



®

AXIOMTEK

eBOX100-51R-FL Series

Embedded System

User's Manual



Disclaimers

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Safety Precautions

Before getting started, please read the following important safety precautions.

1. The eBOX100-51R-FL does not come with an operating system which must be loaded first before installation of any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing any internal components. Use a wrist grounding strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the eBOX100-51R-FL prior to making any installation. Be sure both the system and all external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the eBOX100-51R-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting it to any power outlet.
5. Turn Off system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave equipment in an uncontrolled environment where the storage temperature is below -40°C or above 80°C as it may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
 - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help discharge any static electricity on human body.
 - When handling boards and components, wear a wrist grounding strap available from most electronic component stores.

Classifications

1. Degree of protection against electric shock: not classified
2. Degree of protection against ingress of water: IP40
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
4. Mode of operation: Continuous

General Cleaning Tips

Please keep the following precautions in mind while understanding the details fully before and during any cleaning of the computer and any components within.

A piece of dry cloth is ideal to clean the device.

1. Be cautious of any tiny removable components when using a vacuum cleaner to absorb dirt on the floor.
2. Turn the system off before clean up the computer or any components within.
3. Avoid dropping any components inside the computer or getting circuit board damp or wet.
4. For cleaning, be cautious of all kinds of cleaning solvents or chemicals which may cause allergy to certain individuals.
5. Keep foods, drinks or cigarettes away from the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning computer and peripherals, users can also use house hold items accordingly for cleaning. Listed below are items available for cleaning computer or computer peripherals.

Pay special attention to components requiring designated products for cleaning as mentioned below.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, it is recommended to use a piece of cloth.
- Water or rubbing alcohol: A piece of cloth may be somewhat moistened with water or rubbing alcohol before being rubbed on the computer. Unknown solvents may be harmful to plastic parts.
- Absorb dust, dirt, hair, cigarette and other particles outside of a computer can be one of the best methods of cleaning a computer. Over time these items may restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are applicable to reach areas in keyboard, mouse and other areas.
- Foam swabs: If possible, it is better to use lint free swabs such as foam swabs.



【Note】 : *It is strongly recommended that customer should shut down the system before start to clean any single components.*

Please follow the steps below:

1. Close all application programs;
2. Close operating software;
3. Turn off power switch;
4. Remove all devices;
5. Pull out power cable.

Scrap Computer Recycling

Please inform the nearest Axiomtek distributor as soon as possible for suitable solutions in case computers require maintenance or repair; or for recycling in case computers are out of order.

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SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the eBOX100-51R-FL. Section 1 consists of the following sub-sections:

- General Descriptions
- System Specifications
- Dimensions
- I/O Outlets
- Packing List
- Model List

1.1 General Descriptions

A fan-less embedded system with Intel® Core™ i5-7300U & Intel® Celeron® 3965U processors (formally codename: Kaby Lake) with compact size design. To fulfill smart retails, smart cities and factory automation application needs, the high-end embedded system supports Windows® 10 IoT and it can be wall-mounted, Din-rail mounted and VESA mounted by optional requests.

The eBOX100-51R-FL comes with ultra-slim size, high performance and fundamental features. Equipped with Intel® Core™ i5-7300U & Intel® Celeron® 3965U processors, the eBOX100-51R-FL is offering 12 voltage DC power input and two antenna connectors for WIFI. Besides, the platform is compatible with Microsoft Azure certified and supports full feature I/O to connect other devices such as RFID/Sensor or display, the total solution can help users rapidly implement IoT applications and maximize performance.

Features

- Intel® Core™ i5-7300U 2.6 GHz /Intel® Celeron® 3965U 2.2 GHz
- One DisplayPort to support 4K resolution
- Intel® AMT 11 supported
- M.2 Key E 2230 for Wi-Fi
- M.2 Key B 2242 for storage
- Ultra-compact size with high performance
- Multiple mounting designs: Wall mount, Din-rail and VESA mount

Reliable and Stable Design

The embedded system equipped with Intel® Core™ i5-7300U or Intel® Celeron® 3965U, ultra-slim size and basic functions. And it also support different mounting such as wall mount, vertical din rail and VESA mount. It is the best solution for smart retails, light industries and factory automation.

Flexible Connectivity

It comes with basic interfaces including two RS-232/422/485 ports, two USB 3.0 ports, two USB 2.0 ports, one DisplayPort and two GbE LAN ports.

Embedded O.S. Supported

The eBOX100-51R-FL supports Windows® 10 IoT and Linux.

Easy maintain storage Supported

In terms of storage, the eBOX100-51R-FL supports M.2 key B for storage.

1.2 System Specifications

1.2.1 CPU

- **CPU**
 - Intel® Core™ i5-7300U 2.6 GHz, Dual-core, 3M Cache
 - Intel® Celeron® 3965U 2.2 GHz, Dual-core, 2M Cache
- **Chipset**
 - SoC integrated
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
 - One 260-pin DDR4-2133 SO-DIMM socket, up to 16 GB at the maximum.

1.2.2 I/O System

- **DisplayPort**
 - 1 x DisplayPort++, DisplayPort 1.2 to support 4096x2160 @ 60Hz
- **Ethernet**
 - 2 x 10/100/1000 Ethernet ports (i211AT,i219LM)
 - Intel® i219LM supports 1000/100/10Mbps Gigabit/Fast Ethernet with Wake on-LAN and PXE Boot ROM.
 - Intel® i211AT supports 1000/100/10Mbps Gigabit/Fast Ethernet with Wake on-LAN and PXE Boot ROM.
- **USB Ports**
 - 2 x USB 2.0
 - 2 x USB 3.0
- **Serial Ports**
 - 2 x RS-232/422/485 (9-pin D-Sub male connector)
- **Expansion Interface**
 - 1 x M.2 Key E 2230, support PCIe x1 and USB 2.0
- **Storage**
 - 1 x M.2 Key B 2242, support SATA3
- **Indicator**
 - 1 x Green LED as indicator for PWR status
 - 1 x Orange LED as indicator for HDD active
- **Switch**
 - 1 x ATX PWR switch
 - 1 x ATX/AT Quick switch
- **Antenna**
 - 2 x SMA type connector openings for antenna

1.2.3 System Specifications

- **Watchdog Timer**
 - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
 - 12VDC
 - Optional 12V/60W AC to DC adapter
- **Operation Temperature**
 - -10°C to +50°C (+14°F to +122°F) , with W.T. SSD & Memory
- **Humidity**
 - 10% ~ 95% (non-condensation)
- **Vibration Endurance**
 - IEC 60068-2-27 (with SSD: 50G, half sine, 11 ms duration)
- **Shock Endurance**
 - IEC 60068-2-64 (with SSD: 3Grms STD, random, 5 to 500 Hz, 1 hr/axis)
- **Weight**
 - 0.65 kg (1.43 lb) without package
 - 1.10 kg (2.42 lb) with package
- **Dimension**
 - 146 mm (5.78") x 106mm (4.17") x 55 mm (2.16")

1.2.4 Driver Contents

Please download system drivers and user's manual from AXIOMTEK website.

- Chipset
- Graphic
- Ethernet
- Intel® ME
- User Manual
- Quick Manual

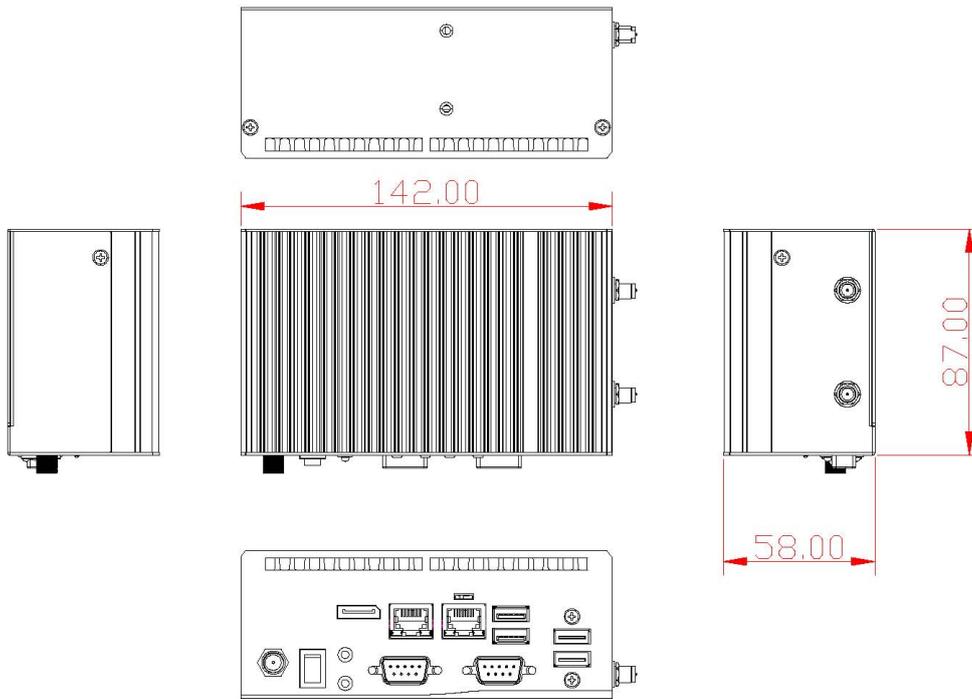


【Note】 : *All specifications and images are subject to change without notice.*

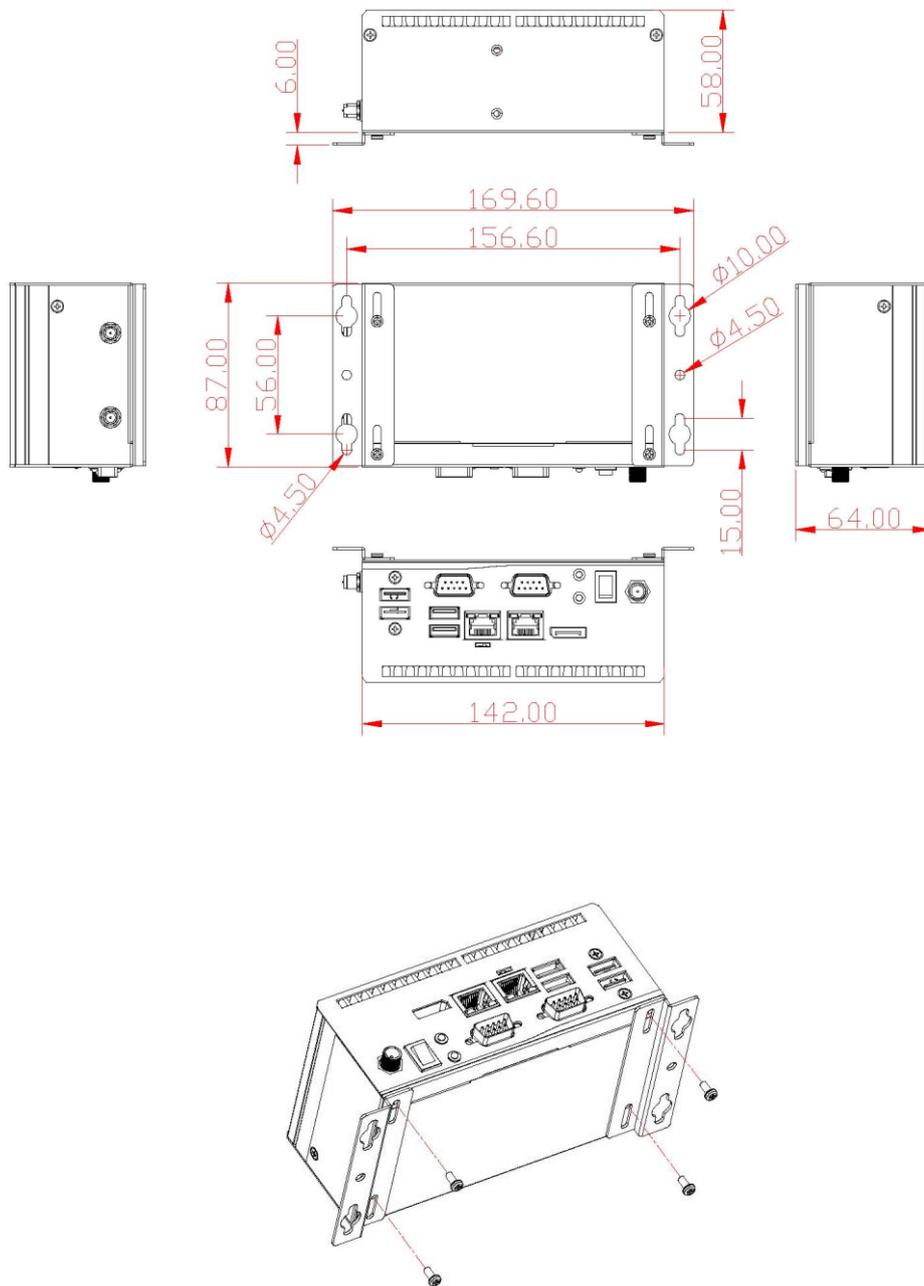
1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX100-51R-FL.

