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SECTION 1
INTRODUCTION

This section contains general information and a detailed specification of the
Section 1 consists of the following sub-sections:

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

1.1 General Descriptions

The is a fanless embedded system powered by 7th / 6th generation Intel® Core™ i7/i5/i3 processor and Celeron® processor (formally codenamed: Kaby Lake / sky lake) and comes with flexible I/O design. To fulfill different application needs, this flexible embedded system supports Windows® 7 (for 6th Gen Intel® CPU, Windows® 10, Ubuntu 18.04, and can be wall-mounted as an optional request.

The is built with an IP30-rated heavy-duty aluminum extrusion, enabling reliable operation in harsh environments. Moreover, it features a wide range of 9 to 36V DC power input with power protection, and supports extended operating temperatures from -40 °C to +60 °C. To help minimize deployment time, this fanless embedded PC provides one optional I/O door for customers to easily install additional I/O output, making it perfectly suitable for any industrial grade applications.

Features

- LGA1151 socket 7th / 6th generation Intel® Core™ i7/i5/i3 & Celeron® processor (Kaby Lake / sky lake) with Intel®H110
- Supporting wide range of DC power input from 9 to 36VDC
- CE (Class A),FCC (Class A) certified, ISO7637-2 compliant
- 2 x internal mini PCIe slots & 2 SIM sockets
- 1 x internal SATA tray & 1 x half size mSATA & 1 x full size mSATA

Reliable and Stable Design

The embedded system supports 7th / 6th generation Intel® Core™ i7/i5/i3 and Celeron® processors with high flexibility and multi-functional design, making it the best solution for any industrial field applications.

Embedded O.S. Supported

With the sky lake processor, can support Windows® 7/10 and Ubuntu 18.04;
With the Kaby Lake processor, can support Windows® 10 and Ubuntu 18.04.

1.2 System Specifications

1.2.1 CPU

- **CPU**
  - LGA1151 socket 7th / 6th generation Intel® Core™ i7/i5/i3 & Celeron® processor, CPU TDP max. up to 35W
- **Chipset**
  - Intel® H110
- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- **System Memory**
  - One 260-pin unbuffered DDR4-2400 MHz SO-DIMM socket, up to 16 GB at the maximum for 6th / 7th generation Intel® Core™ processor

I/O System

- **Display**
  - 1 x HDMI 1.4b (Resolution:4K/2K@60Hz)
- **Ethernet**
  - 2 x 10/100/1000 RJ45 Ethernet ports (2 x I211-AT)
- **USB Ports**
  - 4 x USB3.0
- **Mini Card Interface**
  - 2 x full-size Rev. 1.2 PCI Express Mini Card slot
    - 1 x USB/PCIe with SIM socket
    - 1 x mSATA/USB/PCIe with SIM socket
  - 1 x half-size Rev. 1.2 PCI Express Mini Card slot (mSATA+USB)
- **Storage**
  - 1 x 2.5" SATA HDD/SSD (internal)
  - 1 x Full size mSATA (occupied 1 x PCI Express Mini Card slot)
  - 1 x half size mSATA (occupied 1 x PCI Express Mini Card slot)
- **Indicator**
  - 1 x Green LED as indicator for PWR status
  - 1 x Yellow LED as indicator for HDD active
- **Button**
  - 1 x Power button
  - 1 x Reset button
- **Serial Port**
  - 1 x RS-232/422/485
- **Digital IO**
  - 4 x Digital Input
  - 4 x Digital Output
- **Audio**
  - 1 x MIC In
  - 1 x Line Out
- **Antenna**
  - 4 x SMA type connector openings for antenna

1.2.2 System Specifications

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
  - 9~36VDC input (typical 12/24VDC input)
- **Operation Temperature**
  - -40 °C ~+60 °C (-40 °F ~ 140 °F), with wide operating temperature support
- **Storage Temperature**
  - -40 °C ~+85 °C (-40 °F ~ 185 °F)
- **Humidity**
  - 0% ~ 95% (non-condensation)
- **Vibration Endurance**
  - 3 Grm with SSD (5-500Hz, X, Y, Z directions)
  - 1 Grm with HDD (5-500Hz, X, Y, Z directions)
  - 2 Grm with HDD & Anti-Vibration Kit (5~500Hz, X,Y, Z directions)*
    *Please contact for details.

- 1.71kg (3.77 lb) without package
- 2.19kg (4.83 lb) with package

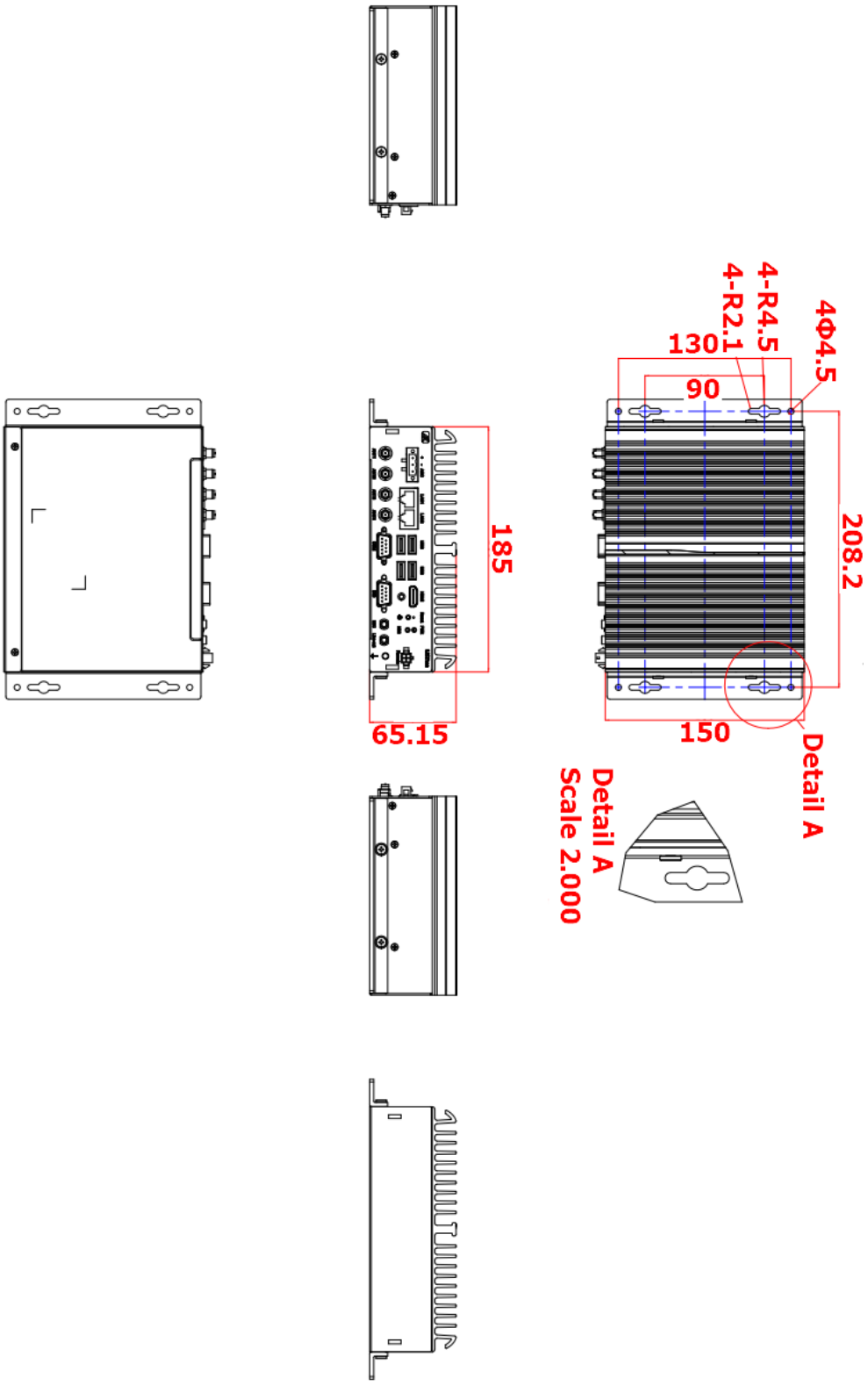
- **Dimension**
  - 185 mm (7.09”) (W) x 150 mm (5.91”) (D) x 65.15 mm (2.56”) (H)

1.2.3 Driver Contents

- **Chipset**
- **Graphic**
- **Intel® ME**
- **Ethernet**
- **Audio**
- **User’s Manual**

1.3 Dimensions

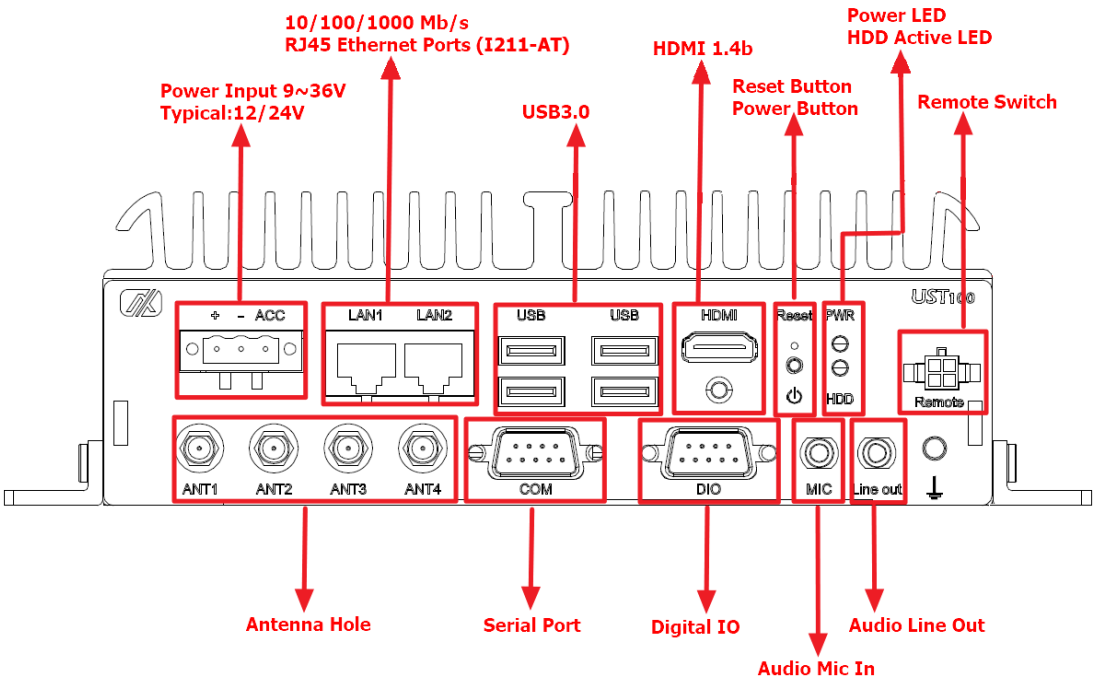
The following diagrams show the dimensions and outlines of the .



1.4 I/O Outlets

The following figures show I/O outlets on the

Front View



1.5 Packing List

The comes with the following bundle package:

- **system unit x 1**
- **HDMI cable fixed x 1**
- **Cable tie x 1**
- **HDD screws x 4**
- **Terminal block x 1**
- **Wall mount kit x1**
- **Wall mount kit screws x 4**
- **Mini Card slot screws x 3**

SECTION 2
HARDWARE INSTALLATION

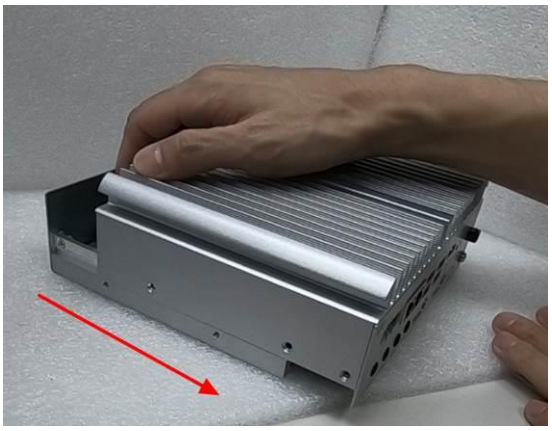
The is convenient for various hardware configurations, such as CPU, DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive), and PCI Express Mini Card modules. Section 2 contains guidelines for hardware installation.

2.1 Installing SO-DIMM

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

Step 2 Remove the screws on both sides of the system.

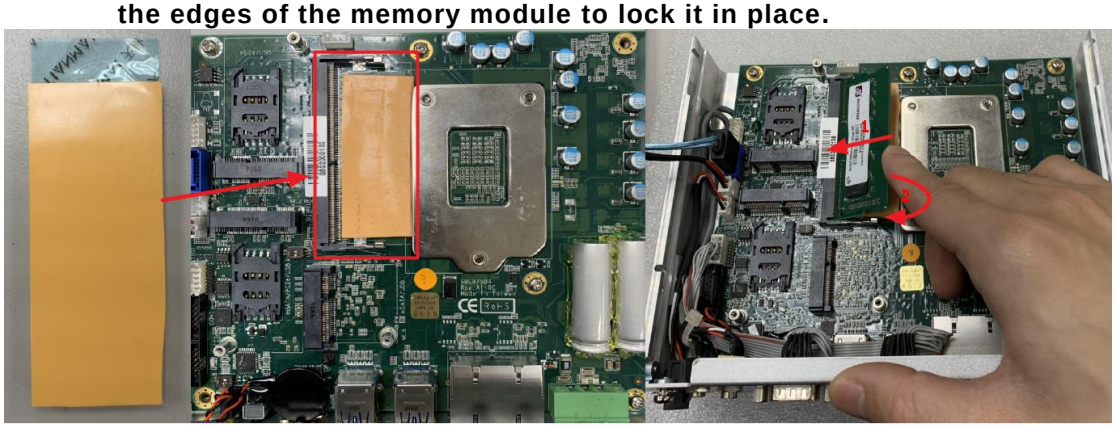
Step 3 Pull the main system away from its bottom cover, flip the system over 180 degrees and put it upside down. (To avoid pulling the SATA cable while extracting the system, be sure to first remove the cable attached to the bottom cover.)



Step 4 Locate the SO-DIMM socket on the motherboard.

Step 5 Use the thermal pad available from the accessory bag and attach it to the position of the slot.

Step 6 Insert the memory module's gold finger into the socket and press the module down until it is fully seated. The socket latches will clip onto the edges of the memory module to lock it in place.



【Note】: ***If no more SO-DIMM replacement is required, it is recommended to secure the module in place with hot melt adhesive.***

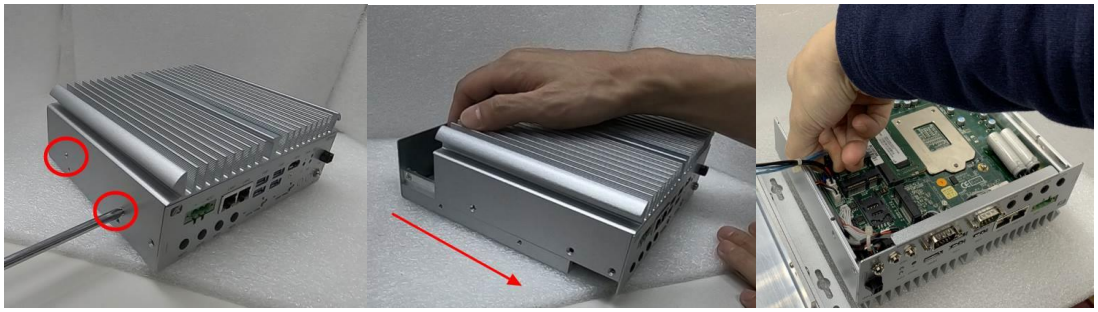
Step 7 **Flip the system back to its upright position and slide the system back onto the bottom cover and fasten all screws to complete installation.**

2.2 Installing 2.5” SATA Device

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

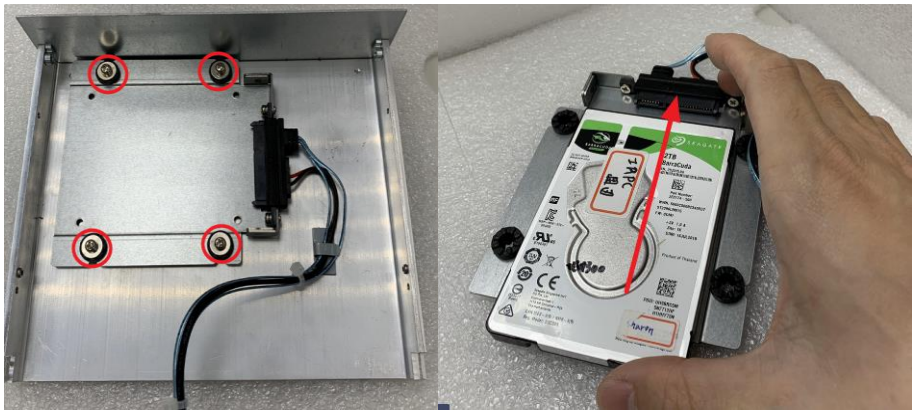
Step 2 **Remove the screws on both sides of the system.**

Step 3 **Pull the main system away from its bottom cover, flip the system over 180 degrees and then put it upside down. (To avoid pulling the SATA cable while extracting the system, be sure to first remove the cable attached to the bottom cover.)**

