eBOX800-511-FL Series

Embedded System

User's Manual

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Safety Precautions

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

1. The eBOX800-511-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 eBOX800-511-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 eBOX800-511-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℃ or above 80℃ 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 production against electric shock: not classified
2. Degree of protection against ingress of water: IP67
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.

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【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.

Trademarks Acknowledgments

Table of Contents

SECTION 1
INTRODUCTION

This section contains general information and detailed specifications of the eBOX800-511-FL.Section 1 consist of the following sub-sections:

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

1.1 General Descriptions

The eBOX800-511-FL comes with Intel® Core™ i5-7300U/Intel® Celeron® 3965U processor (Kabylake SoC), utilizing a full IP67-rated aluminum die-casting and heavy-duty steel case.

It is supports Windows 10, Windows 10 IoT and Linux.

The fanless and streamlined enclosure ensures excellent heat dissipation. In addition, this reliable box pc is designed to operate under wide temperature ranges from -30°C to 60°C, under wide range of DC power input from 9 to 36 VDC and under harsh/outdoor applications with M12 lockable connectors.

Features

1.Fanless with IP67-rated enclosure design
2.Intel® Core™ i5-7300U 2.6 GHz/ Intel® Celeron® 3965U 2.2 GHz SoC onboard
3.Four antenna openings with waterproof design for WLAN & WWAN usage
4.Wide range of DC power input supported from 9 to 36 VDC
5.Flexible I/O for customized designs and mission-critical projects

Reliable and Stable Design

Powered by onboard quad-core processor, the eBOX800-511-FL is equipped with M12 lockable connectors while supporting wall-mount/vest-mount kit for outdoor applications.

Flexible Connectivity

The eBOX800-511-FL features one Gigabit Ethernet ports and two USB 2.0 ports. Additionally, it also supports two RS-232/422/485 serial interfaces.

Embedded O.S. Supported

The eBOX800-511-FL supports not only Windows 10 but also embedded OS, such as Windows 10 Embedded and Linux.

Various Storage Supported

In terms of storage, the eBOX800-511-FL supports one 2.5" SATA storage drive bay and one mSATA device.

1.2 System Specifications

1.2.1 CPU

CPU
- Intel® Core™ i5-7300U 2.6 GHz
- Intel® Celeron® 3965U 2.2 GHz

Chipset
- SoC integrated

BIOS
- American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS

System Memory
- One 260-pin unbuffered DDR4 2133MHz SO-DIMM socket, up to 16 GB at the maximum

1.2.2 I/O System

Display
- 1 x VGA connector (M12 A-Code 12 pos Male)
- Resolution max up to 1600 x 1200 x 24

Ethernet
- 1 x 10/100/1000 Ethernet ports (M12 X-Code 8 pos Female)

USB Ports
- 1 x USB connector to 2 x USB 2.0 ports (M12 A-Code 8 pos Male)

Serial Ports
- 2 x RS-232/422/485 (COM1/COM2)(M12 A-Code 8 pos Male)

Mini PCIe Interface
- 1 x full-size PCI Express Mini Card Slots with mSATA supported
- 1 x half-size PCI Express Mini Card Slots

Storage
- 1 x 2.5" SATA HDD/SSD drive bay
- 1 x mSATA (enabled in BIOS setting)

Indicator
- 1 x Green LED as indicator for system power on

Switch
- 1 x ATX power switch with indicator
- 1 x Power input (M12 A-Code 5 pos Male)

Antenna
- 4 x Antenna opening N Jack type with waterproof design

1.2.3 System Specifications

Watchdog Timer
- 1~255 seconds or minutes; up to 255 levels.

Power Supply
- 9~36 VDC input

Operation Temperature
- -30℃ ~ 60℃ (-22 ºF ~ 140ºF), with W.T. SSD & Memory)

Storage Temperature
- -40℃ ~ 80℃ (-40 ºF ~ 176ºF)

Humidity
- 10% ~ 90% (non-condensation)

Package Vibration Endurance
- 2.25Grm (5-500Hz, X, Y, Z directions)

Weight
- 4.31 kg (9.5 lb) without package
- 5.1 kg (11.24 lb) with package

Dimension
- 210 mm (8.27") (W) x 366.83 mm (14.44") (D) x 83 mm (3.27") (H)

1.2.4 Driver CD Contents

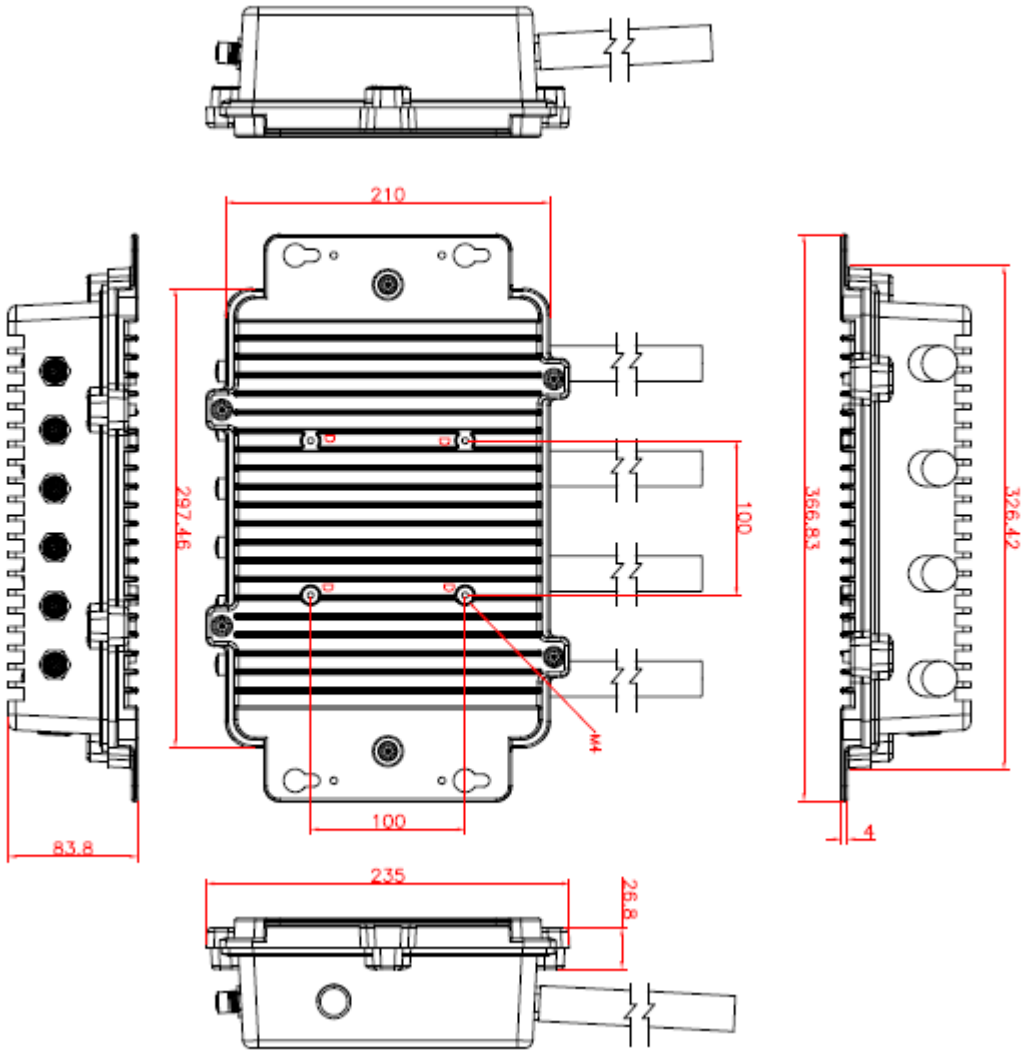
- Ethernet
- Chipset
- Graphic
- Intel Rapid Storage Technology
- Audio
- Intel® TXE Firmware
- User Manual
- Quick Manual

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

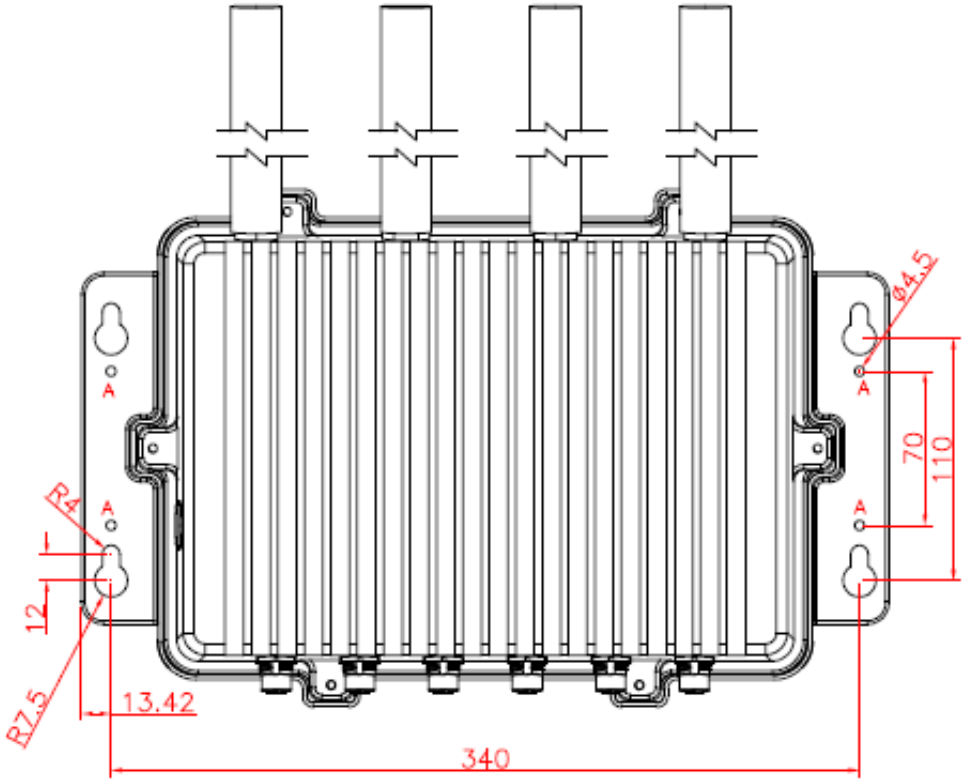
1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX800-511-FL.

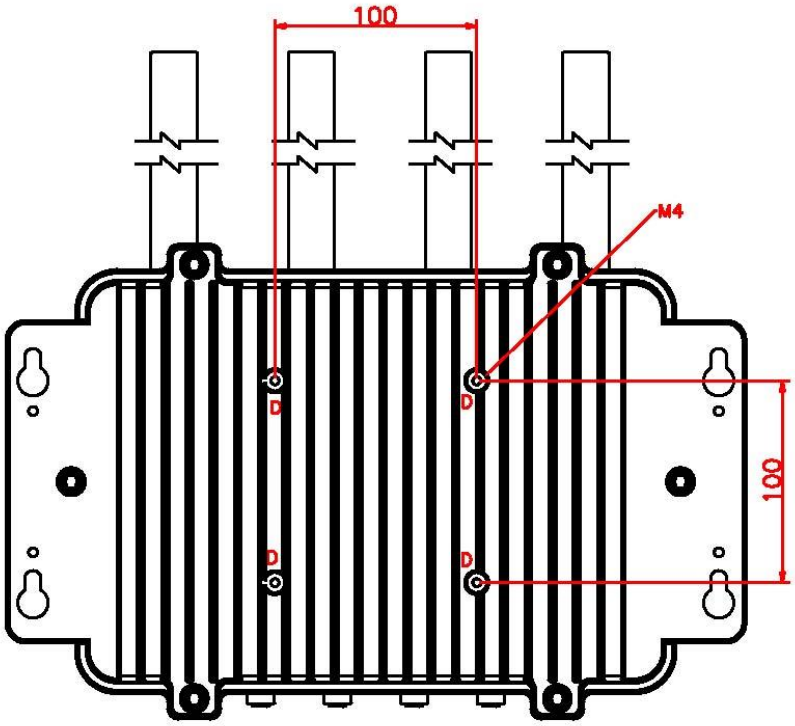
1.3.1 System Dimensions



1.3.2 Wall-mount Bracket Dimensions



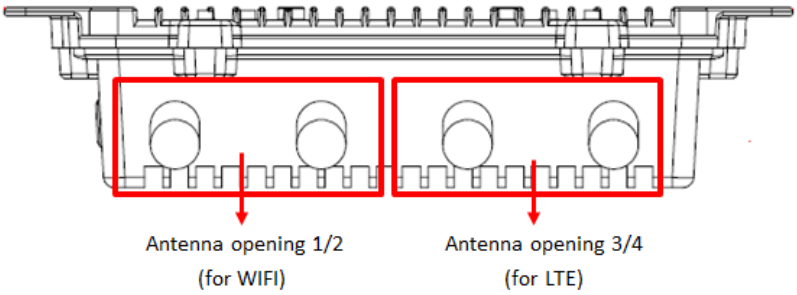
1.3.3 VESA-mount Bracket Dimensions



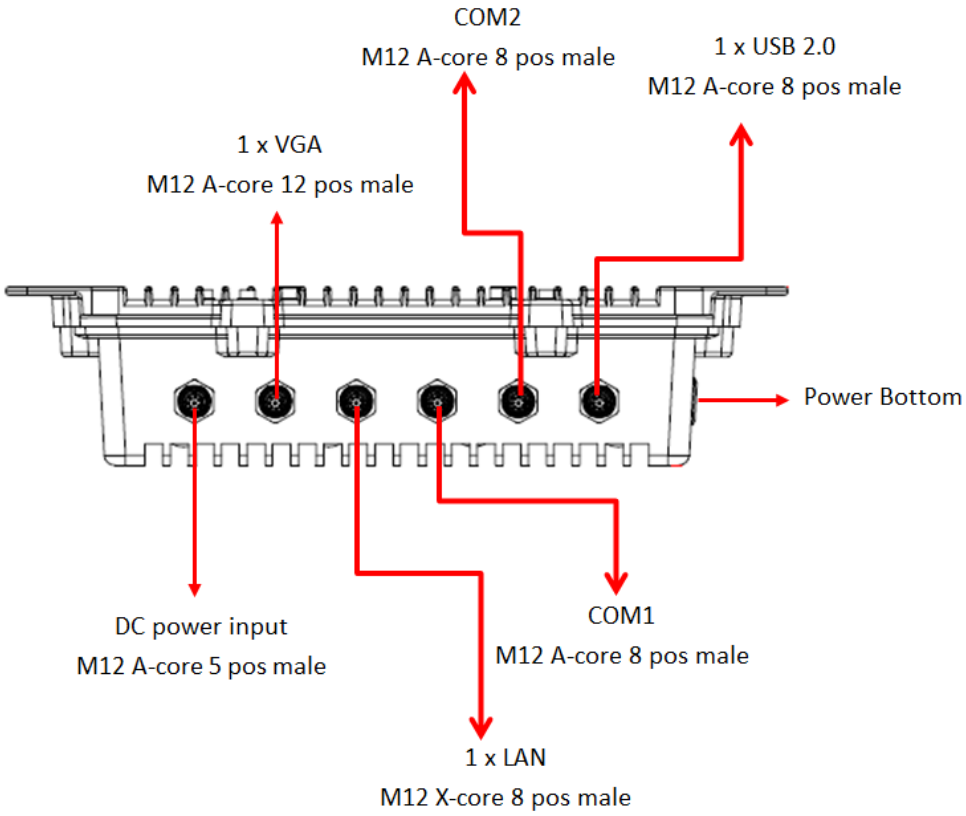
1.4 I/O Outlets

The following figures show I/O outlets on front of the eBOX800-511-FL.

Top View



Bottom View



1.5 Packing List

The eBOX800-511-FL comes with the following bundle package:

- **eBOX800-511-FL System Unit x 1**
- **Quick Installation Guide x 1**
- **DVD x 1 (For Driver and Manual)**
- **waterproof PWR cable (L:1m) x 1**
- **waterproof VGA cable (L:1.8m) x 1**
- **waterproof USB 2.0 cable (L:1.8m) x 1**
- **HDD mylar x 1**
- **HDD screws x 2**
- **HDD poron x 1**

1.6 Model List

eBOX800-511-FL- DC-7300U	Rugged IP67-rated fanless embedded system with Intel® Core™ i5-7300U 2.6 GHz, VGA, 1 GbE LANs, 2 USBs, 2 COMs and 9~36VDC power input
eBOX800-511-FL- DC-3965U	Rugged IP67-rated fanless embedded system with Intel® Celeron® 3965U 2.2 GHz, VGA, 1 GbE LANs, 2 USBs, 2 COMs and 9~36VDC power input

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

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SECTION 2
HARDWARE INSTALLATION

The eBOX800-511-FL is convenient for various hardware configurations, such as DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive) and PCI Express Mini card modules. Section 2 contains guidelines for hardware installation.

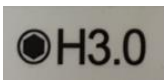
【Note】:

Waterproof capability may be affected if a system is dissembled; under such circumstances Axiomtek shall not be liable for any quality deterioration.

【Note】: Please refer to tightening torque below for all system screws:

⊙ HEX socket set screw: 7.5 kgf

HEX KEY specifications are shown below



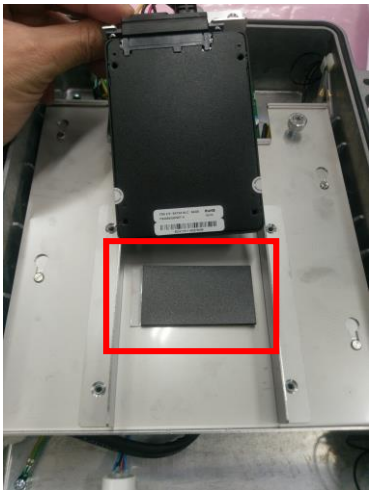
⊙ N jack connector: 10 kgf

2.1 Installation of 2.5" SATA Device

Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom and then loosen all screws.

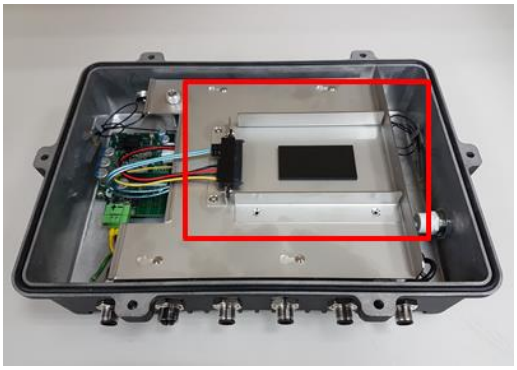
Step 3 Remove the bottom cover.

Note: For 7"mm HDD/SSD, please add a HDD poron before install the HDD/SSD.

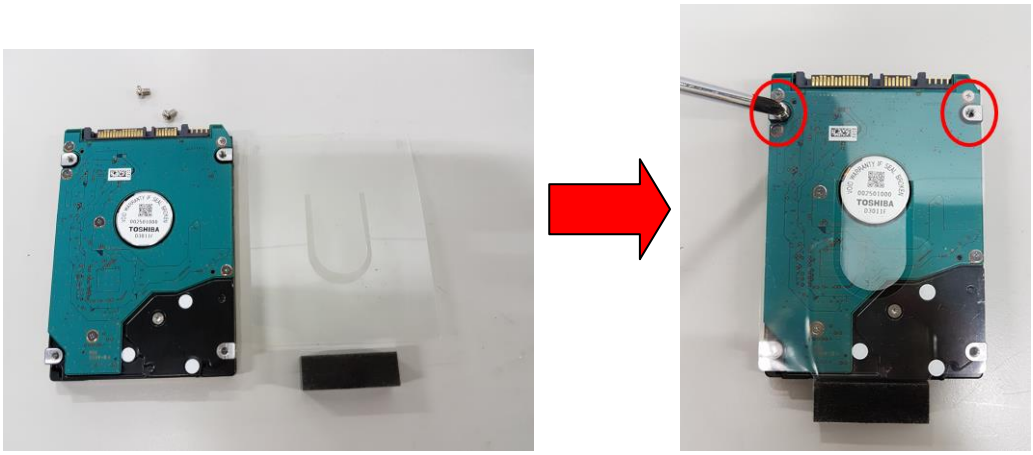


Step 4 Locate SSD/HDD within the red line as marked.

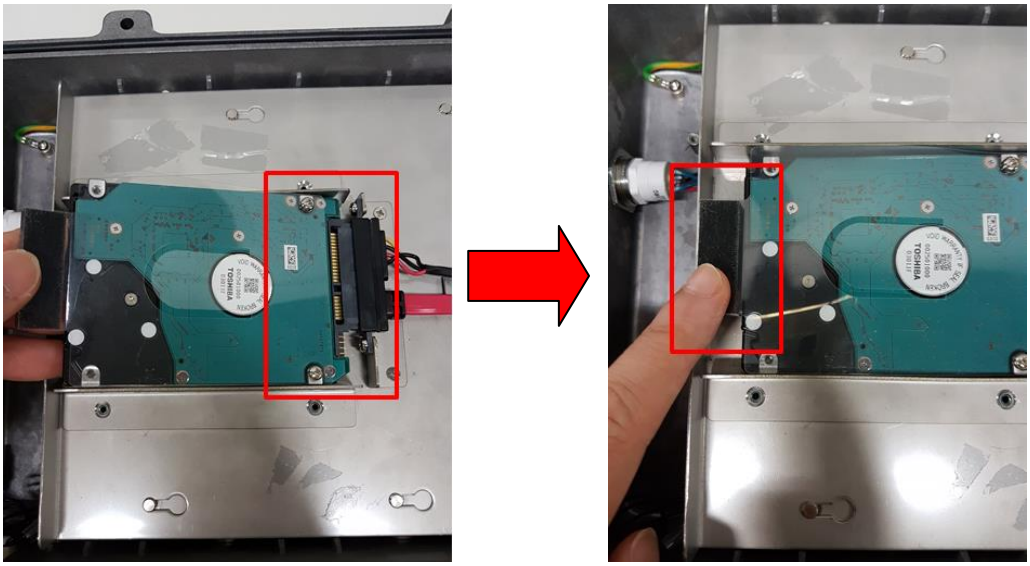
Please notice the direction of connector for HDD.