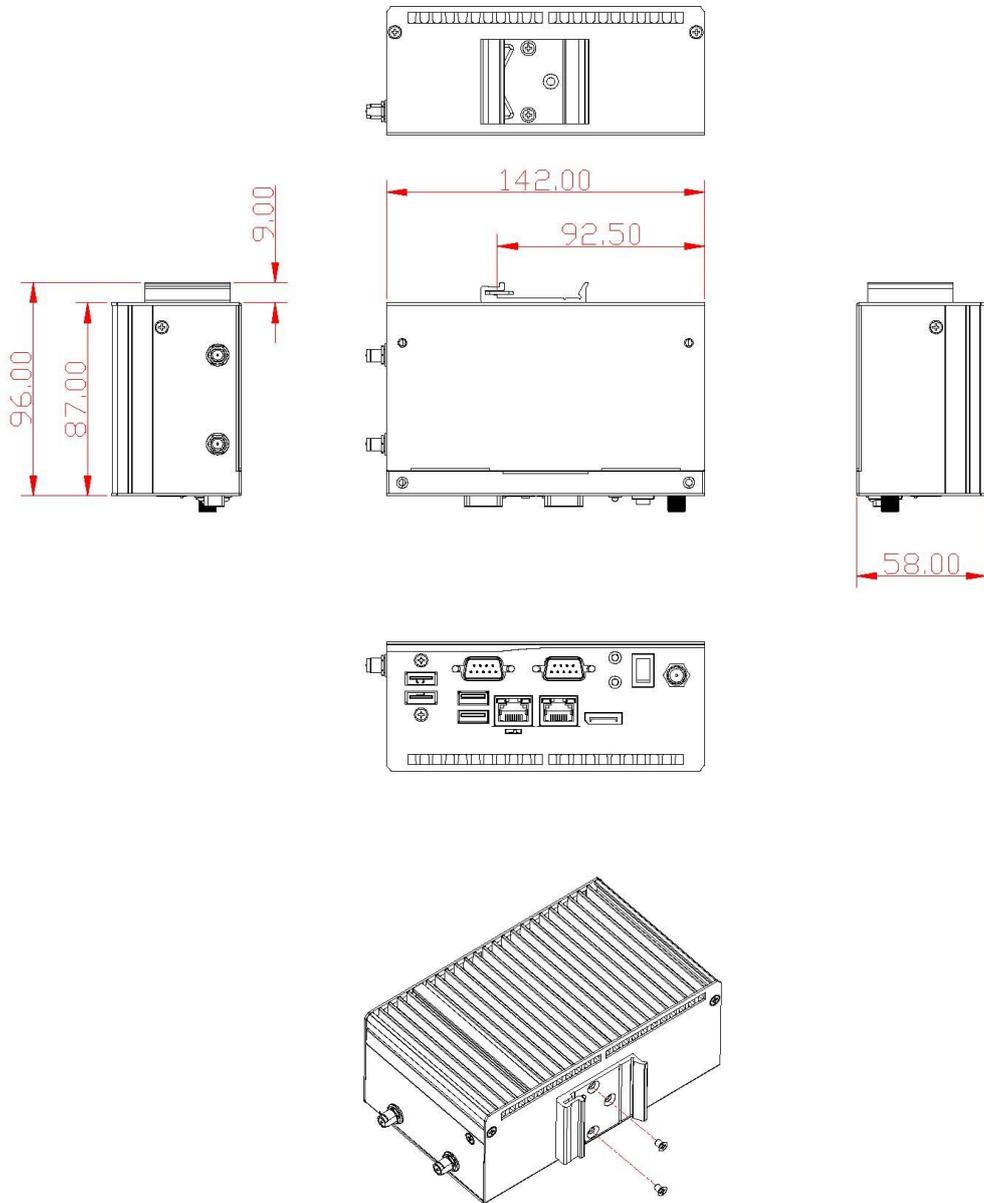
1.3.1 System Dimensions



1.3.2 Wall-mount Bracket Dimensions

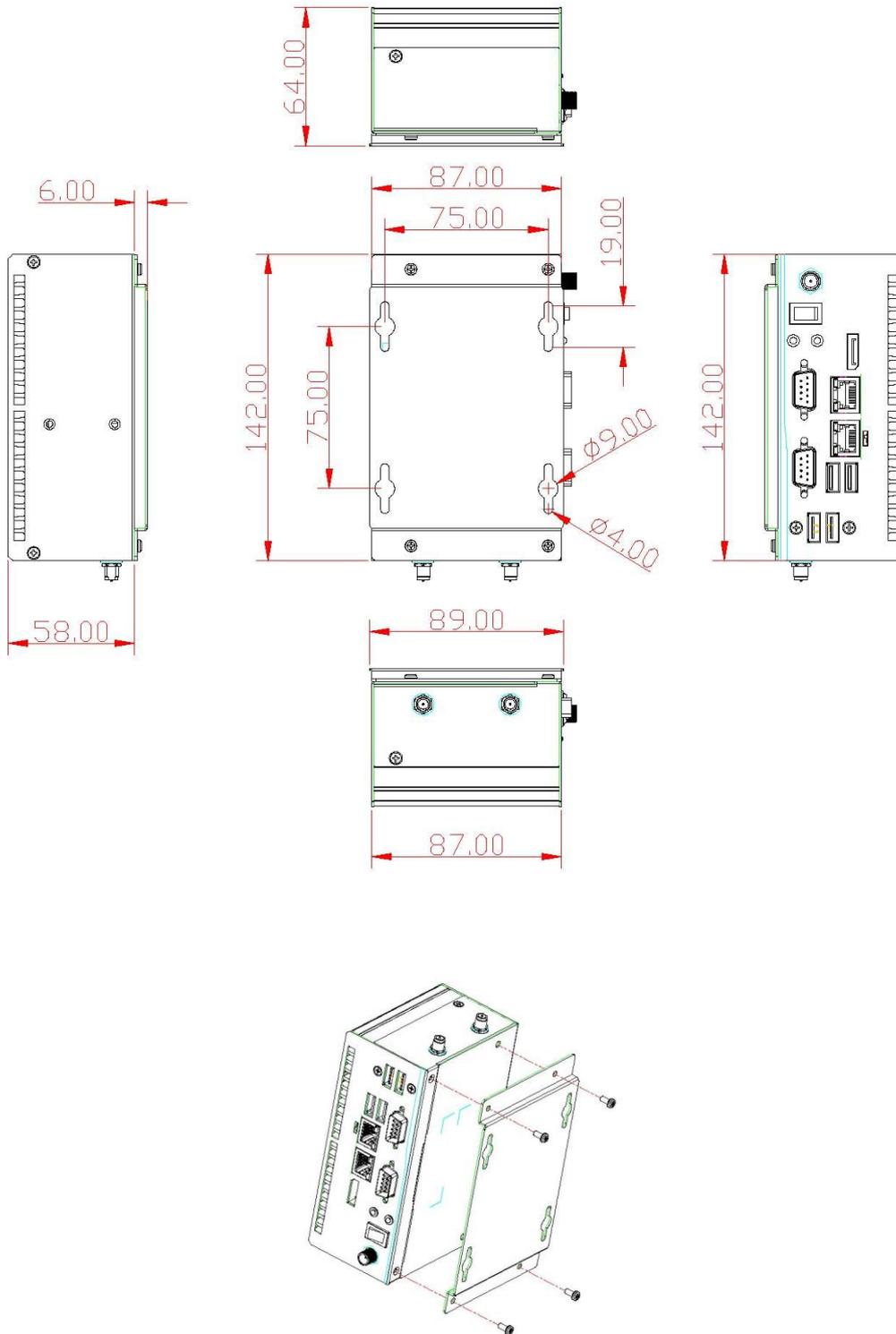


1.3.3 Din-Rail kit Dimensions



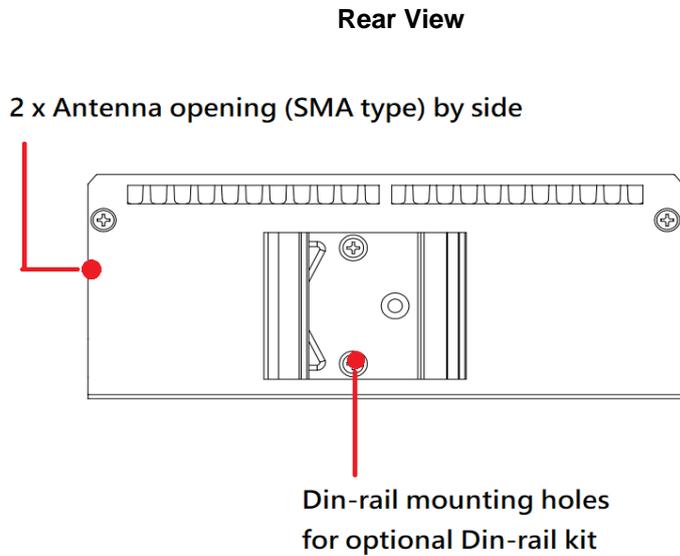
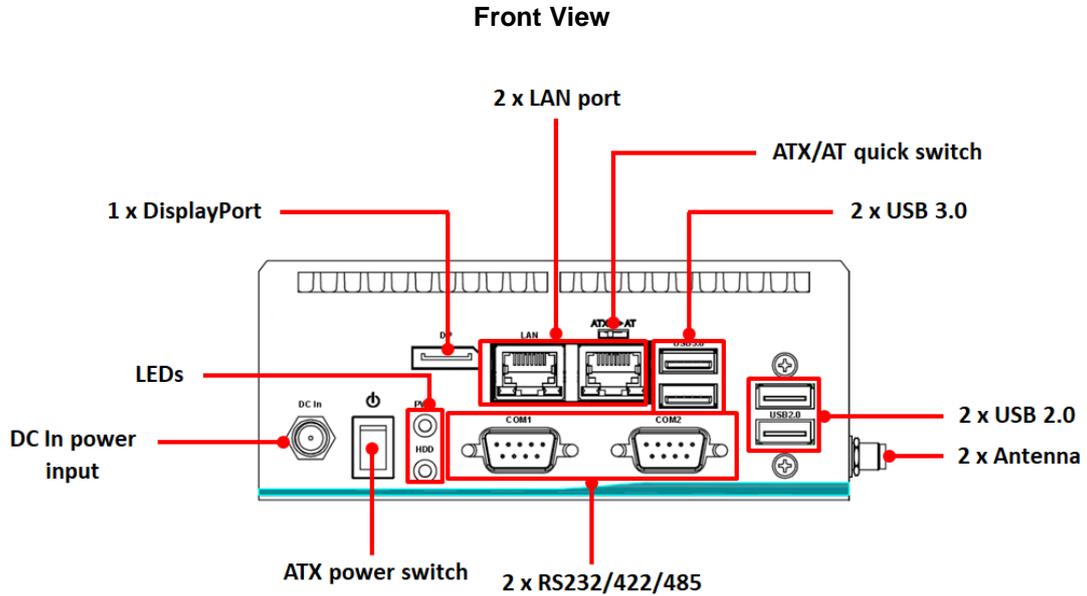
1.3.4 VESA Mount Dimensions

[Note] : Please notice that eBOX100-51R only support vertical VESA mounting.



1.4 I/O Outlets

The following figures show I/O outlets on the eBOX100-51R-FL.



1.5 Packing List

The eBOX100-51R-FL comes with the following bundle package:

- eBOX100-51R-FL System Unit x 1
- Foot Pad x 4
- Screw Pack x 1
- Optional DDR4 SO-DIMM Memory
- Optional Wall-mount kit
- Optional VESA / DIN-Rail kit
- Optional WiFi Kit
- Optional M.2 Storage device
- Optional M.2 Wireless module
- Optional Screw Type AC/DC 60W (12V/5A) Adaptor
- Optional Power cord

Note : Please download Quick Installation Guide & User's manual from the web site.

1.6 Model List

eBOX100-51R-DC-7300U	Fanless ultra compact embedded system with Intel® Core™ i5-7300U, DisplayPort++, 2 GbE LANs, 2 COM and 4 USB (w/o adapter & power cord)
eBOX100-51R-DC-3965U	Fanless ultra compact embedded system with Intel Celeron® 3965U, DisplayPort++, 2 GbE LANs, 2 COM and 4 USB (w/o adapter & power cord)

Please contact Axiomtek's distributors immediately in case any abovementioned items are missing.

SECTION 2 HARDWARE INSTALLATION

The eBOX100-51R-FL is convenient for various hardware configurations, such as DRAM, M.2. Section 2 contain guidelines for hardware installation.

2.1 Installation of M.2 Storage Device

The eBOX100-51R supports one M.2 2242 key B for M.2 SSD storage (SATA interface)

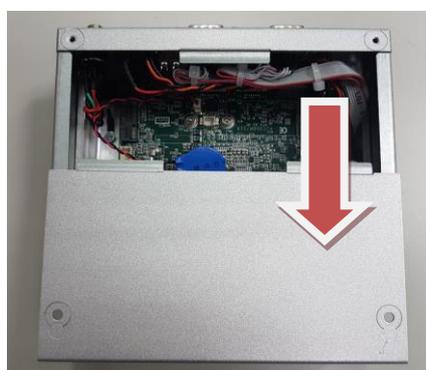
Note: Please remove the DRAM before install the M.2 module if the system has installed the DRAM already.

