USER'S MANUAL

UST210-83K-FL Series

Robust DIN-rail Fanless Embedded System

User's Manual

AXIOMTEK®

www.axiomtek.com

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Safety Precautions

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

1. The UST210-83K-FL does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.

2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist 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 UST210-83K-FL before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the UST210-83K-FL is properly grounded.

4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

5. Turn OFF the 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 this equipment in an uncontrolled environment where the storage temperature is below -45℃ or above 85℃. 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 to discharge any static electricity on your body.

   ▪ When handling boards and components, wear a grounding wrist strap, available from most electronic component stores.

8. This product is intended to be supplied by a Listed Power Adapter or DC power source. Output meets SELV limits, rated 12-24Vdc, minimum 1.6-0.81A, Tma = 25 degree C, and the altitude of operation = 5000m. Supported POE rated 24Vdc, minimum 1.95A Tma = 25 degree C, and the altitude of operation = 5000m.

   If you need further assistance while purchasing the power source, please contact the manufacturer for further information.

CAUTION

Risk of explosion may occur if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

WARNING

● Do not touch the hot surface of the system unit when it is turned on.
● Restricted access area: The equipment should only be installed in a Restricted Access Area.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IP20
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the computer or any components.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may require a designated product for cleaning. Please read the instructions that come with a cleaning product to avoid misusage.

● 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, we still recommend that you rub it with a piece of cloth.

● Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.

● Vacuum cleaner: Vacuuming the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.

● Cotton swabs: Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard-to-reach areas in your keyboard, mouse, and other locations.

● Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

*Note: **We strongly recommended that you should shut down the system before you start to clean any single components.***

Please follow the steps below:

1. Close all application programs;

2. Close operating software;

3. Turn off power;

4. Remove all devices;

5. Pull out the 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 or no longer in use.

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Table of Contents

SECTION 1
INTRODUCTION

This chapter contains general information and detailed specifications of the UST210-83K-FL. Section 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets

1.1 General Description

The UST210-83K-FL fanless embedded system is an ideal solution for communications control and protocol converter applications in harsh environments. Designed for use in strict environments, the UST210-83K-FL adopts an extra low power consumption Intel E3940 (1.6GHz/4-cores) processor, while also supporting an industrial operating temperature range from -40°C to +70°C. The UST210-83K-FL offers a wide selection of I/O functions, including 2 x USB, 1 x HDMI, 4 x LAN, 1 x COM port, 1 x CANBUS and 1 x DIO. Its compact size makes it suitable for DIN-rail or wall mount, allowing for easy installation into control cabinets. By supporting Windows®10, the UST210-83K-FL provides a friendly environment for programmers to develop application software at a lower cost.

The UST210-83K-FL is a robust gateway built with an industrial-grade hardware design. It adopts an advanced cooling system and supports mSATA and 2.5" SATA SSD (or HDD), which makes it a perfect field control & monitoring system solution for the following markets:

- Utility industries (hydro resources; energy; chemical plants; mining, etc.)
- Public transportation industries (traffic/ highway control; train/bus control, etc.)
- Homeland security (weather monitoring/alarm system, etc.)

● **Features**

■ Fanless design

■ Wide temperature operation range of -40°C - +70°C

■ Supports 4 x 10/100/1000 Base-T Ethernets

■ Two SKUs:

a) 1 x CANBUS port + 1 x COM port supporting RS-232/422/485 (4 wires)

b) 2 x COM ports support RS-232/422/485 (4 wires)

■ 2 x USB 3.0

■ 1 x HDMI

■ 2 x PCIe Mini Card slots:

a) 1 x half size (USB/mSATA Interface)

b) 1 x full size (USB Interface) with SIM slot

■ Supports one 2.5" SATA drive and one mSATA (1 x half size Mini Card slot)

■ Wide range 9–36VDC power input with terminal block
(typical 12/24VDC for vehicle application)

■ 8-bit programmable TTL level digital input/output port

■ DIN-rail or wall-mount mounting available

■ CE and FCC certified

■ Supports TPM2.0

■ Supports IEEE802.3 AF/AT PoE 30W (PoE model type only)

● **Embedded O.S. Supported**

■ UST210-83K-FL supports Windows® 10 and Linux Ubuntu 18.04.

1.2 System Specifications

1.2.1 CPU

● Onboard Intel Atom® Apollo Lake-I x5-E3940 processor (1.6 GHz/4-cores).

1.2.2 BIOS

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

1.2.3 System Memory

● One DDR3L 204-pin SO-DIMM (1.35V) slot.

● Supports 1866 MHz max up to 8GB.

1.2.4 Display

● Supports HDMI standards up to 1920x1200@60Hz.

1.2.5 Ethernet Ports

● LAN chip: Intel Ethernet Controller I211.

● Four RJ-45 connectors support 10/100/1000 Base-T Ethernet with 1.5KV magnetic isolated protection.

● Supports Power of Ethernet IEEE802.3 AF/AT 30W (PoE model type only) by using the alternative A & B connection method to carry the power.

⚠️ *The UST210 is designed to function as a PSE device. To prevent damaging the system hardware, do not connect the UST210 to other PSE devices.*

Table 33–2—PSE Pinout alternatives

Conductor	Alternative A (MDI-X)	Alternative A (MDI)	Alternative B (All)
1	Negative V$_{PSE}$	Positive V$_{PSE}$	
2	Negative V$_{PSE}$	Positive V$_{PSE}$	
3	Positive V$_{PSE}$	Negative V$_{PSE}$	
4			Positive V$_{PSE}$
5			Positive V$_{PSE}$
6	Positive V$_{PSE}$	Negative V$_{PSE}$	
7			Negative V$_{PSE}$
8			Negative V$_{PSE}$
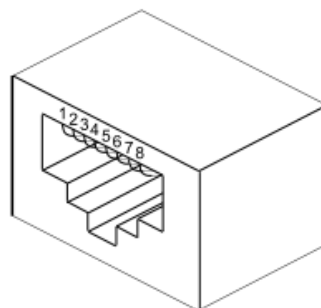
Figure 33–8—PD and PSE eight-pin modular jack
(Picture Source: IEEE std 802.3at-2009 Datasheet)

1.2.6 Remote SW

● 1 x SW CN for remote control.

1.2.7 Storage

● 1 x mSATA (half size mini card slot).

● 1 x SATA.

1.2.8 Wireless

● 2 x Mini Card slots. (one half size and one full size)

● 1 x SIM card socket.

● 4 x antenna holes.

1.2.9 USB

● 2 x USB3.0.

1.2.10 COM/CAN

● 1 port TB supports 1COM+1CANBUS or 2COM

● COM mode supports RS-232/422/485 (which can be selected by BIOS)

● Supports High Speed Mode115.2 Kbps, Up to 1.5 Mbps

● Pin define is listed as follows:

PIN	RS232	RS422	RS485	PIN	RS232	RS422	RS485	CAN
B5	RX	TX+	D+	A5	RX	TX+	D+	x
B4	CTS	TX-	D-	A4	CTS	TX-	D-	x
B3	TX	RX+	x	A3	TX	RX+	x	L
B2	RTS	RX-	x	A2	RTS	RX-	x	H
B1	GND	GND	GND	A1	GND	GND	GND	GND
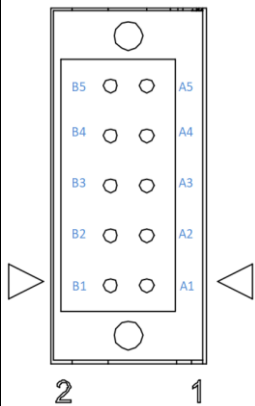
1.2.11 Power

● Wide-range 9 - 36VDC (typical 12/24VDC) power input with terminal block.

● OVP and RVP protection.

● Supports Axiomtek Smart Ignition.

Pin	Signal
1	+
2	-
3	IGN
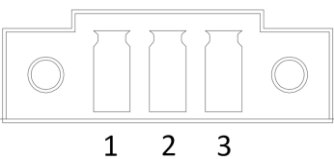
1.2.12 Power & Reset Button

● AT auto power on.

● Power button setting for software must be set up first.

● One reset button.

Note: Power button setting instructions for Windows software is offered in APPENDIX B for reference.

1.2.13 DIO

● One DB9 female connector supports 8 bits TTL level programmable digital input/output.

● The voltage for TTL is 5V.

● The programming is as follows:

- I/O sink current is 8~10mA (output drive current ± 50 mA).

- Input/Output is programmable.

Pin	Signal
1	DIO0
2	DIO1
3	DIO2
4	DIO3
5	DIO4
6	DIO5
7	DIO6
8	DIO7
9	GND
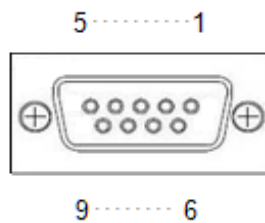
1.2.14 WatchDog Timer (WDT)

● 1~255 seconds or minutes; up to 255 levels.

1.2.15 Restore BIOS Optimal Defaults (SW1)

● Press the tact switch (SW 1) to restore optimal BIOS defaults.

1.2.16 System LED

● The table below summarizes the functional descriptions of the LED indicators and their corresponding colors.

LED Name	Description	Color
ACT	Indicates storage status. The LED flashes when storage is being accessed.	Orange
PWR	Indicates power status. When the DC input is acceptable, the LED will turn on.	Green

1.2.17 Operation Temperature

● -40^0C ~ $+70^0$C

1.2.18 Storage Temperature

● -40^0C ~ $+85^0$C

1.2.19 Humidity

● 0% ~ 95%

1.2.20 Weight

● 0.514 kg

1.2.21 Dimensions

● 48mm (1.22") (W) x110mm (3.93") (D) x155mm (4.92") (H)

1.2.22 System I/O Outlets

● One terminal block 2x5 pin male connector, 2 SKUs available:

 a) COM x1 + CAN x1

 b) COM x2

● One HDMI connector

● Four 10/100/1000 Base-T RJ-45 with 1.5KV magnetic isolated protection.

● Two USB 3.0 ports

● One DC power input with terminal block.

● One 9-pin D-Sub female connector for DIO.

● Four antenna holes.

1.3   Dimensions

The following diagrams show you the dimensions and outlines of the UST210-83K-FL.

