V2403C Series Hardware User Manual

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www.moxa.com/products

V2403C Series Hardware User Manual

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Table of Contents

1. Introduction

This chapter gives a general overview of the V2403C computer's hardware features and specifications.

Overview

The V2403C Series embedded computers are based on an Intel® 7th Gen processor and feature 4 RS-232/422/485 serial ports, 4 Ethernet ports, and 4 USB 3.0 hosts. In addition, the computers provide 1 DisplayPort output and 1 HDMI display with 4k resolution support.

The mSATA socket, SATA connectors, and USB sockets provide the V2403C computers with the reliability needed for industrial applications that require data buffering and storage expansion. The computers also come with 2 2.5-inch storage slots for inserting additional storage media, such as hard disk or solid-state drives, to support convenient, fast, and easy storage replacement.

Package Checklist

The following items are included in the package.

- V2403C embedded computer
- Wall-mounting kit
- Storage disk tray package
- HDMI cable locker
- Quick installation guide (printed)
- Warranty card

✏️ **NOTE**

Please notify your sales representative if any of the above items are missing or damaged.

Product Features

- Intel® Celeron®/Intel® Core™ i3/i5/i7 embedded computer for in-vehicle IoT applications
- A variety of interfaces: Dual displays (HDMI, DP), 4 serial ports, 4 GbE, 4 DIs, 4 DOs, 4 USB hosts, and 2 Mini PCIe slots for wireless options
- -40 to 70°C wide temperature models available

Hardware Specifications

For the product hardware specifications, refer to Moxa's website: https://www.moxa.com.

Hardware Block Diagram
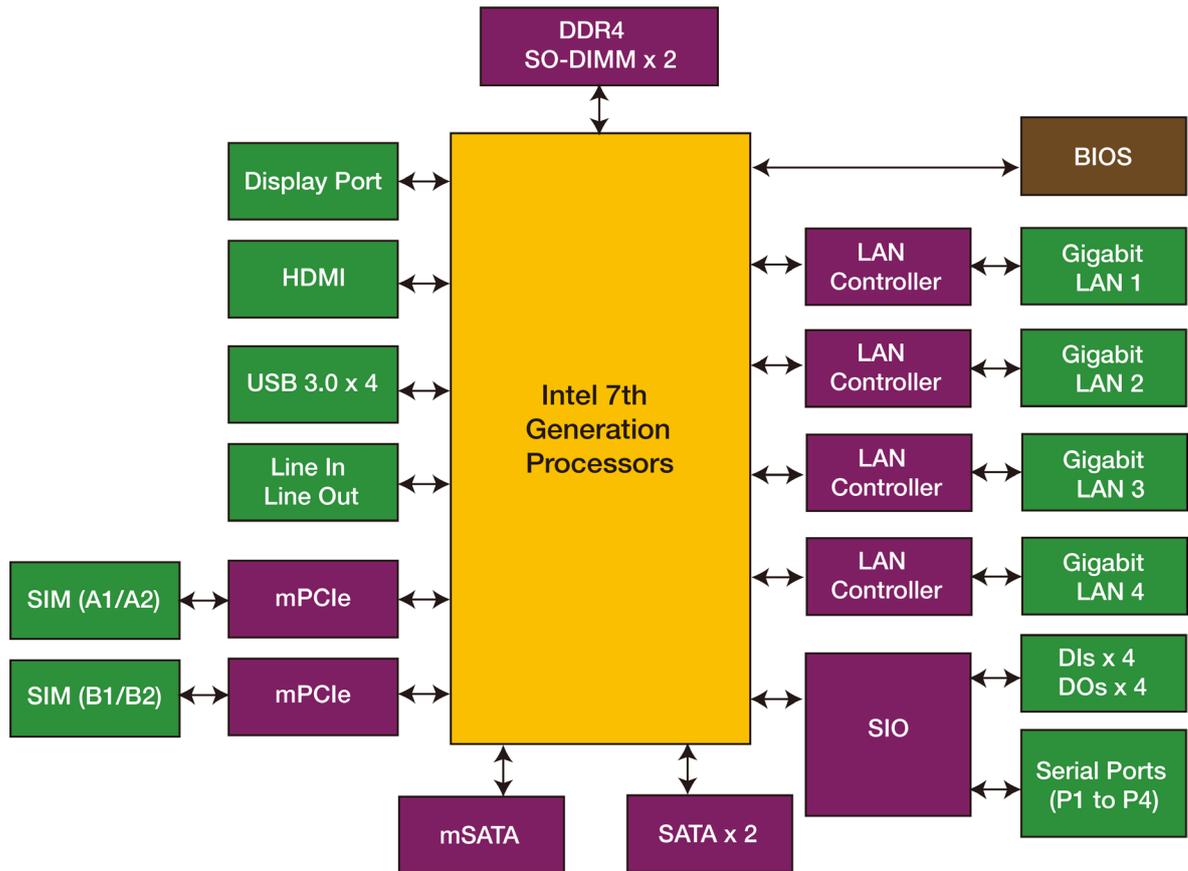
2. Hardware Introduction

V2403C embedded computers are compact, rugged, and ideal for use in industrial applications. LED indicators help you monitor their performance and identify trouble spots. Multiple serial ports allow you to connect a variety of devices for wireless operation and the reliable and stable hardware platform lets you devote your attention to developing your applications, rather than dealing with low-level APIs and device drivers.

Appearance

<u>Front View</u>
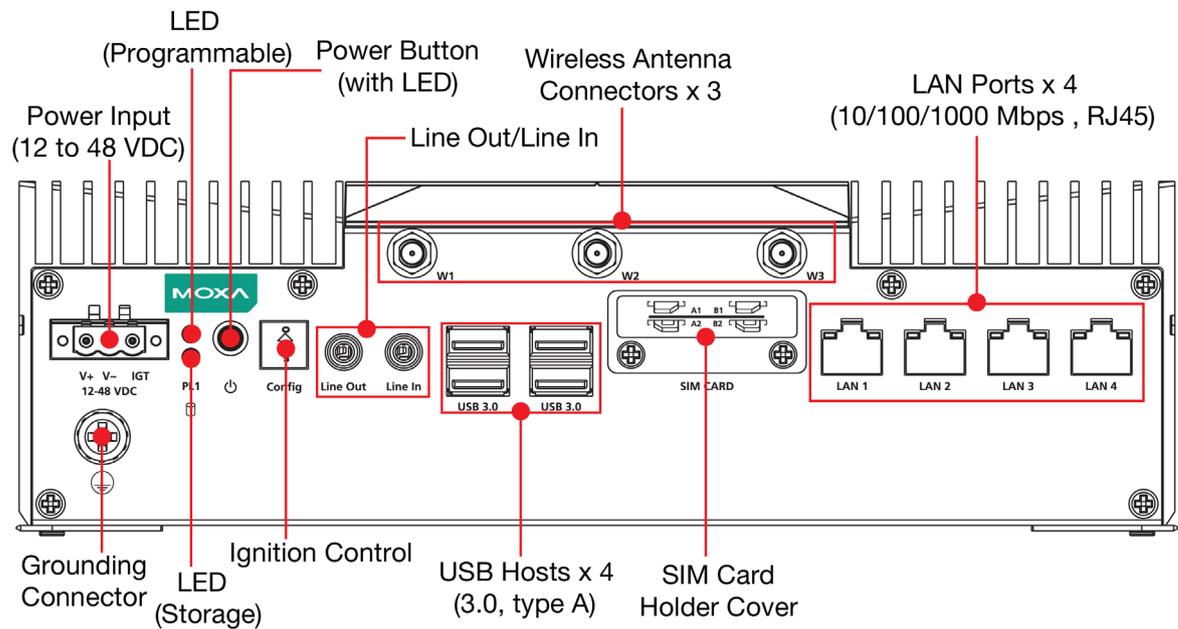
<u>Rear View</u>

Dimensions

Unit: mm (inch)

311.8 (12.28)
284.2 (11.19)
250 (9.84)
150 (5.91)
80 (3.15)
16.5 (0.65)
4.5 (0.18)
8 (0.31)
75 (2.95)
79.5 (3.13)
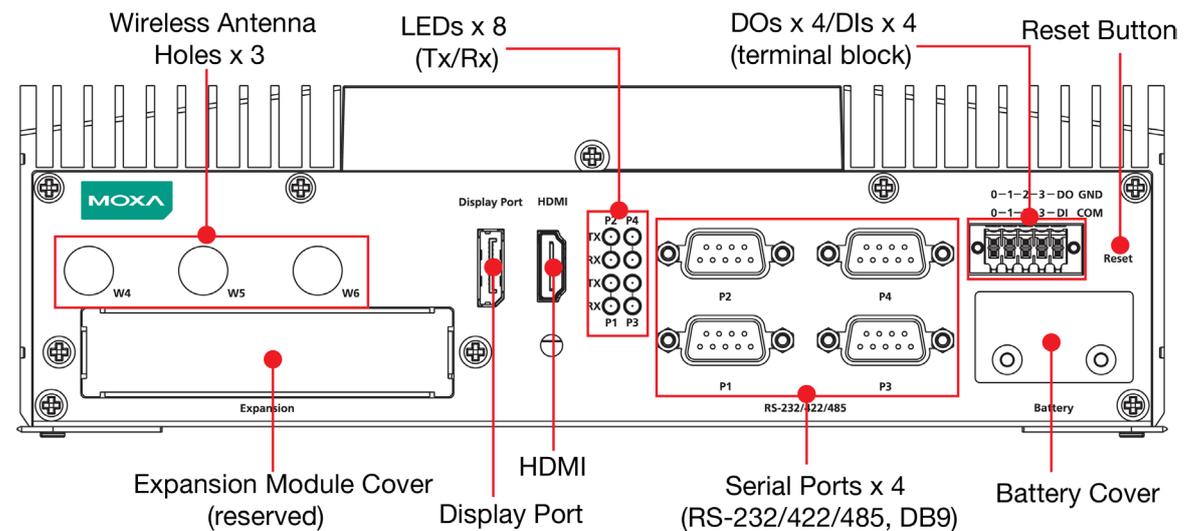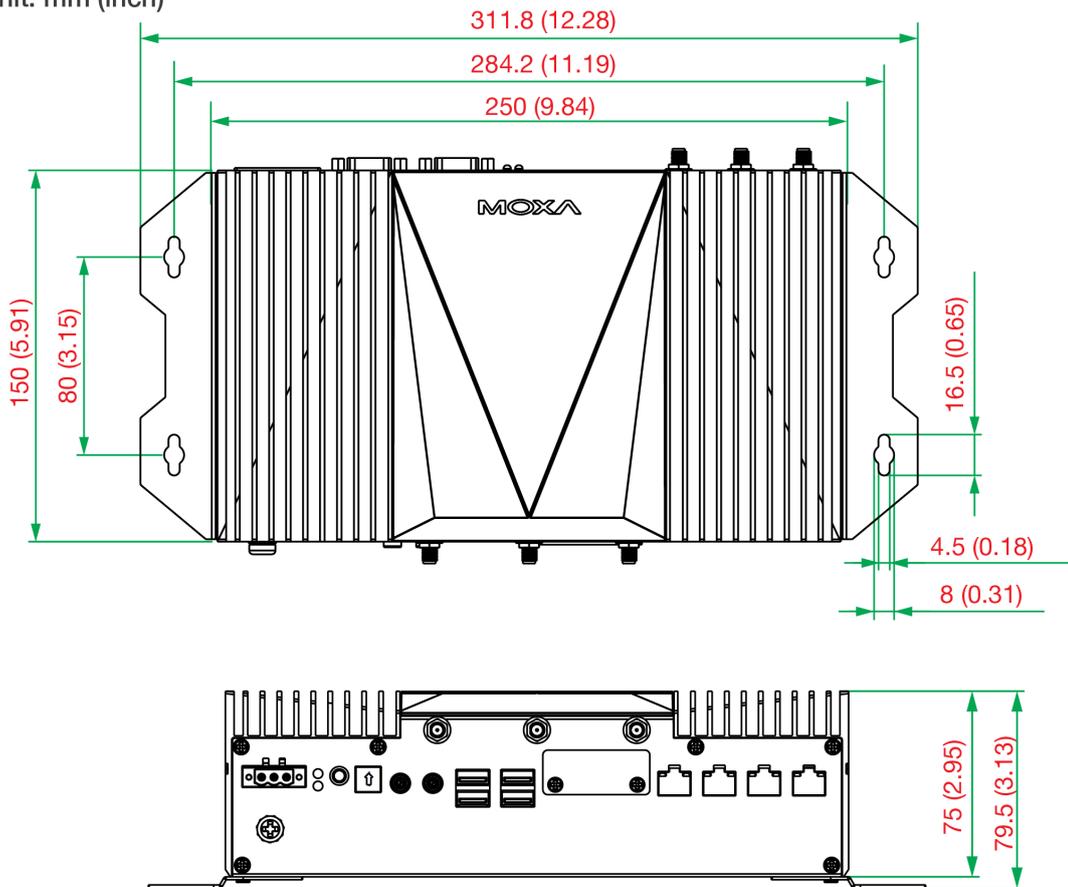
LED Indicators

LED Name	Status	Function
Power	Green	Power is on
	Off	No power input
Ethernet (100 Mbps) (1000 Mbps)	Green	Steady On: 100 Mbps Ethernet link Blinking: Data transmission is in progress
	Yellow	Steady On: 1000 Mbps Ethernet link Blinking: Data transmission is in progress
	Off	Data transmission speed at 10 Mbps or the cable is not connected
Serial ⌐ Tx └ Rx	Green	Tx: Data transmission is in progress
	Yellow	Rx: Receiving Data
	Off	No operation
Storage	Yellow	Data is being accessed from either the mSATA or the SATA drive
	Off	Data is not being accessed from the storage drives

Real-time Clock

The embedded computer's real-time clock is powered by a lithium battery. We strongly recommend that you **DO NOT** replace the lithium battery on your own. If the battery needs to be changed, contact the Moxa RMA service team.

⚠️ **ATTENTION**

There is a risk of explosion if the wrong type of battery is used. To avoid this potential danger, always be sure to use the correct type of battery. Contact the Moxa RMA service team if you need to replace your battery.

Caution

Dispose of used batteries in a suitable manner. Consult the battery manufacturer for details on disposing batteries.

3. Hardware Connection Description

In this chapter, we show how to connect the embedded computers to the network and to a variety of common devices.

Installing the V2403C

Wall or Cabinet Mounting

The V2403C comes with two wall-mounting brackets. Use four screws per side to attach the mounting bracket to the computer. Ensure that the mounting brackets are attached to the V2403C computer in the direction shown in the following figure.
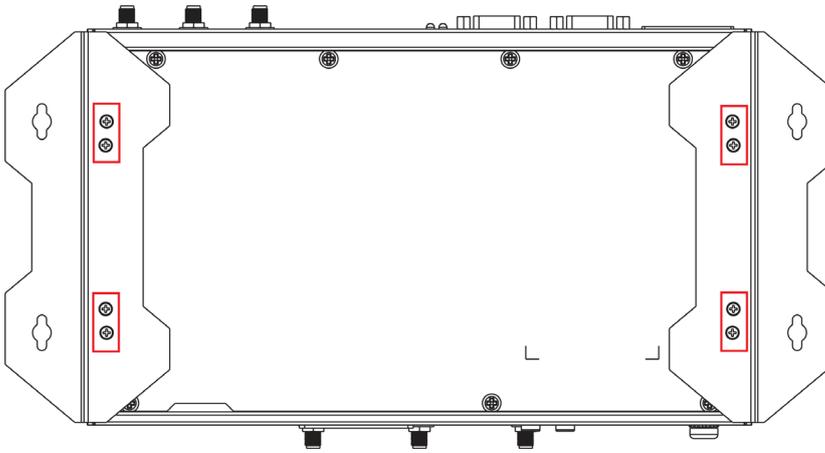
The eight screws are included in the package. They are standard IMS_M3x5L screws and require a torque of 4.5 kgf-cm. Refer to the following illustration for details.
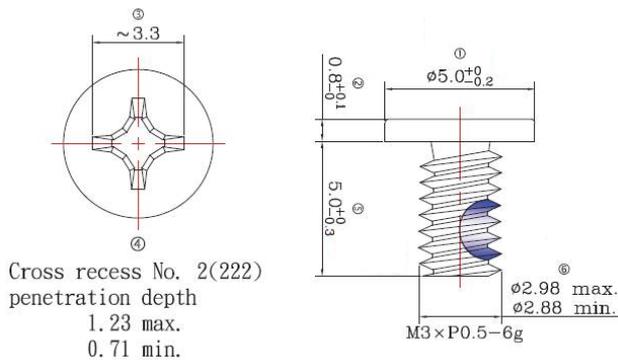
Use two screws (M3*5L standard is recommended) per side to attach the V2403C computer to a wall or a cabinet. The product package does not include the four screws required for attaching the wall-mounting kit to the wall; they need to be purchased separately. Ensure that the V2403C computer is installed in the direction shown in the following figure.
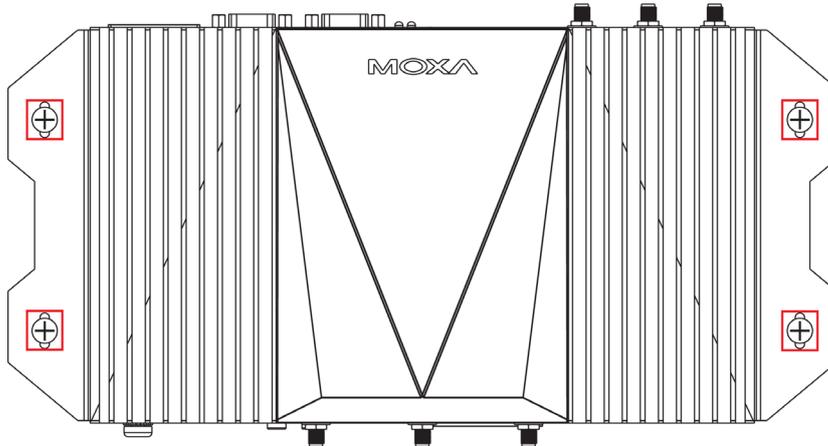
Wiring Requirements

This section describes how to connect peripheral devices to the embedded computer.

You should read and follow these common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

⚠ **ATTENTION**

Do not run signal or communication wiring together with power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is advisable to label the wiring to all devices in the system.

⚠ **ATTENTION**

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your V2403C.