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system to the backside and then loosen two screws.



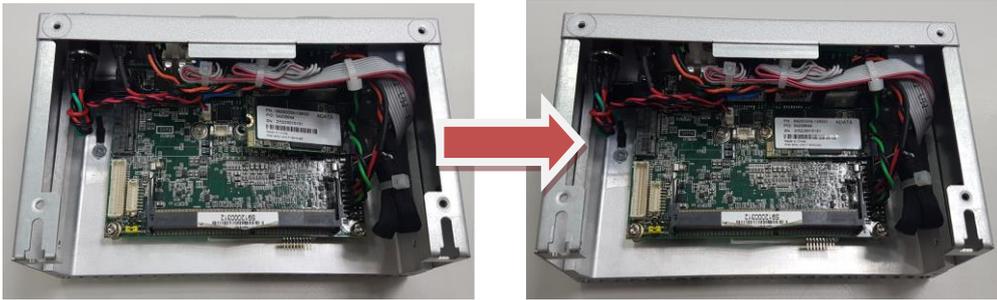
Step 3 Slide away the bottom cover.



Step 4 Locate M.2 2242 key B connector within the red line as marked.



Step 5 Insert the M.2 SSD module firmly and secure the screw.



Step 6 Put the bottom cover back and fasten all of screws to complete installation.

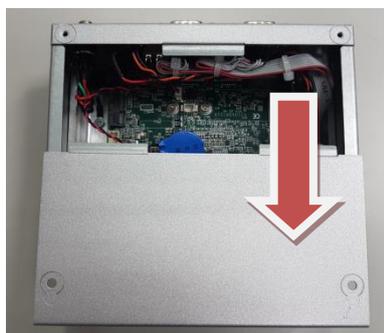
2.2 Installation of M.2 Wireless Module

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system to the backside and then loosen two screws.



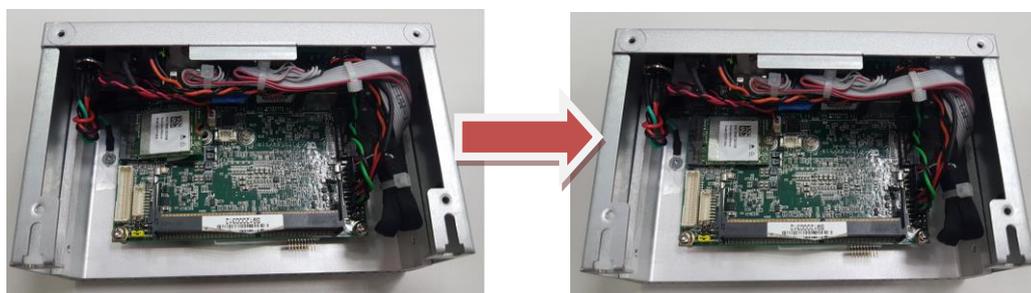
Step 3 Slide away the bottom cover.



Step 4 Locate M.2 2230 key E connector within the red line as marked.



Step 5 Insert the M.2 WiFi module firmly and fasten the screw.



Step 6 Put the bottom cover back and fasten all of screws.

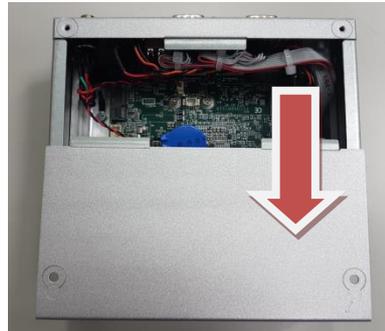
2.3 Installation of DRAM Module

Step 1 Turn off the system and unplug the power cord.

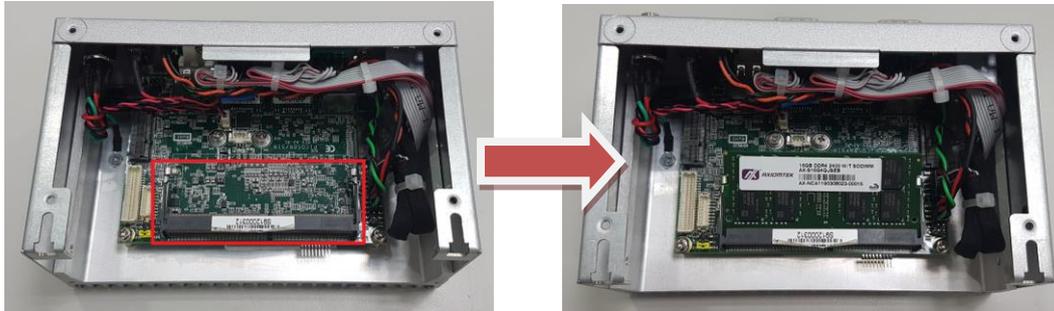
Step 2 Turn the system to the backside and then loosen two screws.



Step 3 Slide away the bottom cover.



Step 4 Locate the memory module, insert a gold colored contact into the socket and push the module two end latches till locked.

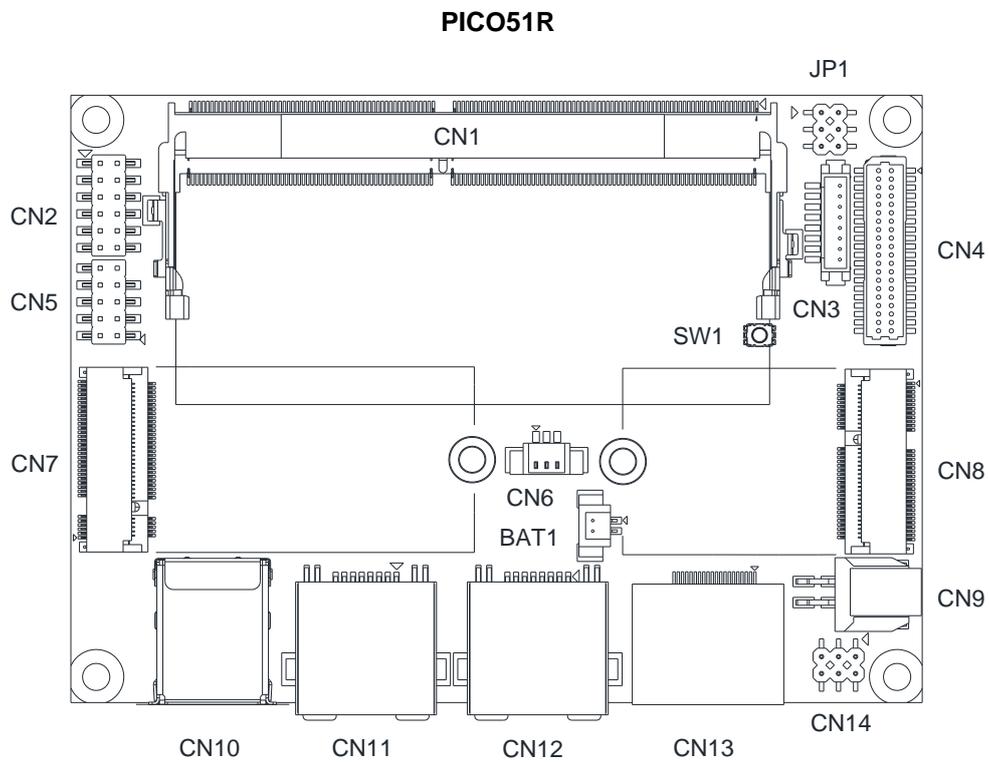


Step 5 Put the bottom cover back and fasten all of screws.

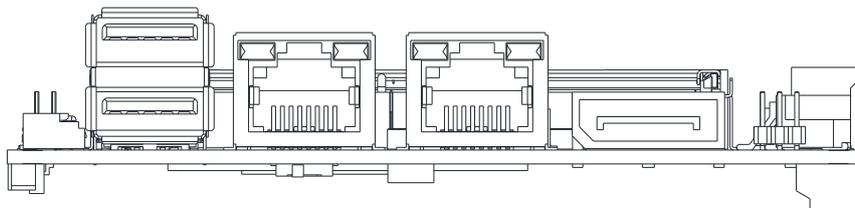
SECTION 3 JUMPER & CONNECTOR SETTINGS

Proper jumper settings configure the eBOX100-51R-FL to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

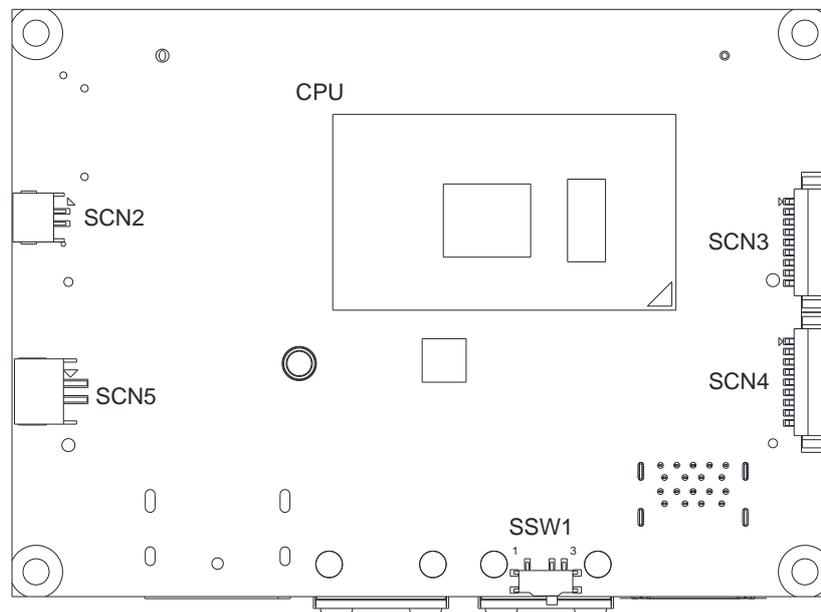
3.1 Locations of Jumpers & Connectors



Top View



Side View



Bottom side



【Note】 : *It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs. Any modifications without instructions might cause system failure.*

3.2 Summary of Jumper Settings

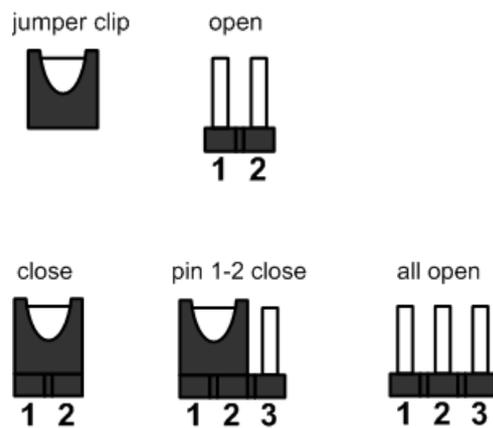
Proper jumper settings configure the eBOX100-51R-FL to meet various application purposes. A table of all jumpers and their default settings is listed below.

Jumper and Switch	Descriptions	Settings
SW1	Restore BIOS Optimal Defaults Default: Normal Operation	Release
SSW1	Auto Power On Default: Enable	2-3 Close



【Note】 : How to setup Jumpers

That a cap on a jumper is to “close” the jumper, whereas that offs a jumper is to “open” the jumper.

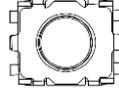


【Note】 : Once the default jumper or switch setting needs to be changed, please do it under power-off condition.

3.2.1 Restore BIOS Optimal Defaults (SW1)

Use SW1 to clear CMOS. Press the tact switch for at least 3 second to restore BIOS optimal defaults.

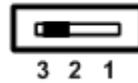
Functions	Settings
Normal (Default)	Release
Restore BIOS optimal defaults	Press



3.2.2 Auto Power On (SSW1)

If SSW1 (AT/ATX Switch) is enabled for power input, the system will be automatically power on without pressing soft power button. If SSW1 is disabled for power input, it is necessary to manually press soft power button to power on the system.

Functions	Settings
Disable auto power on	1-2 close
Enable auto power on (Default)	2-3 close



3.3 Connectors

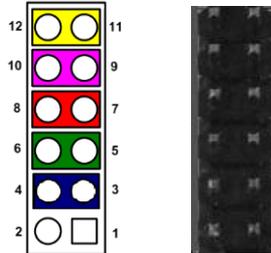
Please refer to pin assignments below:

Section	Connectors	Descriptions
3.3.1	CN2	Front Panel Connector
3.3.2	CN5	USB 2.0 Port 3 and 4
3.3.3	CN6	SMBus Connector
3.3.4	CN7	M.2 2242 Key B Connector
3.3.5	CN8	M.2 2230 Key E Connector
3.3.6	CN10	USB 3.0 Port 1 and 2
3.3.7	CN11, CN12	Ethernet Ports
3.3.8	CN13	DisplayPort Connector
3.3.9	CN14	Digital I/O Connector
3.3.10	BAT1	CMOS Battery Connector
3.3.11	SCN3, SCN4	COM1 and COM2 Connectors
3.3.12	Power and HDD LED Indicator	
3.3.13	System Power Switch	
3.3.14	AC to DC Jack Power In Connector	

3.3.1 Front Panel

This is a 2x6-pin header (pitch=2.0mm) for front panel interface.

