DA-681A-I-WL1 Series Hardware User Manual

Version 1.0, February 2024

www.moxa.com/products

DA-681A-I-WL1 Series Hardware User Manual

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

Copyright Notice

Trademarks

Disclaimer

- Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.
- Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.
- Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.
- This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

Technical Support Contact Information

www.moxa.com/support

Table of Contents

1. Introduction

Thank you for purchasing the Moxa DA-681A-I-WL1 industrial computer, a multi-functional embedded computer designed for control, monitoring, data-acquisition, and protocol-conversion applications.

This manual covers hardware installation, connector interfaces, and BIOS setup of the DA-681A-I-WL1. For software configuration and management, please refer to the user manual for the operating system on your computer.

Overview

The DA-681A-I-WL1 Series x86-based rackmount embedded computers are built around an Intel® Celeron® 4305UE 2.0 GHz processor and come with 1 VGA port, 4 USB ports, 6 Gigabit Ethernet ports, 2 isolated 3-in-1 RS/232/422/485 serial ports, and 10 isolated RS-485 ports. The DA-681A-I-WL1 has a mSATA storage slot for installing the OS. Another plus is that the serial ports come with 2-kV digital galvanic isolation protection to guarantee communication reliability in harsh industrial environments.

The DA-681A-I-WL1 is designed for control, monitoring, data-acquisition, and protocol-conversion applications. Their high interface density and robust design makes them suitable for industrial-automation applications such as power automation, renewable energy, and energy storage.

Model Descriptions and Package Checklist

The DA-681A-I-WL1 Series includes the following models:

- **DA-681A-I-SP-WL1:** 19-inch 1U Rackmount Computer with 6 Gigabit Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, Single Power, without RAM, mSATA and OS, -25 to 55°C temp.
- **DA-681A-I-DPP-WL1:** 19-inch 1U Rackmount Computer with 6 Gigabit Ethernet ports, VGA, 2 RS-232/422/485 ports, 10 RS-485 ports, mSATA, SATA, USB, Dual power, without RAM, mSATA and OS, -25 to 55°C temp.

Each basic system model package includes the following items:

- DA-681A-I-WL1 rackmount computer
- Rack-mounting kit
- Quick installation guide (printed)
- Warranty card

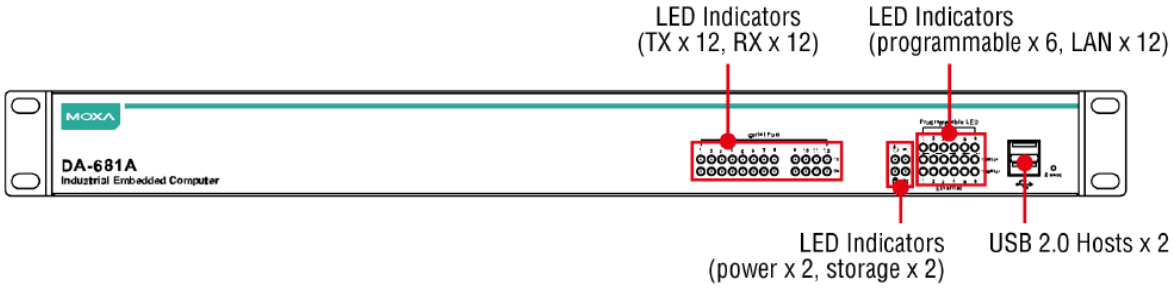
Features

The DA-681A-I-WL1 computer comes with the following features:

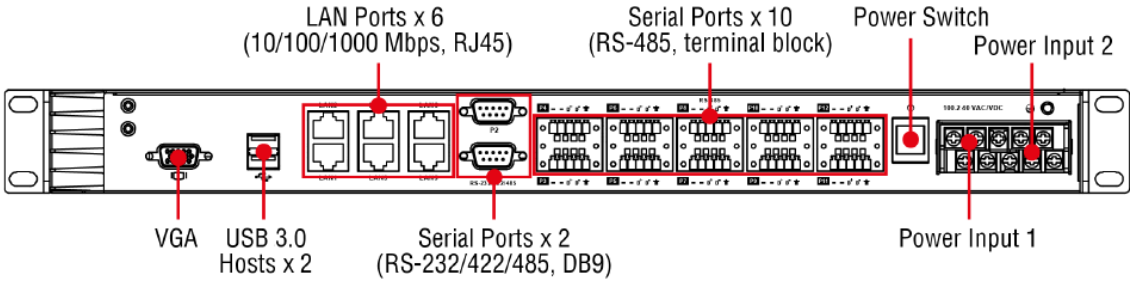
- 8th Gen Intel® Celeron® 4305UE 2.0 GHz processor
- 1 built-in DDR4 memory socket
- 1 mSATA for installing OS and 1 SSD/HDD for storage expansion
- 6 Gigabit Ethernet ports for network redundancy
- 2 USB 3.0 and 2 USB 2.0 ports for connecting high-speed peripherals
- 2 isolated RS-232/422/485 and 10 isolated RS-485 ports
- Supports both 100 to 240 VAC and 100 to 240 VDC power inputs (single power and dual-power models available)

Appearance

Front View

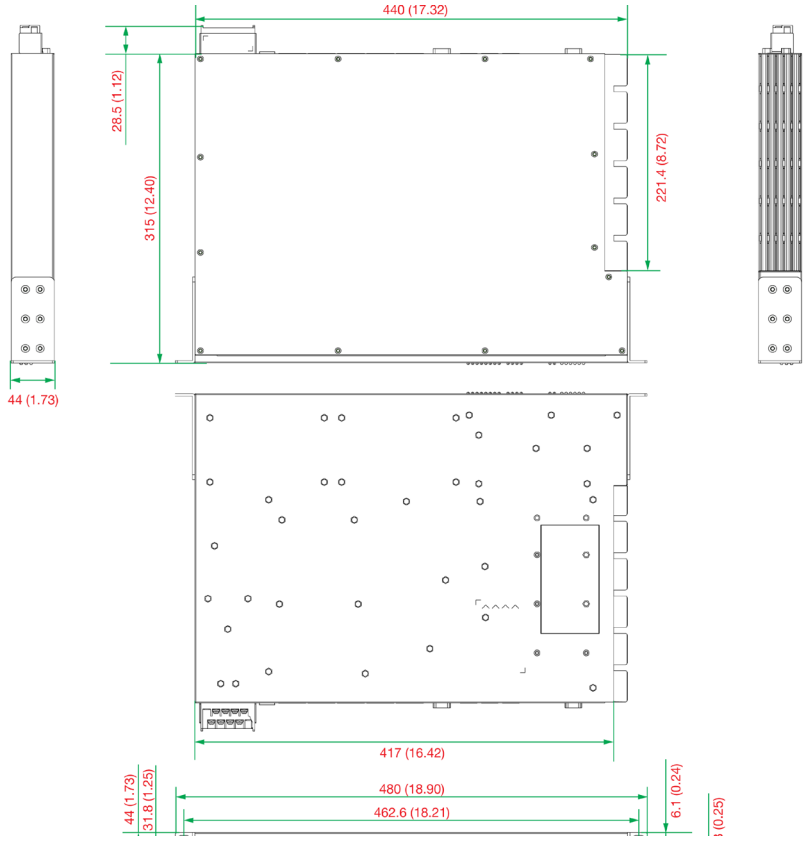


Rear View



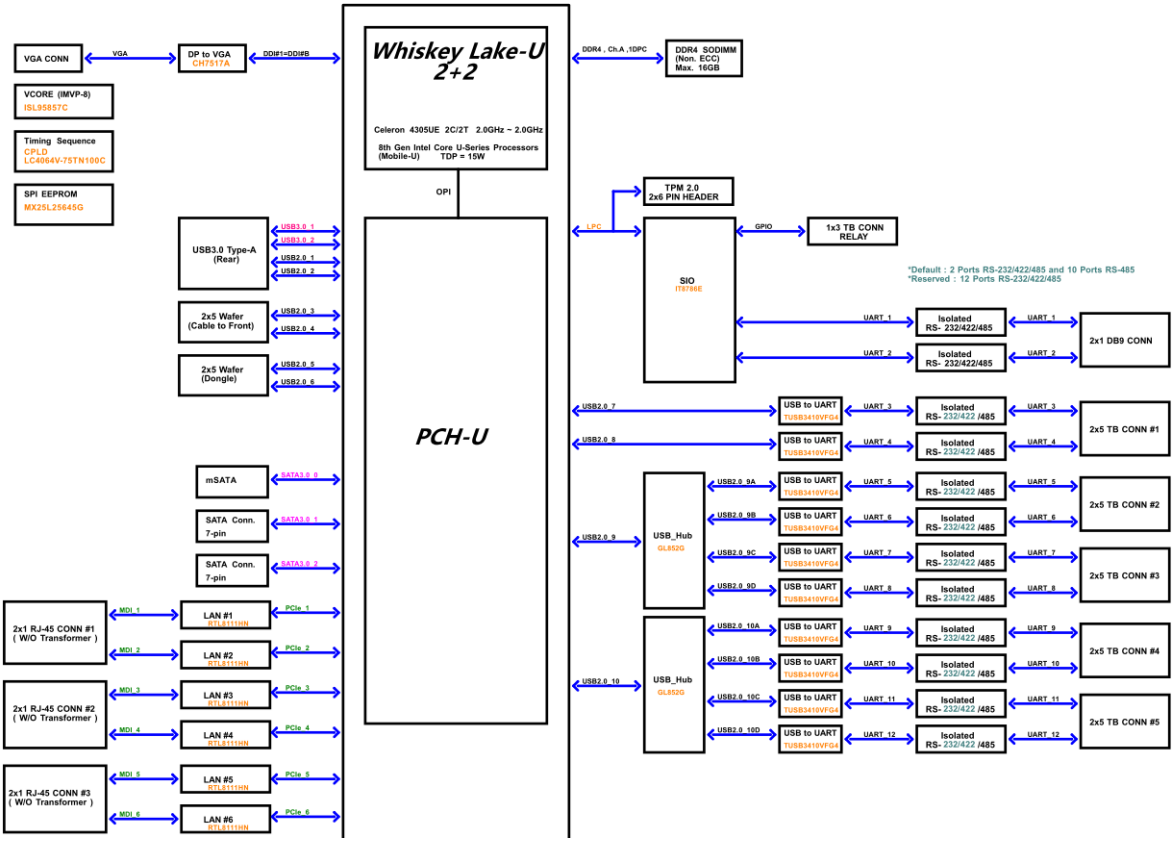
Dimensions

Unit = mm (inches)



Hardware Block Diagram

DA-681A-I-WL1 Basic System



Hardware Specifications

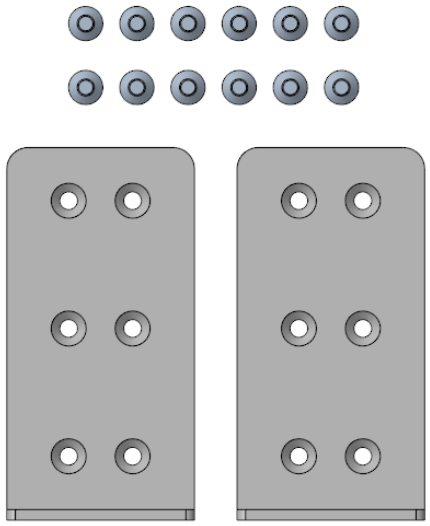
> **NOTE**
>
> The latest specifications for Moxa's products can be found at https://moxa.com.

2. Hardware Installation

The DA-681A-I-WL1 embedded computers are compact and rugged, making them suitable for industrial applications. The LED indicators enable quick troubleshooting and effective monitoring of the computer. Multiple ports are provided for connecting a variety of devices. The DA-681A-I-WL1 embedded 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 DA-681A-I-WL1 embedded computers.

Installing Rack-mounting Ears

The DA-681A-I-WL1 computer comes with a rack-mounting kit for installing the computer on a rack. The rack-mounting kit includes the following items: Two rack-mounting ears and six screws (size: M4x6 mm) for each ear.



Follow the instructions below to install the computer.

1. Attach the left rack-mounting ear to the left side of the DA-681A-I-WL1 computer and secure the six screws.
2. Attach the other rack-mounting ear to the right side of the computer and secure it with the six screws.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

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.

NOTE

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.

- 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.

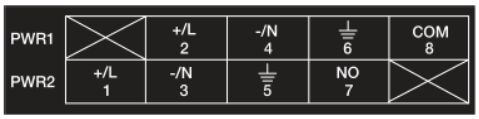
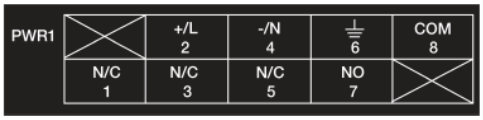
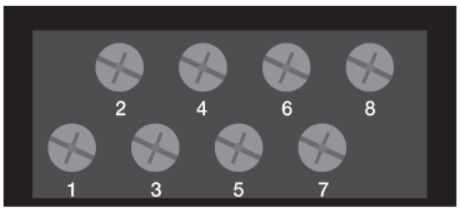
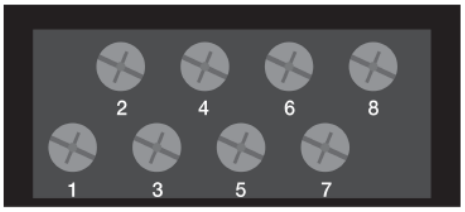
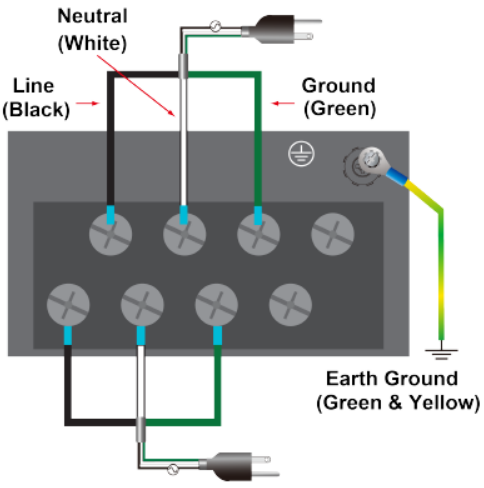
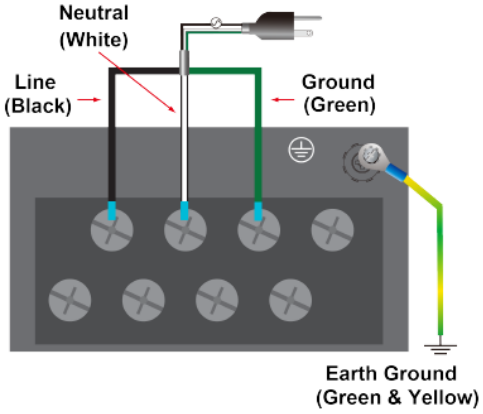
External metal parts of this equipment are extremely hot!! Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

Connecting the Power

The DA-681A-I-WL1 Series includes single-power and dual-power models that use terminal block(s) located on the rear panel. Connect the power cord wires to the screws on the power input and then tighten the screws. The **Power** LED will light up to indicate that power is being supplied to the DA-681A-I-WL1, after which the BIOS will initialize the flash disk module, causing the **Storage** LED to blink. It should then take about 30 to 60 seconds for the operating system to complete the boot-up process.

