DA-680 Series Hardware User Manual

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www.moxa.com/products

DA-680 Series Hardware User Manual

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1. Introduction

Thank you for purchasing the Moxa DA-680 industrial computer, a multi-functional embedded computer designed specifically for IEC 61850-3 substation automation systems.

This manual covers hardware installation, connector interfaces, and BIOS setup of the DA-680. For software configuration and management, please refer to the user manual for the operating system on your computer.

Overview

The DA-680 computer is built around an Intel® Core™ i3 processor and comes with 8 Gigabit Ethernet ports, 1 VGA port, 8/16 isolated RS-485 serial ports, and 5 USB ports. Additionally, one 2.5” HDD/SSD slot and one mSATA slot are included to enable storage expansion for industrial applications that require large storage space for edge data acquisition. With IEC 61850-3, IEEE 1613, and IEC 60255 compliance, the DA-680 is sure to deliver stable and reliable system operation for power applications.

Model Descriptions and Package Checklist

The DA-680 Series includes the following models:

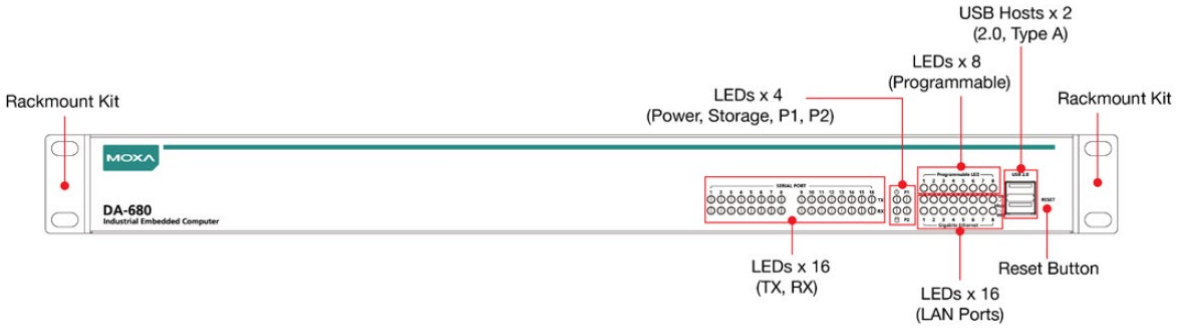
- **DA-680-I-8-WL3-HH:** 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 8 RS-485 ports, mSATA, SATA, USB, dual Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- **DA-680-I-8-WL3-H:** 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 8 RS-485 ports, mSATA, SATA, USB, single Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- **DA-680-I-16-WL3-HH:** 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 16 RS-485 ports, mSATA, SATA, USB, dual Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- **DA-680-I-16-WL3-H:** 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 16 RS-485 ports, mSATA, SATA, USB, single Power, without RAM, mSATA and OS, -25 to 55°C operating temperature

Each basic system model package includes the following items:

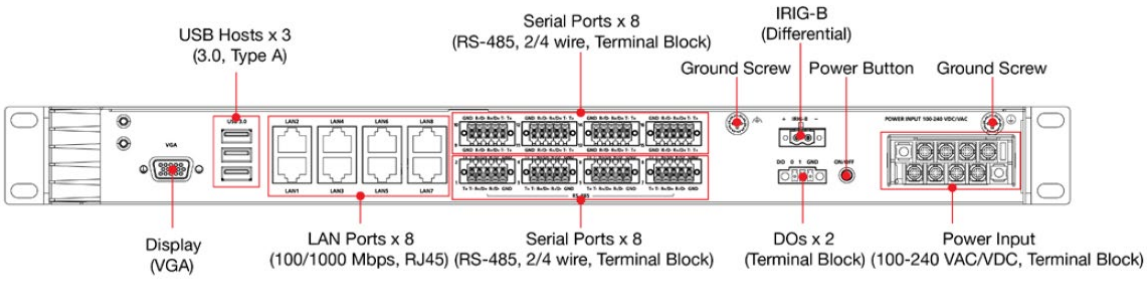
- DA-680 rackmount computer
- Rack-mounting kit
- Quick Installation Guide (printed)
- Warranty card