Pin	Signal	Pin	Signal
1	EXT SPK+	2	EXT SPK-
3	GND	4	PWR_PSON
5	PWRLED-	6	PWRLED+
7	PWRSW-	8	PWRSW+
9	HW RST-	10	HW RST+
11	HDDLED-	12	HDDLED+



External Speaker

Pin 1(+) and 2(-) connect the case-mounted speaker unit or internal buzzer cable. It is strongly recommended to connect with the matching cable, 594H3186800E.

Power Status

Pin 4 and pin 3 are for power status button; letting user know the power status of this board.

Power LED

Pin 6 connects anode (+) of LED and pin 5 connects cathode (-) of LED. The power LED lights up when the system is powered on.

Power On/Off Button

Pin 8 and 7 connect the power button on front panel to CPU board, which allows users to turn on or off power supply.

System Reset Switch

Pin 10 and 9 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

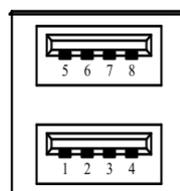
HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 12 and 11 connect the hard disk drive to the front panel HDD LED, pin 11 is assigned as cathode(-) and pin 12 is assigned as anode(+).

3.3.2 USB 2.0 Wafer Connector (CN5)

The Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector is connected via cable from internal USB wafer connector (CN5). This is a 2x5-pin cut pin 9 (pitch=2.0mm) wafer connector, which is compliant with Hirose DF11-10DP-2DSA, for installing versatile USB 2.0 compliant interface peripherals.

Pin	Signal	Pin	Signal
1	+5V_SBY	2	+5V_SBY
3	USB #3_D-	4	USB #4_D-
5	USB #3_D+	6	USB #4_D+
7	GND	8	GND



3.3.3 SMBus Connector (CN6)

This is a 3-pin (pitch=1.25mm) connector for SMBus interface which is compatible with I²C.

Pin	Signal
1	CLK_SBY
2	DAT_SBY
3	GND

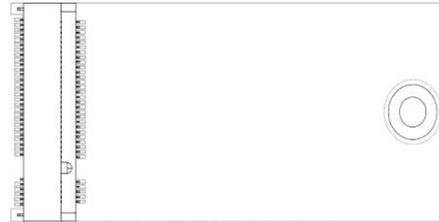


3.3.4 M.2 2242 Key B Connector (CN7)

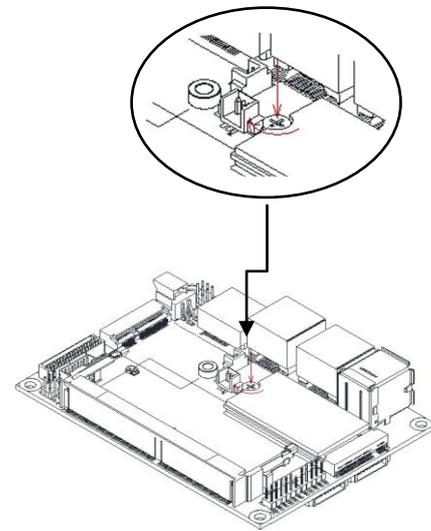
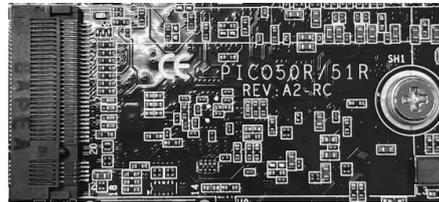
The CN7 is a M.2 Key B connector. It is suggested to install the M.2 storage module via SATA (Default) or PCIe x2 for NVMe (BOM Optional) with 22mm x 42mm (width x length).

Pin	Signal	Pin	Signal
1	CONFIG_3	2	+3.3V_SBY
3	GND	4	+3.3V_SBY
5	GND	6	Full Card PWR OFF
7	USB_DP6	8	W_DISABLE#
9	USB_DN6	10	NC
11	GND	12	KEY B
13	KEY B	14	
15		16	
17		18	
19		20	HDA_BCLK
21	CONFIG_0	22	HDA_SDO
23	GPIO11(+1.8V)	24	HDA_SDIO
25	NC	26	NC
27	GND	28	HDA_SYNC
29	PCI12_RXN/ SATA2_RXN_C	30	SPI_TPM_MISO
31	PCI12_RXP/ SATA2_RXP_C	32	SPI_TPM_CLK
33	GND	34	SPI_TPM_MOSI
35	PCI12_TXN/ SATA2_TXN_C	36	SPI_TPM_CS_N
37	PCI12_TXP/ SATA2_TXP_C	38	NC
39	GND	40	SMBCLK_1P8_SBY
41	SATA3_RXP0 or PCI11_RXN	42	SMBDAT_1P8_SBY
43	SATA3_RXN0 or PCI11_RXP	44	SMBALERT#_1P8_SBY
45	GND	46	NC
47	SATA3_TXN0 or PCI11_TXN	48	NC
49	SATA3_TXP0 or PCI11_TXP	50	PLTRST_2_N (+3.3V Level)
51	GND	52	CLKREQ#_PCIE 3
53	PCI12_CLKN3	54	PCI12_WAKE_N
55	PCI12_CLKP3	56	HDA_RST#
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SPI_TPM_IRQ
67	PLTRST_2_1P8_N	68	SUSCLK (+3.3V Level)
69	CONFIG_1	70	+3.3V_SBY
71	GND	72	+3.3V_SBY
73	GND	74	+3.3V_SBY
75	CONFIG_2		

75 74



1 2



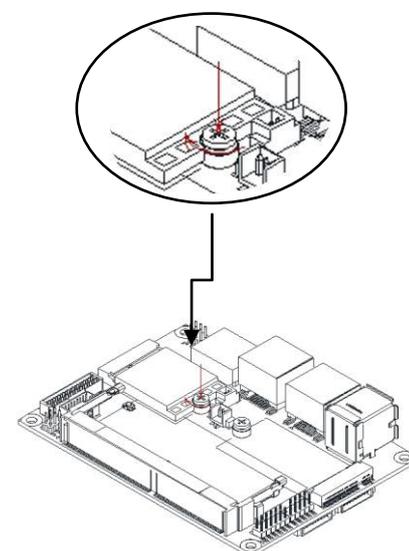
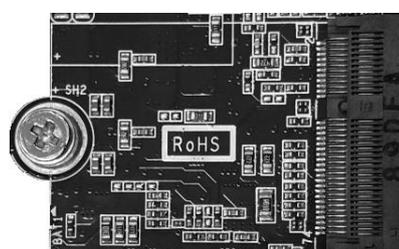
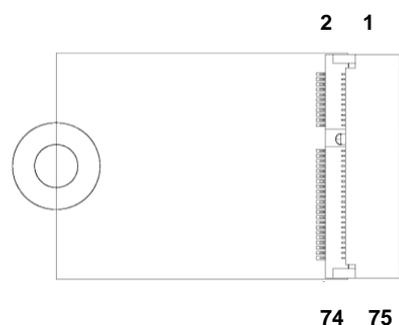
Note

After installing the M.2 Key B card, please follow the red arrow to screw and lock the card. It is suggested to install M.2 Key B card before DDR4

3.3.5 M.2 2230 Key E Connector (CN8)

The CN8 is a M.2 2230 Key E connector. It is suggested to install the M.2 wireless module via PCIe x1 with 22mm x 30mm (width x length).

Pin	Signal	Pin	Signal
1	GND	2	+3.3V_SBY
3	USB2_DP5	4	+3.3V_SBY
5	USB2_DN5	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	GND
19	NC	20	NC
21	NC	22	NC
23	NC	24	Key E
25	Key E	26	
27		28	
29		30	
31		32	
33	GND	34	NC
35	PCIE5_TXP	36	NC
37	PCIE5_TXN	38	NC
39	GND	40	NC
41	PCIE5_RXP	42	NC
43	PCIE5_RXN	44	NC
45	GND	46	NC
47	PCIE_CLKP5	48	NC
49	PCIE_CLKN5	50	SUSCLK (+3.3V Level)
51	GND	52	PLTRST_2_N (+3.3V Level)
53	CLKREQ#_PCI E5	54	W_DIS2# (+3.3V Level)
55	PCIE_WAKE_N	56	W_DI12# (+3.3V Level)
57	GND	58	SMBDAT_3P3_SBY
59	NC	60	SMBCLK_3P3_SBY
61	NC	62	SMBALERT#_3P3_SBY
63	GND	64	NC
65	NC	66	NC
67	NC	68	NC
69	GND	70	NC
71	NC	72	+3.3V_SBY
73	NC	74	+3.3V_SBY
75	GND		



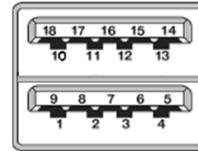
Note

After installing the M.2 Key E card, please follow the red arrow to screw and lock the card. It is suggested to install M.2 Key E card before DDR4 module on SO-DIMM connector (CN1).

3.3.6 USB 3.0 Port (CN10)

The board comes with two Universal Serial Bus (compliant with USB 3.0 (5Gb/s)) type A connectors for installing USB peripherals such as keyboard, mouse, scanner, etc.

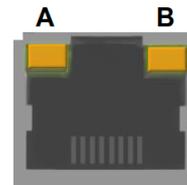
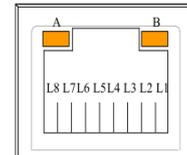
Pin	Signal	Pin	Signal
1	+5V	10	+5V
2	USB_Data1-	11	USB_Data2-
3	USB_Data1+	12	USB_Data2+
4	GND	13	GND
5	SSRX1-	14	SSRX2-
6	SSRX1+	15	SSRX2+
7	GND	16	GND
8	SSTX1-	17	SSTX2-
9	SSTX1+	18	SSTX2+



3.3.7 Ethernet Ports (CN11 and CN12)

The board has two RJ-45 Ethernet connectors, CN12 for LAN1 with Intel® i219LM and CN11 for LAN2 with Intel® i211AT. Ethernet connection can be established by plugging one end of the Ethernet cable into this connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

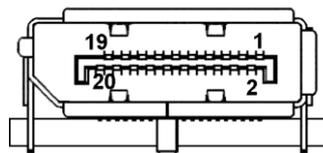
Pins	1000 Base-T	100/10 Base-T	Description
L1	BI_DA+	TX+	Bidirectional or Transmit Data+
L2	BI_DA-	TX-	Bidirectional or Transmit Data-
L3	BI_DB+	RX+	Bidirectional or Receive Data+
L4	BI_DC+	N.C.	Bidirectional or Not Connected
L5	BI_DC-	N.C.	Bidirectional or Not Connected
L6	BI_DB-	RX-	Bidirectional or Receive Data-
L7	BI_DD+	N.C.	Bidirectional or Not Connected
L8	BI_DD-	N.C.	Bidirectional or Not Connected
A	Active Link LED (Orange) Off: No link Blinking: Data activity detected		
B	Speed LED 1000: Orange 100/10: Green/OFF		



3.3.8 DisplayPort Connector (CN13)

The DisplayPort interface is available through connector CN13.

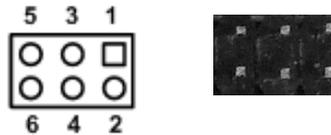
Pins	Signals
1	DPB_LANE0
2	GND
3	DPB_LANE0#
4	DPB_LANE1
5	GND
6	DPB_LANE1#
7	DPB_LANE2
8	GND
9	DPB_LANE2#
10	DPB_LANE3
11	GND
12	DPB_LANE3#
13	Detect Pin
14	GND
15	DPB_AUX
16	GND
17	DPB_AUX#
18	DPB_HPD
19	GND
20	+3.3V



3.3.9 Digital I/O Connector (CN14)

This is a 2x3-pin (pitch=2.0mm) connector. The system default doesn't support DI/DO features, but the main board is reserved with a 4-bit digital I/O that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals.

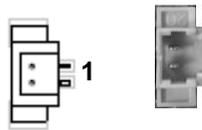
Pin	Signal	Pin	Signal
1	DIO 0	2	DIO 3
3	DIO 1	4	DIO 2
5	+5V	6	GND



3.3.10 CMOS Battery Connector (BAT1)

This is a 2-pin (pitch=1.25mm) wafer connector for CMOS battery interface.

Pin	Signal
1	BAT1(+3V level)
2	GND

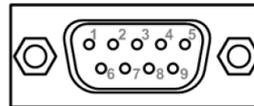


3.3.11 COM Wafer Connectors (SCN3 and SCN4)

The system has two serial ports to support RS-232/422/485 for COM1 and COM2, these two COM ports is connected via 9-pin (pitch=1.25mm) connector which is compliant with Molex 53047-0910. The SCN3 and SCN4 are for COM2 and COM1 interfaces, respectively. For further information please refer to BIOS setting. The pin assignments of RS-232/422/485 are listed in table below.

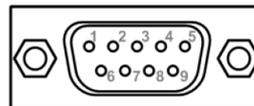
COM1:

Pin	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	No use
4	DTR, Data Terminal Ready	RX-	No use
5	GND, Ground	No use	No use
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use



COM2:

Pin	RS-232	RS-422	RS-485
1	DCD, Data Carrier Detect	TX-	Data-
2	RXD, Receive Data	TX+	Data+
3	TXD, Transmit Data	RX+	No use
4	DTR, Data Terminal Ready	RX-	No use
5	GND, Ground	No use	No use
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use



3.3.12 Power and HDD LED Indicator

The Yellow LED is linked to Hard Disk Drive (HDD) activity signal. LED flashes every time HDD is accessed. The power LED (Green) lights up and will remain steady while the system is powered on.