Wiring the Power Inputs

Refer to the following illustration and table for details on wiring the power inputs to the DA-681A-I-WL1 computer. The table uses the reference numbers in the diagram to identify the lines in the terminal blocks.

<table>
<tr><th>DPP (Dual Power)</th><th>SP (Single Power)</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>AC Terminal
 
</td><td>AC Terminal
 
</td></tr>
</table>

SP Model Power Terminal Block Pin Assignment

Terminal Number	Description	Note
1	NC	No function
2	PWR1 Line	**PWR1 Line** is connected to the Line terminal for the AC power source 1.
3	NC	No function
4	PWR1 Neutral	**PWR1 Neutral** is connected to the Neutral terminal for the AC power source 1.
5	NC	No Function
6	Ground	**Ground** should be connected to the ground terminal for AC power source 1.
7	NO	Normal open pin for the alarm relay.
8	COM	**COM** pin for the alarm relay.

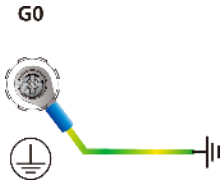
DPP Model Power Terminal Block Pin Assignment

Terminal Number	Description	Note
1	PWR2 Line	**PWR2 Line** is connected to the Line terminal for the AC power source 2.
2	PWR1 Line	**PWR1 Line** is connected to the Line terminal for the AC power source 1.
3	PWR2 Neutral	**PWR2 Neutral** is connected to the Neutral terminal for the AC power source 2.
4	PWR1 Neutral	**PWR1 Neutral** is connected to the Neutral terminal for the AC power source 1.
5	Ground	**Ground** should be connected to the ground terminal for AC power source 2.
6	Ground	**Ground** should be connected to the ground terminal for AC power source 1.
7	NO	Normal open pin for the alarm relay.
8	COM	**COM** pin for the alarm relay.

Grounding the Chassis

A grounding connector is located on the rear panel of the computer.

Connect the grounding connector on the chassis to the earth (ground). The minimum wire diameter is 18 AWG.



ATTENTION

If protective earthing is used as a safeguard, the instructions shall require connection of the equipment protective earthing conductor to the installation protective earthing conductor (for example, by means of a power cord connected to a socket-outlet with earthing connection).

A power button on the rear panel allows users to power on the computer when it is in the sleep or hibernate mode.

Reset Button

Pressing the **Reset** button 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. During normal use, you should NOT use the Reset Button. You should only use this button if the software is not working properly. To protect the integrity of data being transmitted or processed, you should always reset the system from the operating system using the software reboot function.

z

LED

There are 46 LED indicators on the front panel.

Information about each LED indicator is given in the following table:

LED	Color	Description
Serial Port TX 1-12	Green	Serial port is transmitting data
	Off	No operation
Serial Port RX 1-12	Yellow	Serial port is receiving data
	Off	No operation
Power	Green	Power is on
	Off	No power input or power error exists
Storage	Yellow/Blinking	Data is being written to or read from the storage unit
	Off	Storage unit is idle
Power Fail 1	Red	Power 1 has failed (for dual power models only)
	Off	Power is being properly supplied
Power Fail 2	Red	Power 2 has failed (for dual power models only)
	Off	Power is being properly supplied
Gigabit LAN LEDs 1-6	Green	100 Mbps Ethernet mode
	Yellow	1000 Mbps (Gigabit) Ethernet mode
	Off	Not operating, or in 10 Mbps Ethernet mode
Programmable 1-6	Green	As defined by users

Connecting to Displays

The DA-681A-I-WL1 comes with 1 VGA interface on the rear panel for connecting a display.

Connecting USB Devices

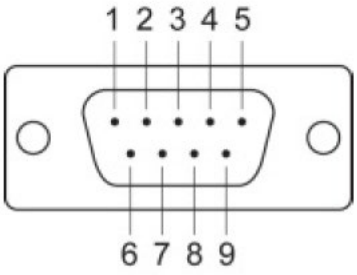
The DA-681A-I-WL1 comes with 2 USB 2.0 ports on the front panel and 2 USB 3.0 ports on the rear panel. The USB ports can be used to connect to other peripherals, such as flash drives, for expanding the system's storage capacity. In addition, both USB ports support system boot up, which can be activated by modifying the BIOS settings. See "*Chapter 3* **BIOS Setup**" for details.

Serial Ports

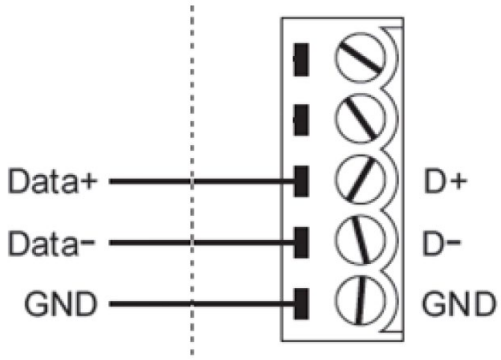
The DA-681A-I-WL1 offers 2 RS-232/422/485 ports with DB9 connectors and 10 RS-485 ports with terminal blocks. The pin assignments for the ports are shown in the following table:

DB9 Pin Assignment

Pin	RS-232	RS-485 (4W)	RS-485 (2W)	RS-422
1	DCD	TxD-(A)	–	TxD-(A)
2	RXD	TxD+(B)	–	TxD+(B)
3	TXD	RxD+(B)	Data+(B)	RxD+(B)
4	DTR	RxD-(A)	Data-(A)	RxD-(A)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–
	–	–	–	–



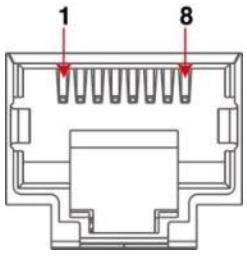
Terminal Block Pin Assignment



Ethernet Ports

The DA-681A-I-WL1 has 6 10/100/1000 Mbps LAN ports with RJ45 connectors. The pin assignments for the ports are shown in the following table:

Pin	100 Mbps	1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	Rx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

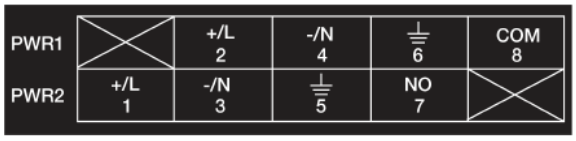


The default IP addresses and netmasks of the Ethernet ports are as follows:

	Default IP Address	Netmask
LAN 1	192.168.3.127	255.255.255.0
LAN 2	192.168.4.127	255.255.255.0
LAN 3	192.168.5.127	255.255.255.0
LAN 4	192.168.6.127	255.255.255.0
LAN 5	192.168.7.127	255.255.255.0
LAN 6	192.168.8.127	255.255.255.0

Relay Output

The DA-681A-I-WL1 is provided with a relay output located on the rear panel of the computer. The default setting is N.O. If you want to change N.O. to N.C., you should open the case and switch the jumper.

DPP Model	SP Model
	

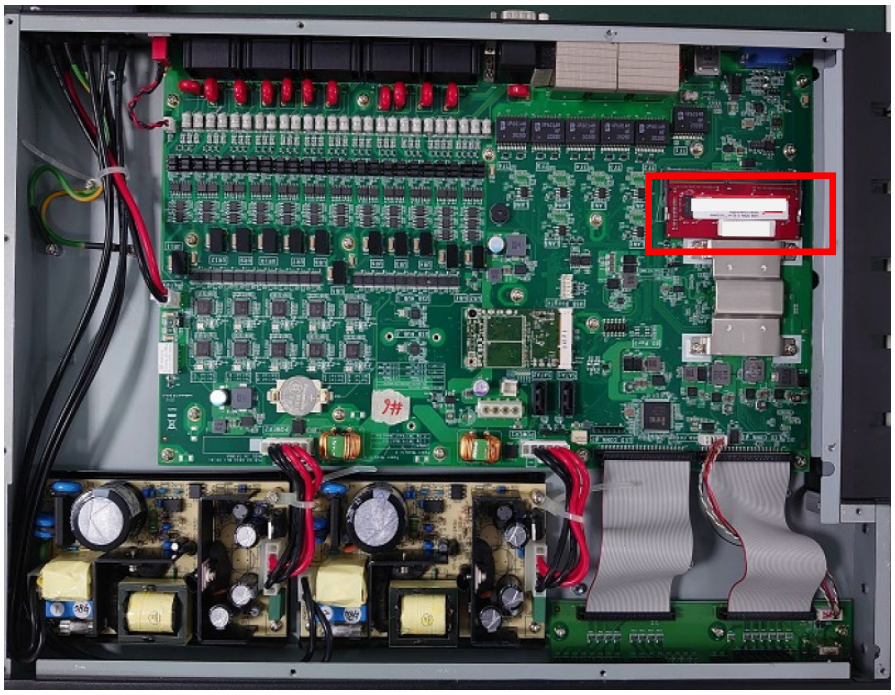
Terminal Number	Description	Note
7	NO	Normal open pin for the alarm relay.
8	COM	**COM** pin for the alarm relay.

	N.O. (Default)	N.C.
No Power Status	Close	Open
Power ON (Normal)	Open	Close
Power OFF	Close	Open
Alert Trigger	Close	Open

Upgrading the Memory Module

The DA-681A-I-WL1 embedded computer supports 1 DDR4 SODIMM modules for up to 16 GB of memory. To upgrade the SDRAM memory module, follow these instructions:

1. Disconnect the DA-681A-I-WL1 from its power source.
2. Unfasten the screws on the top of the computer, and then remove the top cover.
3. Find the location of the SDRAM memory slot.

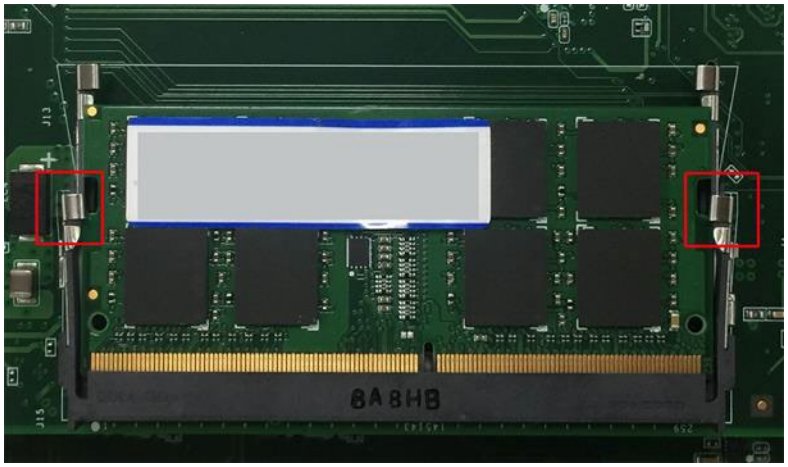


4. Install the new memory module in the slot.

   Make sure you insert the SDRAM in the correct direction. Push down the memory module, making sure that the two fasteners snap in place and are holding the module firmly.

NOTE

If a memory module is already installed in the slot, push the two fasteners to free the module and then remove the module.

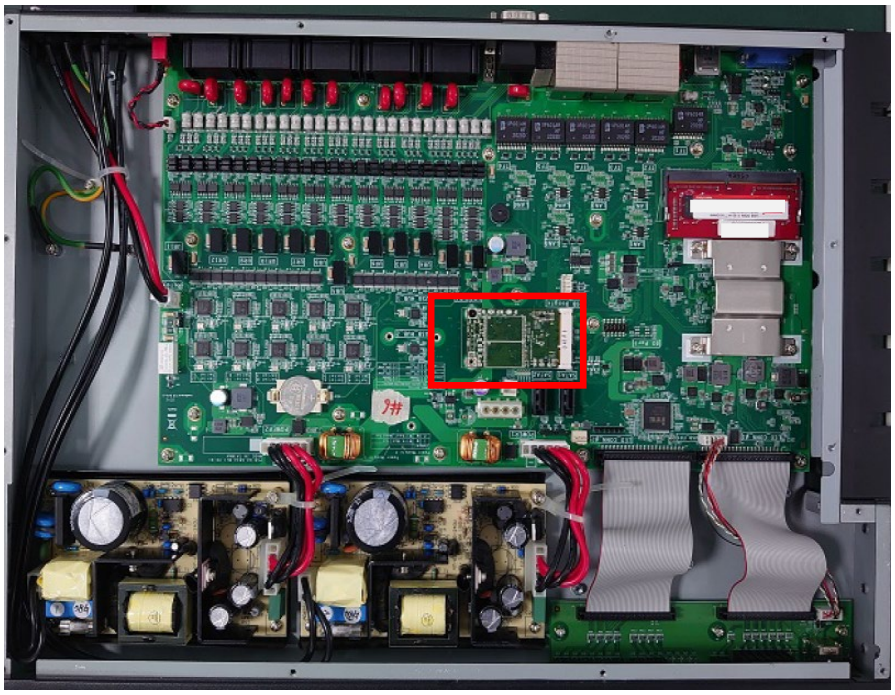


5. Replace the top cover of the computer and fasten the screws.

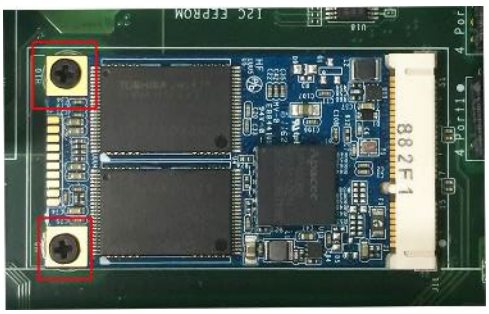
Installing a mSATA Storage Card

The DA-681A-I-WL1 embedded computer comes with a mSATA slot. To insert a mSATA storage card, follow these instructions.