Model without PoE
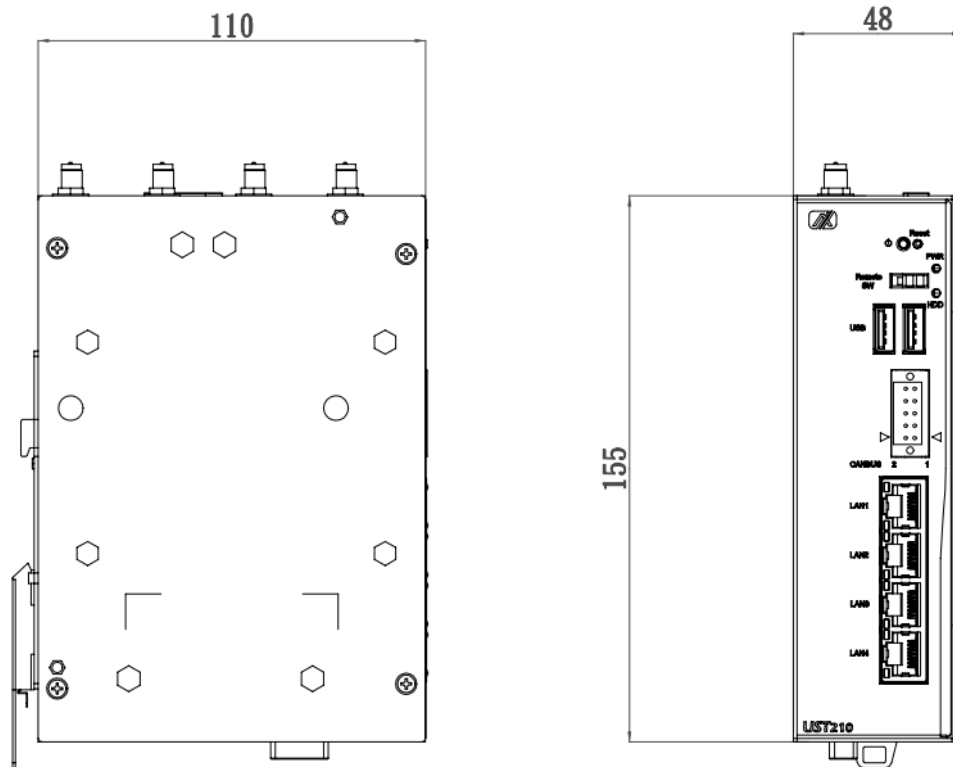
Model with PoE
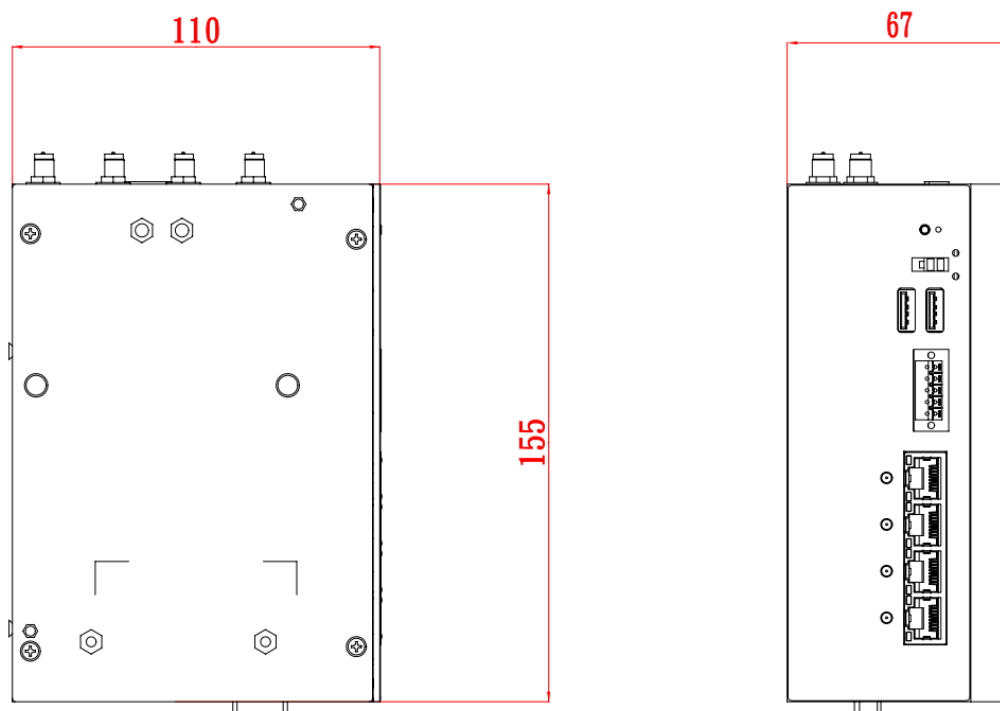
1.4   I/O Outlets

The following figures show you the I/O outlets on the front view and top view of the UST210-83K-FL.

(Without PoE)
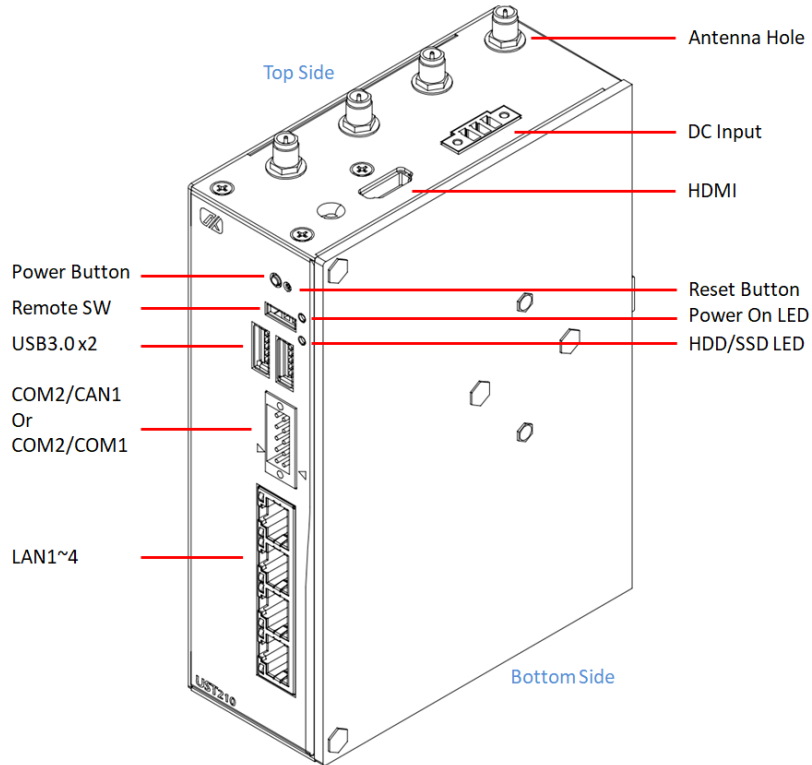
(with PoE)
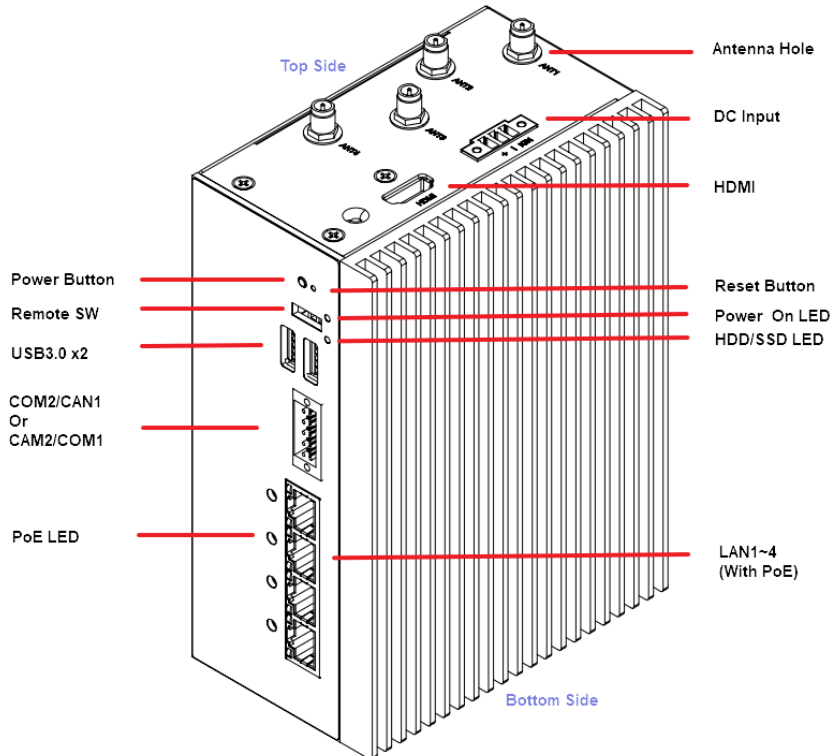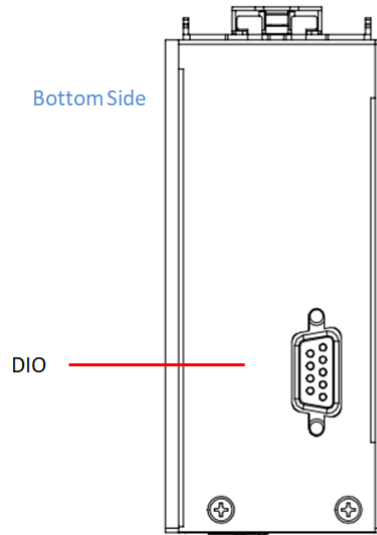
(Without PoE)   (With PoE)
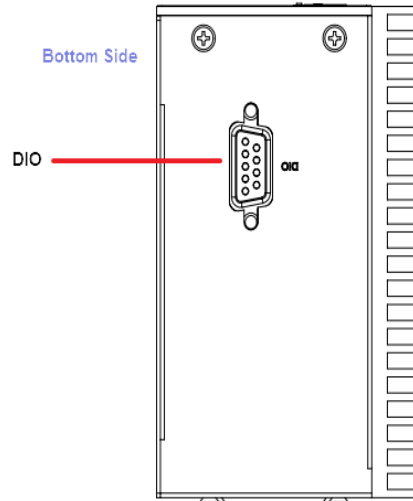
SECTION 2
HARDWARE INSTALLATION

The UST210-83K-FL is convenient for your various hardware configurations, such as memory modules and mSATA drives. Section 2 will show you how to install the hardware.

2.1   Installing the Memory Module

Step 1   Turn off the system.

Step 2   Loosen all screws from the cover and flip the cover to the left.
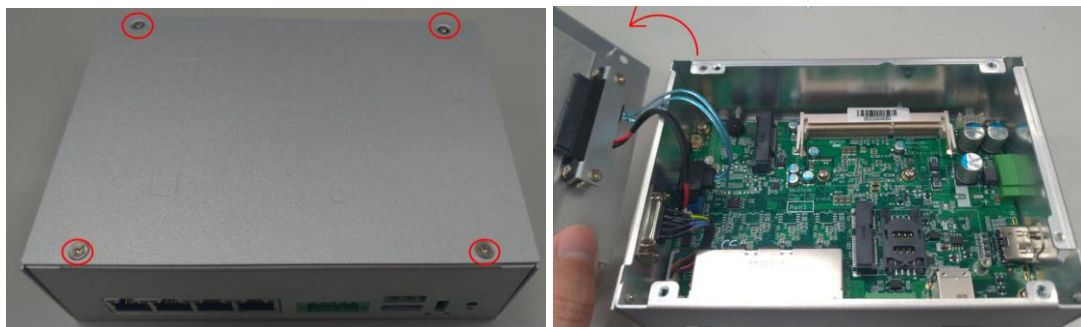
Step 3   Put the thermal pad on the memory module.
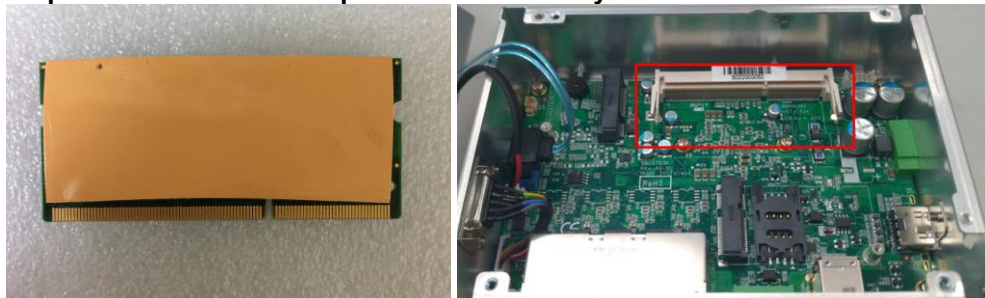
Step 4   Insert the memory into the slot and push the memory down to lock it in place; make sure the memory is locked by the socket.
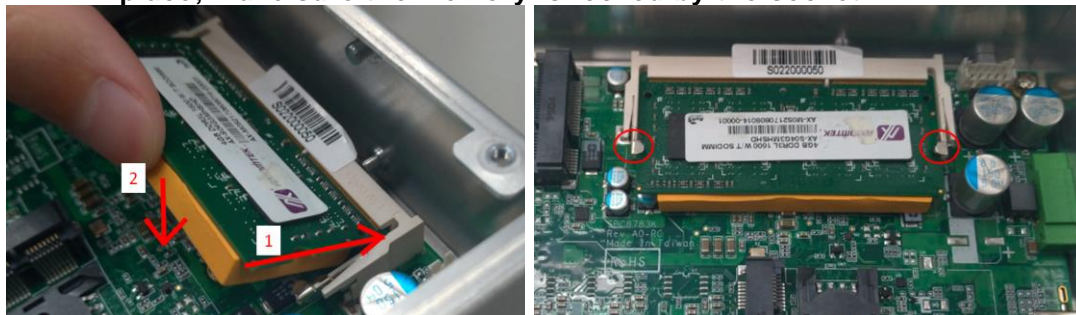
2.2   Installing the mSATA

