RKP-C110 Series Hardware User Manual

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www.moxa.com/products

RKP-C110 Series Hardware User Manual

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Technical Support Contact Information

www.moxa.com/support

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1. Introduction

Thank you for purchasing the Moxa RKP-C110 industrial computer. This manual covers hardware installation, connector interfaces, and BIOS setup of the RKP-C110. For software configuration and management, please refer to the user manual for the operating system on your computer.

Overview

The RKP-C110 Series rackmount computers are powered by a 11th Gen Intel® Celeron® or Intel® Core™ i3, i5, or i7 processor. The computers come with a rich set of interface options including up to 10 software-selectable RS-232/422/485 serial ports, up to 12 Gigabit Ethernet ports, and 8 digital inputs and 8 digital outputs. The communication interfaces are located on the front and rear sides of the product, enabling easy access and expansion for industrial applications. Two hand-rotated 2.5" SSD storages and an outer replaceable RTC battery design deliver a reliable, durable, and versatile platform for a more user-friendly option.

Designed as 1U standard form factor fanless rackmount computers with an operating temperature range of -30 to 60°C and a build-in TPM 2.0 module, the RKP-C110 computers are ideal as reliable and secure computing platforms for industrial applications in extreme operating environments.

Package Checklist

Each basic system model is shipped with the following standard items.

RKP-C110 Series

- RKP-C110 Series rackmount computer (mounting ears attached)
- 2-pin terminal block for DC power
- 2 10-pin terminal blocks for DI/DO
- Pack of 8 screws for the storage trays
- Quick Installation Guide
- Warranty card

RKP-C110 Series (2HV-T models)

- RKP-C110 Series rackmount computer
- 2 rack-mounting ears with 16 screws
- 5-pin terminal block for AC/DC power
- 2 10-pin terminal blocks for DI/DO
- Pack of 8 screws for the storage trays
- Quick Installation Guide
- Warranty card

✏️ **NOTE**

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

Product Features

The RKP-C110 computer has the following features:

- 1U Rackmount computer with fanless design
- 11th Gen Intel® Celeron® or Intel® Core™ i3, i5, or i7 processors
- Rich interface options of up to 10 Serial ports or up to 12 LAN ports
- 12/24 VDC and dual 100 to 240 VDC/VAC power input options
- -30 to 60°C wide-temperature design
- Standard form factor to fit in industrial application
- Interface front-side display design

Hardware Specifications

✏️ **NOTE**

The latest specifications for Moxa's products can be found at https://moxa.com.

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2. Hardware Introduction

In this chapter, we provide information about the RKP-C110 computer's hardware components.

Appearance

Front View

RKP-C110-C1-T/RKP-C110-C3-T/RKP-C110-C5-T/RKP-C110-C7-T Models
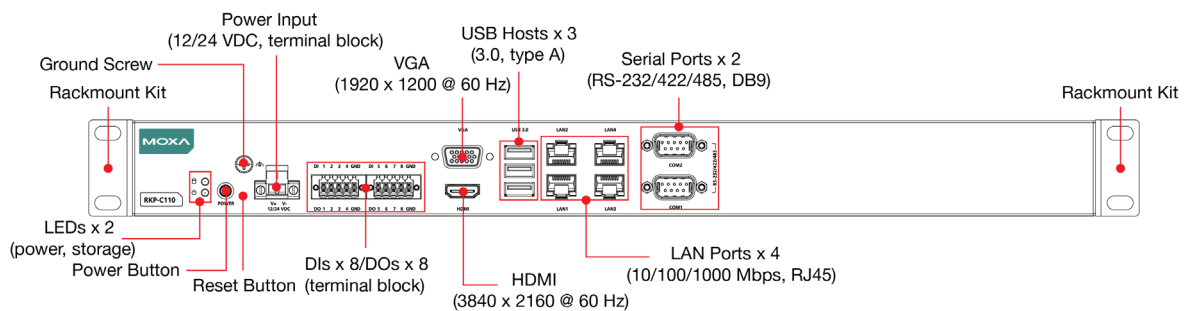
RKP-C110-C1-8L-T/RKP-C110-C3-8L-T/RKP-C110-C5-8L-T/RKP-C110-C7-8L-T Models
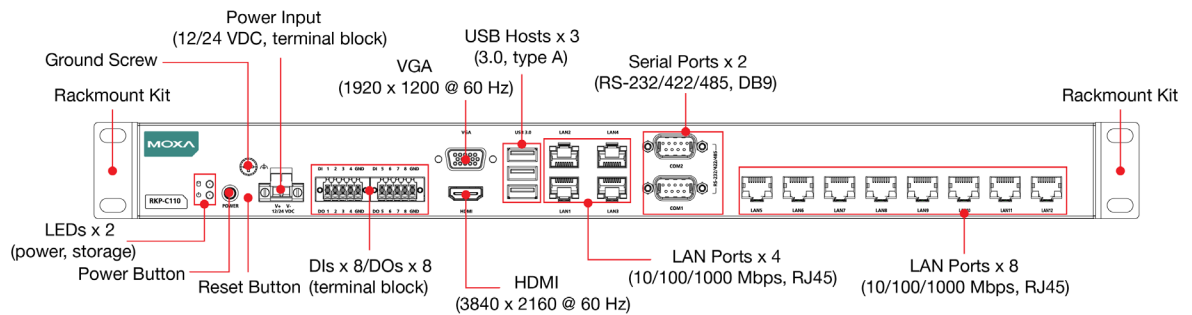
RKP-C110-C1-8C-T/RKP-C110-C3-8C-T/RKP-C110-C5-8C-T/RKP-C110-C7-8C-T Models
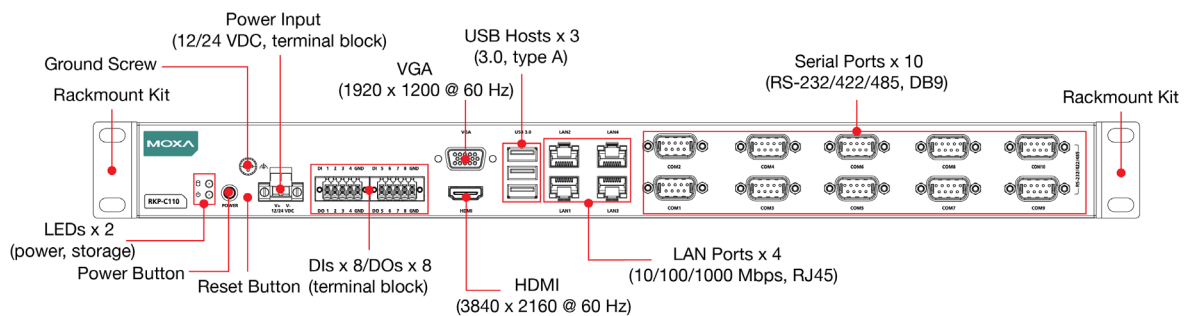
RKP-C110-C1-2L4C-T/RKP-C110-C3-2L4C-T/RKP-C110-C5-2L4C-T/RKP-C110-C7-2L4C-T Models
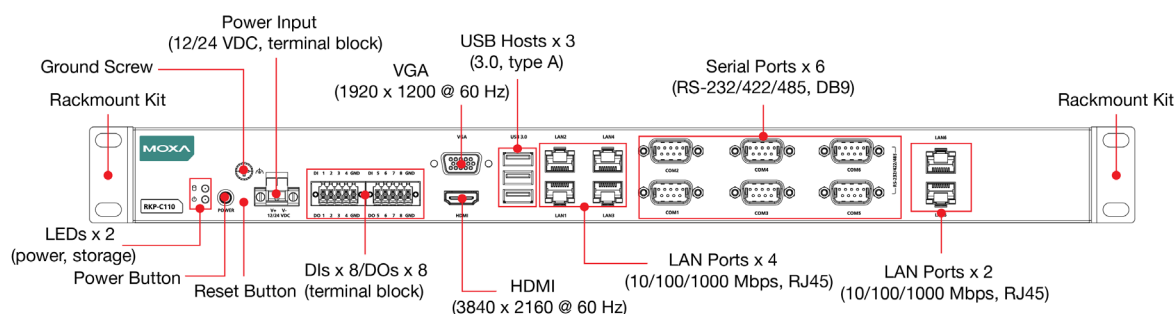
RKP-C110-C1-2HV-T/RKP-C110-C3-2HV-T/RKP-C110-C5-2HV-T/RKP-C110-C7-2HV-T Models
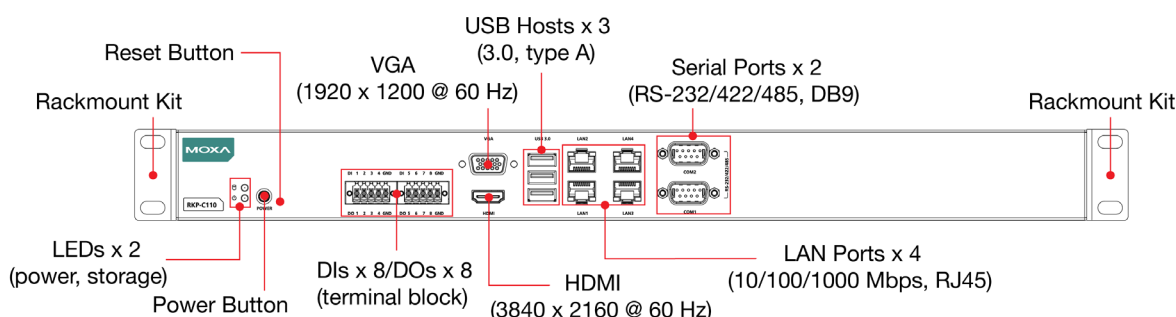
Rear View

RKP-C110-C1/RKP-C110-C3/ RKP-C110-C5/RKP-C110-C7 Models
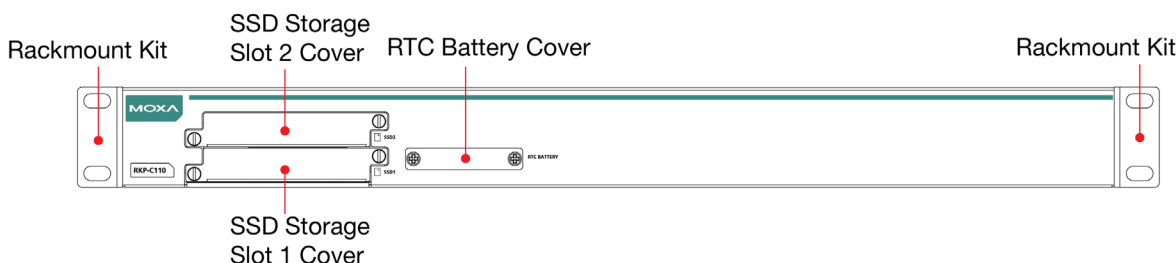
RKP-C110-C1-2HV-T/RKP-C110-C3-2HV-T/RKP-C110-C5-2HV-T/RKP-C110-C7-2HV-T Models
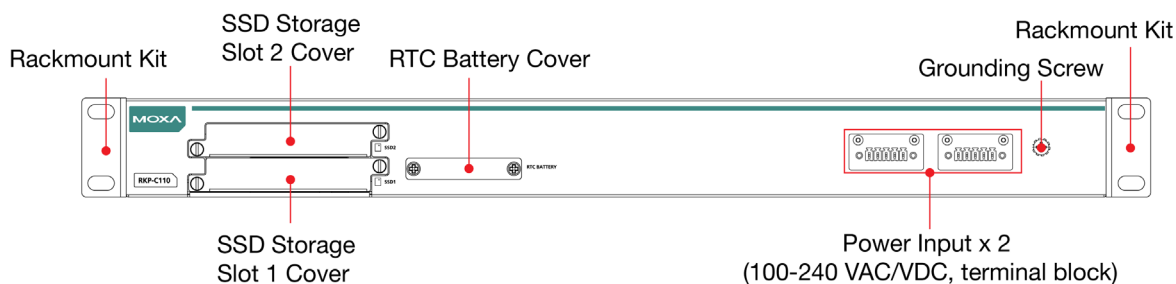
Dimensions

RKP-C110-C1/RKP-C110-C3/RKP-C110-C5/RKP-C110-C7 Models

Unit: mm (inch)

230 (9.06)

440 (17.32)

44 (1.73)

31.8 (1.25)

480 (18.90)

462.6 (18.21)

6.3 (0.25)

11.9 (0.47)
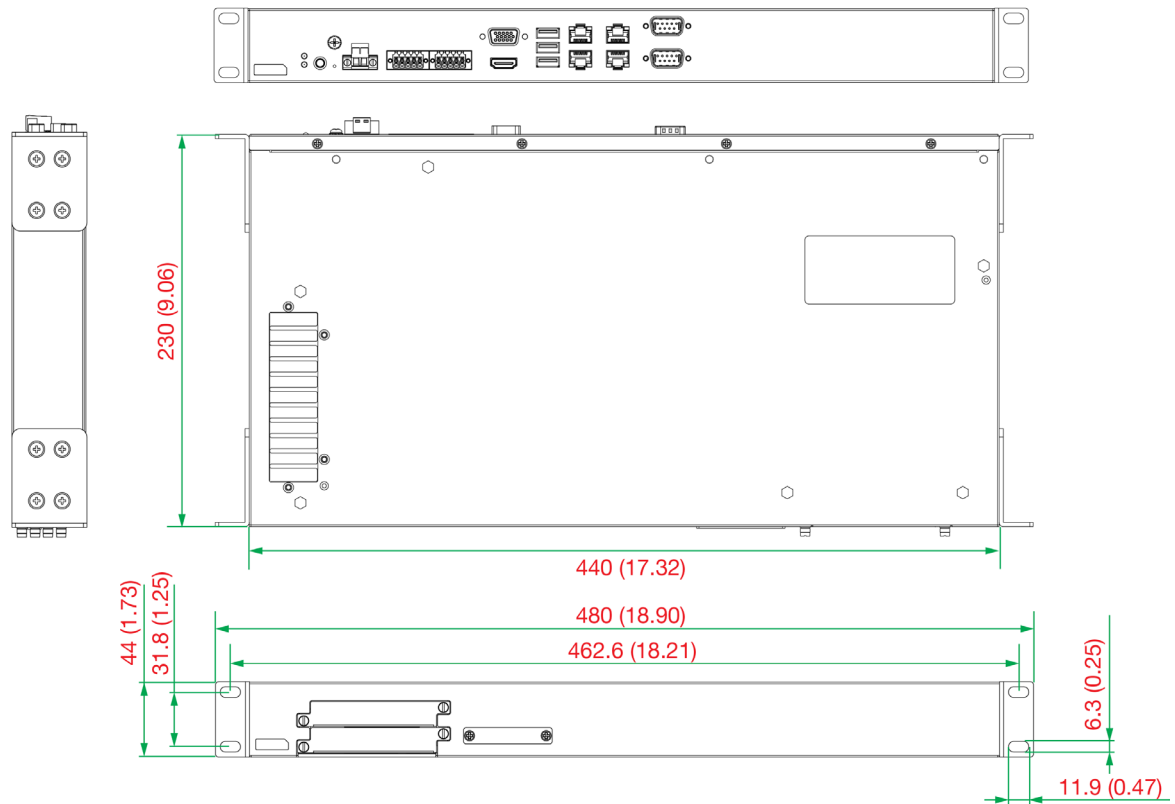
RKP-C110-C1-2HV-T/RKP-C110-C3-2HV-T/RKP-C110-C5-2HV-T/RKP-C110-C7-2HV-T Models

Unit: mm (inch)
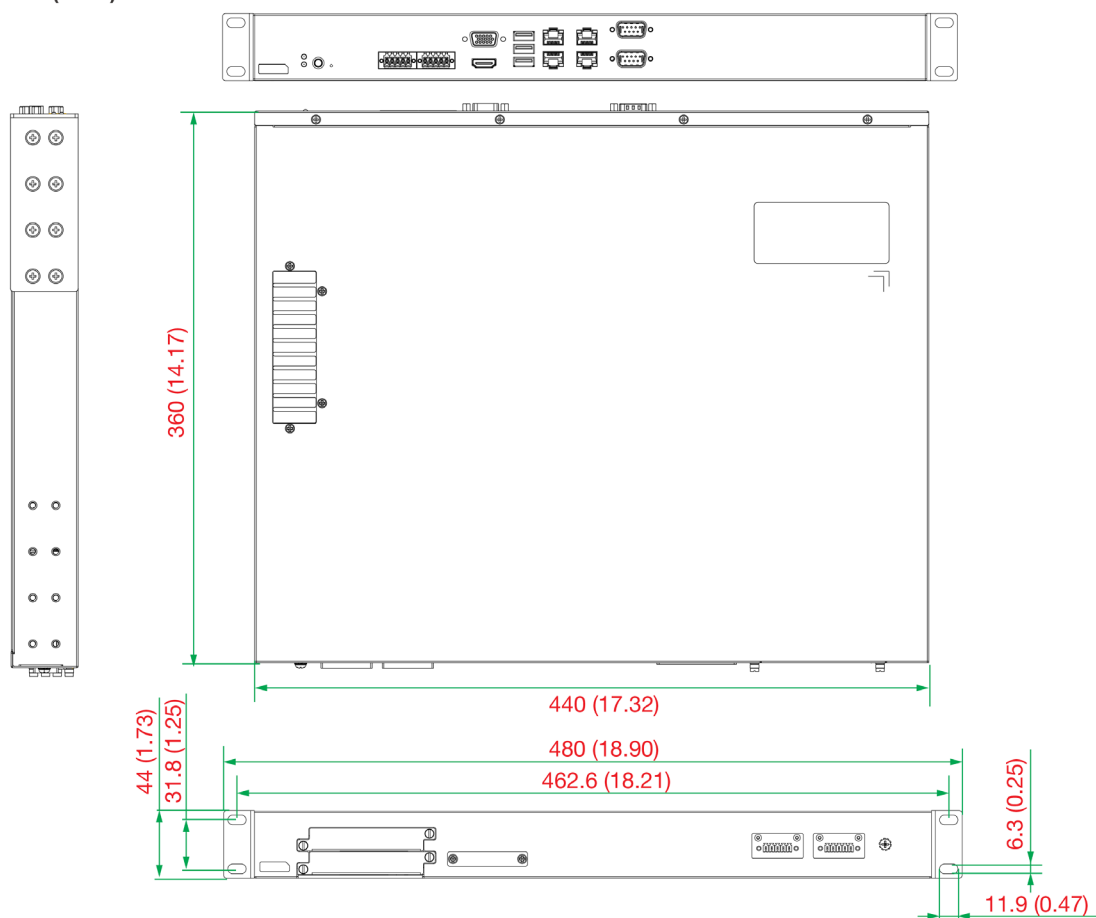
LED Indicators

The following table describes the function of the LED indicators located on the front panel of the computer.