1. Disconnect the DA-681A-I-WL1 from its power source.
2. Unfasten the screws on the top of the computer, and then take off the top cover.
3. Find the location of the mSATA slot.



4. Insert the mSATA storage card into the slot and fasten the two screws to secure the card to the slot.



5. Replace the top cover of the computer and fasten the screws.

ATTENTION

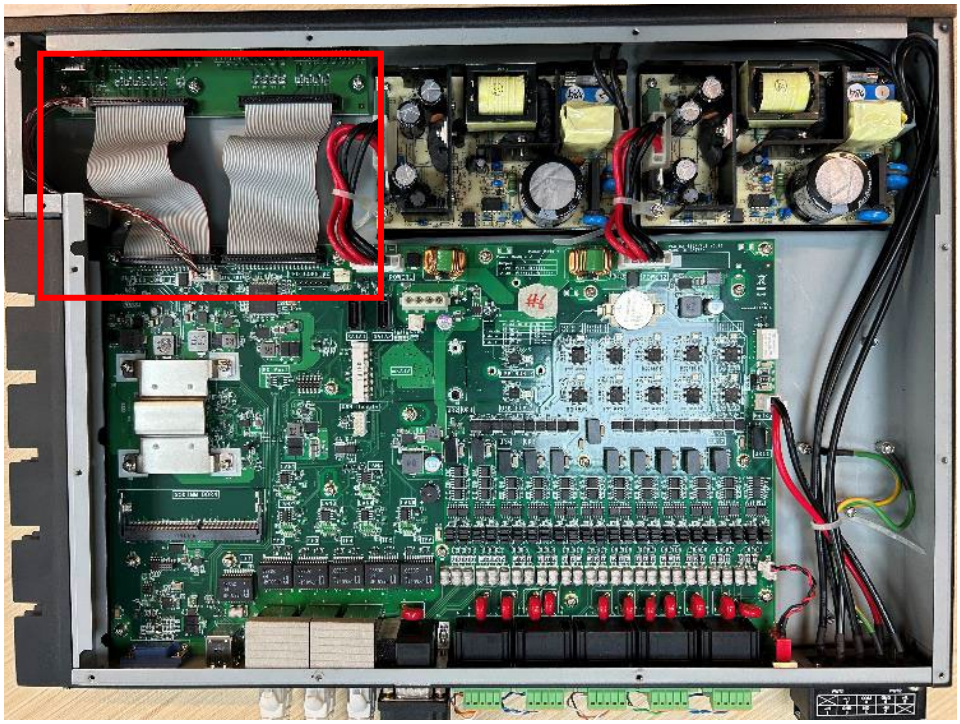
The DA-681A-I-WL1 rackmount computer does not support hot swap and plug and play functions for the mSATA storage card. You must disconnect the power source to the computer before inserting or removing the mSATA storage card.

Installing SATA Hard Disks

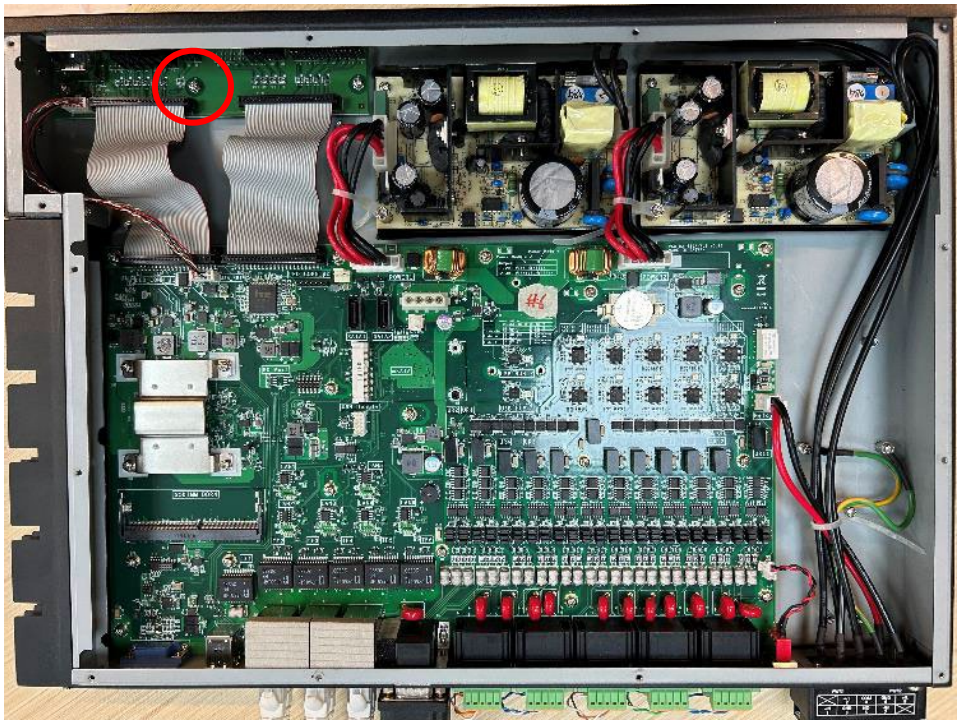
The DA-681A-I-WL1 comes with one SATA slot that allows users to install a 2.5” SATA HDD/SSD. Follow these steps to install a SATA disk.

You will need to purchase the hard disk kit, including the hard disk tray and the screws.

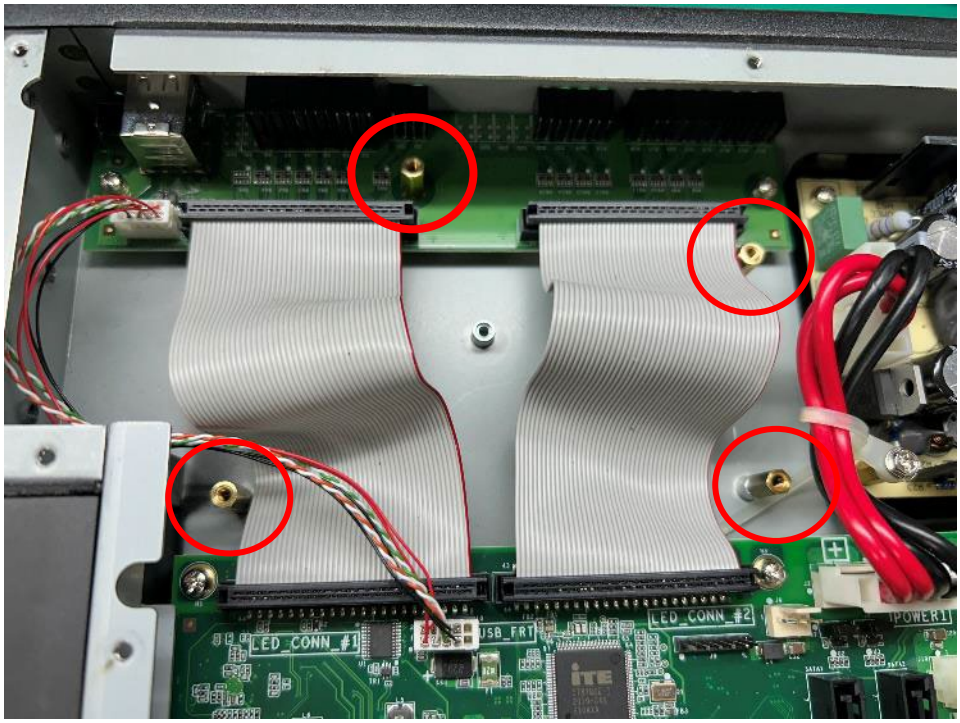
1. Disconnect the DA-681A-I-WL1 from its power source.
2. Open the top cover of the DA-681A-I-WL1.
3. The hard disk bracket should be installed on the top left side of the DA-681A-I-WL1.



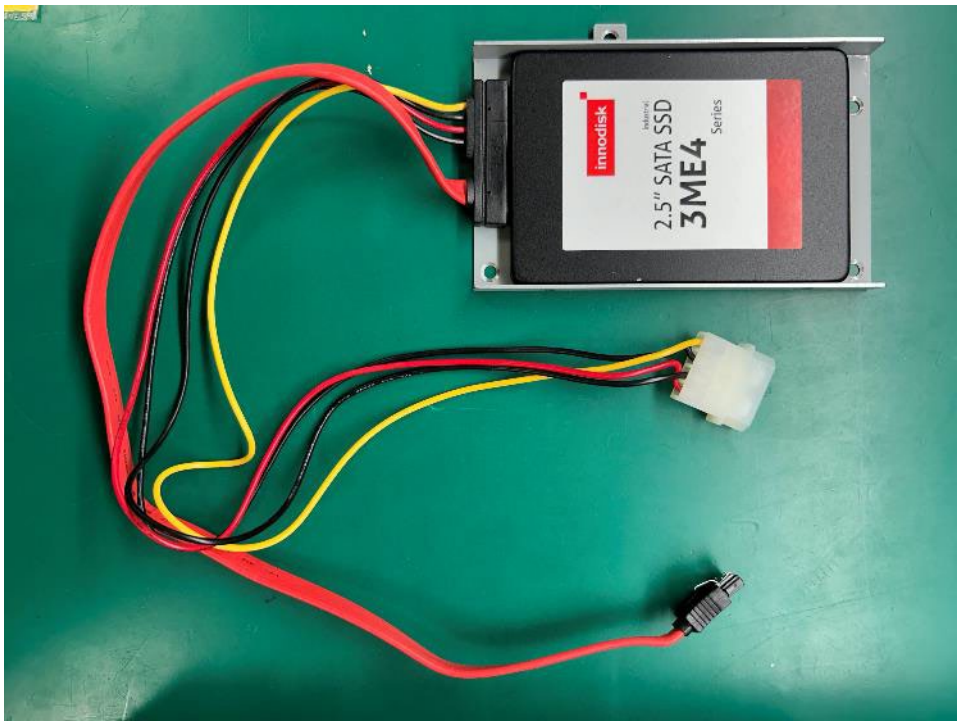
4. Remove the screws for the LED board.



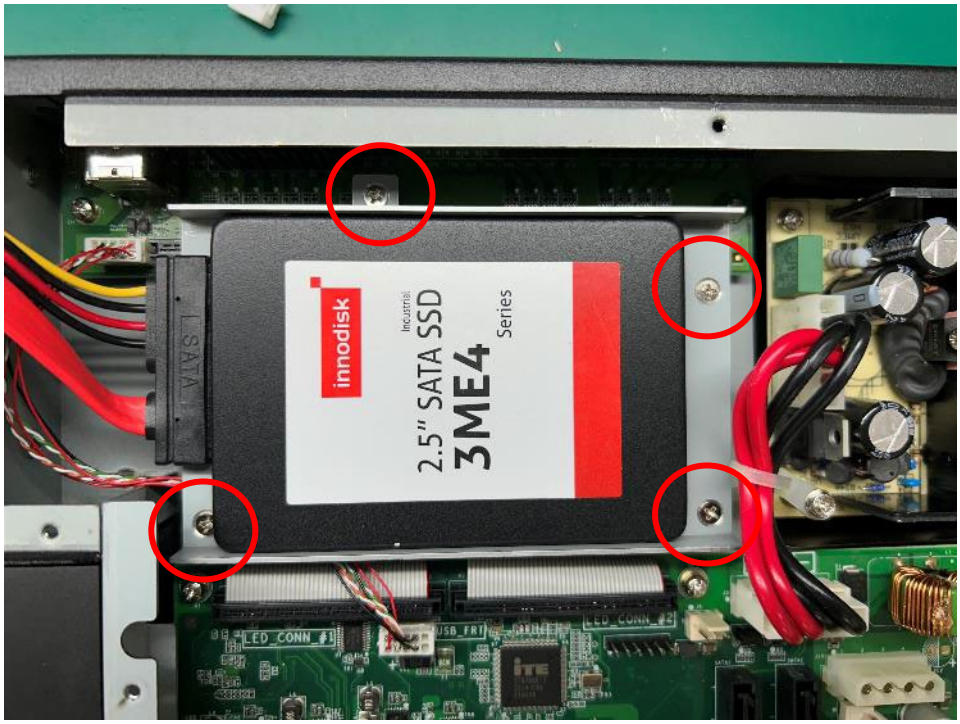
5. Install the four spacers on the embedded computer.



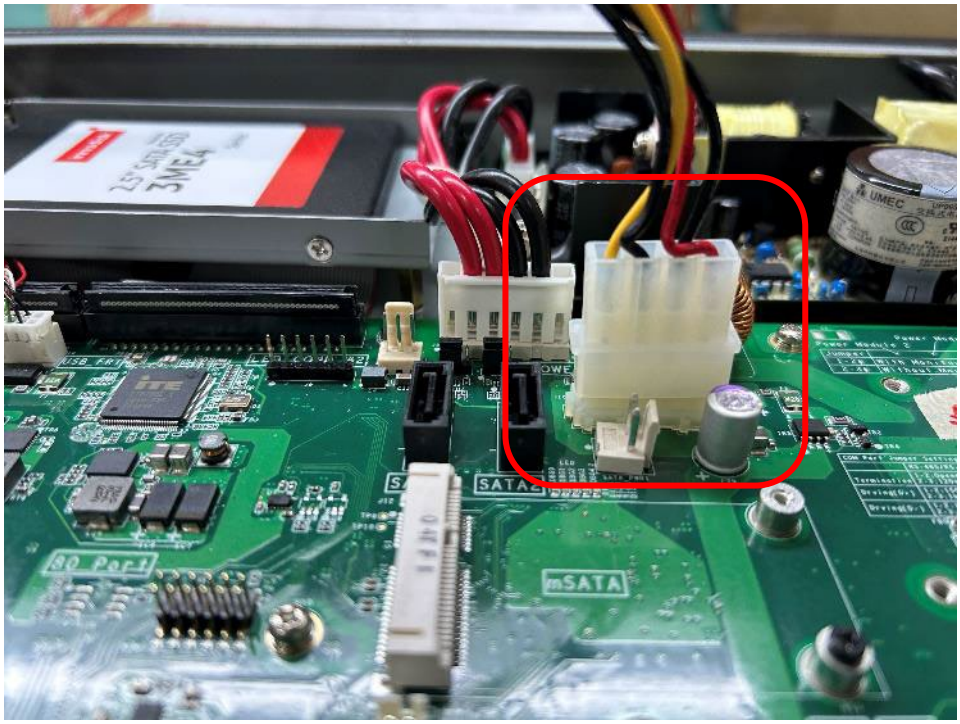
6. Install the SATA hard disk / Solid State Disk in the hard disk bracket.
7. Connect the SATA cable and power cable to the hard disk / Solid State Disk.