Step 1   Insert the mSATA into the slot.
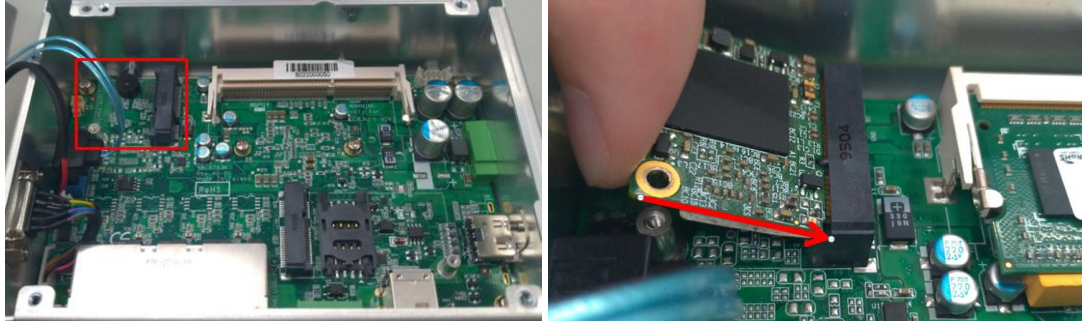
Step 2   Fasten the screws tightly.
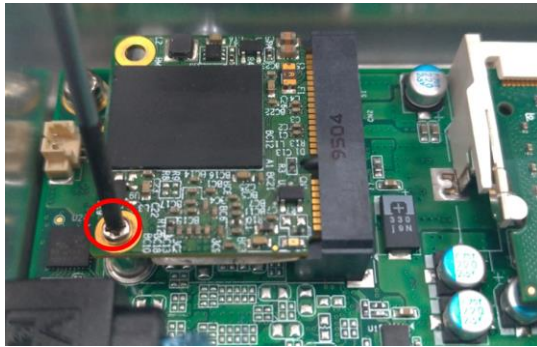
2.3   Installing the Wireless Module

Step 1   Pull the SIM socket backward to unlock, and flip the cover to open

Step 2   Insert the SIM Card into the socket and put it back down. Then slide the socket forward to lock it in place.

Step 3   Insert the wireless module into the slot and fasten the screw.
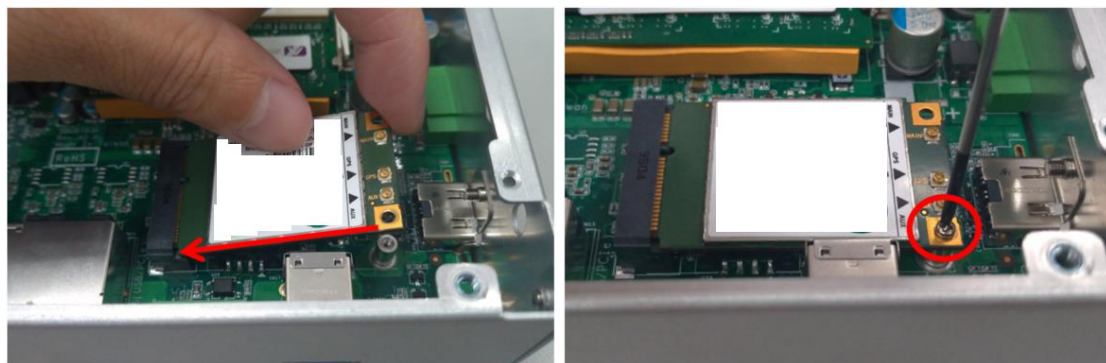
Step 4   Remove the antenna plug from one antenna hole on the system chassis, and prepare the antenna cable.
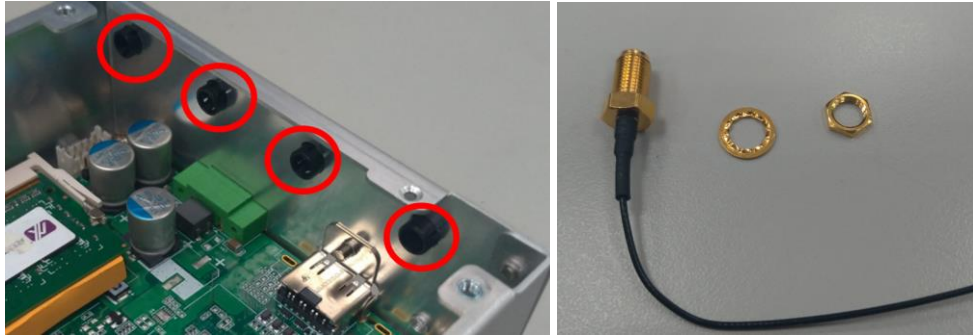
Step 5   Make the antenna cable's gold connector through the antenna hole on the system chassis, and screw it tight with the antenna nut and gasket.

Step 6   Screw the RF antenna to the gold connector.
Step 7   Connect the other end of the cable to the connector on the wireless module.

Note: Use only standard-size SIM cards, as illustrated below:
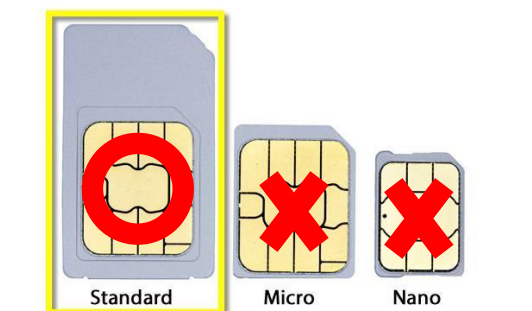
2.4   Installing the Hard Disk

Step 1   Loosen the bracket screw and take off the bracket, and apply the HDD pad on the bracket.
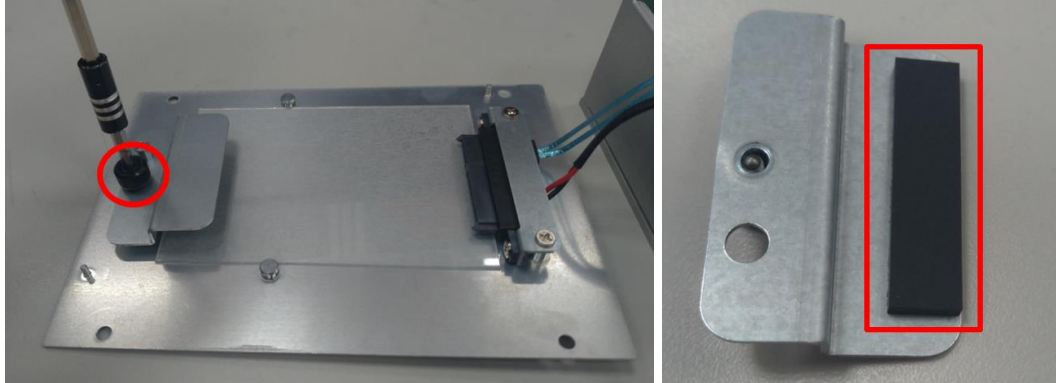
Step 2   Insert the hard disk and screw the bracket to the system chassis.
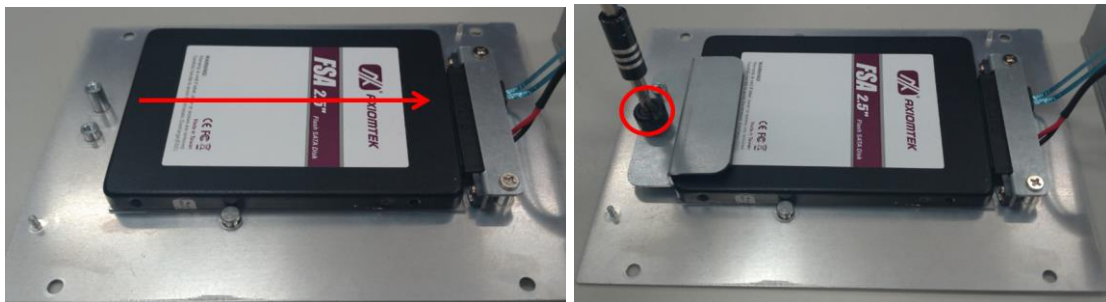
2.5   Installing the DIN-rail Mount and Wall Mount Kits

The UST210-83K-FL provides DIN-rail and Wall Mount kits that customers can install as below:

Method 1: DIN-rail Mount

Step 1   Prepare the DIN-rail mount assembling components (screws and bracket) ready.

Step 2   Assemble the bracket to the system unit and fasten all screws tight.

(without PoE)

(with PoE)
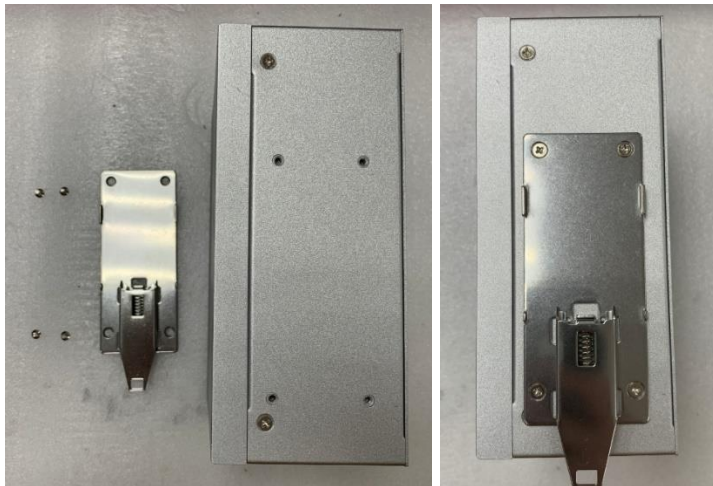
Note: Only 4mm length M3 type screws are accepted.