Wiring Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

Connect the 12 to 48 VDC power line with terminal block to the V2403C computer. If the power is supplied properly, the **Ready** LED will glow a solid green after a 25 to 30 second delay.
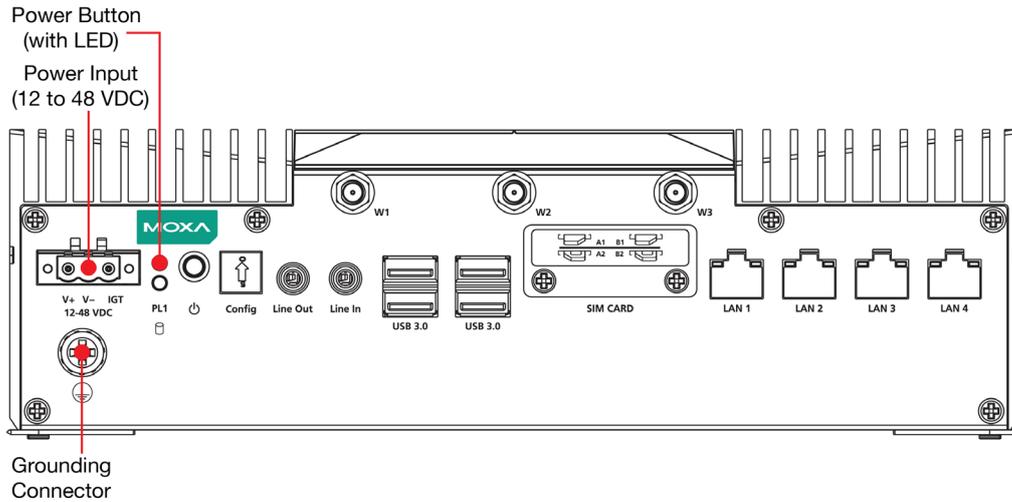
Pin	Definition
1	V+
2	V-
3	Ignition
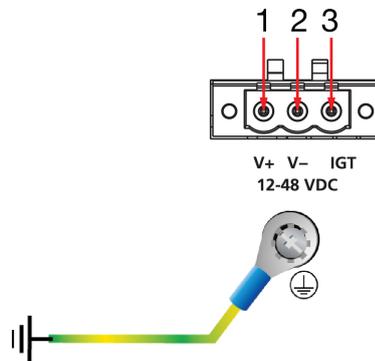
The power input specification is given below:

- DC power source rating of 12 V @ 5.83 A; 48 V @ 1.46 A, and a minimum of 18 AWG.

For surge protection, connect the grounding connector located below the power connector with the earth (ground) or a metal surface.

Grounding the Unit

In addition, a grounding connector is also provided below the power input connector. Connect the wire to an appropriately grounded metal surface.

Configuring the Ignition Control Switch

There is an ignition control switch on the front panel of the V2403C. This design helps users to set up the power ignition time and determine when to trigger the power; it is particularly convenient for the applications in various transportation industries.
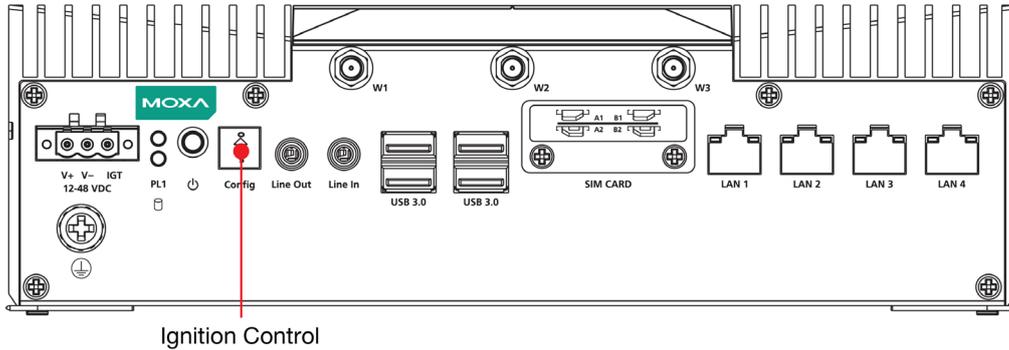
Ignition Control

Connecting the Ignition Control Power Input

1. Select a number from 0 to 9 on the switch.
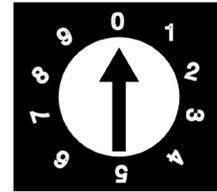
2. Make the following connections:

- Connect V+ for the system to a 12 to 48 VDC DC power source
- Connect the positive line on IGT to a 12 to 24 VDC power source
- Connect the negative line on V- to the DC power sources
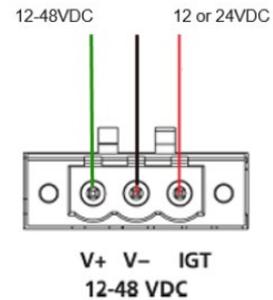
Refer to the following table for the detailed switch number and the corresponding power on time and power off time.

IGT Function	Switch Number	PWR on Time (sec)	PWR off Time (sec)
No	0	Not available	Not available
Yes	1	0.5	30
Yes	2	1	30
Yes	3	1	60
Yes	4	2	60
Yes	5	2	90
Yes	6	3	90
Yes	7	3	150
Yes	8	4	180
Yes	9	5	180

Connecting Data Transmission Cables

This section describes how to connect V2403C embedded computers to a network and serial devices.

Connecting to the Network

Four 10/100/1000 Mbps Ethernet ports using RJ45 connectors are located on the front panel of the computer. Refer to the following figure the specific location of the Ethernet ports.

LAN Ports x 4
(10/100/1000 Mbps , RJ45)
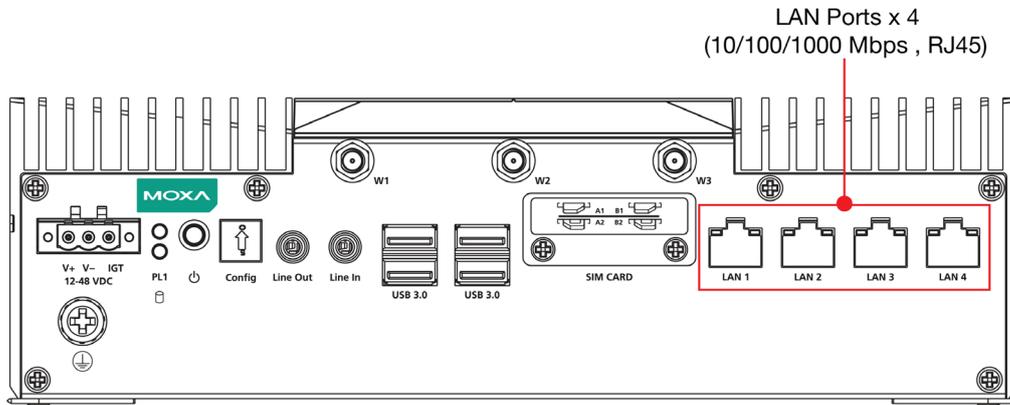
Refer to the following figure for the pin assignments of the Ethernet ports.
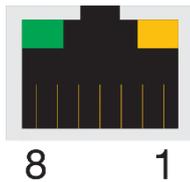
Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	ERx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

Connecting to a Serial Device

The V2403C comes with four serial ports, which can be configured for RS-232/422/485 interfaces. These ports are located on the rear panel.

Serial Ports x 4
(RS-232/422/485, DB9)
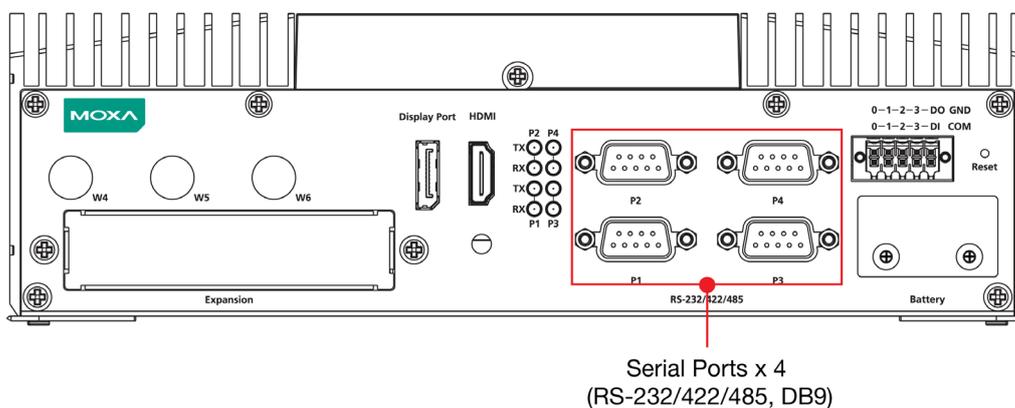
Use a serial cable to connect your serial device to the embedded computer's serial port. These ports have male DB9 connectors and can be configured for RS-232, RS-422, or RS-485 using the software. The pin assignments of the ports are shown in the table below:

DB9 Male Port

1 2 3 4 5

6 7 8 9
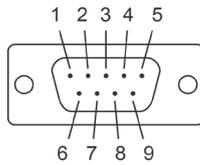
RS-232/422/485 Pinouts

Pin	RS-232	RS-422	RS-485-4W	RS-485-2W
1	DCD	TxDA(-)	TxDA(-)	–
2	RxD	TxDB(+)	TxDB(+)	–
3	TxD	RxDB(+)	RxDB(+)	DataB(+)
4	DTR	RxDA(-)	RxDA(-)	DataA(-)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–

✏️ **NOTE**

This is the pin assignment for the computer-side connectors on the V2403C. If you are wiring peripheral-side connectors for a serial cable, you will need to match the pin assignment of the connectors.

Connecting an Audio Input and Output

The V2403C comes with a Line-in and a Line-out with 35 mm jack plug connectors, allowing users to connect a speaker or an earphone.

Line Out/Line In
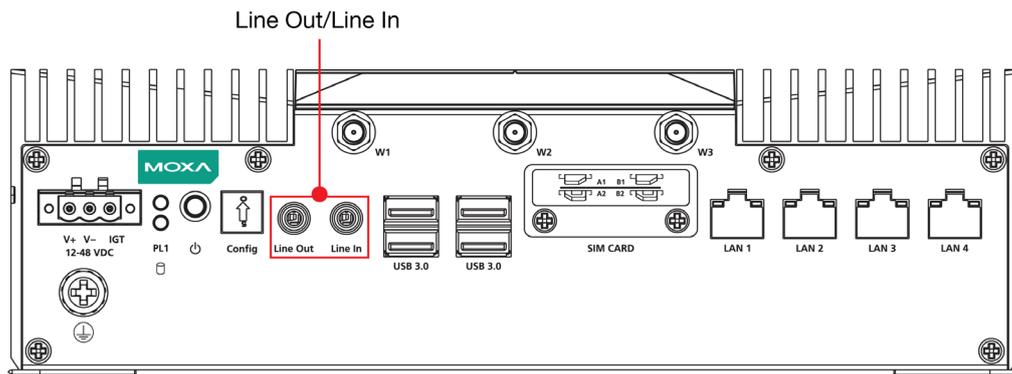
Digital Input/Output

The V2403C comes with a 4-channel digital input and a 4-channel digital output through a terminal block connector.

DOs x 4/DIs x 4
(terminal block)
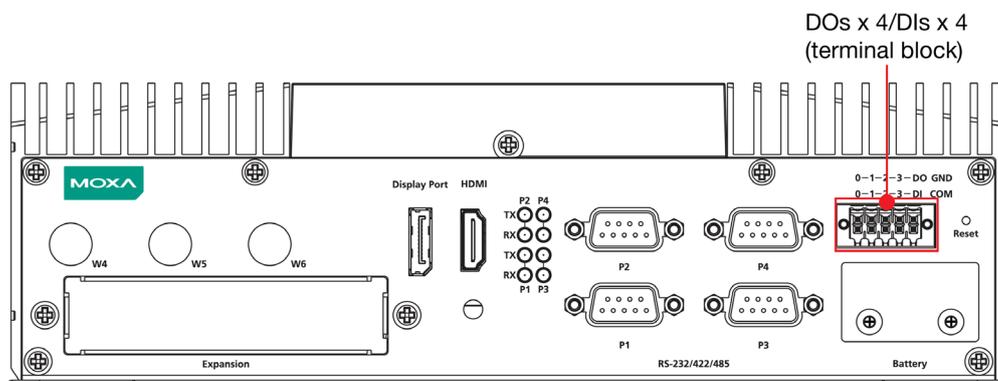
Refer to the following figures for the pin definitions and the current ratings.

```
0－1－2－3－DO GND
0－1－2－3－DI  COM
```
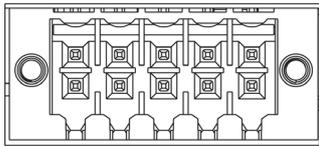
Digital Inputs
Dry Contact
Logic 0: Short to Ground
Logic 1: Open
Wet Contact (DI to COM)
Logic 1: 10 to 30 VDC
Logic 0: 0 to 3 VDC

Digital Outputs
Current Rating: 200 mA per channel
Voltage: 24 to 30 VDC

The wiring methods are shown in the diagram below:
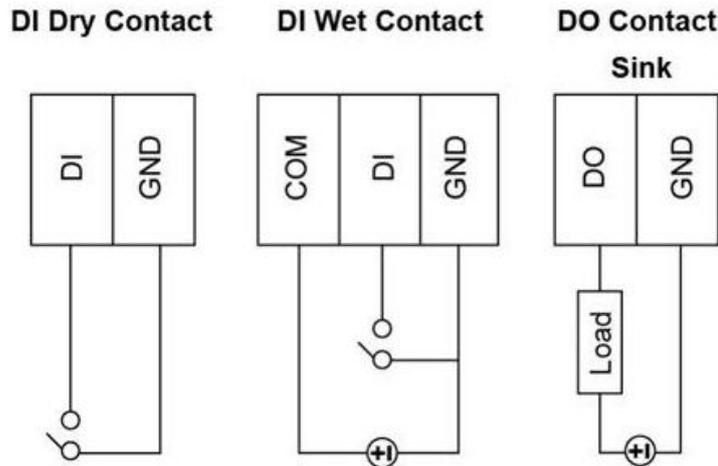
✏️ **NOTE**

If you are using wet contacts, you must connect the source to power. In addition, both DI and DO can only be wired as sink types.

Connecting to Display Monitors

The V2403C comes with a DisplayPort connector on the rear panel to connect a monitor. To ensure that the monitor image remains clear, tighten the monitor cable after connecting it to the V2403C.

In addition, an HDMI connector is also provided on the rear panel, allowing users to connect another display with an HDMI interface.
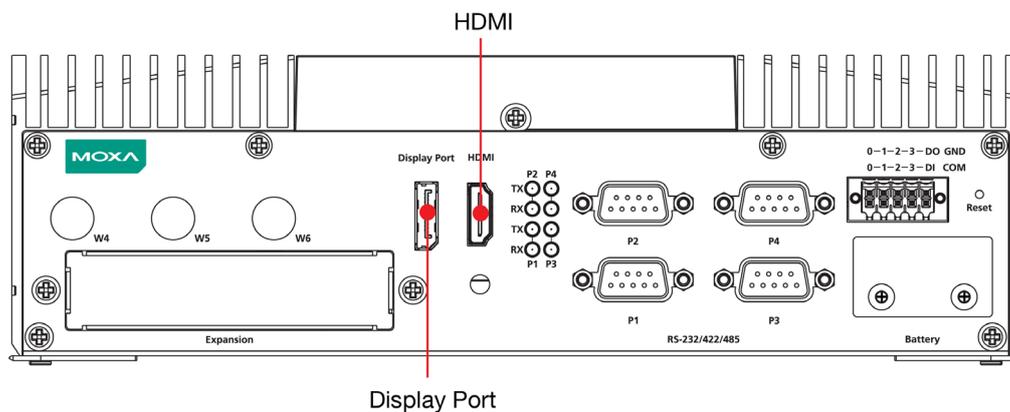
✏️ **NOTE**

For reliable video streaming capability, use HDMI-certified cables to connect to the HDMI port.

Connecting to the USB Ports

The V2403C comes with four USB ports on the front panel. All four ports come with USB 3.0 type A interfaces. Refer to the following illustrations for the location of these ports.

USB Hosts x 4
(3.0, type A)
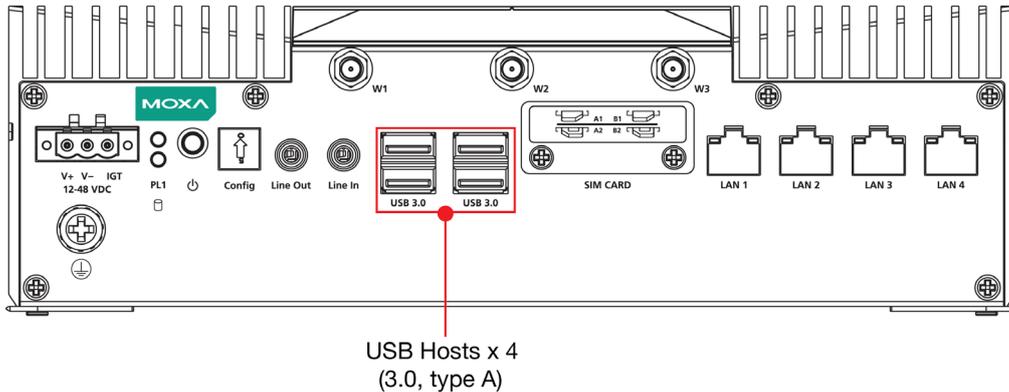
You can use these USB ports to connect various peripheral devices, such as a keyboard, mouse, and USB storage drives, to your computer.

Installing a Storage Drive

The V2403C comes with two storage sockets for installing 2.5-inch storage disks.

Follow these steps to install a hard disk drive.

1. Unpack the storage disk tray from the product package.

    Screws x 2 for Disk Tray

    Screws x 4 for Hard Disk

    Disk Tray

2. Place the disk drive on the tray.

3. Turn the disk and tray arrangement around to view the rear side of the tray. Fasten the four screws to secure the disk to the tray.