LED Color	Description
Green	Power on/off
Orange	Hard disk drive activity



3.3.13 System Power Switch

This button is for turning on/off the system power.

Functions	Descriptions
On	Turn on/off system
Off	Keep system status



3.3.14 AC to DC Jack Power In Connector

The system supports a DC12V DC-jack connector for system power input.

Connect it to the power AC-DC 12V/60W adapter (optional)

Pin	Signal
1	+12V
2	GND



SECTION 4

BIOS SETUP UTILITY

This section provides users with detailed descriptions in terms of how to set up basic system configurations through the BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the key immediately.
2. After press the key, the main BIOS setup menu displays. Users can access to other setup screens, such as the Advanced and Chipset menus, from the main BIOS setup menu.

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

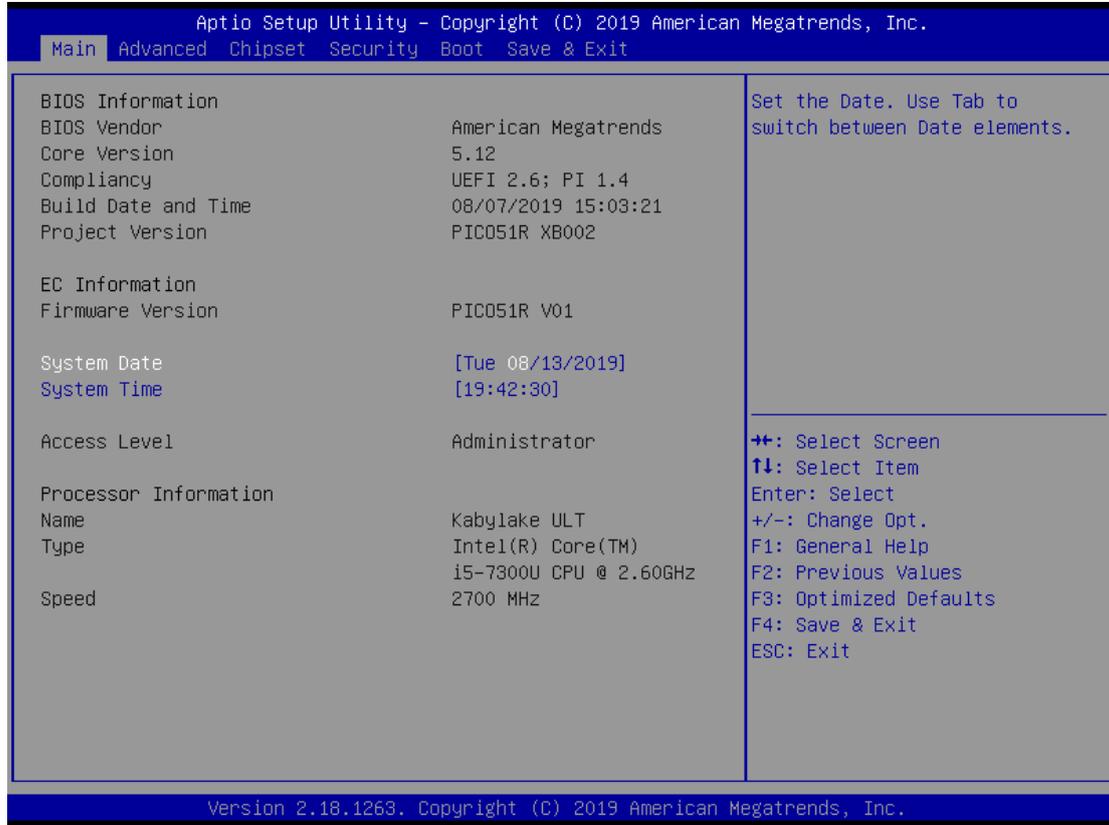


【Note】 : Some of the navigation keys differ from one screen to another.

Hot Keys	Descriptions
→← Left/Right	The Left and Right <Arrow> keys allow users to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow users to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow users to change the field value of a particular setup item.
Tab	The <Tab> key allows users to select setup fields.
F1	The <F1> key allows users to display the General Help screen.
F2	The <F2> key allows users to Load Previous Values.
F3	The <F3> key allows users to Load Optimized Defaults.
F4	The <F4> key allows users to save any changes they made and exit the Setup. Press the <F4> key to save any changes.
Esc	The <Esc> key allows users to discard any changes they made and exit the Setup. Press the <Esc> key to exit the setup without saving any changes.
Enter	The <Enter> key allows users to display or change the setup option listed for a particular setup item. The <Enter> key can also allow users to display the setup sub- screens.

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.



BIOS & EC Information

Display BIOS and EC firmware information.

System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Access Level

Display the access level of current user.

Processor Information

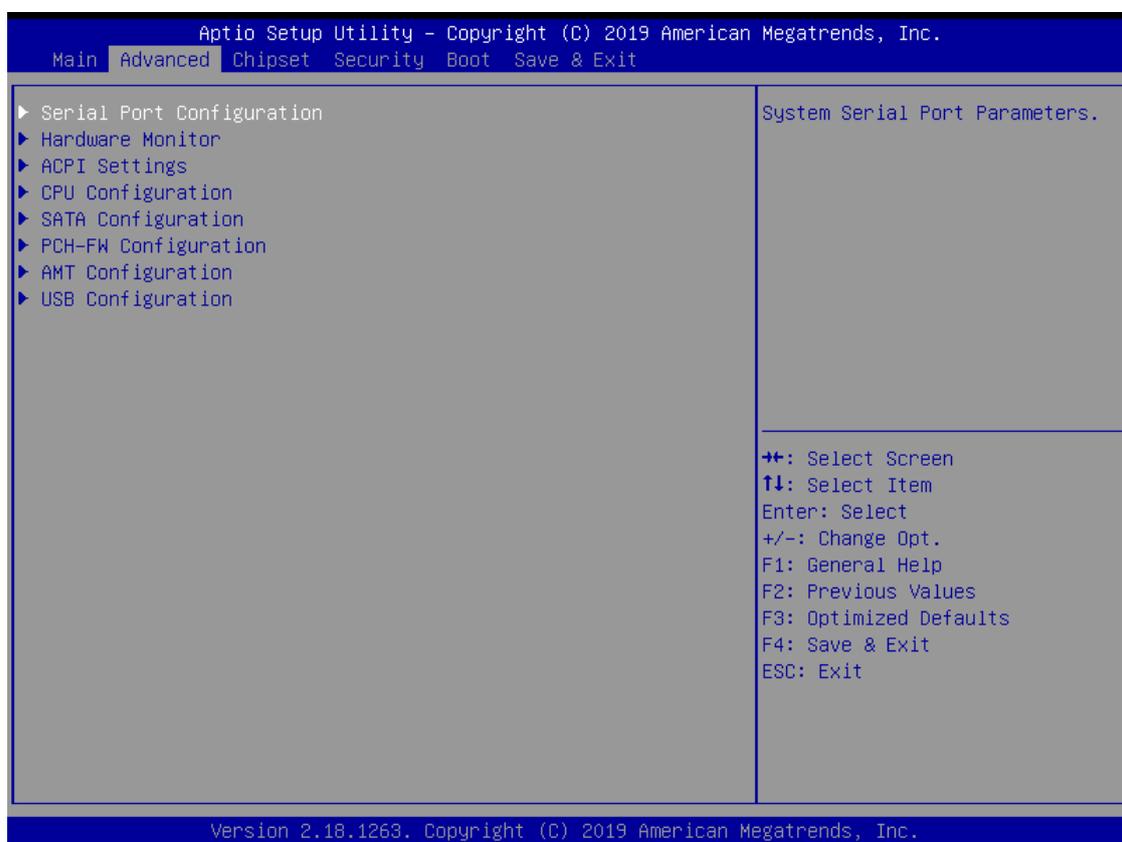
Display processor information.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

- ▶ Serial Port Configuration
- ▶ Hardware Monitor
- ▶ ACPI Settings
- ▶ CPU Configurations
- ▶ SATA Configurations
- ▶ PCH-FW Configurations
- ▶ AMT Configurations
- ▶ USB Configurations

For items marked with “▶”, please press <Enter> for more options.



Serial Port Configurations

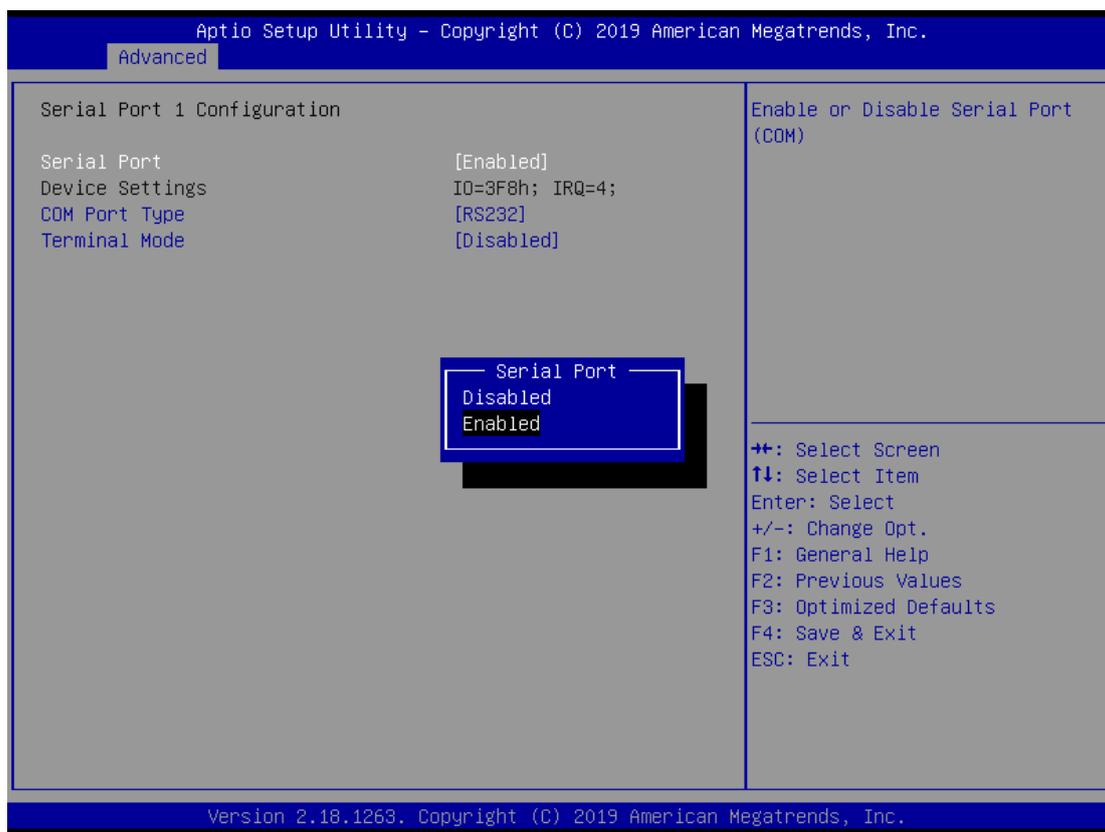
Users can use this screen to select options for the Serial Port Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with “ ”, please press <Enter> for more options.



Serial Port 1~2 Configuration

Use these items to set parameters related to serial port 1~2.

Serial Port 1 Configuration



Serial Port

Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

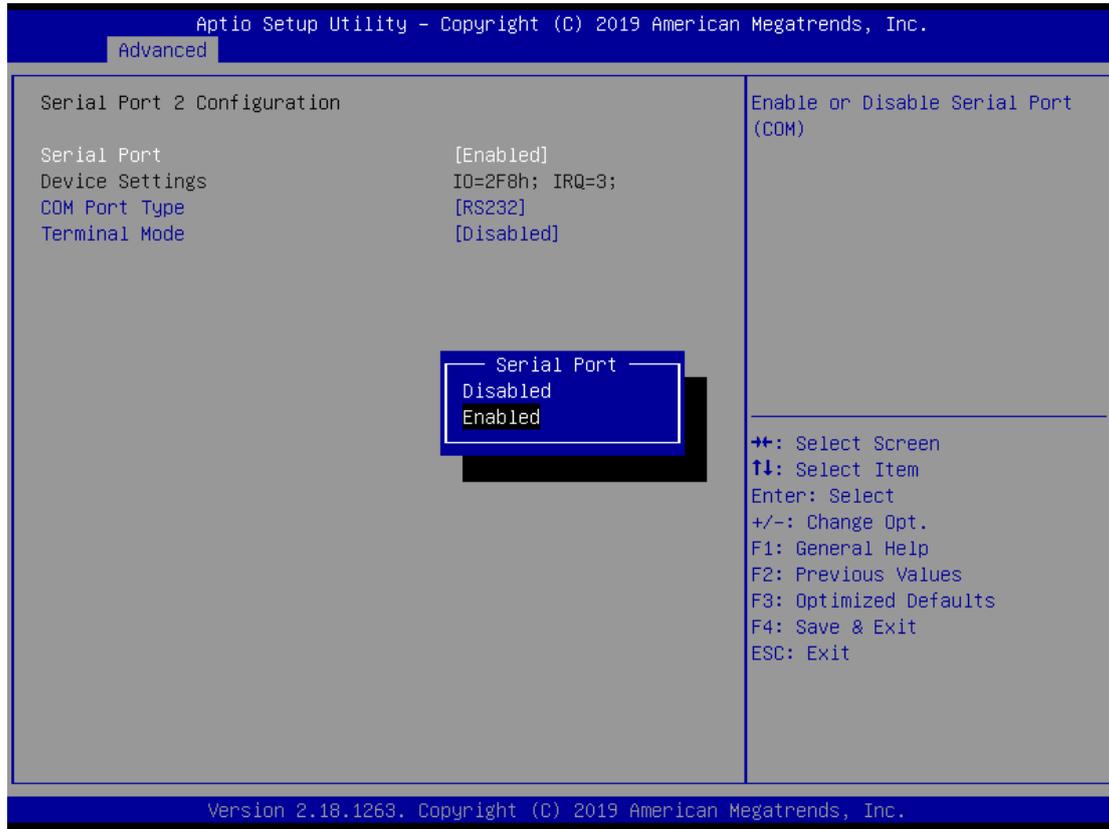
COM Port Type

Use this item to set RS-232/422/485 communication mode.