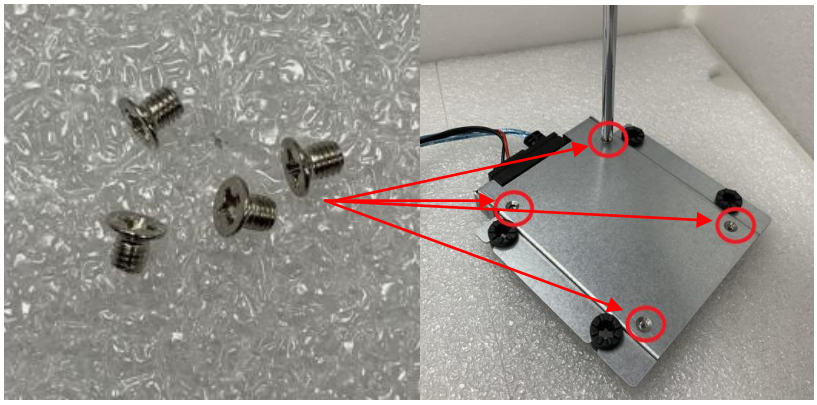


Step 4 **Remove the SATA drive tray screws and round gaskets.**

Step 5 **Insert the HDD or SSD.**

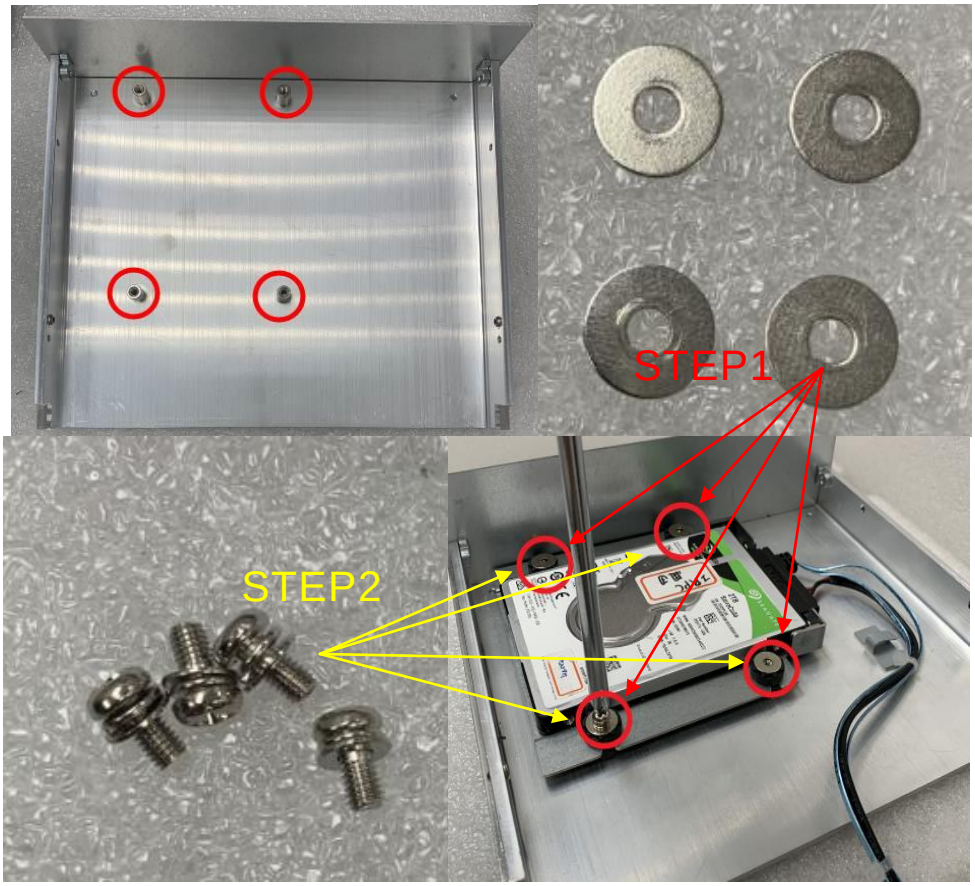


Step 6 **Position the screw holes on the HDD/SSD against the holes on the SATA drive tray. Then screw the HDD/SSD firmly to the tray with the four supplied screws, as illustrated below.**

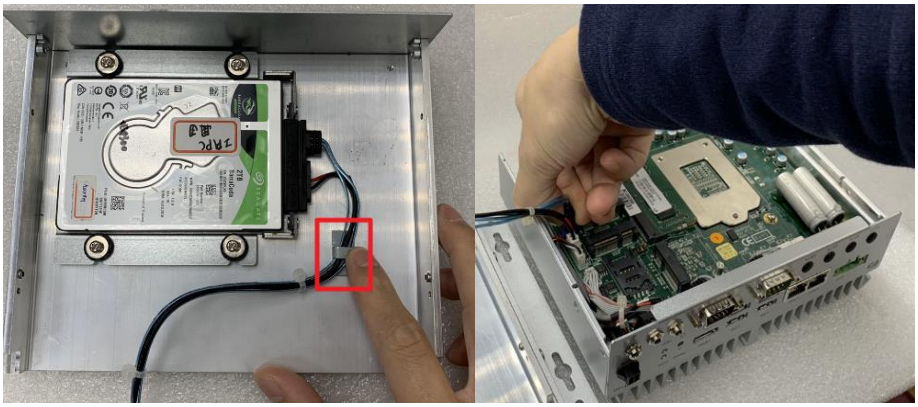


Step 7 **Align the screw holes on the edges of the SATA drive tray to the screw posts on the inside of the chassis. Insert the screw holes through the screw posts to attach the HDD/SSD onto the chassis.**

Step 8 **Place the round gaskets onto the screw holes. Insert and fasten the screws firmly to secure the SATA drive tray in place.**



Step 9 Use the cable clips to fasten the SATA cable to the chassis and insert connector.



Step 10 Slide the system back onto the bottom cover and fasten all screws to complete installation.

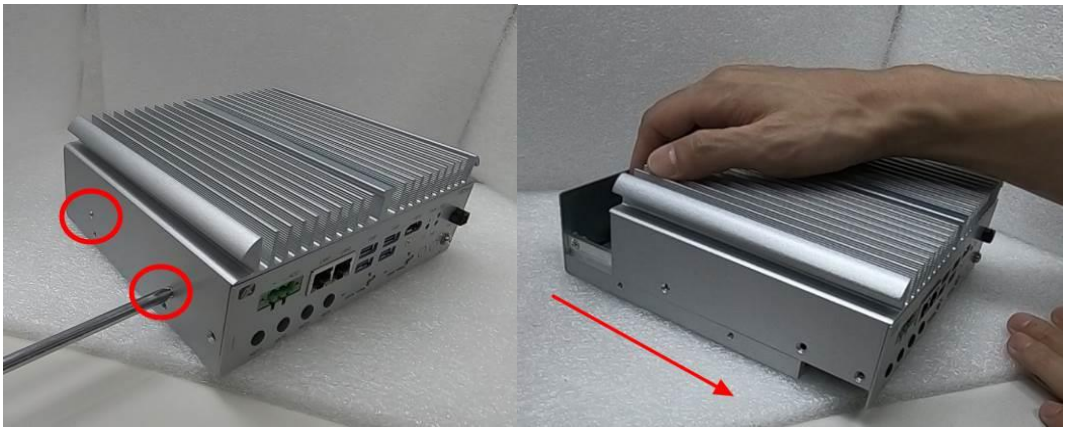
2.3 Installing mSATA Module

【Note】 **-functional slot that supports mSATA, PCIe and USB interfacing. To use the MC2 slot for connecting an mSATA card, the user will need to enter BIOS to modify MC2 configuration settings. For detailed instructions please refer to section 4.4 Advanced Menu > SATA and RST Configuration.**

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

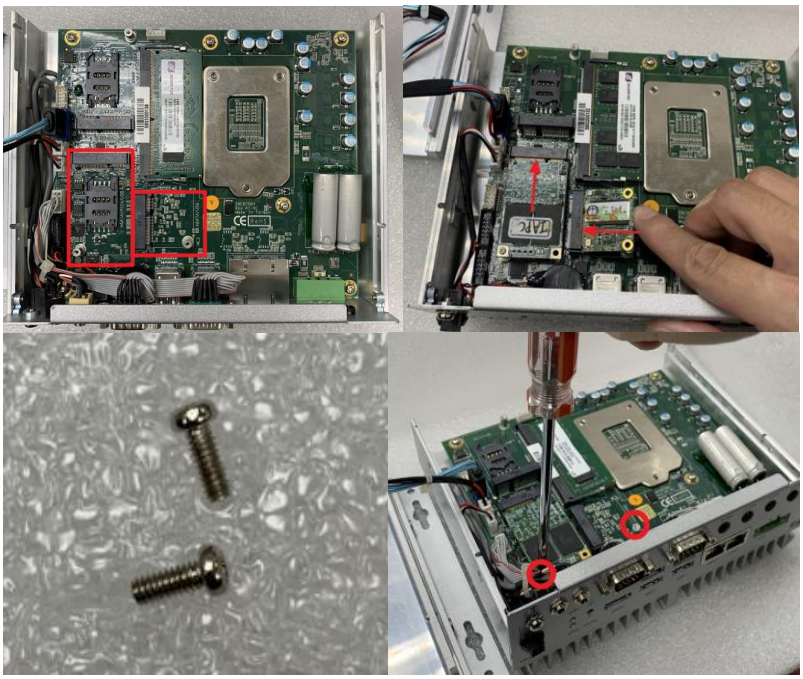
Step 2 **Remove the screws on both sides of the system.**

Step 3 **Pull the main system away from its bottom cover, flip the system over 180 degrees and then put it upside down. (To avoid pulling the SATA cable while extracting the system, be sure to first remove the cable attached to the bottom cover.)**



Step 4 **Locate the mSATA slot on the motherboard, and insert the full-size or half-size Mini mSATA card into the slot.**

Step 5 **Screw the Mini mSATA card firmly in place.**



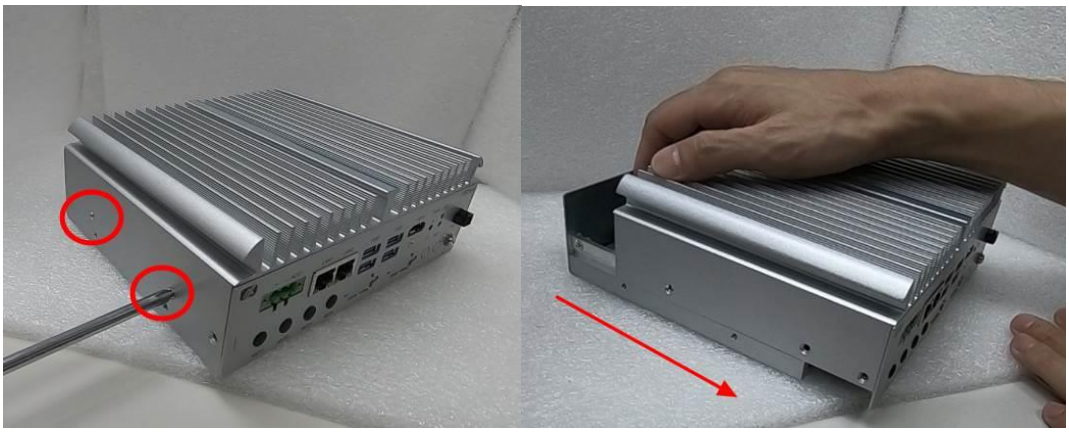
Step 6 Slide the system back onto the bottom cover and fasten all screws to complete installation.

2.4 Installing 4G/3G Module

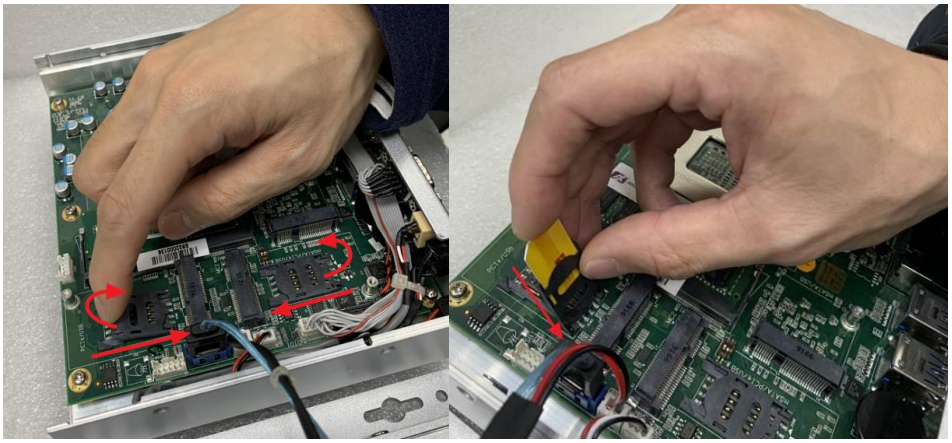
Step 1 **Turn off the system and unplug the power cord.**

Step 2 **Remove the screws on both sides of the system.**

Step 3 **Pull the main system away from its bottom cover, flip the system over 180 degrees and put it upside down. (To avoid pulling the SATA cable while extracting the system, be sure to first remove the cable attached to the bottom cover.)**



Step 4 **Push the SIM slot backward to release and lift it up. Insert the SIM card into the slot.**

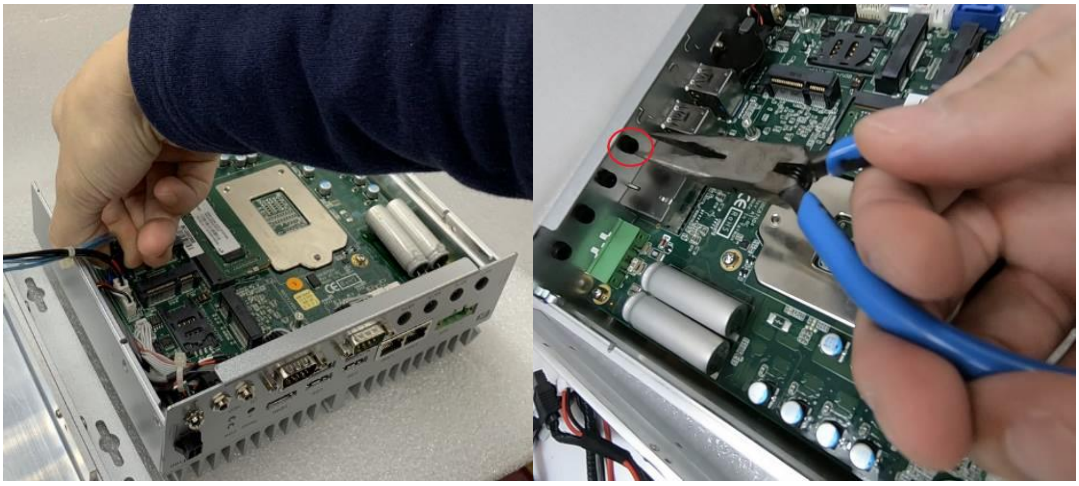


Step 5 **Press the SIM card slot down and push it back in place.**

Step 6 **Insert the 4G/3G module and screw it firmly in place.**

Step 7 **Unplug all cables.**

Step 8 **Remove the black antenna plug cover.**

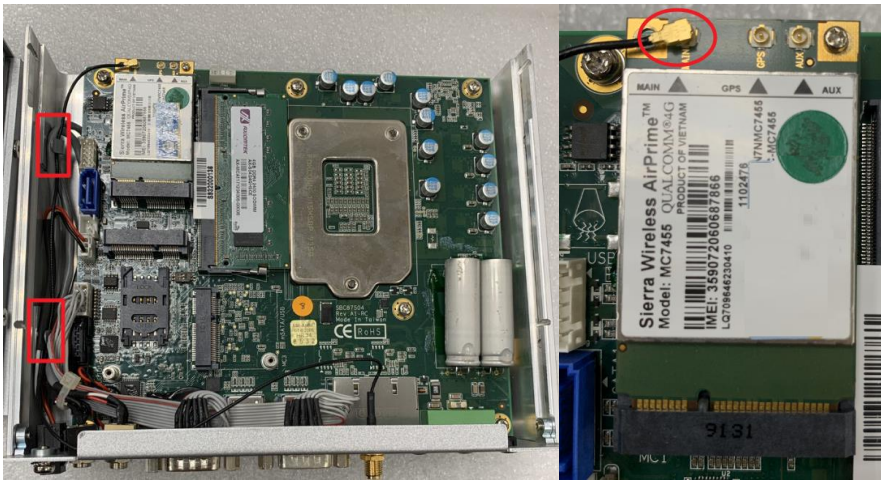


Step 9 **Insert the end of the RF cable through the antenna hole.**

Step 10 **Screw the end of the RF cable tightly with the antenna nut and gasket.**

Step 11 **Fasten the RF cable to the side clips.**

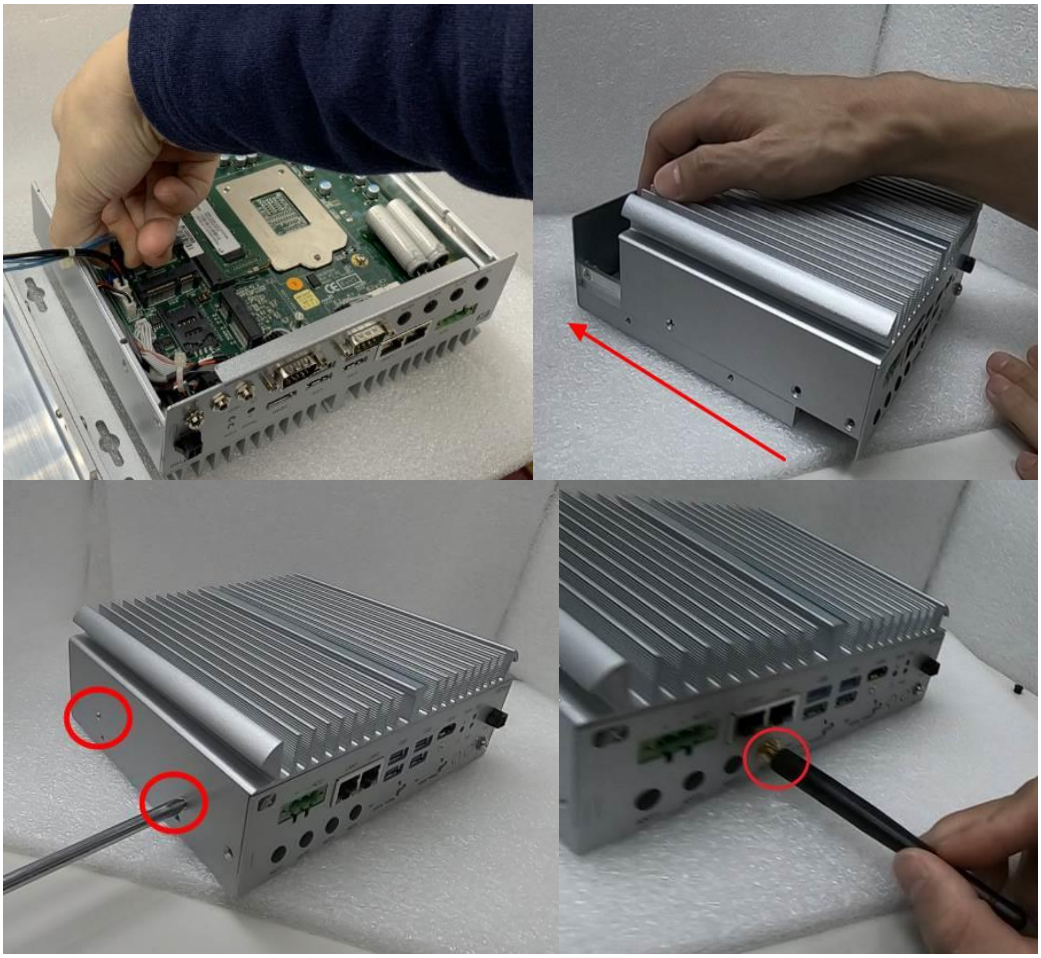
Step 12 **Attach the other end of the RF cable to the connector of the 3G/4G module marked with "MAIN".**



Step 13 **Plug all cables back.**

Step 14 **Slide the system back onto the bottom cover and fasten all screws.**

Step 15 Screw the external RF antenna to the end of the RF cable tightly to complete installation.