Method 2: Wall Mount

Step 1   Prepare the wall mount assembling components (screws and bracket) ready.
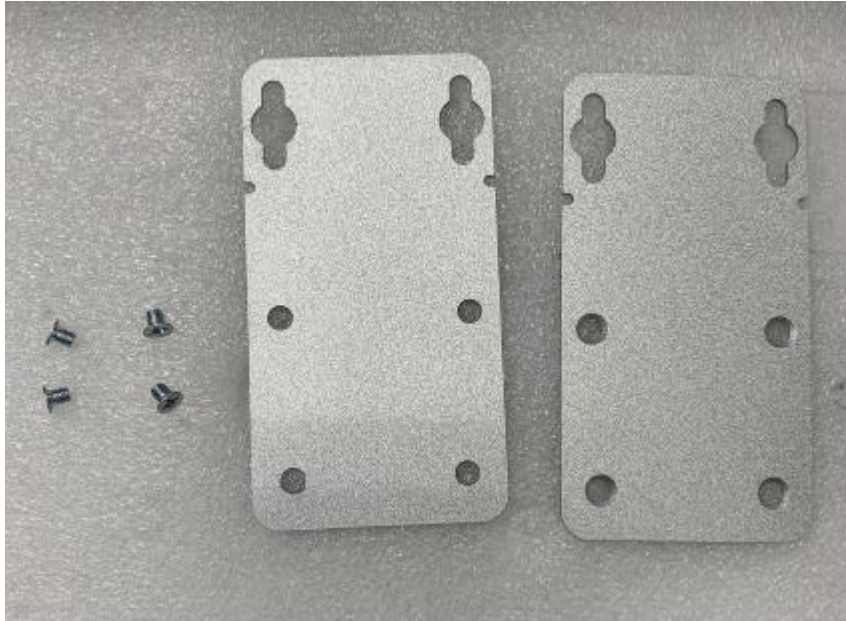
Step 2 **Align the positioning notches on the wall mount bracket to the edges of the system unit. Make sure the screw hole chamfers face upward and then screw the bracket firmly to the system unit.**

(Without PoE)   **(With PoE)**

2.6 Installing the Cable Fixing Plate

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

Step 2 To fasten the HDMI cable fixing plate (Figure 1) to the system, position the hole on the plate against the hole on the system chassis, insert the screw into the holes, and turn the screw tightly to fasten the plate, as shown in Figure 2 below.

Step 3 Insert the HDMI cable into the system's HDMI port. Then Insert a cable tie through the loop of the cable fixing plate to bind the HDMI cable to the plate, as shown in Figure 3 below.

(Figure 1)   **(Figure 2)**   **(Figure 3)**

SECTION 3
AMI UEFI BIOS UTILITY

The AMI UEFI BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a flash backup to save the Setup information whenever the power is turned off.

3.1   Entering Setup

To enter the setup screens, follow the steps below:

Turn on the computer and press the <Del> key immediately.

After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

3.2   The Main Menu

Once you enter the AMI BIOS Aptio Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use Select Screen Keys (or Move Keys) to select the Setup Page you intend to configure and then press <Enter> to accept or to enter its sub-menu.

```
           Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information                                            Set the Date. Use Tab to
    BIOS Version                  SBC8783K V1.00                switch between Date elements.
    Build Date and Time           07/16/2020 10:23:01           Default Ranges:
                                                                Year: 2005-2099
    System Date                   [Fri 08/07/2020]              Months: 1-12
    System Time                   [18:58:18]                    Days: dependent on month

    Access Level                  Administrator



                                                                →←: Select Screen
                                                                ↑↓: Select Item
                                                                Enter: Select
                                                                +/-: Change Opt.
                                                                F1: General Help
                                                                F2: Previous Values
                                                                F3: Optimized Defaults
                                                                F4: Save & Exit
                                                                ESC: Exit



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```

System Date
The date format is <day> <month> <date> <year>.
System Time
This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

3.3 Advanced Features

This Advanced menu allows users to configure and improve your system, or to set up some system features according to your preference. You can select any of the items in the left frame of the screen to go to the sub menus:

- ► CPU Configuration
- ► SATA Configuration
- ► USB Configuration
- ► Hardware Monitor
- ► F81804 Super IO Configuration
- ► Serial Port Console Redirection
- ► Trusted Computing
- ► Device Configuration
- ► PoE Configuration
- ► Smart Ignition Management

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

※PoE Configuration (only available for PoE model type)

```
        Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ CPU Configuration                                    CPU Configuration Parameters
 ▶ SATA Configuration
 ▶ USB Configuration
 ▶ Hardware Monitor
 ▶ F81804 Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ Trusted Computing
 ▶ Device Configuration
 ▶ POE Configuration
 ▶ Smart Ignition Management

                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

- **CPU Configuration**

Scroll to this item and press <Enter> to view the CPU Configuration information.

(Please refer to below graphics.)

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
  Advanced

  CPU Configuration                                         When enabled, a VMM can
                                                            utilize the additional
  Intel(R) Atom(TM) Processor E3940 @ 1.60GHz               hardware capabilities provided
  CPU Signature                   506CA                     by Vanderpool Technology
  Microcode Patch                 1A
  Max CPU Speed                   1600 MHz
  Min CPU Speed                   800 MHz
  Processor Cores                 4
  Intel HT Technology             Not Supported
  Intel VT-x Technology           Supported
  64-bit                          Supported

  L1 Data Cache                   24 kB x 4
  L1 Code Cache                   32 kB x 4                  ➜←: Select Screen
  L2 Cache                        1024 kB x 2               ↑↓: Select Item
  L3 Cache                        Not Present               Enter: Select
                                                            +/-: Change Opt.
  Intel Virtualization Technology [Enabled]                 F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit




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```

● **SATA Configuration**

Scroll to this item and press <Enter> to view the SATA Configuration information.

(Please refer to below graphics.)
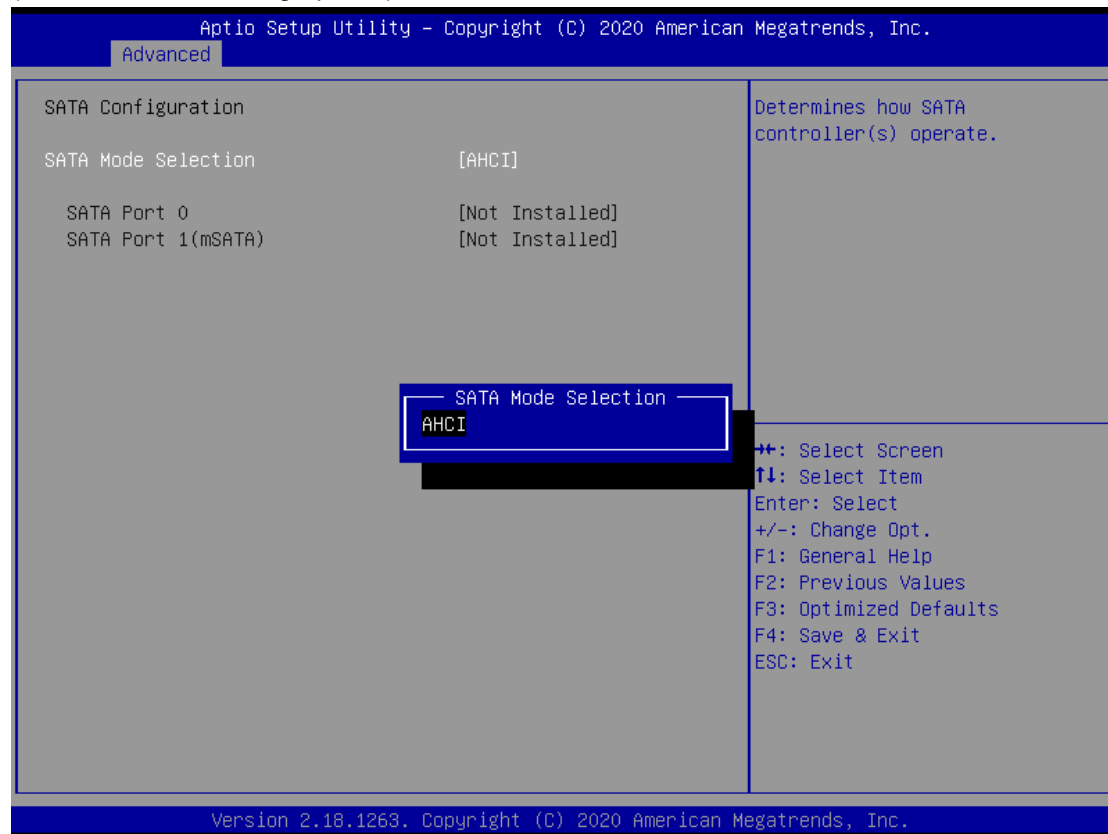
● **USB Configuration**

Scroll to this item and press <Enter> to view the USB Configuration information.

(Please refer to below graphics.)

```
            Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
    Advanced

  USB Configuration                                    Mass storage device emulation
                                                       type. 'AUTO' enumerates
  USB Module Version              17                   devices according to their
                                                       media format. Optical drives
  USB Controllers:                                     are emulated as 'CDROM',
        1 XHCI                                         drives with no media will be
  USB Devices:                                         emulated according to a drive
        1 Drive, 1 Keyboard, 1 Mouse, 1 Hub            type.

  Mass Storage Devices:
  USB 2.0 Flash Disk 0.00            [Auto]

                                                       →←: 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) 2017 American Megatrends, Inc.
```

● **H/W Monitor**

Scroll to this item and press <Enter> to view the hardware status items under monitoring.

(Please refer to below graphics.)

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
 Advanced

 Pc Health Status

 CPU                          : +29 ℃
 SYSTEM                       : +33 ℃
 +3.3V                        : +3.312 V
 +5V                          : +4.989 V
 +3.3VSB                      : +3.328 V
 +5VSB                        : +5.016 V
 VBAT                         : +3.056 V



                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



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```

● **F81804 Super IO Configuration**

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 supports RS422 and RS485 modes as well as high-speed mode.

You can enable High-speed mode, which can be selected in the BIOS menu.

COM port speed supports up to 1.5 Mbps.

(Please refer to below graphics.)

```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Advanced

   F81804 Super IO Configuration                          Set Parameters of Serial Port
                                                          1 (COMA)
   Super IO Chip                        F81804
 ▶ Serial Port 1 Configuration
 ▶ Serial Port 2 Configuration




                                                          ↔: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit



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```

```
         Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 Serial Port 1 Configuration                                     RS232/RS422/RS485

 Device Settings                      IO=3F8h; IRQ=4;


 Select Mode                          [RS232]

 High-speed mode                      [Disabled]


                        ┌──────── Select Mode ────────┐
                        │  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



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```

● **Trust Computing**

This sub-menu will allow you to enable/disable Trusted Platform Module (TPM) support and to configure the TPM State. Select Trusted Computing and press Enter to access the sub-menu.