Terminal Mode

Enable terminal mode to enable the RS-422/485 termination resistor to enhance the signal.

Serial Port 2 Configuration



Serial Port

Enable or disable serial port 2. The optimal setting for base I/O address is 2F8h and for interrupt request address is IRQ3.

COM Port Type

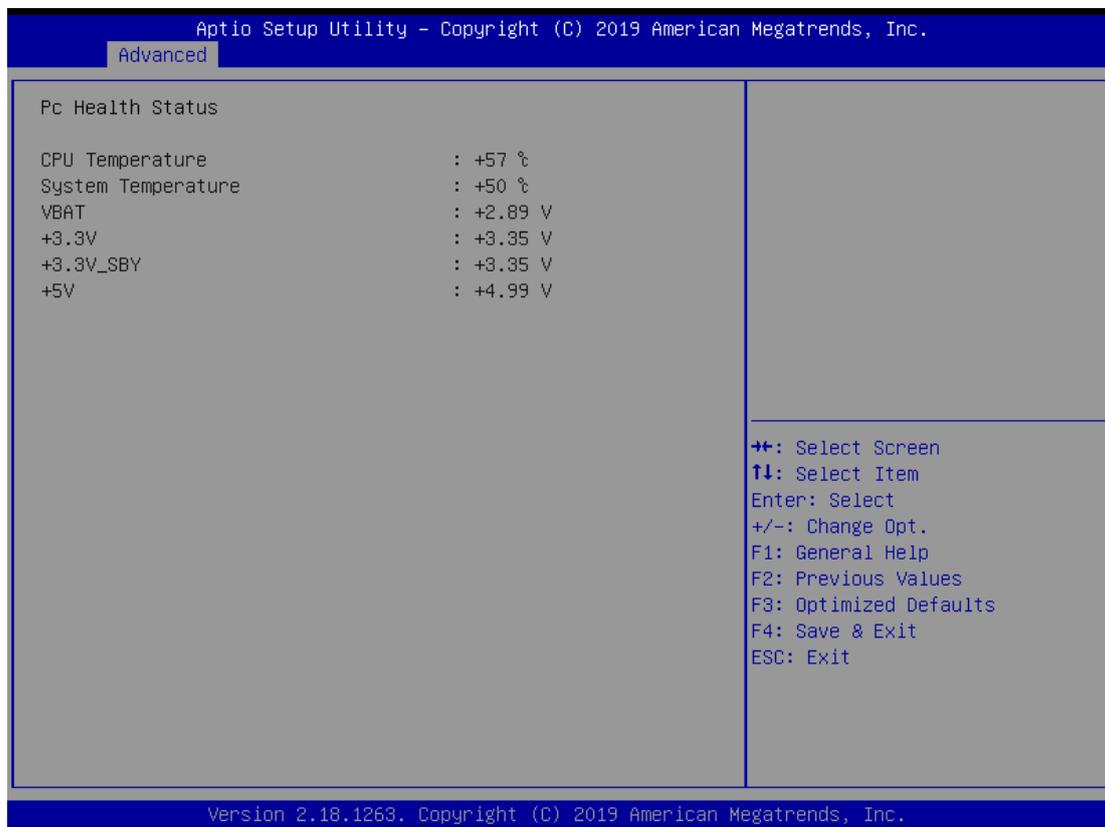
Use this item to set RS-232/422/485 communication mode.

Terminal Mode

Enable terminal mode to enable the RS-422/485 termination resistor to enhance the signal.

Hardware Monitor

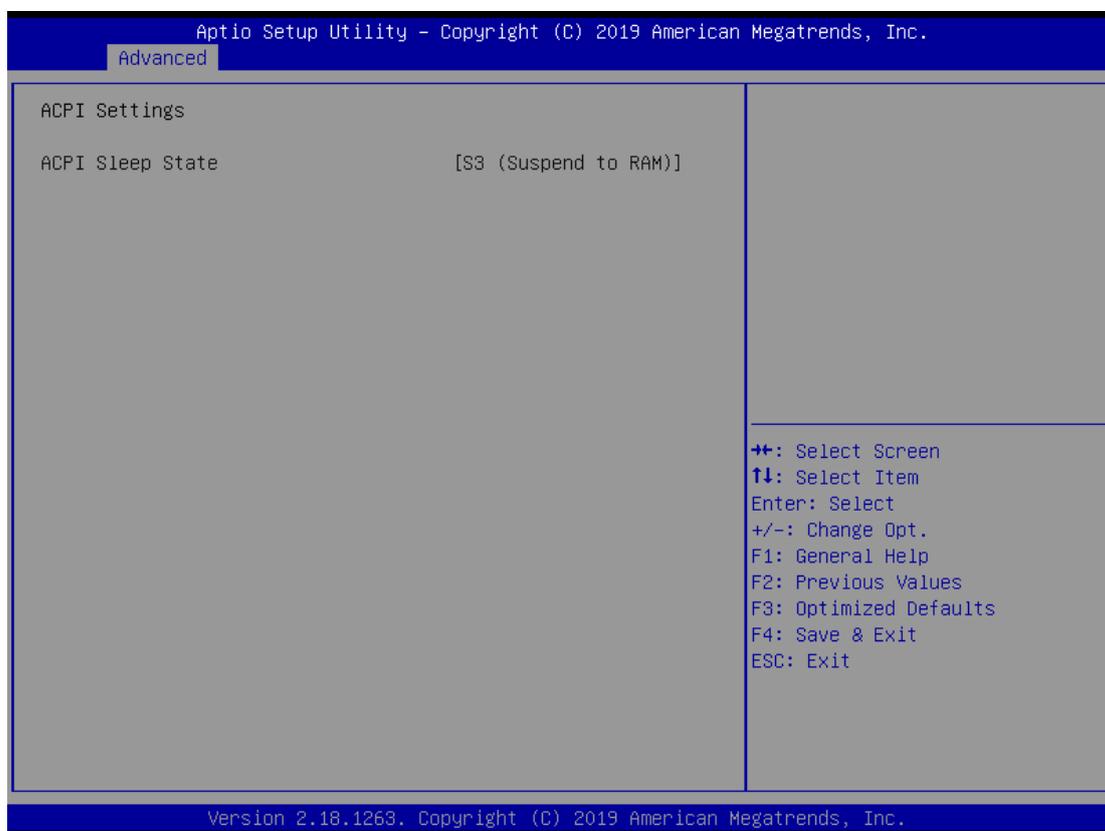
This screen monitors hardware health status.



This screen displays the temperature of system and CPU, system voltages (VBAT, +3.3V, +3.3V standby and +5V).

ACPI Settings

Use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

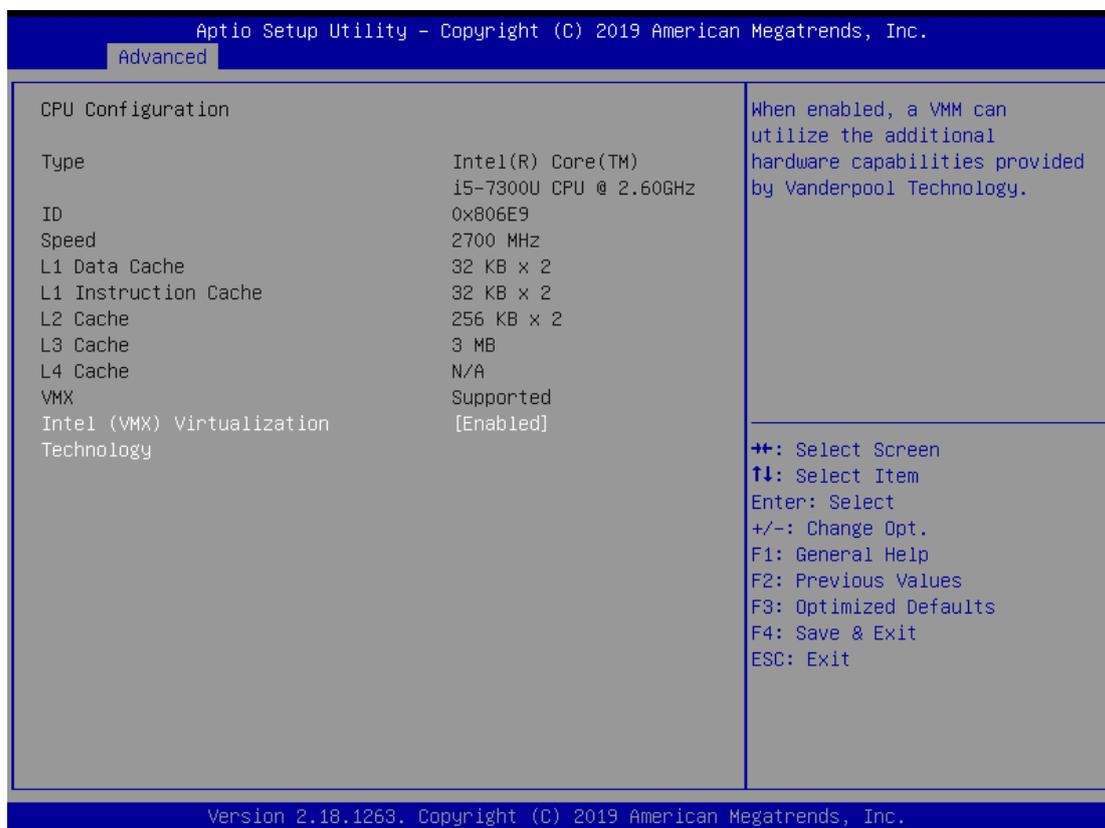


ACPI Sleep State

Select the ACPI (Advanced Configuration and Power Interface) sleep state. The S3 (Suspend to RAM) option selects ACPI sleep state the system will enter when suspend button is pressed.

CPU Configurations

This screen shows the CPU version and its detailed information.



Intel Virtualization Technology

Enable or disable Intel® Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

SATA Configurations

In this Configuration menu, users can see the currently installed hardware in the SATA port. During system boot up, the BIOS automatically detects the presence of SATA device.



SATA Mode Selection

The SATA operation mode is AHCI (Advanced Host Controller Interface).

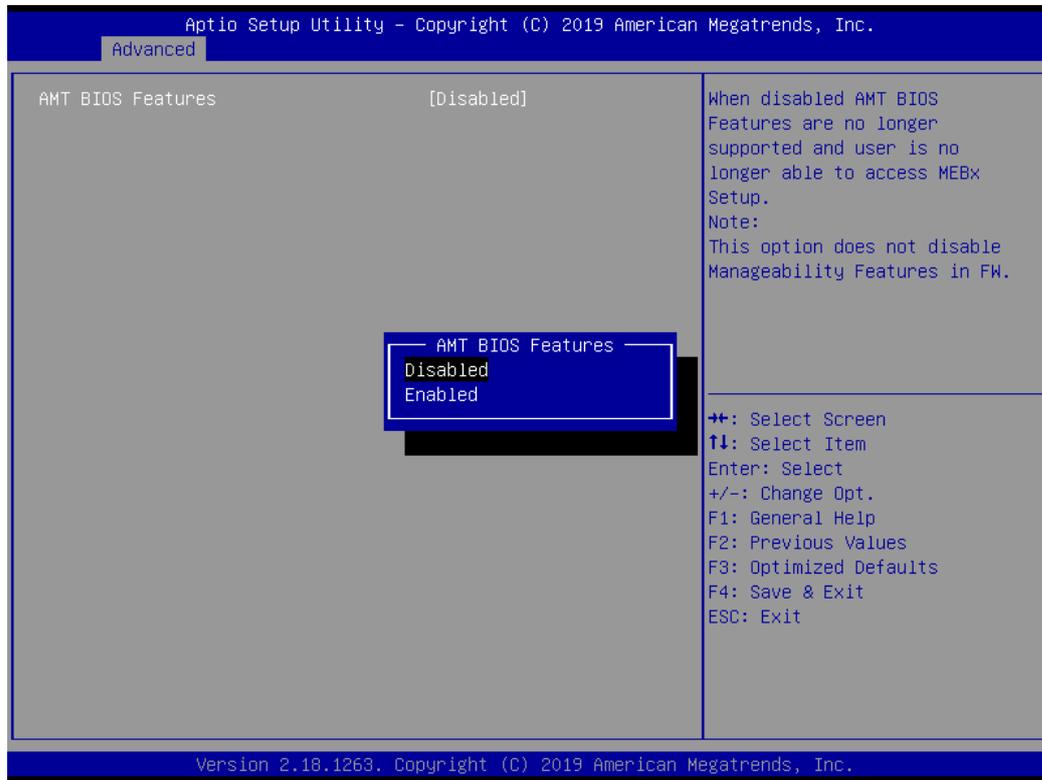
PCH-FW Configurations

This screen displays ME Firmware information.