4. Remove all screws on the rear panel of the V2403C computer.
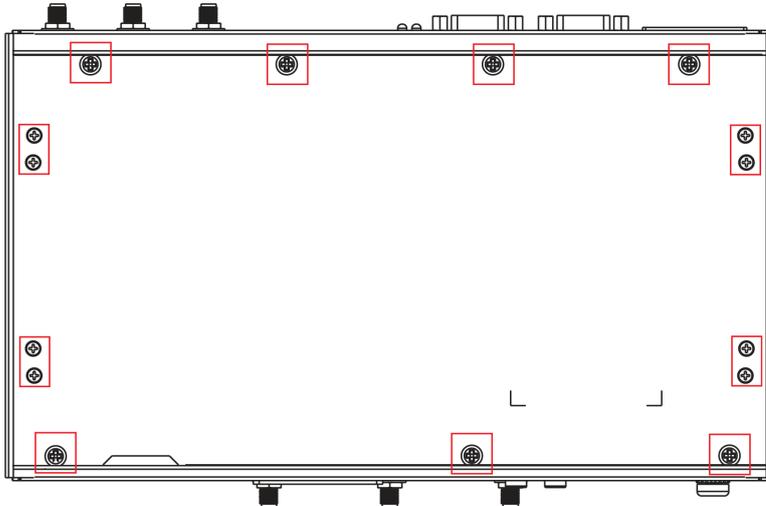
5. Take out the rear cover of the computer and find the location of the storage sockets. There are two sockets A and B and either can be used.
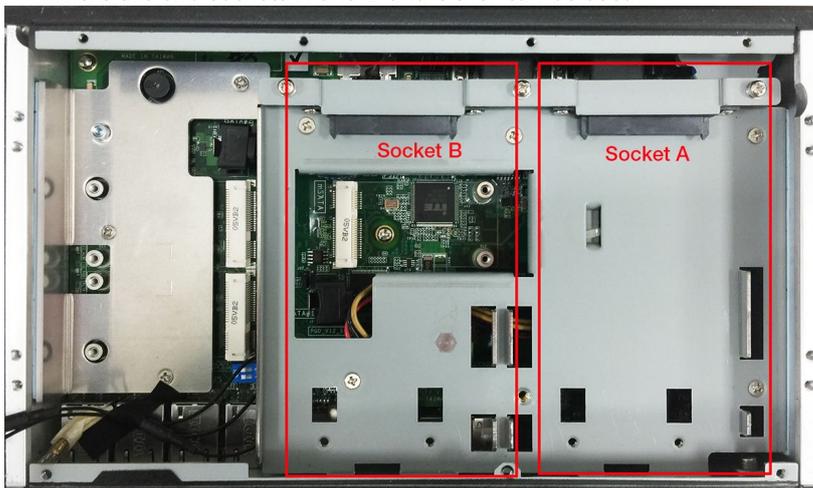
6. Place the storage disk tray in the socket with the edge of the tray near the groove on the socket.
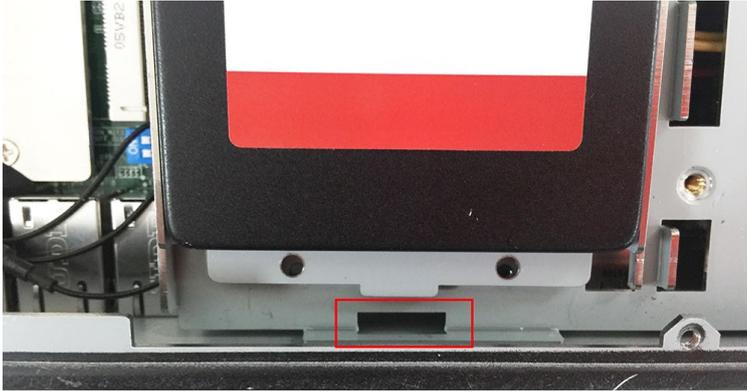
7. Push the tray upwards (towards the groove) in the socket so that the connectors on the storage disk tray and the socket can be connected.
8. Fasten the two screws on the bottom of the tray to secure it in place.
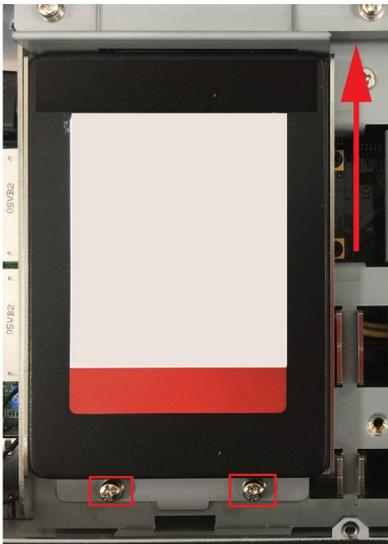
Installing the SIM Cards

The V2403C comes with 2 sockets for installing Wi-Fi or cellular modules. To install the cellular module, you must first install the SIM card. Follow these steps to install a SIM card.

> ✏️ **NOTE**
>
> Only the Micro SIM card is supported.

1. Find the SIM card holder cover on the front panel.

SIM Card
Holder Cover
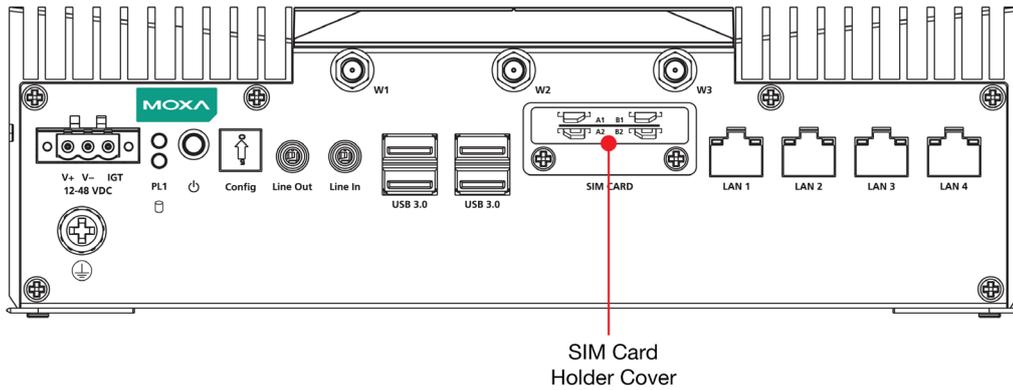
2. Unfasten the two screws on the cover and remove the cover.
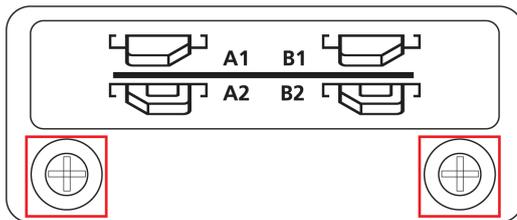
SIM CARD

Each cellular module supports dual SIM cards; the location of the SIM card slots is indicated in the following diagram:

Module A1   Module B1

Module A2   Module B2
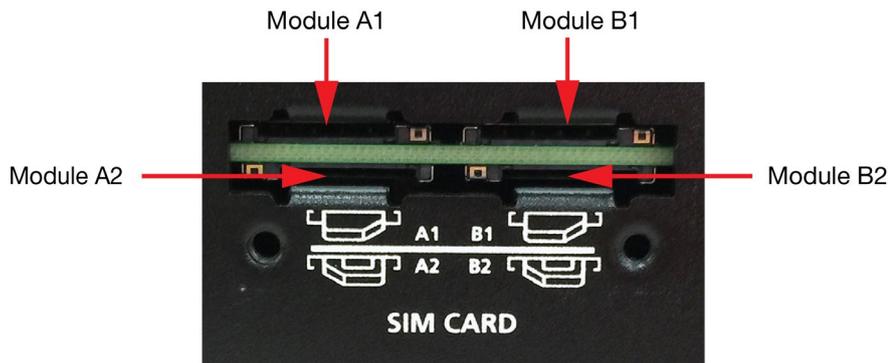
3. Check the illustration icon on the panel next to the slots and insert the SIM card(s) in the correct direction.
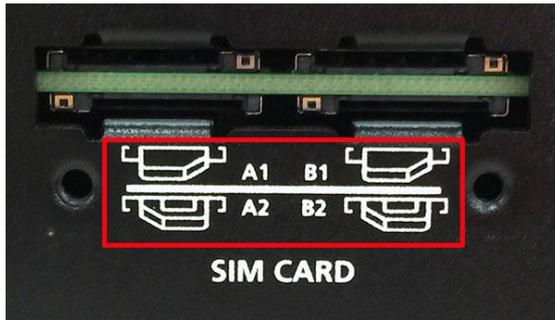
Inserting the SIM cards incorrectly may damage the slot and the SIM card. Check the following diagrams to confirm that the SIM card is inserted correctly into the slots.

Module A1	Module A2
Module B1	Module B2
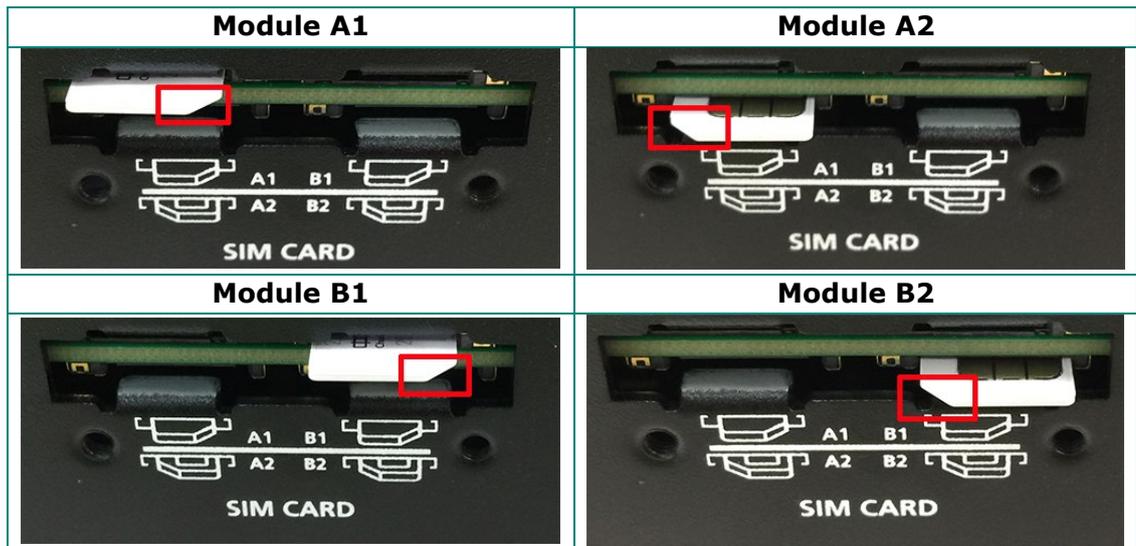
To remove the SIM card, simply push in the SIM card to release it and pull out the SIM card.

4. Put back the cover on the SIM card slot.

Installing the Wi-Fi Module

Follow these steps to install the Wi-Fi Module.

1. Remove the wall-mounting kit brackets.
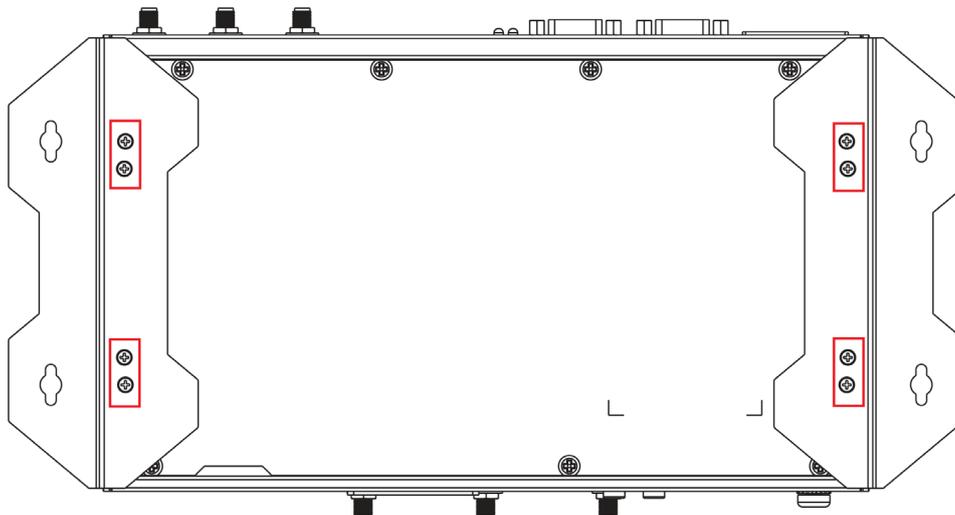
2. Remove the four screws on the bottom panel of the computer.
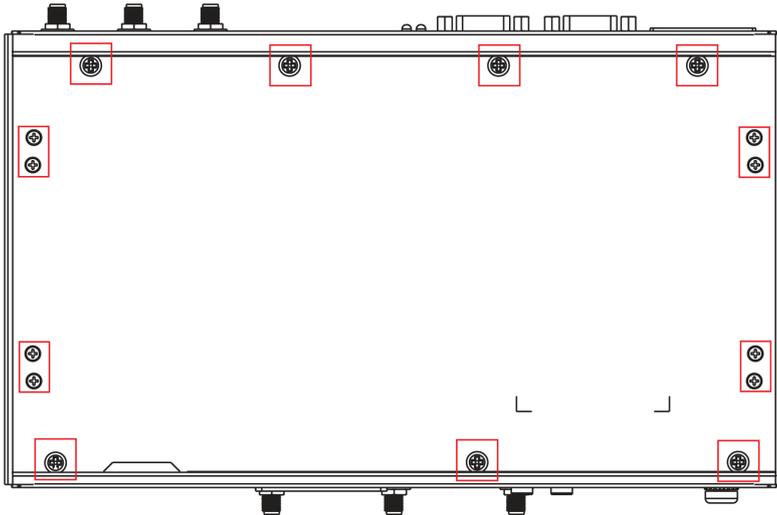
3. Take out the bottom cover of the computer and find the location of the Wi-Fi module sockets.

   There are two sockets; you can install your Wi-Fi module on either one. However, we strongly suggest you install the Wi-Fi module on Socket 2, as it is closer to the antenna connectors located on the front panel.
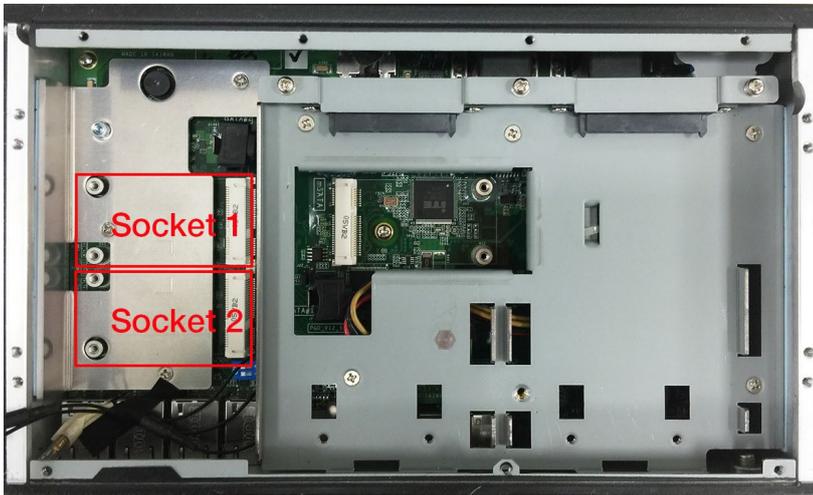
4. Check the Wi-Fi module package contents.
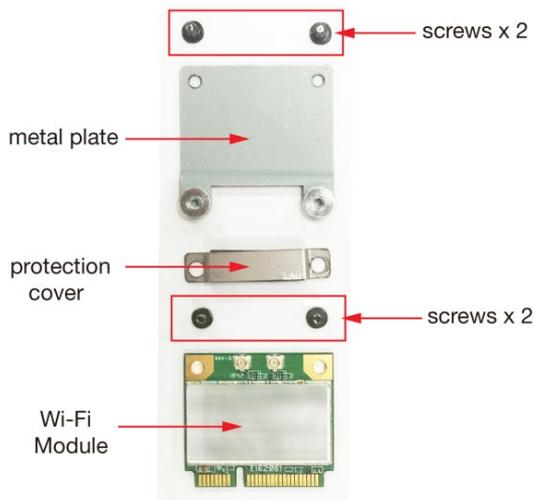
5. Install the metal plate and secure it with the two screws in the package.
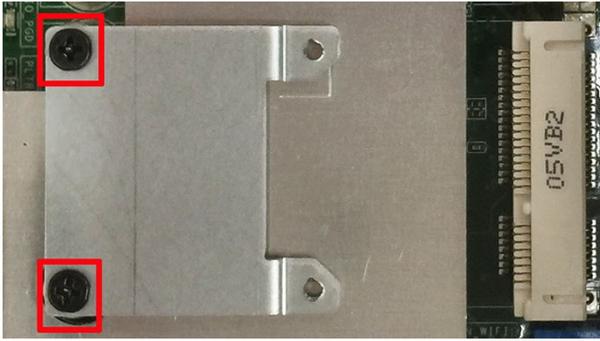
6. Remove the plastic cover on the cable.
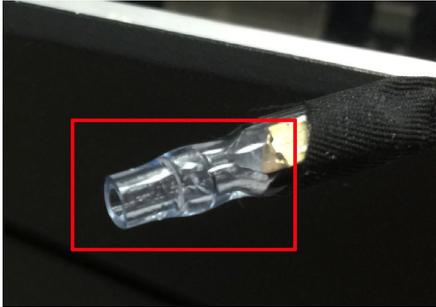
7. Place the Wi-Fi module in the socket and connect the antenna cables to the connectors. There are three cables, you may use any two to connect onto the Wi-Fi module.
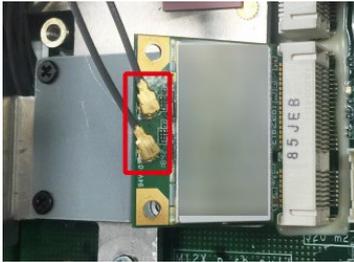
8. Place the protection cover on the antenna cable connectors and secure the cover with the two screws in the package.
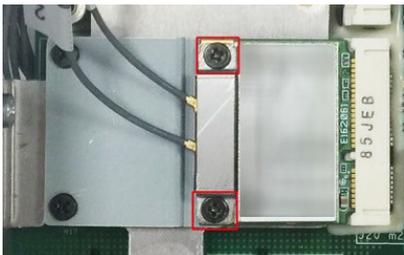
Installing the Cellular Module

Follow these steps to install the cellular module on the computer.

1. Check the contents of the cellular module package.

DIV/ANT/GPS Cables and Connectors x 3

Screws x 2

Nuts x 3

Cellular Module x 1

Locking Washers x 3
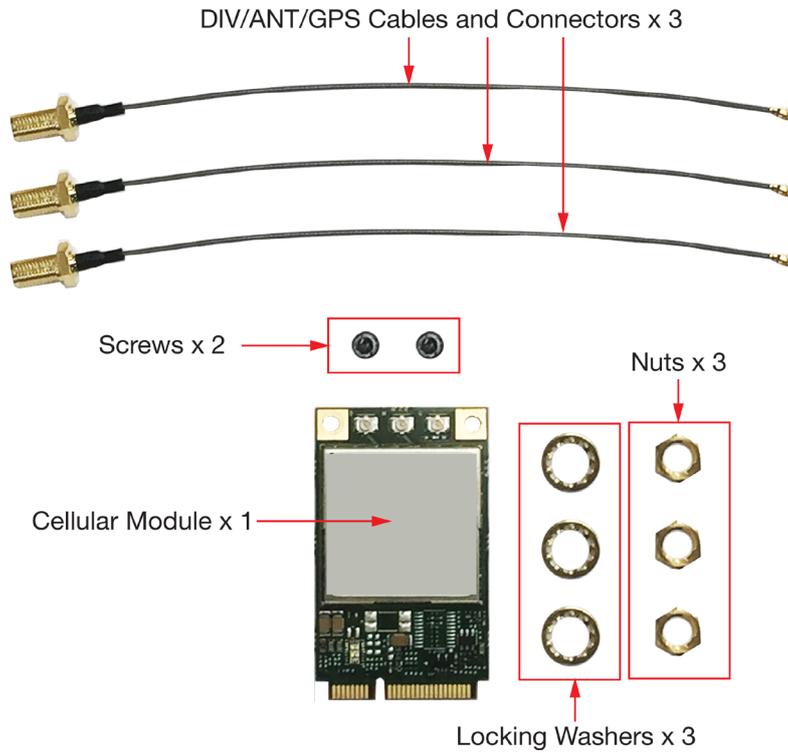
2. Insert the module in the socket and secure it with the two screws in the package.