Select the Security Device Support item to enable the TPM device.

```
            Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     Advanced

   Configuration                                              Enables or Disables BIOS
    Security Device Support           [Disable]               support for security device.
     NO Security Device Found                                 O.S. will not show Security
                                                              Device. TCG EFI protocol and
                                                              INT1A interface will not be
                                                              available.


                        ┌───── Security Device Support ─────┐
                        │ Disable                           │
                        │ Enable                            │
                        └───────────────────────────────────┘
                                                              Select Screen
                                                              Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit



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```

```
                   Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
     Advanced

                                                                        Enables or Disables BIOS
                                                                        support for security device.
   TPM20 Device Found                                                   O.S. will not show Security
                                                                        Device. TCG EFI protocol and
   Security Device Support               [Enable]                       INT1A interface will not be
   Active PCR banks                      SHA-1                          available.
   Available PCR banks                   SHA-1,SHA256


   TPM 20 InterfaceType                  [TIS]

                                                                        →←: Select Screen
                                                                        ↑↓: Select Item
                                                                        Enter: Select
                                                                        +/-: Change Opt.
                                                                        F1: General Help
                                                                        F2: Previous Values
                                                                        F3: Optimized Defaults
                                                                        F4: Save & Exit
                                                                        ESC: Exit




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```

● **DIO Configuration**

The DIO Modification default setting is "disable".

If the setting is changed to "enable", you can load manufacture default and program DIO setting.

(Please refer to below graphics.)

```
                    Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
            Advanced

 ▶ Onboard Device Configuration                                Onboard Device Configuration
                                                              status



                                                              ➡: 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) 2017 American Megatrends, Inc.
```

```
                    Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
            Advanced

 ▶ Onboard DIO Configuration                                  Onboard DIO status



                                                              ➡: 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) 2017 American Megatrends, Inc.
```

```
            Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
    Advanced

 Onboard DIO Configuration                                    Enabled or Disabled DIO
 DIO Modification                    [Disabled]               Modification
▶ DIO port 1-8




                                                              →←: 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) 2016 American Megatrends, Inc.
```

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
    Advanced

 DIO status
 1.Input/Output Status               Out & High
 2.Input/Output Status               Out & High
 3.Input/Output Status               Out & High
 4.Input/Output Status               Out & High
 5.Input/Output Status                In & High
 6.Input/Output Status                In & High
 7.Input/Output Status                In & High
 8.Input/Output Status                In & High




                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit




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```

```
                    Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
        Advanced

   Onboard DIO Configuration                                      Enabled or Disabled DIO
   DIO Modification                 [Enabled]                     Modification
 ▶ Load Manufacture Default
 ▶ DIO port 1-8




                                                                 ↔: 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) 2017 American Megatrends, Inc.
```

```
                    Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
        Advanced

   DIO status                                                     Input/Output Setting
   1.Input/Output Status           Out & High
     Input/Output Setting          [Output]
     High/Low Setting              [High]
   2.Input/Output Status           Out & High
     Input/Output Setting          [Output]
     High/Low Setting              [High]
   3.Input/Output Status           Out & High
     Input/Output Setting          [Output]
     High/Low Setting              [High]
   4.Input/Output Status           Out & High
     Input/Output Setting          [Output]
     High/Low Setting              [High]
   5.Input/Output Status            In & High                     ↔: Select Screen
     Input/Output Setting          [Input]                        ↑↓: Select Item
   6.Input/Output Status            In & High                     Enter: Select
     Input/Output Setting          [Input]                        +/-: Change Opt.
   7.Input/Output Status            In & High                     F1: General Help
     Input/Output Setting          [Input]                        F2: Previous Values
   8.Input/Output Status            In & High                     F3: Optimized Defaults
     Input/Output Setting          [Input]                        F4: Save & Exit
                                                                  ESC: Exit




                    Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

● **PoE Configuration**

Power over Ethernet (PoE) describes any of several standard or ad-hoc systems which pass electrical power along with data on twisted pair Ethernet cabling.

※ This function is only available for UST210-83K-E3940-4POE-COM-CAN-TVDC or UST210-83K-E3940-4POE-2COM -TVDC.

This menu allows users to set the power and enable/disable a specific port.

```
         Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

    POE Controller 0                             The disconnection power level
                                                 of a specific power
    Power Budget(W)                  30 (W)
    Set Power Budget(W) (Max:30)     30

    Total Power Consume(W)           0 (W)
       Port1                         0 (W)
       Port2                         0 (W)
       Port3                         0 (W)
       Port4                         0 (W)

  ▶ Port Configuration

                                                 →←: Select Screen
  ▶ Save Current Setting to POE                  ↑↓: Select Item
  ▶ Load Default Setting                         Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit

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```

Power Budget

Display current total power budget on all ports.

Note: Please be advised that, when setting up power budget, the value of power budget must not be smaller than the sum-up of the operating watts required by the power device (PD) and Power Classifications. Otherwise, the system will not provide electricity to the PD. Please request the PD supplier for clear Power Classifications watts values or check the info in the BIOS.

Set Power Budget

Set connection power level for a specific power (Max:30).

Actual Total Power Consume
The UST210-83K-FL supplies power to devices according to actual power budget.

Save Current Setting to POE
Save the current settings from menu into the POE non-volatile memory and these user values become the defaults after any reset.

Load Default Setting
Restore to default settings and save to POE. Default: Power Budget 30W, all ports enabled.
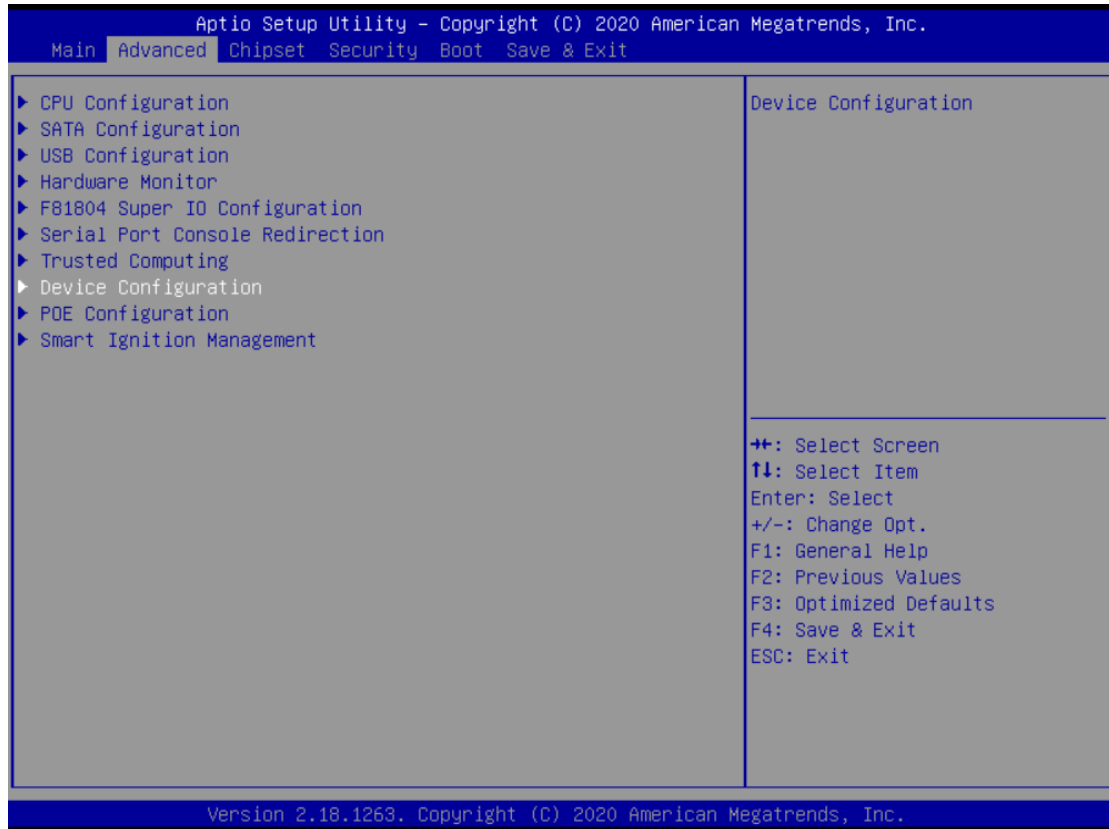
```
        Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

                                                                   Port1
        Port1                          [Enabled]
        Power Status                   Turn Off
        Detect                         Open circuit
        Class                          Unknown

        Port2                          [Enabled]
        Power Status                   Turn Off
        Detect                         Open circuit
        Class                          Unknown

        Port3                          [Enabled]
        Power Status                   Turn Off                    →←: Select Screen
        Detect                         Open circuit                ↑↓: Select Item
        Class                          Unknown                     Enter: Select
                                                                   +/-: Change Opt.
        Port4                          [Enabled]                   F1: General Help
        Power Status                   Turn Off                    F2: Previous Values
        Detect                         Open circuit                F3: Optimized Defaults
        Class                          Unknown                     F4: Save & Exit
                                                                   ESC: Exit




        Version 2.18.1263. Copyright (C) 2020 American Megatrends, Inc.
```
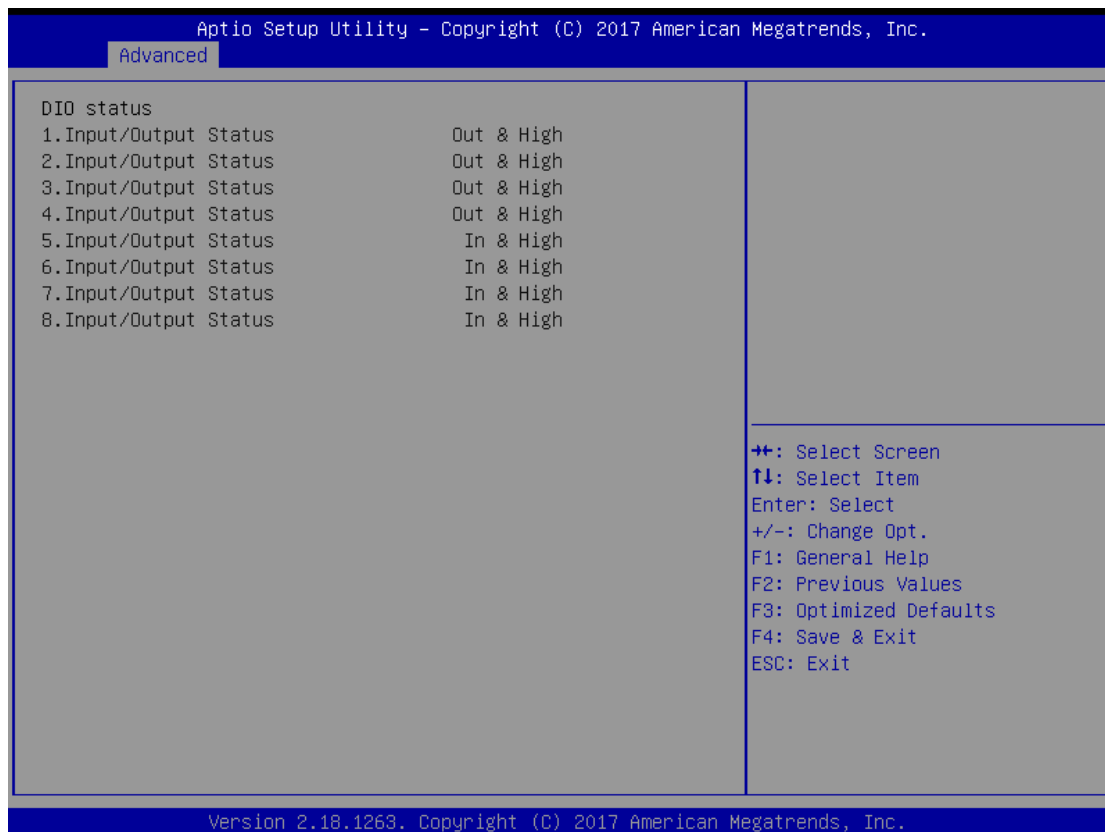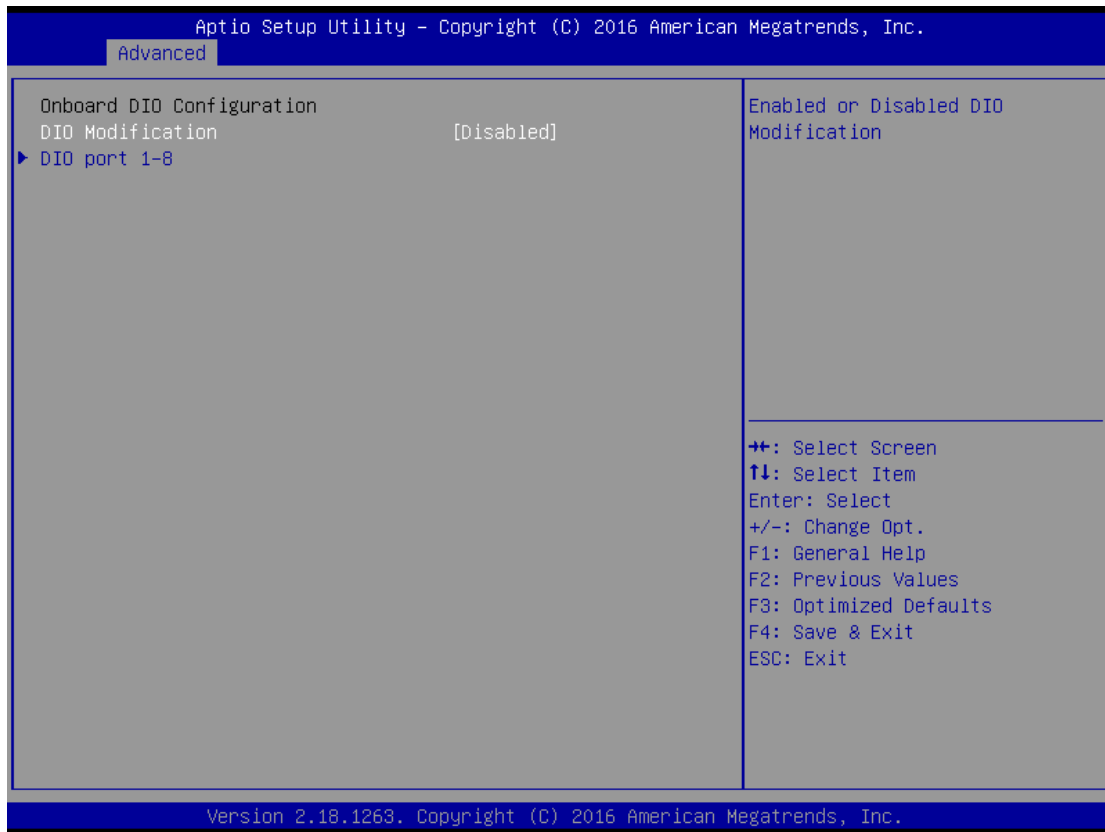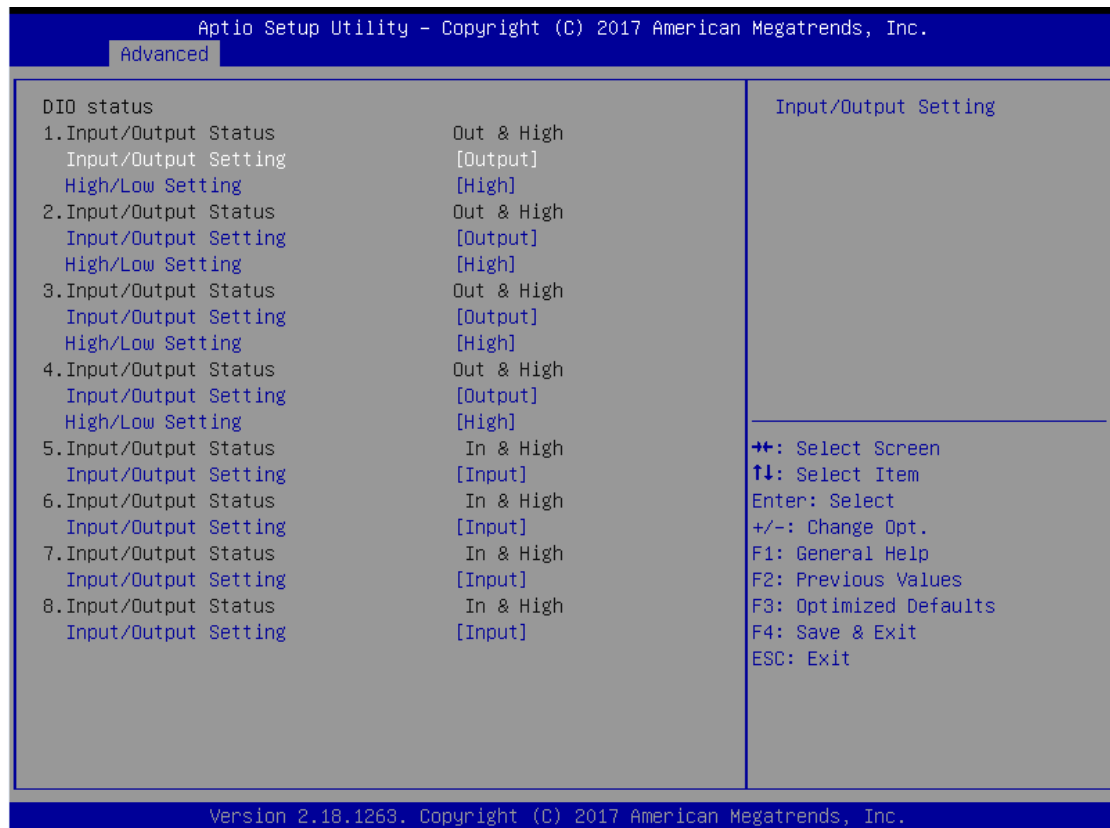
Port1~Port4
Enable/Disable a specific POE port and display all port status.