Step 5 Before install an SSD/HDD, please place the mylar on top of the SSD/HDD and fasten two screws.



Step 6 Install the SSD/HDD into the HDD drive bay and push the poron down to ensure the complete insertion of SSD/HDD.

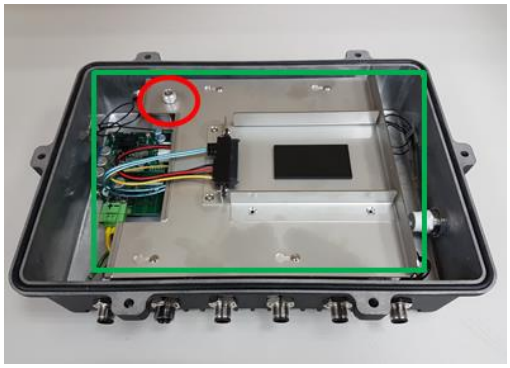


2.2 Installation of SO-DIMM

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

Step 2 Six screws on the bottom heatsink are used to fasten the heatsink to the chassis.

Step 3 Loosen the thumb screws to remove the metal plate then a SO-DIMM socket on main board is visible.



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 Replace the metal plate, fasten the thumb screws, then put the bottom cover and fasten six screws back onto the system.

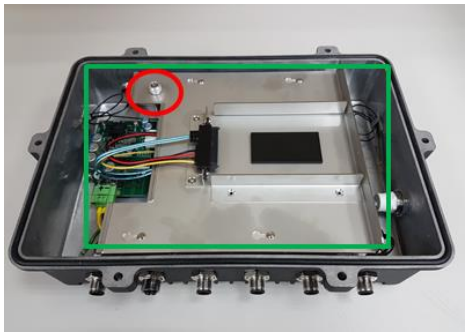
【Note】: Make sure all screws are fastened.

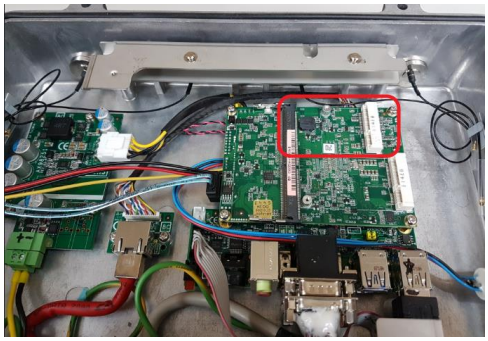
2.3 Installation of WI-FI Mini PCIe Module (half-size)

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

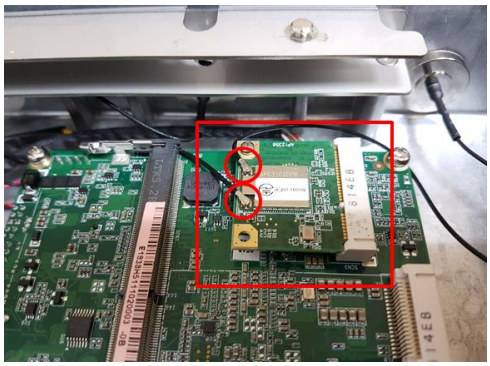
Step 2 **Turn the system upside down to locate screws at the bottom, and then loosen all screws.**

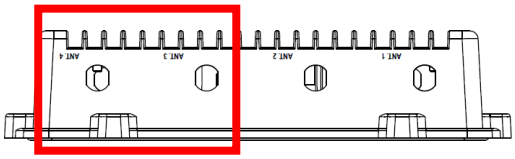
Step 3 **Remove the metal plate by loosening the thumb screw, identify the WI-FI, and then insert a WI-FI module.**





Step 4 **Connect RF Cable to I-PEX4 connector of WI-FI module and install Antenna 1 and Antenna 2.**





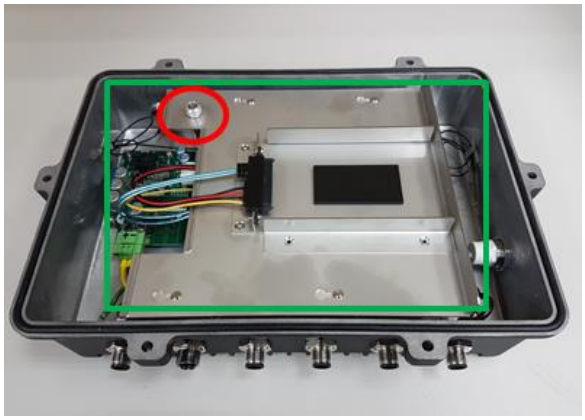
2.4 Installation of 3G/4G Mini PCIe Module (full-size)

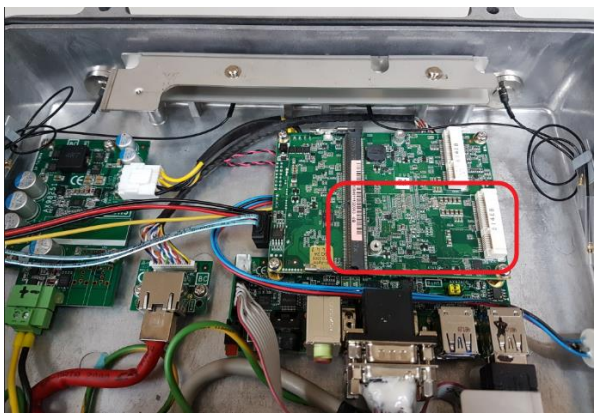
Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.

Step 3 Remove the metal plate by loosening the thumb screws, identify the socket，and then insert a 3G/4G module.

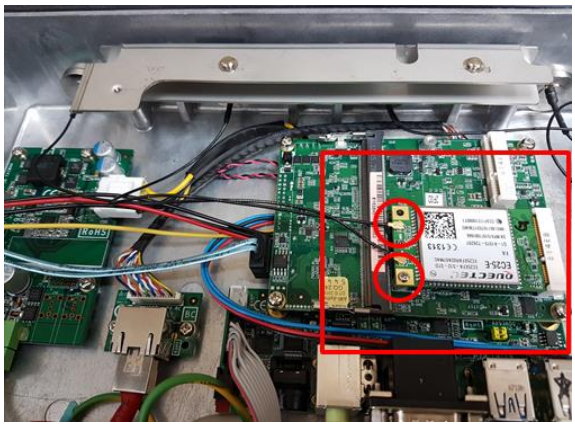
Note: eBOX800-511 doesn't have SIM slot, please use 3G/4G module with SIM on holder.

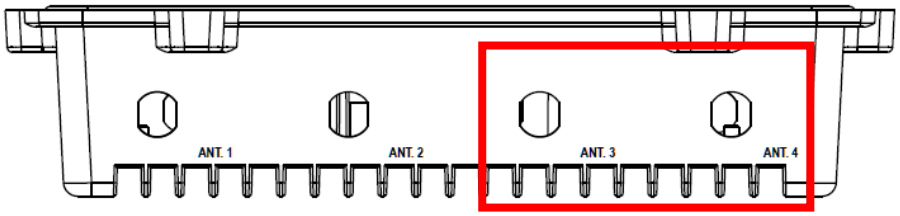
Note: Due to the full size PCIe mini card slot supports mSATA or PCIe mini card, please choose either one to install, and refer to Section 4.4 for BIOS setting.





Step 4 Connect RF cable to I-PEX4 connector of 3G/4G Module and install Antenna 3 and Antenna 4.



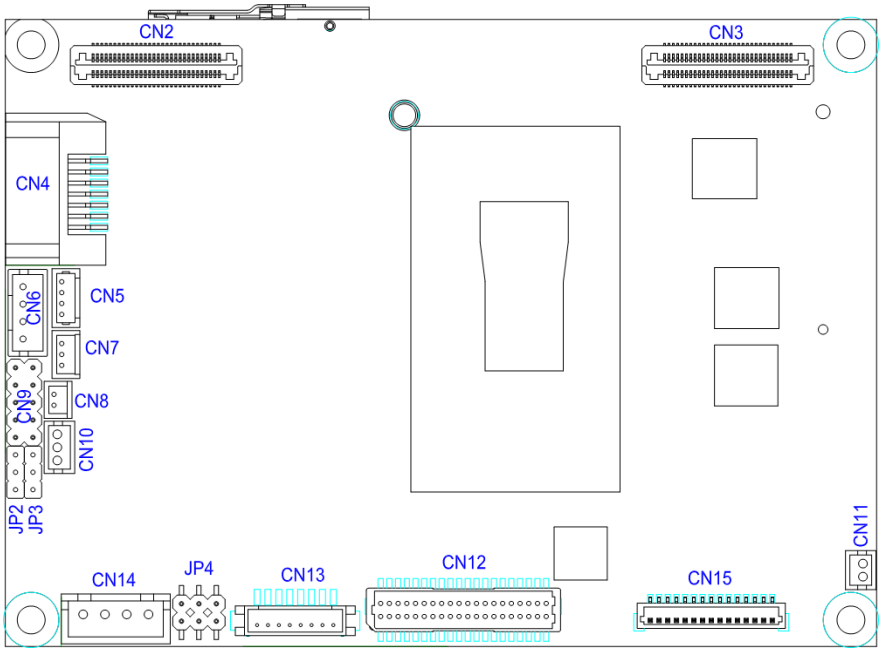


SECTION 3
JUMPER & CONNECTOR SETTINGS

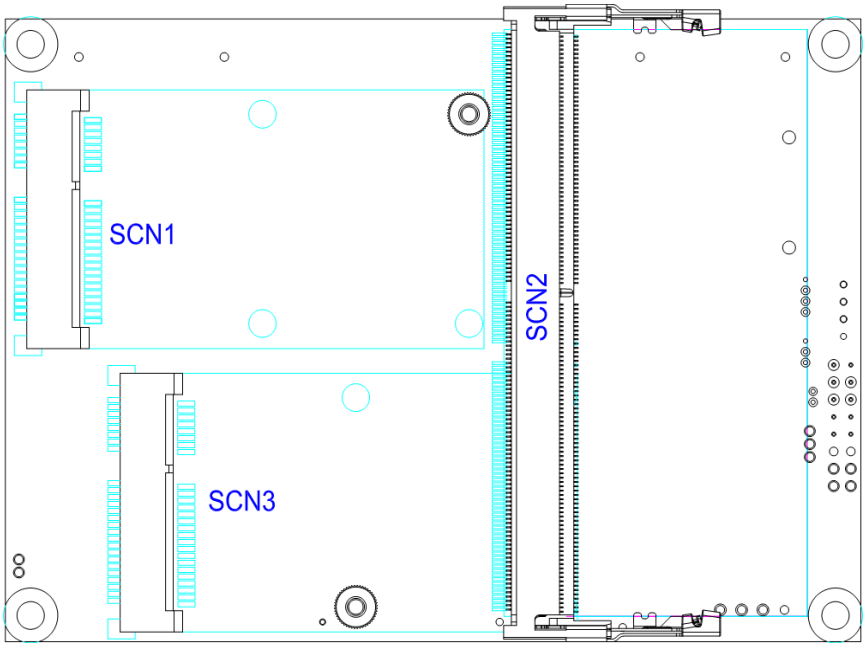
Proper jumper settings configure the eBOX800-511-FL to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

PICO511 Top View



PICO511 Bottom View



【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 eBOX800-511-FL to meet various application purposes. A table of all jumpers and their default settings is listed below.

PICO511

Jumpers	Descriptions	Settings
JP2	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
JP3	Auto Power On Default: Enable	2-3 Close

【Note】: How to setup Jumpers

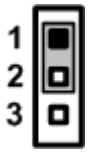
That a cap on a jumper is to "close" the jumper, whereas that offs a jumper is to "open" the jumper.

[Open] [Closed] [Pin1-2 Closed]

3.2.1 Restore BIOS Optimal Defaults (JP2)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

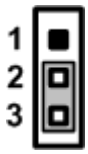
Function	Setting
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close



3.2.2 Auto Power On (JP3)

If JP3 is enabled for power input, the system will be automatically power on without pressing soft power button. If JP3 is disabled for power input, it is necessary to manually press soft power button to power on the system.

Function	Setting
Disable auto power on	1-2 close
Enable auto power on (Default)	2-3 close



3.3 Connectors

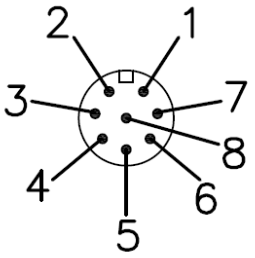
Please refer to pin assignments below :

External Connectors	**Sections**
Serial Port	3.3.1
Ethernet Port	3.3.2
USB Port	3.3.3
DC Power Jack Connector	3.3.4
VGA Connector	3.3.5
Internal Connectors	**Sections**
Half-size PCI-Express Mini Card (on PICO511)	3.3.6
Full-size PCI-Express Mini Card or mSATA Connector (on PICO511)	3.3.7
SATA Power Connector (CN6) (on PICO511)	3.3.8
CMOS connector (CN8) (on PICO511)	3.3.9
Ethernet connector (CN15)	3.3.10
Power connector (CN14)	3.3.11

3.3.1 Serial Port (M12 A-Code 8 pos Male)

The following table shows pin assignments of this connector:

Pins	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	No use
4	DTR	RX-	No use
	GND	GND	GND
5	DSR	No use	No use
6	RTS	No use	No use
7	CTS	No use	No use
8	RI	No use	No use



【Note】:*Each port +5V maximum: 2A, +12V maximum: 1A.*

Warning:

According to IP67 warrantee, please indicate specific COM1 settings at the time of placing an order; don't disassemble the system without authorization.

When receiving information via RS-422/485, if there appear some wrong codes, please check whether RS-422/485 is connected to GND at both ends. The standard method of RS-422/485 is to connect GND at both ends and make sure that receiver and transmitter have the common ground.

3.3.2 Ethernet Port (M12 X-Code 8 pos Female)

Connectable via a M12 X-CODE LAN connector, the eBOX800-511-FL may be equipped with a high performance Plug and Play Ethernet interface which is fully compliant with IEEE 802.3 standard.

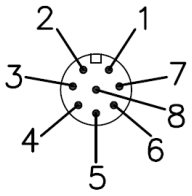
Please refer to detailed pin assignment listed below:

Pins	Signals	Pins	Signals
L1	MDI0P	L5	MDI3P
L2	MDI0N	L6	MDI3N
L3	MDI1P	L7	MDI2N
L4	MDI1N	L8	MDI2P

3.3.3 USB Port (M12 A-Code 8 pos Male)

The USB is a Universal Serial Bus (compliant with USB 2.0 (480 Mbps)) connector on the rear I/O. It is commonly used for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pins	Signals	Pins	Signals
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	GND	8	GND

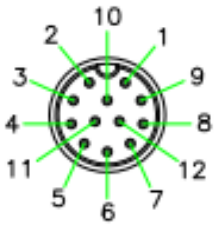


3.3.4 DC Power Jack Connector (M12 A-Code 5 pos Male)

Pins	Signals
1	9~36V
2	9~36V
3	GND
4	GND
5	Earth Ground

3.3.5 VGA Connector (M12 A-Code 12 pos Male)

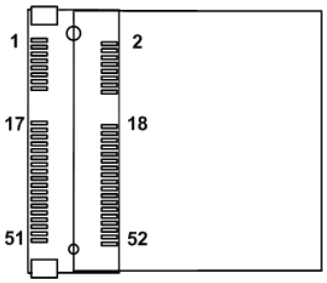
Pins	Signals	Pins	Signals
1	Red	7	Vertical Sync
2	Green	8	DDC CLK
3	Blue	9	VCC
4	DDC DATA	10	GND
5	Horizontal Sync	11	GND
6	GND	12	GND



3.3.6 Half-size PCI-Express Mini Card Connector (SCN3)

This is a half-size PCI-Express Mini Card connector on the bottom side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express or USB 2.0.

Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN	24	+3.3VSB
25	PE_RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN	32	SMB_DATA
33	PE_TXP	34	GND
35	GND	36	USB_D4-
37	GND	38	USB_D4+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.3.7 Full-Size PCI-Express Mini Card Connector (SCN1)

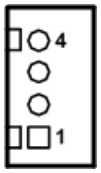
This is a full-size PCI-Express Mini Card connector on the bottom side complying with PCI-Express Mini Card Spec. V1.2. It supports either PCI-Express, USB 2.0 or SATA (mSATA). To enable or disable mSATA support, please refer to BIOS setting in section 4.4.

Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE#
21	GND	22	PERST#
23	PE_RXN/ SATA_RXP	24	+3.3VSB
25	PE_RXP/ SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN/ SATA_TXN	32	SMB_DATA
33	PE_TXP/ SATA_TXP	34	GND
35	GND	36	USB_D4-
37	GND	38	USB_D4+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB

3.3.8 SATA Power Connector (CN6)

The CN6 is a 4-pin (pitch=2.0mm) wafer connector, which is compliant with JST B4B-PH-K-S, for SATA power interface.

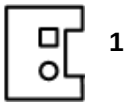
Pins	Signals
1	+5V
2	GND
3	GND
4	+12V



3.3.9 CMOS Battery Connector (CN8)

This connector is for CMOS battery interface.

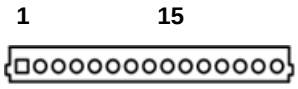
Pins	Signals
1	+3.3V
2	GND



3.3.10 Ethernet Connector (CN15)

This is a JST BM16B-SRSS-TB 15-pin wafer connector for Ethernet interface. Gently connect CN15 to AX93287 I/O board's CN1.

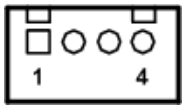
Pins	Signals
1	1000 LAN LED
2	100 LAN LED
3	GND
4	MDI3-
5	MDI3+
6	MDI1-
7	MDI2-
8	MDI2+
9	MDI1+
10	MDI0-
11	MDI0+
12	GND
13	LAN_VDD33
14	LAN_LINK_ACT
15	GND



3.3.11 Power Connector (CN14)

The CN14 is a 4-pin (pitch=2.5mm) wafer connector in right angle for DC +12V input. Gently connect CN14 to AX98251 power board's CN1.

Pins	Signals
1	+12V
2	+12V
3	GND
4	GND



3.4 Waterproof Cables

The eBOX800-511-FL series uses specific M12 connector for waterproof as enclosed in the accessory box; included in the box are also VGA, USB and Power cables. Please refer to pictures below for cables pin definitions.

Power Cable

Pins	Signals
V+	9~36VDC power input
⏚	Earth Ground
GND	GND
GND	GND

USB Cable

With two extended USB ports, the USB cable is combined with M12 connectors for waterproof.

VGA Cable

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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 <Del> key immediately.
2. After press the <Del> 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

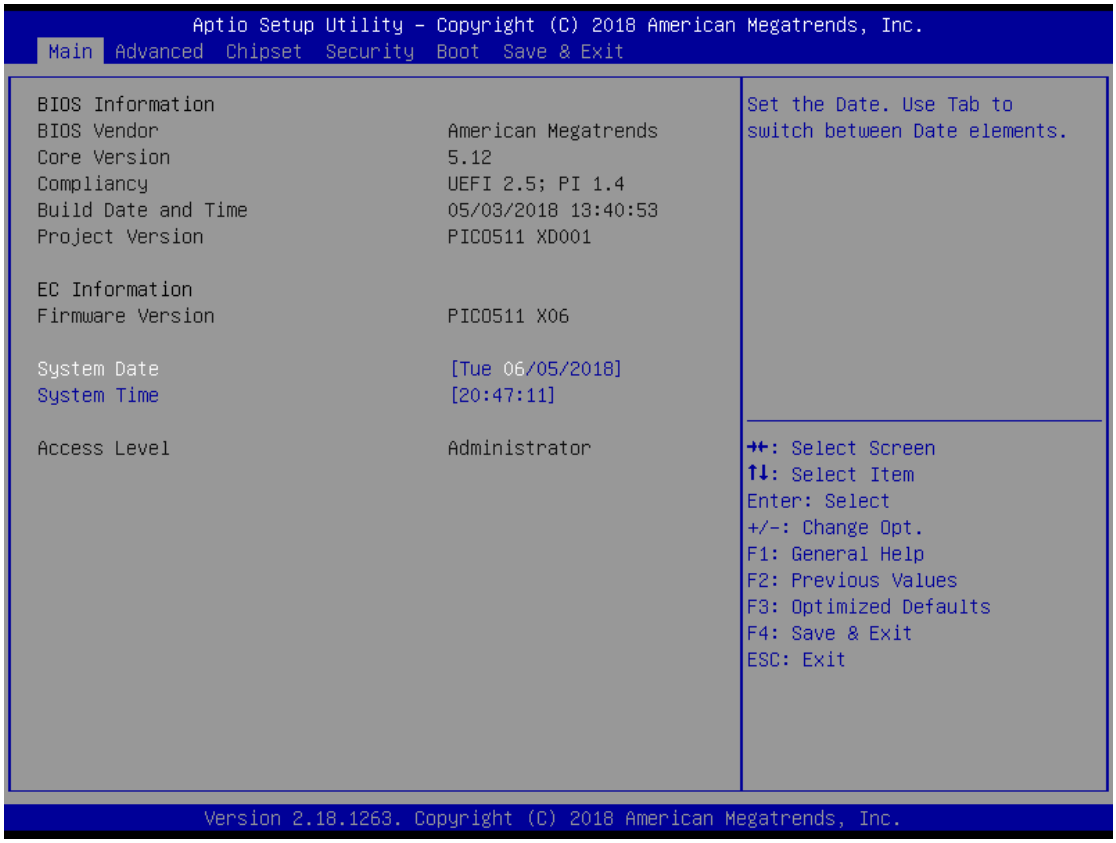
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

【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 Information
Display the auto-detected BIOS information.