Appearance

Front View

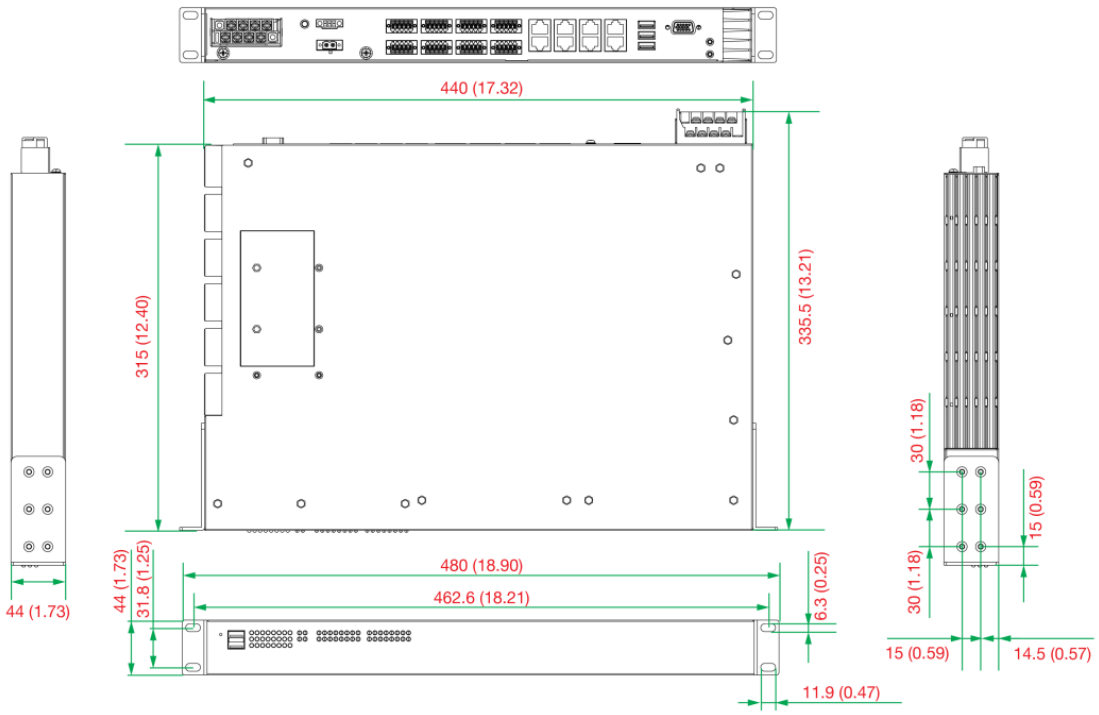


Rear View



Dimensions

Unit: mm (inch)