LED	Color	Description
Power	Green	Power is ON
	OFF	No power input or any other power error
Ethernet (10/100 Mbps) (1000 Mbps)	Green	Steady ON: 10/100 Mbps Ethernet link Blinking: Data is being transmitted or received
	Yellow	Steady ON: 1000 Mbps Ethernet link Blinking: Data is being transmitted or received
	OFF	No Ethernet connection
Storage (2.5" SSD)	Yellow	Blinking: Data is being accessed from the SSD drive
	OFF	Data is not being accessed from the SSD drive

Reset Button

Pressing the **Reset** button, located on the front panel, initiates a hardware warm reboot. The button plays the same role as a desktop PC's reset button. After pressing the reset button, the system will reboot automatically. DO NOT use the Reset button under normal conditions; use it only if the software is not working properly. To protect the integrity of data being transmitted or processed, you should always reset the system via the operating system using the software reboot function.

Reset Button
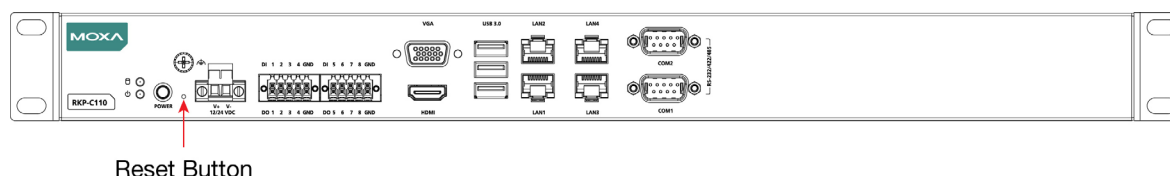
Real-time Clock (RTC)

The RKP-C110's real-time clock is powered by a lithium battery. To replace the RTC battery on your own, follow the instructions in the Replacing the RTC Battery section. Contact a qualified Moxa support engineer if you have an issue with the RTC battery.

✎ **ATTENTION**

There is a risk of explosion if the battery is replaced with an incorrect type.

3. Hardware Connections

The RKP-C110 computers are compact and rugged, making them suitable for industrial applications. The LED indicators allow users to monitor performance and quickly identify trouble spots. Multiple ports are provided for connecting a variety of different devices. The computers come with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. This chapter describes the hardware installation and connector interfaces of the RKP-C110 computer.

Installing Rack-mounting Ears

RKP-C110 Series

The RKP computers (except 2HV-T models of the RKP-C110 Series) come with rack-mounting ears attached.

If you need to reattach the mounting ears, use four M4x7 mm screws for each ear to attach them to the sides of the computer.

To mount the RKP computer on to a rack, place the computer on the rack and use four screws to secure the rack-mounting ears to the rack to secure it in place.
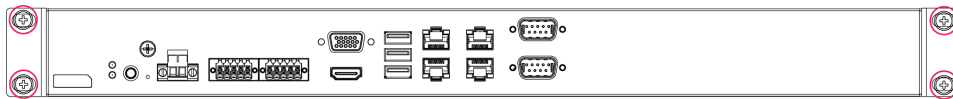
RKP-C110-2HV-T Series

Step 1: Use eight M4x7 mm screws for each ear to attach them to the sides of the computer.

Step 2: Place the RKP on the rack and use four screws to secure the rack-mounting ears to the rack.
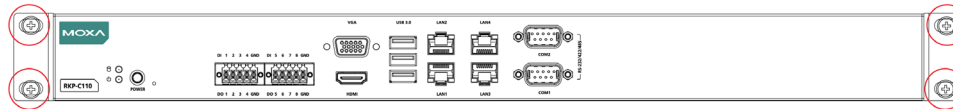
Refer to the right figure for the specifications of the M4x7 mm screws.
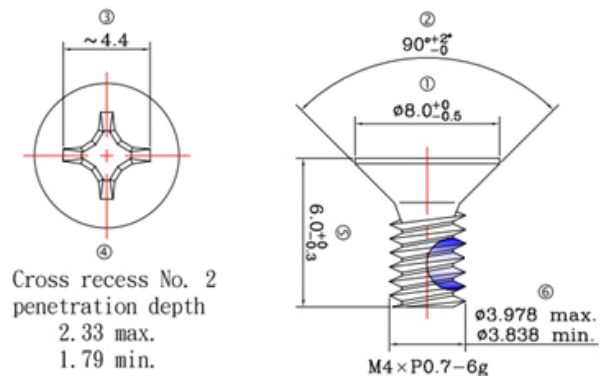
Wiring Requirements

The following common safety precautions should be observed before installing any electronic device:

- Power wires and communication/signal wires should be routed through separate paths. If power and communication/signal wires must cross paths, make sure the wires are perpendicular at the intersection point.
- Use the type of signal transmitted through a wire to determine which wires should be bundled together and which ones should be kept separate. The rule of thumb is that wiring that carries similar electrical signals can be bundled together.
- When necessary, we strongly advise labeling the wiring for all devices in the system.

ATTENTION

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

ATTENTION

Safety First!

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

Electrical Current 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 rating, 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.

Restricted Access Location

This equipment is intended to be used in Restricted Access Locations, such as a computer room, with access limited to SERVICE PERSONAL or USERS who have been instructed on how to handle the metal chassis of equipment that is so hot that special protection may be needed before touching it. The location should only be accessible with a key or through a security identity system.

Connecting the Power

RKP-C110 Series

The RKP-C110 computers are provided with 2-pin power input connectors in a terminal block on the front panel. Insert the power-cord wires into the connectors and tighten them to secure the wires in place. Plug in the power cable to a power source. The power LED will light up to indicate that power is being supplied to the computer. It should take about 30 to 60 seconds for the operating system to complete the boot-up process.

Pin	Definition
1	V+
2	V-
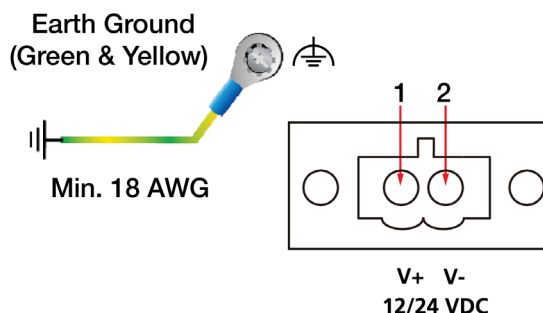
The power input specification is given below:

The DC power source rating is 12 VDC @ 7.34 A, or 24 VDC @ 3.4 A. An 18 AWG cable size DC power is suggested.

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

RKP-C110-2HV-T

The RKP C110-2HV-T computers are provided with 5-pin power input connectors in a terminal block on the rear panel. Insert the power-cord wires into the connectors and tighten them to secure the wires in place. Plug in the power cable to a power source. The power LED will light up to indicate that power is being supplied to the computer. It should take about 30 to 60 seconds for the operating system to complete the boot-up.
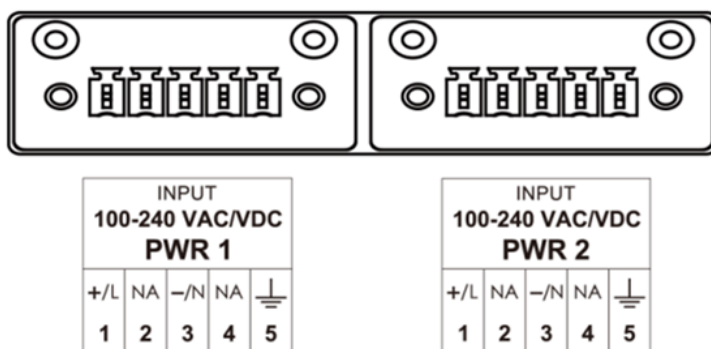
⚠ **ATTENTION**

This product is intended to be supplied by a Listed Power Supply with the output marked LPS and rated to deliver the following:

- RKP-C110 Series:
  12 VDC at a maximum of 7.34 A
  24 VDC at a maximum of 3.4 A
- RKP-C110 Series (2HV-T models):
  100 to 240 VAC, 50/60 Hz, 0.79 to 0.38 A
  100 to 240 VDC, 0.86 to 0.32 A
- Minimum Tma = 60°C

If you need assistance with purchasing a power adapter, contact the Moxa technical support team.

⚠ ATTENTION

Before connecting the RKP-C110 computer to the AC/DC power inputs, ensure that the AC/DC power source voltage is stable.

- The wiring for the input terminal block shall be installed by qualified and experienced professionals.
    - ➢ Wire Type: Cu、FW2
    - ➢ Use 18-12 AWG wire size and a torque value of 0.51 N-m.
- Use only one conductor in a clamping point between the DC power source and the power input.

⚠ NOTE

If using Class I adapter, the power cord adapter should be connected to a socket outlet with an earthing connection or the power cord and adapter must comply with Class II construction.

✎ NOTE

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

An 18 AWG cable size conductor must be used when the connection to the external grounding screw is utilized. The heat sink is grounded to the chassis by an internal screw.

⚠ Warning

Hot Surface!

External metal parts of this equipment are hot!!

Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

⚠ 警告

為避免電磁干擾，本產品不應安裝或使用於住宅環境。

⚠ WARNING

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Ethernet Ports

The RKP-C110 comes with 4, 6, or 12 Gigabit LAN ports. When the LAN cable is properly connected, the LEDs on the front panel glow to indicate the connection status.

The pin assignments are shown below:

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)-
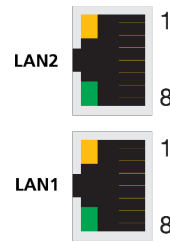
Serial Ports

The RKP-C110 comes with 2, 6, or 10 software-selectable RS-232/422/485 serial ports with DB9 connectors, which are located on the front panel. The pin assignments are shown below:

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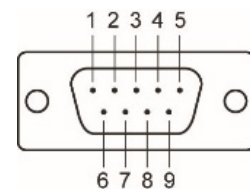
Digital Inputs/Digital Outputs

The RKP-C110 is provided with four digital inputs and four digital outputs in a terminal block. They are located on the front panel of the computer.

For pin definitions, see the figure below:
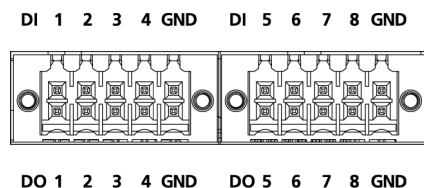
Digital Inputs
Dry Contact:
Logic 0: Short to Ground
Logic 1: Open

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

For wiring methods, see the figure below:
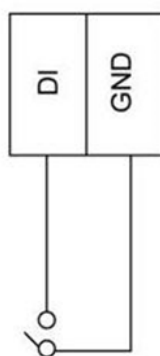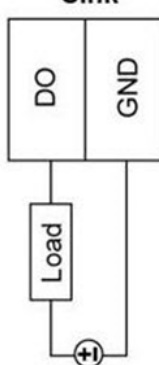
Connecting USB Devices

The RKP-C110 has 3 USB 3.0 Type-A connectors located on the front panel. The ports support keyboard and mouse devices and can also be used to connect a flash disk for storing large amounts of data.

Connecting to Displays

The RKP-C110 has an HDMI connector and a VGA connector located on the front panel, allowing users to connect to an audio or video device.

✎ **NOTE**

Use HDMI-certified cables for a reliable audio or video connection.

Installing Storage Disks

The RKP-C110 comes with two storage slots that allow users to install two 2.5" SATA HDD/SSD. The slots are located on the rear panel of the computer. Follow these steps to install a storage disk.
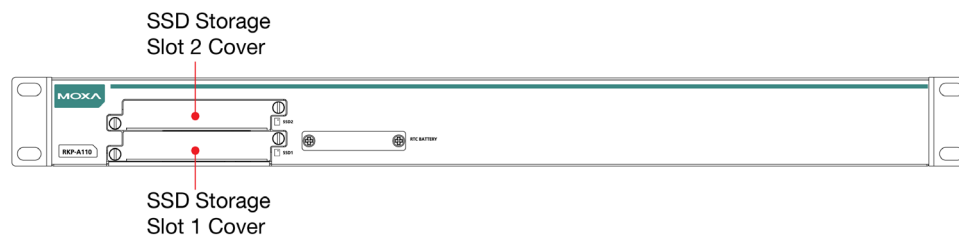
To install an SSD drive, do the following:

1. Unfasten the screw on the storage slot cover.
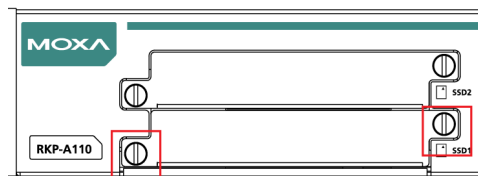
2. Pull out the storage tray and find the four screws included in the product package.

3. Place the storage disk on the tray.
   Ensure that the storage disk aligns with the screws on the storage tray.

---

4. Reverse the storage tray and fasten four screws to secure the storage drive to the tray.

5. Insert the storage tray into the slot and secure the tray in place with two screws.
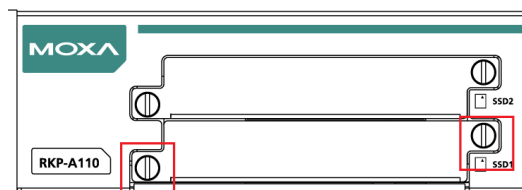
6. Use the same method to install a storage disk in the other slot.

Replacing the RTC Battery

The RKP-C110 comes with one slot for a battery on the bottom panel of the computer. A lithium battery (3 V / 200 mA) is preinstalled in the slot.

To replace the battery, do the following:

1. Unfasten the two screws on the battery cover.

2. Take off the cover.

   The battery is attached to the slot cover as indicated in the image.
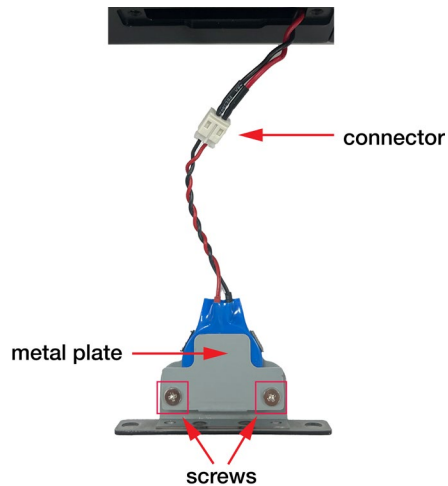
3. Unplug the connector of the battery-cover assembly from the internal wire of the slot.
4. Remove the two screws on the metal plate attached to the battery holder.