System Language
Choose the system default language.

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.

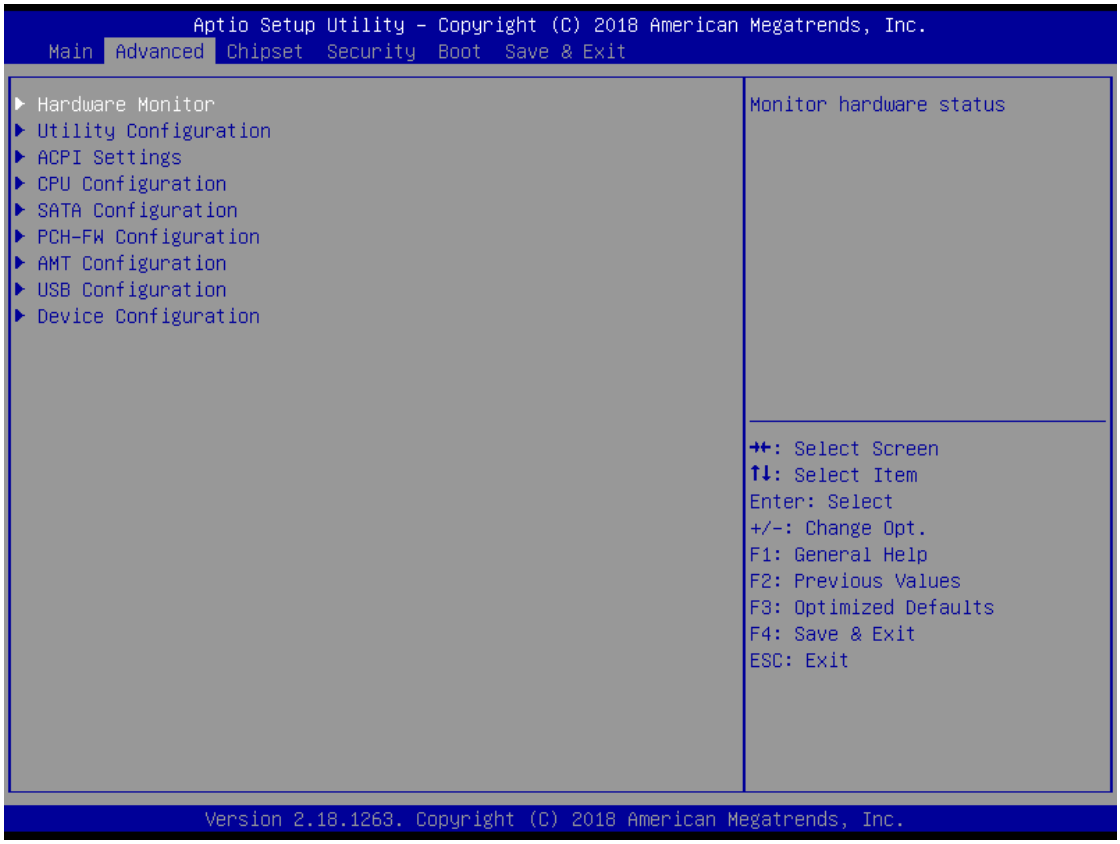
Access Level
Display the access level of current user.

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:

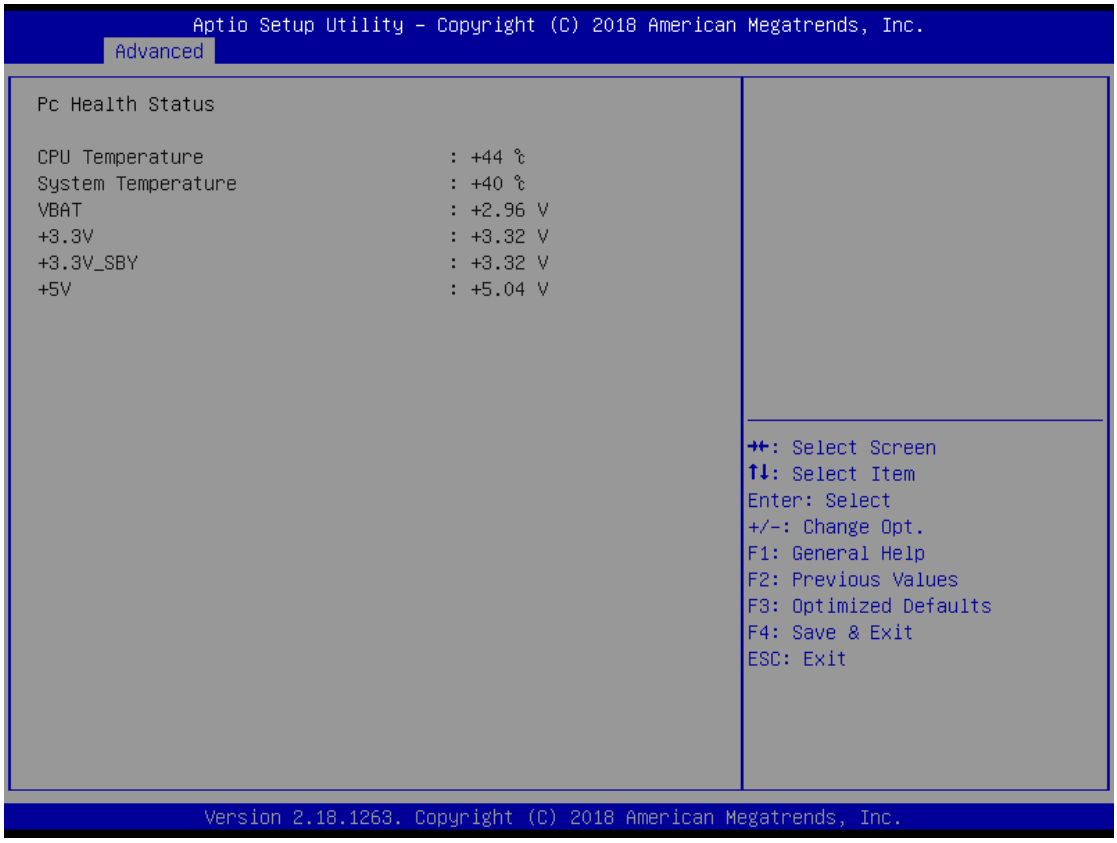
- ► Hardware Monitor
- ► Utility Configuration
- ► ACPI Settings
- ► CPU Configuration
- ► SATA Configuration
- ► PCH-FW Configuration
- ► AMT Configuration
- ► USB Configuration
- ► Device Configuration

For items marked with "►", please press <Enter> for more options.



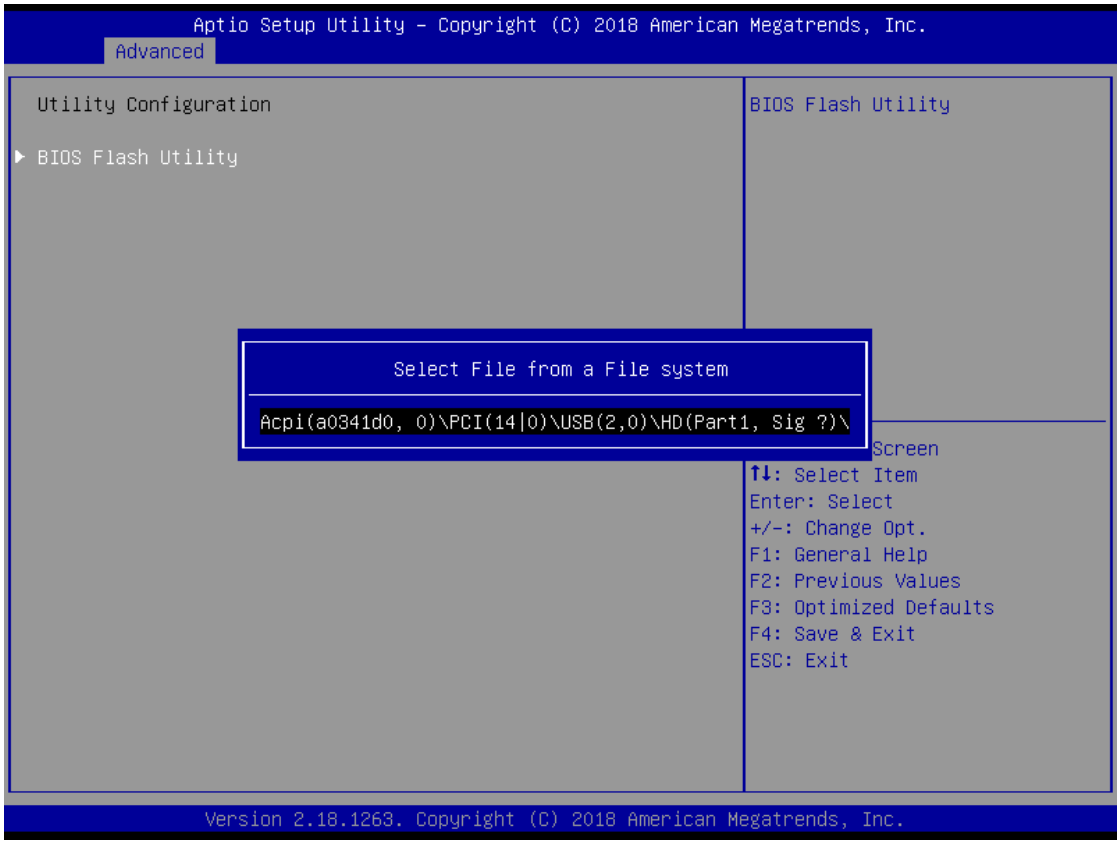
Hardware Monitor

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.



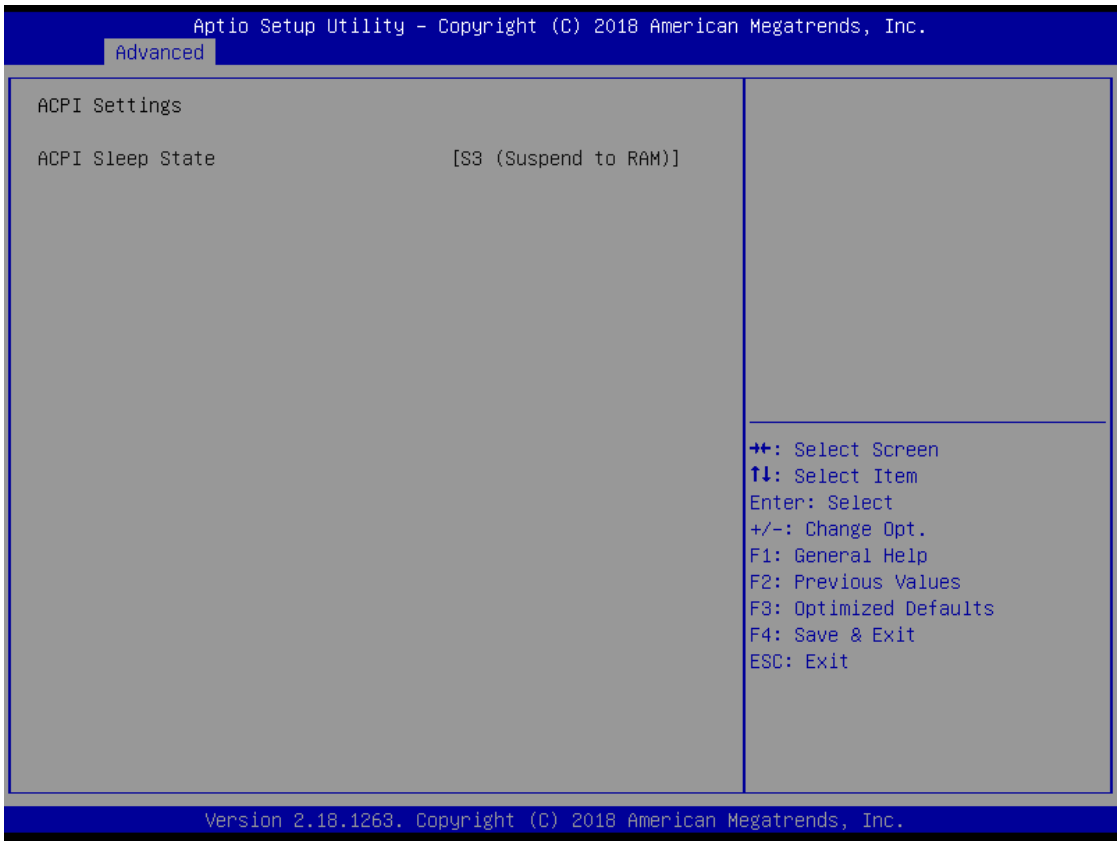
This screen displays the temperature of system and CPU, system voltages (VBAT, +3.3V, +3.3_SBY and +5V).

Utility Configuration



BIOS Flash Utility
BIOS flash utility configuration. For more detailed information, please refer to Appendix D.

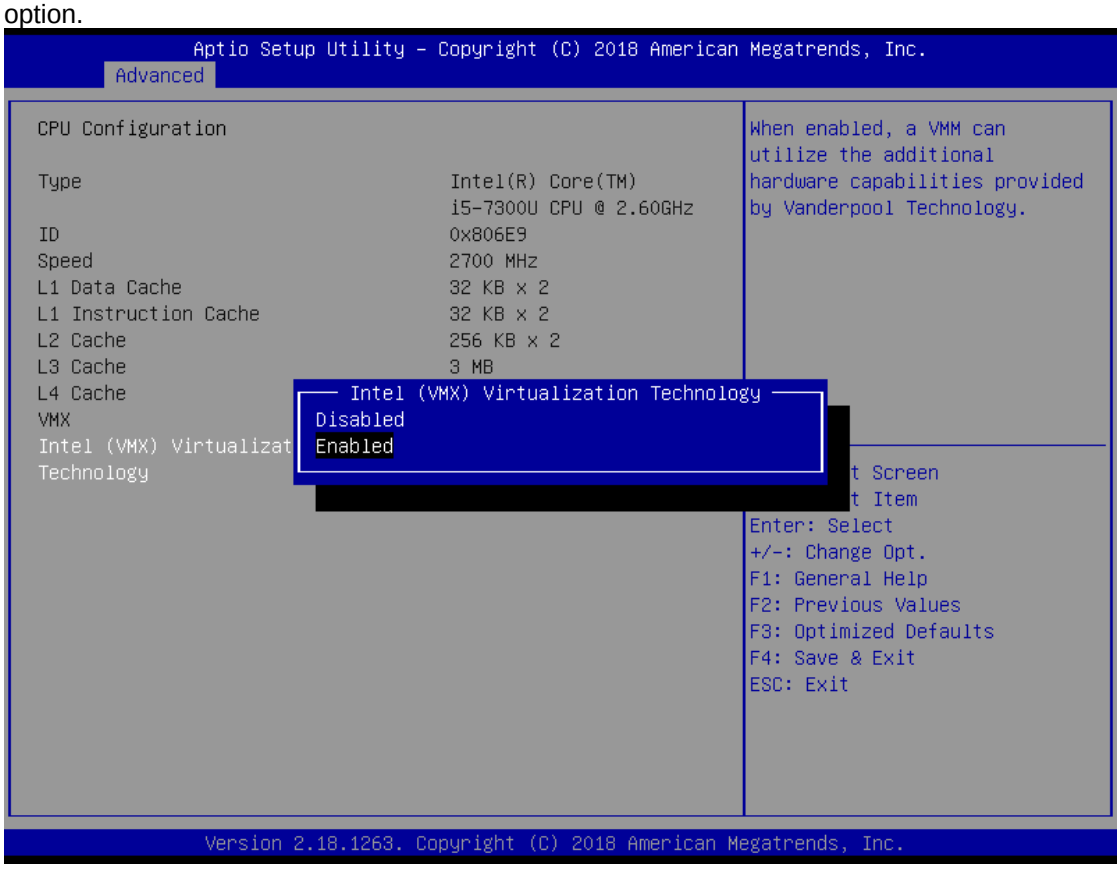
ACPI Settings



ACPI Sleep State
The setting is S3 (Suspend to RAM); this option selects ACPI sleep state the system will enter when suspend button is pressed.

CPU Configurations

This screen shows the CPU Configuration and you can change the value of the selected option.

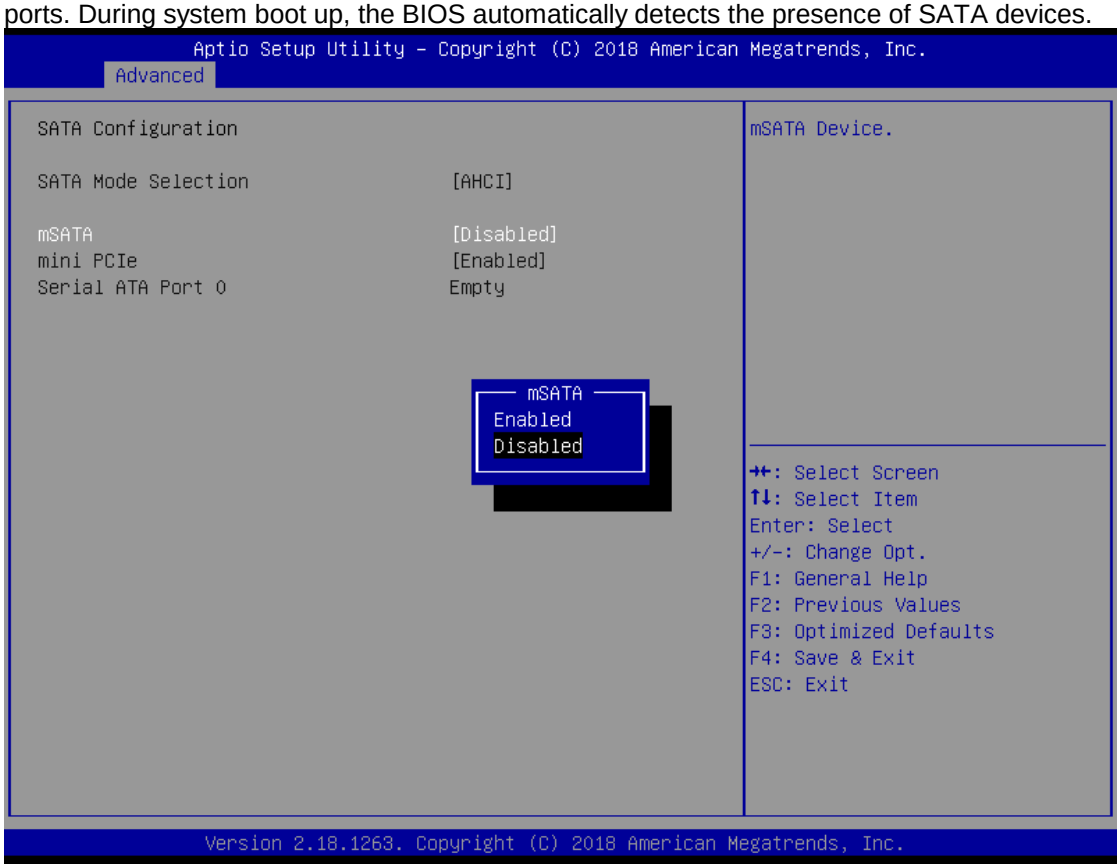


Intel (VMX) Virtualization Technology

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 Configuration

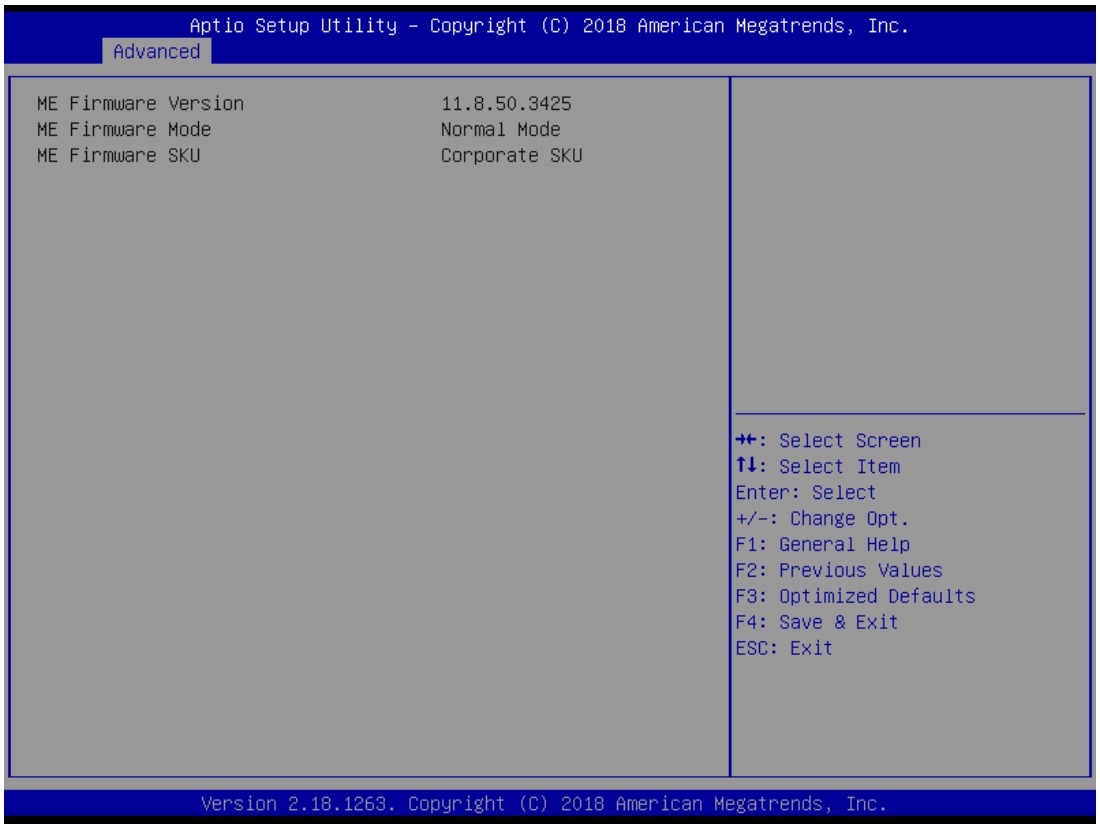
In the SATA Configuration menu, you can see the current installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



SATA Mode Selection
The SATA mode is set to AHCI.