● **Smart Ignition Management**

The Smart Ignition Management setting includes Axiomtek DIO settings. Press Enter to access the sub-menu. Calculated based on the 24-hour military-time clock.

```
          Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
    Advanced

  Smart Ignition Management                              Change power mode
  Manufacturer                  Axiomtek                 Enabled  : In-Vehicle
  Model                         PSUII                    Disabled : AT/Raiway
  Firmware Version              V100                     *PSU and system would reset
                                                         after save setting
  PSU State                     System On
  Power Mode                    AT Mode
  Vin Voltage(V)                11.8
  IGN Signal                    On

  Shutdown Delay Timer (IGN Off)      00:00:02
  Shutdown Delay Timer (Low Voltage)  00:03:00

  Ignition Management           [Disabled]               ↔: Select Screen
                                                         ↑↓: Select Item
  Auto Power On                 [Enabled]                Enter: Select
                                                         +/-: Change Opt.
  ▶ Advance Setting                                      F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
  ▶ Save Settings                                        F4: Save & Exit
  ▶ Restore Factory Settings                             ESC: Exit



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```

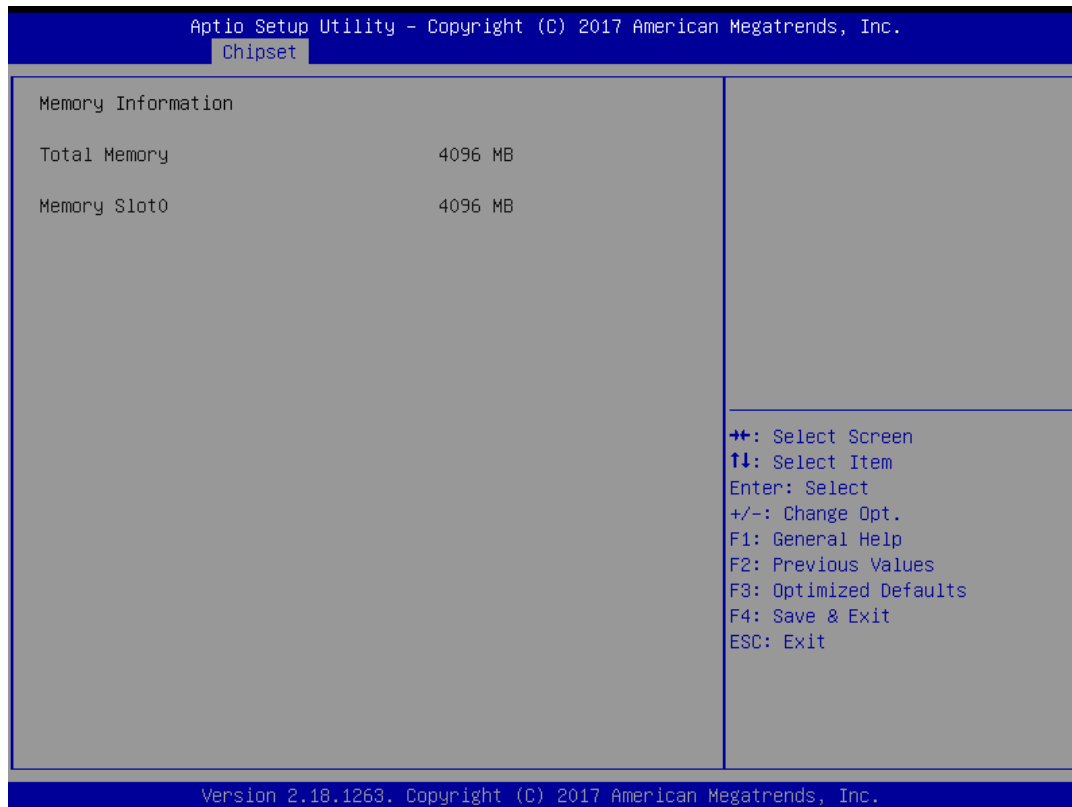| BIOS menu item	Description

Ignition Management	Enabled
	        Switch to In-Vehicle mode
	Disabled
	        Switch to AT/Railway mode
	*PSU and system will reset after setting is saved

Auto Power On	Enabled
	        System will turn on automatically under below conditions
	        - Manually disconnects and reconnects system power
	        - Power interruption: Resumes power after power fail
	Disabled
	        System will not turn on automatically when power is connected or when power resumes from a power failure

Advance Setting	Set system on/off timing and voltage threshold levels
Save Settings	Save the current settings to PSU
Restore Factory Settings	Restores factory defaults to remove any incorrect or corrupt settings that might have prevented the system from properly powering on/off.