5. Place a new battery in the battery holder, replace the metal plate, and fasten the two screws on to the frame to secure the battery.
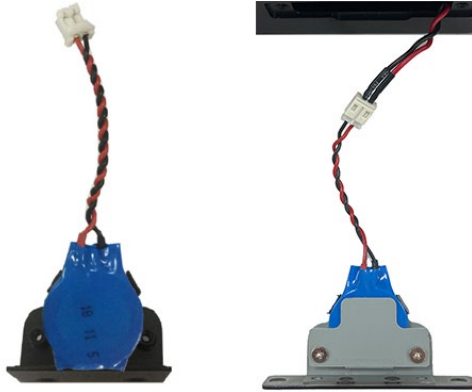
6. Plug in the connector of the battery-cover assembly to the internal wire of the slot.
7. Place the battery holder back in the slot and secure it by fastening the two screws on the cover.

⚠️ **WARNING**

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

To reduce the risk of fire or burns, do not disassemble, crush, or puncture the battery; do not dispose of it in fire or water and do not short external contacts.

Replacing the Memory

The RKP computer comes with one slot for memory.

To replace the memory, do the following:

1. Power off the computer and unplug the power cord.
2. Remove the top cover.

   Remove fourteen M3x4 mm screws (RKP-A110/RKP-C110 Series) or seventeen M3x4 mm screws (RKP-C110-2HV-T models) and one M3x6 mm screw. The location of the screws on the RKP computer cover is shown in the following diagram:

3. Find the location of the heat sink.

4. Unfasten the two M3x6 mm screws on the heat sink and remove the heat sink to reveal the memory slot.

5. Pull the latches outward on both sides of the memory.
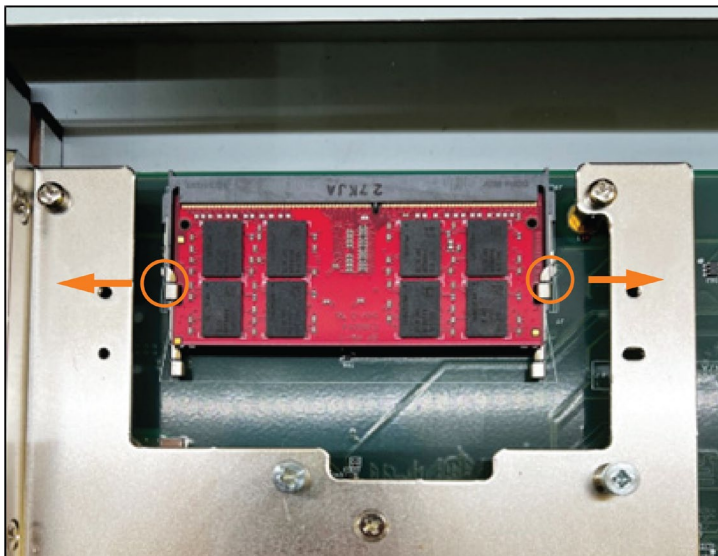
6. Remove the memory from the slot.
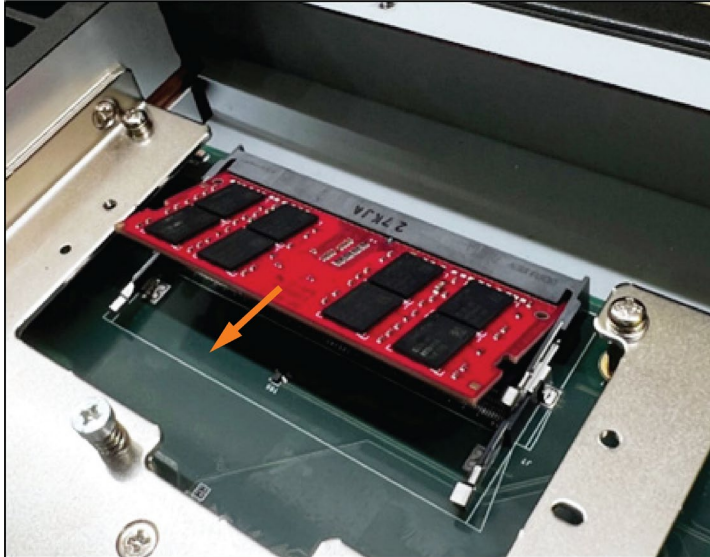
7. Insert the new memory into the slot and push it down.
8. Replace the heat sink and the top cover, and fasten all screws.

4. BIOS Setup

This chapter describes the BIOS settings of the RKP-C110 computer. The BIOS is a set of input/output control routines for peripherals, which are used to initialize system peripherals before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these peripherals' basic input/output interfaces.

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 opens up with the following options:

- **Continue:** Continue to boot up
- **Boot Manager:** Select the device for booting up
- **Device Management:** 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

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

```
                              Front Page
 Front Page

Continue                                    This selection will direct the system
▶Boot Manager                               to 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
```
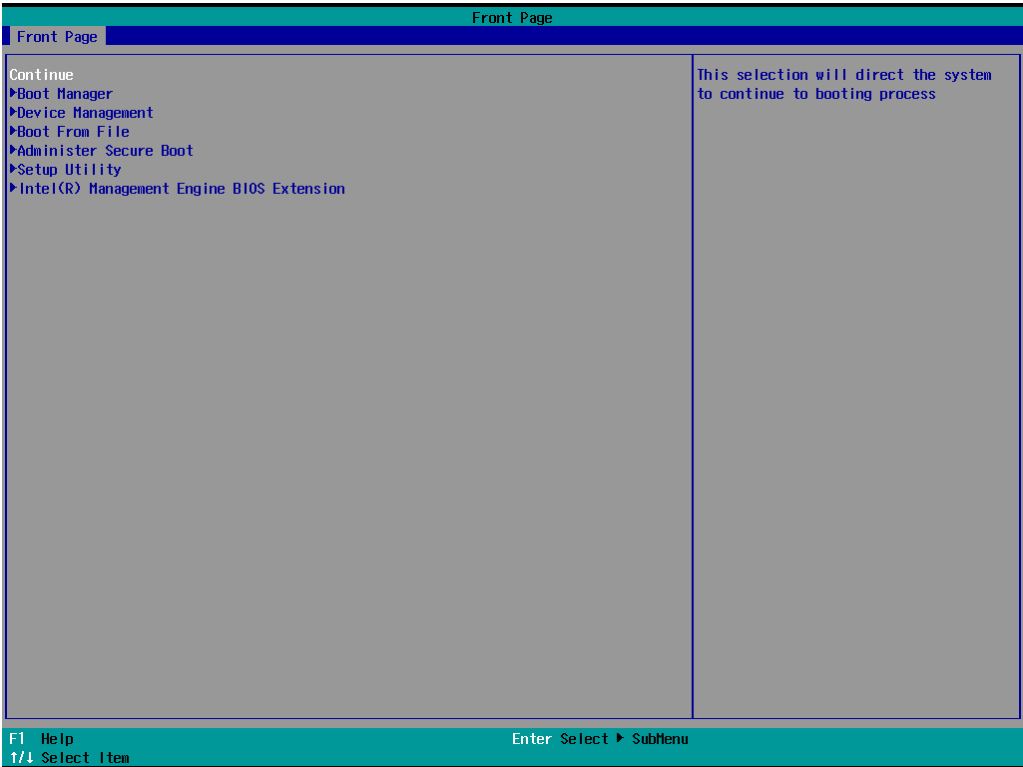
When you enter **Setup Utility**, a basic description of each function key is listed at the bottom of the screen.

F1	**General Help**	**↑ ↓ .**	**Select Item**
F5 / F6	**Change Values**	**←→**	**Select Menu**
F9	**Setup Defaults**	**ESC**	**Exit**
F10	**Save and Exit**	**EN TER**	**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                RKP-C110                 This is the help for the hour, minute,
 BIOS Version                V1.0.0S01                second field. Valid range is from 0 to
                                                      23, 0 to 59, 0 to 59. INCREASE/REDUCE :
 Processor Type              11th Gen Intel(R) Core(TM) i7-1185G7E @  +/-.
                             2.80GHz
 System Memory Speed         2400 MT/s
 Cache RAM                   5120 KB
 Total Memory                16384 MB
 SODIMM0                     8192 MB
 SODIMM1                     8192 MB

 CPUID:                      0x806C1 (TigerLake ULT)
 CPU Stepping:               806C1 (B0 Stepping)
 L1 Data Cache:              48 KB x 4
 L1 Instruction Cache:       32 KB x 4
 L2 Cache:                   1280 KB x 4
 L3 Cache:                   12 MB
 L4 Cache:                   N/A
 Number Of Processors:        4 Core(s) /  8 Thread(s)
 Microcode Rev:              000000AA
 PCH Rev / SKU               20 (B0 Stepping) / TGL PCH-LP U Premium
 GOP Ver:                    17.0.1077
 Intel ME Version / SKU      15.0.45.2411 / CORPORATE
 System Time                 [11:07:34]
 System Date                 [08/21/2023]



 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 computer 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                    RKP-C110                This is the help for the hour, minute,
  BIOS Version                    V1.0.0S01               second field. Valid range is from 0 to
                                                          23, 0 to 59, 0 to 59. INCREASE/REDUCE :
  Processor Type                  11th Gen Intel(R) Core(TM) i7-1185G7E @   +/-.
                                  2.80GHz
  System Memory Speed             2400 MT/s
  Cache RAM                       5120 KB
  Total Memory                    16384 MB
  SODIMM0                         8192 MB
  SODIMM1                         8192 MB

  CPUID:                          0x806C1 (TigerLake ULT)
  CPU Stepping:                   806C1 (B0 Stepping)
  L1 Data Cache:                  48 KB x 4
  L1 Instruction Cache:           32 KB x 4
  L2 Cache:                       1280 KB x 4
  L3 Cache:                       12 MB
  L4 Cache:                       N/A
  Number Of Processors:            4 Core(s) /  8 Thread(s)
  Microcode Rev:                  000000AA
  PCH Rev / SKU                   20 (B0 Stepping) / TGL PCH-LP U Premium
  GOP Ver:                        17.0.1077
  Intel ME Version / SKU          15.0.45.2411 / CORPORATE
  System Time                     [11:07:34]
  System Date                     [08/21/2023]




 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 BIOS setup utility to open the advanced features screen.

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

                                                        Configures Boot Settings.
  ▶Boot Configuration
  ▶SATA Configuration
  ▶CPU Configuration
  ▶Video Configuration
  ▶Chipset Configuration
  ▶PCH-FW Configuration
  ▶Console Redirection
  ▶SIO IT8786E



  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 value.

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
```
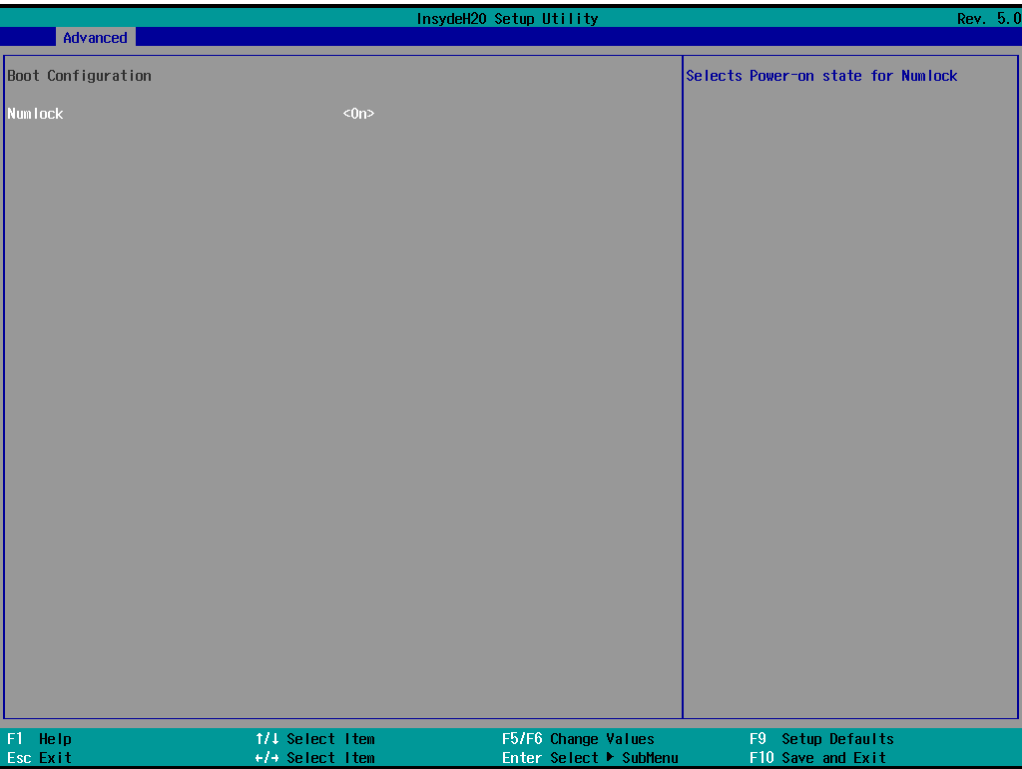
SATA Configuration

This section allows you to select the SATA speed limit and enable or disable the RAID mode.

```
                          InsydeH20 Setup Utility                        Rev. 5.0
    Advanced

SATA Configuration                                    Set total SATA port speed limited.

SATA Speed Limited                <Auto>
Map SATA Root Port under VMD      <Disabled>

▶Serial ATA Port 0     [MRSAJAA064GTW25C00        ]
  Hot Plug                        <Disabled>
▶Serial ATA Port 1     [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
```
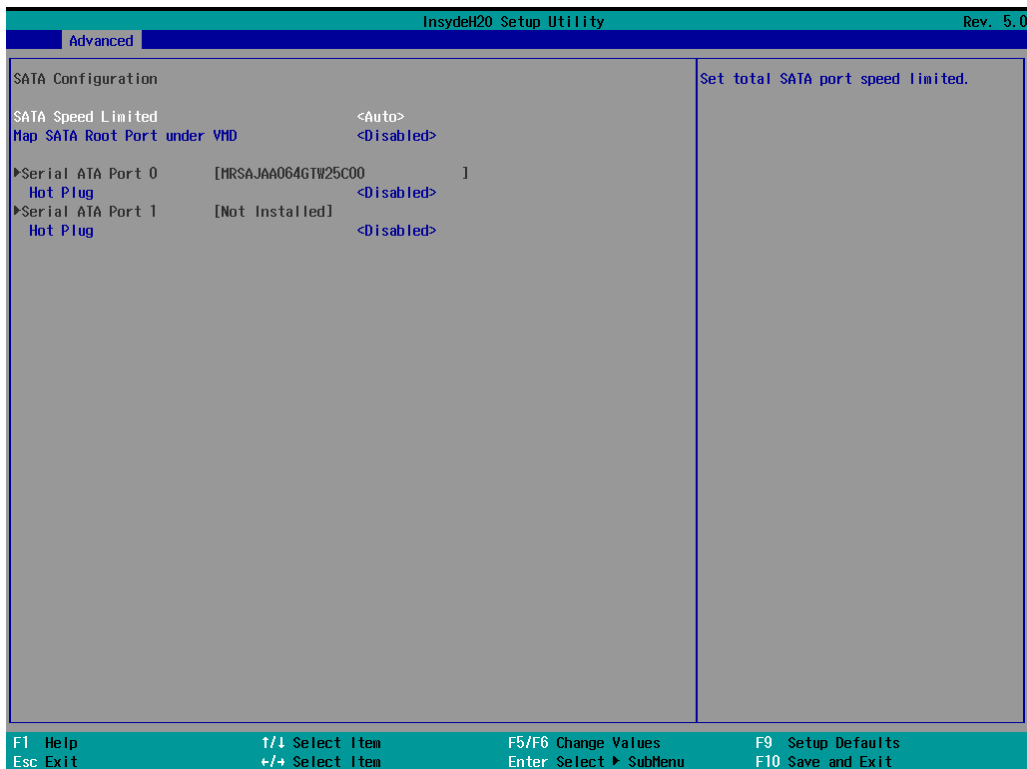
SATA Speed Limited

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

Map SATA Root Port under VMD

Options: Disabled (default), Enabled

Serial ATA Port

This setting displays information on the drives installed on your computer.

SATA Port—Hot Plug

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

Options: Disabled (default), Enabled

RAID

You must set the **Map SATA Root Port under VMD** to enable redundant array of inexpensive disks technology. The device has two SATA interfaces, which only support RAID level 0 and RAID level 1.

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.
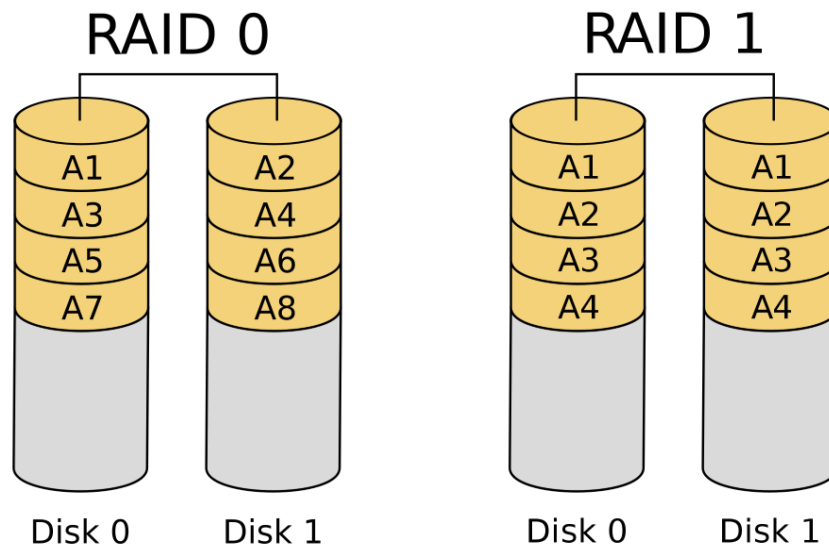
Source: https://en.wikipedia.org/wiki/Standard_RAID_levels for details.

Intel® Rapid Storage Technology

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