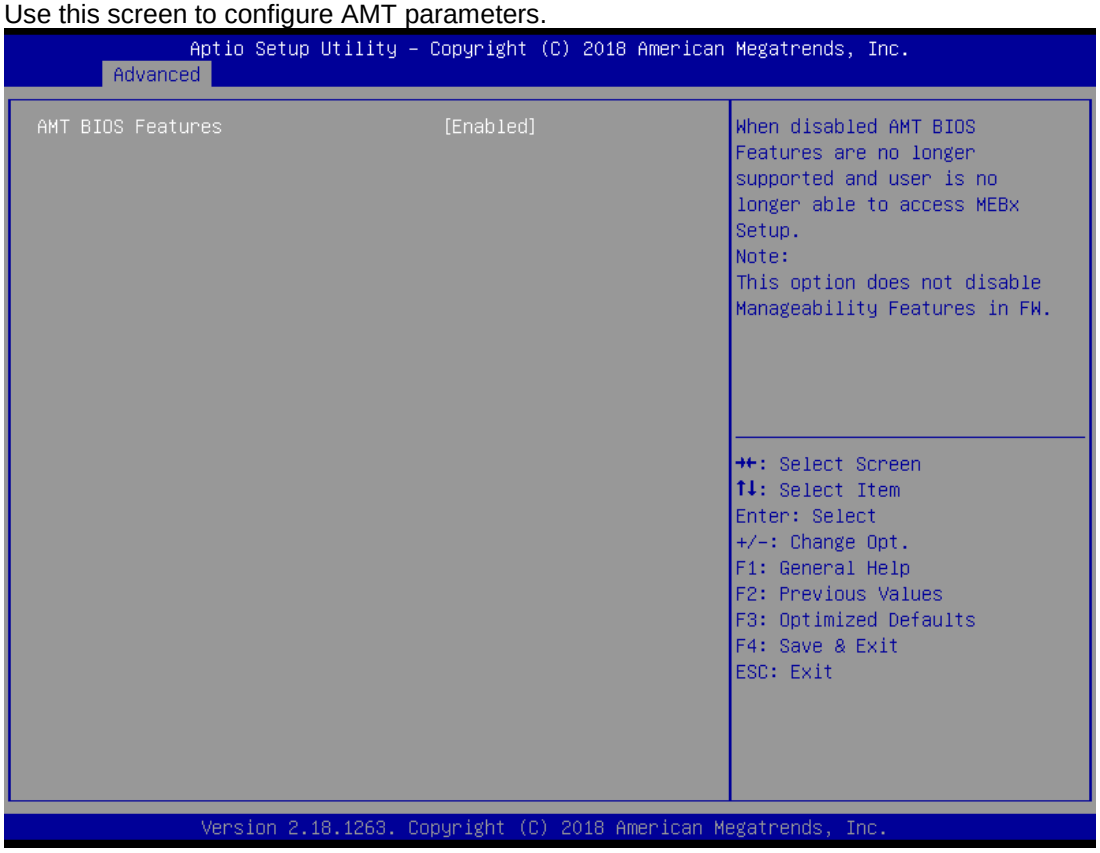
mSATA
Enable or disable mSATA feature.

PCH-HW



AMT Configuration

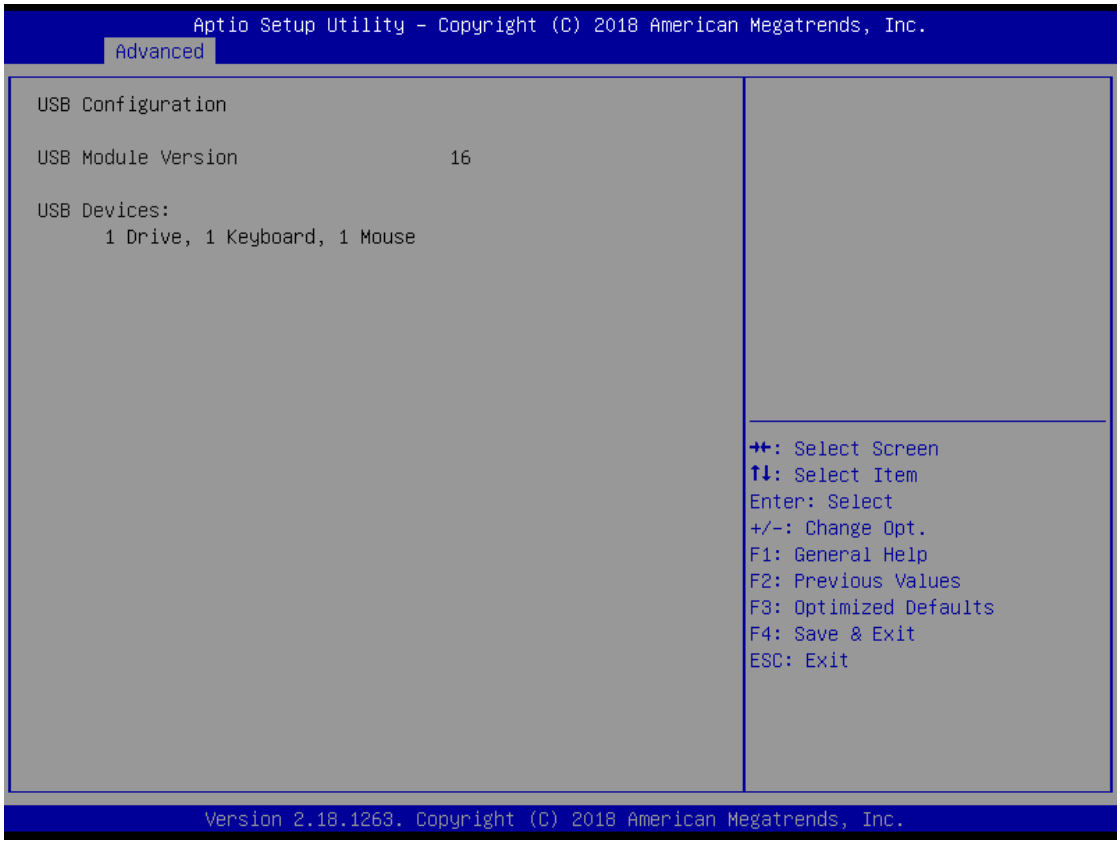
Use this screen to configure AMT parameters.



AMT BIOS Features

Enable or disable AMT (Active Management Technology) BIOS features. The default is Enabled. After enabling, please refer to Appendix C for iAMT settings.

USB Configuration

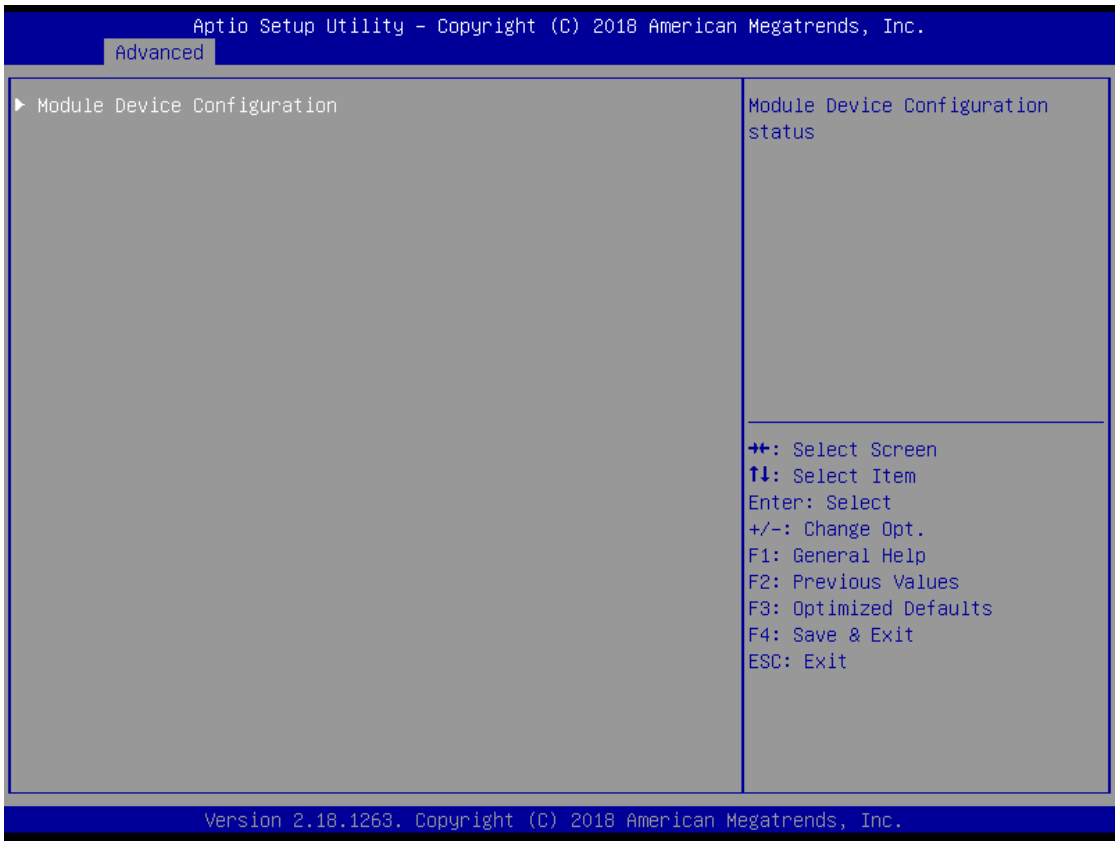


USB Devices

Display all detected USB devices.

Device Configuration

A description of selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.

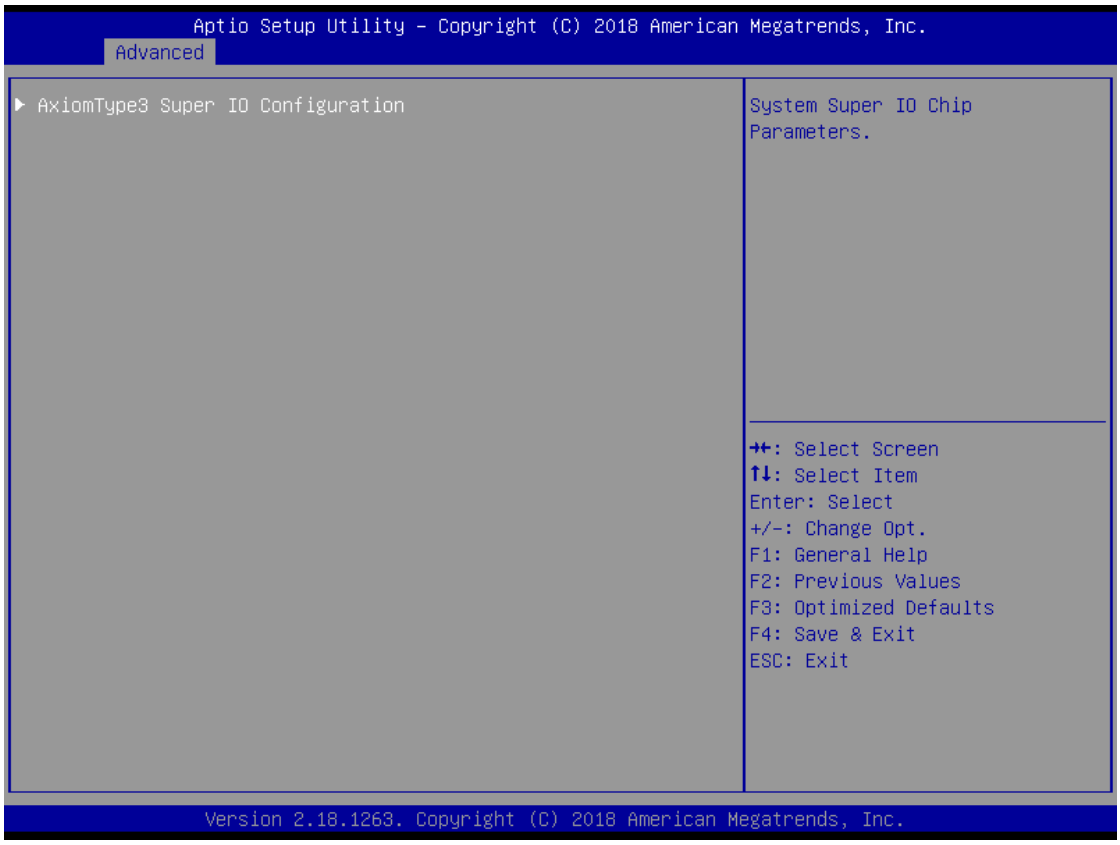


Module Device Configuration

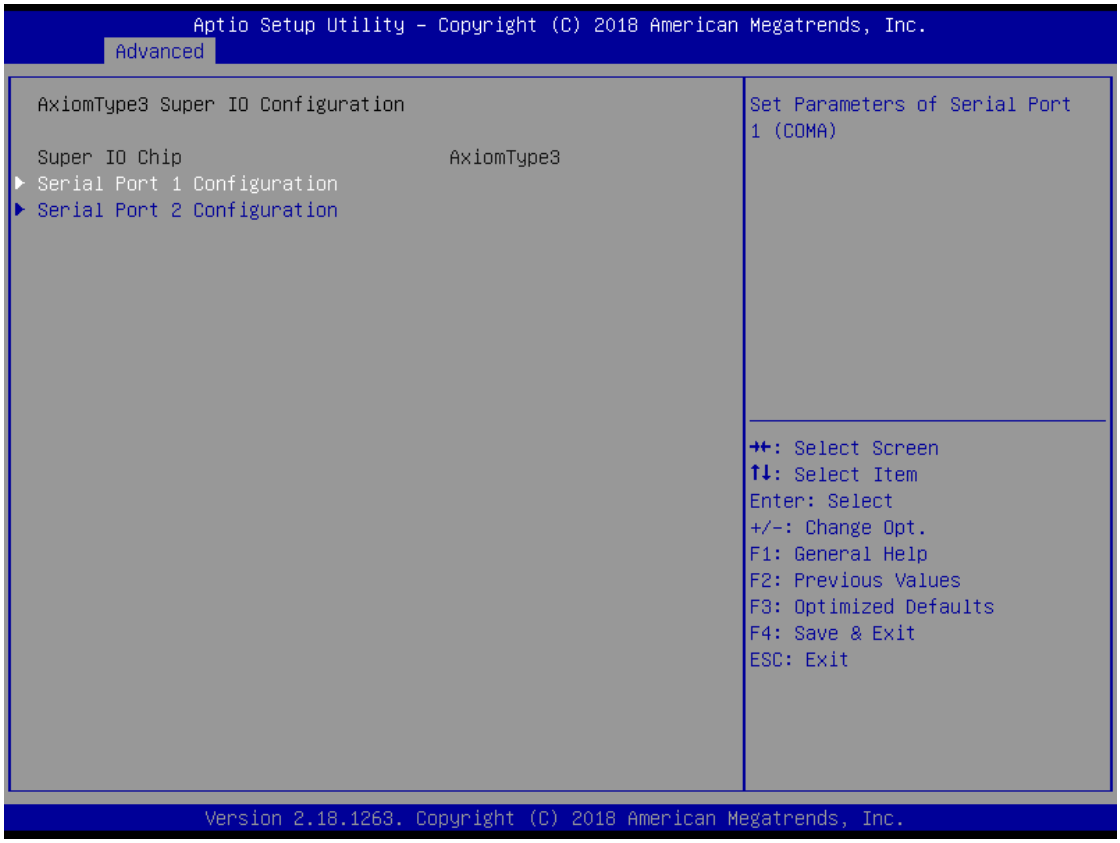
This option appears only if an I/O board is installed CN2 and CN3 (See Section 2.5.1). BIOS will auto-detect all supported functions and you can use it to change settings on the I/O board. The PICO511 supports the following I/O boards: AX93A00, AX93A01, AX93A02 and AX93A09.

Module Device Configuration

This screen is available only if an I/O board with serial ports is connected. For items marked with "►", please press <Enter> for more options.



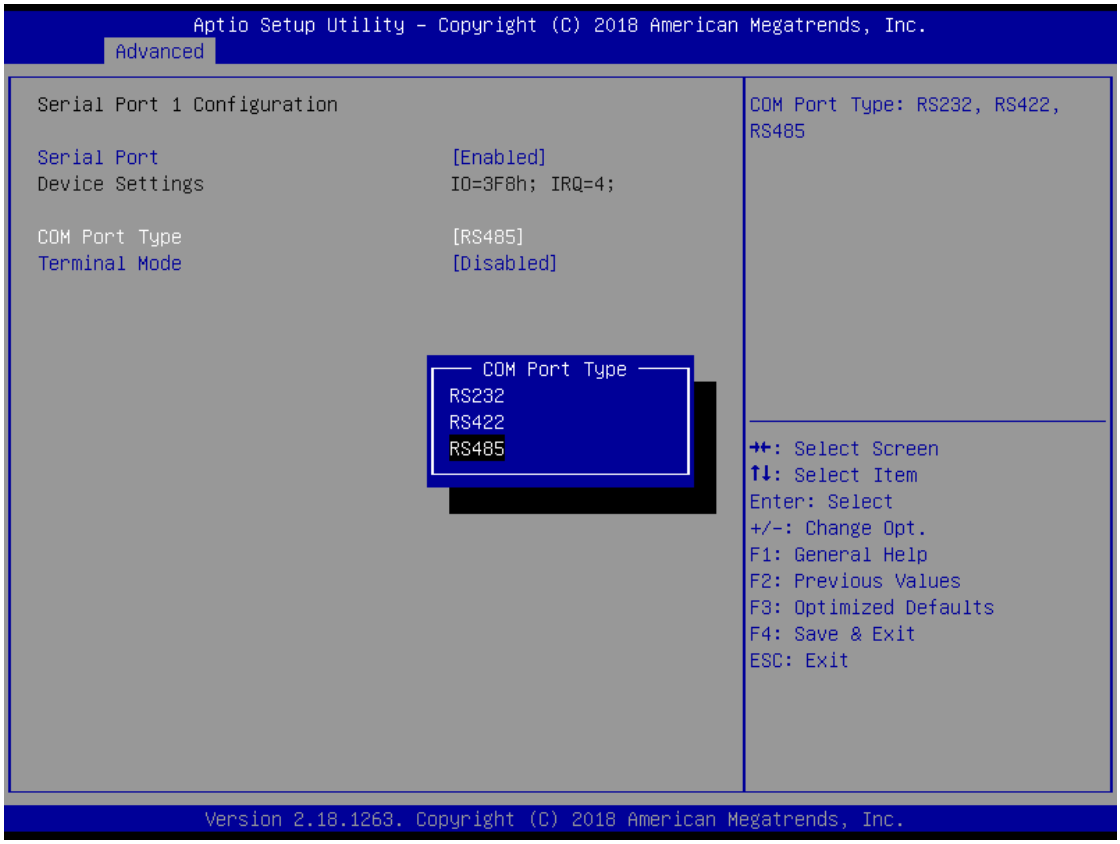
AxiomType3 Super IO Configuration



Serial Port 1~2 Configuration

Set parameters related to serial port 1~2 on I/O board.

Serial Port 1 Configuration



COM Port Type

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

Terminal Mode

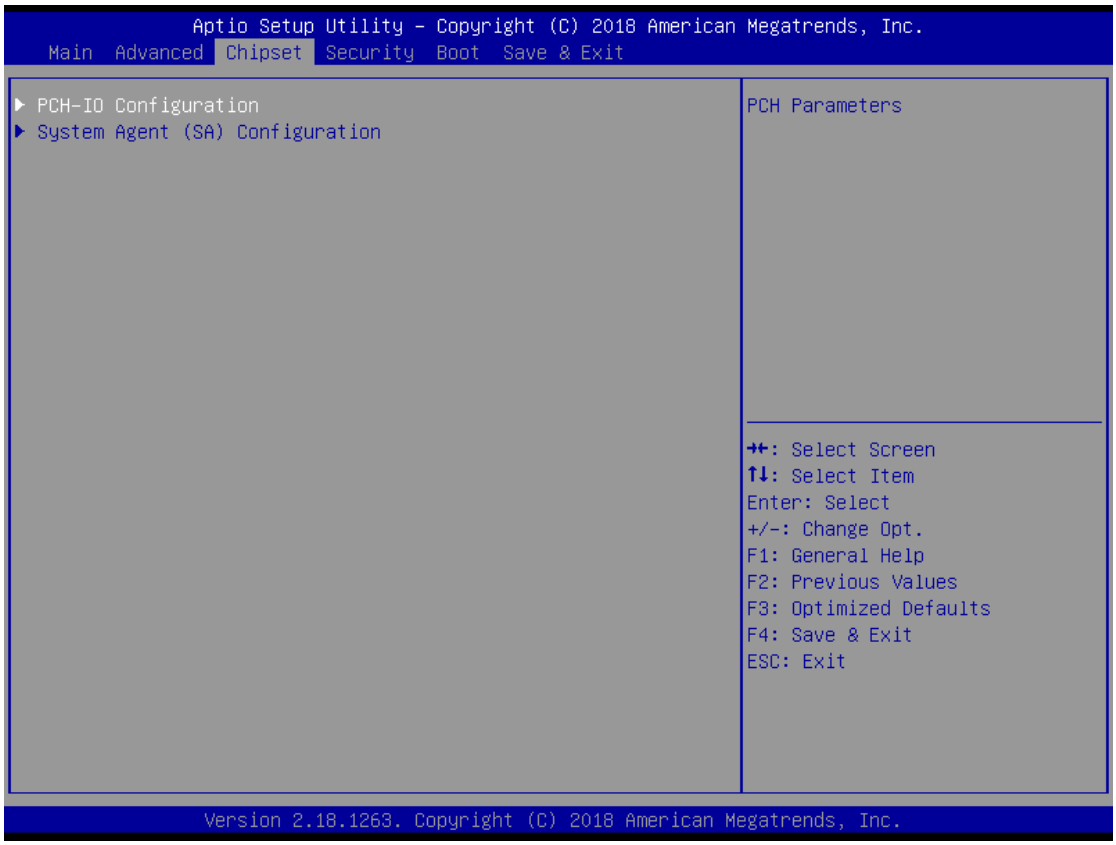
Enable or disable terminal mode.