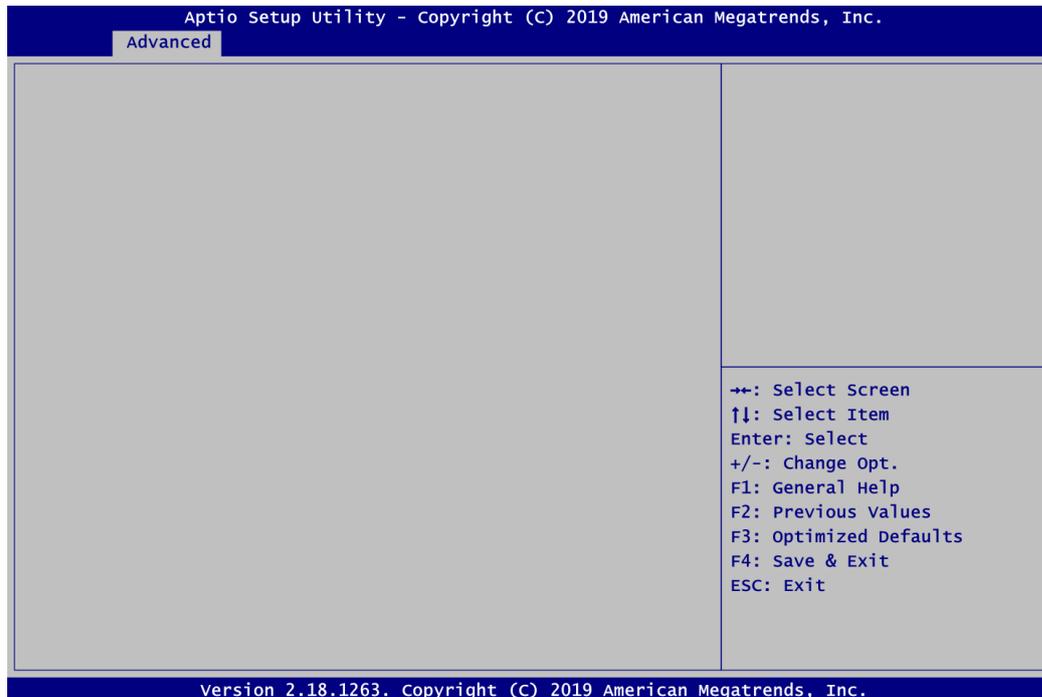
AMT Configurations

Use this screen to configure AMT parameters..



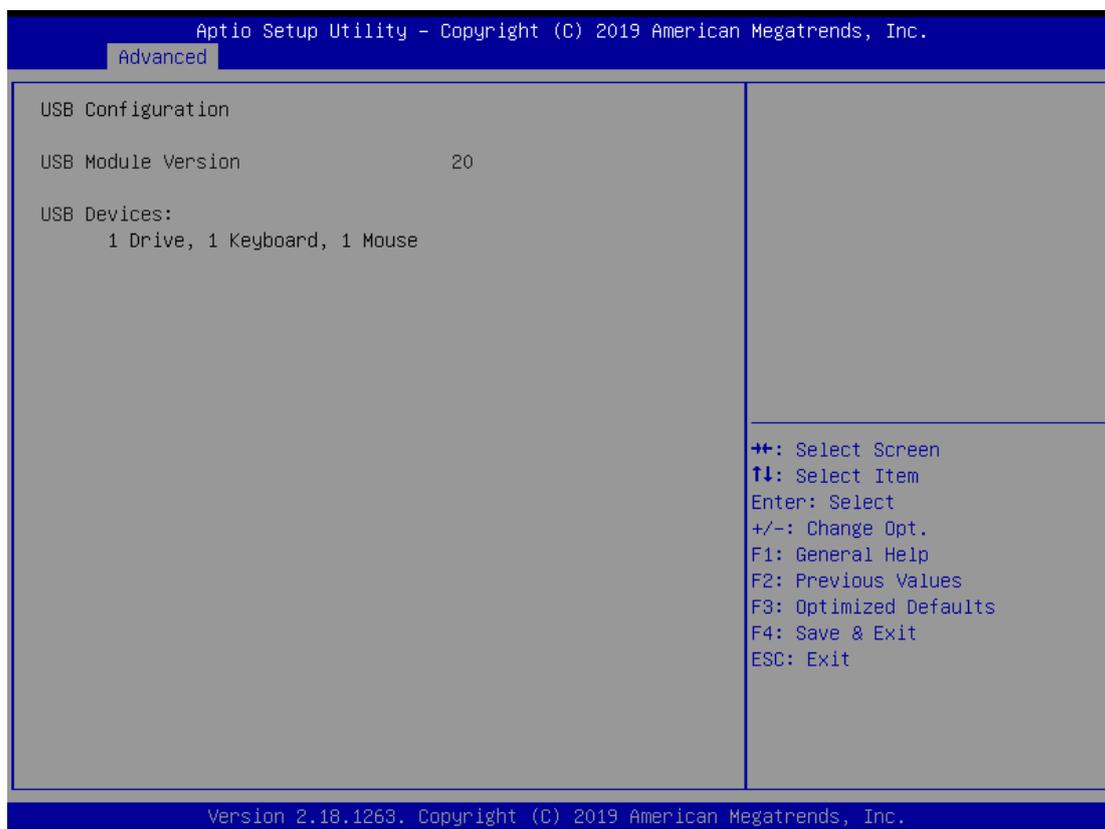
AMT BIOS Features

Enable or disable Active Management Technology BIOS features. The default is Enabled. Note that this screen will be empty, if the CPU does not support Intel® AMT, see image below.



USB Configurations

This screen is for BIOS flash utility.



USB Devices

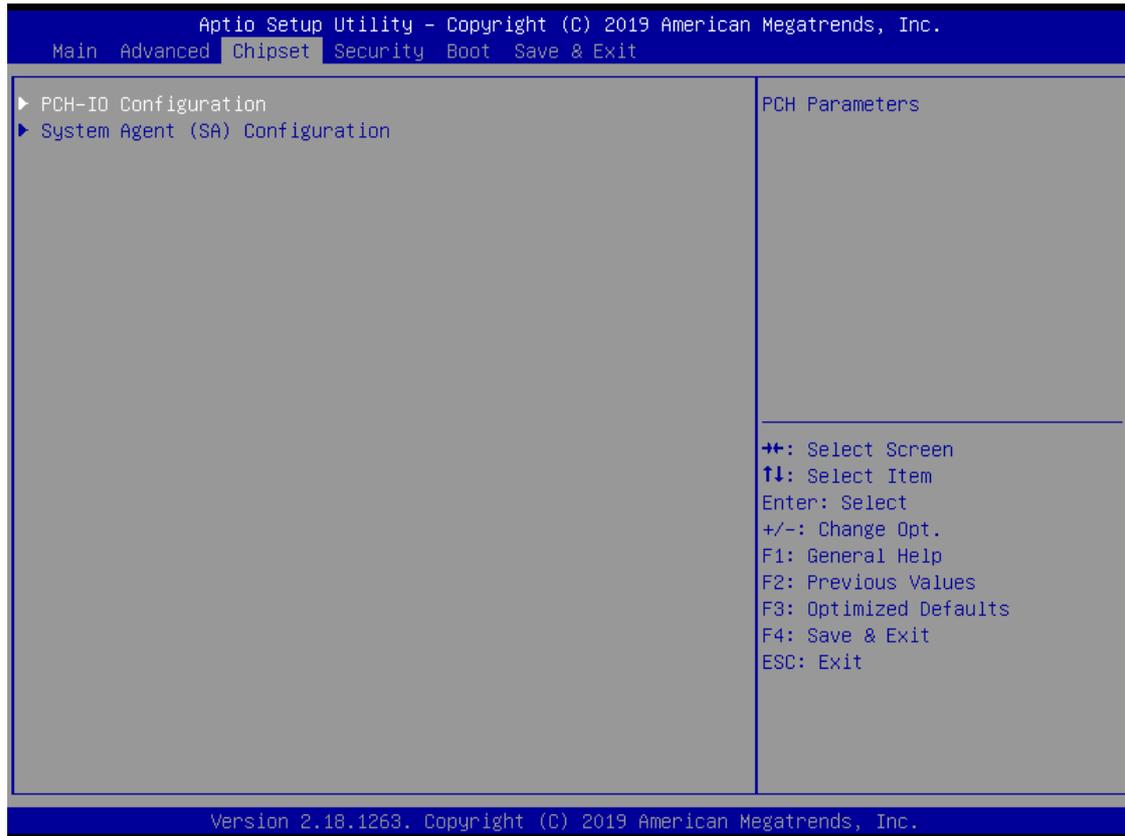
Display all detected USB devices.

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

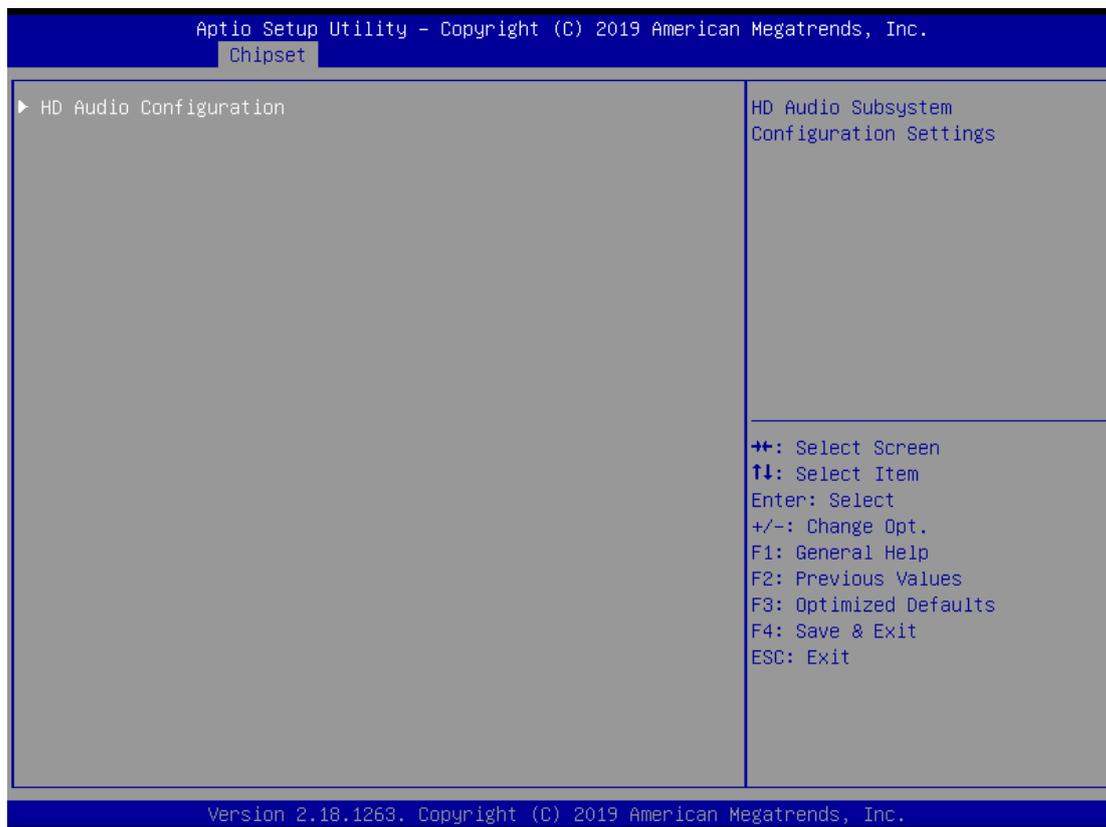
- ▶ PCH-IO Configuration
- ▶ System AGENT (SA) Configuration

For items marked with “▶”, please press <Enter> for more options.