```
                        InsydeH20 Setup Utility                          Rev. 5.0
   Advanced

SATA Configuration                                       Map/UnMap SATA Root Port to VMD for
                                                         RAID mode
SATA Speed Limited                   <Auto>
Map SATA Root Port under VMD         <Enabled>

▶Serial ATA Port 0      [Not Installed]
  Hot Plug                           <Disabled>
▶Serial ATA Port 1      [M.2 (S42) 3ME4    ]
  Hot Plug                           <Disabled>




                        ┌─────────────────────────────┐
                        │  Map SATA Root Port under VMD │
                        │                               │
                        │  Disabled                     │
                        │  Enabled                      │
                        └─────────────────────────────┘




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

After enabling **Map SATA Root Port under VMD**, saving changes, and rebooting the system, you can select the **Device Manager** to configure the Intel® Rapid Storage Technology settings.

```
                              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

 Create RAID Volume                                         Enter a unique volume name that has no
                                                            special characters and is 16 characters
 Name:                             Volume1                  or less.
 RAID Level:                       <RAID0 (Stripe)>

 Select Disks:
 SATA 0.0, MOXA FTM Plus-60 SSD    < >
 A060C21C200019, 55.8GB
 SATA 0.1, M.2 (S42) 3ME4          < >
 CA12107260500029, 29.8GB

 Strip Size:                       <64KB>
 Capacity (MB):                    [0]

 ▶Create Volume

 Select at least two disks




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

✏️ **NOTE**

If you plan to install Windows OS on the RAID volume, you might experience a situation where the installer fails to recognize the RAID disk during setup.

To resolve this, please refer to the *Install Windows on the RAID Volume* section.

Installing Windows on the RAID Volume

1. Download the VMD drivers from the Moxa website.
2. Extract and **Copy** all driver files to a USB (which will be used to install Windows).
   The iaStorVD.sys file that is required for Windows installation must be located in the USB.
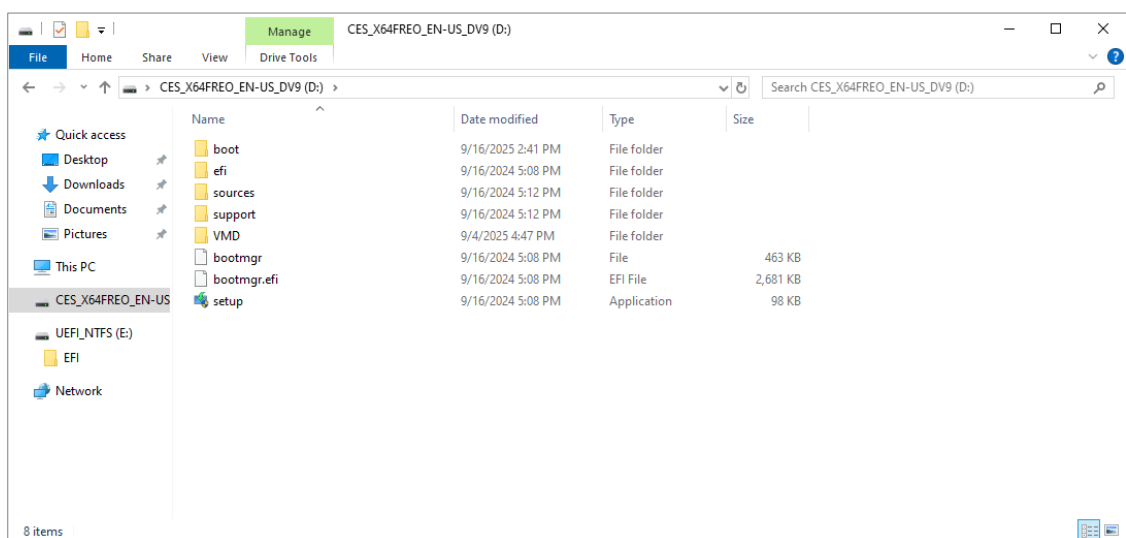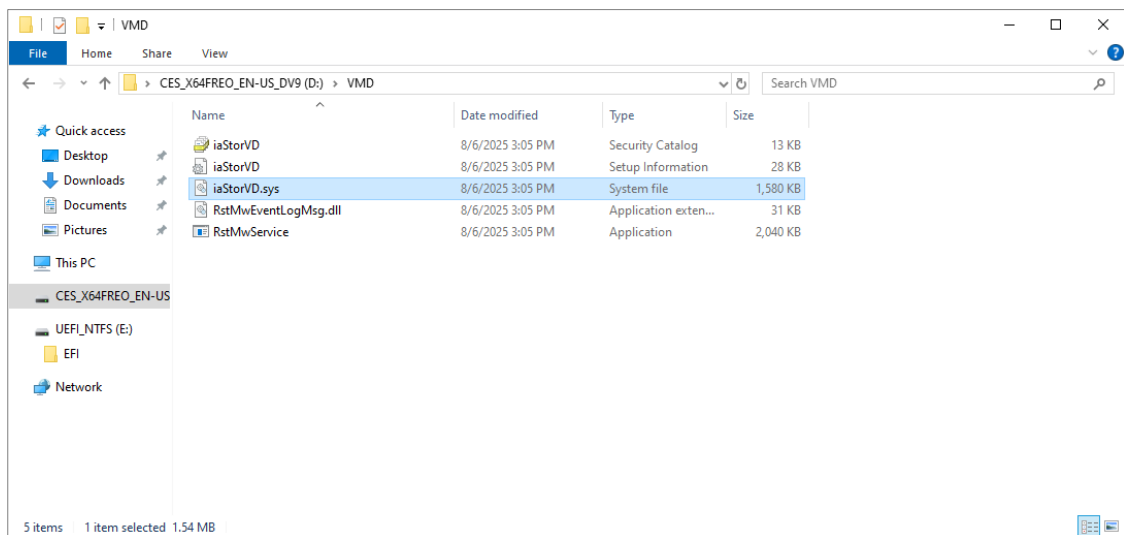
3. **Start** the Windows OS installation process from the USB with preinstalled Windows OS.

4. In the **Windows Setup** screen, click **Load Driver**.
   The VMD driver is required to detect the drives being managed by Intel® RST under the Intel® VMD Controller.
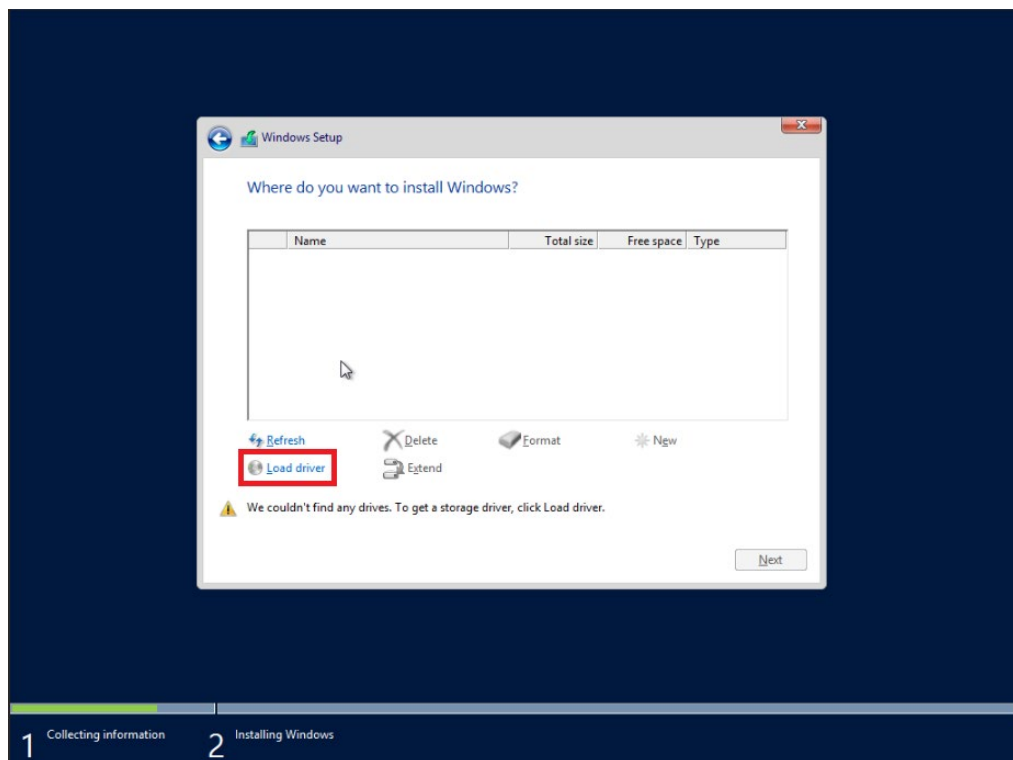
5. Click **Browse** to locate the **iaStorVD.sys** file.
   The file is in the **/VMD/** folder and is one of the files copied earlier to the USB.
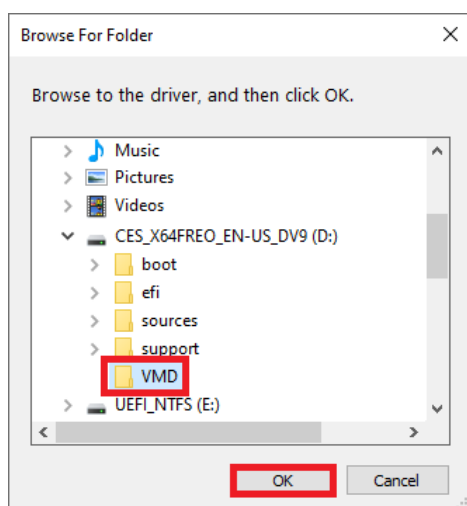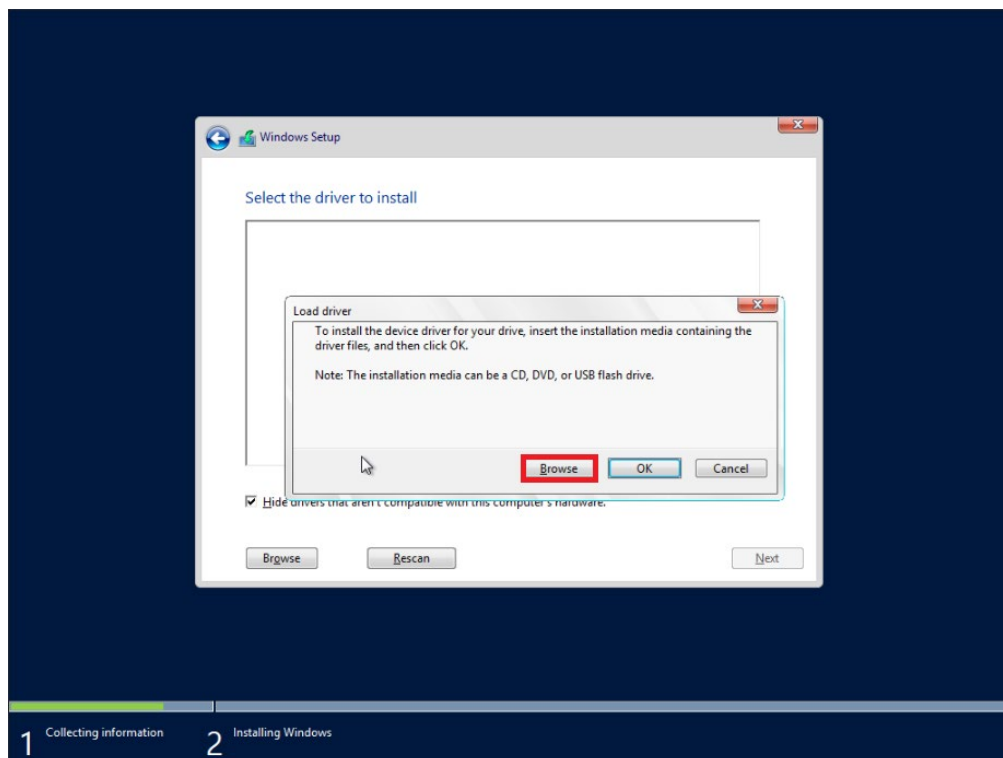
6. Select a driver to install and click **Next**.
   For example, Intel® RST Controller.
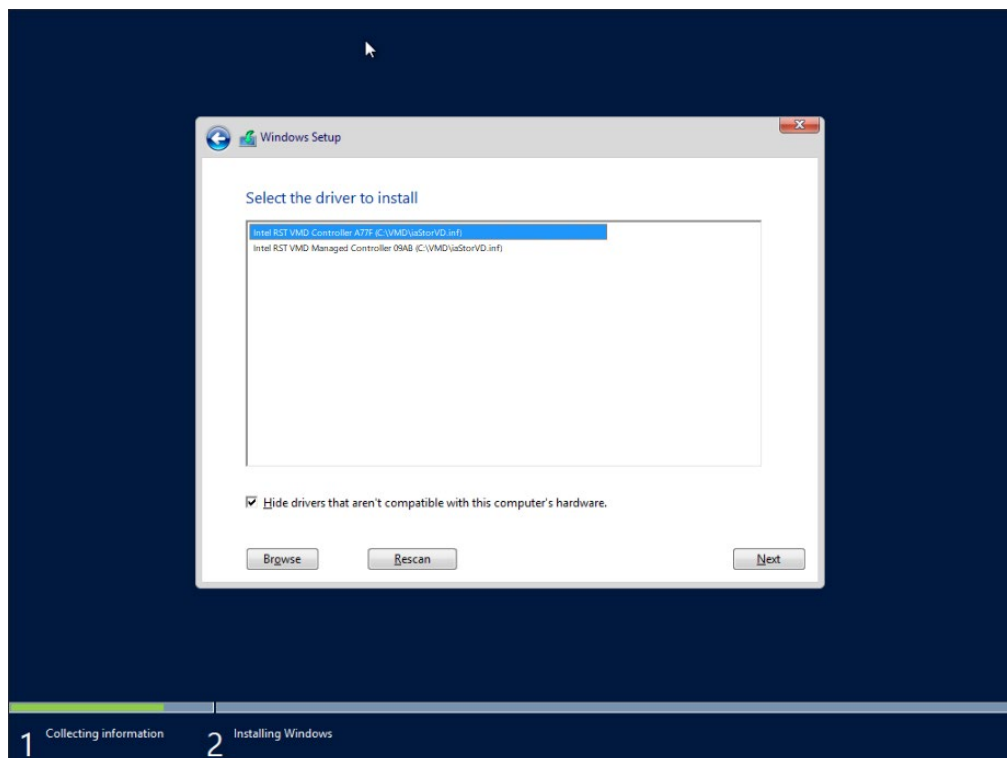
7. Select an installation drive.
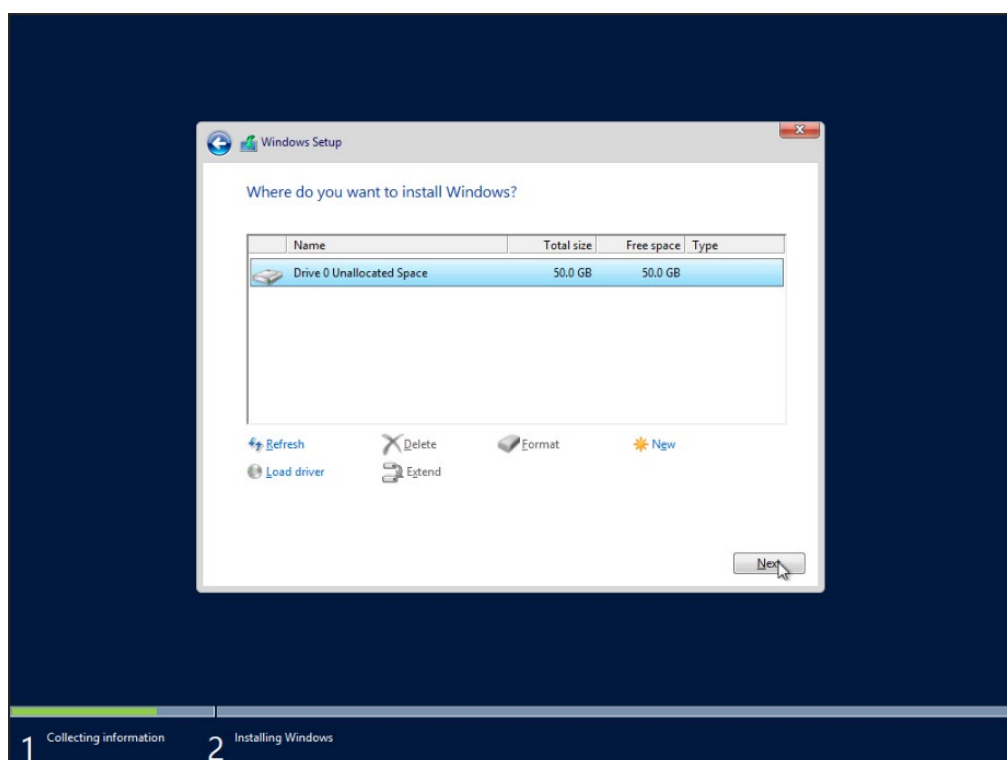
8. Click **Next** to complete the installation process.

CPU Configuration