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:

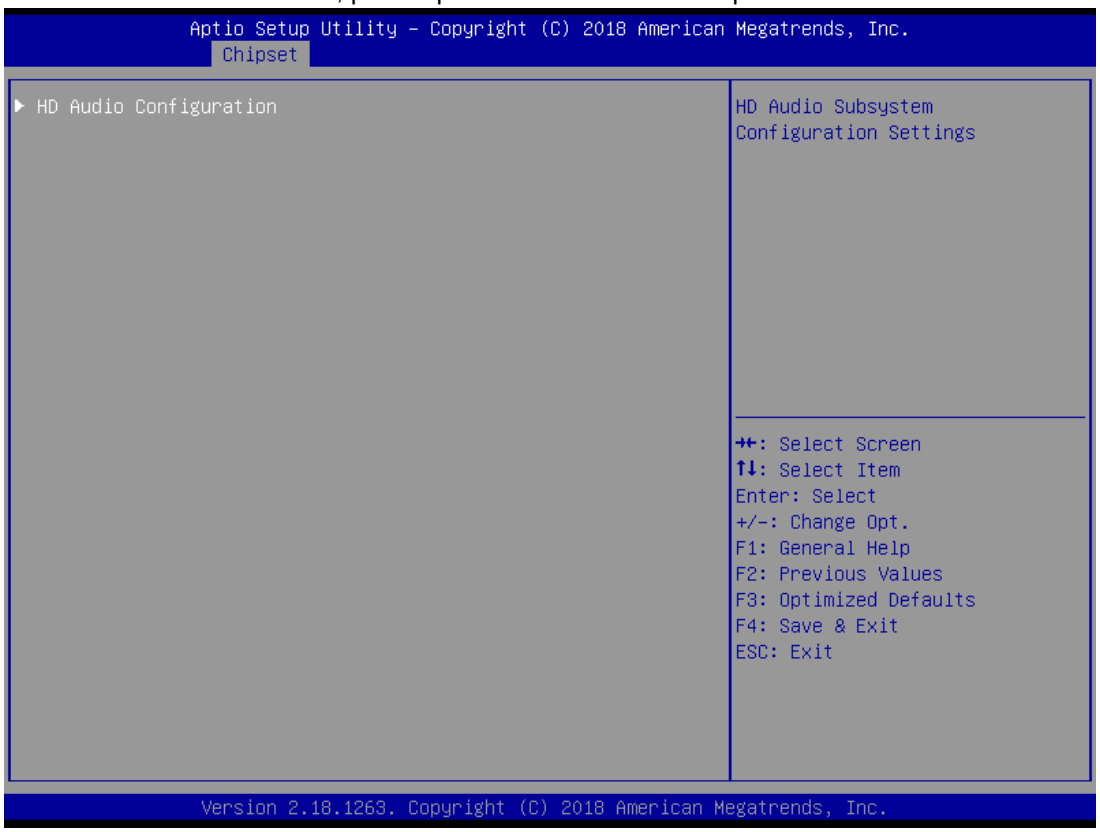
- ► PCH-IO Configuration
- ► System Agent (SA) Configuration

For items marked with "►", please press <Enter> for more options.



HD Audio

For items marked with " ", please press <Enter> for more options.

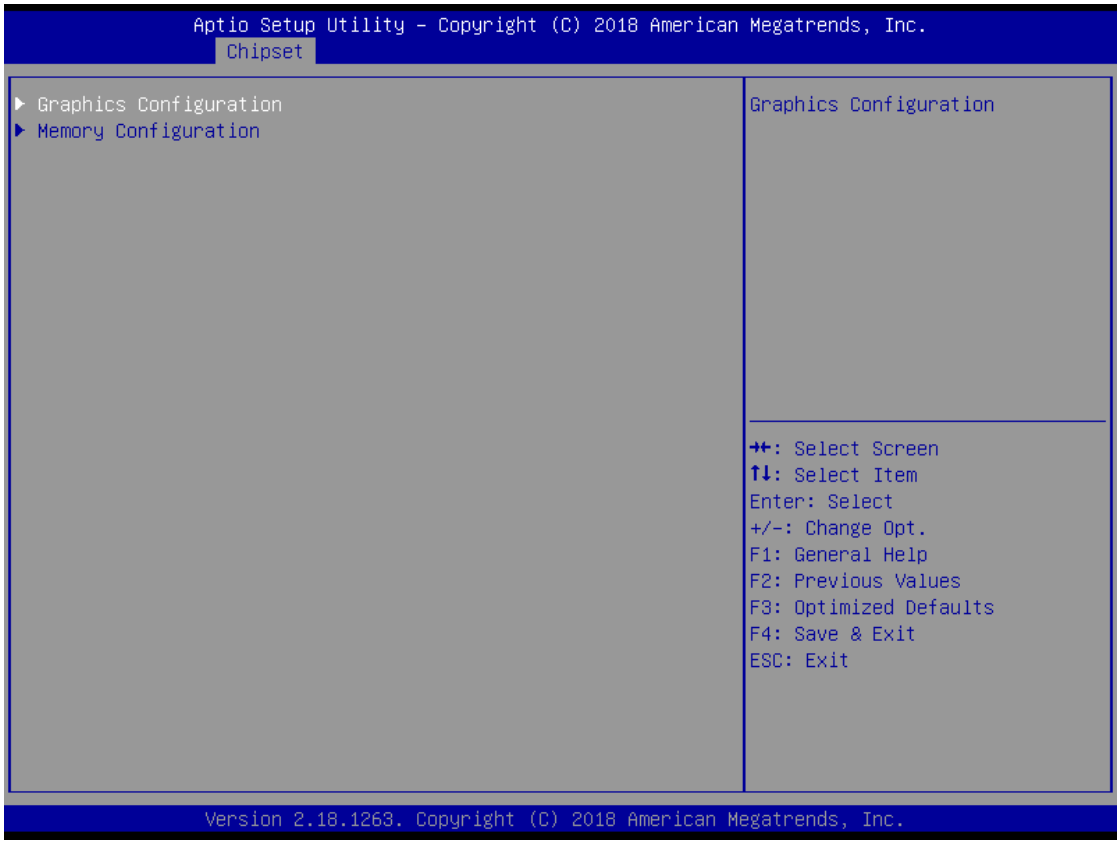


HD Audio Configuration

Use this item to set HD audio configuration.

System Agent (SA) Configuration

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

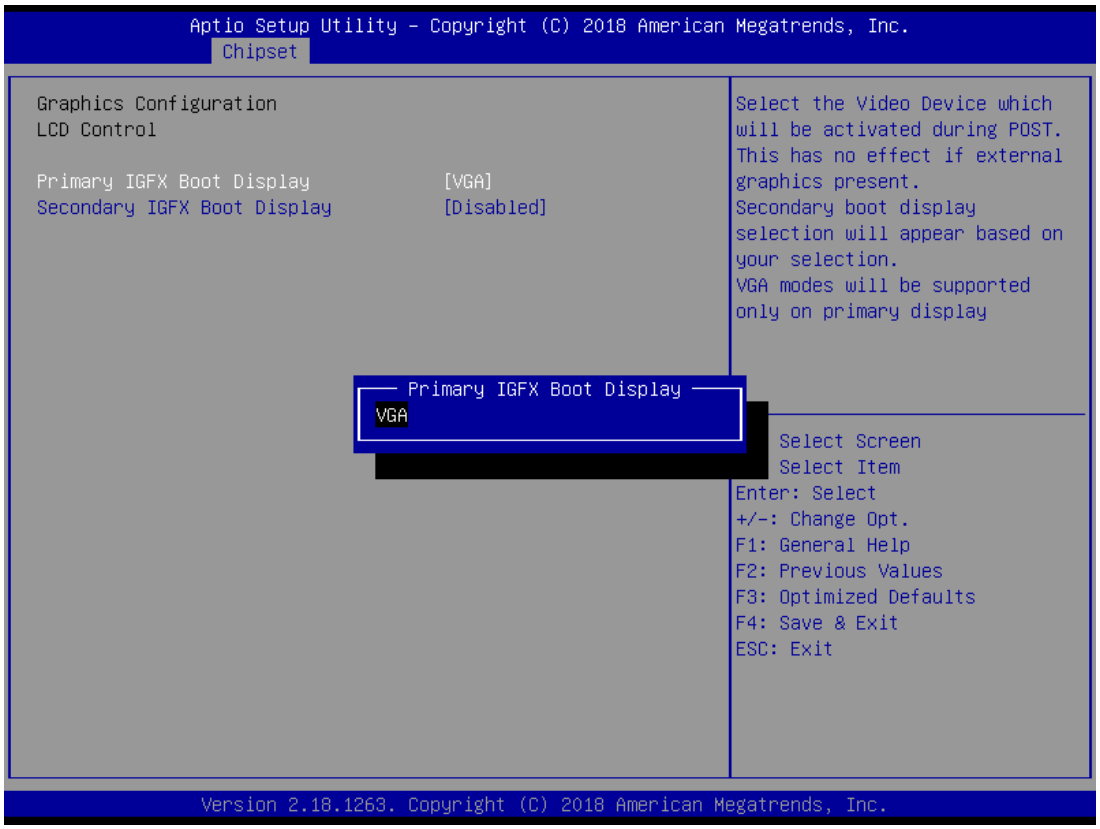


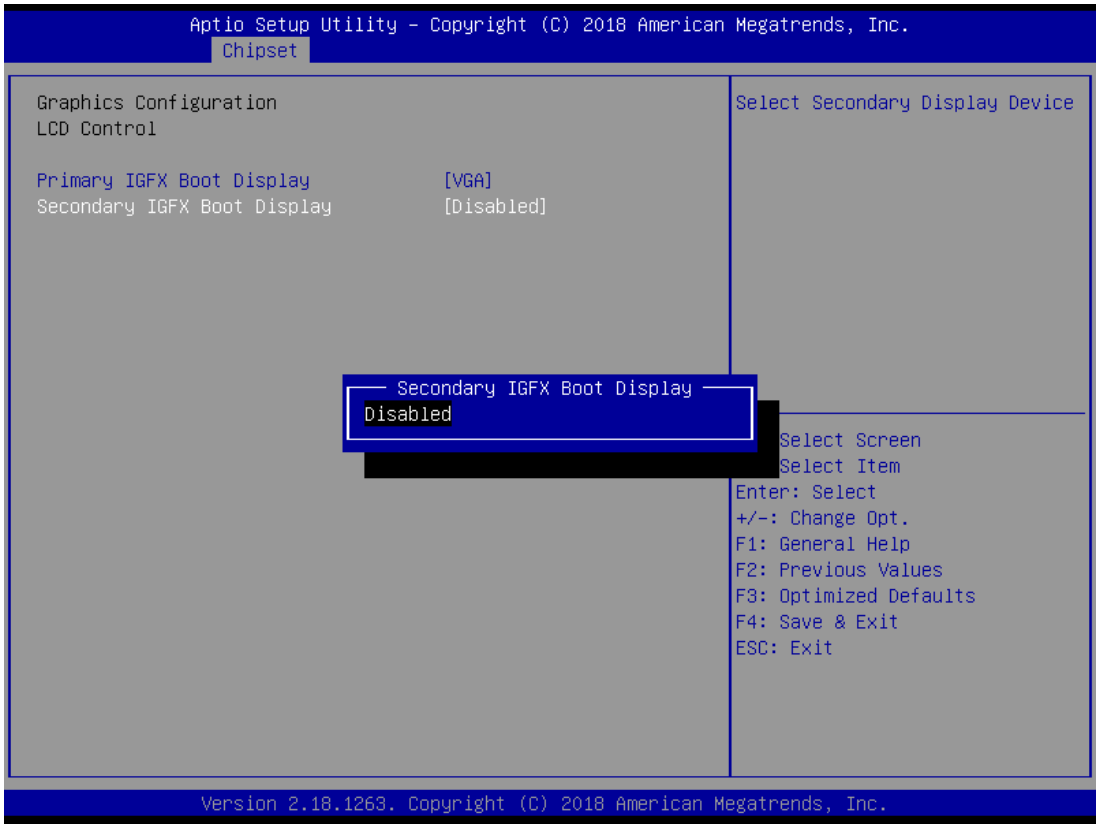
Graphics Configuration

Use this item to open graphics configuration sub screen.

Memory Configuration

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



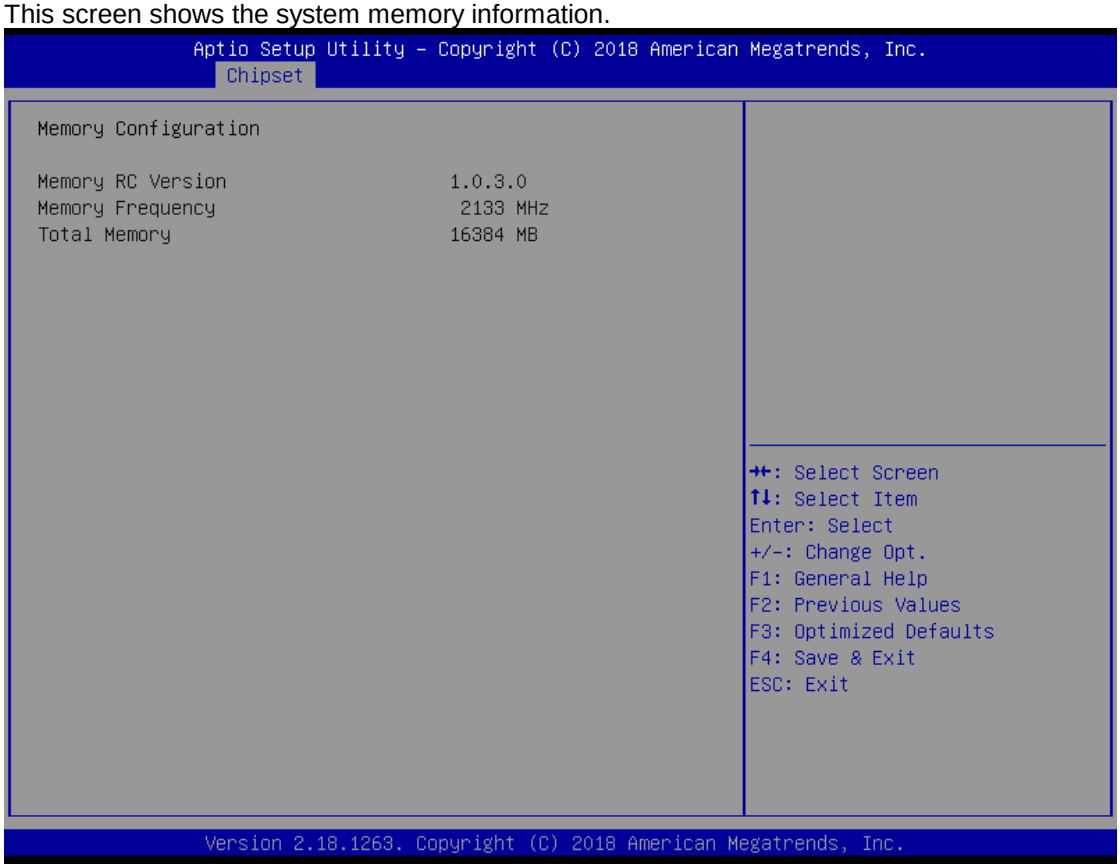


Primary IGFX Boot Display

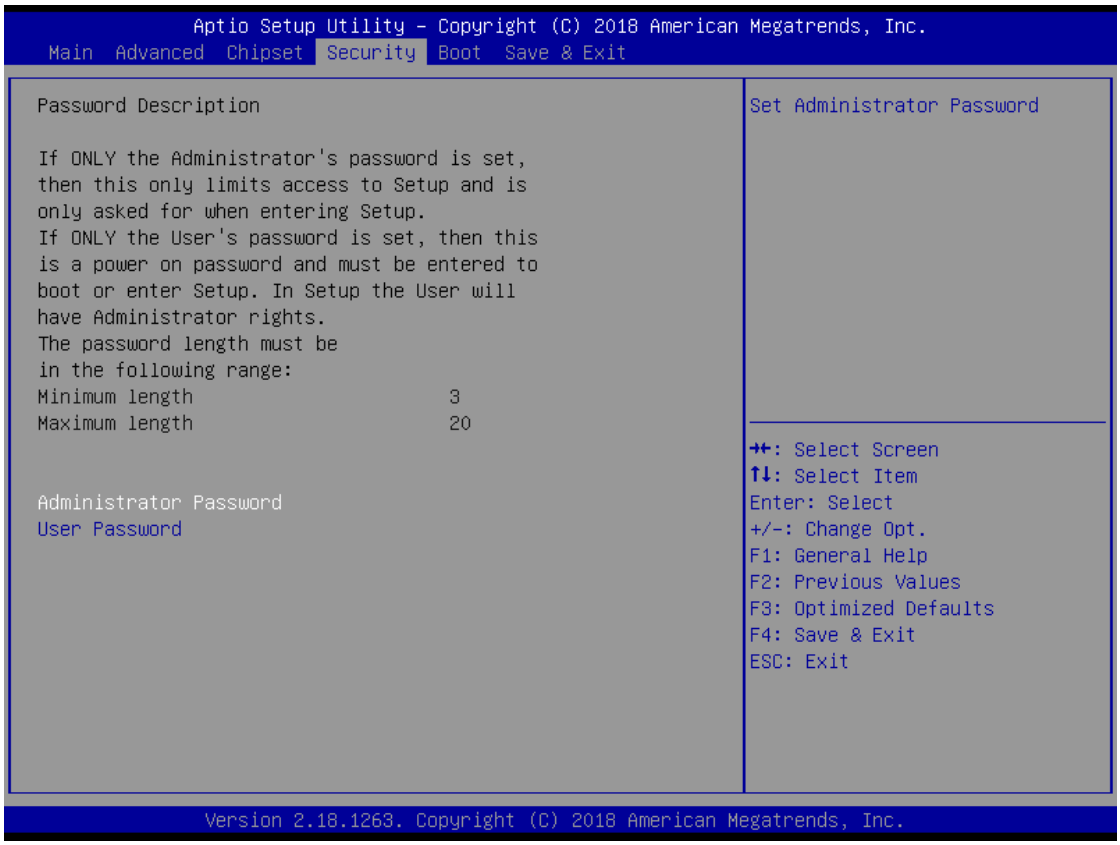
Select the video device which will be activated during POST (Power-On Self Test).

Memory information

This screen shows the system memory information.



Security Menu



Administrator Password

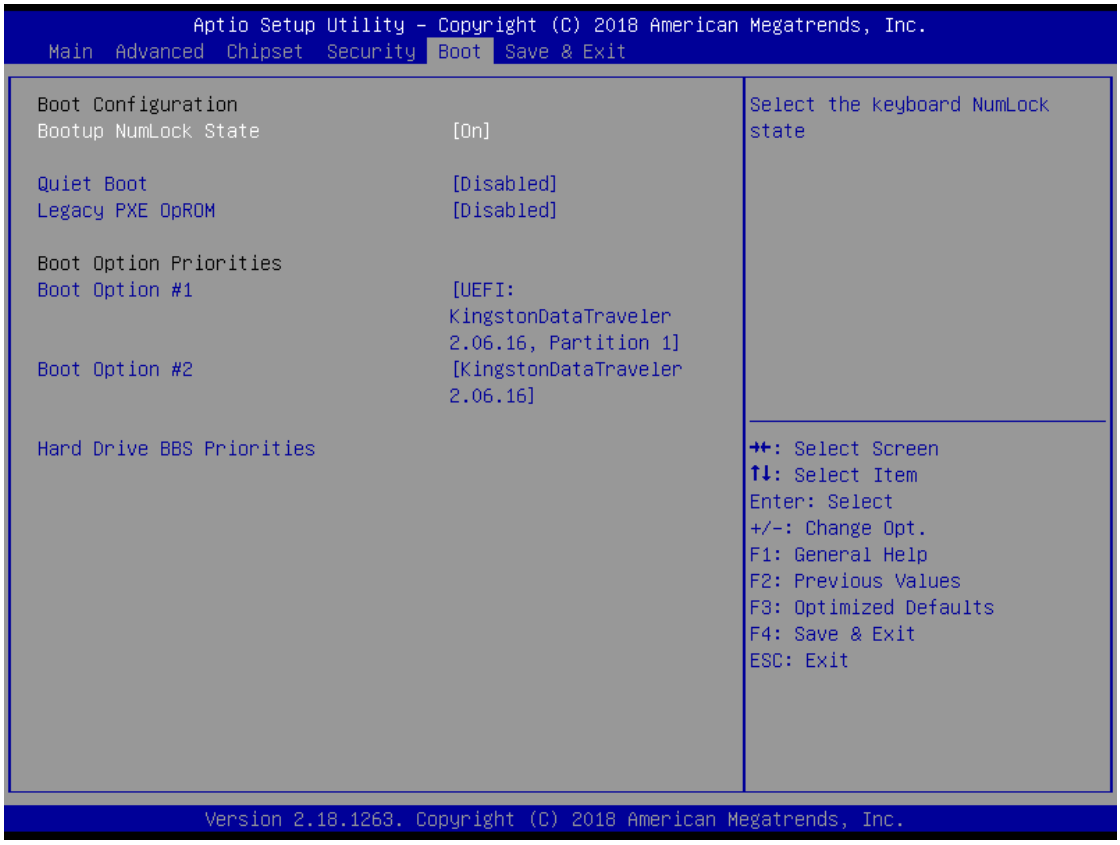
This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

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

4.6 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.