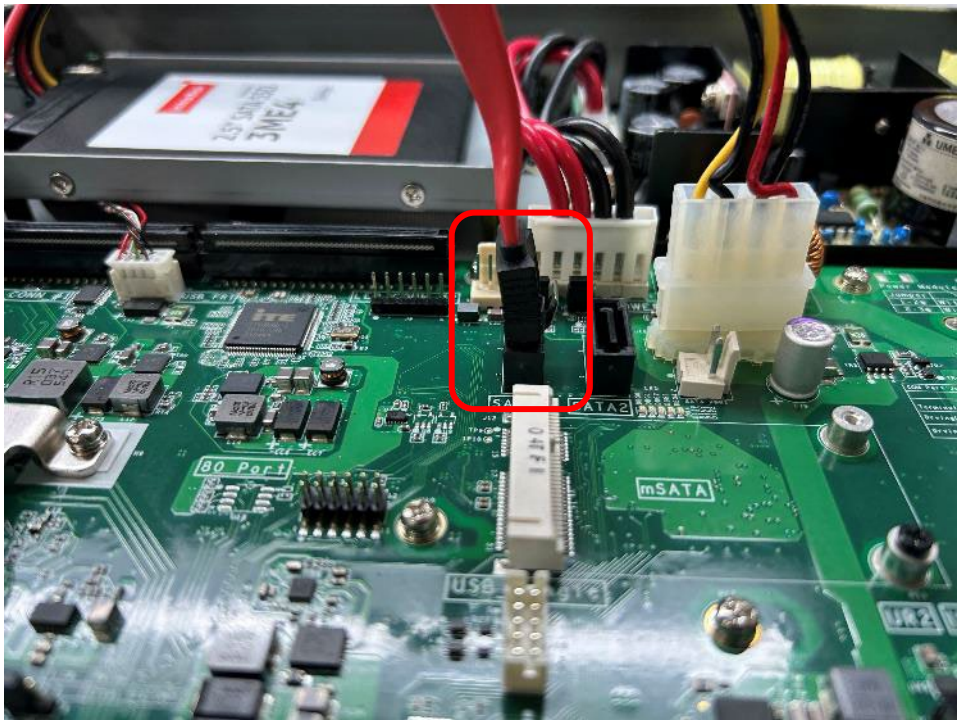
8. Next, install the SATA hard disk / Solid State Disk and bracket in the DA-681A-I-WL1. Make sure the screws are firmly attached.



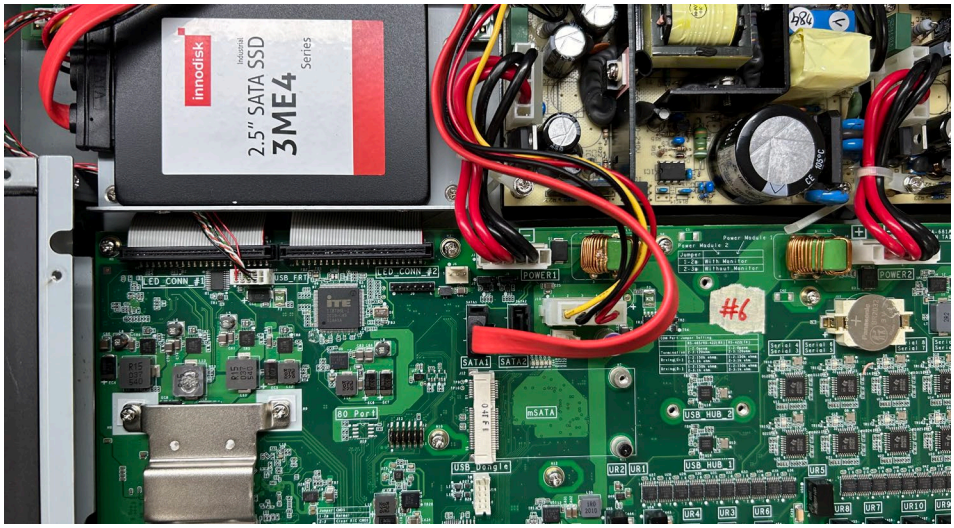
9. Connect the SATA power cable to the computer.



10. Connect the SATA HDD/SSD signal cable to the computer.



11. Properly position the cables, as shown in the following figure.



ATTENTION

The SATA hard disk kit and cables are not included in the basic shipment of the DA-681A-I-WL1 embedded computer. Any standard SATA disk cable and power cable can be used.

3. BIOS Setup

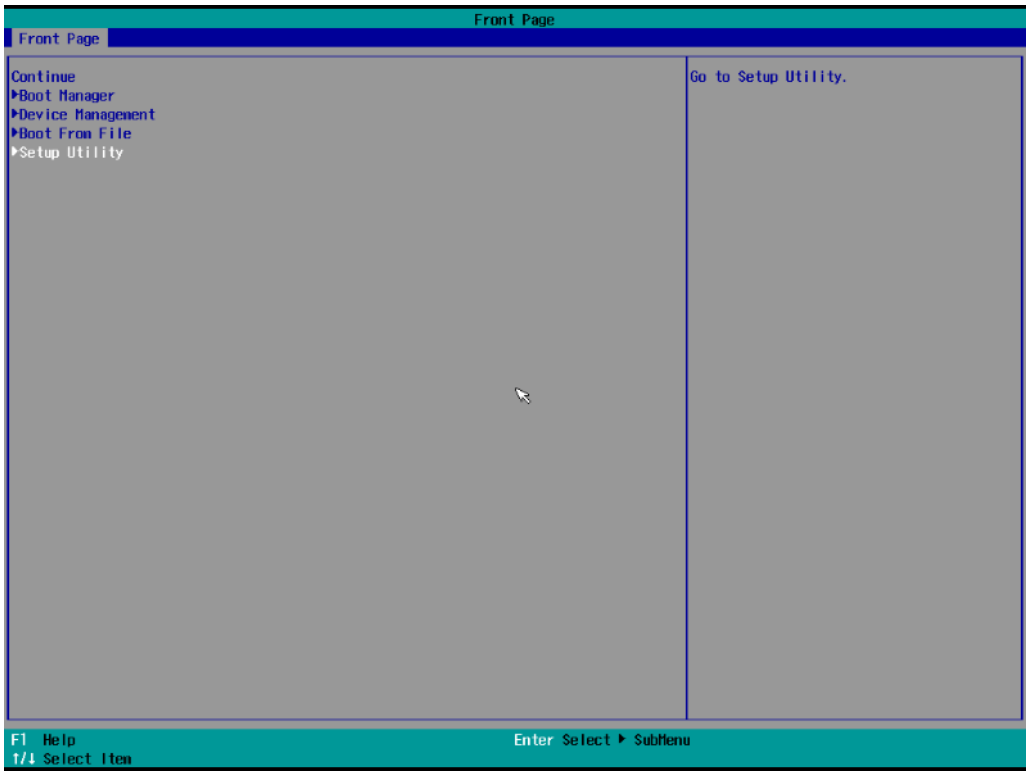
This chapter describes the BIOS settings of the DA-681A-I-WL1 computer. The BIOS is a set of input/output control routines for peripherals, which are used to initialize system peripherals before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these 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

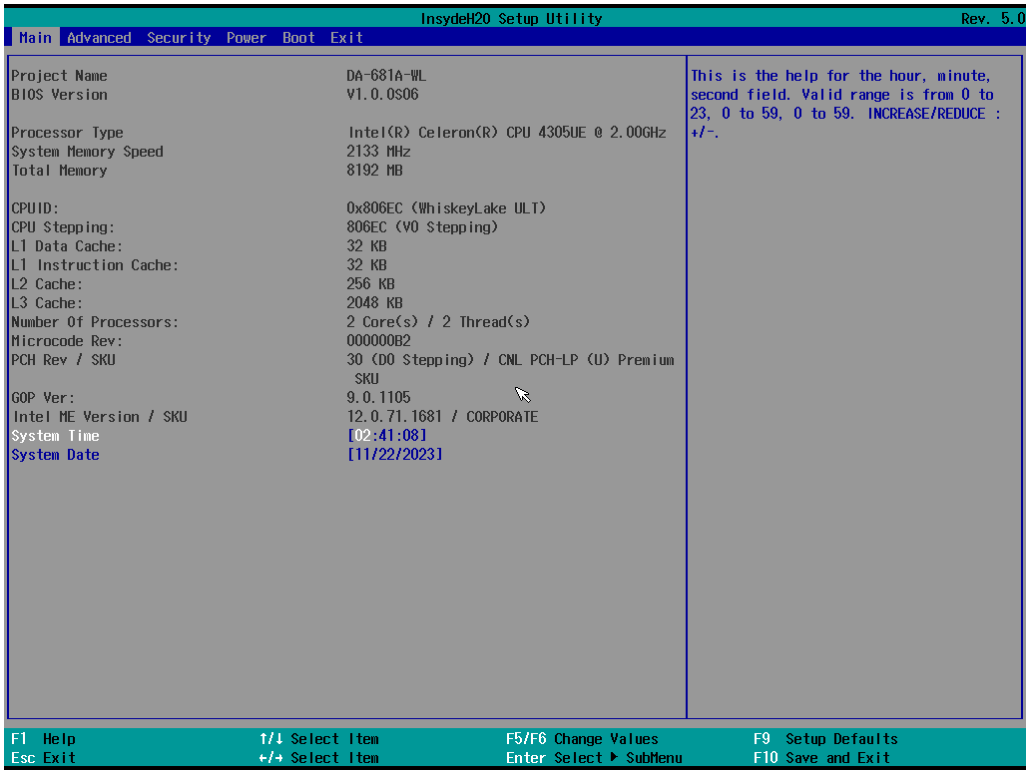
Select **F2** to enter the **BIOS configuration**.



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.

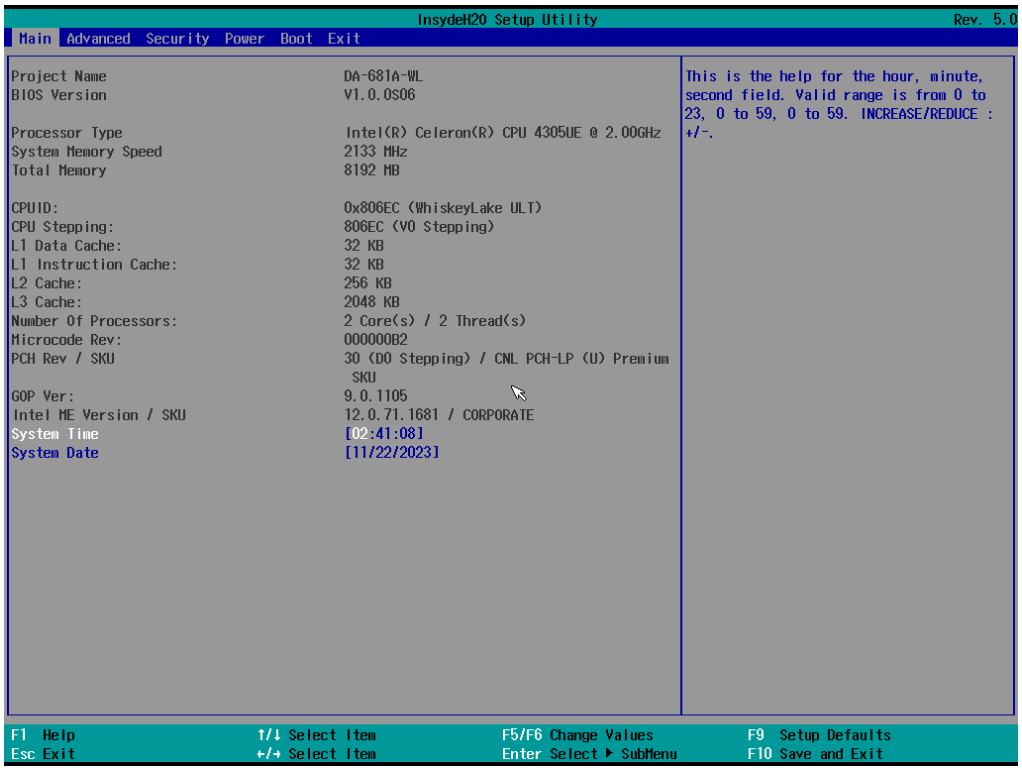


NOTE

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

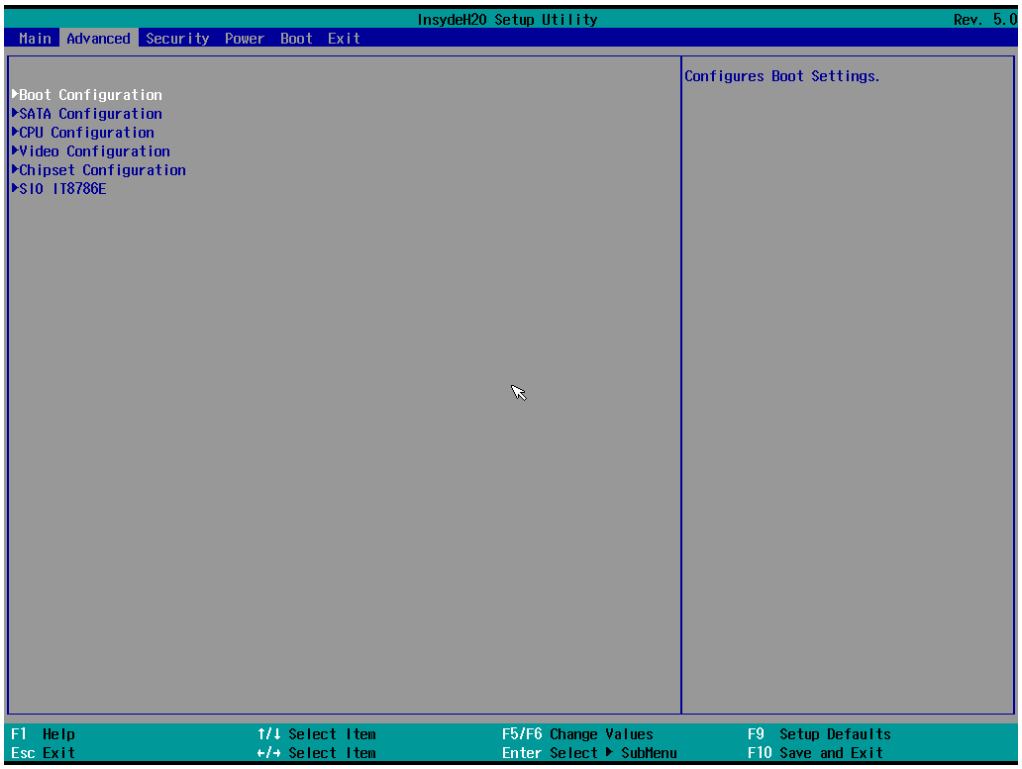
Main Page

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



Advanced Settings

Select the **Advanced** tab in the BIOS setup utility to open the advanced features screen.