```
                          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>
C states                        <Disabled>




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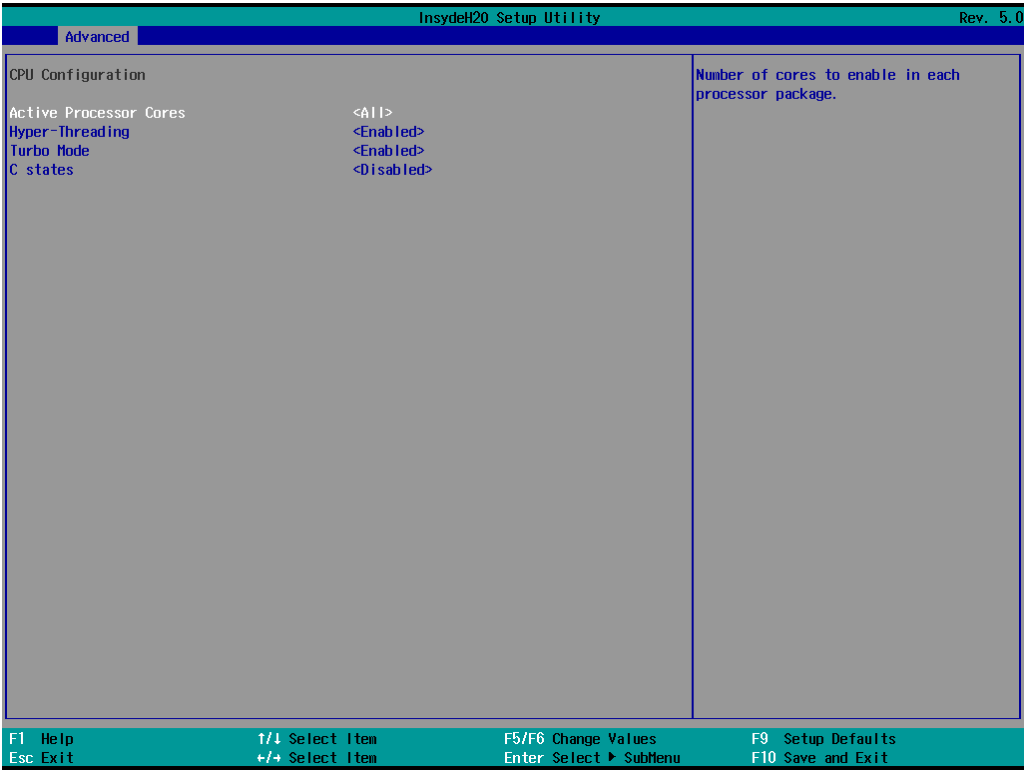
Active Processor Cores

This item indicates the number of cores to enable in each processor package (the number of cores is dependent on the processor).

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

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

Enable/Disable processor Turbo Mode (not supported in models with an Intel® Celeron® processor).

Options: Disabled, Enabled (default)

C states

Enable/Disable CPU Power Management. Allows the CPU to go to C states when it is not 100% utilized.

Options: Disabled (default), Enabled

Video Configuration

```
                         InsydeH20 Setup Utility                    Rev. 5.0
    Advanced

 Video Configuration                                 Select DVMT 5.0 Pre-Allocated
                                                     (Fixed) Graphics Memory size
 DVMT Pre-Allocated             <64M>                used by the Internal Graphics
 DVMT Total Gfx Mem             <256M>               Device.














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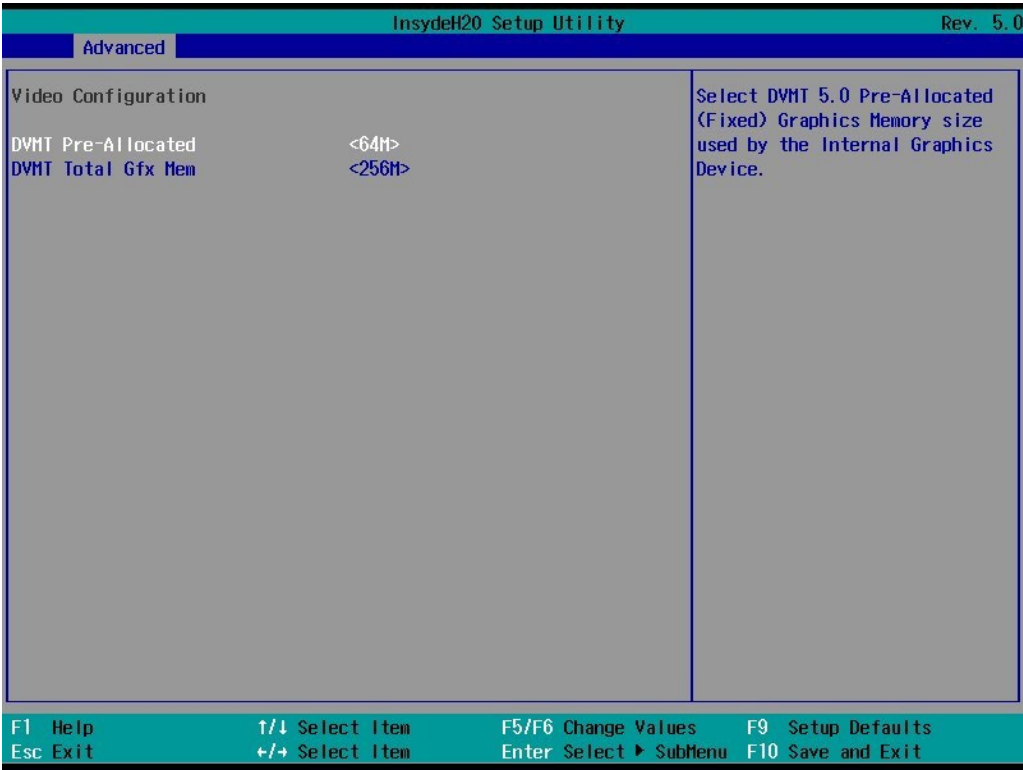
DVMT Pre-Allocated

Selecting this option allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

Options: 64M (default), 96M, 128M, 160M

DVMT: The amount of video memory your computer has depends 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 option 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 option allows you to configure the chipset settings.

```
                                    InsydeH20 Setup Utility                          Rev. 5.0
    Advanced

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

  DO-0 Level                             <High>
  DO-1 Level                             <High>
  DO-2 Level                             <High>
  DO-3 Level                             <High>
  DO-4 Level                             <High>
  DO-5 Level                             <High>
  DO-6 Level                             <High>
  DO-7 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 option 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

System will load default when detecting RTC battery loss.

Options: Disabled, Enabled (default)

DO-X Level

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

Options: High (default), Low

PCH-FW Configuration

This section allows you to configure the PCH-FW settings.

```
                              InsydeH20 Setup Utility                          Rev. 5.0
    Advanced

ME Firmware Version             15.0.45.2411              When Disabled ME will be put into ME
ME Firmware Mode                Normal Mode               Temporarily Disabled Mode.
ME Firmware SKU                 Corporate SKU
ME Firmware Status 1            0x90000255
ME Firmware Status 2            0x3985810E

ME State                        <Enabled>
ME Unconfig on RTC Clear        <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
```

ME State

When Disabled ME will be put into ME Temporarily Disabled Mode.

Options: Disabled, Enabled (default)

ME Unconfig on RTC Clear

When Disabled ME will not be unconfigured on RTC Clear.

Options: Disabled, Enabled (default)

Unconfigure ME

Unconfigure ME by resetting MEBx password to default.

Console Redirection

This section allows you to configure the console redirection settings.

```
                          InsydeH20 Setup Utility                          Rev. 5.0
    Advanced
 Console Redirection Setup                          Enable Console Redirection Function

 Console Serial Redirect         <Disabled>




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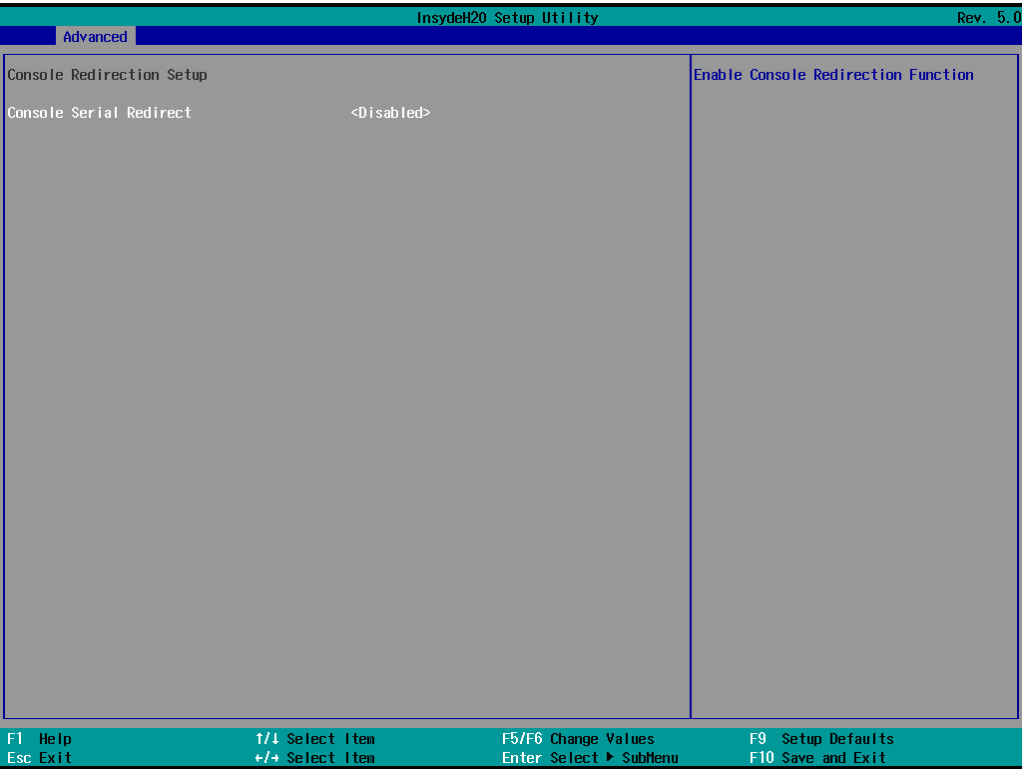
Console Serial Redirect

When the Console Redirection Function is enabled, the console information will be sent to both the display monitor and the serial port (COM1).

Options: Disabled (default), Enabled

SIO ITE8786E

This option allows users to configure serial port settings.

```
                          InsydeH20 Setup Utility                         Rev. 5.0
     Advanced

                                                              UART Configuration
    IT8786E Chip 1
    I/O Configuration Port          2Eh/2Fh
    ▶UART Port 1 Configuration
    ▶UART Port 2 Configuration
    ▶Hardware Monitor




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

```
                          InsydeH20 Setup Utility                         Rev. 5.0
     Advanced

    UART Port 1 Configuration                              Configure UART Port using options :
                                                             [Disabled] Disable device
    UART Port 1                      <Enabled>               [Enabled]  Enable device and use
    Base I/O Address                 <3F8h>                below settings
    Interrupt                        <IRQ4>
    UART Mode                        <RS232>




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

UART Port 1

This function allows users to configure the resources for the serial port 1.

Enable: Enables the Serial Port 1 connection (default)

Disable: Disables the Serial Port 1 connection

UART Port 2

This function allows users to configure the resources for serial port 2.

Enable: Enables the Serial Port 2 connection (default)

Disable: Disables the Serial Port 2 connection

✎ **NOTE**

The other UART ports can only be configured by OS utility

Hardware Monitor

This option allows users to view stats on the computer such as CPU and system temperature, voltage levels, and other chipset information.

```
                          InsydeH20 Setup Utility                       Rev. 5.0
   Advanced

Hardware Monitor

Voltage
   3.3V                            3.261 V
   5V                              5.079 V

Temperature
   System (°C/°F)                  51.0 °C/ 123.8 °F
   System2 (°C/°F)                 40.0 °C/ 104.0 °F
   CPU (°C/°F)                     94.0 °C/ 201.2 °F

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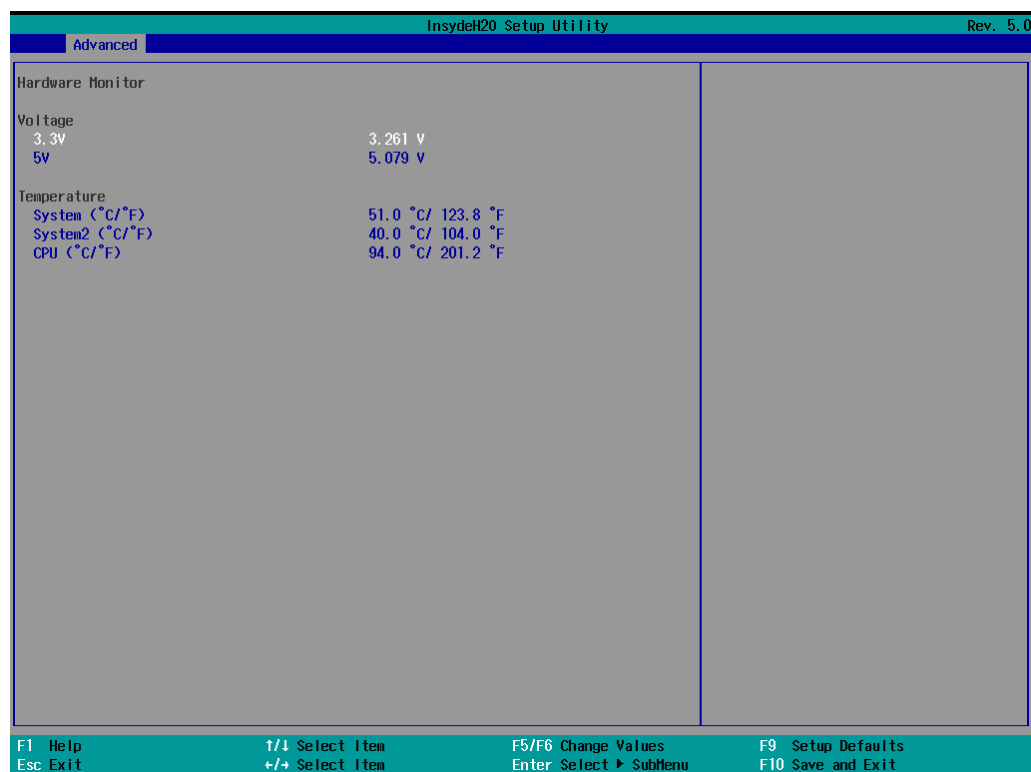
Security Settings

The **Security** page includes security-related settings. You will require the supervisor password and user password.

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

                                                        Clear TPM. Removes all TPM context
 Current TPM Device          <TPM 2.0 (DTPM)>          associated with a specific Owner.
 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 indicates if the system has a TPM module configured and provides information on its type.

TPM State

This item allows users to view the 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. To set the password, select the **Set Supervisor Password** option**,** enter the password, and re-confirm the password.

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.

```
                              InsydeH2O Setup Utility                          Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

                                                          Password length must be 8 or more
 Current TPM Device           <TPM 2.0 (DTPM)>            characters
 TPM State                    All Hierarchies Enabled, Owned
 Clear TPM                    [ ]

 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 choose when the input password screen will pop up.