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

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

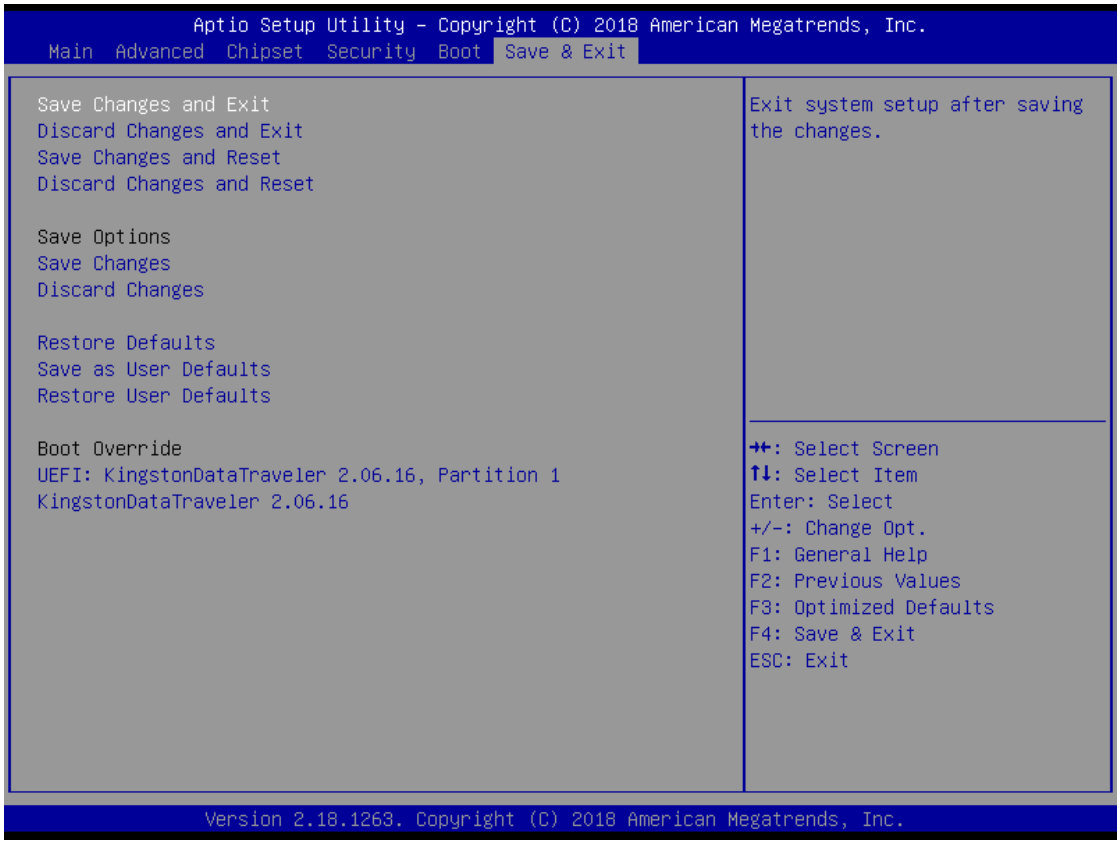
Boot Option Priorities
These are settings for boot priority. Specify the boot device priority sequence from the available devices.

Hard Drive BBS Priorities

These are settings for configuring the order for a specific device group. These options are only visible if at least one device for this group is present.

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

A.1 About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

A.2 How to Use Watchdog Timer

Assembly sample code :

```
movdx,fa10; 5 seconds (Maximum is 65535 seconds; fill in
                        ;   0xFA10   and   0xFA11   register,   ex:
              0xFA11=0x01,
                        ; 0xFA10=0x68 means 360 seconds)
moval,05
outdx,al

movdx,fa12; Enable WDT
moval,01
outdx,al
```

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APPENDIX B
iAMT SETTINGS

The Intel® Active Management Technology (Intel® iAMT) has decreased a major barrier to IT efficiency that uses built-in platform capabilities and popular third-party management and security applications to allow IT a better discovering, healing, and protection their networked computing assets.

In order to utilize Intel® iAMT you must enter the ME BIOS (<Ctrl + P> during system startup), change the ME BIOS password, and then select "Intel® iAMT" as the manageability feature.

B.1 Entering MEBx

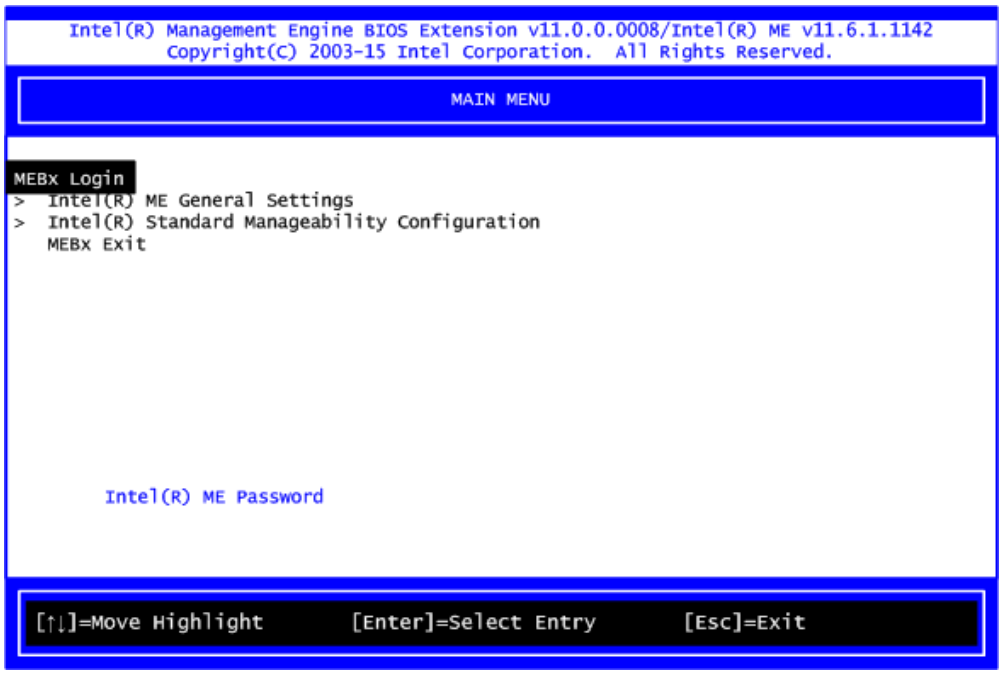
1. Go to BIOS to enable iAMT function (see section 4.4).
2. Exit from BIOS after starting iAMT, and press <Ctrl + P> to enter MEBx Setting.

Note

It is better to press <Ctrl + P> before the screen popping out.

B.2 Set and Change Password

1. You will be asked to set a password when first log in. The default password is "admin".



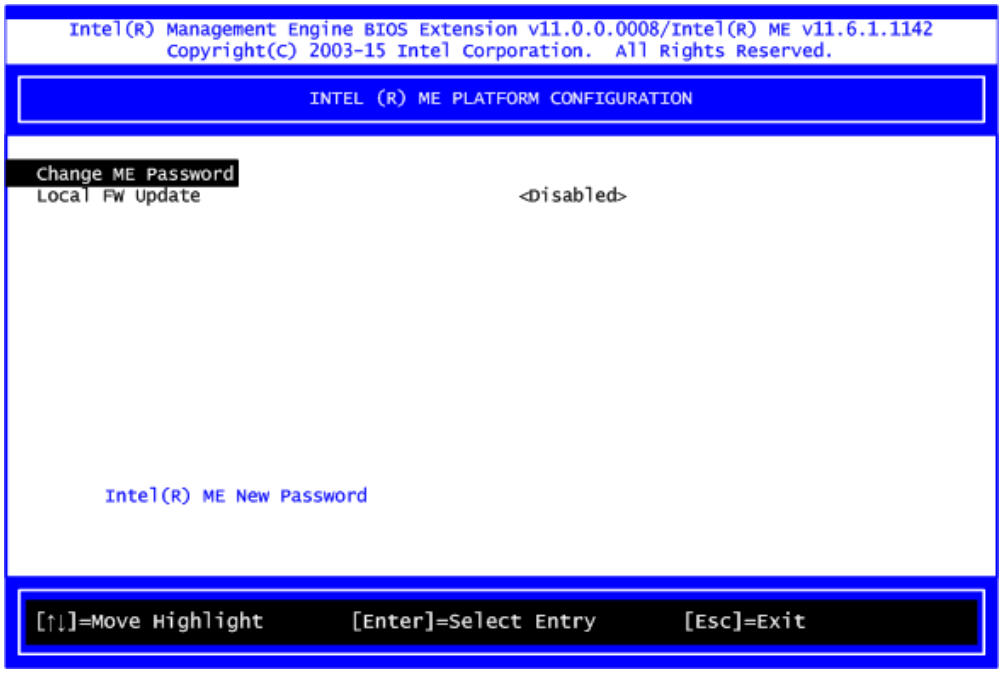
2. You will be asked to change the password before setting ME.

3. You must confirm your new password while revising. The new password must contain: (example: **!!11qqQQ**) (default value).

   - Eight characters
   - One upper case
   - One lower case
   - One number
   - One special symbol, such as ! 、$ or ; 、(、" , excepted)

   Underline (_) and space are valid characters for password, but they won't make higher complexity.

4. From Main Menu, select ME General Settings to get into ME Platform Configuration screen. In this screen you can modify Local FW Update setting.

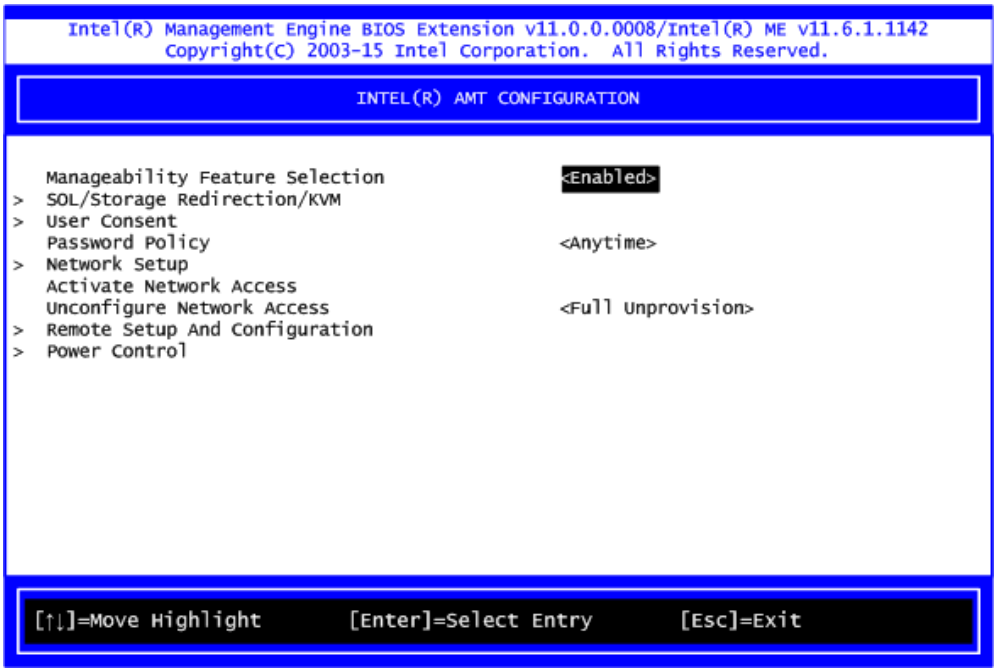


5. Return to Main Menu.

B.3 iAMT Configuration

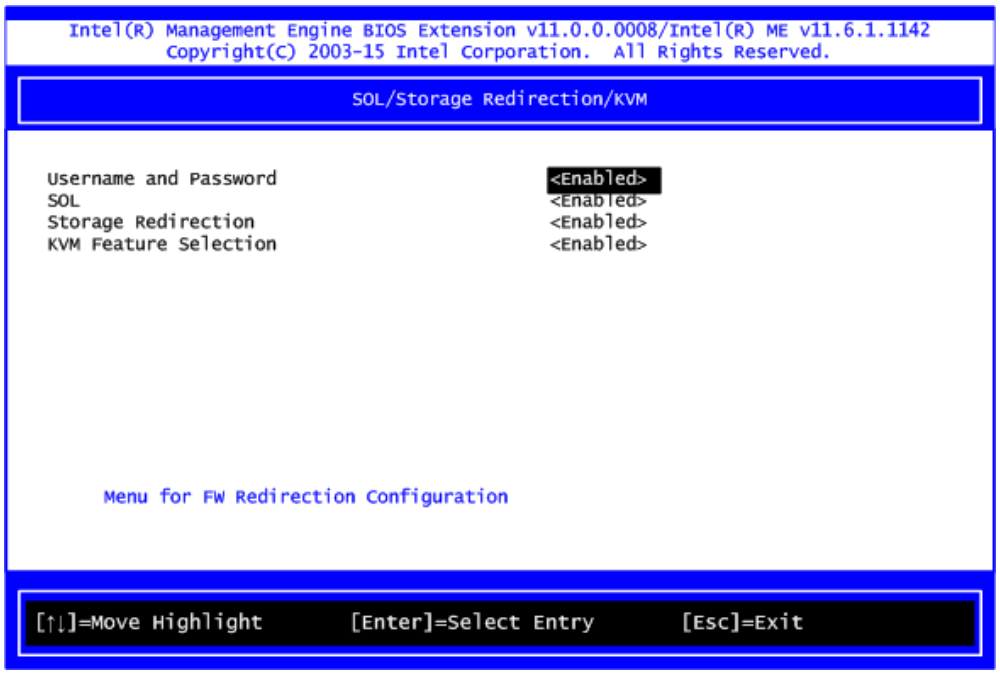
1. From Main Menu, select Intel® Standard Manageability Configuration and press <Enter>.

2. Set Manageability Feature Selection to Enabled.

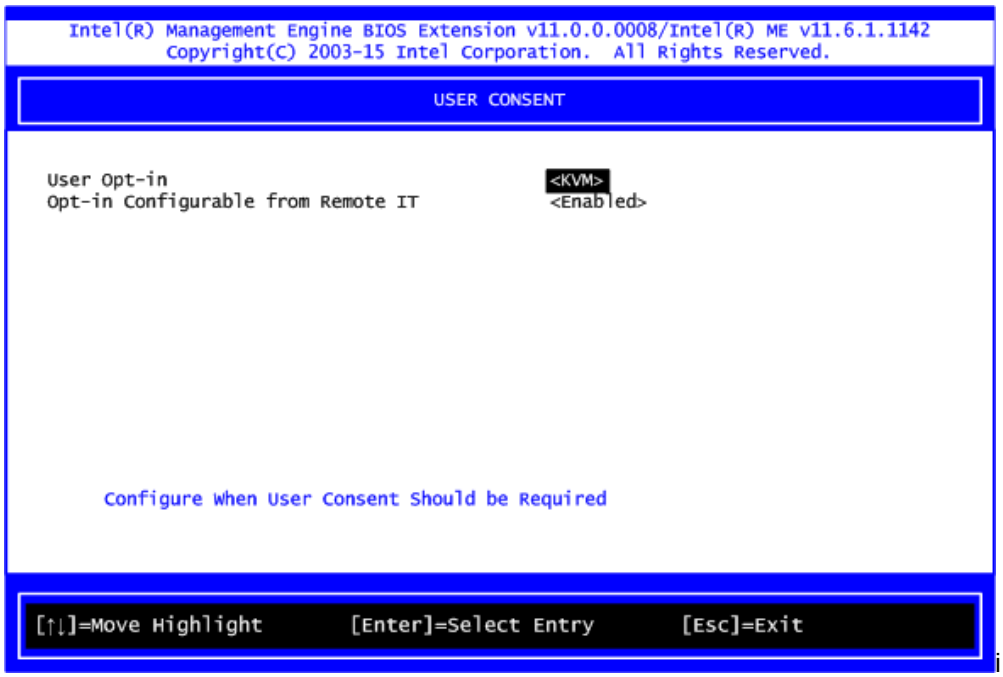


- **SOL/Storage Redirection/KVM**

  This screen is for enabling or disabling Serial-over-LAN (SOL)/Storage Redirection/Keyboard Video Mouse (KVM) functionality.



- **User Consent**



i

User Opt-in

Configure this item when user consent should be required.

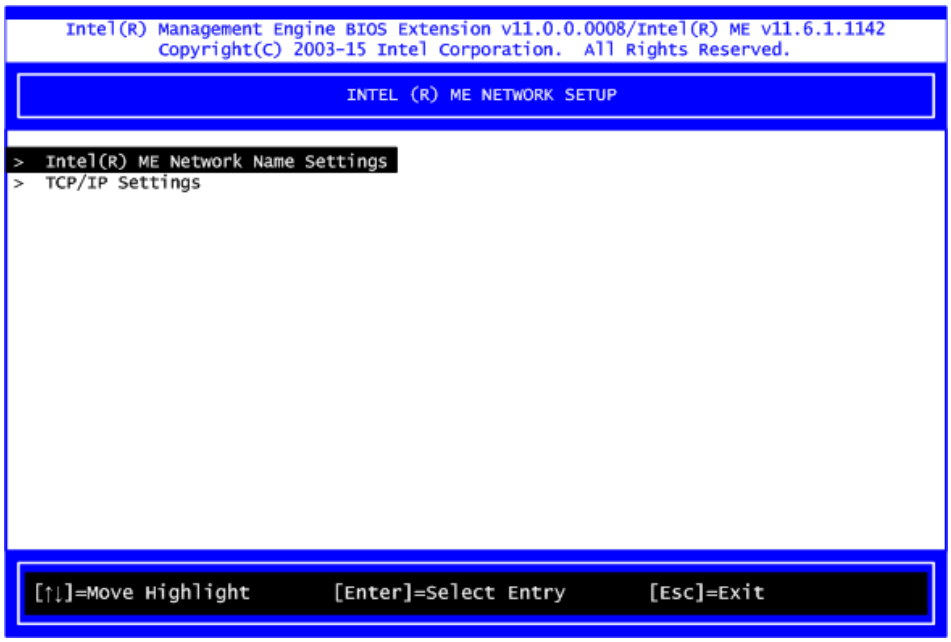
Opt-in Configurable from Remote IT

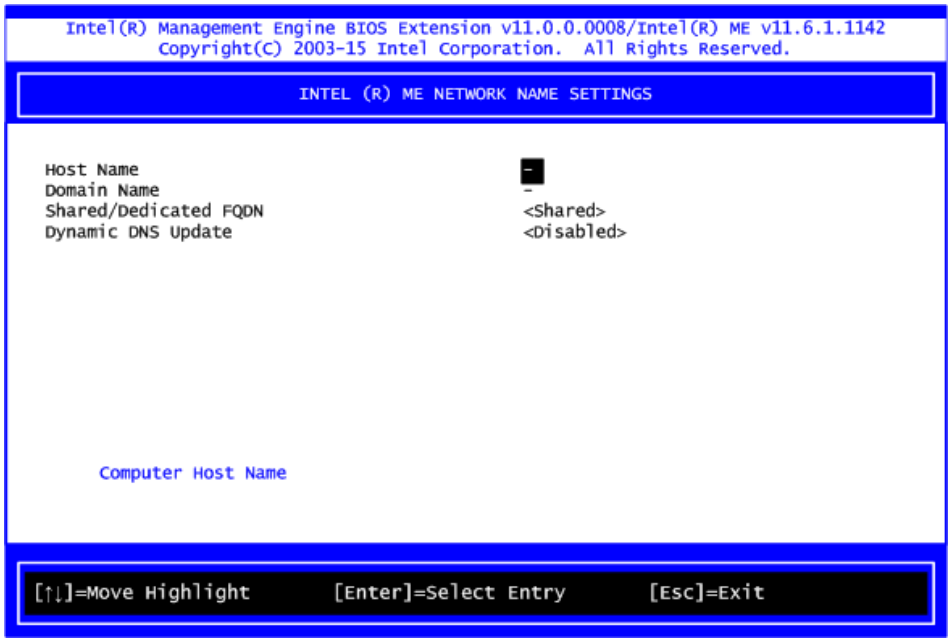
Enable or disable remote change capability of user consent feature.

- **Network Setup**

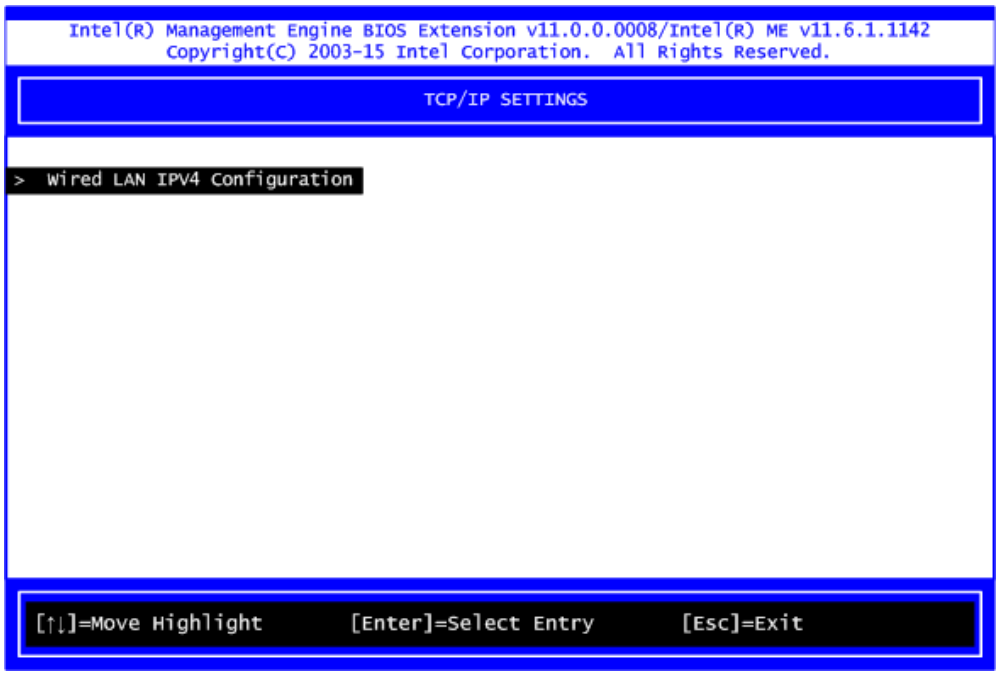
1.From Intel® AMT Configuration Menu, select Network Setup.