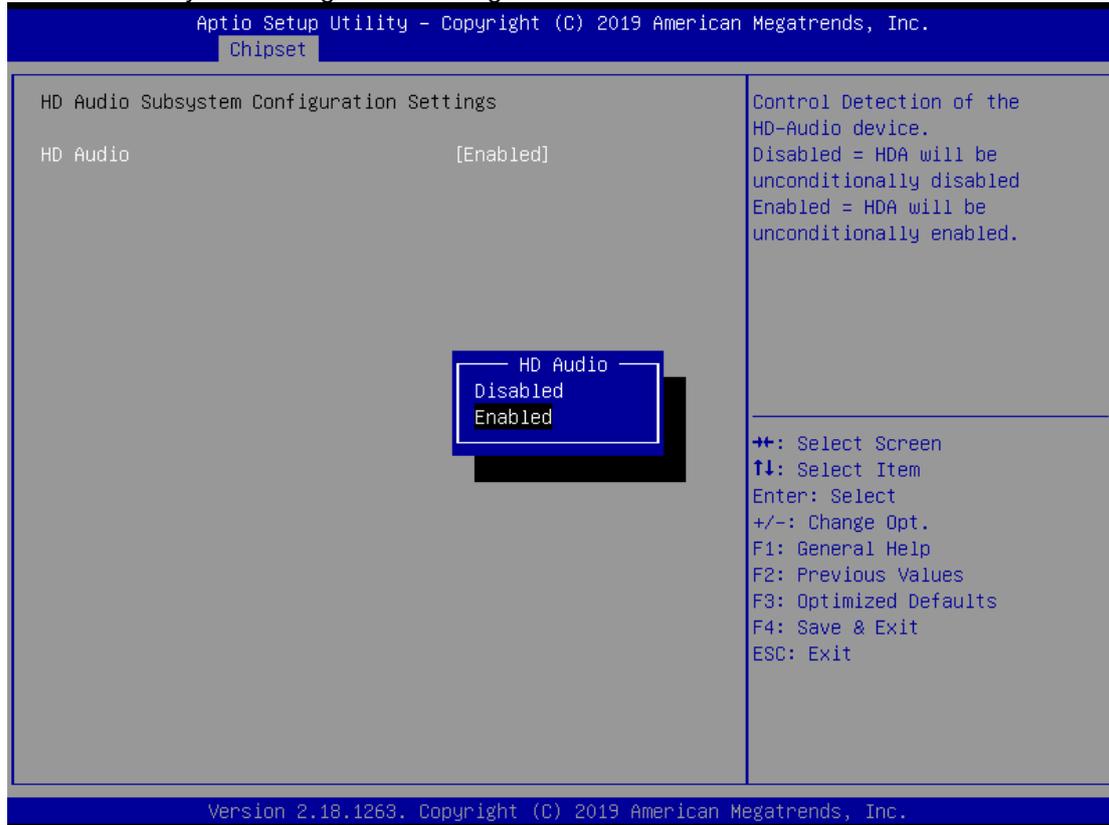
PCH-IO Configuration

This screen allows users to configure parameters of North Bridge chipset.



HD Audio Configuration

HD Audio subsystem configuration settings



HD Audio

Control detection of the HD Audio device.

-Disabled: HDA will be unconditionally disabled.

-Enabled: HDA will be unconditionally enabled.

System AGENT (SA) Configuration

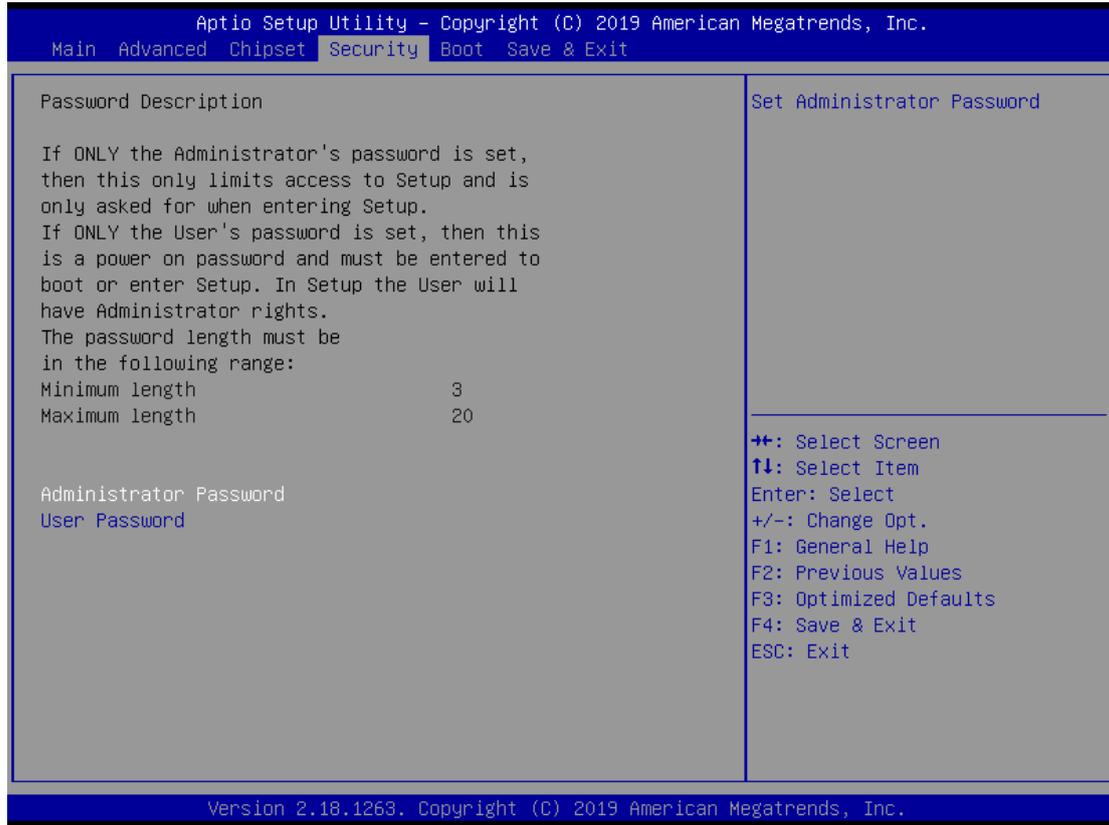
This screen shows System Agent version information and provides function for specifying related parameters.



Memory Configuration

Use this item to refer to the information related to system memory.

4.6 Security Menu



Administrator Password

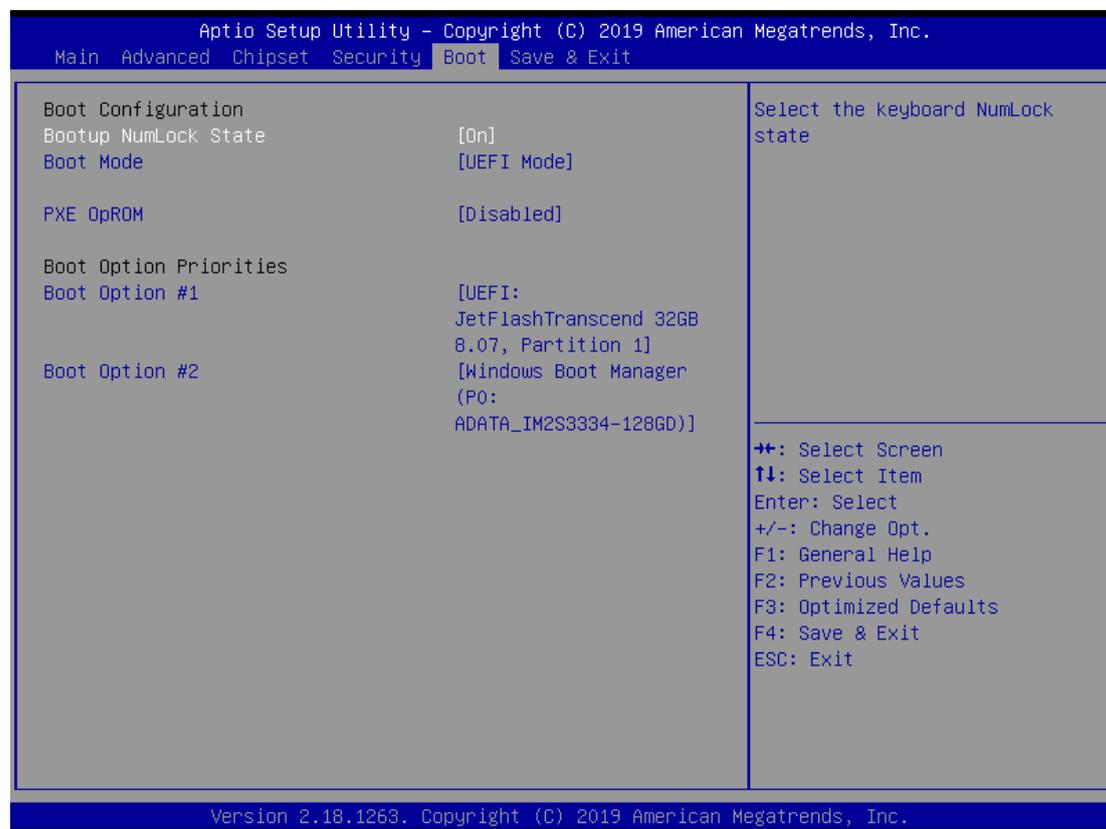
This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

This item indicates whether a user password has been set (installed or uninstalled).

Boot Menu

The Boot menu allows users to change boot options of the system.



Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.

Boot Mode

Use this option for boot mode settings.

- UEFI Mode: Select support to boot any UEFI-capable OS.
- Legacy Mode: Select support to boot non UEFI-capable OS that expects a legacy BIOS interface.

Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

PXE OpROM

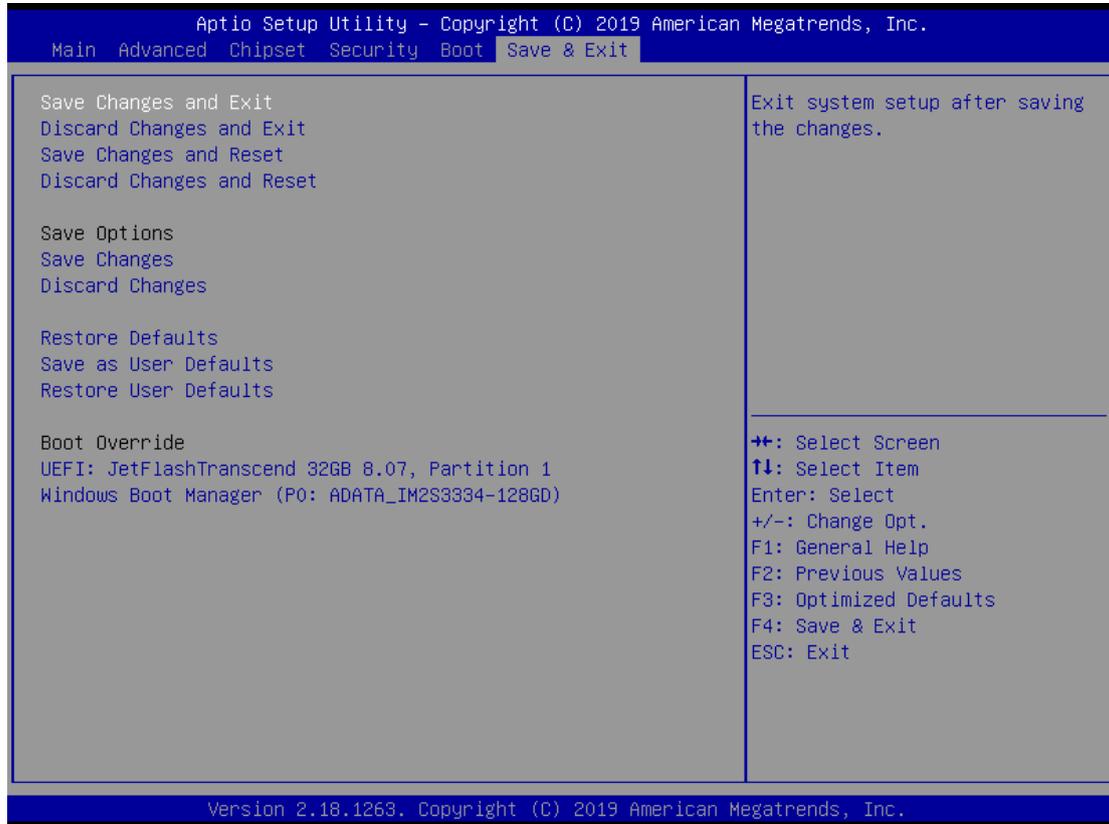
Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

Boot Option Priorities

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.7 Save & Exit Menu

The Save & Exit menu allows users to load system configurations with optimal or fail-safe default values.



Save Changes and Exit

When users have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configurations and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

Save Changes and Reset

When completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

Save Changes

When completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

Discard Changes

Select this option to quit Setup without making any permanent changes to the system configurations. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

Restore Defaults

It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

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APPENDIX A WATCHDOG TIMER

About Watchdog Timer

Software stability is major issue in most applications. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solutions in this regard.

The watchdog timer is a counter that triggers a system to reset when it counts down to zero from a preset value. The software starts the counter with an initial value and must reset it periodically. If the counter ever reaches zero, it means the software has crashed, the system will reboot.

Sample Program

The following example enables configurations using debug tool.

Enable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device enable:

2E 30

2F 01

↓

Set timer unit:

2E F0

2F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

2E F1

2F 0A; Set reset time (where 0A (hex) = 10sec)

Disable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device disable:

2E 30

2F 00