2.5 Installing the Wall Mount Kit

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

Step 2 Take out the wall mount kit and mounting screws from the accessory package.

Step 3 Locate the wall mount screw holes on both sides of the system. Screw the wall mount brackets tightly to the system, as illustrated below.

2.6 Installing the Cable Fixing Plate

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

Step 2 Loosen and remove the fixing screw located below the HDMI port.

Step 3 To fasten the HDMI cable fixing plate to the system, position the hole on the plate against the hole on the system, insert the screw through the holes, and turn the screw tightly to fasten the plate, as shown below.

Step 4 Insert the HDMI cable into the HDMI port.

Step 5 Insert a cable tie through the loop of the cable fixing plate to bind the HDMI cable to the plate, as shown below.

SECTION 3
DIP SWITCH & BUTTONS & CONNECTOR SETTINGS

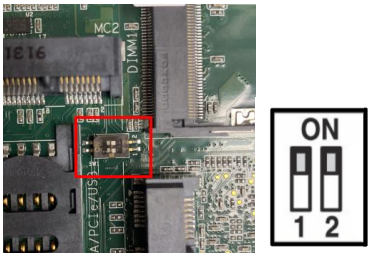
Proper DIP switch settings configure the to meet various application needs. Hereby all jumper settings along with their default settings are listed for devices onboard.

3.1 Summary of DIP Switch Settings

Proper DIP switch settings configure the to meet various application purposes. The table below lists all jumpers and their default settings.

SW1 switch settings are indicated as below:

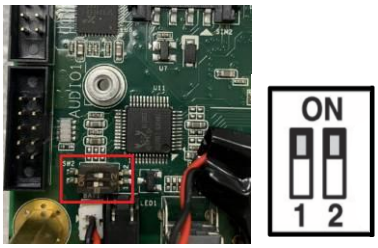
Switch1	Swtich2	Descriptions
OFF	ON	**AT mode :** 9~36VDC AT mode (Note1)
OFF	OFF	**In-vehicle mode:** (Default) Auto detects 12 / 24VDC input with ignition control



【Note】 - can support 9~36VDC AT Mode Power function (waived ACC power connection and ignition function).

SW2 switch settings are indicated as below:

Switch	Descriptions	Settings	Mode
2	Restores BIOS optimal	ON	Restore
		OFF	Normal (Default)



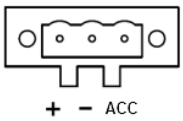
3.2 Connectors

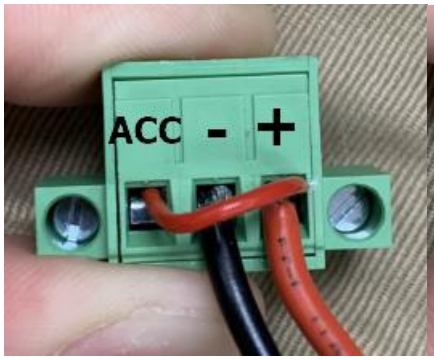
Please refer to pin assignments below:

3.2.1 DC-in Power Connector

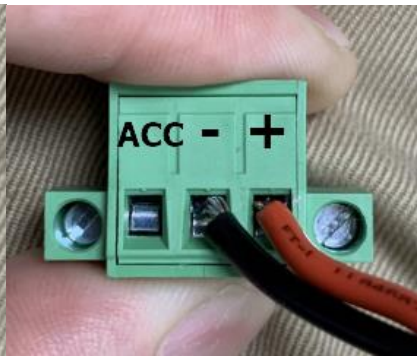
The system supports the 9~36V (Default 12/24V) DC-in connector for system power input.

Pins	Signals
1	DC+
2	GND
3	ACC (Ignition)





(Figure 1)



(Figure 2)

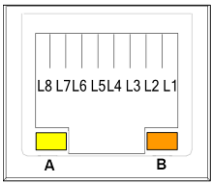
【Note】 ***Connect the DC-in power connector for the in-vehicle system as follows:***

1. ***For in-Vehicle applications, the ACC Pin needs to be connected to accessory power on the vehicle. If the test environment cannot provide accessory power, refer to Figure 1.***
2. ***For AT mode application, please refer to SW1 Switch Mode in Section 3.1, and the ACC of the power connector is an empty pin as shown in the figure (Figure 2.***

3.2.2 Ethernet Connector (LAN1~2)

The board has two RJ-45 connectors for LAN1-2 Ethernet (Intel i211-AT) connectivity.

LED	Lamp Status
A	Activity link LED (yellow) OFF: No link Blinking: Link established; data activity detected
B	Speed LED OFF: 10Mbps data rate Green: 100Mbps data rate Orange: 1GMbps data rate



3.2.3 HDMI Connector

The HDMI Rev1.4b (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable. Pin definition follows ***HDMI Type A standard***.

3.2.4 Remote Switch Connector

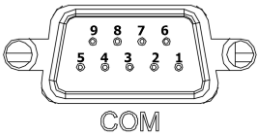
The remote switch is ideal for a remote button, which can act as an power on/off button.

Pins	Signal	Description
1	NC	N/A
2	Switch Signal	Low Active. Acts as PC's ATX switch when an external switch is installed (Pin 3 active). **The internal pull up resistor does not connect to any power source.
3	Ext. SW Sensor	Low Active. Detects whether an external power switch is installed or not. ** The internal pull up resistor does not connect to any power source.
4	GND	Ground

3.2.5 Serial Port Connector

The system has one serial ports. COM are RS-232/422/485 ports. Please refer to Chapter 4 for detailed BIOS settings.

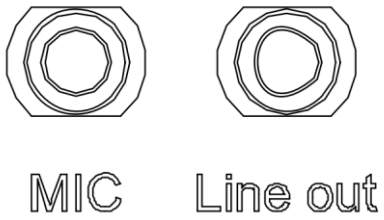
Pins	RS-232	RS-422	RS-485
1	DCD, Data carrier detect	TX-	Data-
2	RXD, Receive data	TX+	Data+
3	TXD, Transmit data	RX+	NC
4	DTR, Data terminal ready	RX-	NC
5	GND, ground	GND, ground	GND, ground
6	DSR, Data set ready	NC	NC
7	RTS, Request to send	NC	NC
8	CTS, Clear to send	NC	NC
9	RI, Ring indicator	NC	NC



3.2.6 Audio Connector

These two 3.5mm audio jacks are ideal for connecting TRS stereo plugs for Audio Mic-In and Audio Line-out.

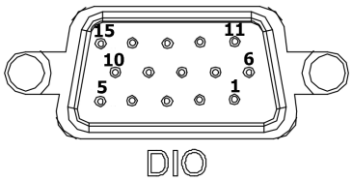
PIN	Signals
1	Microphone In
2	Line Out



3.2.7 Digital IO

The upports 8CH digital input or output. Please refer to Chapter 4 for detailed BIOS settings.

Pins	Signals	Pins	Signals
1	GPIO 0	9	+5V
2	GPIO 7	10	GND
3	GPIO 1	11	N/A
4	GPIO 6	12	N/A
5	GPIO 2	13	N/A
6	GPIO 5	14	N/A
7	GPIO 3	15	N/A
8	GPIO 4		



3.2.8 Full-Size PCI Express Mini Card Slot

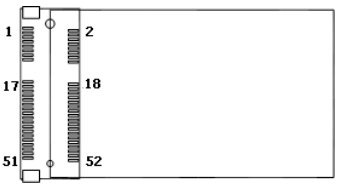
Full-Size (MC1 & MC2)

-size PCI-Express Mini Card slots. **MC1** applies to either ***PCI-Express2.0*** or ***USB 2.0*** signals. **MC2** applies to either ***PCI-Express2.0***, ***USB 2.0*** or ***SATA3.0 (mSATA)*** signals and complies with ***PCI-Express Mini Card Spec. V1.2***.

【**Note**】***For MC2 slot related function switching, please refer to Chapter 4.4 SATA and RST Configuration.***

The table follows PCI-Express Mini Card Spec. V1.2:

Pins	Signals	Pins	Signals
51	NC	52	+3.3Vaux
49	NC	50	GND
47	NC	48	+1.5V
45	NC	46	NC
43	GND	44	NC
41	+3.3Vaux	42	NC
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp / mSATA_Tp	34	GND
31	PETn / mSATA_Tn	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp / mSATA_Rp	26	GND
23	PERn / mSATA_Rn	24	+3.3Vaux
21	GND	22	PERST#
19	NC	20	W_DISABLE#
17	NC	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	NC	8	UIM_PWR
5	NC	6	1.5V
3	NC	4	GND
1	WAKE#	2	3.3Vaux

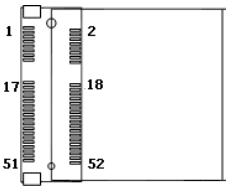


Half-Size (MC3)

MC3 applies to ***SATA3.0 (mSATA)*** signals. Users can install an mSATA card into this slot. Complies with ***PCI-Express Mini Card Spec. V1.2***.

The table follows PCI-Express Mini Card Spec. V1.2:

Pins	Signals	Pins	Signals
51	NC	52	+3.3Vaux
49	NC	50	GND
47	NC	48	+1.5V
45	NC	46	NC
43	GND	44	NC
41	+3.3Vaux	42	NC
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	mSATA_Tp	34	GND
31	mSATA_Tn	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	mSATA_Rp	26	GND
23	mSATA_Rn	24	+3.3Vaux
21	GND	22	PERST#
19	NC	20	W_DISABLE#
17	NC	18	GND
Mechanical Key			
15	GND	16	NC
13	REFCLK+	14	NC
11	REFCLK-	12	NC
9	GND	10	NC
7	NC	8	NC
5	NC	6	1.5V
3	NC	4	GND
1	WAKE#	2	3.3Vaux



3.3 Buttons

s

below list all default settings.

3.3.1 Power Button

The power button is on the I/O side. It allows users to control power on/off state of the

Functions	Descriptions
On	Turns on/off system
Off	Keeps system status

3.3.2 Reset Button

The reset button allows users to reset .

Functions	Descriptions
On	Resets system
Off	Keeps system status

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 pressing the <Del> key, the main BIOS setup menu displays. Users can access 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 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.

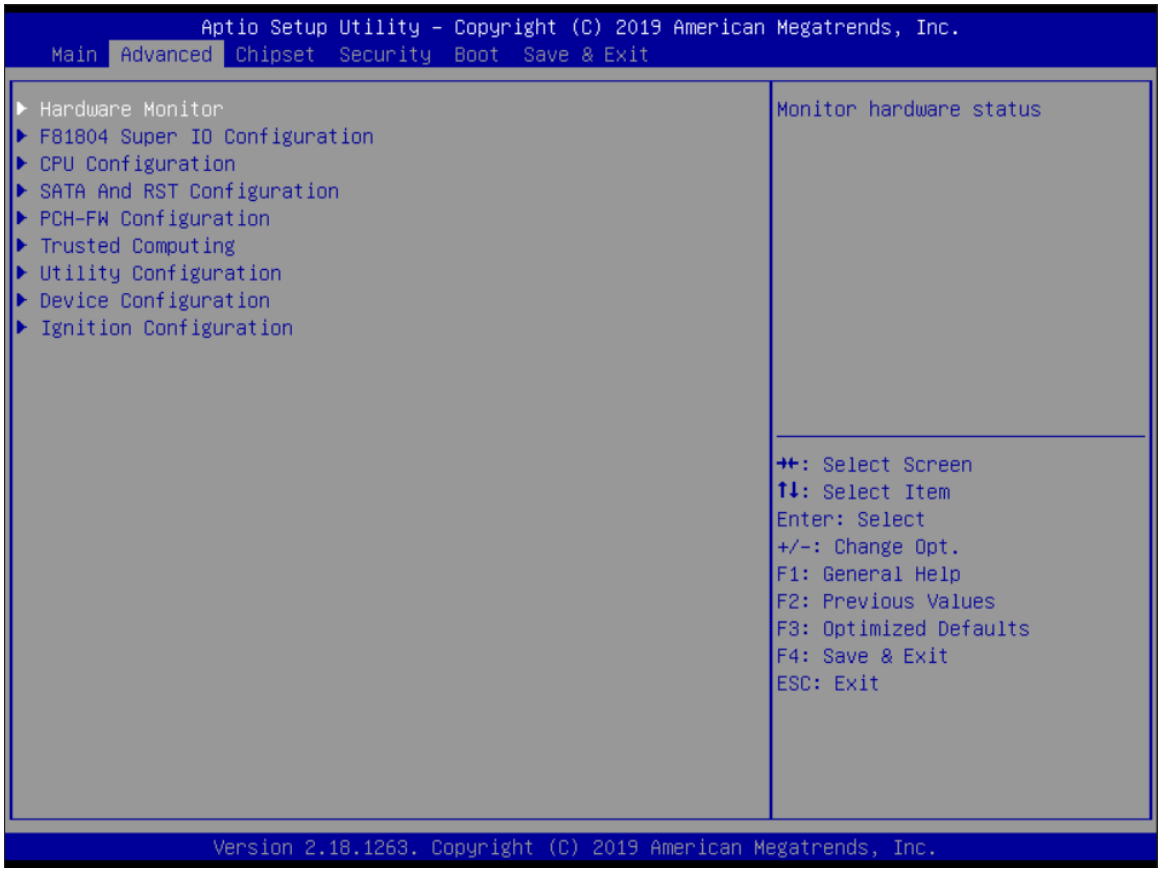
Access Level
Display the access level of the current user.

4.4 Advanced Menu

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

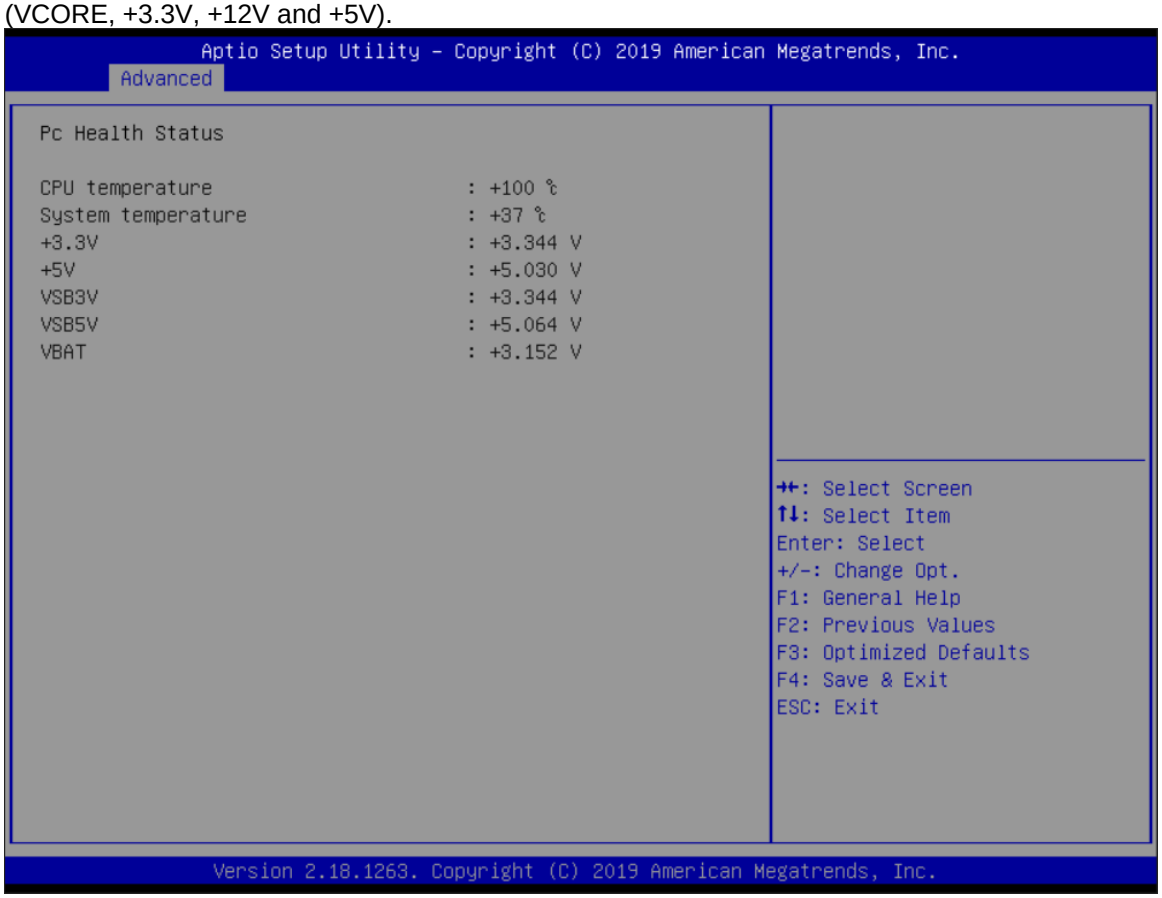
- ► Hardware Monitor
- ► F81804 Super IO Configuration
- ► CPU Configuration
- ► SATA And RST Configuration
- ► PCH-FW Configuration
- ► Trusted Computing
- ► Utility Configuration
- ► Device Configuration
- ► Ignition Configuration

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



Hardware Monitor

This screen displays the temperatures of the system and CPU as well as system voltages (VCORE, +3.3V, +12V and +5V).