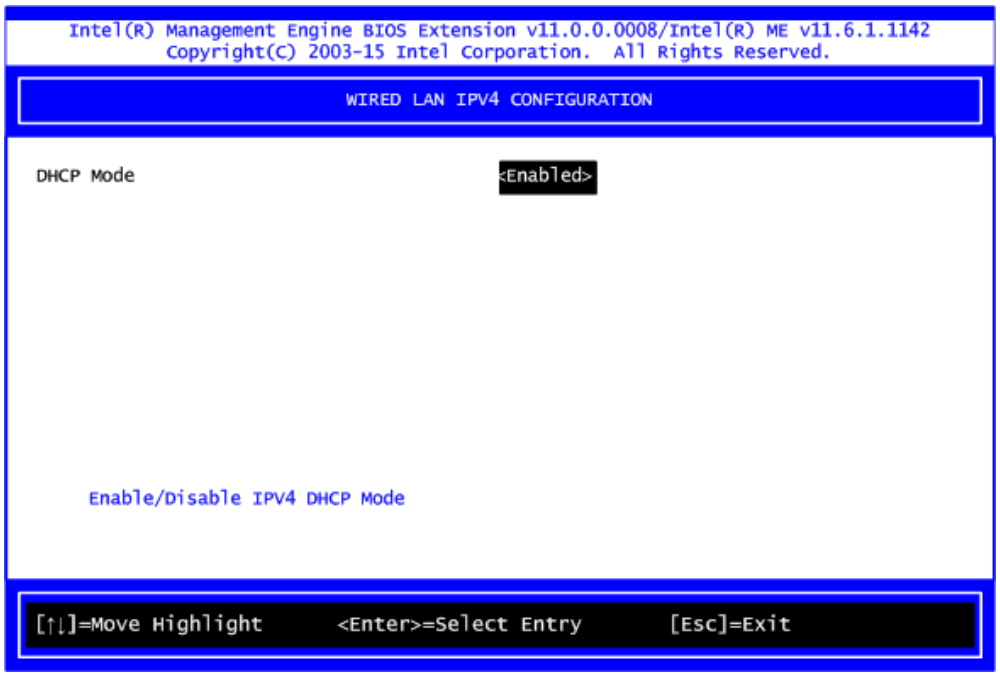
2.Select ME Network Name Settings to set computer host and domain name.





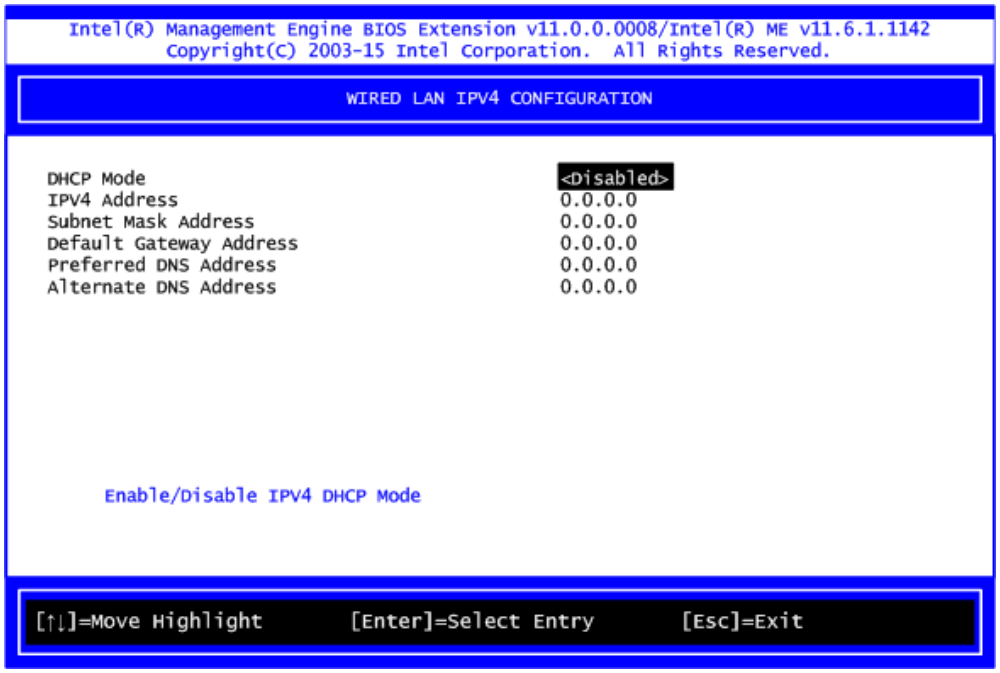
3.Select TCP/IP to get into Network interface. Get into DHCP Mode and set it to Disabled.



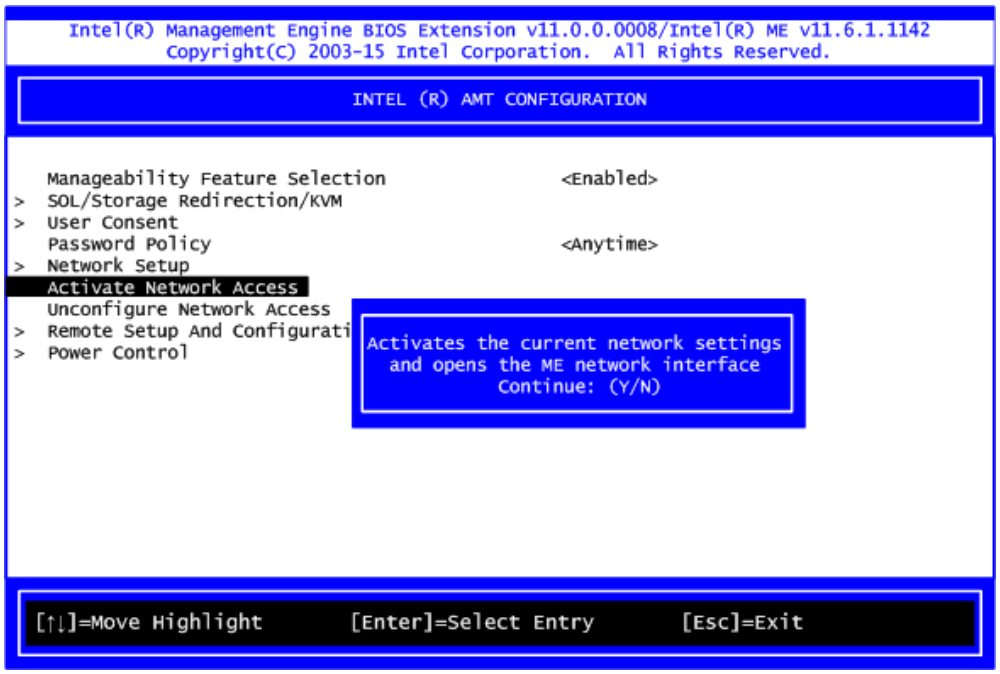


4.If DHCP Mode is disabled, set the following settings:

- ●IP address
- ●Subnet mask

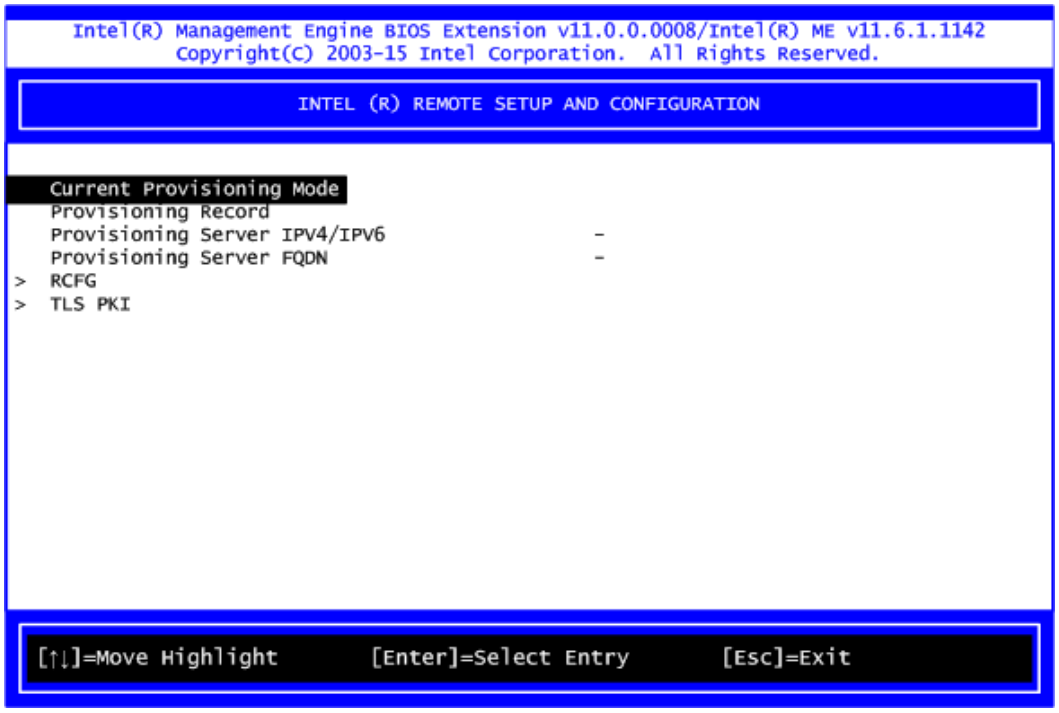


5.Go back to Intel® iAMT Configuration, then select Activate Network Access and press <Enter>.

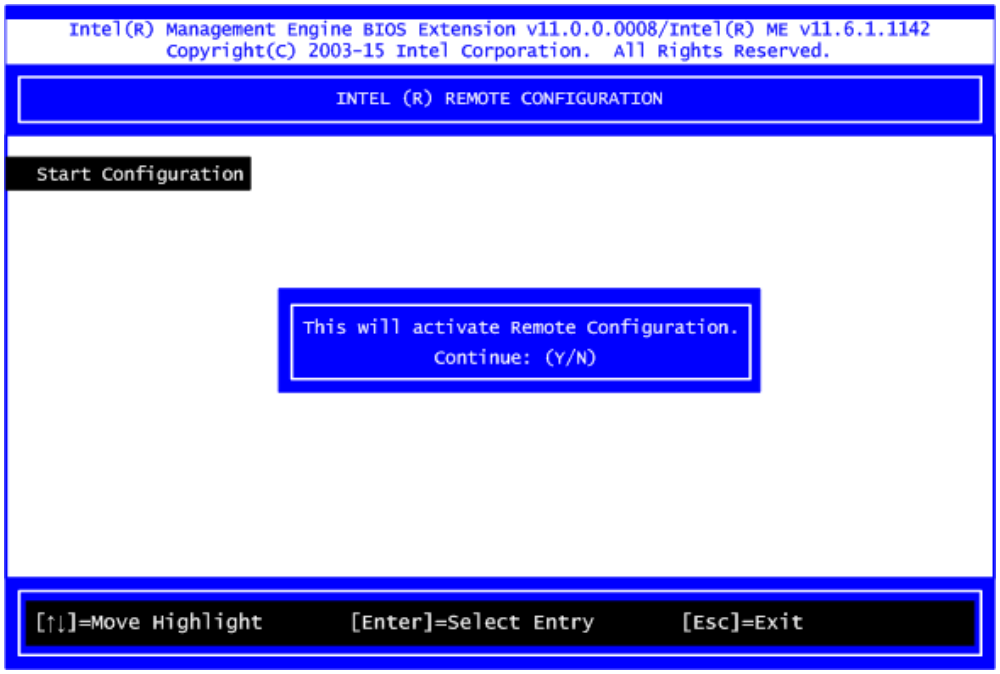


6.Exit from MEBx after completing the iAMT settings.

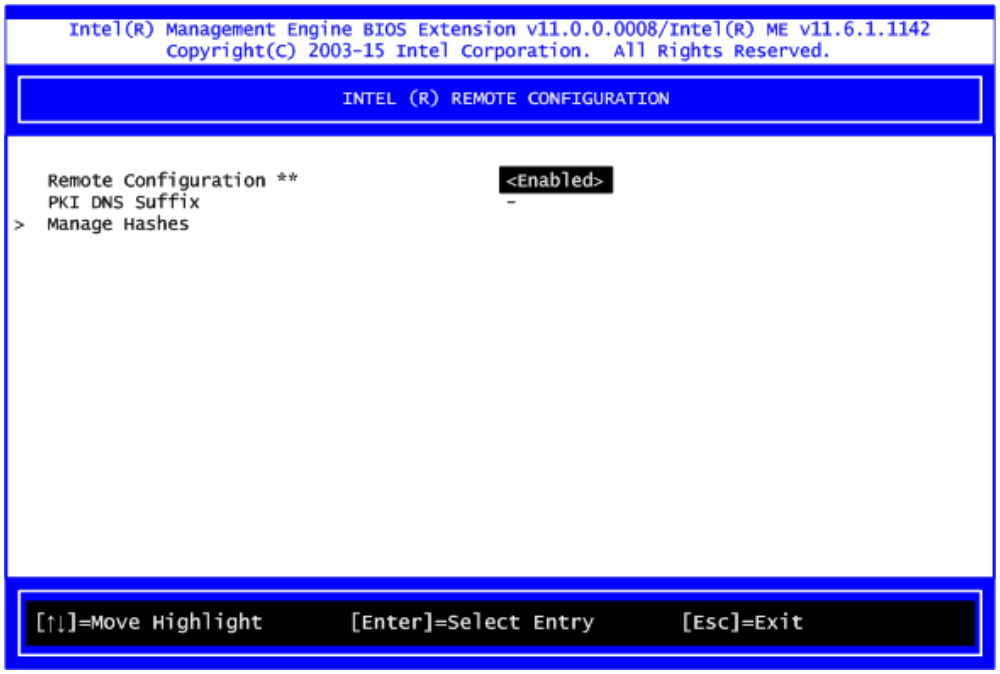
- **Remote Setup and Configuration**

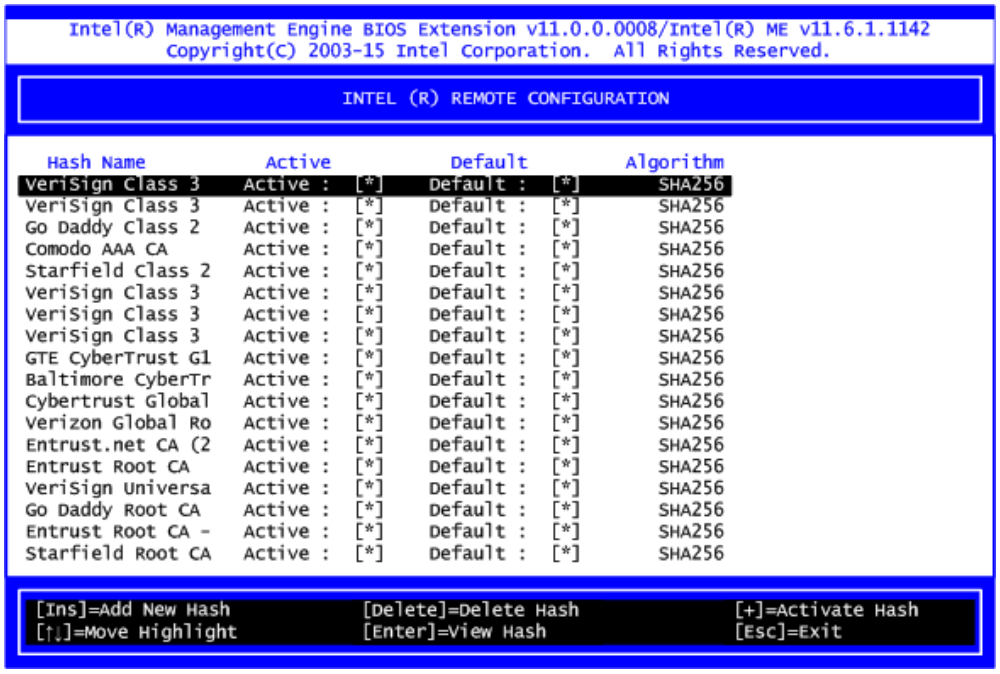


1.Select TLS PKI to get into remote configuration screen. Then select Start Configuration to activate it.

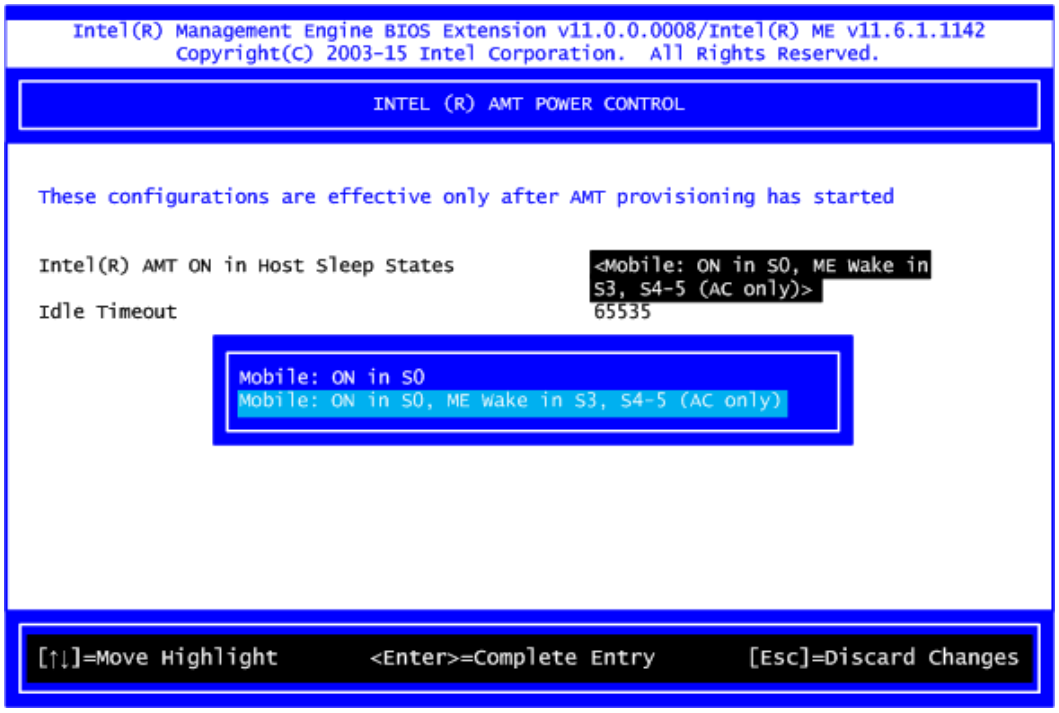


2.Select Manage Hashes to add, delete and activate hash.





- **Power Control**



AMT ON in Host Sleep States

Select the appropriate AMT ON in Host Sleep States setting. Options are ON in S0 and ON in S0, ME Wake in S3, S4-5 (AC only).

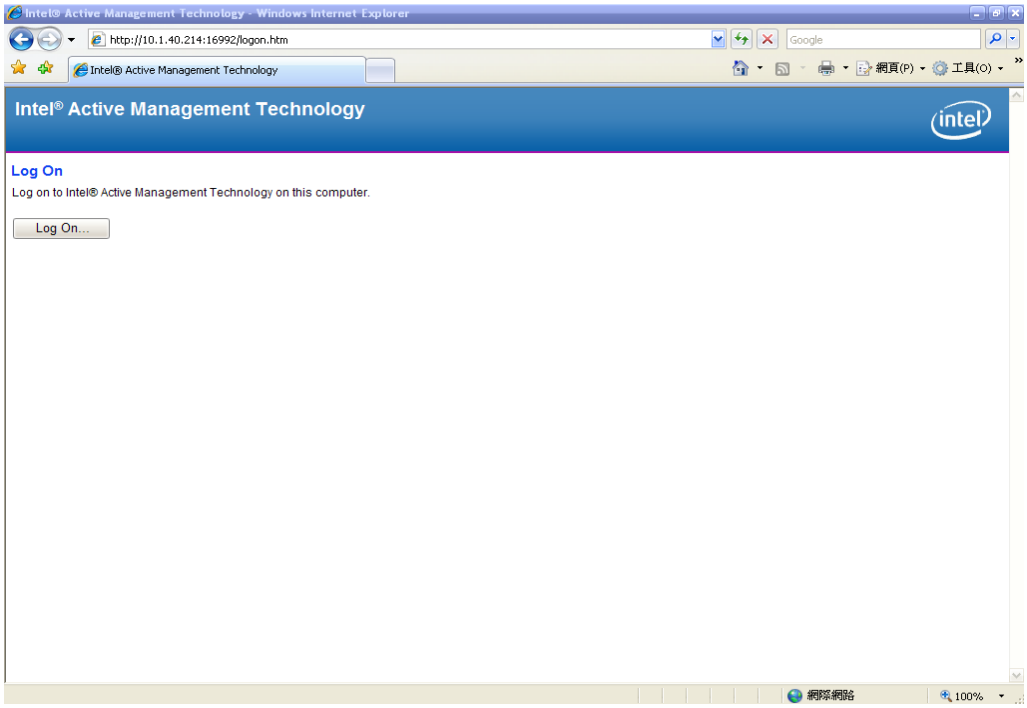
Idle Timeout

This is timeout value for Wake_On_ME in minutes. It must be set to a non-zero value.