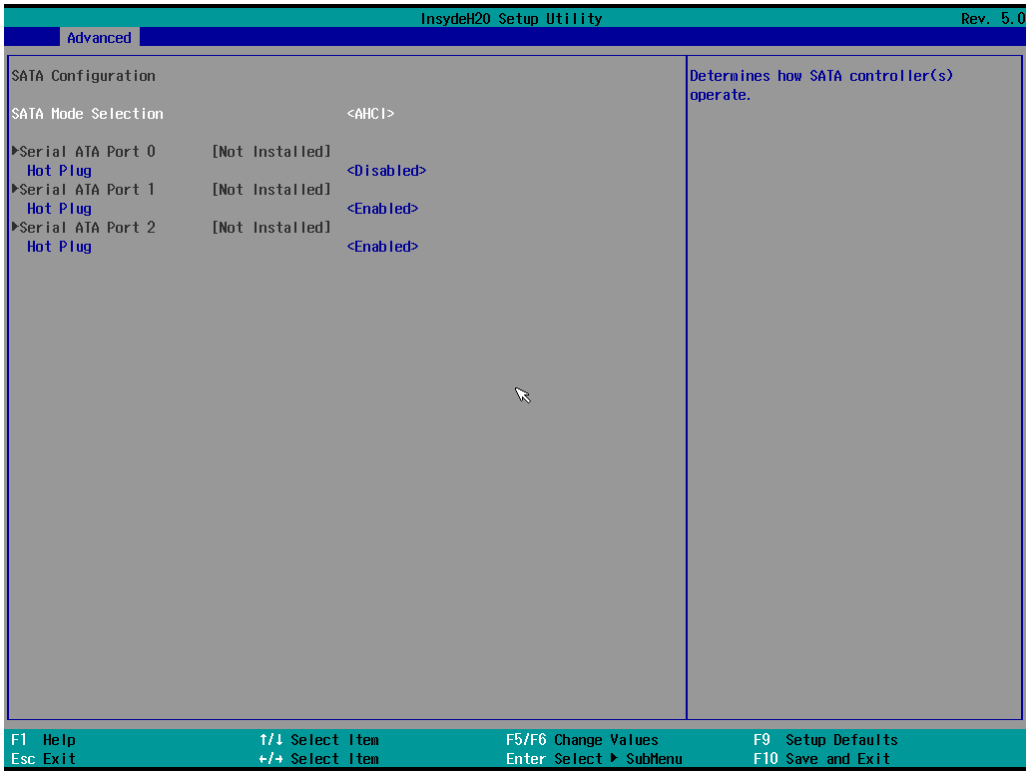
Boot Configuration

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

Options: On (default), Off.

SATA Configuration

The host drive controller can be configured for AHCI (default) or Intel RST Premium mode.



Serial ATA Port

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

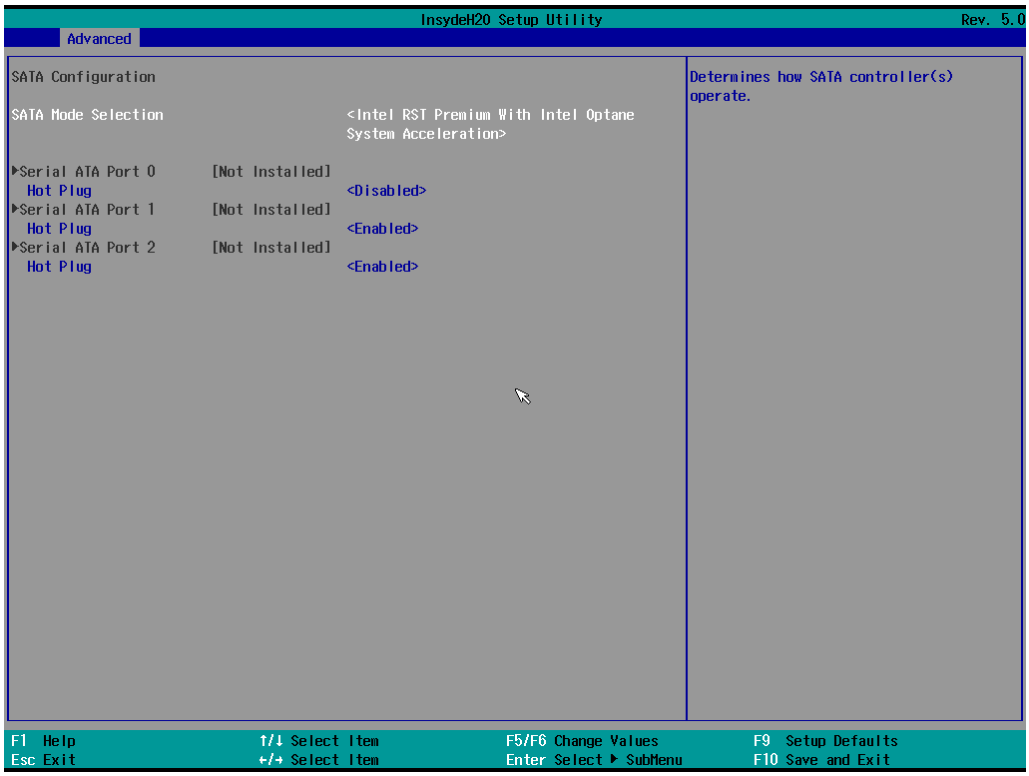
SATA Port—Hot Plug

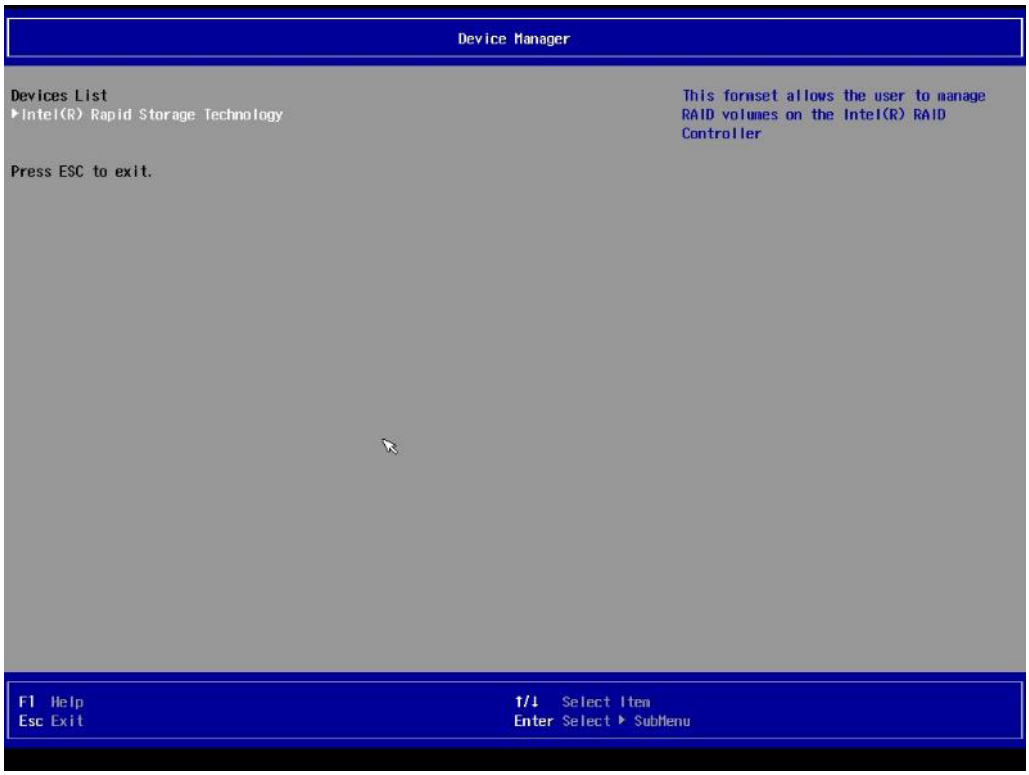
This item allows you to enable/disable hot-plugging capabilities (the ability to remove the drive while the computer is running) for the storage drives installed.

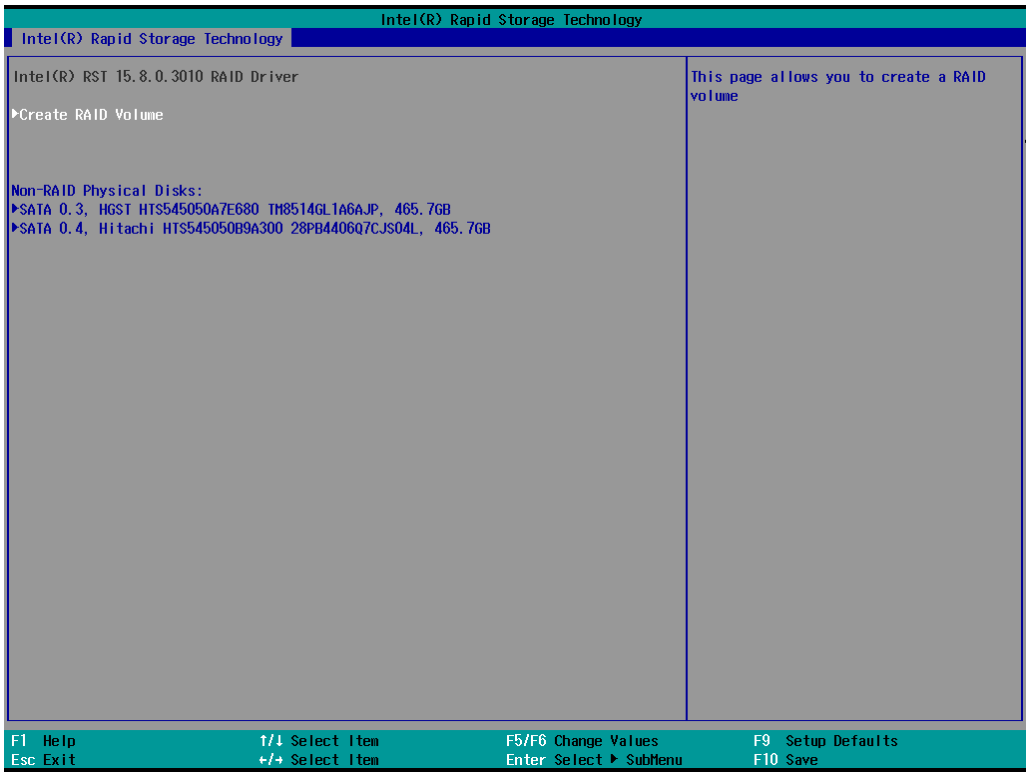
Options: Disabled (default for Port 0), Enabled (default for Port 1 and Port 2)

Intel Rapid Storage Technology

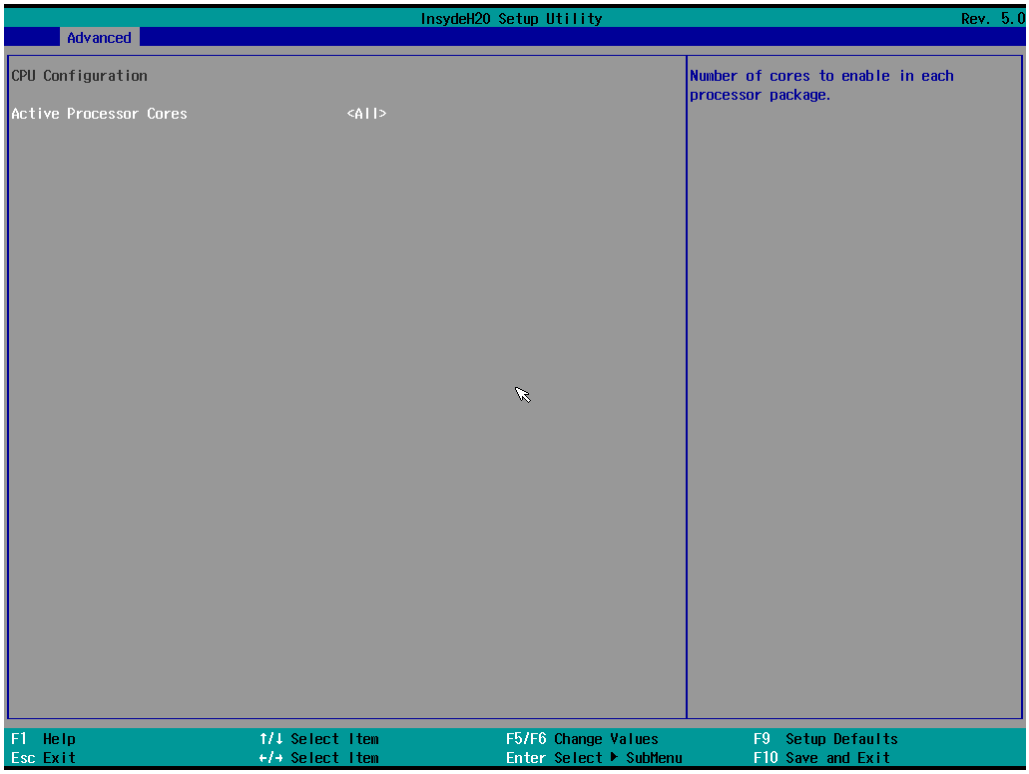
This option allows users to configure the Intel® Rapid Storage Technology. To configure the Intel Rapid Storage Technology settings, select the **Device Management** option when setting the Intel RST Premium mode, or saving changes and rebooting the computer.







