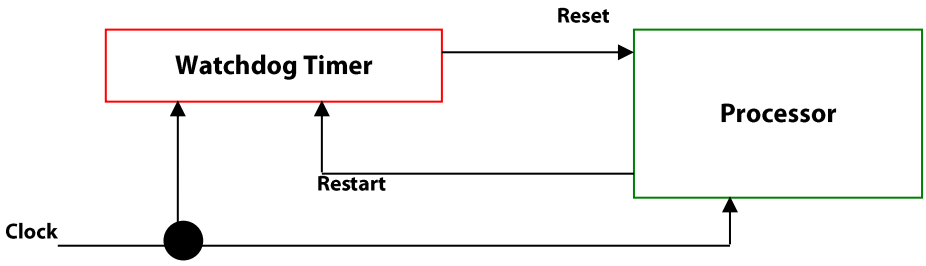
ME will runs into the temporary disable mode, Ignore if ME Ignition FW

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

APPENDIX A: WATCHDOG TIMER

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

To download sample watchdog code, please refer to our official website at www.lannerinc.com.



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