B.4 iAMT Web Console

1. From a web browser, please type http://(IP ADDRESS):16992, which connects to iAMT Web.

   Example: http://10.1.40.214:16992

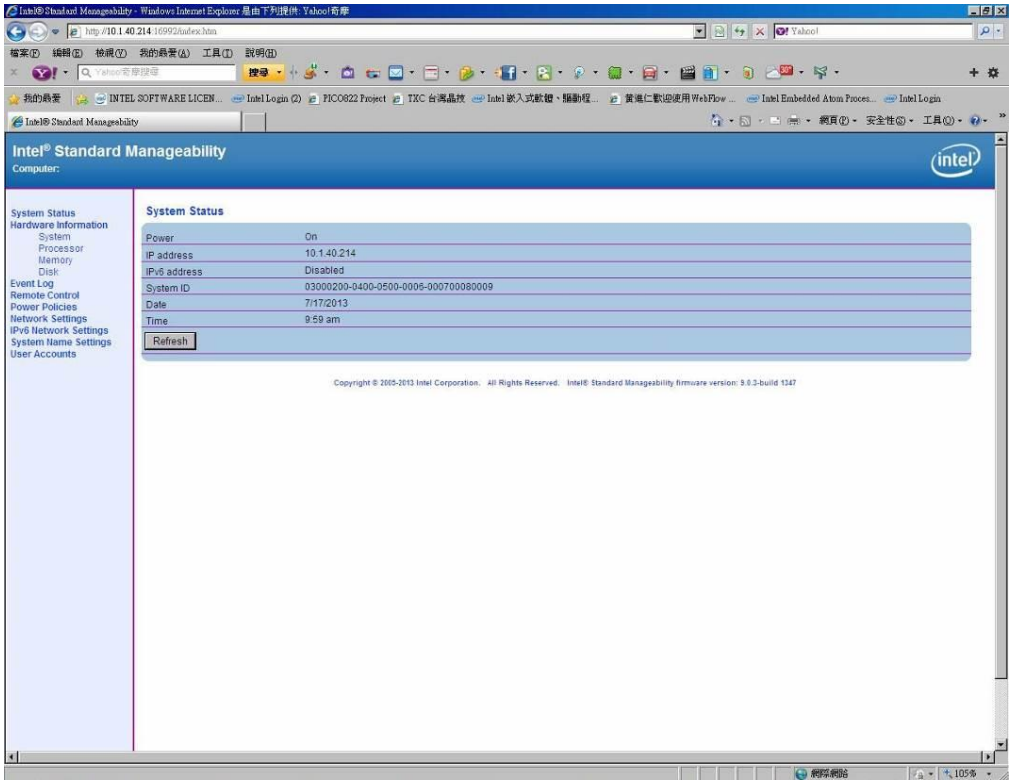


2. To log on, you will be required to type in username and password for access to the Web.

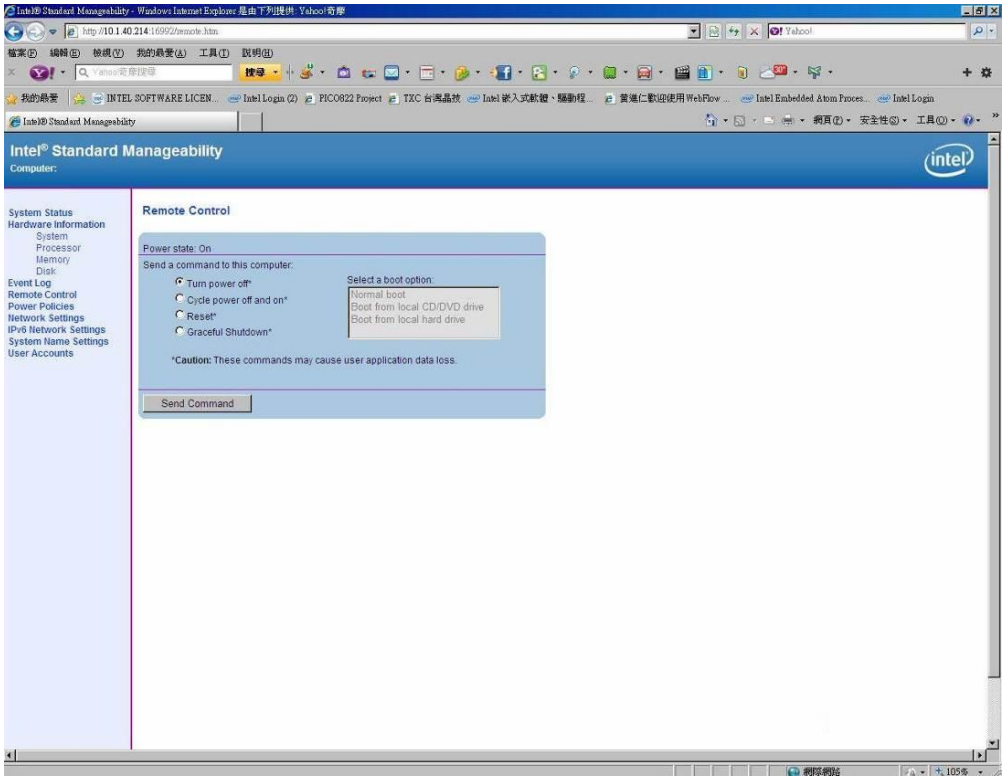
   USER: admin (default value)

   PASS: (MEBx password)

3. Enter the iAMT Web.



4. Click Remote Control, and select commands on the right side.

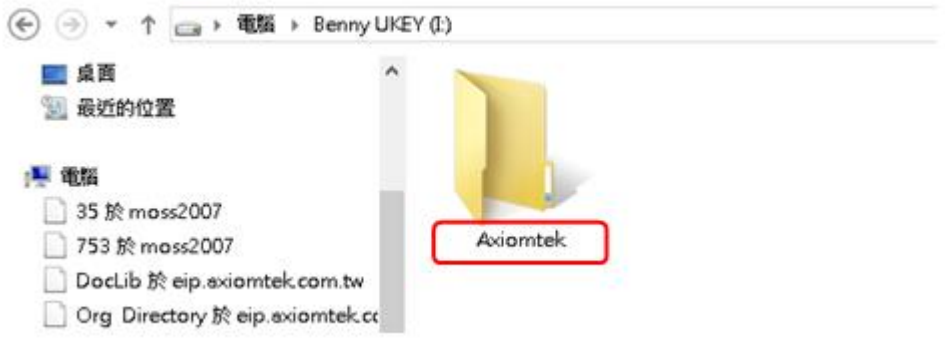


5. When you have finished using the iAMT Web console, close the Web browser.

APPENDIX C
BIOS Flash Utility

The BIOS Flash utility is a new helpful function in BIOS setup program. With this function you can easily update system BIOS without having to enter operating system. In this appendix you may learn how to do it in just a few steps. Please read and follow the instructions below carefully.

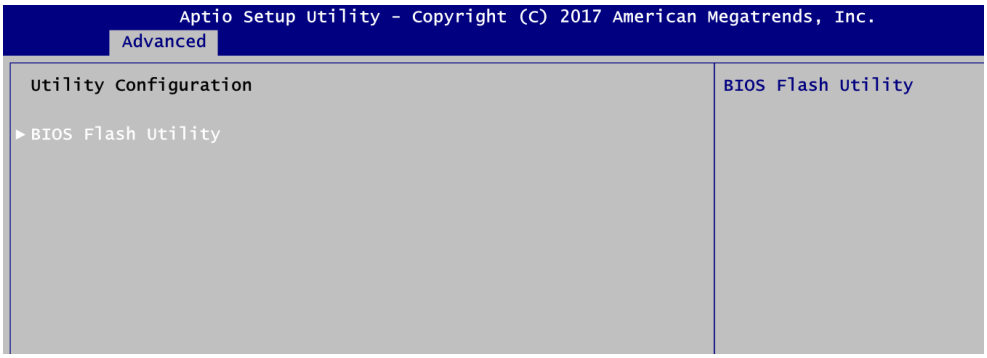
1. In your USB flash drive, create a new folder and name it "Axiomtek", see figure below.



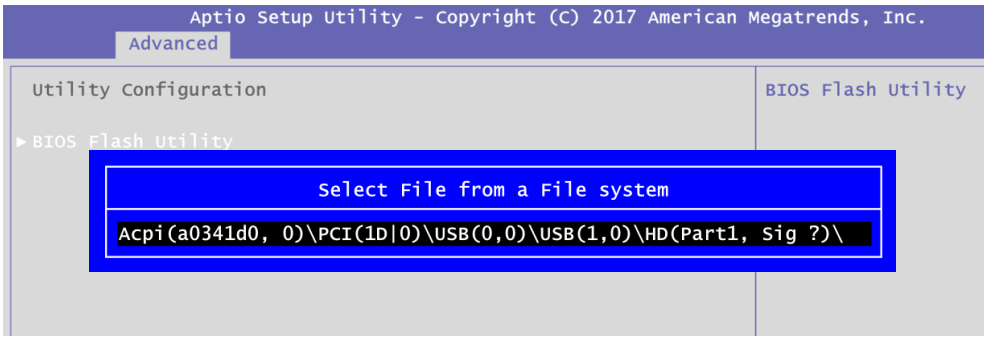
2. Copy BIOS ROM file (e.g. PICO511.005) to "Axiomtek" folder.

3. Insert the USB flash drive to your system.

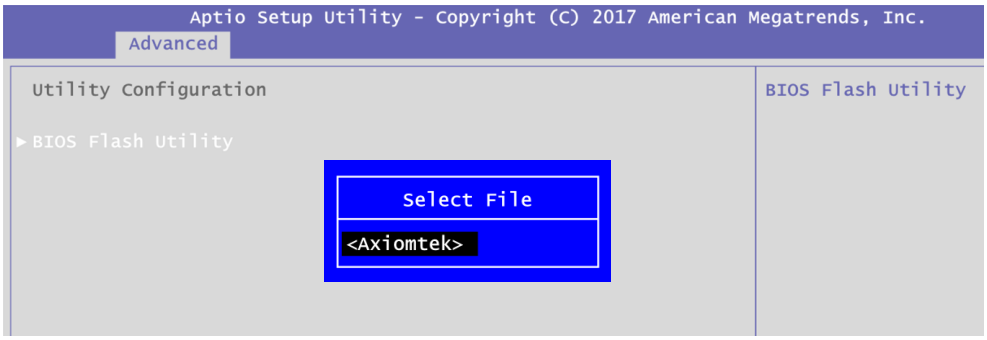
4. Enter BIOS setup menu and go to Advanced\Utility Configuration. Select BIOS Flash Utility and press <Enter>.



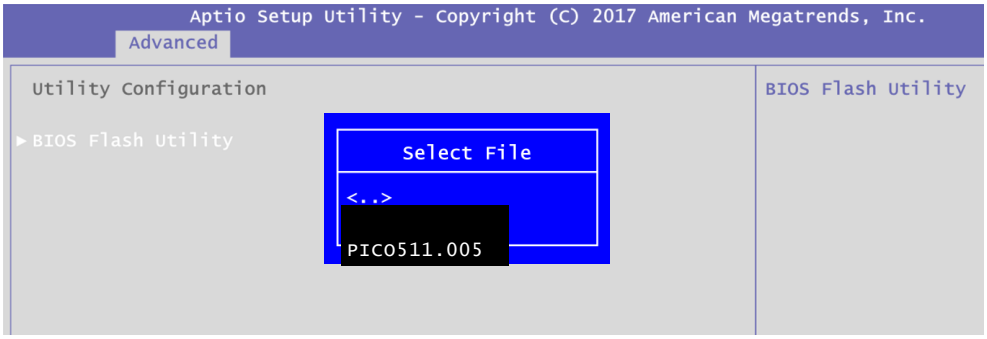
5. BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.



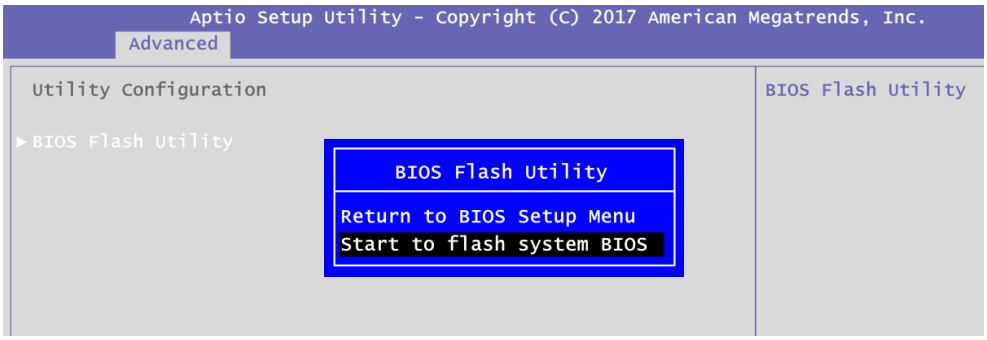
6. Select the USB drive containing BIOS ROM file you want to update using the <↑> or <↓> key. Then press <Enter> to get into "Axiomtek" folder.



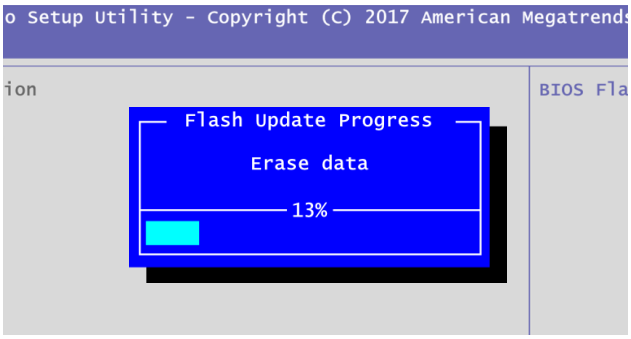
7. Now you can see the BIOS ROM file on the screen, press <Enter> to select.

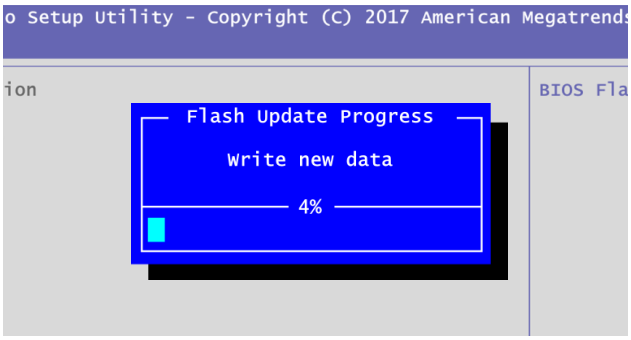


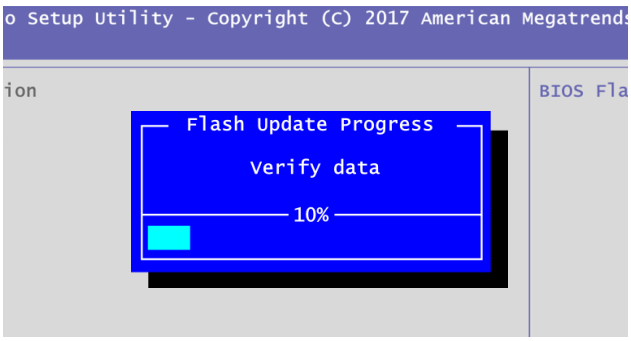
8. Select Start to flash system BIOS option to begin updating procedure.



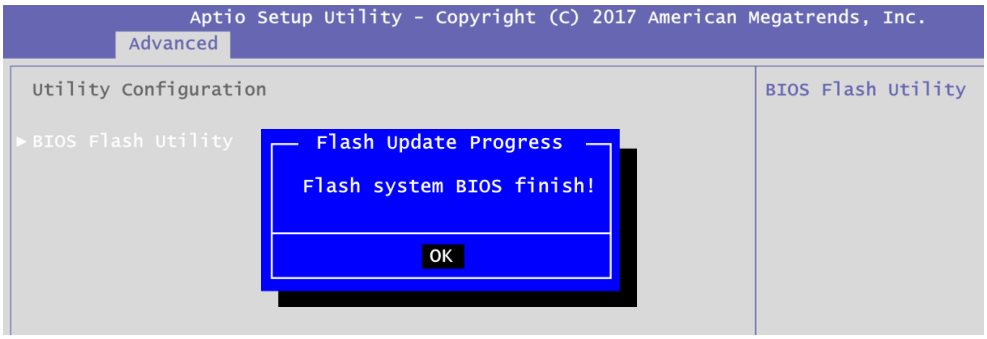
9. Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.







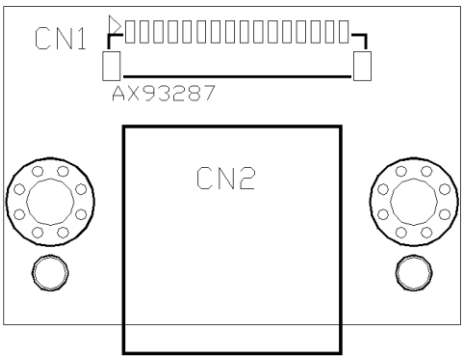
10. When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.



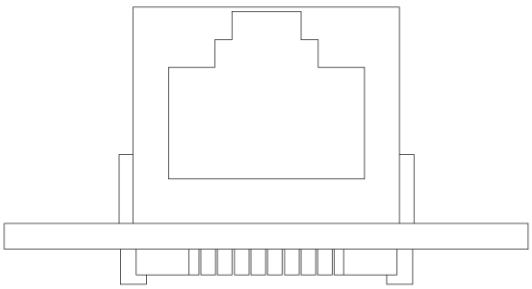
APPENDIX D
IO BOARD

The AX93287/AX93A00 is an I/O expansion board which is suggested to attach carefully to PICO511. Its specifications and detailed information are given in this appendix.

AX93287 TOP View



AX93287 Side View

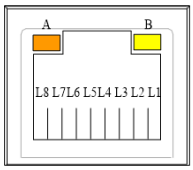


Ethernet Connector from AX93287 (CN1)

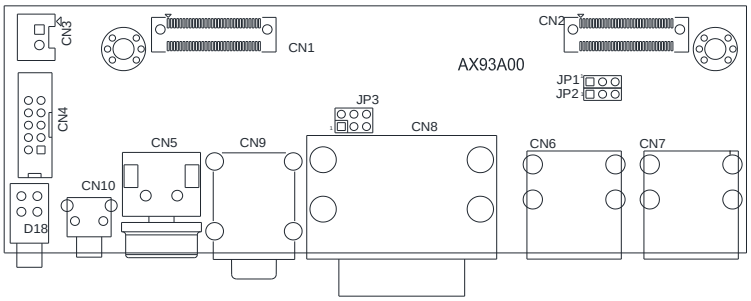
Pins	Signals	Pins	Signals
1	100_LAN_LED	9	MDI1-
2	1000_LAN_LED	10	MDI1+
3	NC	11	NC
4	MDI3-	12	MDI0-
5	MDI3+	13	MDI0+
6	NC	14	NC
7	MDI2-	15	LINK_ACT
8	MDI2+	16	VDD3

Note: ***CN1 is suggested to connect CN3 on AX92902 via LAN cable.***

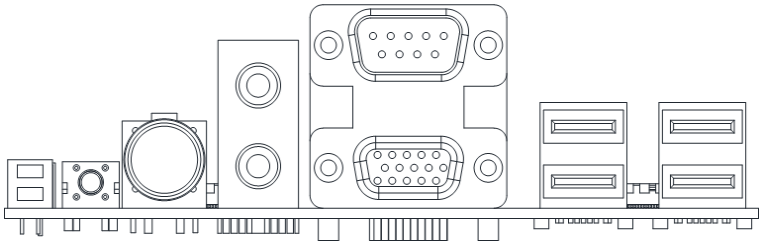
Pins	Signals	Pins	Signals
L1	MDI0+	L5	MDI2+
L2	MDI0-	L6	MDI2-
L3	MDI1+	L7	MDI3+
L4	MDI1-	L8	MDI3-
A	100 LAN LED (Green) / 1000 LAN LED (Orange)		
B	Active LED (Yellow)		



AX93A00 TOP View



AX93A00 side view

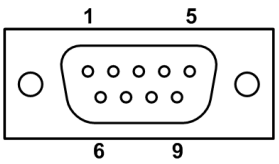


AX93A00

Jumpers	Descriptions		Settings
JP1	USB port 0 and 1 Power Selection	+5V_SBY (Default)	1-2 Close
		+5V	2-3 Close
JP2	USB port 2 and 3 Power Selection	+5V_SBY (Default)	1-2 Close
		+5V	2-3 Close
JP3	COM1 Data/Power Selection	Power: Set COM1 pin 9 to +12V level	1-3 Close
		RS-232 Data: Set COM1 pin 9 to RI (Default)	3-5 Close
		Power: Set COM1 pin 1 to +5V level	2-4 Close
		RS-232 Data: Set COM1 pin 1 to DCD (Default)	4-6 Close

COM 1 Connector (CN8)

Pins	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	No use
4	DTR	RX-	No use
5	GND	No use	No use
6	DSR	No use	No use
7	RTS	No use	No use
8	CTS	No use	No use
9	RI	No use	No use



COM 2 Wafer Connector (CN4)

Pins	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	DSR	No use	No use
3	RXD	TX+	Data+
4	RTS	No use	No use
5	TXD	RX+	No use
6	CTS	No use	No use
7	DTR	RX-	No use
8	RI	No use	No use
9	GND	No use	No use
10	No use	No use	No use