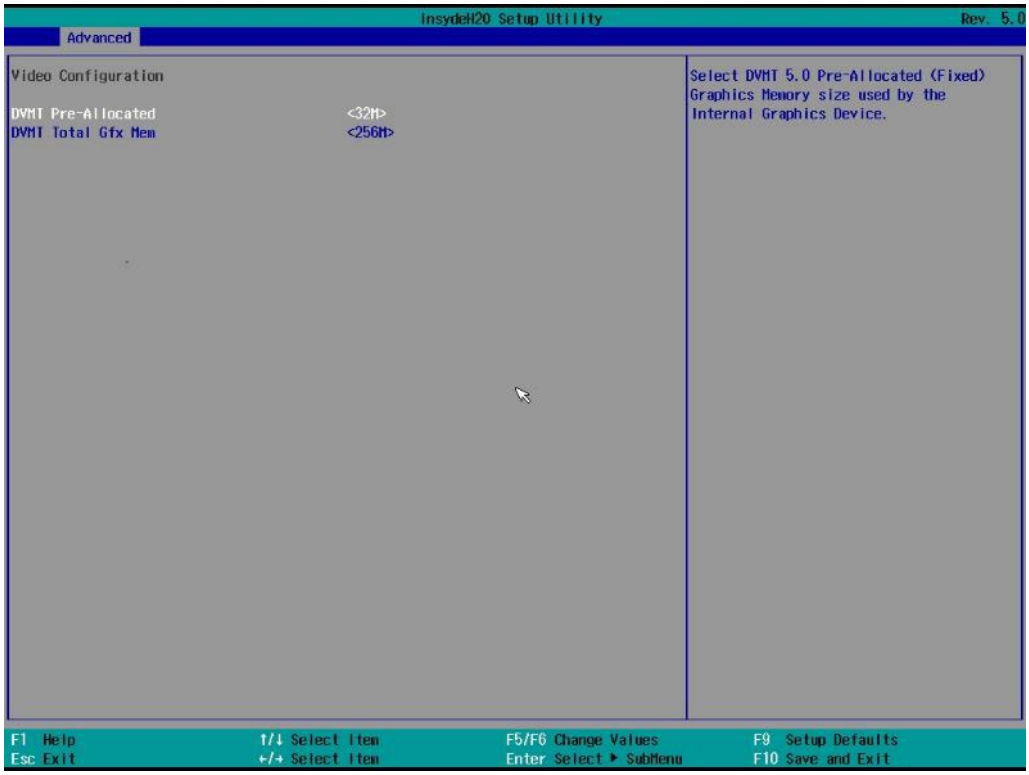
CPU Configuration



Active Processor Cores

This item indicates the number of cores that can be enabled in each processor package.

Video Configuration



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: 12M, 24M, 32M (default), 40M, 48M, 56M, 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.

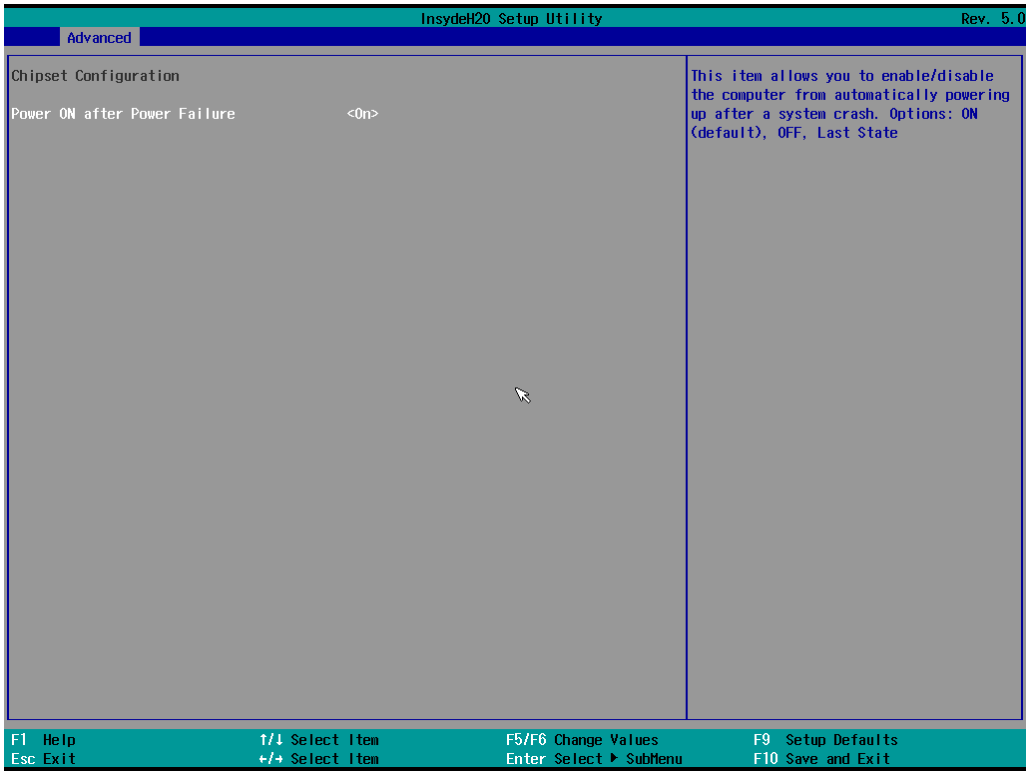
DVMT Total Gfx Mem

This 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.



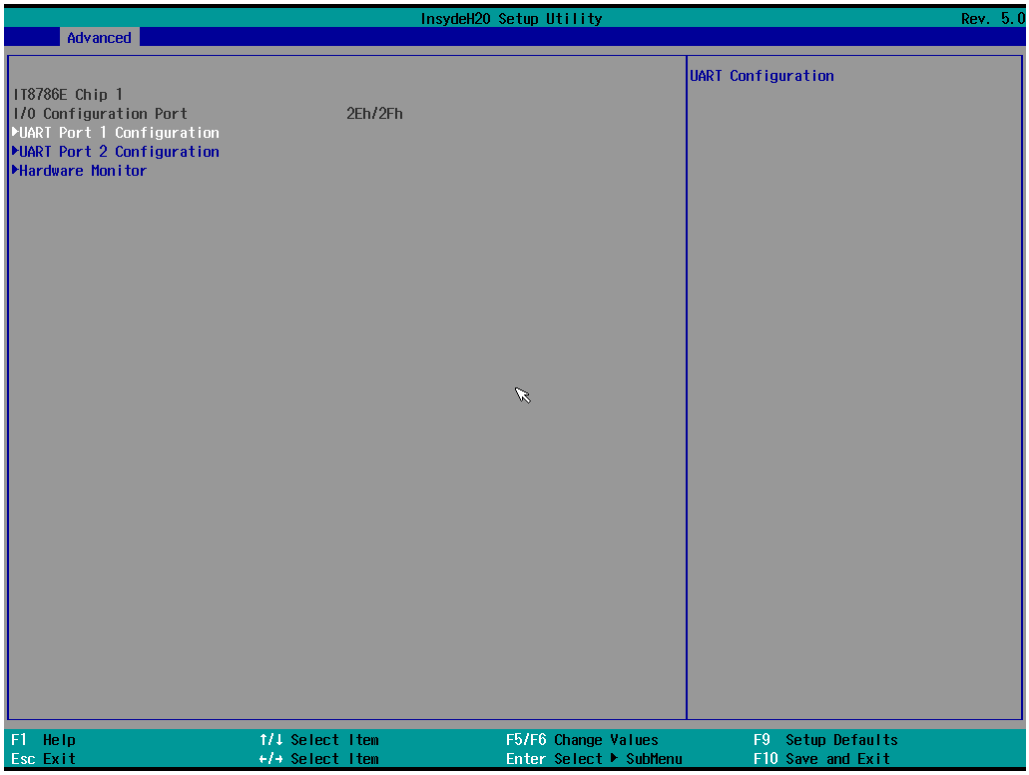
Power ON after Power Failure

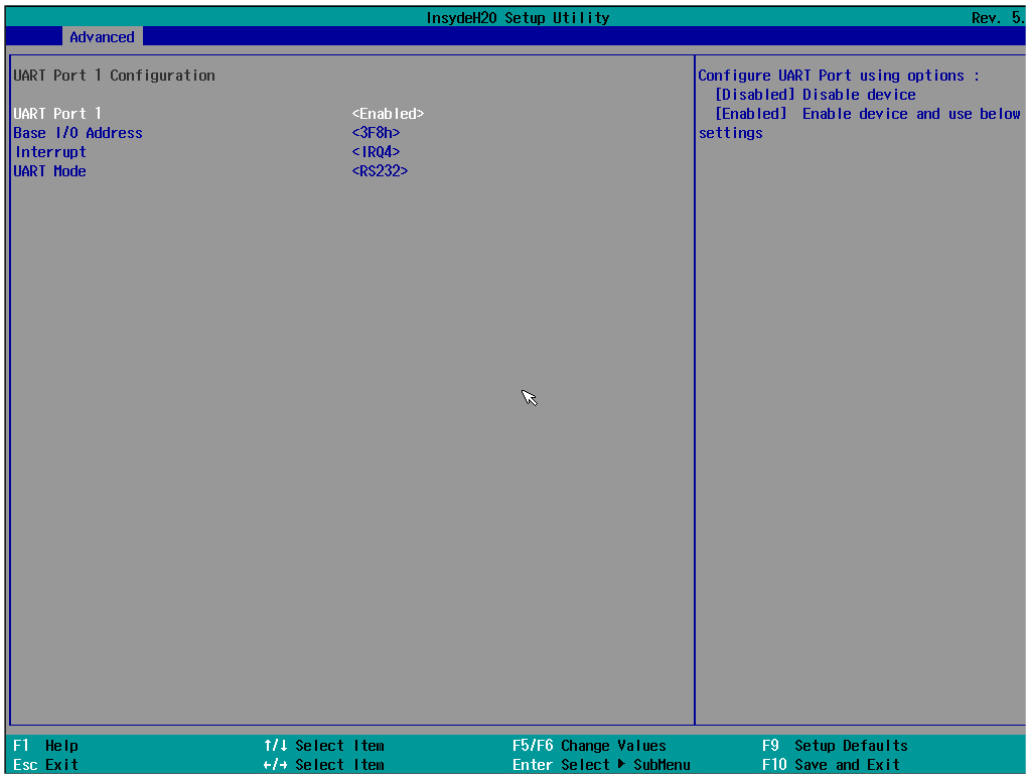
This option allows you to enable/disable the computer from automatically powering up after system power is re-enabled.

Options: ON (default), OFF, Last State

SIO ITE8786E

This option allows users to configure serial port settings.