✎   **NOTE**

We strongly suggest installing the cellular module on socket 1 because it is closer to the antenna holes on the rear panel.

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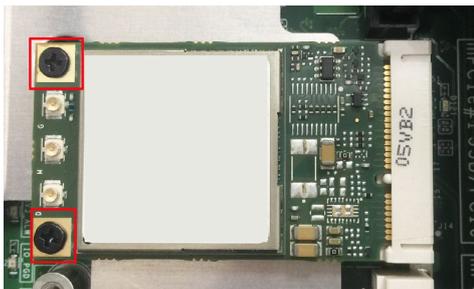
3. Connect the three antenna cables to the connectors.
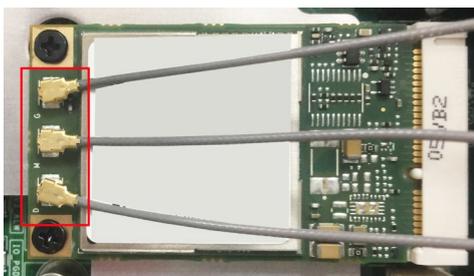
There are three antenna connectors on the cellular module: one for GPS, one for RX communication, and one for RF communication. See the following figure for details.

RX Diversity
Antenna (DIV)

Main RF
Antenna (ANT)

GNSS
Antenna (GPS)
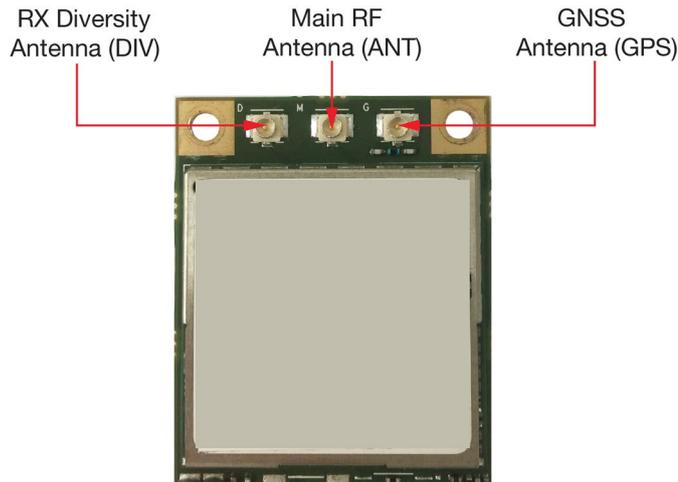
Installing the Wireless Cables and Antennas

Installing the Wi-Fi Module Antennas

Since you have already connected the cables on the Wi-Fi module, you only need to connect the antennas to the connectors. The Wi-Fi antenna connectors are of the SMA type and are located on the front panel.

Wireless Antenna
Connectors x 3
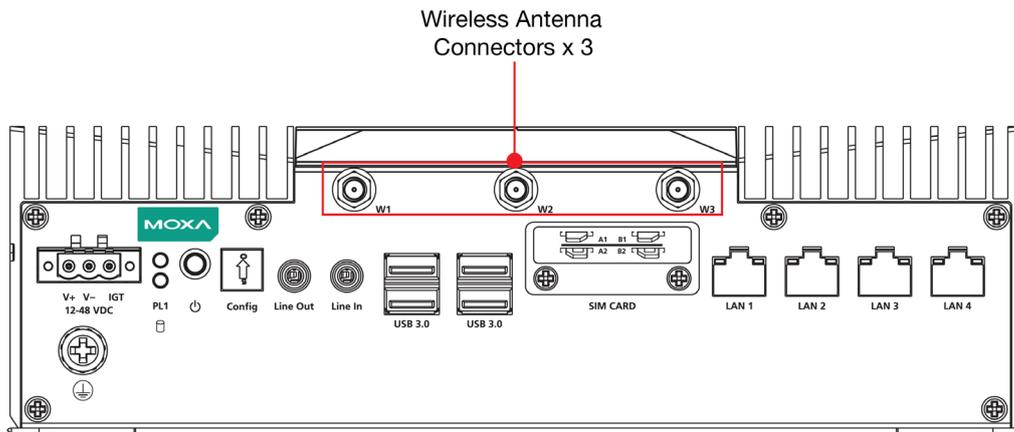
Connect the antenna to the connector and tightened it to ensure that it is secure.

Installing the Cellular Module Antennas

There are three antenna apertures located on the left upper side of the rear panel. To install antennas, do the following:

1. Remove the plastic cover.
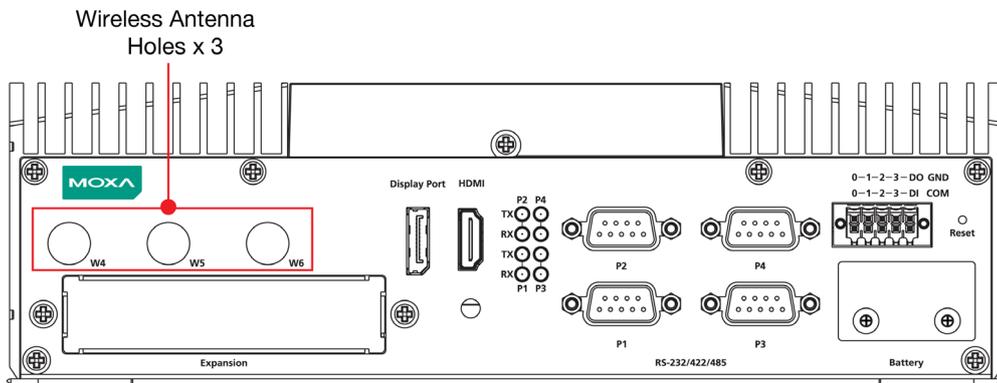
2. Insert the cable and the connector into an aperture on the rear panel.

3. On the other end of the connector, pass the antenna mount's threaded connection ring through the mounting hole, hold the locking washer against the rear panel and secure the antenna connector by tightening the nut onto the threaded protection ring.
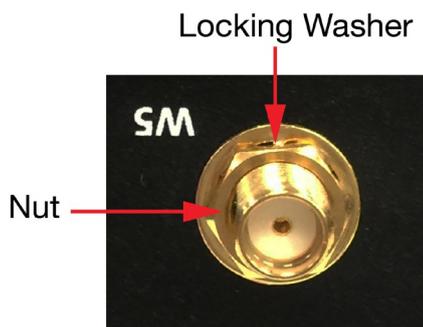
4. Use the same method to install another two antenna connectors.

5. Install the antenna on the connector. Make sure you have tightened the antenna securely.

Switching the Wireless Module Socket

As there are two wireless module sockets and you can install a Wi-Fi or cellular module in either of the sockets, a DIP switch is provided to enable the selection of Wi-Fi or cellular module. The DIP switch is located below the wireless module socket as shown in the following illustration:
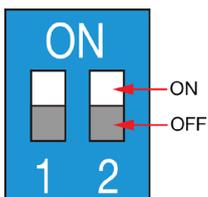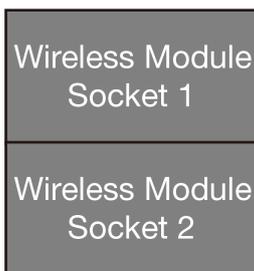
Status	Socket 1	Socket 2
ON (default)	Wi-Fi	Wi-Fi
OFF	Cellular	Cellular

For example, if you install a cellular module in the first socket, you need to turn the DIP switch 1 to OFF.

Installing the mSATA Drive

There is a mSATA socket inside the computer; users can install the mSATA on their own for storage capacity expansion. Remove the rear cover of the computer, the mSATA socket is in the central part of the computer as indicated in the following diagram.
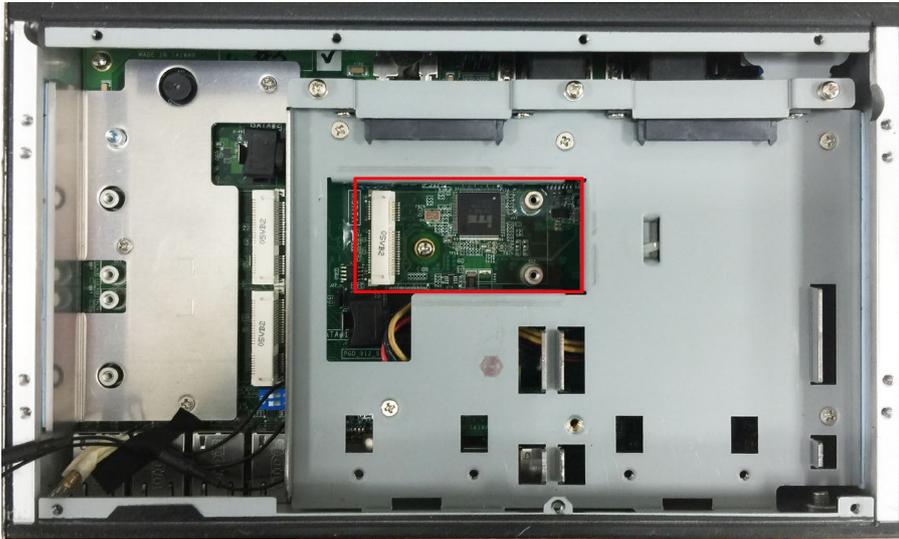
Insert the mSATA module into the socket and fasten two screws to secure the module.

Upgrading the Memory

The V2403C comes with 2 DDR4 2400 SO-DIMM slots but without any preinstalled memory. To install or replace the memory, follow these steps.

1. Remove the screw on the rear panel and take off the top cover.
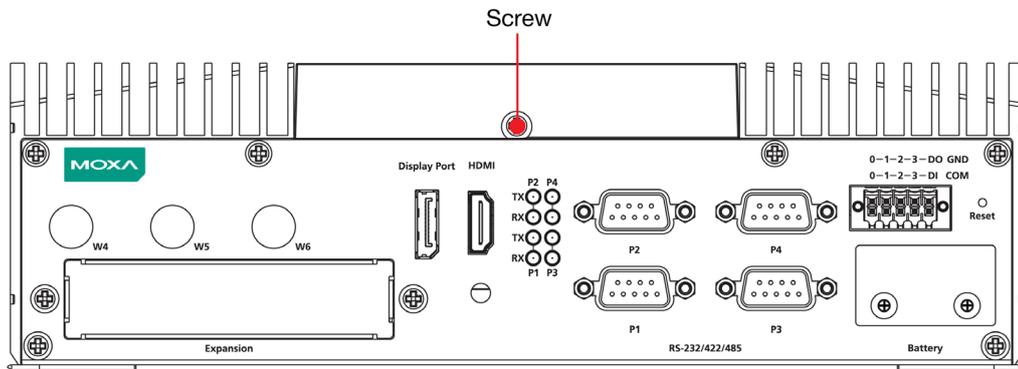
2. There are two memory slots located inside the computer.

3. Insert the new memory card into the first slot, pull in the clutches, and push down the memory card. Ensure that the memory card in securely inserted.

4. Use the same method to insert another memory card into the second slot.

5. To remove the memory card, pull the two clutches outwards on both sides of the memory card.

6. Put back the top cover and the screw on the rear panel.

✏️ **NOTE**

The V2403C supports up to 32 GB total memory (16 GB per channel). For any memory compatibility issue, contact Moxa Technical Support Team.

Replacing the Battery

The V2403C comes with one battery slot containing a lithium battery with the specifications 3V/195 mAh.

To replace the battery, do the following:

1. The battery cover is located on the rear panel of the computer.
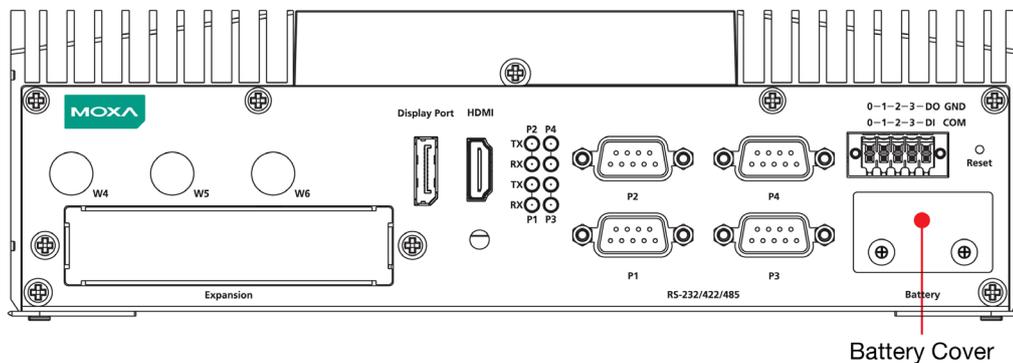
Battery Cover

2. Unfasten the two screws on the battery cover.
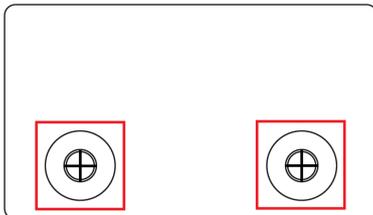
3. Remove the cover. The battery is attached to the cover.
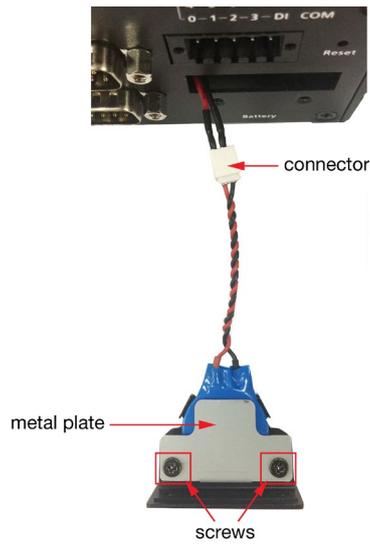
4. Separate the connectors and remove the two screws on the metal plate.

5. Replace the battery, place the metal plate on the battery, and fasten the screws to secure the batteries.
6. Plug in the connector, place the battery into the slot, and put back the cover.
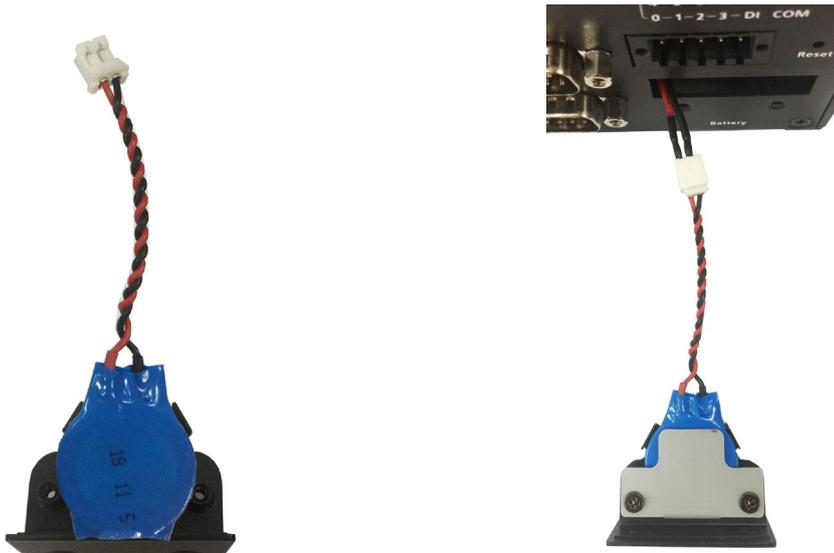
7. Secure the cover with the two screws.

NOTE

Make sure you use the correct type of battery. Incorrect battery may cause system damage. Contact Moxa's technical support staff for assistance, if necessary.

NOTE

This computer is intended to be installed in a restricted access area only. In addition, for safety reasons, the computer should be installed and handled only by qualified and experienced professionals.

NOTE

This computer is designed to be supplied by listed equipment and rated 12 to 48 VDC, minimum 5.83 to 1.46 A, minimal Tma=70°C. If you need assistance with purchasing a power adapter, contact the Moxa technical support team.

4. BIOS Setup

In this chapter, we describe the V2403C computer's BIOS settings. The BIOS is a set of input/output control routines for peripherals. BIOS is used to initialize basic peripherals and help boot the operating system before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these input/output peripherals. The configuration settings are stored in the CMOS RAM, which receives power from a backup battery when the computer is not receiving power from an external power source. The system information is retained even after the system reboots, or the power is disconnected.

Entering the BIOS Setup

To enter the BIOS setup utility, press the F2 key while the system is booting up. The main BIOS Setup screen will appear. You can configure the following settings on this screen.

- **Continue:** Continue to boot up
- **Boot Manager:** Select the device for booting up
- **Device Manager:** Enter the device configuration menu
- **Boot From File:** Select the UEFI boot-up file
- **Setup Utility:** Enter the BIOS configuration menu
- **Intel® Management Engine BIOS Extension:** Enter the AMT configuration menu

✏️ **NOTE**

The Intel® AMT function is supported only in the models with i5, i7 processors.