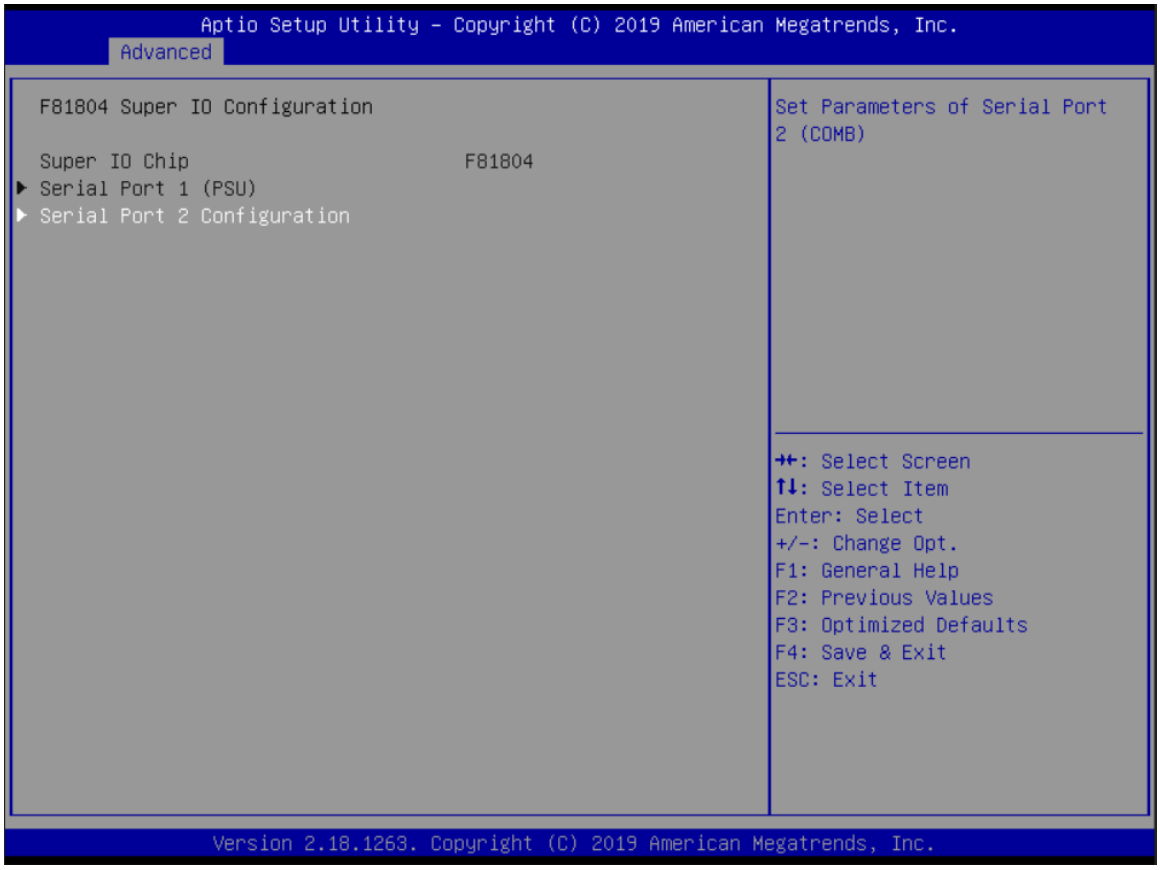


F81804 Super IO Configuration

Use this screen to select options for the NCT6106D Super IO Configurations, 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

The default setting for all Serial Ports is RS232.

You can change the setting by selecting the value you want in each COM Port Type. The system also supports RS422 & RS485 mode and high speed mode. Com Port speed supports up to 1.5 Mbps.

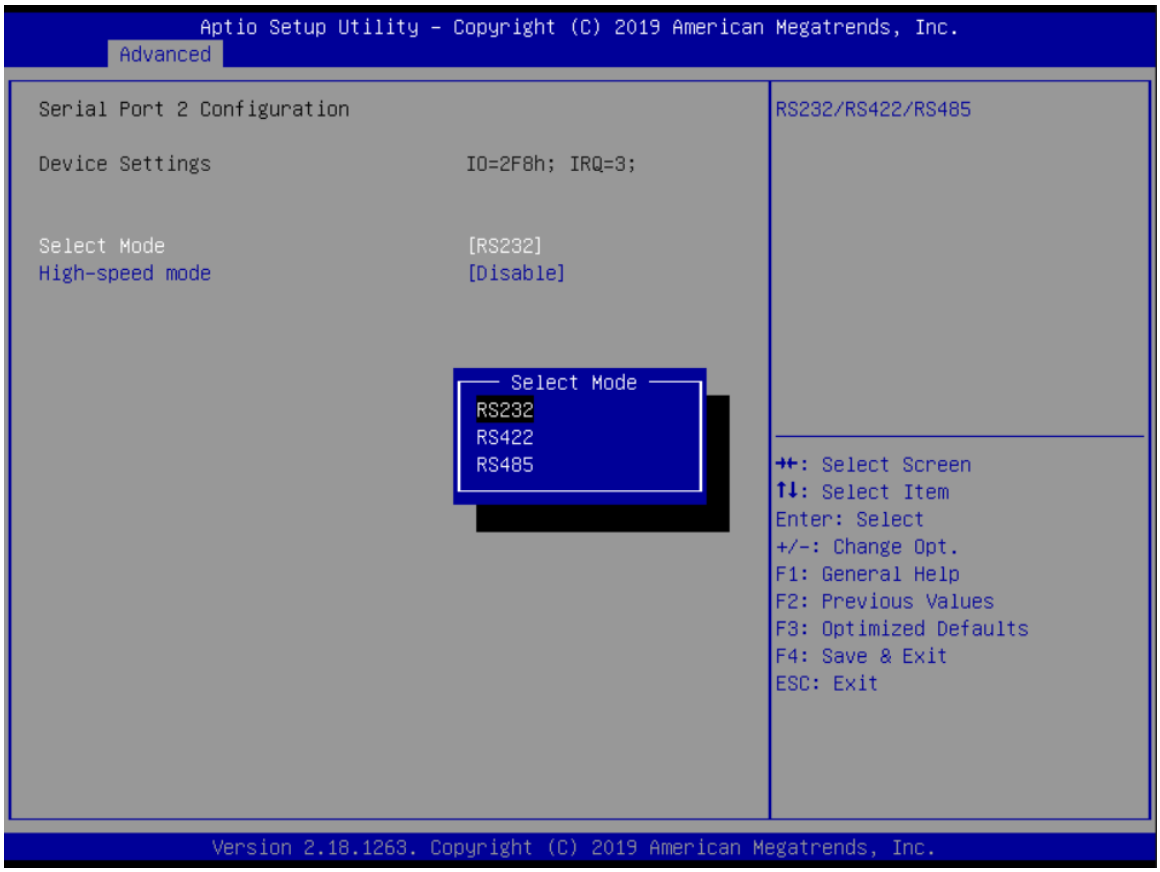


Serial Port 1
Serial port 1 is the communication interface for ignition configuration and is not available.

Serial Port 2 (COM2) Configurations
Use these items to set parameters related to serial port 2.

Select Mode
Use this option to set RS-232/RS-422/RS-485 mode

High Speed Mode
Enable communication speed up to 1.5 Mbps.


Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced
Serial Port 2 Configuration
Device Settings
IO=2F8h; IRQ=3;
Select Mode
[RS232]
High-speed mode
[Disable]
Select Mode
RS232
RS422
RS485
RS232/RS422/RS485
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.

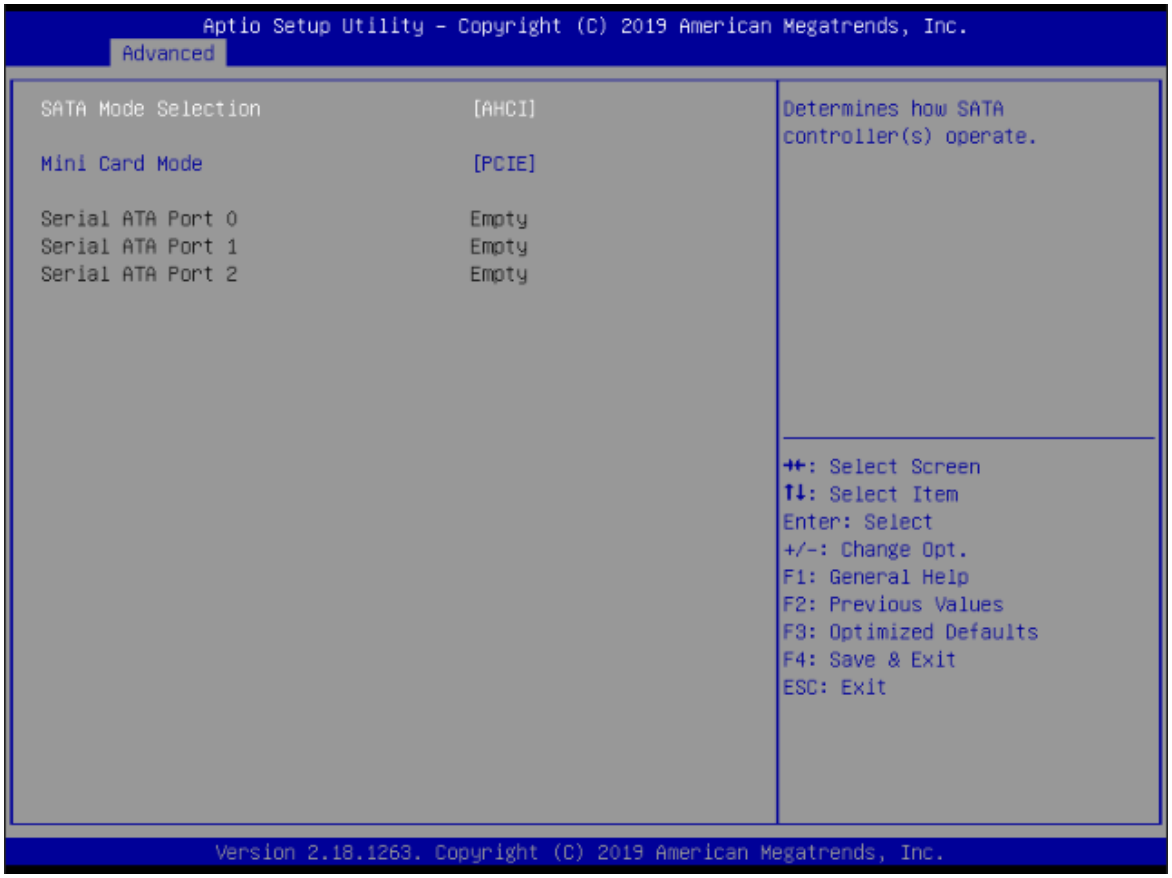
CPU Configuration

This screen shows the CPU version and its detailed information.

Intel Virtualization Technology

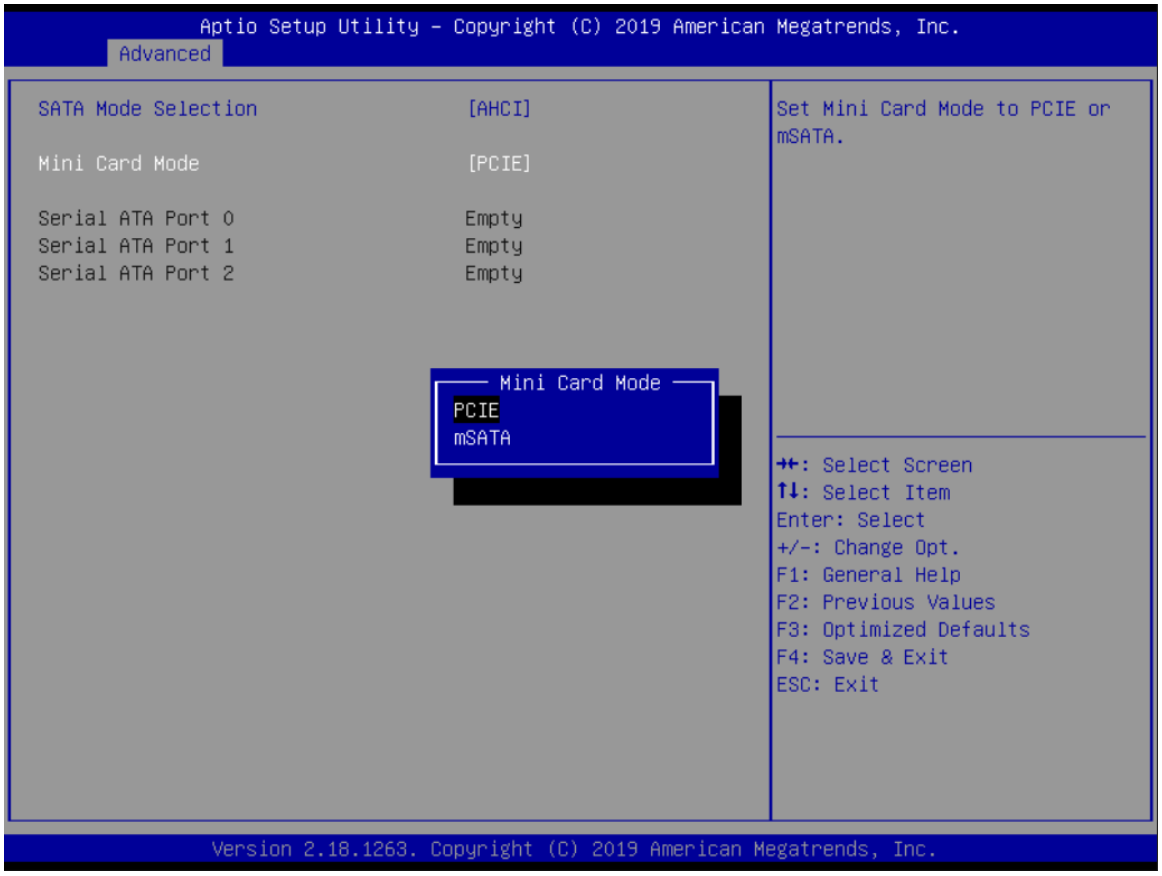
It allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

SATA and RST Configuration



SATA Mode Selection

AHCI (Advanced Host Controller Interface) mode is how SATA controller(s) operate.



Mini Card Mode

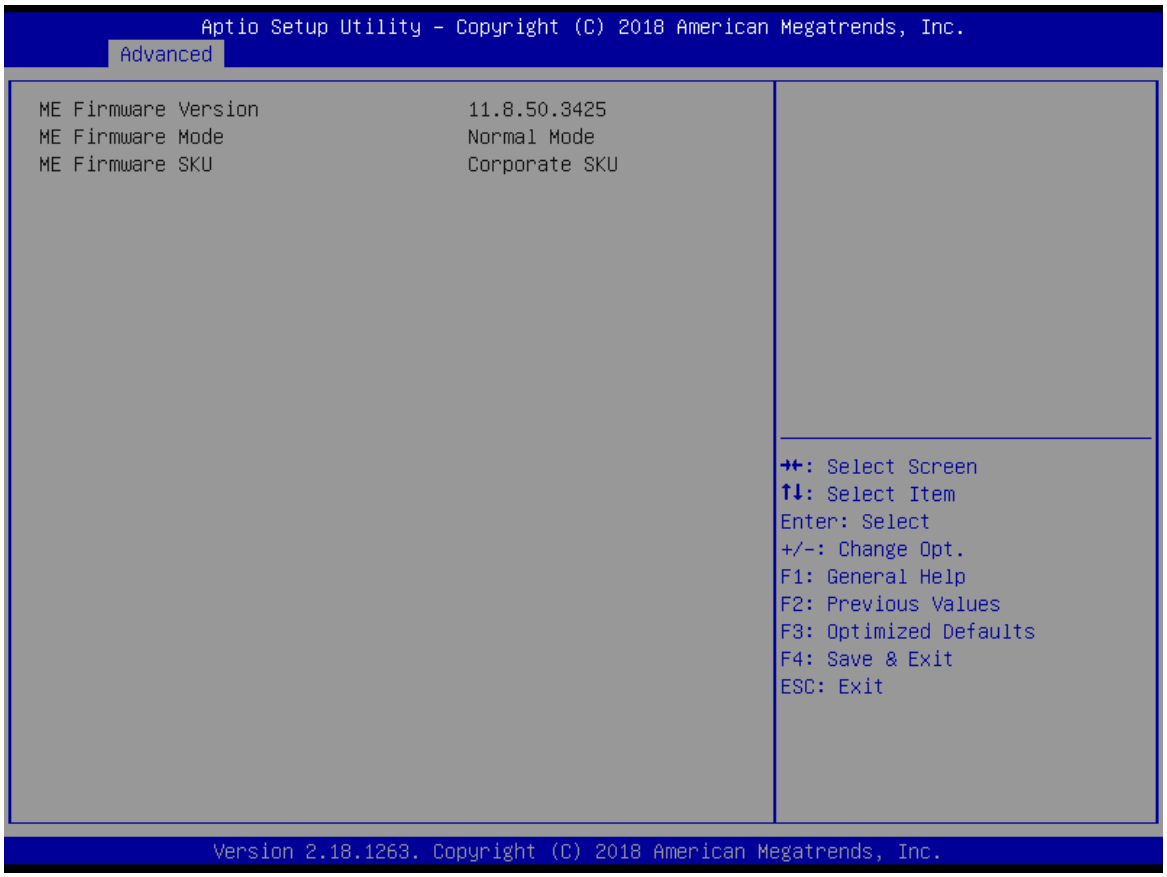
If the MC2 slot location is to be used for connecting an mSATA card, the user needs to change the Mini Card mode to mSATA and save it, so that the MC2 slot can function properly as an mSATA interface (default setting is PCIE).

Serial ATA Port 0~2

It shows the device installed in connector SATA0~2.