UART Port 1 Configuration

UART Port 1

Options: Enabled (default), Disabled

Base I/O Address

Options: 3F8h (default), 2F8h

Interrupt

Options: IRQ4 (default), IRQ3

UART Mode

Options: RS232 (default), RS422, RS485

UART Port 2 Configuration

UART Port 2

Options: Enabled (default), Disabled

Base I/O Address

Options: 2F8h (default), 3F8h

Interrupt

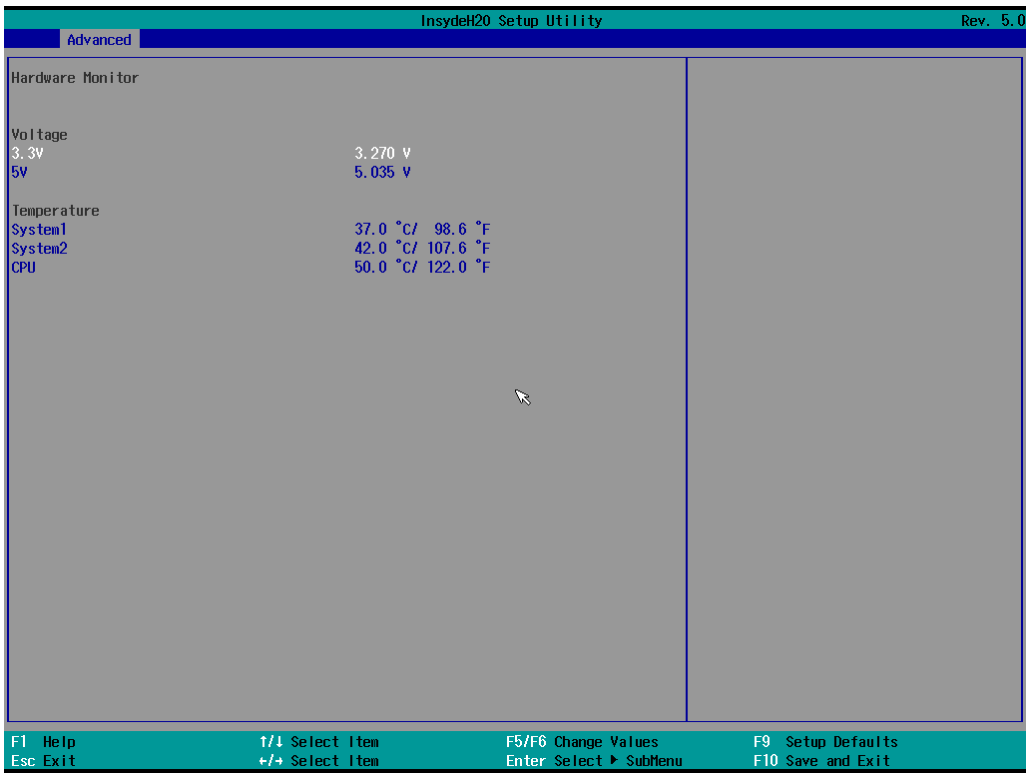
Options: IRQ3 (default), IRQ4

UART Mode

Options: RS232 (default), RS422, RS485

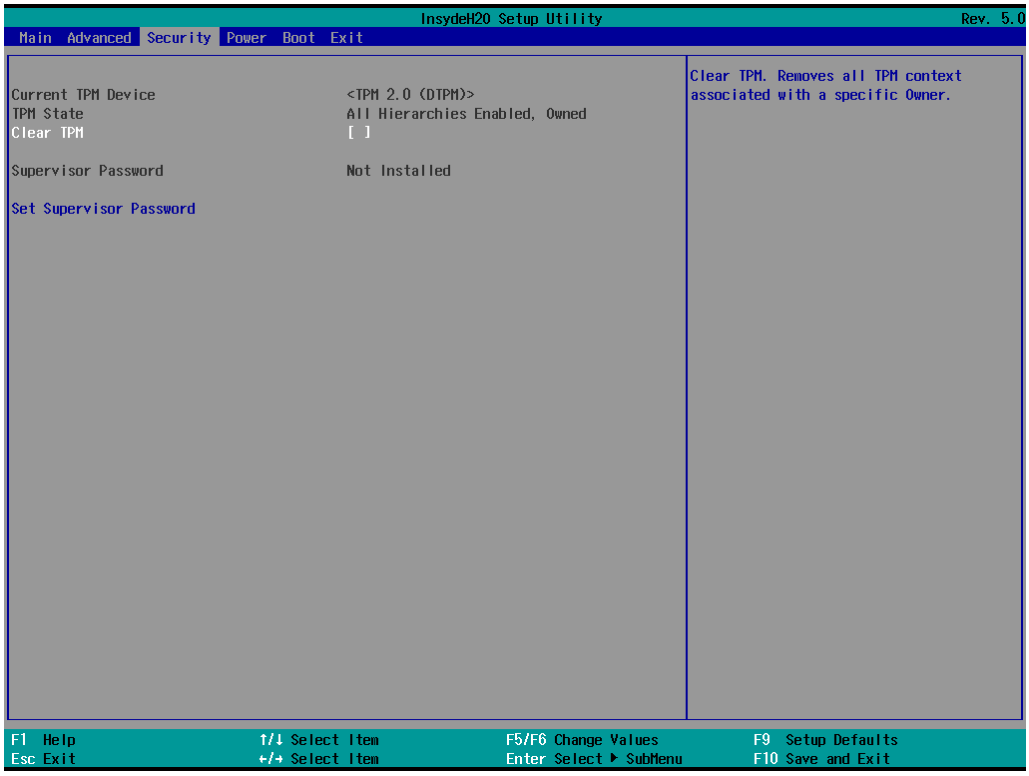
Hardware Monitor

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



Security Settings

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



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.

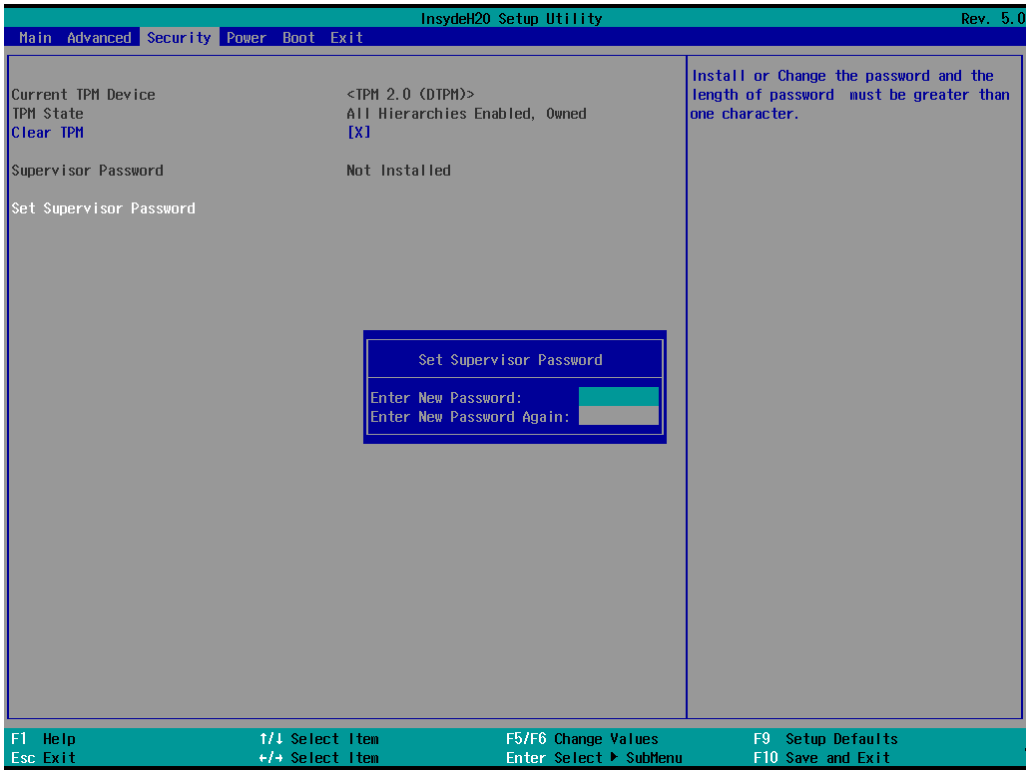
Clear TPM

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

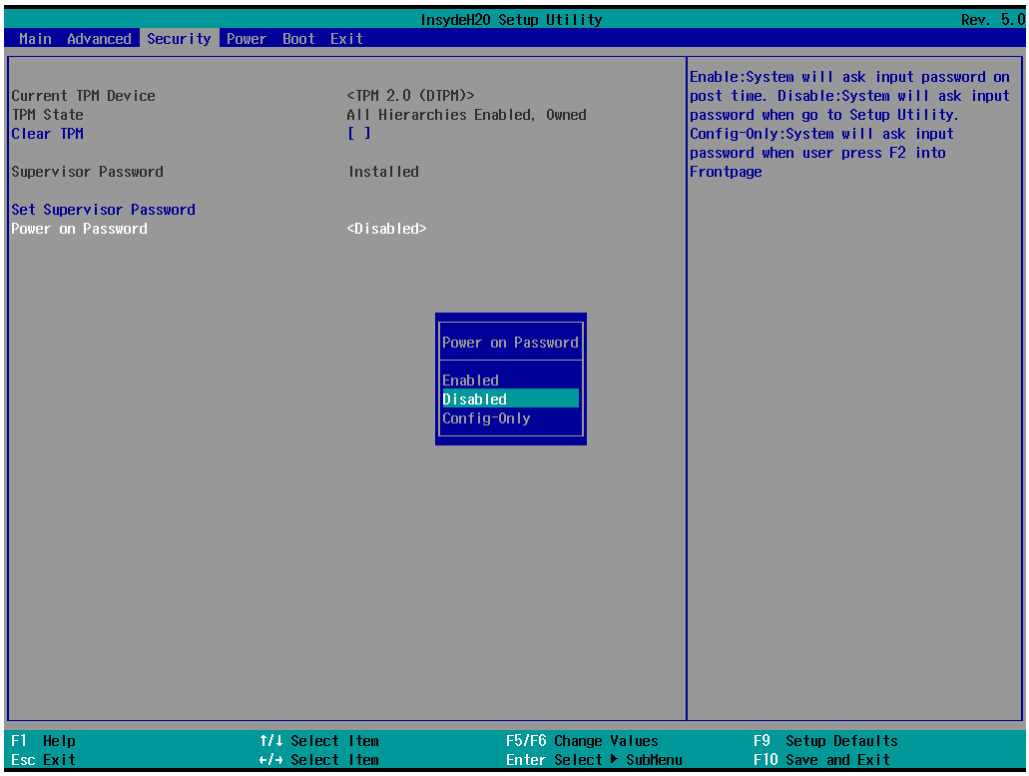
Set Supervisor Password

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.



After setting the supervisor password, users can choose when the input password screen will pop up.



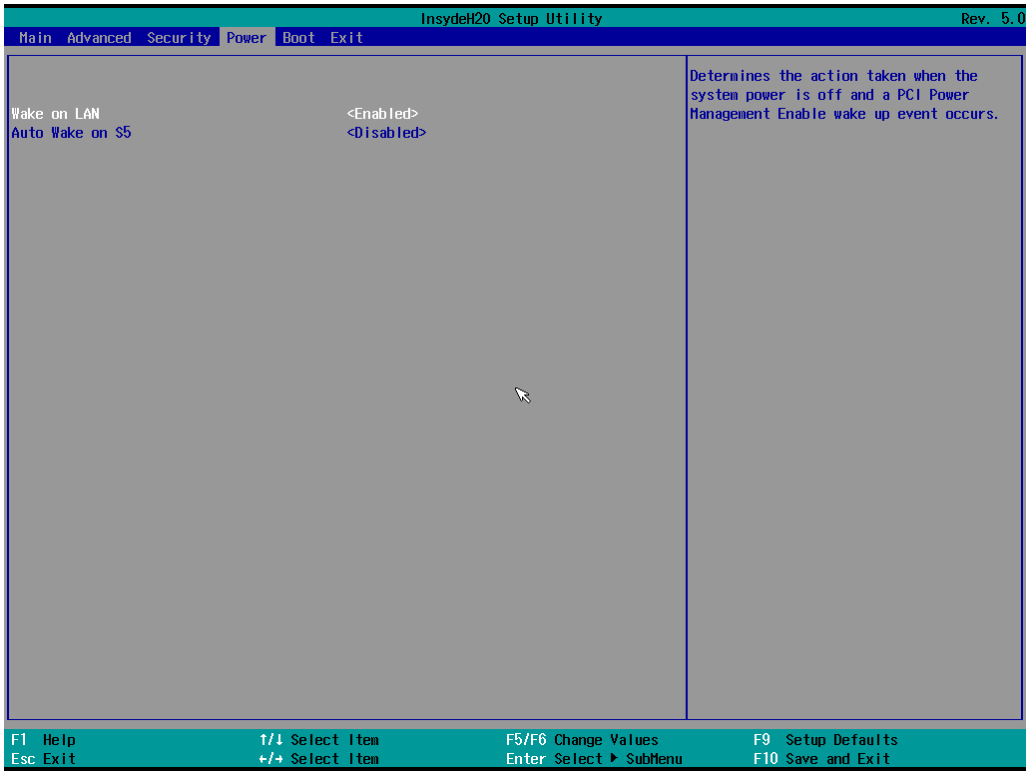
Enable: System will ask input password during post time.

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.



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

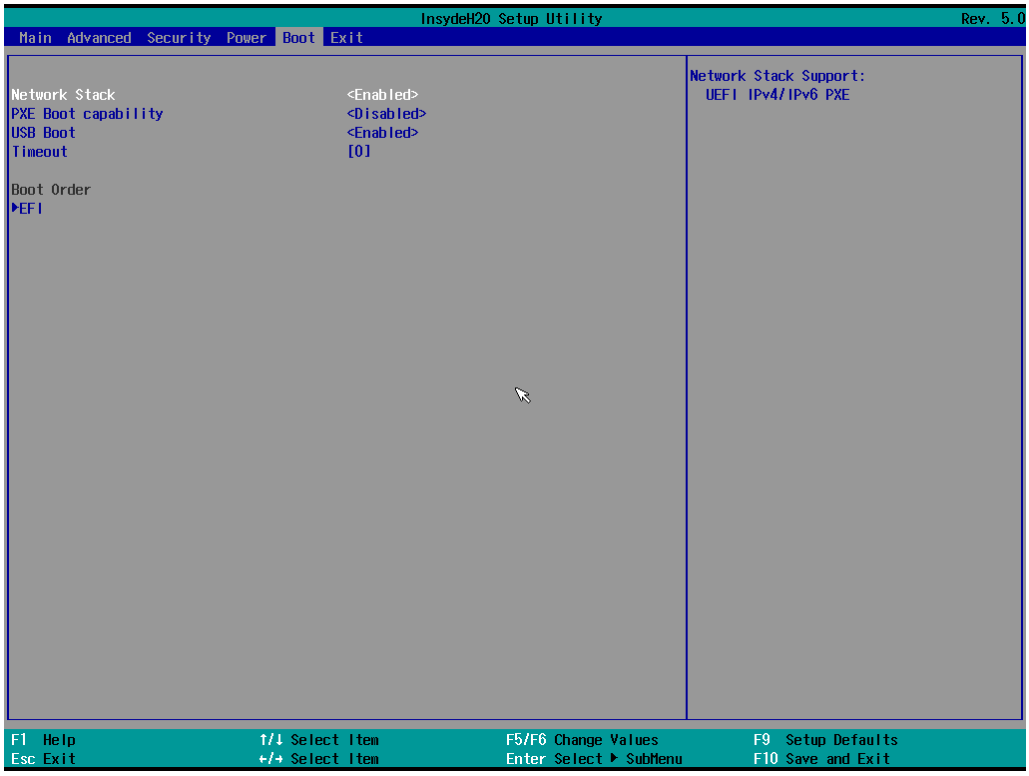
Auto Wake on S5

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.