Select **F2** to enter the **BIOS configuration**.


```
                                    Front Page
 Front Page

 Continue                                          This selection will direct the system to
 ▶Boot Manager                                     continue to booting process
 ▶Device Management
 ▶Boot From File
 ▶Setup Utility
 ▶Intel(R) Management Engine BIOS Extension












 F1  Help                          Enter Select ▶ SubMenu
 ↑/↓ Select Item
```
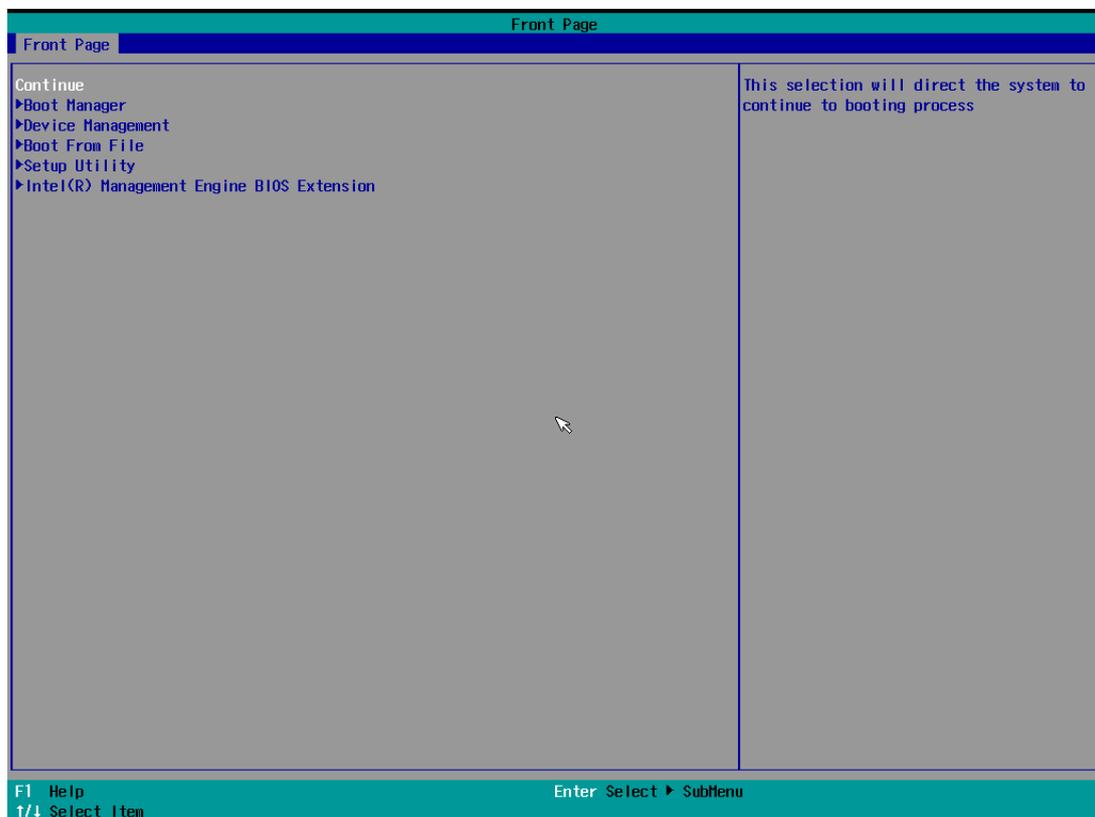
When you enter **Setup Utility**, a basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to use them.

F1	**General Help**	↑↓.	**Select Item**
F5/ F6	**Change Values**	←→	**Select Menu**
F9	**Setup Defaults**	**ESC**	**Exit**
F10	**Save and Exit**	**ENTER**	**Select or go to Submenu**

The BIOS configuration screen will be shown when you enter the **Setup Utility** option, as shown in the following figure:


```
                          InsydeH20 Setup Utility                              Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

Project Name                  KabyLake-U                    This is the help for the hour, minute,
BIOS Version                  V1.0.0S15                     second field. Valid range is from 0 to
                                                            23, 0 to 59, 0 to 59. INCREASE/REDUCE :
Processor Type                Intel(R) Core(TM) i5-7300U CPU @ 2.60GHz   +/-.
System Memory Speed           2133 MHz
Total Memory                  8192 MB
SODIMM 0                      [Not Installed]
SODIMM 1                      8192 MB

CPUID:                        0x806E9 (KABYLAKE ULT ULX)
L1 Data Cache:                32 KB
L1 Instruction Cache:         32 KB
L2 Cache:                     256 KB
L3 Cache:                     3072 KB
Number Of Processors:         2 Core(s) / 4 Thread(s)
PCH Rev / SKU                 21 (C1 Stepping) / SKL PCH-LP (U) iHDCP
                              2.2 Premium
GOP Ver:                      9.0.1080
Intel ME Version / SKU        11.8.50.3434 / CORPORATE
System Time                   [18:14:55]
System Date                   [07/14/2019]





F1  Help              ↑/↓ Select Item      F5/F6 Change Values      F9  Setup Defaults
Esc Exit              ←/→ Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

✏️ **NOTE**

The **Processor Type** information will vary depending on the model that you have purchased.

Main Page

The **Main** page displays basic system hardware information, such as model name, BIOS version, and CPU type.

```
                           InsydeH20 Setup Utility                              Rev. 5.0
  Main  Advanced  Security  Power  Boot  Exit

  Project Name                    KabyLake-U                    This is the help for the hour, minute,
  BIOS Version                    V1.0.0S15                     second field. Valid range is from 0 to
                                                                23, 0 to 59, 0 to 59.  INCREASE/REDUCE :
  Processor Type                  Intel(R) Core(TM) i5-7300U CPU @ 2.60GHz  +/-.
  System Memory Speed             2133 MHz
  Total Memory                    8192 MB
  SODIMM 0                        [Not Installed]
  SODIMM 1                        8192 MB

  CPUID:                          0x806E9 (KABYLAKE ULT ULX)
  L1 Data Cache:                  32 KB
  L1 Instruction Cache:           32 KB
  L2 Cache:                       256 KB
  L3 Cache:                       3072 KB
  Number Of Processors:           2 Core(s) / 4 Thread(s)
  PCH Rev / SKU                   21 (C1 Stepping) / SKL PCH-LP (U) iHDCP
                                  2.2 Premium
  GOP Ver:                        9.0.1080
  Intel ME Version / SKU          11.8.50.3434 / CORPORATE
  System Time                     [18:14:55]
  System Date                     [07/14/2019]

  F1   Help          ↑/↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
  Esc  Exit          ←/→ Select Item      Enter Select ▶ SubMenu    F10 Save and Exit
```

Advanced Settings

Select the **Advanced** tab in the main menu to open the advanced features screen.

✎ **NOTE**

The **Active Management Technology** is not supported in the KL1 and KL3 models.

```
                            InsydeH20 Setup Utility                          Rev. 5.0
  Main  Advanced  Security  Power  Boot  Exit

                                                       Configures Boot Settings.
  ▶Boot Configuration
  ▶SATA Configuration
  ▶CPU Configuration
  ▶Active Management Technology Support
  ▶Video Configuration
  ▶Chipset Configuration
  ▶SIO ITE8786E
  ▶Console Redirection




  F1  Help            ↑/↓ Select Item     F5/F6 Change Values      F9  Setup Defaults
  Esc Exit            ←/→ Select Item     Enter Select ▶ SubMenu   F10 Save and Exit
```

Boot Configuration

This item allows users to configure the default value of Numlock.

Options: On (default), Off.

```
                        InsydeH20 Setup Utility                          Rev. 5.0
   Advanced

 Boot Configuration                                  Selects Power-on state for Numlock

 Numlock                        <On>








 F1  Help          ↑/↓ Select Item    F5/F6 Change Values     F9  Setup Defaults
 Esc Exit          ←/→ Select Item    Enter Select ▶ SubMenu  F10 Save and Exit
```

SATA Configuration

```
                           InsydeH20 Setup Utility                              Rev. 5.0
     Advanced
SATA Configuration                                         Determines how SATA controller(s)
                                                           operate.
SATA Mode Selection                <AHCI>
SATA Speed Limited                 <Auto>

▶Serial ATA Port 0      [Not Installed]
  Hot Plug                         <Enabled>
▶Serial ATA Port 1      [Not Installed]
  Hot Plug                         <Enabled>
▶Serial ATA Port 2      [Not Installed]
  Hot Plug                         <Disabled>

F1  Help                 ↑/↓ Select Item      F5/F6 Change Values     F9  Setup Defaults
Esc Exit                 ←/→ Select Item      Enter Select ▶ SubMenu  F10 Save and Exit
```

SATA Mode Selection

You can use this setting to select the mode for the host drive controller. Options available are **AHCI** (default) and **Intel RST Premium**.

SATA Speed Limited

This item allows you to choose the SATA speed limitation from Gen1, Gen 2 to Gen3.

Options: Gen 1, Gen 2, Gen 3 (default)

Serial ATA Port

This setting displays information on the installed drives.

SATA Port Hot Plug

This setting allows you to enable/disable hot-plug capability (the ability to remove the drive while the computer is running) for installed storage drives.

Options: Enabled (default for Port 0/1), Disabled (default for Port 2 (mSATA))

RAID

Set HDC configuration as "Intel RST Premium" to enable **r**edundant **a**rray of **i**nexpensive **d**isks technology. The V2403C has three SATA interfaces, which only supports RAID levels 0, 1, 5 and Recovery.

Recovery utilizes RAID 1 (mirroring) functionality to copy data from a designated master drive to a designated recovery drive. The master drive data can be copied to the recovery drive either continuously or on request.

When using the continuous update policy, changes made to the data on the master drive while the system is not docked are automatically copied to the recovery drive when the system is re-docked. When using the on-request update policy, the master drive data can be restored to a previous state by copying the data on the recovery drive back to the master drive.
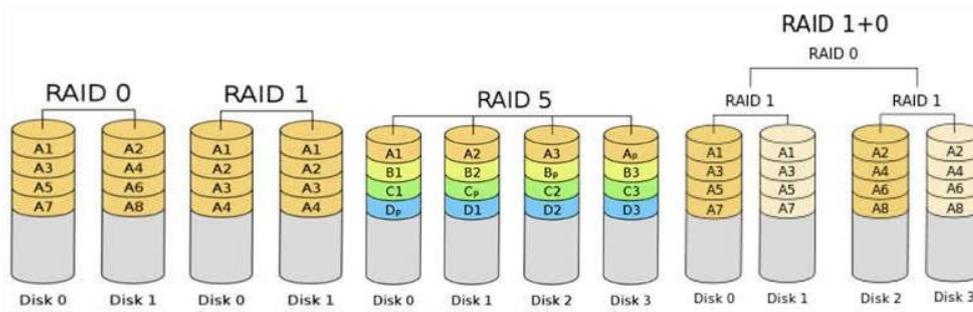

Source: http://en.wikipedia.org/wiki/Standard_RAID_levels for details.
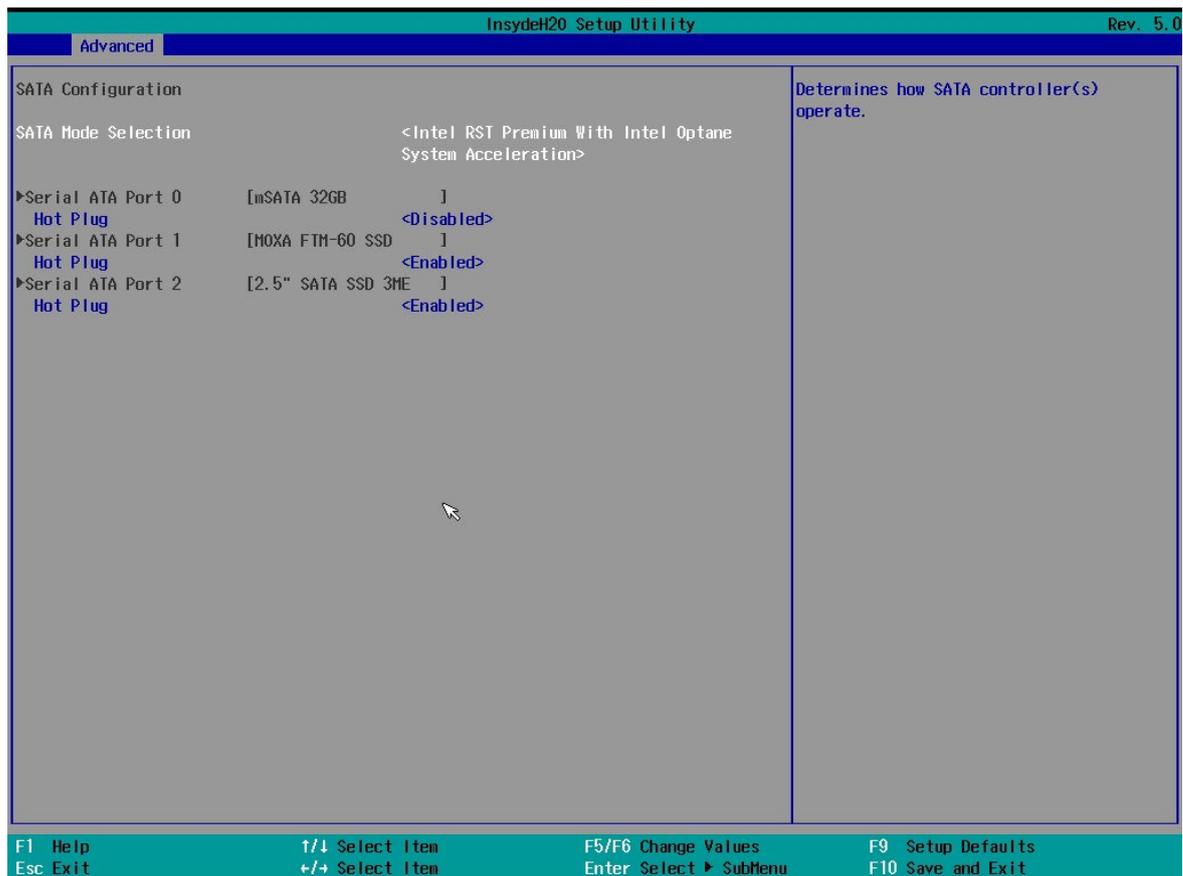
When setting the Intel RST Premium mode, or saving changes and reboot, you can select **Device Management** to configure the following Intel Rapid Storage Technology.

Intel Rapid Storage Technology

This section allows users to configure Intel® Rapid Storage Technology.

```
                                  Device Manager
────────────────────────────────────────────────────────────────────────────

Devices List                                  This formset allows the user to manage
▶Intel(R) Rapid Storage Technology            RAID volumes on the Intel(R) RAID
                                              Controller

Press ESC to exit.














────────────────────────────────────────────────────────────────────────────
F1  Help                              ↑/↓  Select Item
Esc Exit                              Enter Select ▶ SubMenu
```

```
                          Intel(R) Rapid Storage Technology
 Intel(R) Rapid Storage Technology
────────────────────────────────────────────────────────────────────────────

 Intel(R) RST 15.8.0.3010 RAID Driver          This page allows you to create a RAID
                                               volume
▶Create RAID Volume


 Non-RAID Physical Disks:
▶SATA 0.3, HGST HTS545050A7E680 TM8514GL1A6AJP, 465.7GB
▶SATA 0.4, Hitachi HTS545050B9A300 28PB4406Q7CJS04L, 465.7GB
















────────────────────────────────────────────────────────────────────────────
F1  Help          ↑/↓ Select Item       F5/F6 Change Values      F9  Setup Defaults
Esc Exit          ←/→ Select Item       Enter Select ▶ SubMenu   F10 Save
```

CPU Configuration

> ✎ **NOTE**
>
> **Hyper-Threading** function is not supported in the models with the Intel® Celeron® processor.

```
                          InsydeH20 Setup Utility                              Rev. 5.0
  Advanced

 CPU Configuration                                        Number of cores to enable in each
                                                          processor package.
 Active Processor Cores            <All>
 Hyper-Threading                   <Enabled>
 Turbo Mode                        <Enabled>

















 F1  Help                ↑/↓ Select Item    F5/F6 Change Values        F9  Setup Defaults
 Esc Exit                ←/→ Select Item    Enter Select ▶ SubMenu     F10 Save and Exit
```
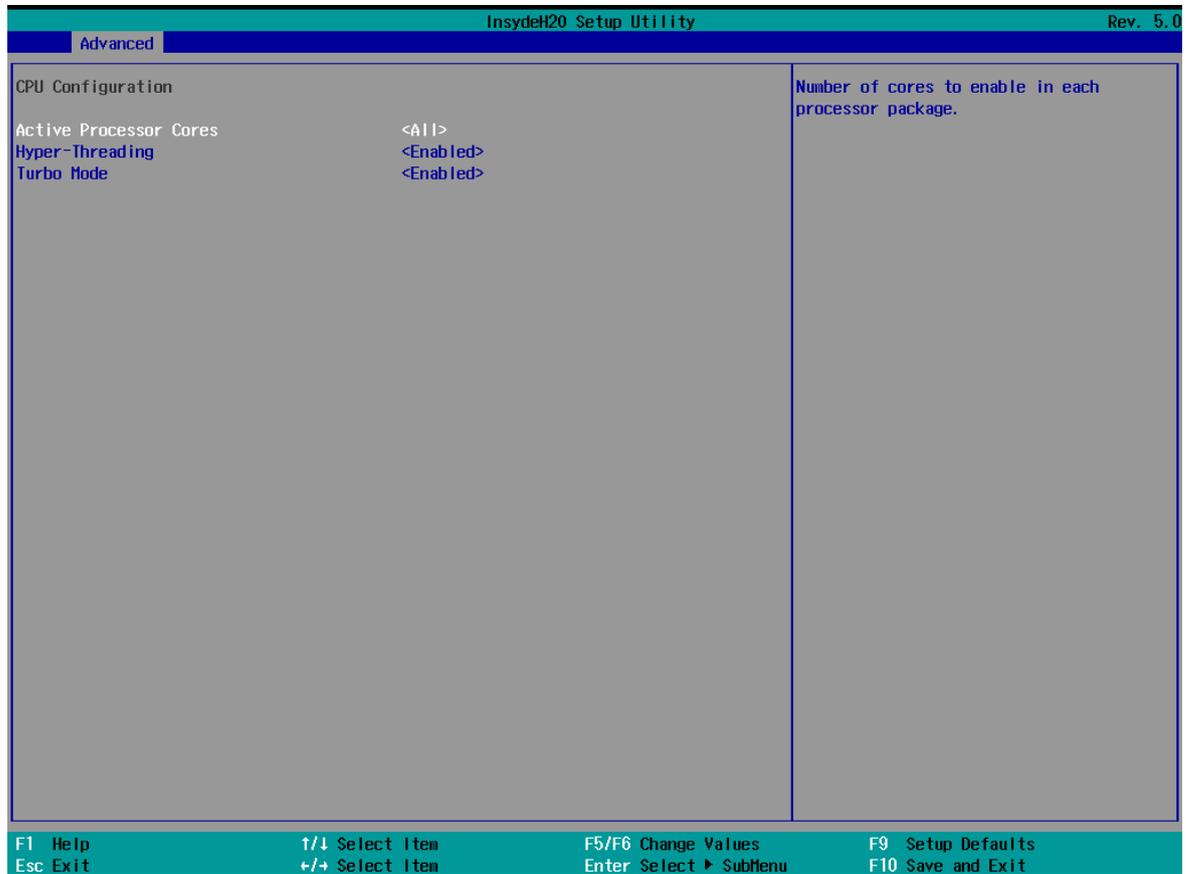
Active Processor Cores

This item indicates the number of cores to enable in each processor package.

Hyper-Threading

This feature makes the processor resources work more efficiently, enabling multiple threads to run on each core. It also increases processor throughput, improving overall performance on threaded software.

Options: Disabled, Enabled (default)

Turbo Mode

This feature allows you to enable the CPU to overclock or underclock based on system load automatically to save energy or speed up processing.

Options: Disabled, Enabled (default)

> ✎ **NOTE**
>
> V2403C-KL1-T does not support **Turbo Mode** function because the Intel® Celeron® 3965U processor doesn't support it.

Active Management Technology Support

This item allows you to configure the Intel® Active Management Technology (Intel® Celeron® and i3 models do not support this function).