```
                              InsydeH2O Setup Utility                          Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

                                                          Enable:System will ask input password
 Current TPM Device           <TPM 2.0 (DTPM)>            on post time. Disable:System will ask
 TPM State                    All Hierarchies Enabled, Owned  input password when go to Setup
 Clear TPM                    [ ]                         Utility. Config-Only:System will ask
                                                          input password when user press F2 into
 Supervisor Password          Installed                  Frontpage

 Set Supervisor Password
 Power on Password            <Disabled>




                    ┌──────────────────────────────┐
                    │  Power on Password           │
                    │                              │
                    │  Enabled                     │
                    │  Disabled                    │
                    │  Config-Only                 │
                    └──────────────────────────────┘




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

Enable: System will ask input password during 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 Power page allows users to configure the power settings of the computer.

```
                          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>













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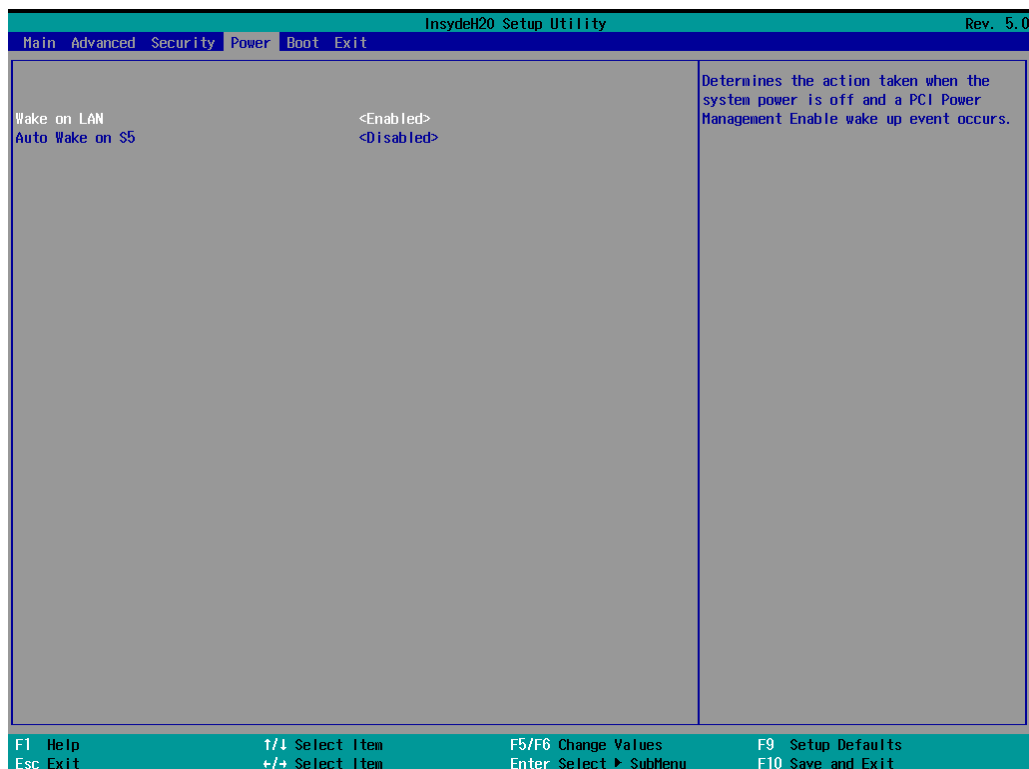
Wake on LAN

Enable this feature if you want to wake up the system by a LAN device from a remote host.

Options: Enabled (default), Disabled

Auto Wake on S5

This option 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)

Boot Settings

The **Boot** page includes configuration settings for the boot-up process.

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

                                                      Network Stack Support:
  Network Stack              <Disabled>                 Windows 8 BitLocker Unlock
  USB Boot                   <Enabled>                  UEFI IPv4/IPv6 PXE
  Timeout                    [0]                        Legacy PXE OPROM

  ▶EFI




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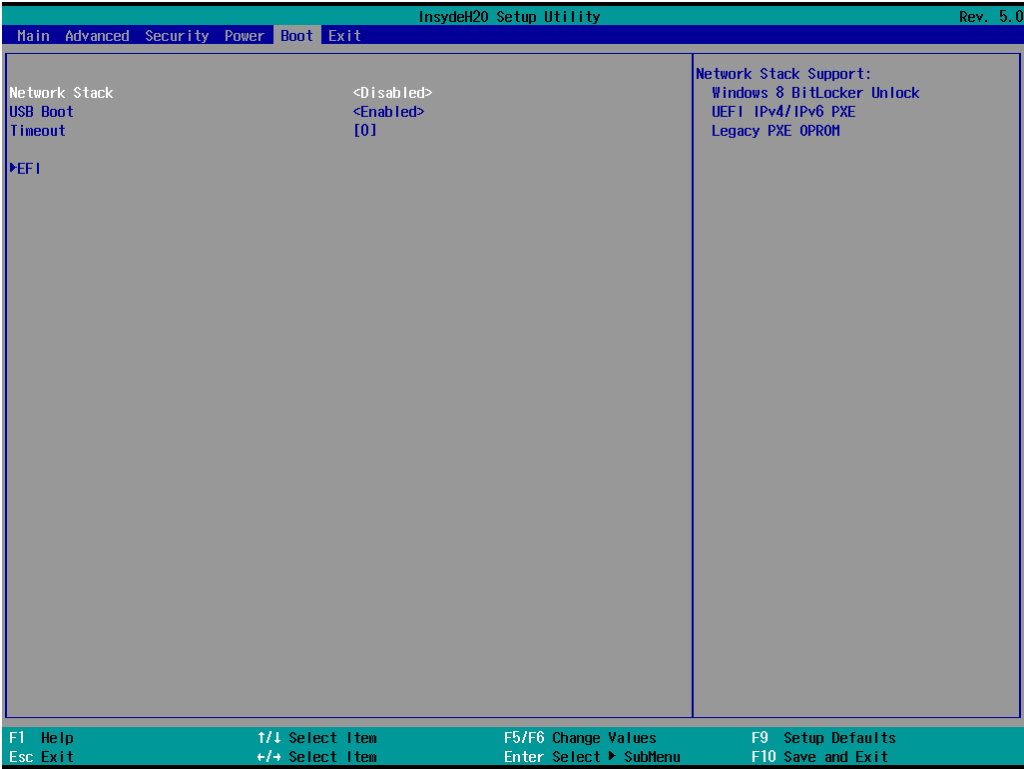
✏️ **NOTE**

If you have not added any storage to your computer, you will not see the EFI option.

Network Stack

This option is used to deploy 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 option allows users to start PXE over IPv4 or IPv6

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

USB Boot

Used to enable or disable boot-up from USB devices.

Options: Enabled (Default), Disabled

Timeout

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

EFI

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

```
                        InsydeH20 Setup Utility                          Rev. 5.0
              Boot

EFI

EFI Hard Drive (YCA12107260500029-M.2    [X]
(S42) 3ME4)
EFI USB Device (SanDisk)                 [X]






















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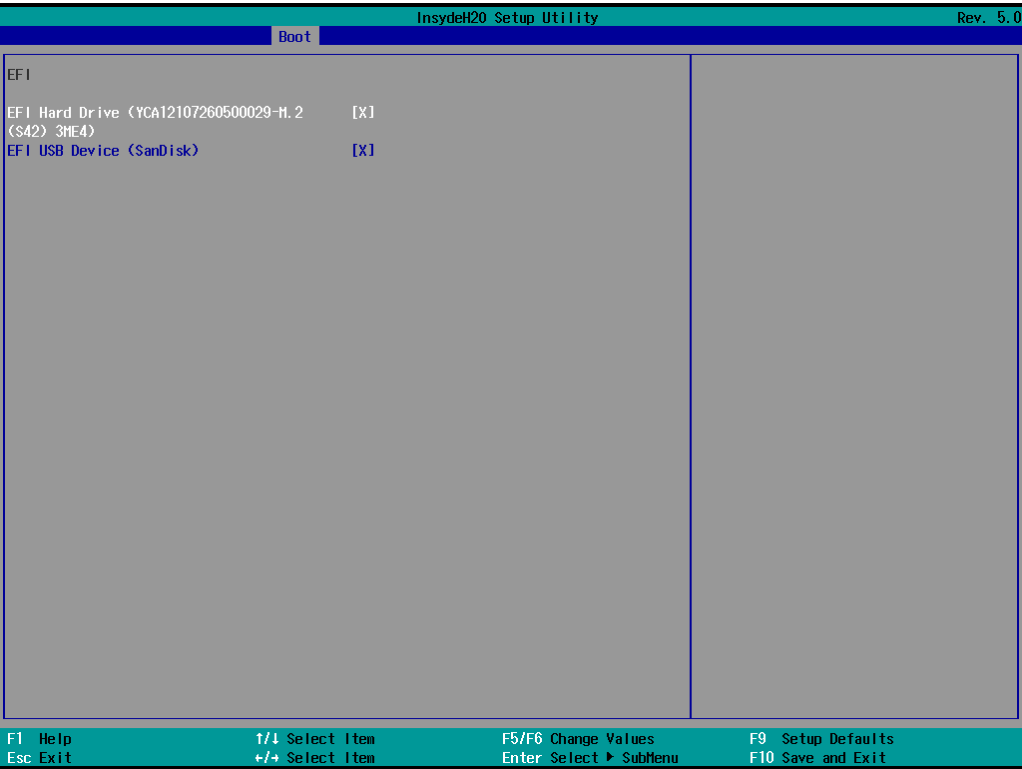
Exit Settings

The **Exit** page includes options to exit the BIOS environment.

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

 Exit Saving Changes                                  Exit system setup and save your 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 option allows you to exit the BIOS environment and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

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

Options: Yes (default), No

Exit Discarding Changes

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

Options: Yes (default), No

Load Optimal Defaults

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

Options: Yes (default), No

Load Custom Defaults

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

Options: Yes (default), No

Save Custom Defaults

This option allows you to save the current BIOS values as a custom default that may be reverted to at any time by using the **Load Custom Defaults** option.

Options: Yes (default), No

Discard Changes

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

Options: Yes (default), No

Enabling AMT

✏️ **NOTE**

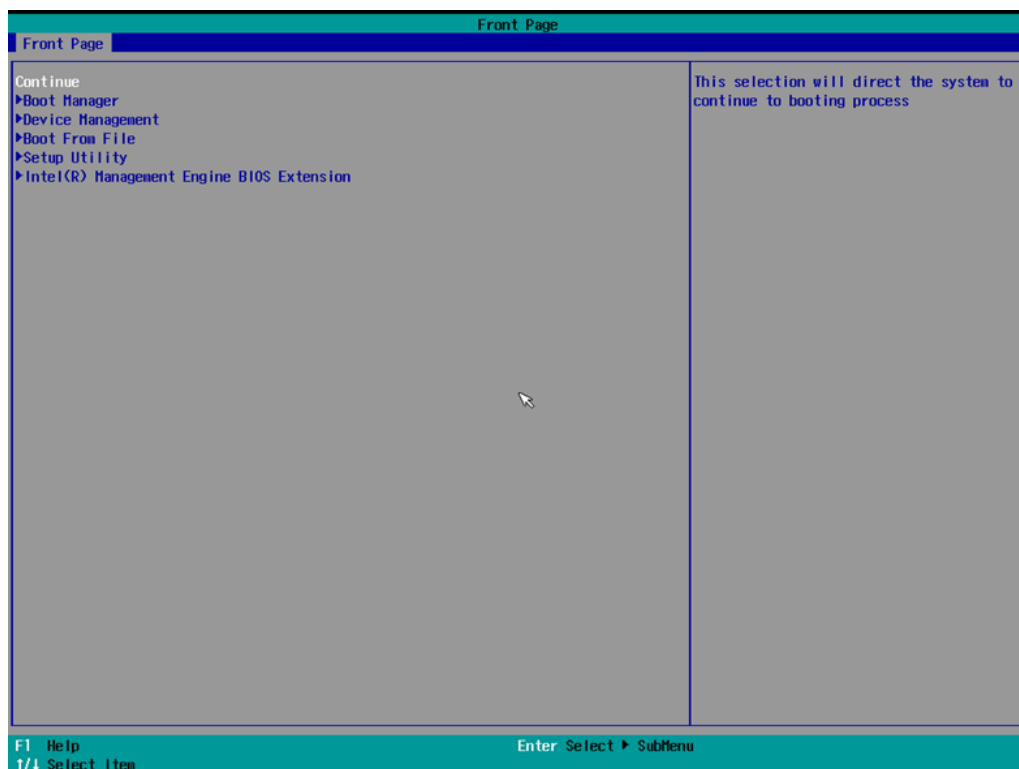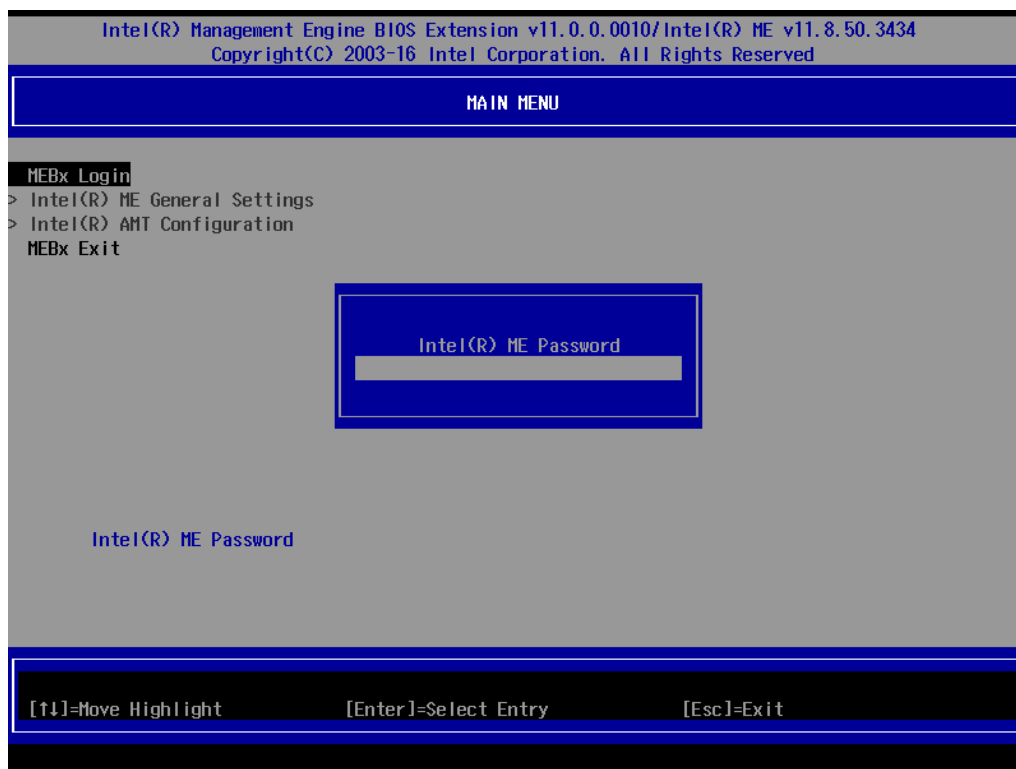The AMT function is not supported in the models with Celeron and i3 CPU.

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.
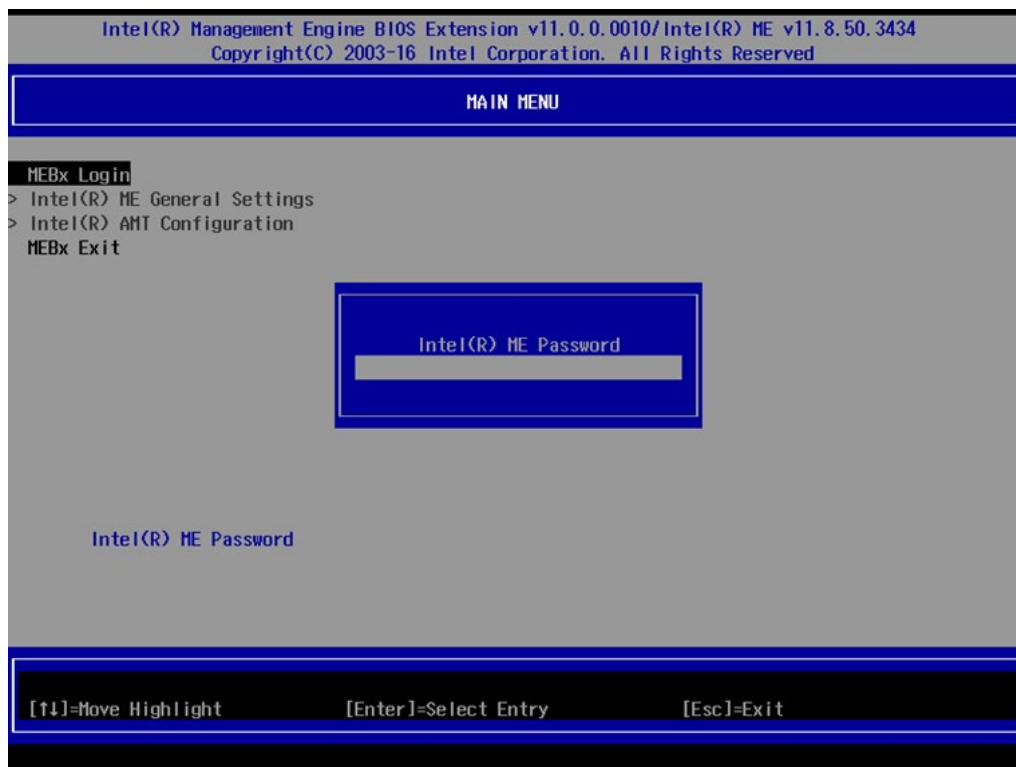
2. Press **<Enter>** to start the login procedure.