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

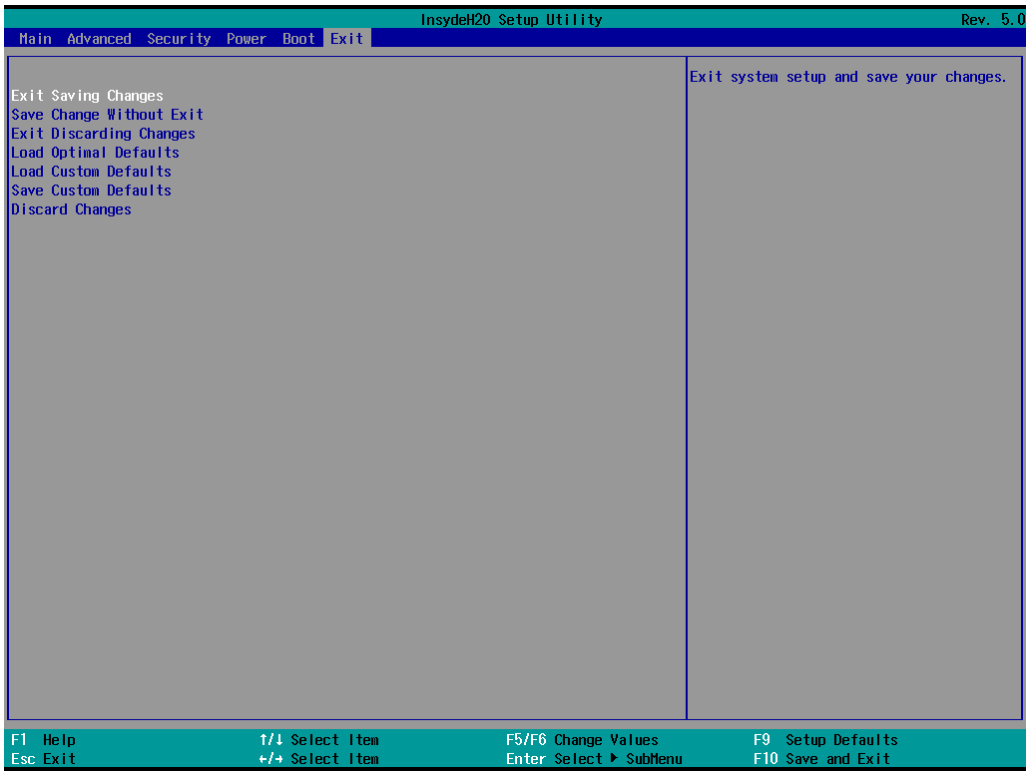
This option allows users to set the number of seconds that the firmware will wait before booting the system with the default boot selection.

EFI

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

Exit Settings

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



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

Upgrading the BIOS

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

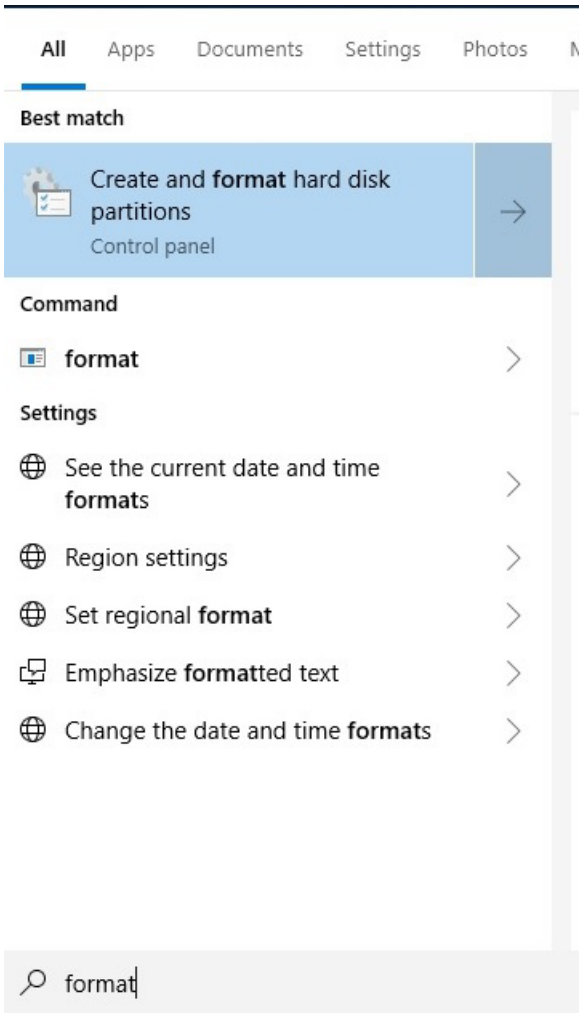
NOTE

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

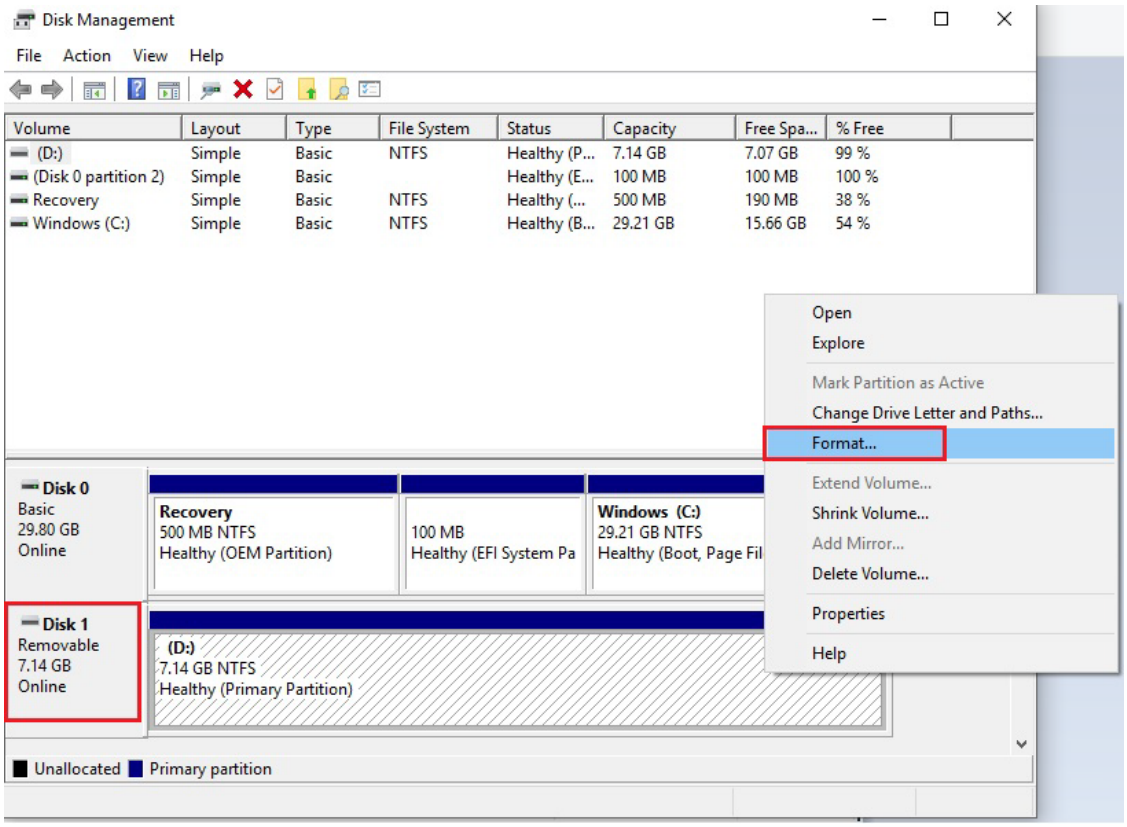
Step 1: Create a Bootable USB Disk

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

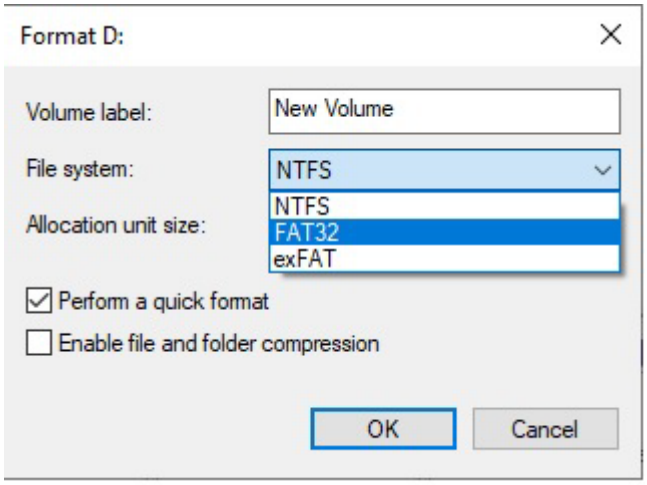
1. Search for "format" and select Create and format hard disk partitions.



2. Right click on the USB disk and select Format.



3. 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.

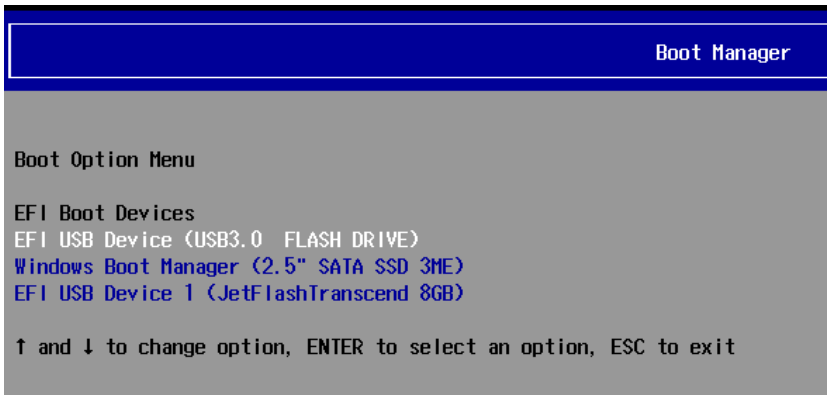
1. Get the BIOS upgrade file (includes an **efi** folder and an **xxxx.efi** file)
2. Copy the **efi** folder and **xxxx.efi** file to the bootable USB disk.

Step 3: Run the Upgrade Program on the Computer

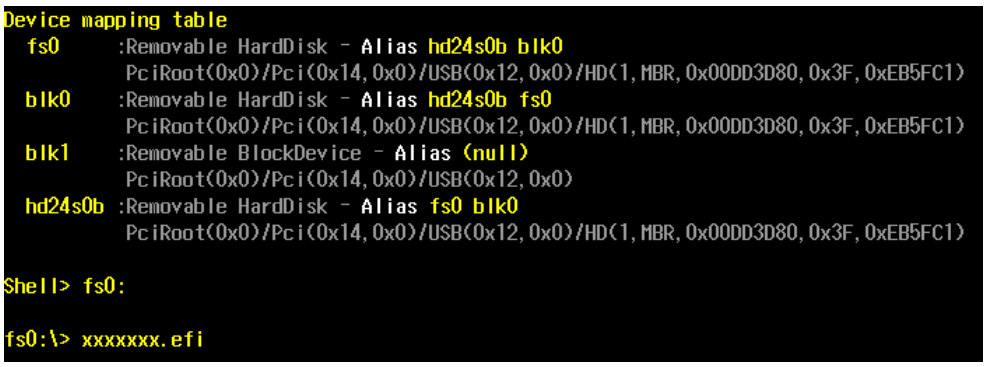
1. Reboot the computer from the USB device and press **F2** while it is booting up to go to the Boot Manager.

   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.

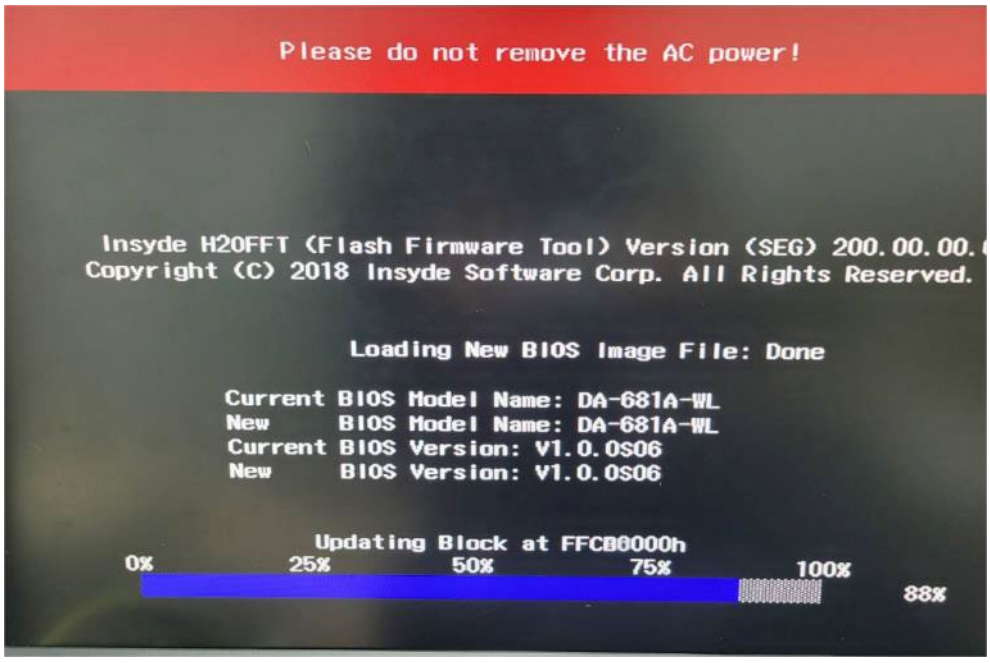
2. Select the USB disk to boot from.



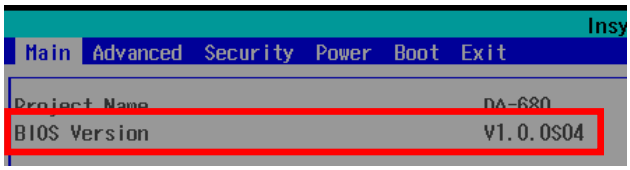
3. In the SHELL environment console, type **fs0:**, then go to the directory where the upgrade file is located and type **xxxxxx.efi** (the name of the file is based on the upgrade file you get from Moxa).



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



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



   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-E6C69977AC02,0x134000,0x3A6E800)
  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 located the upgrade file and run it.

```
fs0:\> fs1:

fs1:\> cd BIOS

fs1:\BIOS> ls
Directory of: fs1:\BIOS

  12/22/22  06:09p <DIR>          4,096  .
  12/22/22  06:09p <DIR>              0  ..
  10/05/22  02:09p          34,487,824  BIOS.efi
         1 File(s)  34,487,824 bytes
         2 Dir(s)


fs1:\BIOS>
```

ATTENTION

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

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 the same type and rating of fuse.

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).