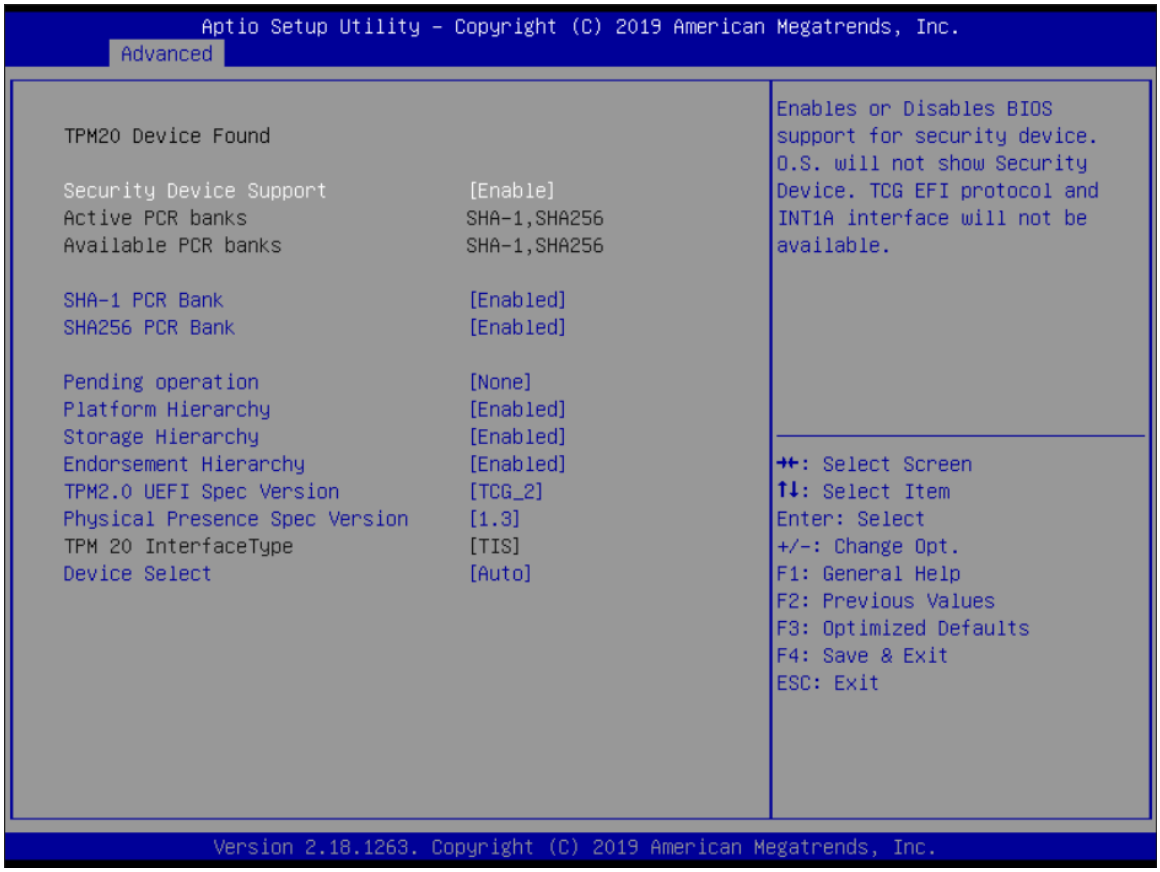
PCH-FW Configuration

This screen shows ME Firmware information.



Trusted Computing

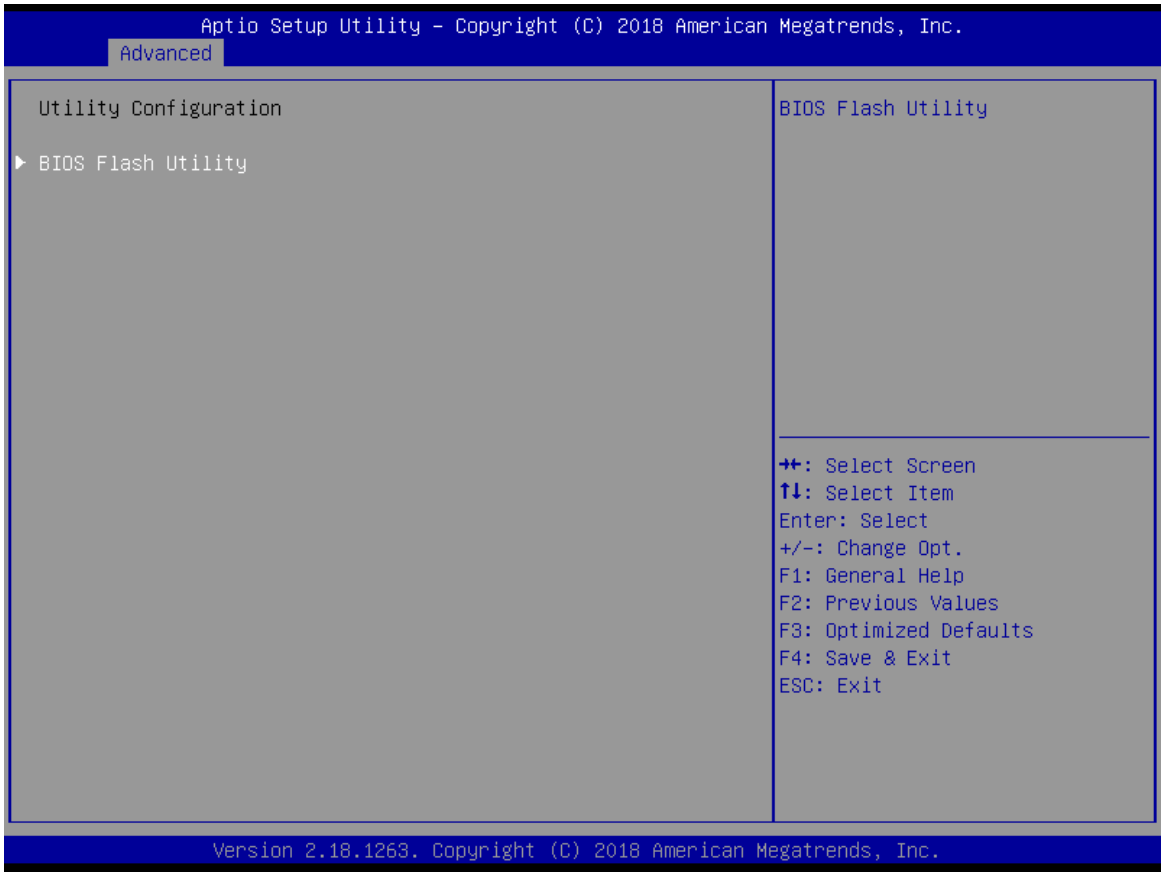
Select the Security Device Support to enable or disable the TPM function.

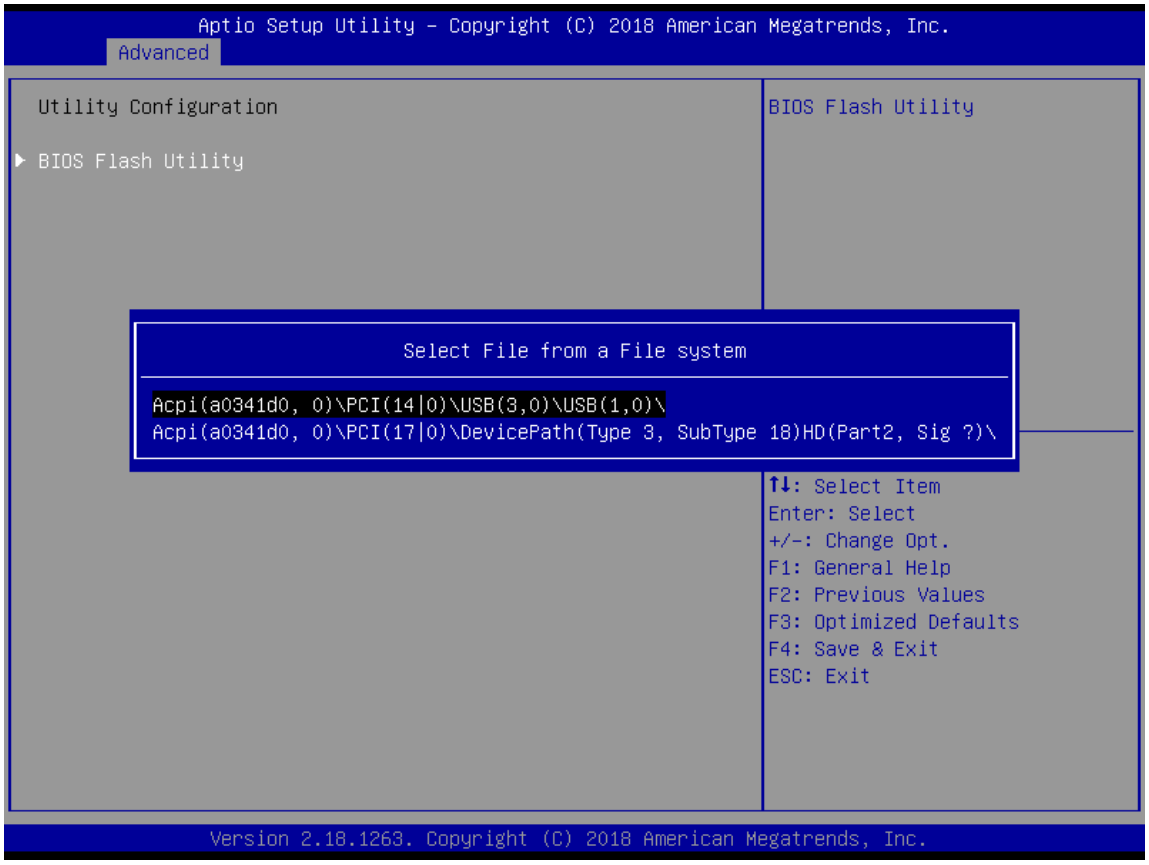


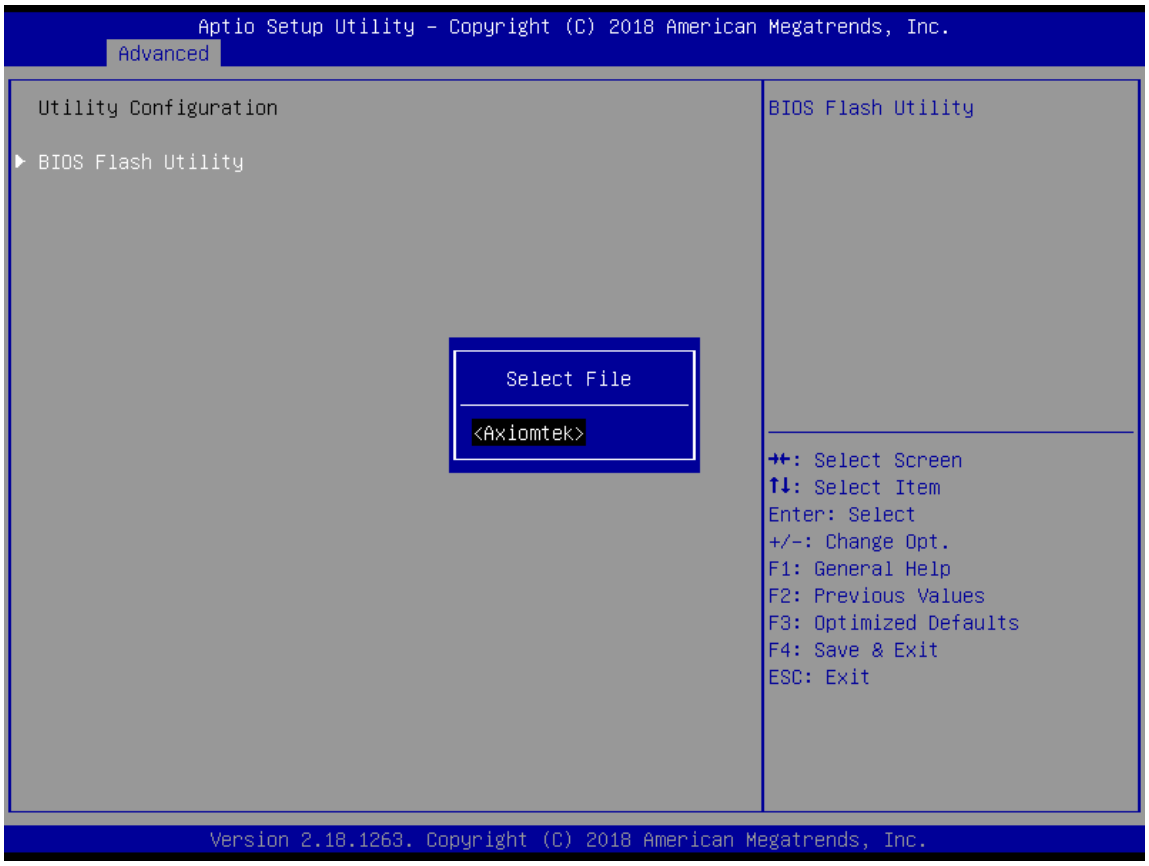
Utility Configuration

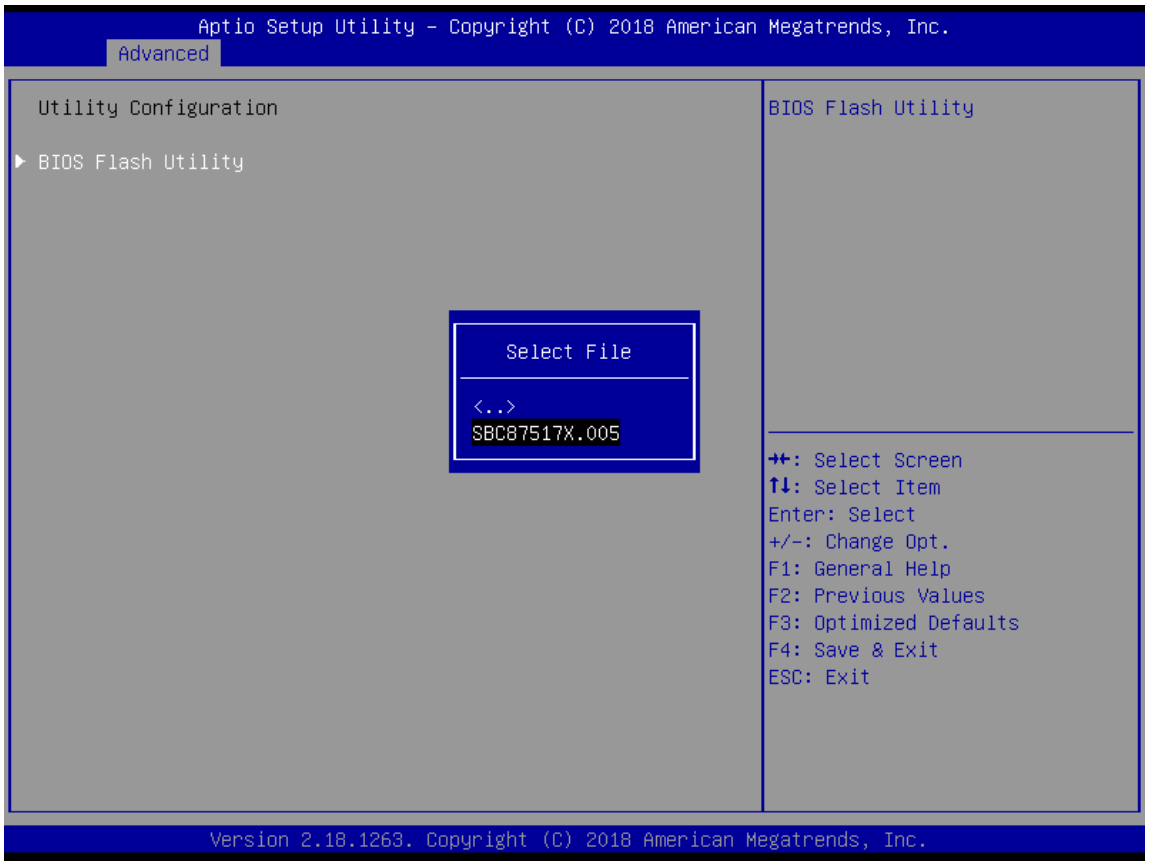
BIOS flash utility is a tool for flashing BIOS on setup menu. Follow the step to flash BIOS.

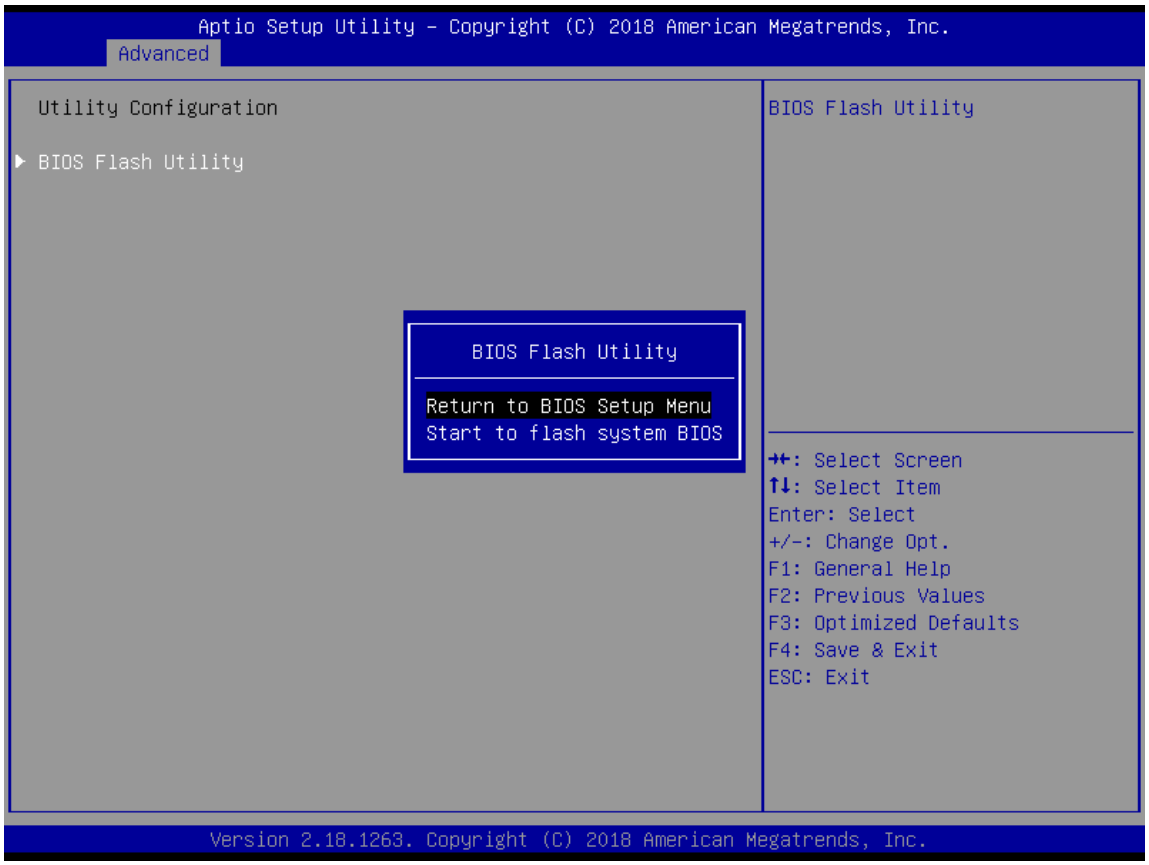
1. Create a folder and rename .
2. Copy the BIOS file to the folder (Ex: X: \ **SBC**XXXXXX.XXX, please refer the screenshot as below) (Note: The BIOS file name must contain the word "**SBC**" to be identified).
3. Enter the BIOS flash utility and locate the BIOS file.
4. Push "Start to flash system BIOS".




Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
Advanced
Utility Configuration
BIOS Flash Utility
BIOS Flash Utility
Select File from a File system
Acpi(a0341d0, 0)\PCI(14|0)\USB(3,0)\USB(1,0)\
Acpi(a0341d0, 0)\PCI(17|0)\DevicePath(Type 3, SubType 18)HD(Part2, Sig ?)\
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

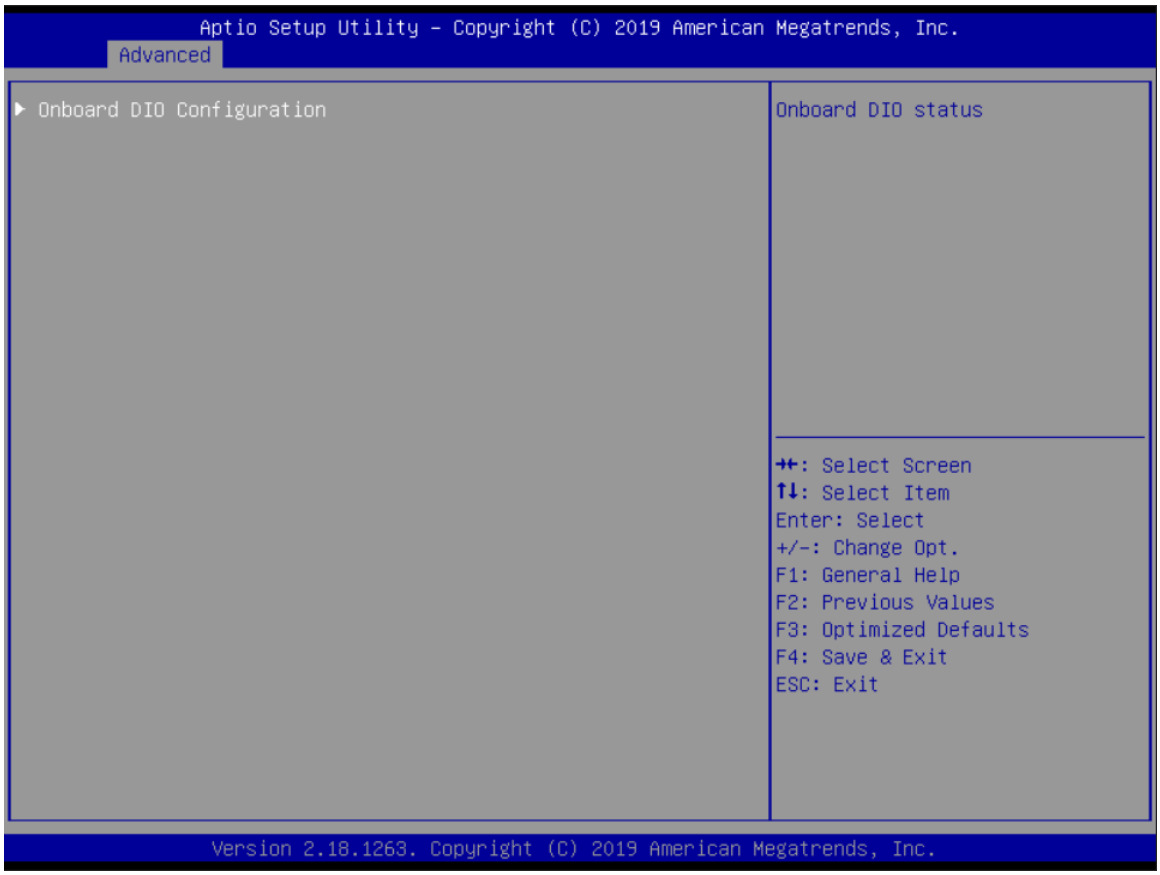

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
Advanced
Utility Configuration
BIOS Flash Utility
BIOS Flash Utility
Select File
<Axiomtek>
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

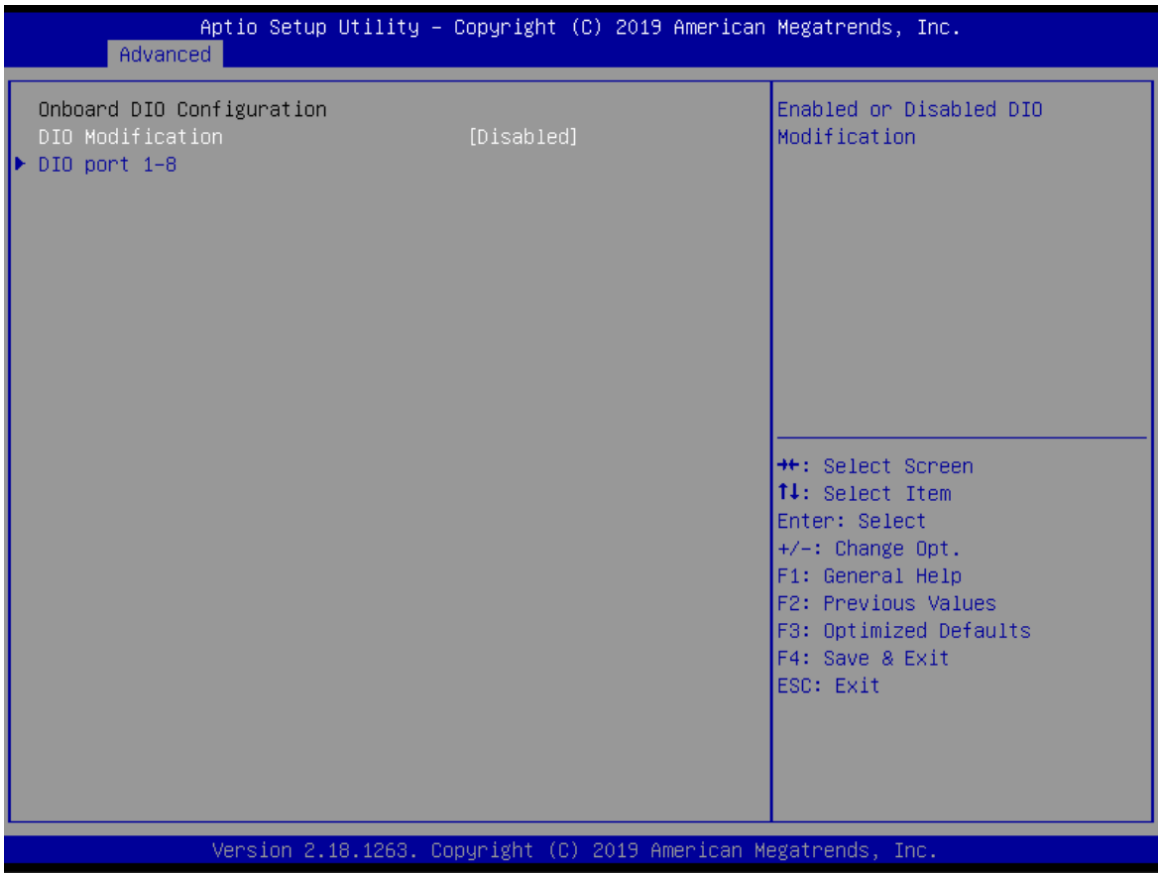

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
Advanced
Utility Configuration
BIOS Flash Utility
BIOS Flash Utility
Select File
<..>
SBC87517X.005
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

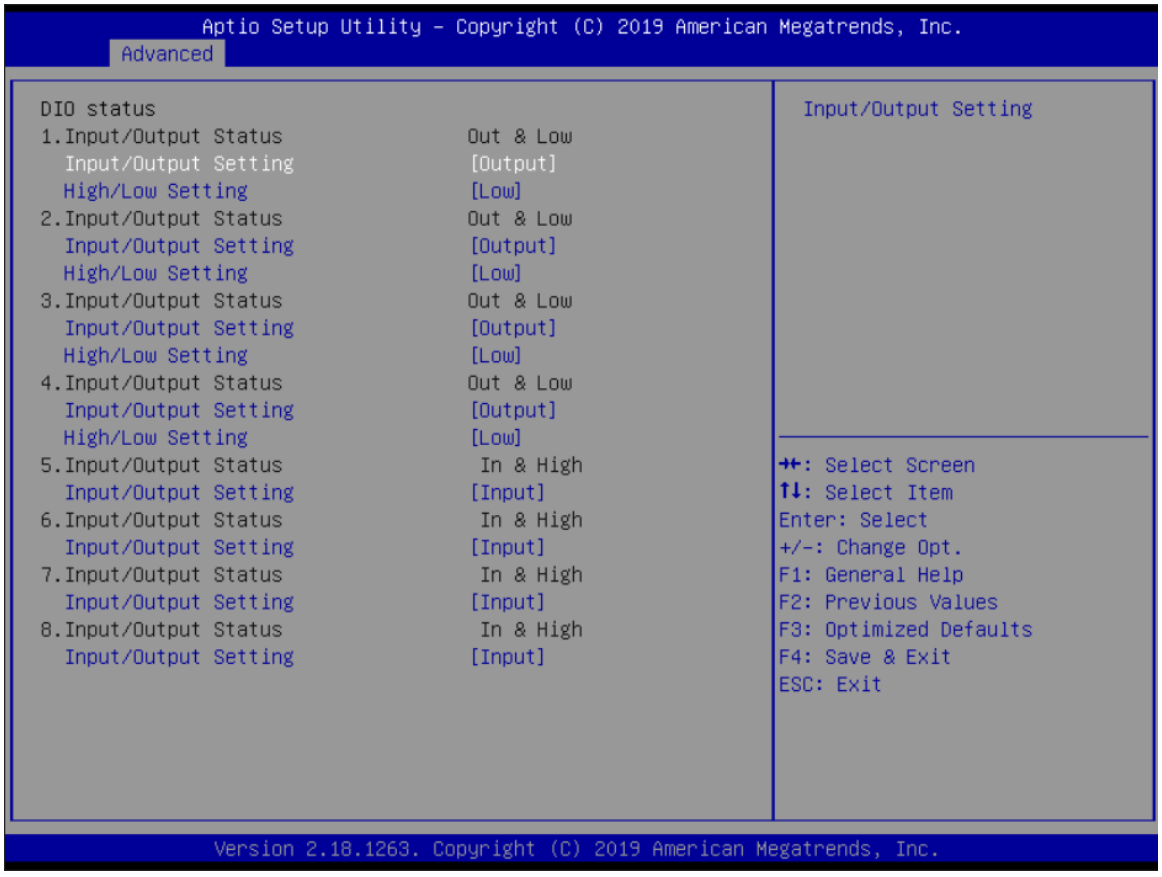

Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
Advanced
Utility Configuration
BIOS Flash Utility
BIOS Flash Utility
BIOS Flash Utility
Return to BIOS Setup Menu
Start to flash system BIOS
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

Device Configuration

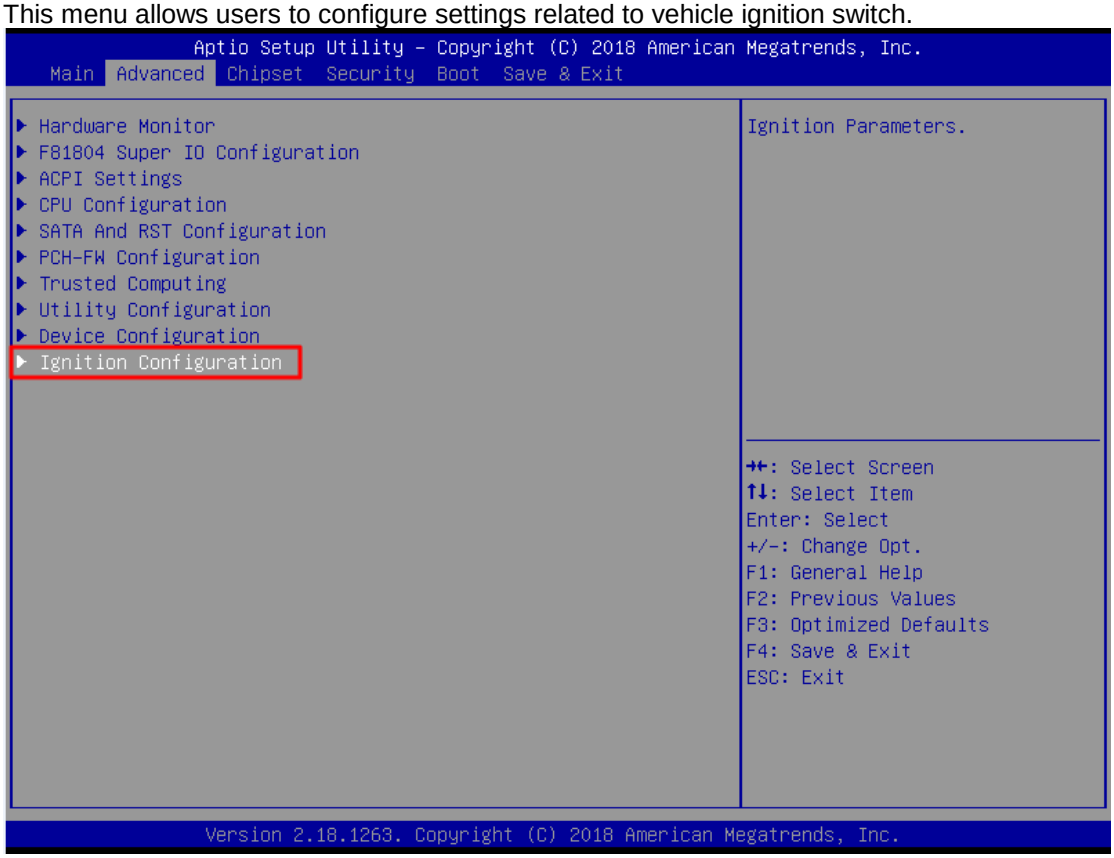
The DIO Modification default setting is “Disabled”. If the setting is changed for “enable”, you can load manufacture default and program DIO setting. (Please refer below graphics.)




Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced
Onboard DIO Configuration
DIO Modification [Disabled]
DIO port 1-8
Enabled or Disabled DIO Modification
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced
DIO status
1.Input/Output Status Out & Low
Input/Output Setting [Output]
High/Low Setting [Low]
2.Input/Output Status Out & Low
Input/Output Setting [Output]
High/Low Setting [Low]
3.Input/Output Status Out & Low
Input/Output Setting [Output]
High/Low Setting [Low]
4.Input/Output Status Out & Low
Input/Output Setting [Output]
High/Low Setting [Low]
5.Input/Output Status In & High
Input/Output Setting [Input]
6.Input/Output Status In & High
Input/Output Setting [Input]
7.Input/Output Status In & High
Input/Output Setting [Input]
8.Input/Output Status In & High
Input/Output Setting [Input]
Input/Output Setting
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.

Ignition Configuration
This menu allows users to configure settings related to vehicle ignition switch.



Firmware Version
Display Ignition controller firmware version.

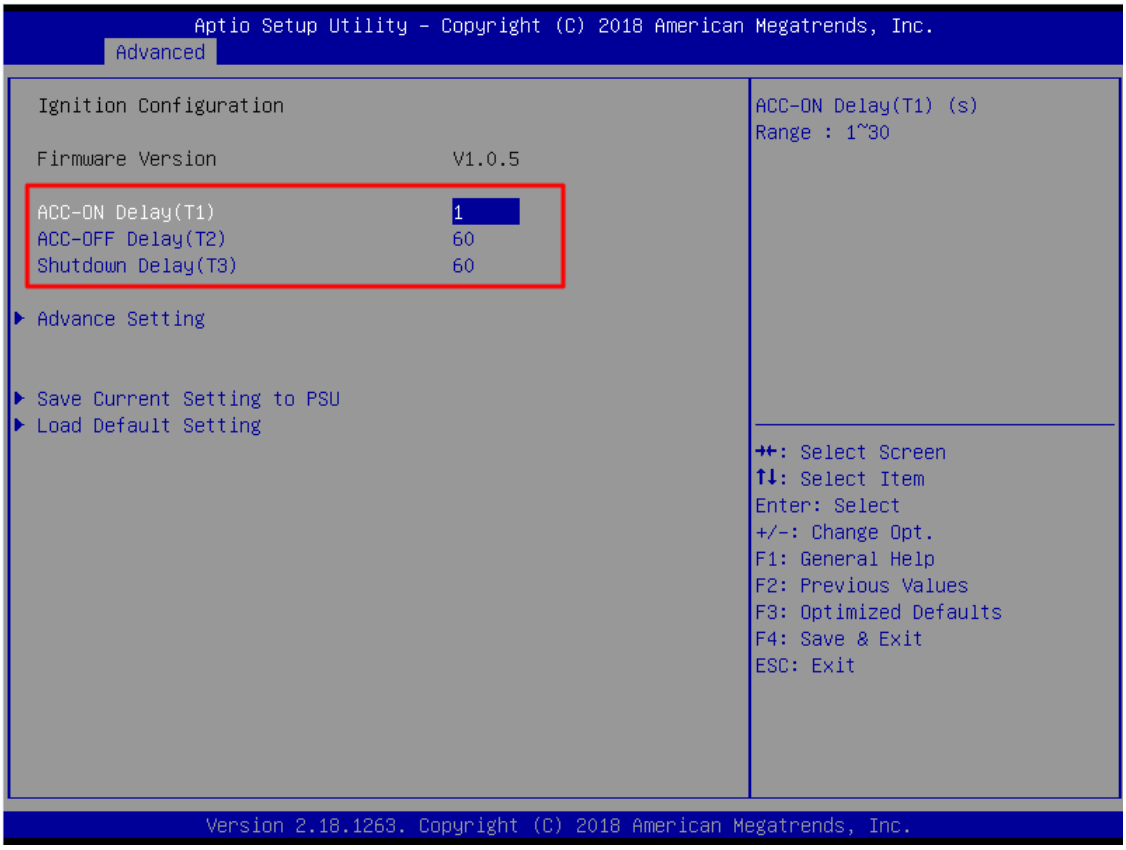
Use this screen to set ACC Timer.

(1) ACC-ON Delay (T1): Set delay timer for system power on.

(2) ACC-OFF Delay (T2): Set delay timer for system power off.