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**.

```
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

┌──────────────────────────────────────────────────────────────────────────────┐
│                                  MAIN MENU                                     │
└──────────────────────────────────────────────────────────────────────────────┘

 MEBx Login
> Intel(R) ME General Settings
> Intel(R) AMT Configuration
  MEBx Exit
                        ┌─────────────────────────────────┐
                        │                                 │
                        │     Intel(R) ME New Password    │
                        │   ┌─────────────────────────┐   │
                        │   │                         │   │
                        │   └─────────────────────────┘   │
                        │                                 │
                        └─────────────────────────────────┘




        Intel(R) ME Password



┌──────────────────────────────────────────────────────────────────────────────┐
│  [↑↓]=Move Highlight          [Enter]=Select Entry          [Esc]=Exit         │
└──────────────────────────────────────────────────────────────────────────────┘
```

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**.

```
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

┌──────────────────────────────────────────────────────────────────────────────┐
│                         WIRED LAN IPV4 CONFIGURATION                           │
└──────────────────────────────────────────────────────────────────────────────┘

  DHCP Mode                             <Disabled>
  IPV4 Address                          172.16.1.2
  Subnet Mask Address                   255.255.255.0
  Default Gateway Address               0.0.0.0
  Preferred DNS Address                 0.0.0.0
  Alternate DNS Address                 0.0.0.0








        Subnet mask (e.g. 255.255.255.0)




┌──────────────────────────────────────────────────────────────────────────────┐
│  [↑↓]=Move Highlight          [Enter]=Select Entry          [Esc]=Exit         │
└──────────────────────────────────────────────────────────────────────────────┘
```

Set Static IP or DHCP by request.

6. Set Active 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

```
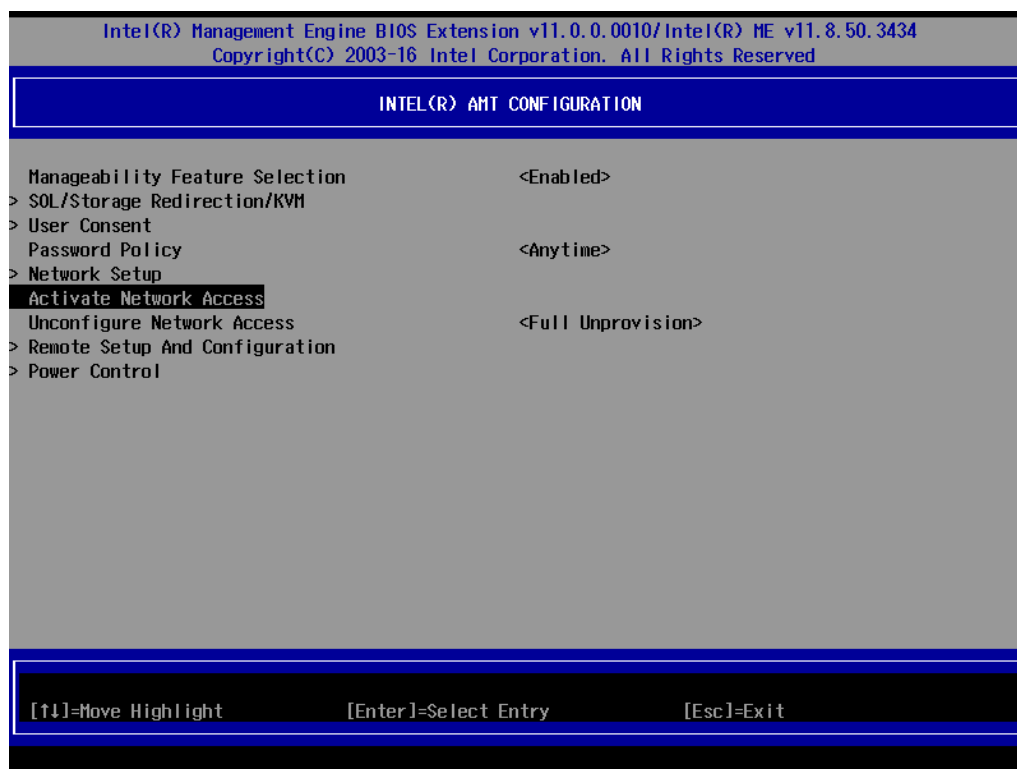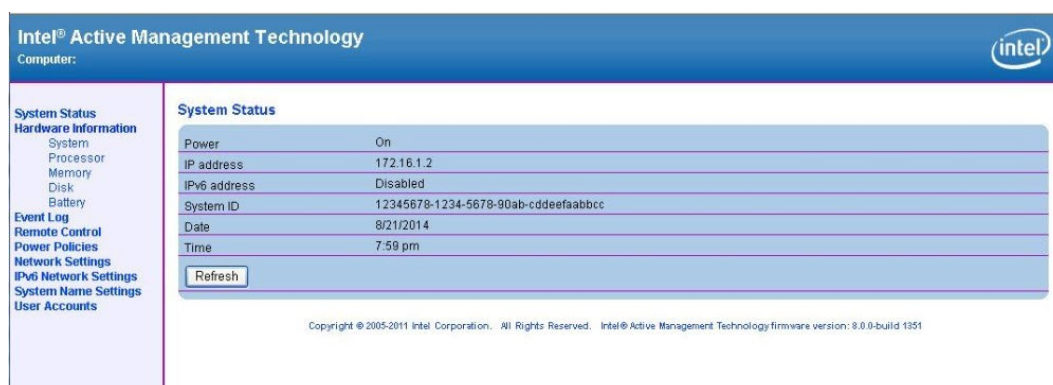
Using Active Management Technology (AMT)

You can use any AMT tool available to run the remote management function using a web browser.

1. Type the IP address of your computer as configured in the AMT configuration settings with port **16992**. The AMT logon screen will appear.

2. Click **Log On** and type the username (**admin**) and password.

✎ **NOTE**

The AMT port is LAN 1.

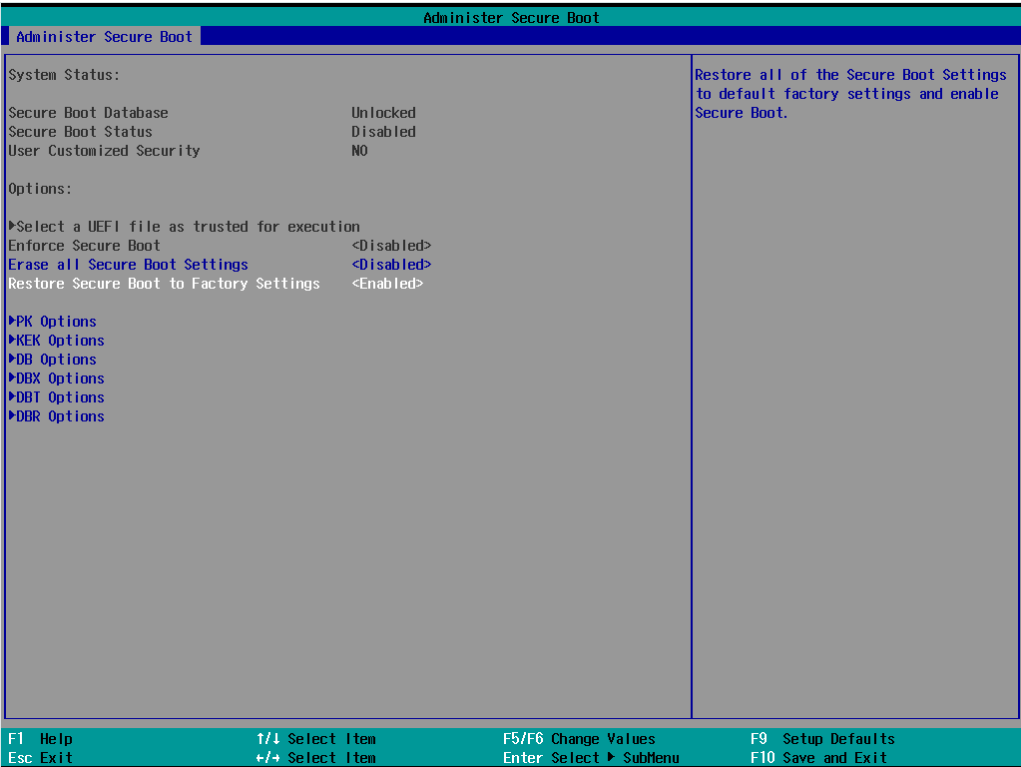✎ **NOTE**

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

---

Administering Secure Boot

Press F2 to go to the Administer Secure Boot.

```
                          Administer Secure Boot
 Administer Secure Boot

 System Status:                                          Restore all of the Secure Boot Settings
                                                         to default factory settings and enable
 Secure Boot Database              Unlocked              Secure Boot.
 Secure Boot Status                Disabled
 User Customized Security          NO

 Options:

 ▶Select a UEFI file as trusted for execution
 Enforce Secure Boot               <Disabled>
 Erase all Secure Boot Settings    <Disabled>
 Restore Secure Boot to Factory Settings  <Enabled>

 ▶PK Options
 ▶KEK Options
 ▶DB Options
 ▶DBX Options
 ▶DBT Options
 ▶DBR Options




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

Secure Boot helps computers resist attacks and infection from malware. The feature defines an interface between the operating system and BIOS. It detects tampering with boot loaders, key operation system files, and unauthorized option ROMs by validating their digital signatures.

Enabling UEFI Secure Boot
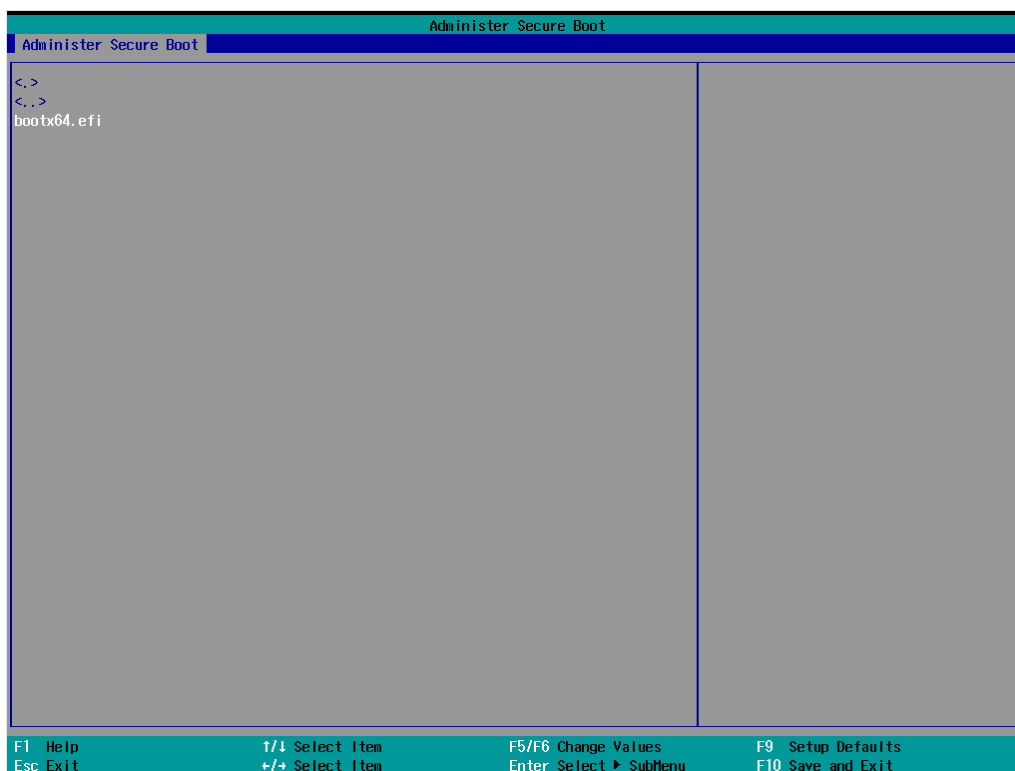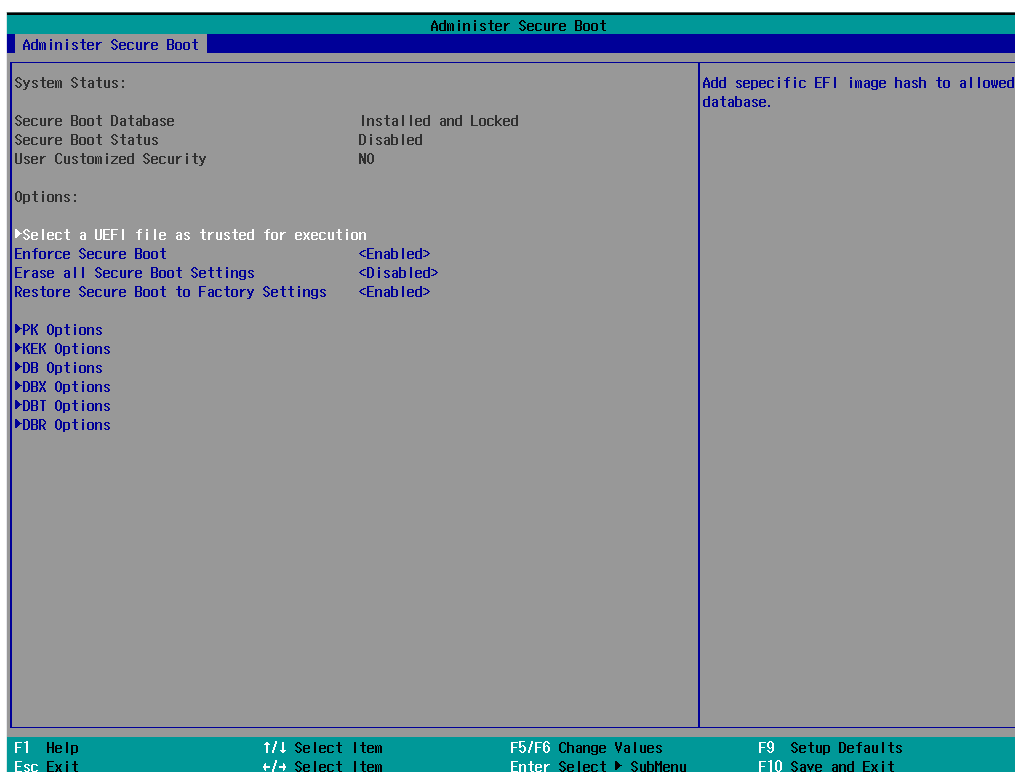
Set as "enabled" in "Restore Secure Boot to Factory Settings" under Administer Secure Boot menu. Press F10 as save and exist.

```
        EFI USB Device (SanDisk) has been blocked by the current security policy.
                                   [Ok]
```
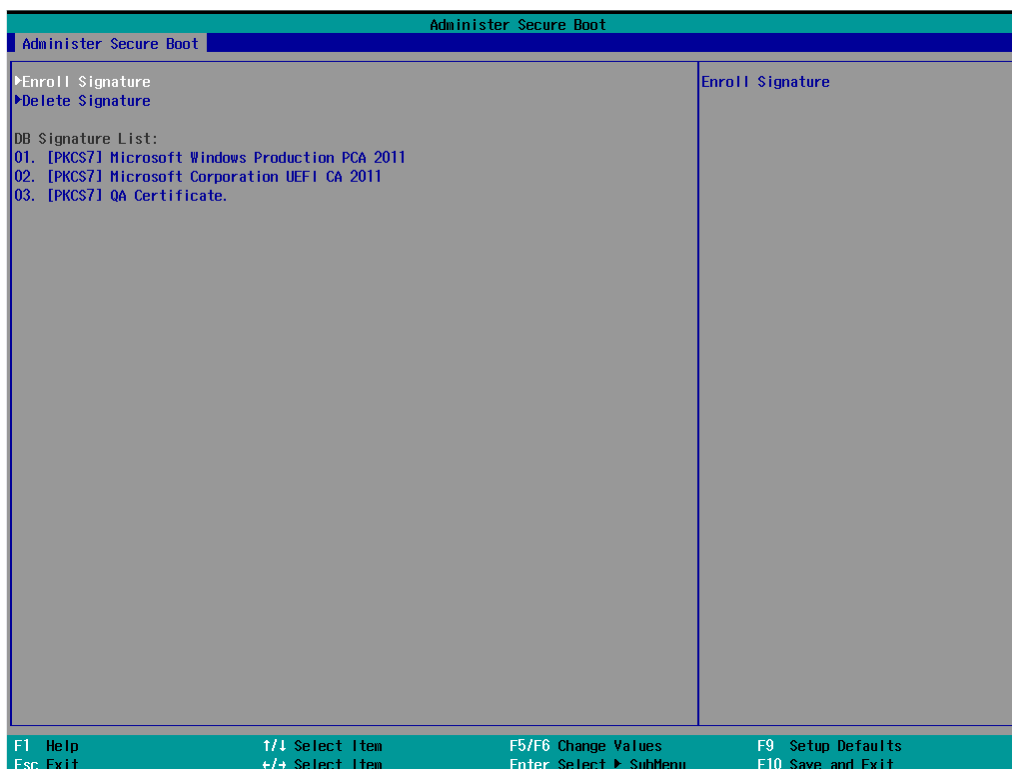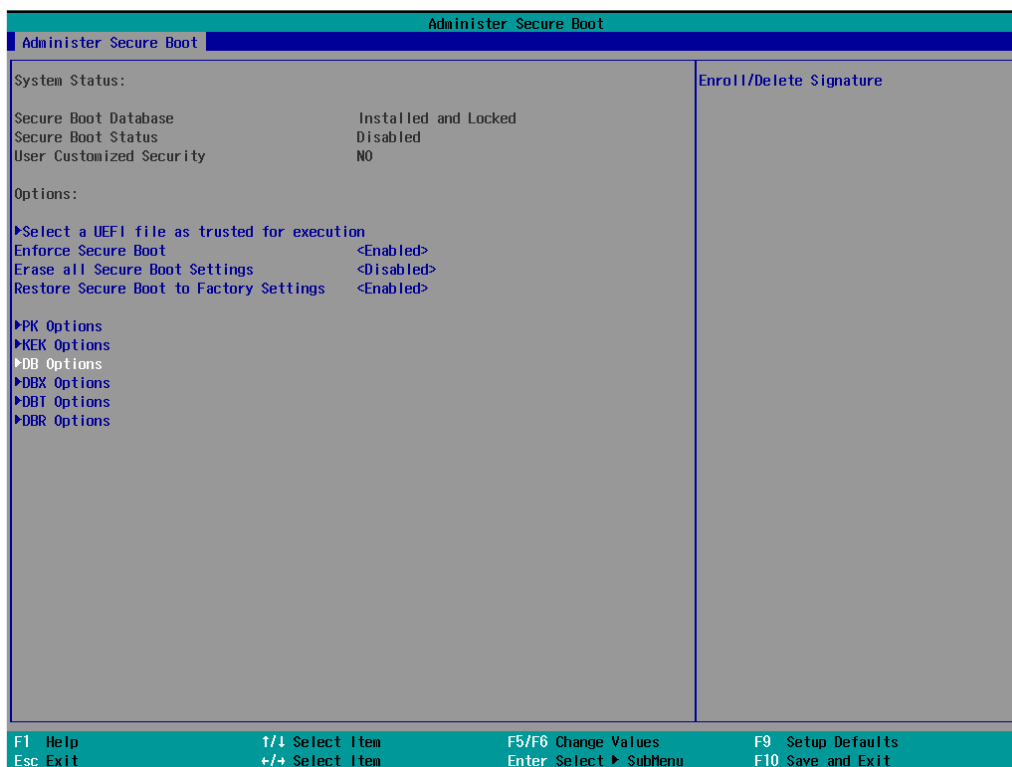
Moxa has included a Microsoft key in BIOS by default; if users cannot boot up using a non-Windows OS, use the following example:

Enroll EFI Image

```
                              Administer Secure Boot
  Administer Secure Boot

 System Status:                                              Add sepecific EFI image hash to allowed
                                                             database.
 Secure Boot Database               Installed and Locked
 Secure Boot Status                 Disabled
 User Customized Security           NO

 Options:

 ▶Select a UEFI file as trusted for execution
 Enforce Secure Boot                     <Enabled>
 Erase all Secure Boot Settings          <Disabled>
 Restore Secure Boot to Factory Settings <Enabled>

 ▶PK Options
 ▶KEK Options
 ▶DB Options
 ▶DBX Options
 ▶DBT Options
 ▶DBR Options




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

```
                              Administer Secure Boot
  Administer Secure Boot

 <.>
 <..>
 bootx64.efi









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

Enter "Administer Secure Boot" once again and see "Select a UEFI file as trusted for execution", put loader into the database named and followed by the UEFI standard \EFI\BOOT\BOOT{machine type short-name}. E.g., efi\boot\BootX64.efi, Debian (EFI\debian\grubx64.efi), Suse (EFI\opensuse\grubx64.efi)

Enroll Customer Key

```
                        Administer Secure Boot
 Administer Secure Boot

 System Status:                                        Enroll/Delete Signature

 Secure Boot Database           Installed and Locked
 Secure Boot Status             Disabled
 User Customized Security       NO

 Options:

 ▶Select a UEFI file as trusted for execution
 Enforce Secure Boot                   <Enabled>
 Erase all Secure Boot Settings        <Disabled>
 Restore Secure Boot to Factory Settings  <Enabled>

 ▶PK Options
 ▶KEK Options
 ▶DB Options
 ▶DBX Options
 ▶DBT Options
 ▶DBR Options




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

```
                        Administer Secure Boot
 Administer Secure Boot

 ▶Enroll Signature                                    Enroll Signature
 ▶Delete Signature

 DB Signature List:
 01. [PKCS7] Microsoft Windows Production PCA 2011
 02. [PKCS7] Microsoft Corporation UEFI CA 2011
 03. [PKCS7] QA Certificate.




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

Enter "DB OPTION" and enroll your key. Please make sure your key is CRT format and uses RSA 2048 or better.

Upgrading the BIOS

This section describes how to upgrade the BIOS on your computer.

✎ **NOTE**

Incorrect BIOS updates may permanently damage the computer. We strongly recommend that you contact the Moxa technical support team for assistance in obtaining all the necessary tools and the most current information before attempting to upgrade the BIOS on any Moxa device.
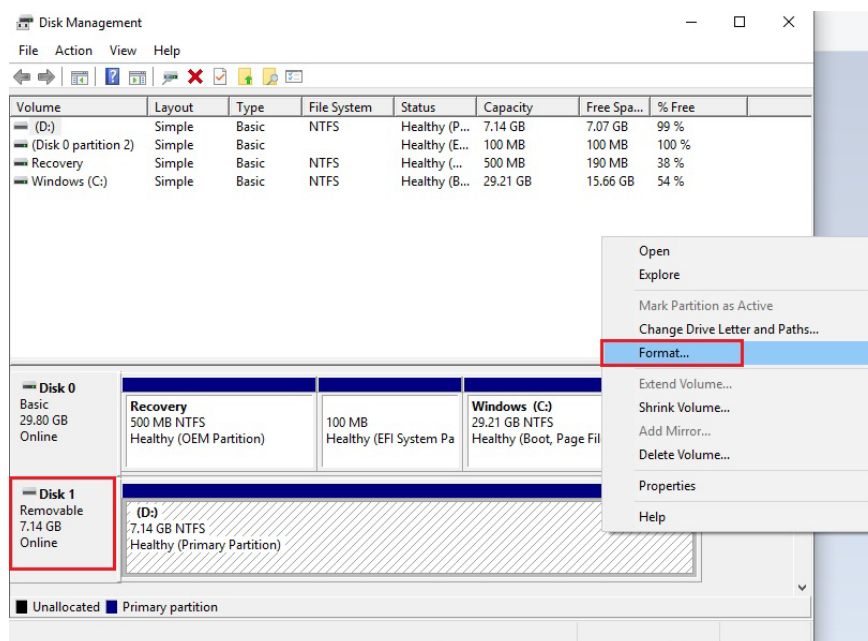

Step 1: Create a Bootable USB Disk

Before upgrading the BIOS, you must create a bootable USB drive for the system.

1. Insert a USB disk in the computer's USB drive.
2. Search for "format" and select **Create and format hard disk partitions**.
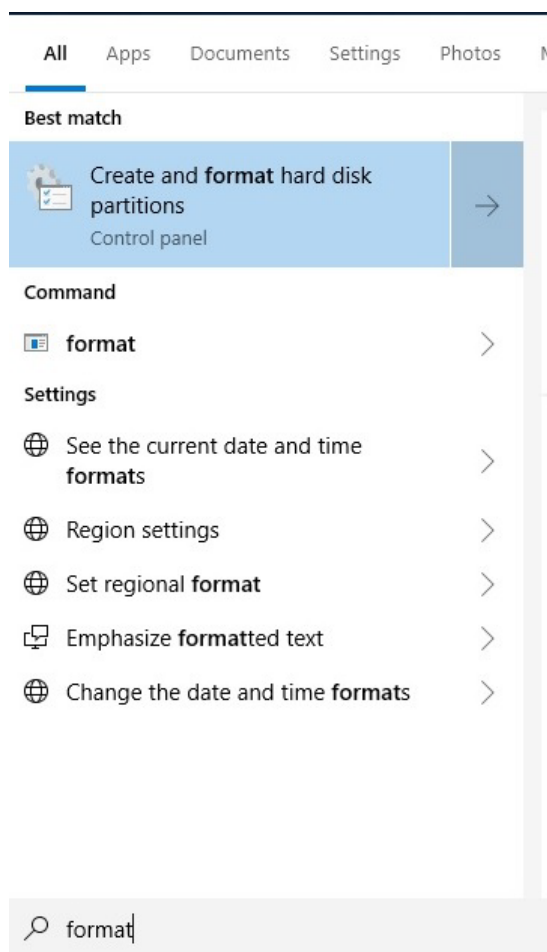
3. Right click on the USB disk and select **Format**.

4. Select **FAT32** for the **File System** and click **OK** to start formatting the USB disk.
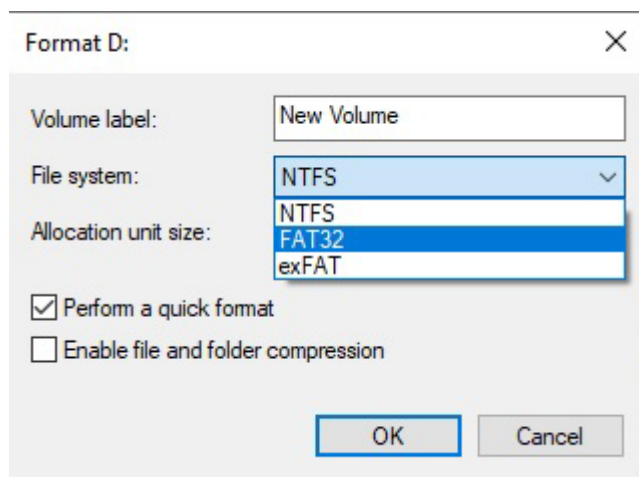
Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.
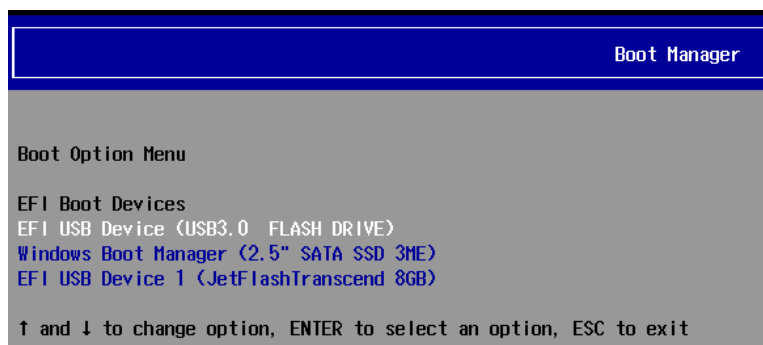
1. Get the BIOS upgrade file (includes an **efi** folder and an **xxxx.efi** file)
2. Copy the **efi** folder and **xxxx.efi** file to the bootable USB disk.

Step 3: Run the Upgrade Program on the Computer

1. Reboot the computer from the USB device and press **F2** while it is booting up to go to the Boot Manager.

   If the BIOS does not recognize the USB device as the boot device, the USB device may not have a partition table. Use the Windows command line tool **diskpart** to rebuild the partition table.

2. Select the USB disk to boot from.

```
                                                    Boot Manager


Boot Option Menu

EFI Boot Devices
EFI USB Device (USB3.0  FLASH DRIVE)
Windows Boot Manager (2.5" SATA SSD 3ME)
EFI USB Device 1 (JetFlashTranscend 8GB)

↑ and ↓ to change option, ENTER to select an option, ESC to exit
```

   The screen will switch to the SHELL environment.

3. Type **fs0:**, then go to the directory where the upgrade file is located and type **xxxxxx.efi** (the name of the file is based on the upgrade file you get from Moxa).

```
Device mapping table
  fs0    :Removable HardDisk - Alias hd24s0b blk0
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
  blk0   :Removable HardDisk - Alias hd24s0b fs0
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
  blk1   :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)
  hd24s0b :Removable HardDisk - Alias fs0 blk0
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)

Shell> fs0:

fs0:\> xxxxxxx.efi
```

4. The upgrade program will run automatically. Wait for the process to complete.

⚠ **ATTENTION**

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

```
Insyde H2OFFT (Flash Firmware Tool) Version (SEG) 200.00.00.13
Copyright (C) 2020 Insyde Software Corp. All Rights Reserved.


             Loading New BIOS Image File: Done

      Current BIOS Model Name:
      New     BIOS Model Name:
      Current BIOS Version: V1.0.0S12
      New     BIOS Version: V1.0.0S12



Common Region:00 StartAddr:0xFE000000 EndAddr:0xFE000FFF
Common Region:01 StartAddr:0xFF400000 EndAddr:0xFFFFFFFF
             Updating Block at FE21D000h
      0%       25%       50%       75%      100%
      ■■□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□        6%
```

5. When the upgrade is done, the computer will automatically reboot.
   You can check the BIOS version on the Main page.

Main	Advanced	Security	Power	Boot	Exit

```
Project Name
BIOS Version                                    V1.0.0S12
```
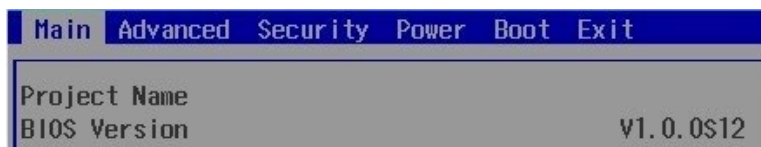
If the system has more than one boot device, you will see more than one fsx (x represents the number of devices).

```
EFI Shell version 2.50 [22281.4149]
Current running mode 1.1.2
Device mapping table
  fs0    :HardDisk - Alias hd33e0a2 blk0
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(2,GPT,0AC3B829-99B0-4FDE-844D-8A10C1D55C6C,0xFA000,0x32000)
  fs1    :Removable HardDisk - Alias hd25r0b blk1
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
  fs2    :Removable BlockDevice - Alias f25s0 blk2
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)
  blk0   :HardDisk - Alias hd33e0a2 fs0
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(2,GPT,0AC3B829-99B0-4FDE-844D-8A10C1D55C6C,0xFA000,0x32000)
  blk1   :Removable HardDisk - Alias hd25r0b fs1
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
  blk2   :Removable BlockDevice - Alias f25s0 fs2
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)
  blk3   :HardDisk - Alias (null)
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(1,GPT,5796BAEF-EC3F-447F-B4F1-21EB08DC5D57,0x800,0xF9800)
  blk4   :HardDisk - Alias (null)
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(3,GPT,7C8FF3C6-53E8-4CF9-8141-65DF7EF04399,0x12C000,0x8000)
  blk5   :HardDisk - Alias (null)
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(4,GPT,1AABAECE-BE17-4C27-AF60-E6C69977AC02,0x134000,0x3A6E800X
  blk6   :BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)
  blk7   :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
```

6. Access each device path **fsx** (x is the device index), then type **ls** to view the content of the boot device until you locate the upgrade file and run it.

```
fs0:\> fs1:

fs1:\> ls
Directory of: fs1:\

06/27/19  11:43a <DIR>          16,384    efi
06/13/19  11:10a            17,974,704    820C100S16 efi
          1 File(s)   17,974,704 bytes
          1 Dir(s)
```

A. Safety Installation Instructions

A. RTC Battery Warning

> ⚠️ **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**
>
> There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions on the battery.

B. Fuse Warning

CAUTION: For continued protection against fire, replace only with fuse of the same type and rating.

C. Rack-mounting Warning

The following or similar rack-mounting instructions are included with the installation instructions:

(1) Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

(2) Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

(3) Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

(4) Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

(5) Reliable Grounding: Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., by using power strips).