```
                            InsydeH20 Setup Utility                          Rev. 5.0
      Advanced

Active Management Technology Support                    Disabling this option will cause ME not
                                                        to unconfigure on RTC clear
ME Unconfig on RTC Clear State        <Enabled>
Unconfigure ME                        [ ]

                                    .













F1  Help              ↑/↓ Select Item     F5/F6 Change Values      F9  Setup Defaults
Esc Exit              ←/→ Select Item     Enter Select ▶ SubMenu   F10 Save and Exit
```
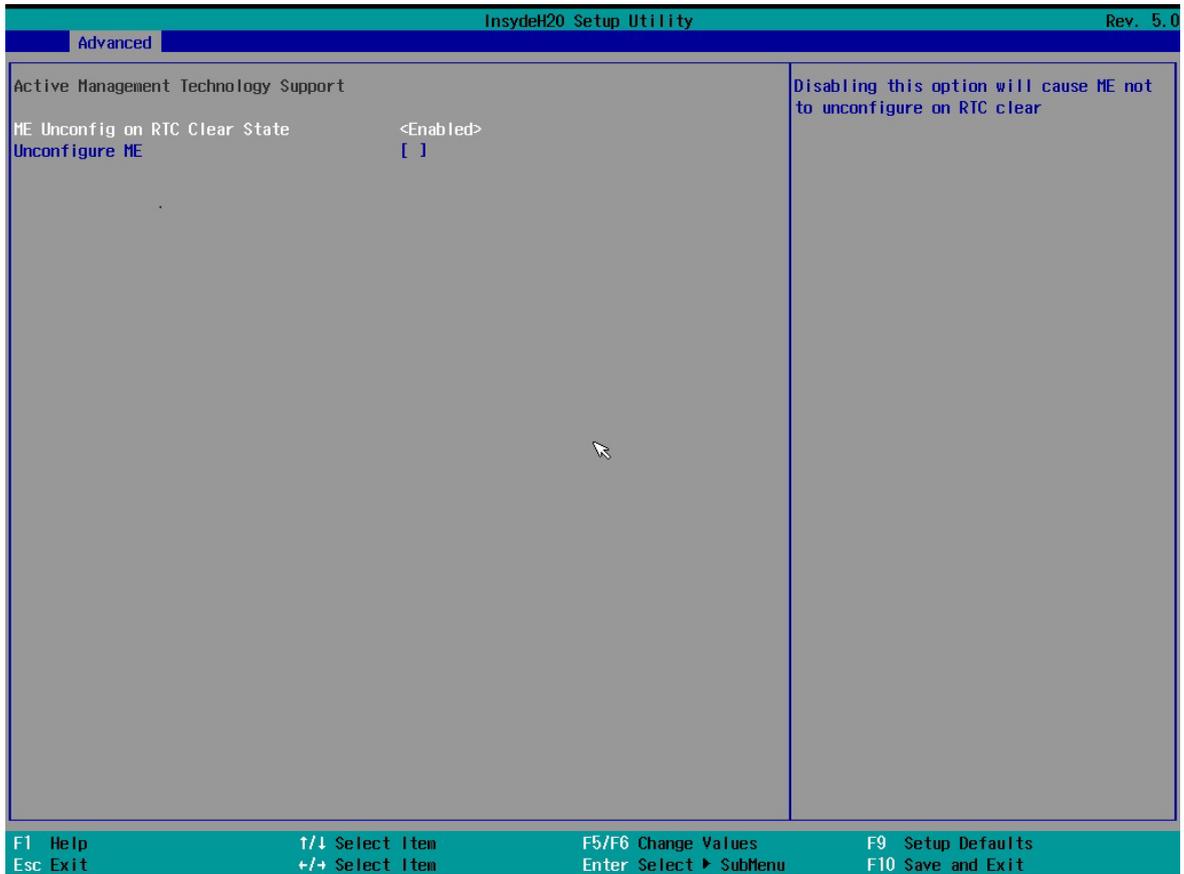
Unconfigure ME on RTC Clear State

Disabling this option will cause ME not to unconfigure upon RTC clear.

Options: Disabled, Enabled (default)

Unconfigure ME

Unconfigure ME by resetting the MEBx password to the default password.

Video Configuration

```
                          InsydeH20 Setup Utility                          Rev. 5.0
      Advanced

 Video Configuration                                Select DVMT 5.0 Pre-Allocated (Fixed)
                                                    Graphics Memory size used by the
 DVMT Pre-Allocated              <32M>              Internal Graphics Device.
 DVMT Total Gfx Mem              <256M>


                                       .




                                            ▶




 F1   Help              ↑/↓ Select Item       F5/F6 Change Values      F9   Setup Defaults
 Esc  Exit              ←/→ Select Item       Enter Select ▶ SubMenu   F10  Save and Exit
```
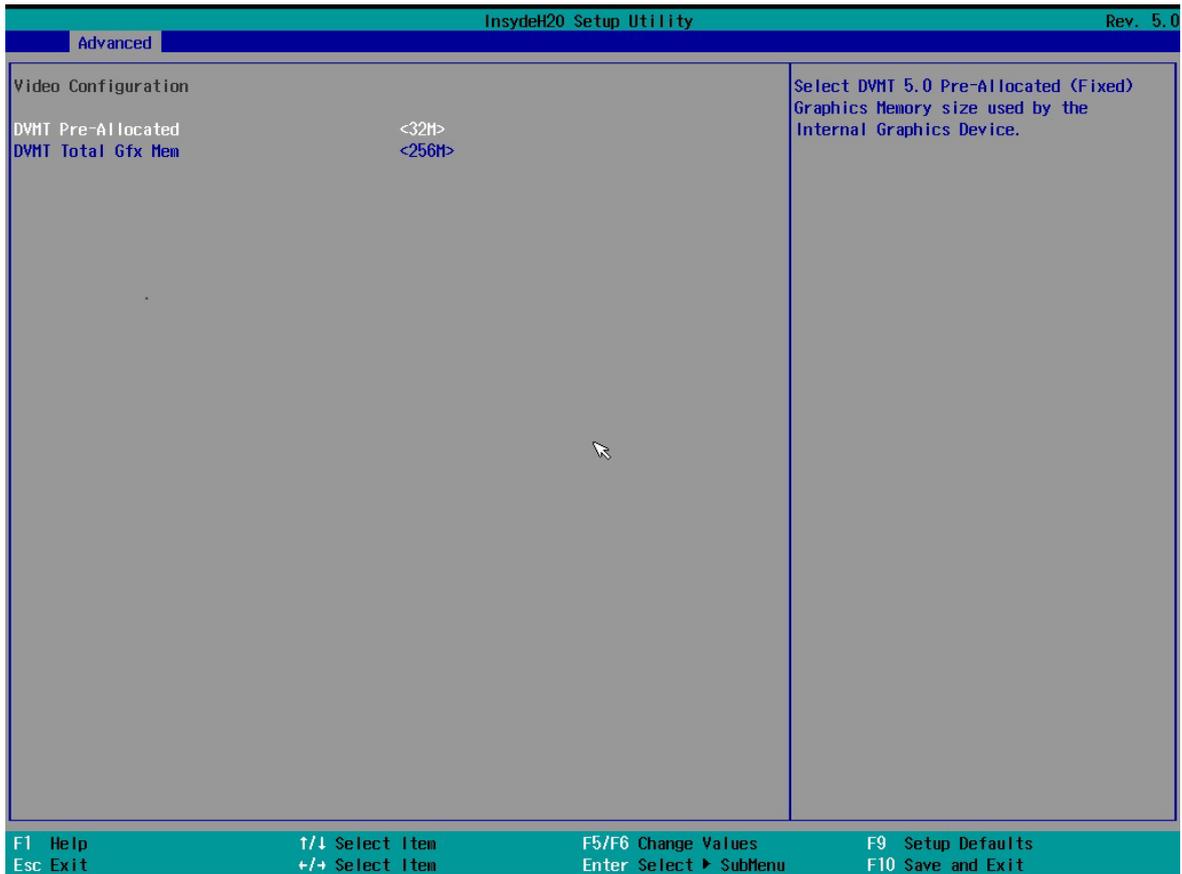
DVMT Pre-Allocated

This item allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

Options: 12 M, 16M, 20M, 24M, 28M, 32M (default), 36M, 40M, 44M, 48M, 52M, 56M, 60M, 64M

DVMT: The amount of video memory your computer has is dependent on the amount of pre-allocated memory set for your system plus the Dynamic Video Memory Technology (DVMT). DVMT dynamically allocates system memory for use as video memory creating the most efficient use of available resources for maximum 2D/3D graphics performance.

DVMT Total Gfx Mem.

This item allows you to configure the maximum amount of memory DVMT will use when allocating additional memory for the internal graphics device.

Options: 256 MB (default), 128 MB, Max.

Chipset Configuration

This item allows you to configure the chipset settings.

```
                              InsydeH2O Setup Utility                                   Rev. 5.0
    Advanced

   Chipset Configuration                                       This item allows you to enable/disable
                                                               the computer from automatically powering
   Power ON after Power Failure          <ON>                  up after a system crash. Options: ON
   Load Default After Cleaning RTC Battery  <Enabled>          (default), OFF, Last State

   DO-0 Level                            <High>
   DO-1 Level                            <High>
   DO-2 Level                            <High>
   DO-3 Level                            <High>


















   F1  Help                  ↑/↓ Select Item      F5/F6 Change Values          F9  Setup Defaults
   Esc Exit                  ←/→ Select Item      Enter Select ▶ SubMenu       F10 Save and Exit
```

Power ON after Power Failure

This item allows you to enable/disable the computer from automatically powering up after system power is re-enabled.

Options: ON (default), OFF, Last State

Load Default After Cleaning RTC Battery

This item allows you to enable the system to load the default setting when RTC battery loss is detected.

Options: Disabled, Enabled (default)

DO-0 Level

This item allows users to set the DO 0 to high or low.

Options: High (default), Low

DO-1 Level

This item allows users to set the DO 1 to high or low.

Options: High (default), Low

DO-2 Level

This item allows users to set DO-2 to high or low.

Options: High (default), Low

DO-3 Level

This item allows users to set DO-3 to high or low.

Options: High (default), Low

SIO ITE8786E

This section allows users to configure serial port settings.

```
                        InsydeH20 Setup Utility                              Rev. 5.0
      Advanced

 Serial Port A                <AUTO>                    Configure Serial port using options :
   UART Mode                  <RS232>                   [Disable] No Configuration [Enable] User
 Serial Port B                <AUTO>                    Configuration [Auto] EFI/OS chooses
   UART Mode                  <RS232>                   configuration
 Serial Port C                <AUTO>
   UART Mode                  <RS232>
 Serial Port D                <AUTO>
   UART Mode                  <RS232>
 ►Hardware Monitor




 F1  Help              ↑/↓ Select Item      F5/F6 Change Values        F9  Setup Defaults
 Esc Exit              ←/→ Select Item      Enter Select ► SubMenu     F10 Save and Exit
```

Serial Port A

This function allows users to configure the resources for serial port A.

Disable: No resources

Enable: User configures the resources

Auto (default): EFI/OS chooses the resources

Serial Port B

This function allows users to configure the resources for serial port B.

Disable: No resources

Enable: User configures the resources

Auto (default): EFI/OS chooses the resources

Serial Port C

This function allows users to configure the resources for serial port C.

Disable: No resources

Enable: User configures the resources

Auto (default): EFI/OS chooses the resources

Serial Port D

This function allows users to configure the resources for serial port D.

Disable: No resources

Enable: User configures the resources

Auto (default): EFI/OS chooses the resources

Hardware Monitor

This item allows you to view stats such as CPU and system temperature, voltage levels, and other chipset information.

```
                              InsydeH20 Setup Utility                            Rev. 5.0
   Advanced

 Hardware Monitor

 Voltage
   3.3V                              3.288 V
   5V                                4.896 V

 Temperature
   System (°C/°F)                    47°C/116°F
   System2 (°C/°F)                   46°C/114°F
   CPU (°C/°F)                       69°C/156°F

 F1  Help              ↑/↓ Select Item      F5/F6 Change Values      F9  Setup Defaults
 Esc Exit              ←/→ Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```
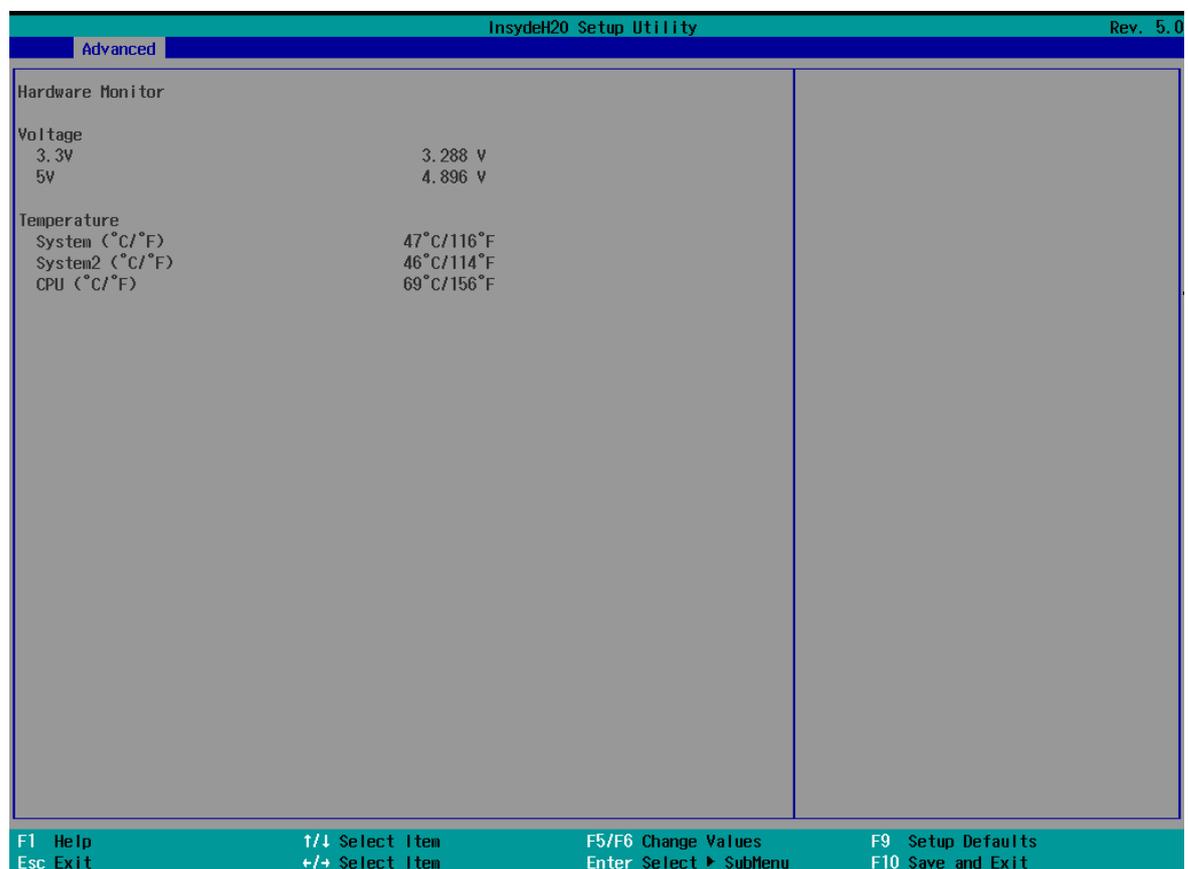
Console Redirection

When the Console Redirection Function is enabled, the console information will be output to both the HDMI monitor and through the serial port.

Options: Disabled (default), Enabled

Security Settings

This section allows users to configure security-related settings with a supervisor password and user password.

```
                                 InsydeH20 Setup Utility                              Rev. 5.0
   Main  Advanced  Security  Power  Boot  Exit

                                                              Clear TPM. Removes all TPM context
                                                              associated with a specific Owner.
   Current TPM Device              <TPM 2.0 (DTPM)>
   TPM State                       All Hierarchies Enabled, Owned
   Clear TPM                       [ ]

   Supervisor Password             Not Installed

   Set Supervisor Password




   F1  Help                ↑/↓ Select Item          F5/F6 Change Values        F9  Setup Defaults
   Esc Exit                ←/→ Select Item          Enter Select ▶ SubMenu     F10 Save and Exit
```

Current TPM Device

This item shows if the system has TMP device and its type.

✏️ **NOTE**

The TPM module is an optional module that needs to be purchased separately. Contact a Moxa representative for details.

TPM State

This item allows you view the status of current TPM settings.

Clear TPM

This item allows users to remove all TPM context associated with a specific owner.

Set Supervisor Password

This item allows you to set the supervisor password. Select the **Set Supervisor Password** option and enter the password and confirm the password again.

To delete the password, select the **Set Supervisor Password** option and enter the old password; leave the new password fields blank, and then press enter.

```
InsydeH20 Setup Utility                                                      Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 Current TPM Device          <TPM 2.0 (DTPM)>          Install or Change the password and the
 TPM State                   All Hierarchies Enabled, Owned    length of password  must be greater than
 Clear TPM                   [X]                       one character.

 Supervisor Password         Not Installed

 Set Supervisor Password




                              ┌─────────────────────────────────┐
                              │     Set Supervisor Password      │
                              ├─────────────────────────────────┤
                              │ Enter New Password:         ____ │
                              │ Enter New Password Again:   ____ │
                              └─────────────────────────────────┘









 F1  Help              ↑/↓ Select Item      F5/F6 Change Values      F9  Setup Defaults
 Esc Exit              ←/→ Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

After setting the supervisor password, users can configure when the password screen should be displayed.
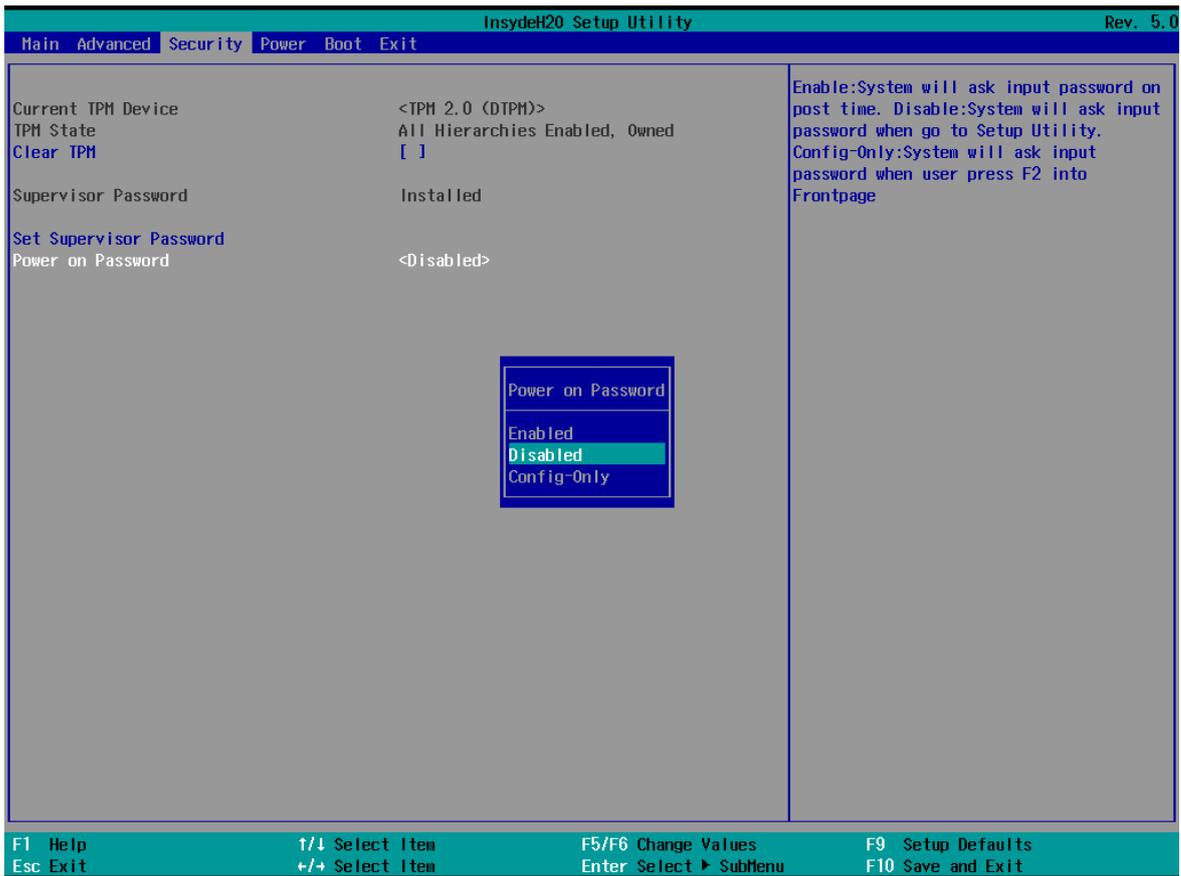
Enable: System will ask input password on post time.

Disable: System will ask for the password to go to the setup utility.

Config-Only: System will only ask for the password when you select the **config (F2)** option

Power Settings

The section allows users to configure power settings.