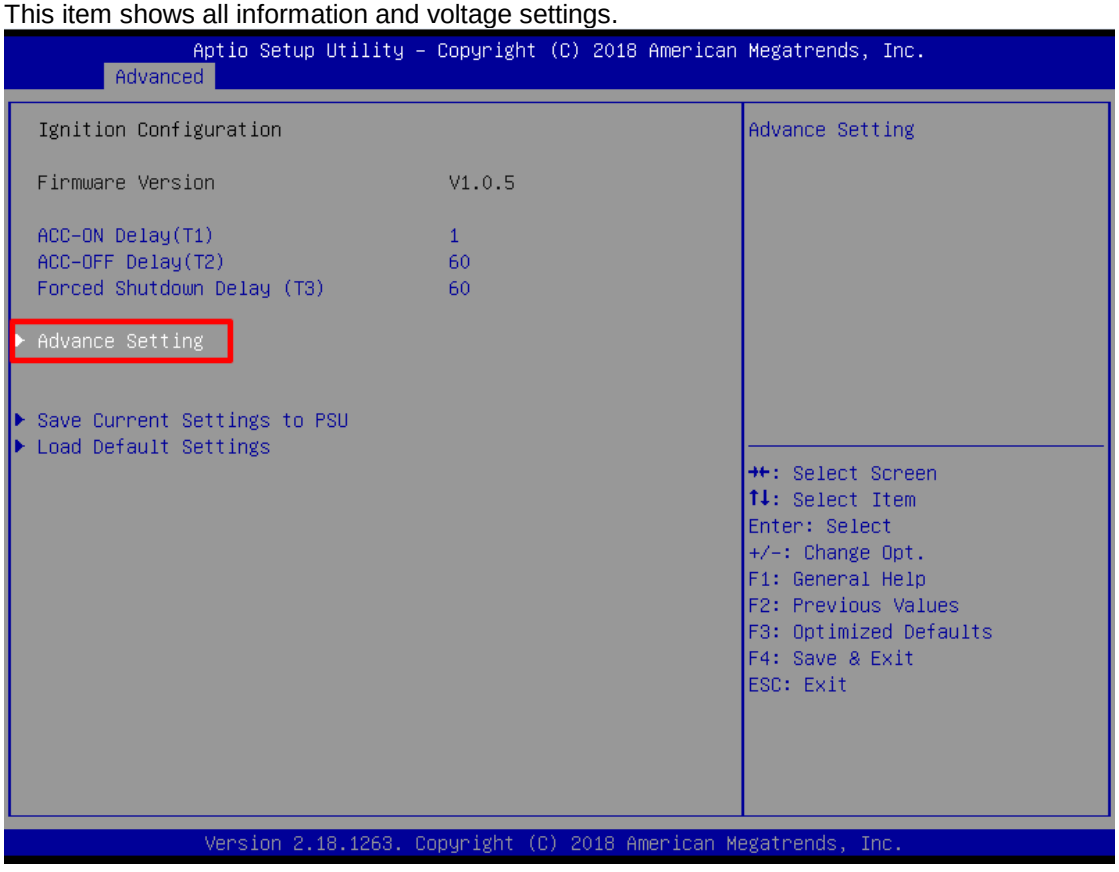
(3) Shutdown Delay (T3): In case the system OS fails to shut down and gets stuck on the shutdown screen, setting time out will allow the system to force turn off system power.

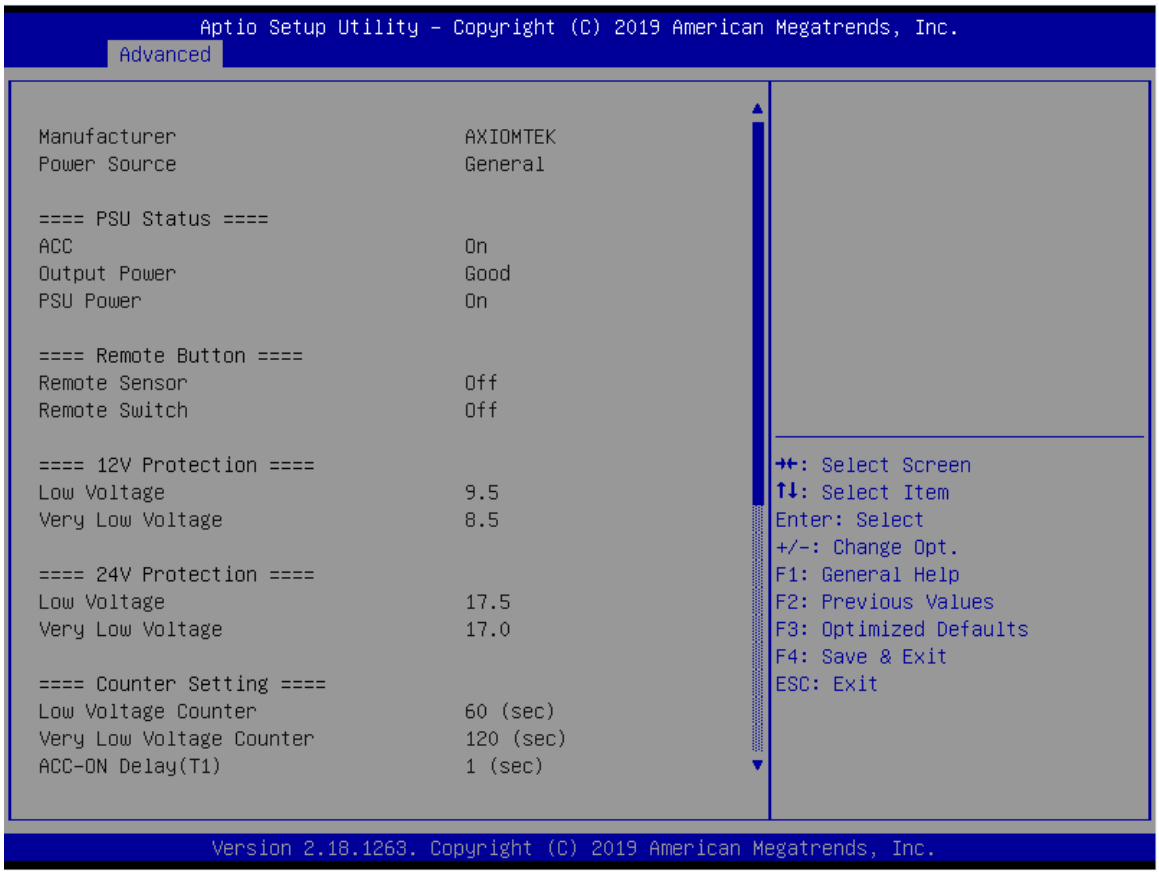
Function	Specification range	Unit
ACC ON Delay (T1)	1~30	Sec
ACC OFF Delay (T2)	60~10800	Sec
Shutdown Delay (T3)	60~600	Sec



Advance Setting

This item shows all information and voltage settings.





Voltage Setting

Voltage setting is designed to protect the lead-acid batteries and keep the system from running out of power when the lead-acid battery is low, so as not to drain the battery. (It is strongly recommended that users should avoid changing the defaults.)

(1) Low Voltage: Notifies the system to shut down when voltage drops to the specified value.

(2) Very Low Voltage: Force turns off system power when voltage drops to the specified value.

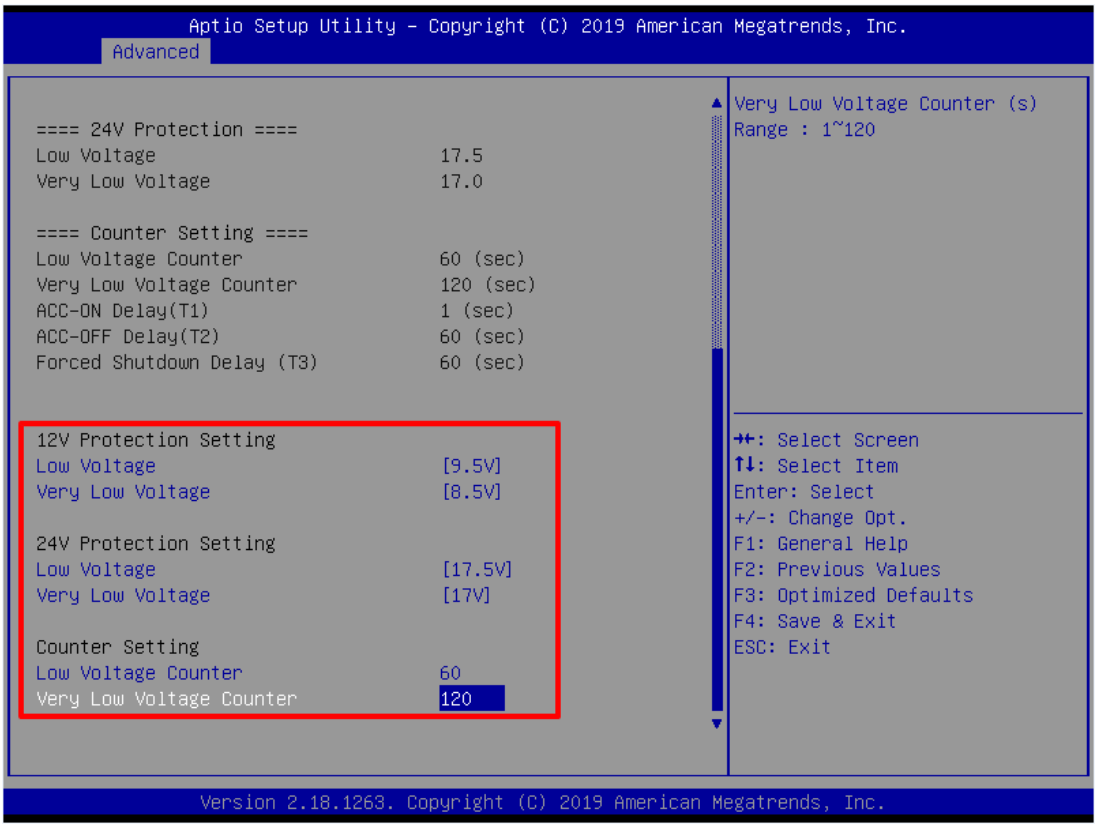
DC Mode	Function	Configuration range	Default Value	Unit
12V	Start Voltage	Low Voltage + 1V	10.5	V
	Low Voltage	9~12	9.5	
	Very Low Voltage	8.5~11.5	8.5	
24V	Start Voltage	Low Voltage + 2V	19.5	
	Low Voltage	17.5~24	17.5	
	Very Low Voltage	17~23.5	17	

Counter Setting

(1) Low Voltage Counter: Sets shut down delay time.

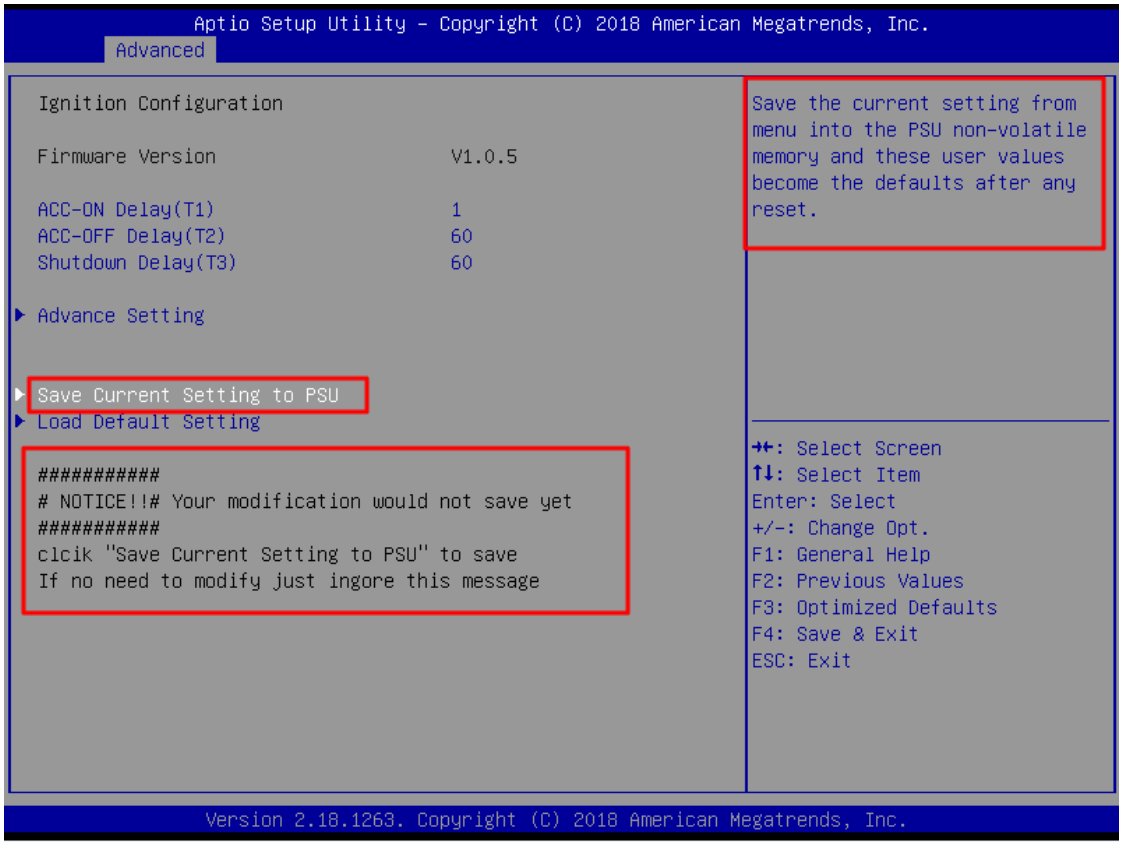
(2) Very Low Voltage Counter: Sets force turn off system power delay time.

Function	Spec range	Default Value	Unit
Low Voltage Counter	1~60	60	sec
Very Low Voltage Counter	1~120	120	sec



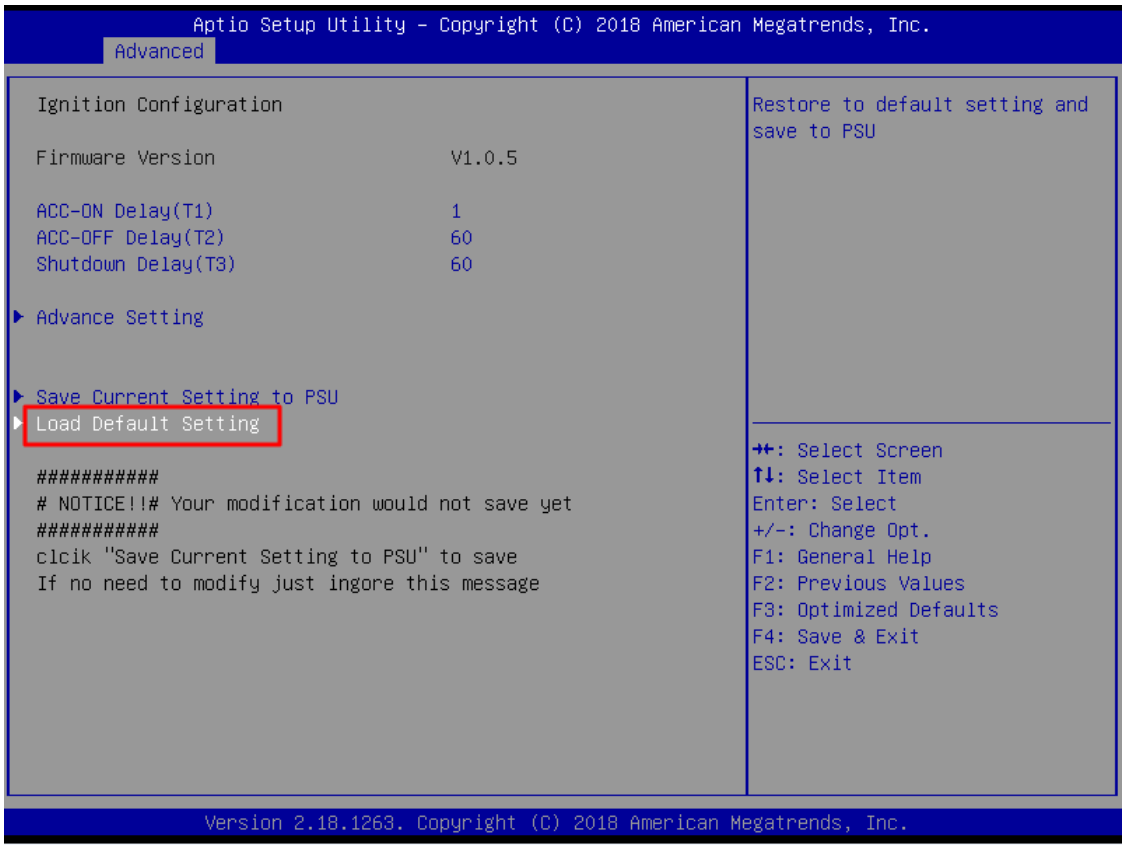
Save Setting

When all settings are completed, select “Save Current Setting to PSU” to save changes. If the user forgets to save current settings, the interface will pop up a notice message.



Load Default Setting

This option allows you to restore to default settings and save factory defaults.