```
              Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.
       Advanced

    ======== Voltage      ========                        Enable : IGN signal would
    Activate Voltage Trigger(V)          9                trigger [System Turn On Delay]
    Low Voltage Trigger(V)               8                and [Shutdown Delay]
                                                          Disable: IGN signal would not
    Shutdown Delay Timer (Low Voltage)                    affect any power managment
    Minuium Timer                   00:01:00
    Maximum Timer                   03:00:00
     Hour                           0
     Minute                         3
     Second                         0
    ======== IGN Function ========
    IGN Trigger                     [Enabled]

    System Turn On Delay Timer(IGN On)                    →←: Select Screen
    Minuium Timer                   00:00:02              ↑↓: Select Item
    Maximum Timer                   00:30:00              Enter: Select
     Hour                           0                     +/-: Change Opt.
     Minute                         0                     F1: General Help
     Second                         2                     F2: Previous Values
    Shutdown Delay Timer (IGN Off)                        F3: Optimized Defaults
    Minuium Timer                   00:00:01              F4: Save & Exit
    Maximum Timer                   06:00:00              ESC: Exit
     Hour                           0
     Minute                         0
     Second                         2


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```

BIOS menu item	Description
Activate Voltage Trigger	The system only turns on when the voltage delivered by the power source is higher than the value you set here.
Low Voltage Trigger	The system will begin countdown stage once voltage drops below the value you set here.
	If the power source voltage does not come back above the value of [Activate Voltage Trigger] within the time you set for [Shutdown Delay Time (Low Voltage)], the system will shut down and remain off.
Shutdown Delay Timer (Low Voltage)	The counter will be activated once power source voltage drops below the value defined in [Low Voltage Trigger]. The system will be forced to turn off once timer completes countdown.
IGN Trigger	Enable
	IGN signal will trigger [System Turn On Delay] and [Shutdown Delay].
	Disable
	IGN signal will not affect any power management.
System Turn On Delay Timer (IGN On)	When receiving the IGN signal, the system will be turned on after setup time is counted down.
	The counter will be reset if IGN is off and on during the system countdown time.
Shutdown Delay Timer (IGN Off)	When the system is on, IGN voltage goes off, and the system will be gracefully shut down by the operating system after being triggered by the setup timer signal within the time you

	set.
	Additionally, if power source voltage is lower than the setup value it will cause the system to turn off as well.

3.4 Chipset Feature

This section contains fully optimized chipset features in the system.

```
            Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
           Chipset

    Memory Information

    Total Memory              4096 MB

    Memory Slot0              4096 MB








                                                      ↔: 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) 2017 American Megatrends, Inc.
```
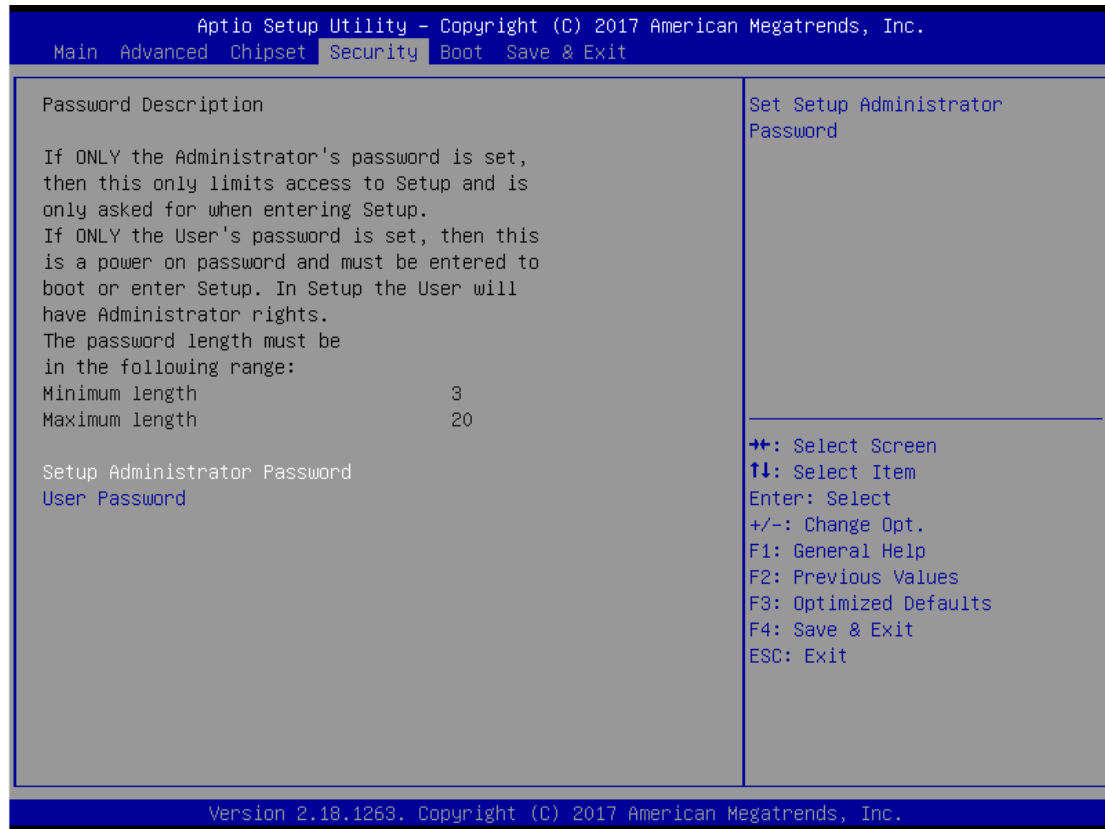
3.5   Security

The Security menu allows users to enhance system security by setting an administrator password and a user password. No password has been set in the default setting.

(Please refer to below graphics.)

```
                Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

   Password Description                               Set Setup Administrator
                                                      Password
   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length                   3
   Maximum length                  20
                                                      →←: Select Screen
                                                      ↑↓: Select Item
   Setup Administrator Password                       Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit



                Version 2.18.1263. Copyright (C) 2020 American Megatrends, Inc.
```

```
               Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit

 Password Description                                    Set Setup Administrator
                                                         Password
 If ONLY the Administrator's password is set,
 then this only limits access to Setup and is
 only asked for when entering Setup.
 If ONLY the User's password is set, then this
 is a power on password and must be entered to
 boot or enter Setup. In Setup the User will
 have Administrator rights.
 The password length must be
 in the following range:
 Minimum length                        3
 Maximum length                        20                ─────────────────────────
                                                         ➔←: Select Screen
 Setup Administrator Password                            ↑↓: Select Item
 User Password                                           Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit



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```

Note: The BIOS default has no password. The user must remember the password after creating one. If the user forgets the password RMA is the only solution.

3.6 Boot Type

The Boot menu allows users to change boot options of the system, providing UEFI, Legacy, and Compatible modes to select from.

The default setting boot mode is [UEFI Mode].

(Please refer to below graphics.)

```
          Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

  Boot Configuration                                    Select the boot mode.
                                                        [UEFI Boot]
  Setup Prompt Timeout            1                     Support to boot any
  Bootup NumLock State            [On]                  UEFI-capable OS.
                                                        [Legacy Boot]
  Boot Mode                       [UEFI Mode]           Support to boot non
  Launch UEFI PXE OpROM policy    [Disabled]            UEFI-capable OS that expects a
                                                        legacy BIOS interface.
  Boot Option Priorities
  Boot Option #1                  [Windows Boot Manage...]
  Boot Option #2        ┌──── Boot Mode ────┐  ...]
                        │ UEFI Mode         │
                        │ Legacy Mode       │
                        └───────────────────┘           ↔: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

The Boot Option Priorities can be set by selecting Boot Option #1, #2…

(Please refer to below graphics.)

.
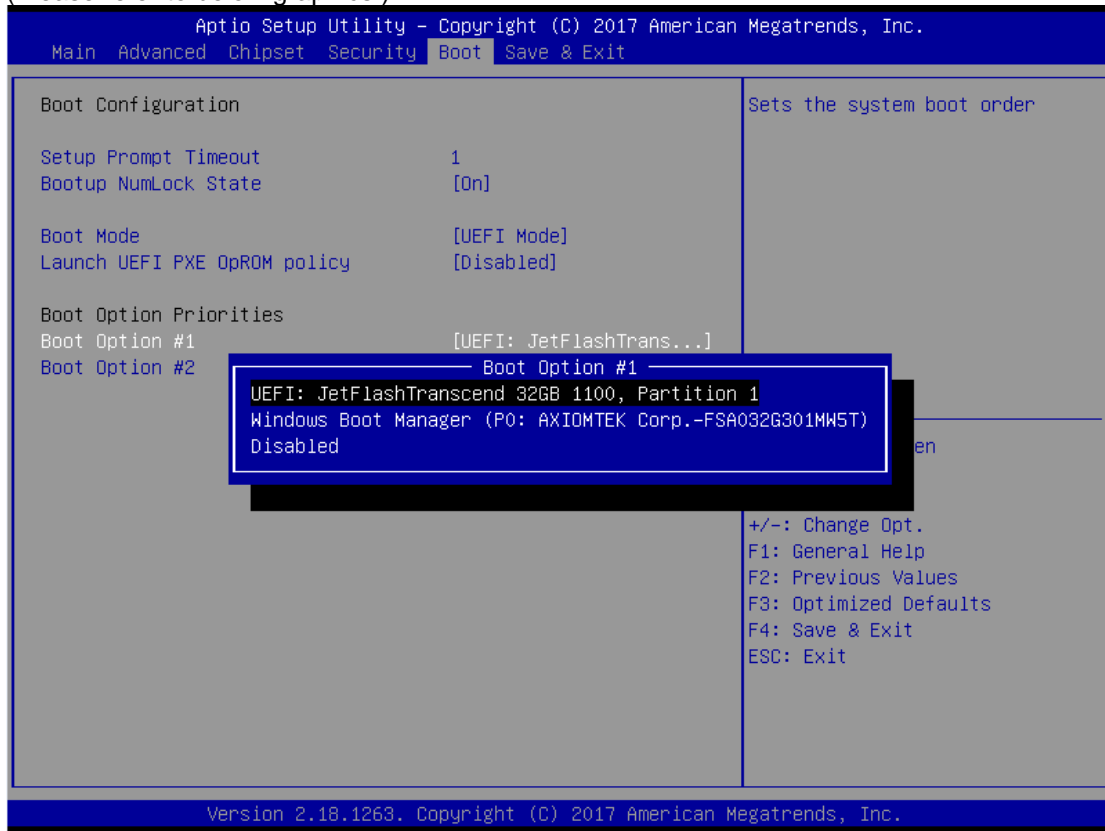
3.7   Save & Exit

The Save & Exit menu allows users to determine whether or not to accept their modifications to the system configuration, or to keep default values for optimal fail-safe performance.