```
                              InsydeH20 Setup Utility                              Rev. 5.0
  Main  Advanced  Security  Power  Boot  Exit

                                                        Determines the action taken when the
                                                        system power is off and a PCI Power
  Wake on LAN                      <Enabled>            Management Enable wake up event occurs.
  Auto Wake on S5                  <Disabled>


  mPCIE#1 Power                    <Off>
  mPCIE#2 Power                    <Off>                              .






 F1  Help              ↑/↓ Select Item      F5/F6 Change Values       F9  Setup Defaults
 Esc Exit              ←/→ Select Item      Enter Select ▶ SubMenu    F10 Save and Exit
```
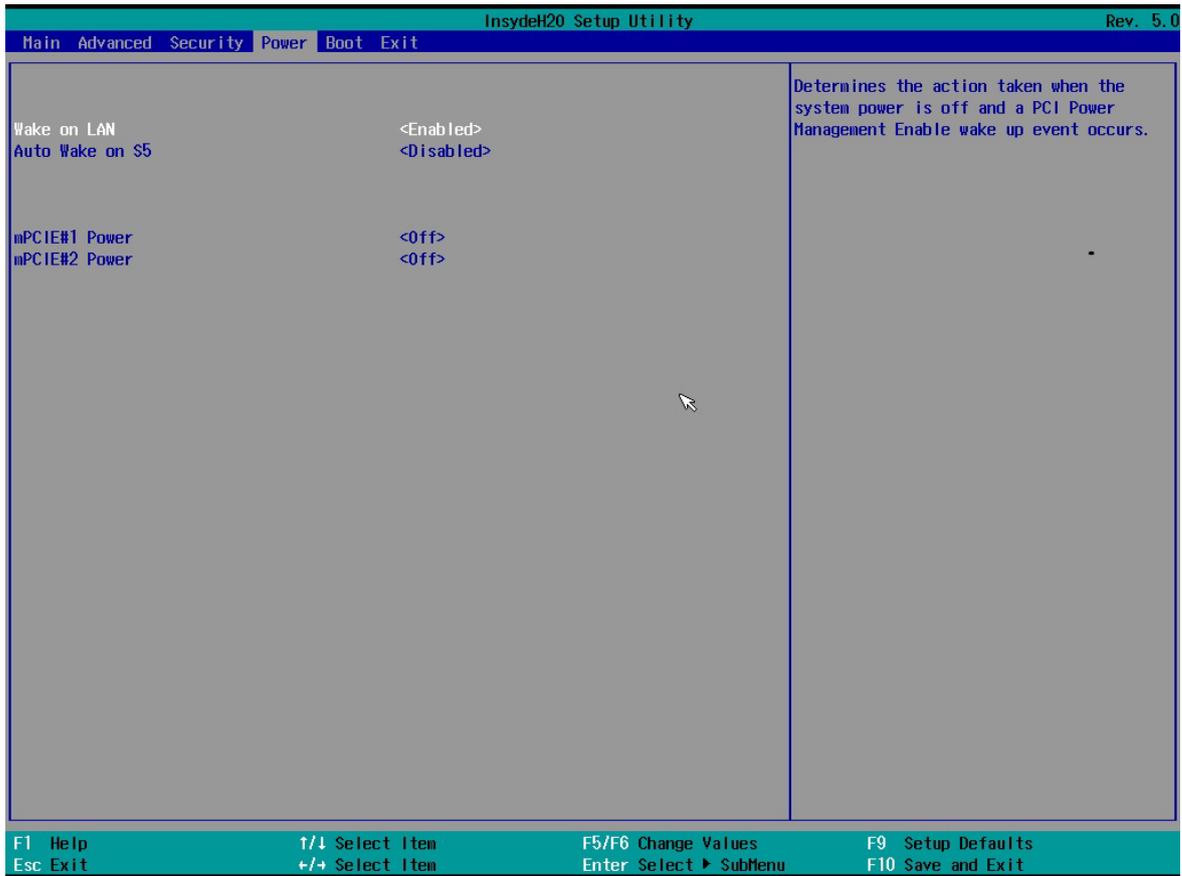
Wake on LAN

This feature is used to wake the system by a LAN device from a remote host.

Options: Enabled (default), Disabled

Auto Wake on S5

This item allows you to configure the computer to wake from S5 status. S5 stands for Soft Off, where the PSU remains engaged but power to all other parts of the system is cut. Auto-wake on S5 schedules a soft-reboot at certain periodic times that may be specified in the BIOS.

Options: Disabled (default); By Every Day (user specifies a regular daily time when the computer will power up); By Day of Month (user specifies a regular day each month when the computer will power up)

mPCIE#1 Power

This item allows you to control the power in the 1st mPCIe connector.

Options: Off (default), on

mPCIE#2 Power

This item allows you to control the power in the 2nd mPCIe connector.

Options: Off (default), on

Boot Settings

The section allows users to configure boot settings.
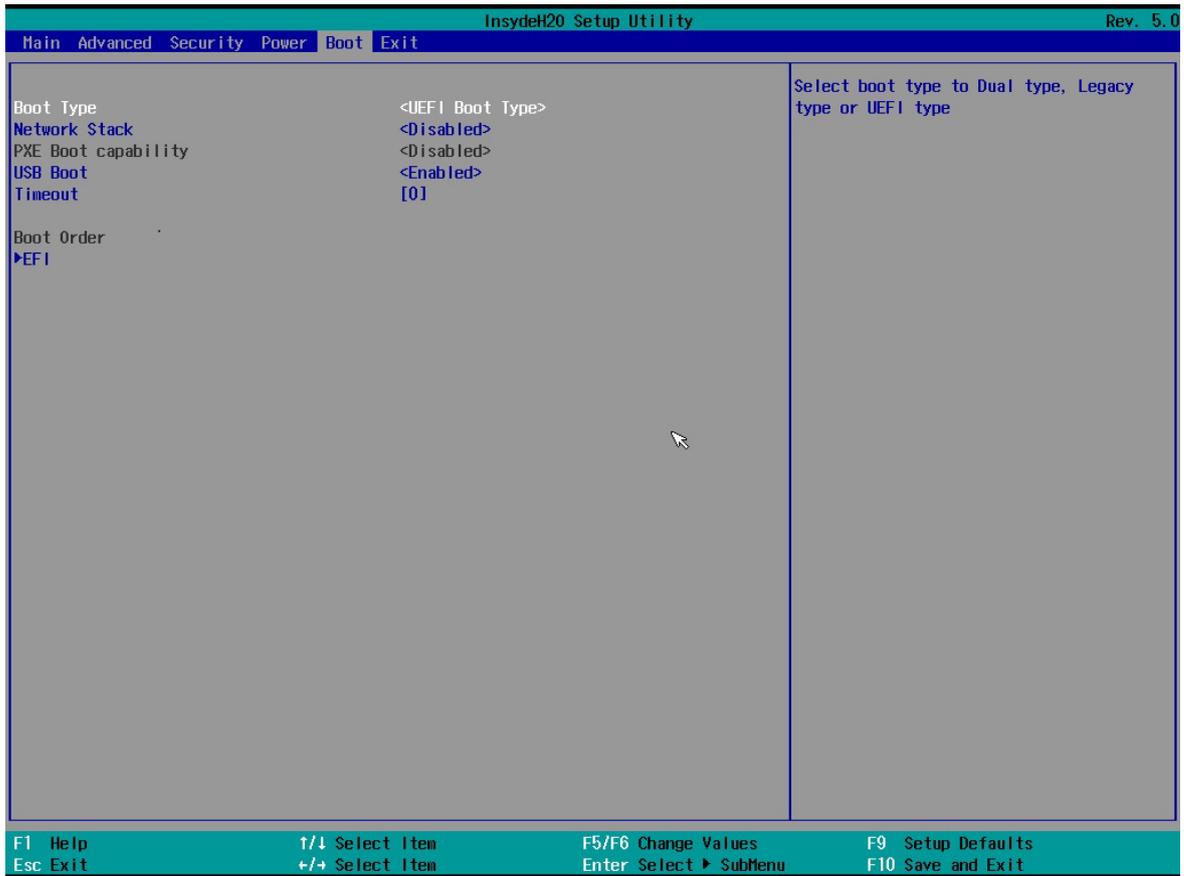
✏️ **NOTE**

If you do not add any storage, you will not see the EFI option.

Boot Type

This item allows you to enable/disable the quick boot function.

Options: Dual Boot Type, Legacy Boot Type, UEFI Boot Type (default)

Network Stack

It deploys an Internet Protocol (IP) stack. The IP stack provides an application library to open/close connections to remote devices and send/receive data between the remote devices.

Options: Disabled (default), Enabled

PXE Boot capability

PXE Booting is booting a system over a network. This item allows users to start PXE over IPv4 or IPv6

Options: Disabled (default), UEFI: IPv4, UEFI: IPv6, UEFI: IPv4/IPv6

USB Boot

Set booting to USB boot devices capability.

Options: Enabled (Default), Disabled

Timeout

This item allows users to set the number of seconds that the firmware will wait before booting the original default boot selection.

EFI

This item allows users to select the boot order. Use F5 (move down) or F6 (move up) to change the value.

Enabling AMT

✏️ **NOTE**

The AMT function is not supported in KL1 and KL3 models.

To enter the BIOS setup utility, press the "F2" key while the system is booting up. The main **BIOS Setup** screen will appear. Five options will be available:

1. Select **Intel® Management Engine BIOS Extension** to enter the **AMT configuration**.

```
                                    Front Page
 Front Page

Continue                                          This selection will direct the system to
▶Boot Manager                                     continue to booting process
▶Device Management
▶Boot From File
▶Administer Secure Boot
▶Setup Utility
▶Intel(R) Management Engine BIOS Extension




















F1  Help                         Enter Select ▶ SubMenu
↑/↓ Select Item
```
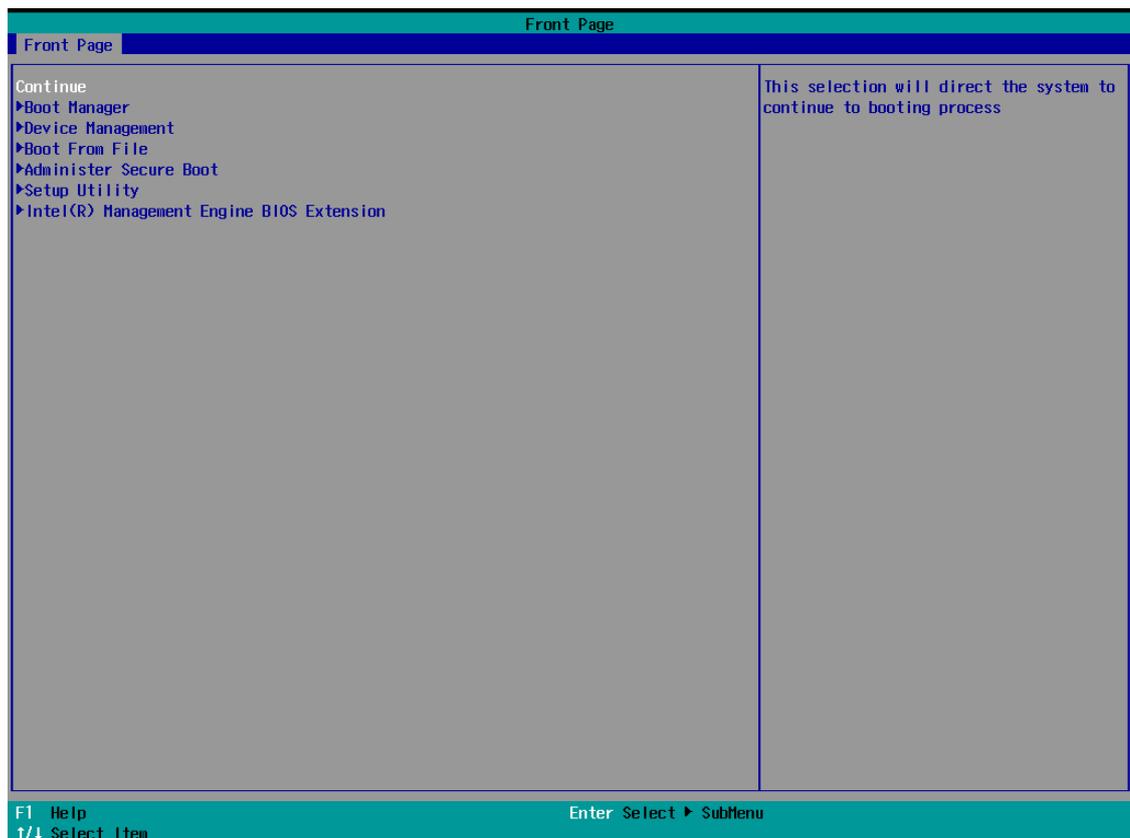
2. Press **<Enter>** to start the login procedure.
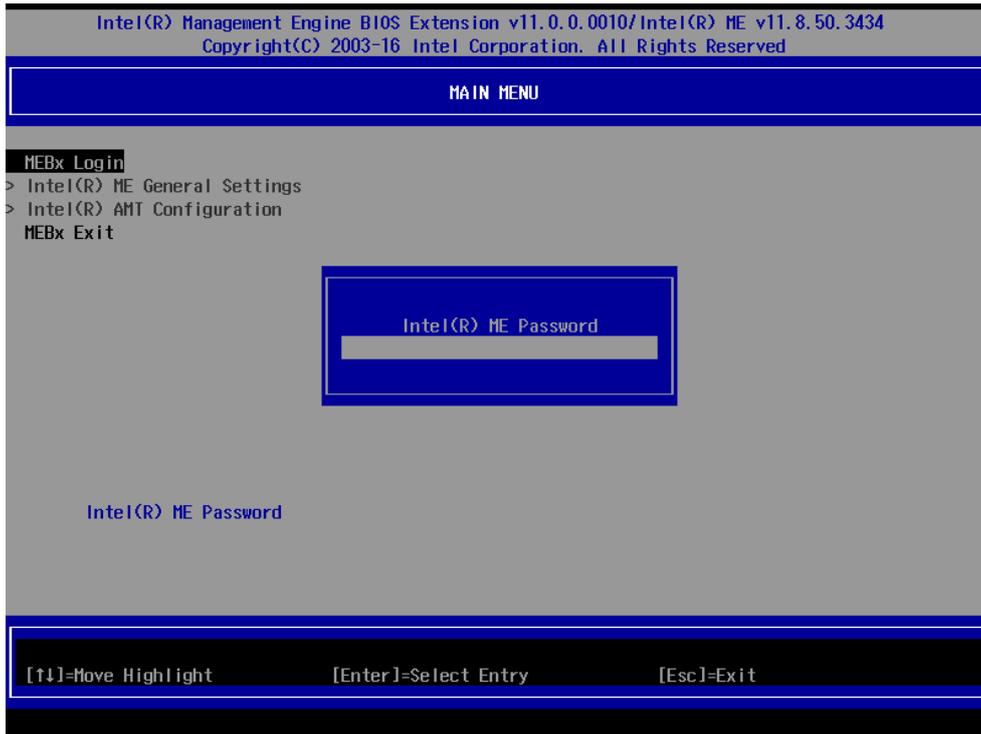
3. Type the default password **admin.**

4. Type the new password. It must include both upper-case and lower-case characters, numbers, and special symbols. E.g., **Admin'12**.

5. Select **Intel® AMT Configuration** to enable remote access without a local user present for consent, select **User Consent**, and then select **User Opt-in** and change the value to **None**.

6. Set static IP or DHCP by request.
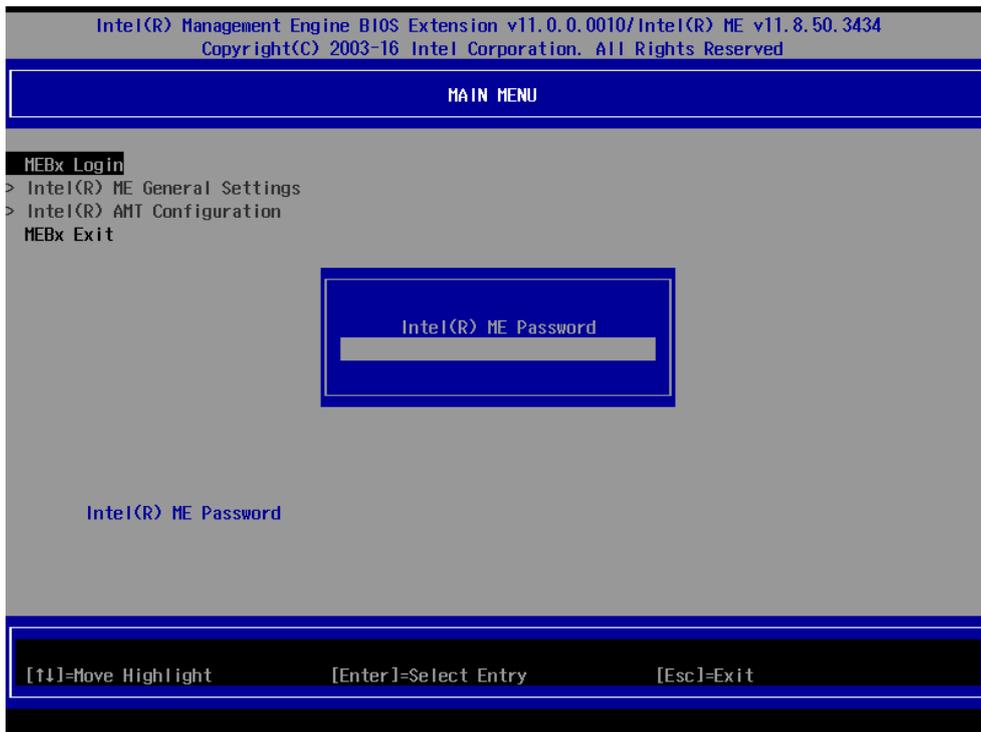
7. Set **Activate Network Access** to enable remote access capability.