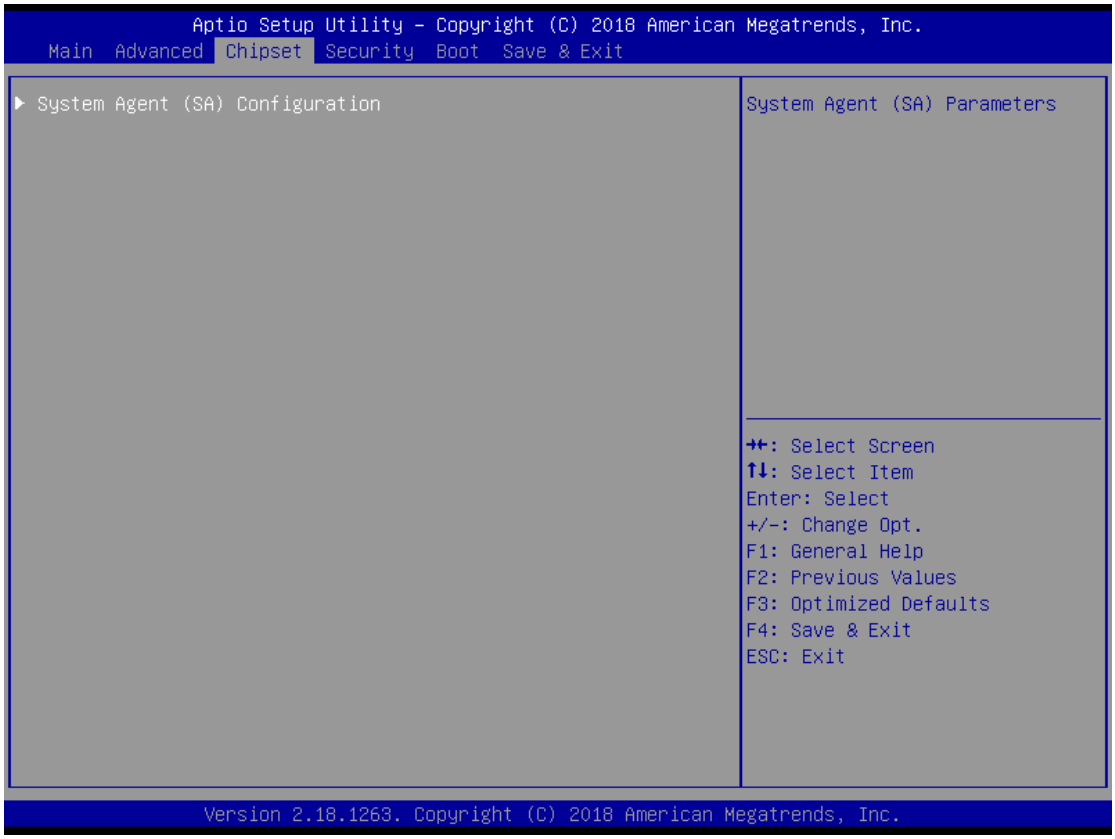


4.5 Chipset Menu

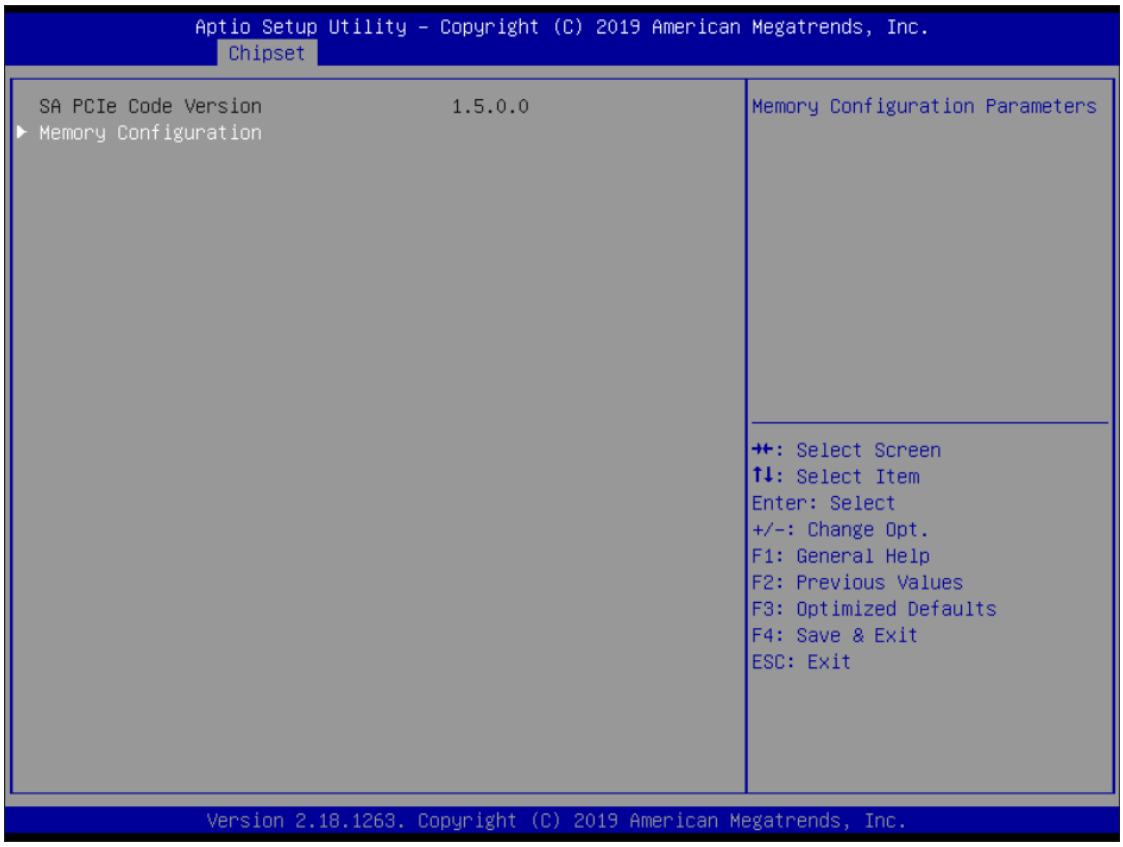
The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

► System Agent (SA) Configurations

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

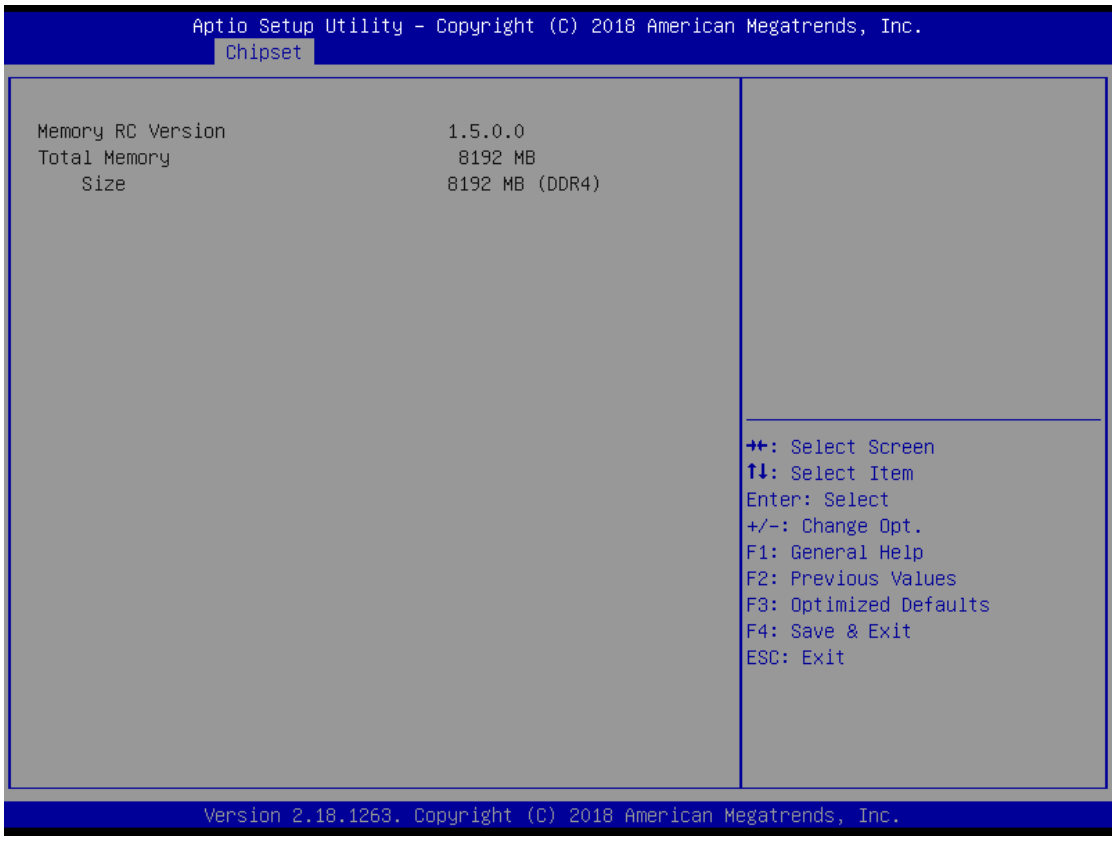


System Agent (SA) Configurations

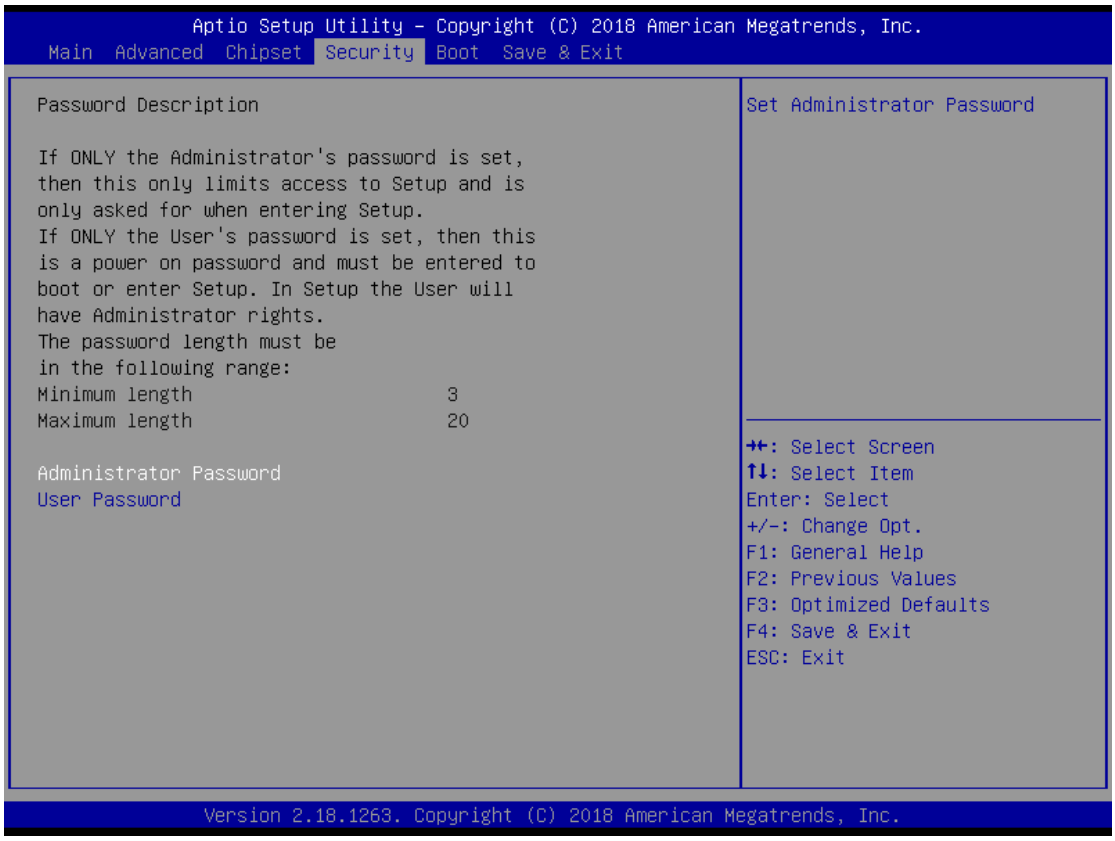


Memory Configuration

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


Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
Chipset
Memory RC Version 1.5.0.0
Total Memory 8192 MB
Size 8192 MB (DDR4)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

Security Menu



Administrator Password

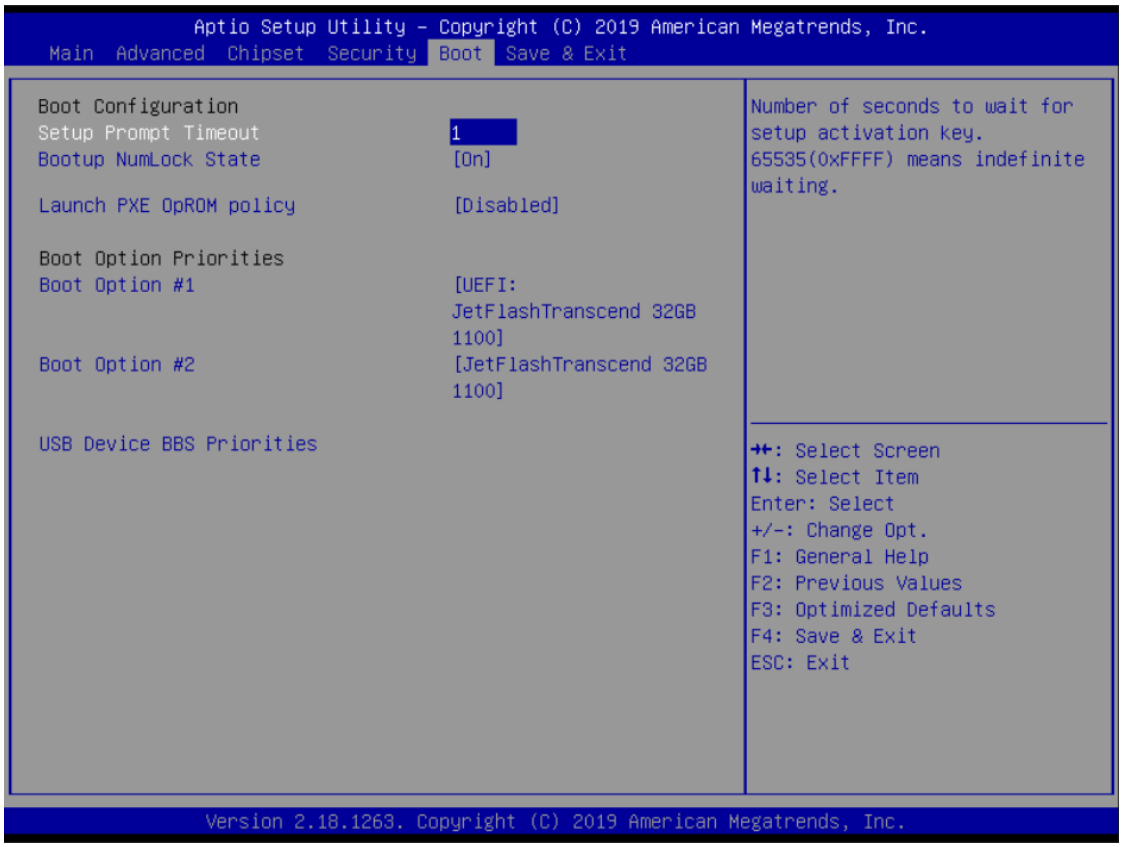
This item indicates whether an administrator password has been set (installed or uninstalled).

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.



Setup Prompt Timeout

Use this item to set up number of seconds to wait for setup activation key where 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

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

Launch PXE OpROM policy

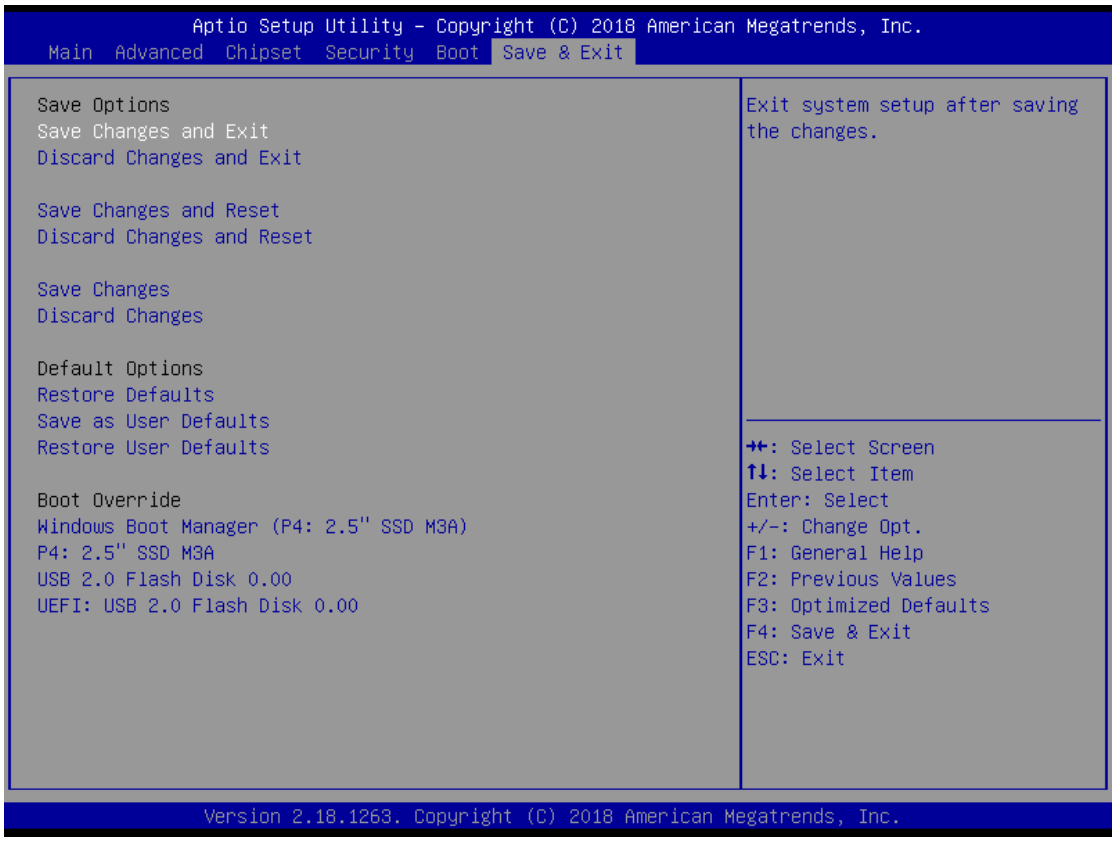
Controls the execution of UEFI and Legacy PXE OpROM.

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 users have 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

After completing 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.

APPENDIX A
WATCHDOG TIMER

About Watchdog Timer

Software stability is a major issue in most applications. Some embedded systems are not watched by humans for 24 hours. It is usually too slow to wait for someone to reboot when a computer hangs. The system needs 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.

How to Use the Watchdog Timer

The user can configure the watchdog timer using the watchdog function included in the AXVIEW2.0 software developed , or using the debug.exe software released by Microsoft.

Sample Program

The below sample code shows how to use DEBUG.exe in DOS mode to configure WDT function.

Enable watchdog timer

STEP	Sample code	Note
1. Enter configuration mode	O 2E 87	Un-lock super I/O
	O 2E 87	Un-lock super I/O
2. Select logic device	O 2E 07	Select logic register
	O 2F 08	Switch to WDT device
3. Enable WDT device	O 2E 30	Select register
	O 2F 01	Enable WDT
3. Set time unit	O 2E F0	Select logic register
	O 2F M	M = 08h (Minute) , M = 00h (Second)
4. Set timer	O 2E F1	Select logic register
	O 2F 0A	Set timer (where 0A (hex) = 10sec)

Disable watchdog timer

STEP	Sample code	Note
1. Enter configuration mode	O 2E 87	Un-lock super I/O
	O 2E 87	Un-lock super I/O
2. Select logic device	O 2E 07	Select logic register
	O 2F 08	Switch to WDT device
3. Disable WDT device	O 2E 30	Select register
	O 2F 00	Disable WDT