(Please refer to below graphics.)

```
                  Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
        Main   Advanced   Chipset   Security   Boot   Save & Exit

    Save Options                                          Exit system setup after saving
    Save Changes and Exit                                 the changes.
    Discard Changes and Exit

    Save Changes and Reset
    Discard Changes and Reset

    Save Changes
    Discard Changes

    Default Options
    Restore Defaults
    Save as User Defaults
    Restore User Defaults                                 ↔: Select Screen
                                                          ↑↓: Select Item
    Boot Override                                         Enter: Select
    UEFI: JetFlashTranscend 32GB 1100, Partition 1        +/–: Change Opt.
    Windows Boot Manager (P0: AXIOMTEK Corp.–FSA032G301MW5T) F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

                  Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS menu item	Description
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 configuration 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	After completing the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations will 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 configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.
Restore Defaults	It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.
Save as User Defaults	Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.
Restore User Defaults	It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.
Boot Override	Select a drive to immediately boot that device regardless of the current boot order.

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APPENDIX A
WATCHDOG TIMER

About Watchdog Timer

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.

How to Use Watchdog Timer

The following example enables configuration using a debug tool.

Enable WDT

↓

Enable configuration:

      O 2E 87 ; Un-lock super I/O

      O 2E 87

↓

Select logic device:

      O 2E 07 ; Select logic register

      O 2F 07 ; Switch to WDT device

↓

Set timer value:

      O 2E F6 ; Select logic register

      O 2F 05 ; Timer value 0~255 (Sec/Min) (Ex: 5)

↓

Clear WDT status (optional):

      O 2E F5 ;

      O 2F 40

↓

Set base timer:

      O 2E F5

      O 2F M ; M = 28h (Minute)

          M = 20h (Second)

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APPENDIX B
POWER BUTTON SETTING FOR WINDOWS SOFTWARE

Please enter the power button setting through the PC console, and then follow below pictures to complete the setting.
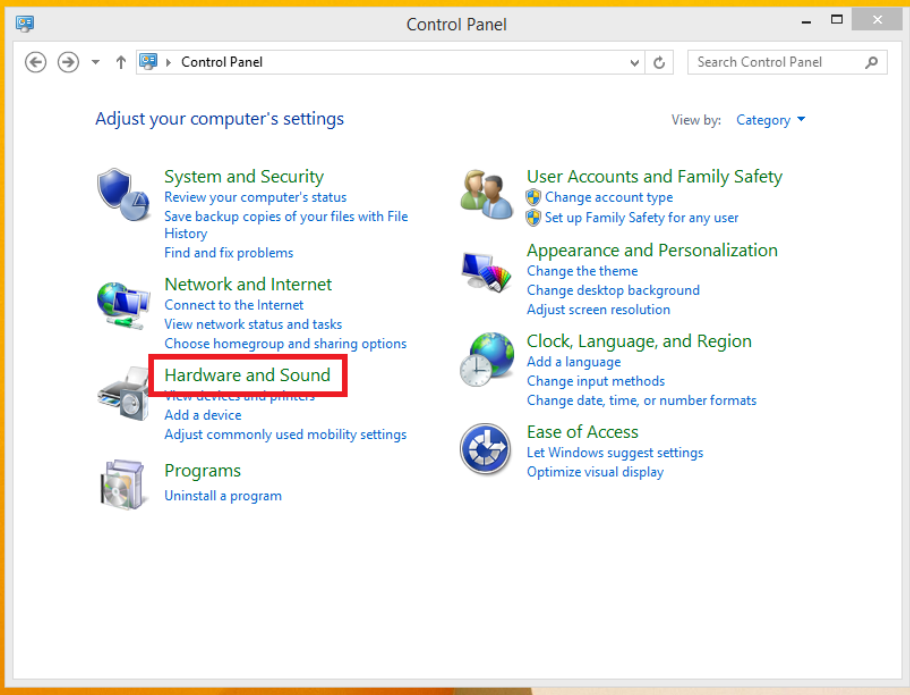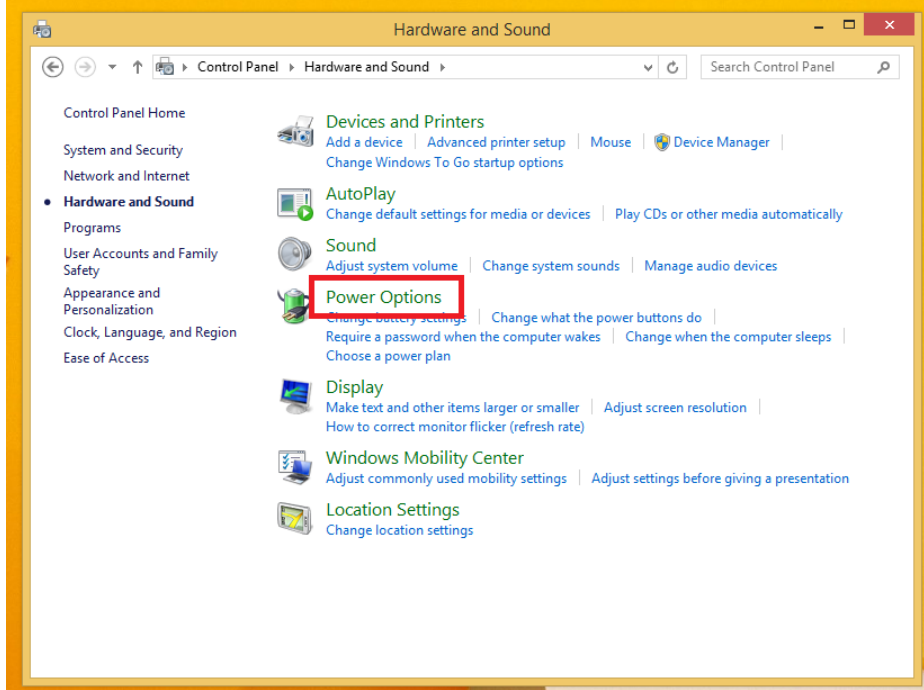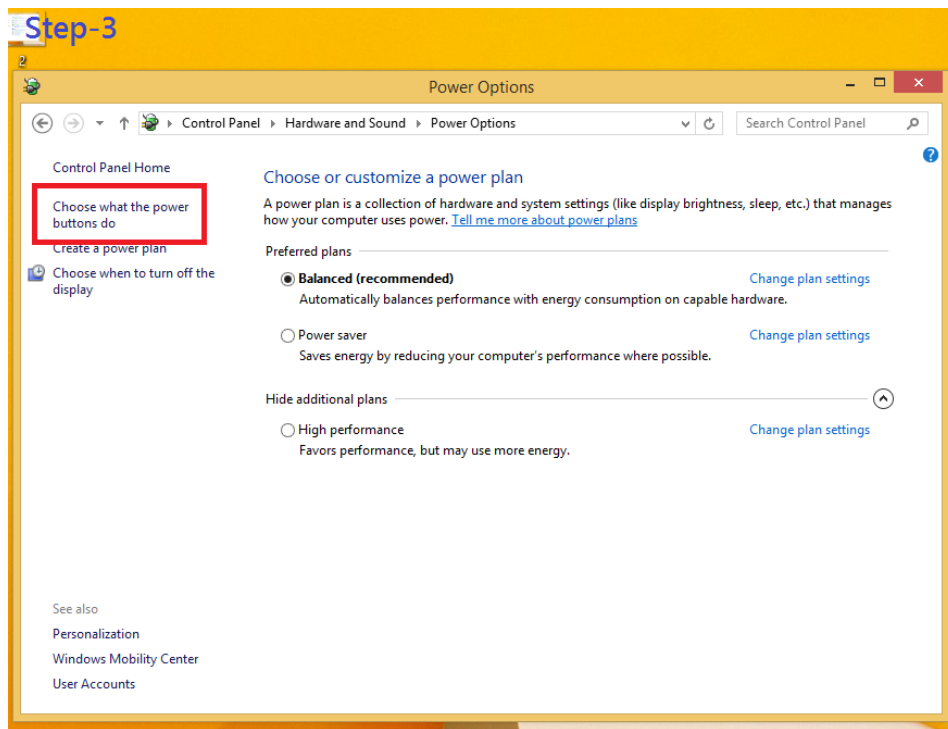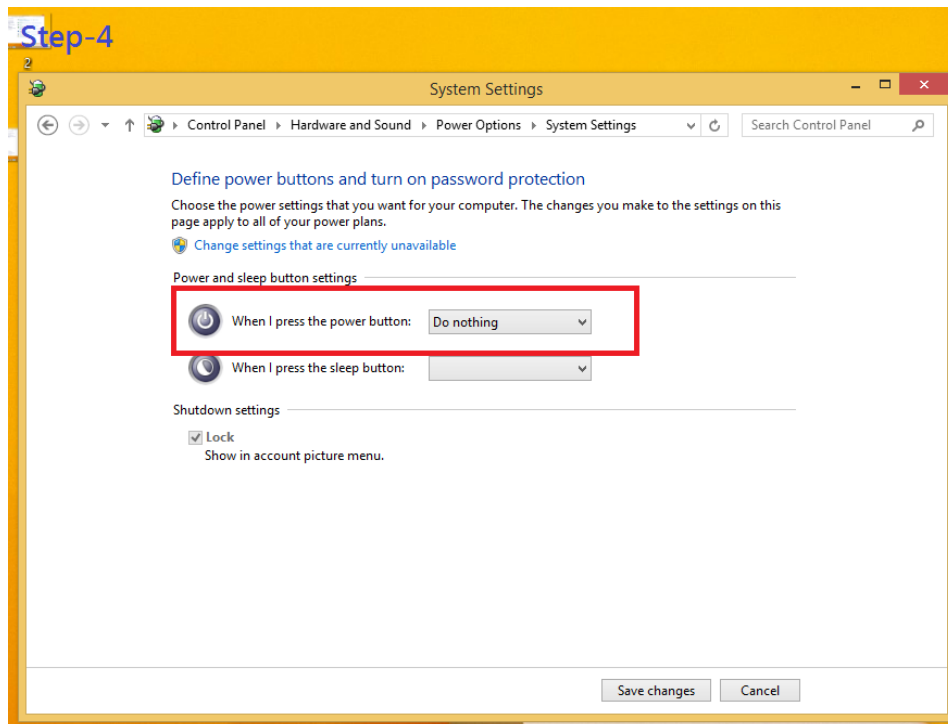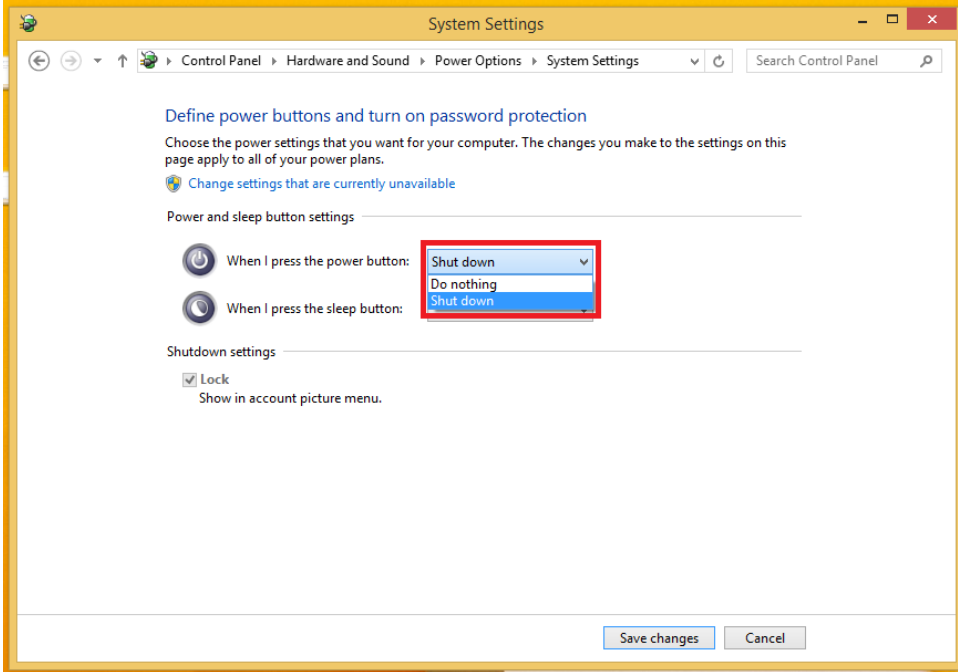
Please check if the action of pressing power button is "Shut down" to let ACC work normally and prevent unexpected hard shut down.

Step-5

Step-6