```
         Intel(R) Management Engine BIOS Extension v11.0.0.0010/Intel(R) ME v11.8.50.3434
                      Copyright(C) 2003-16 Intel Corporation. All Rights Reserved

                                    INTEL(R) AMT CONFIGURATION

        Manageability Feature Selection                <Enabled>
    >   SOL/Storage Redirection/KVM
    >   User Consent
        Password Policy                                 <Anytime>
    >   Network Setup
        Activate Network Access
        Unconfigure Network Access                      <Full Unprovision>
    >   Remote Setup And Configuration
    >   Power Control




        [↑↓]=Move Highlight            [Enter]=Select Entry            [Esc]=Exit
```

Exit Settings

The section allows users to exit the BIOS environment.


```
                                   InsydeH20 Setup Utility                          Rev. 5.0
     Main  Advanced  Security  Power  Boot  Exit

                                                        Exit system setup and save your changes.
     Exit Saving Changes
     Save Change Without Exit
     Exit Discarding Changes
     Load Optimal Defaults
     Load Custom Defaults
     Save Custom Defaults
     Discard Changes















     F1  Help              ↑/↓ Select Item       F5/F6 Change Values        F9  Setup Defaults
     Esc Exit              ←/→ Select Item       Enter Select ▶ SubMenu     F10 Save and Exit
```

Exit Saving Changes

This item allows you to exit the BIOS environment and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

This item allows you to save changes without exiting the BIOS environment.

Options: Yes (default), No

Exit Discarding Changes

This item allows you to exit without saving any changes that might have been made to the BIOS.

Options: Yes (default), No

Load Optimal Defaults

This item allows you to revert to the factory default BIOS values.

Options: Yes (default), No

Load Custom Defaults

This item allows you to load custom default values for the BIOS settings.

Options: Yes (default), No

Save Custom Defaults

This item allows you to save the current BIOS values as a "custom default" that may be reverted to at any time by the "load custom defaults" selection just above.

Options: Yes (default), No

Discard Changes

This item allows you to discard all settings you have just configured.

Options: Yes (default), No

Remote Management Using AMT

You can use any of the available AMT tools to execute the remote management function. The easiest method is using a web browser.

1. Type the IP for your V2403C that was configured in the AMT configuration with port **16992**. The AMT logon screen will appear.

2. Click on "Log On" and type the username (**admin**) and password to log in and control the V2403C remotely.
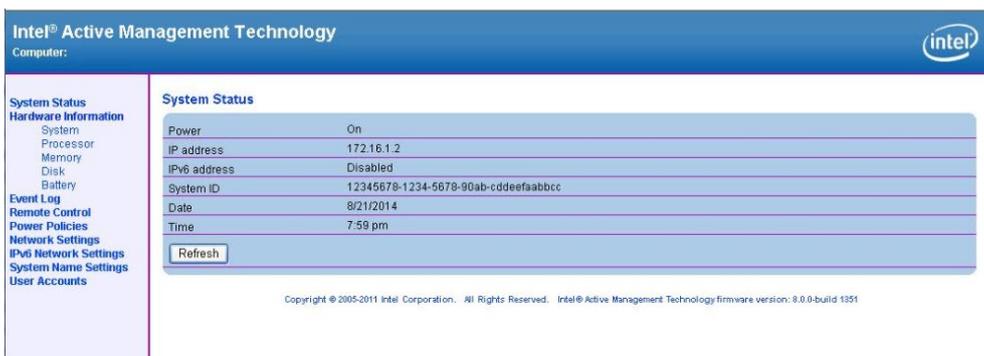
✎ **NOTE**

The V2403C's AMT port is LAN1.

✎ **NOTE**

Refer to the Intel AMT Implementation and Reference Guide for details:
https://software.intel.com/sites/manageability/AMT_Implementation_and_Reference_Guide/default.htm?turl=WordDocuments%2Faccessingintelamtviathewebuiinterface.htm

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Upgrading the BIOS

This section describes how to upgrade the BIOS. However, note that it is easy to permanently damage the computer when upgrading the BIOS. We strongly recommend that you contact Moxa's technical support staff for assistance to obtain all the necessary tools and the most current advice before attempting to upgrade the BIOS on any Moxa device.

Step 1: Create a Bootable USB Disk

Before upgrading the BIOS, every user should first create a bootable USB drive as a system boot device.

1. Search "format", then select **Create and format hard disk partitions**.
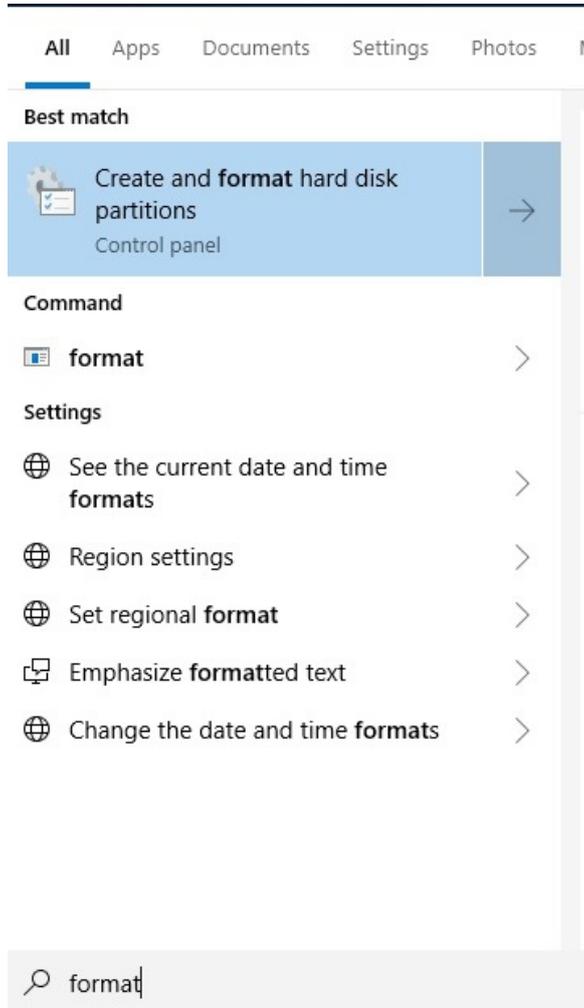
2. Right click on the USB disk then select "**Format**".
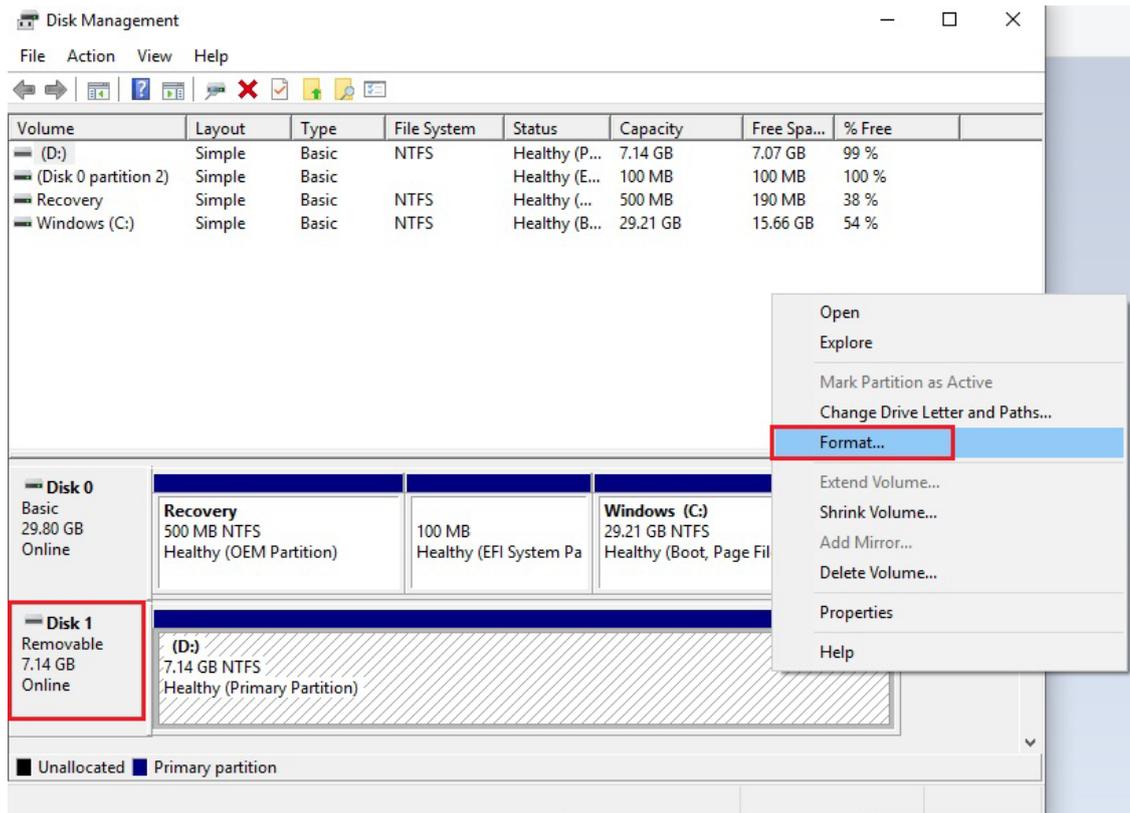
3. Select **FAT32** and click OK to start formatting.
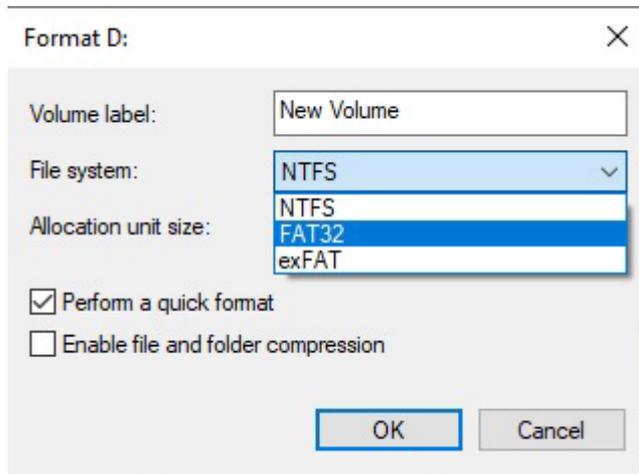
Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.

1. Get the BIOS upgrade file; it includes an **efi** folder and a file **xxxx.efi**.
2. Copy **efi** folder and **xxxx.efi** file to the Bootable USB Disk.

Step 3: Run the upgrade program on the computer

1. Reboot the computer, and press F2 while booting up to go to the Boot Manager. If BIOS cannot recognize the USB drive as the boot devices, the USB drive could have no partition table. Use windows command line tool **diskpart** to rebuild the partition table.

2. Select the USB Disk.
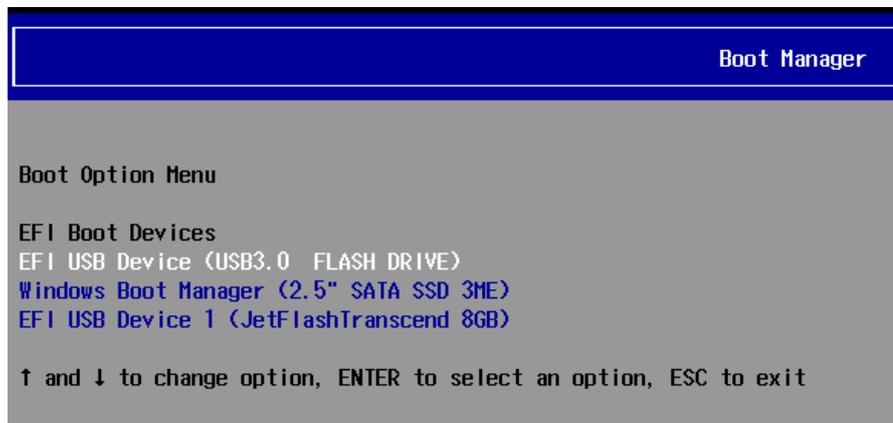
3. Screen will switch to the SHELL environment, type **fs0:** then, go to the directory where the upgrade file is located, and type **xxxxxx.efi** (the name is based on the upgrade file you get from Moxa).

4. The upgrade program will run automatically. Wait patiently until the procedure is finished.
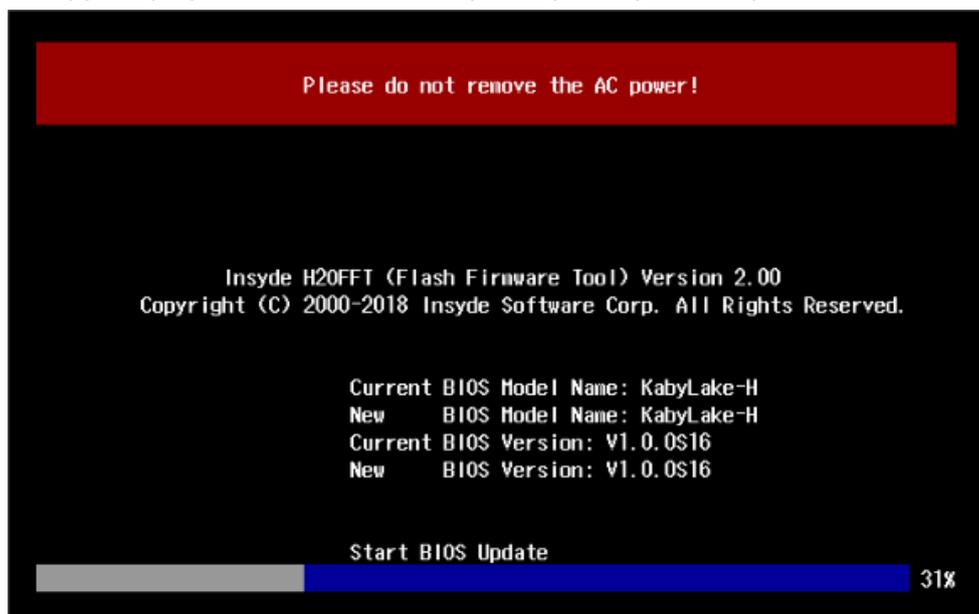
5. When the upgrade is finished, the computer will automatically reboot. You may check the BIOS version on the Main page.
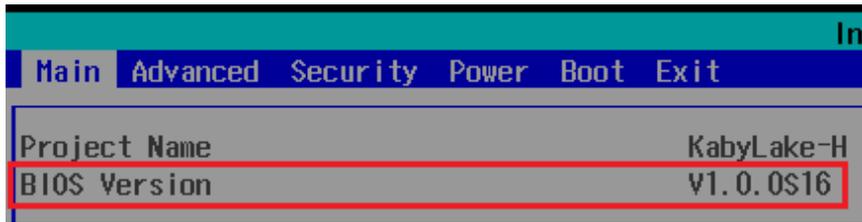
6. If the system has more than one boot device, you will see more than one fsx (x represents the number).
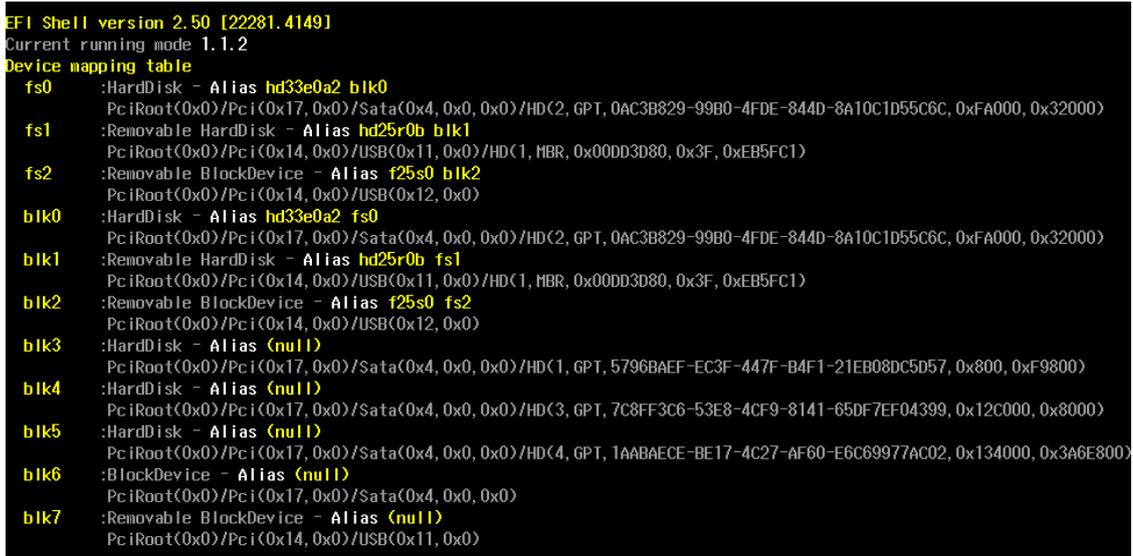
7. Go to each **fsx** (x means number), then type **ls** to view the content of the boot device. If find the upgrade file, execute it.
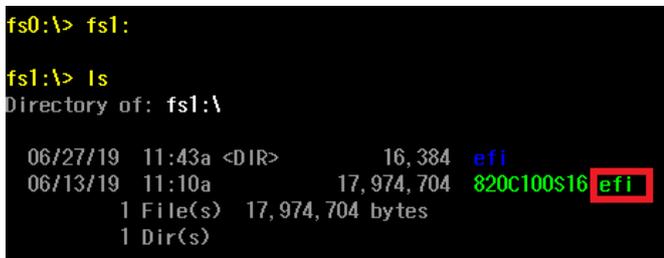
⚠️ **ATTENTION**

Do NOT switch off the power supply during the BIOS upgrade, since doing so may cause the system to crash.

A. Regulatory Approval Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A: FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Community

⚠ WARNING

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.