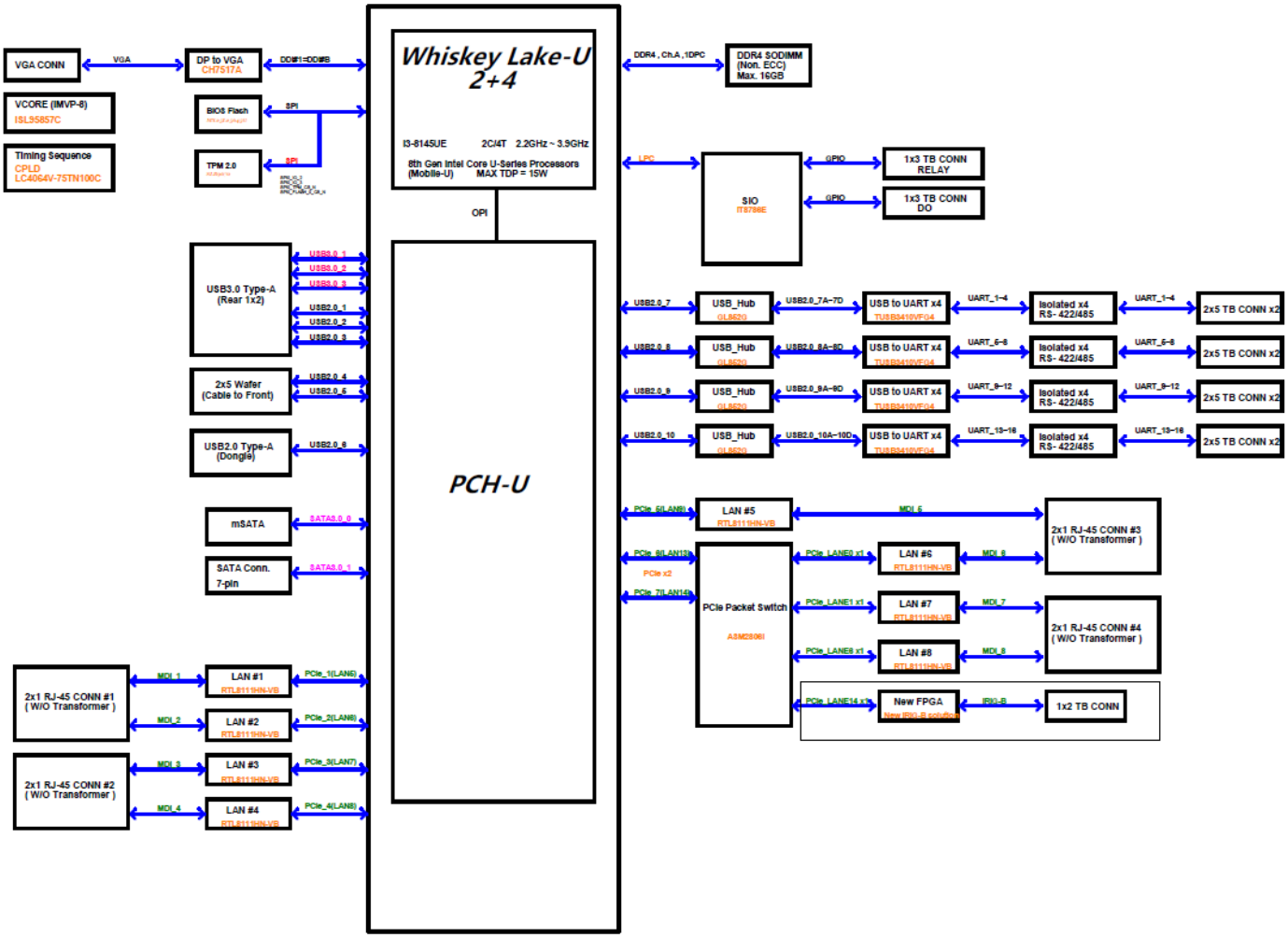
Features

The DA-680 computer comes with the following features:

- IEC 61850-3, IEEE 1613, and IEC 60255 compliance for power substation automation systems
- 8th Gen Intel® Core™ processor
- 1 built-in DDR4 memory socket
- 1 mSATA for installing OS and 1 SSD/HDD for storage expansion
- 8 Gigabit Ethernet ports for network redundancy
- 5 USB ports for connecting high-speed peripherals
- 8 or 16 isolated RS-485 ports
- Supports both 100 to 240 VAC and 100 to 240 VDC power inputs (single power and dual-power models available)

Hardware Block Diagram

DA-680 Basic System



Hardware Specifications

NOTE

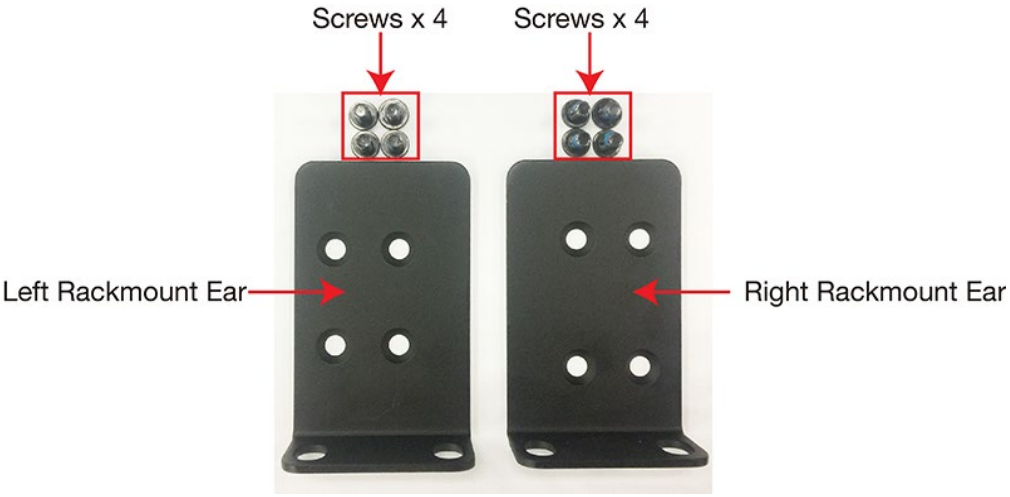
The latest specifications for Moxa's products can be found at https://moxa.com.

2. Hardware Installation

The DA-680 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-680 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-680 embedded computers.

Installing Rack-mounting Ears

The DA-680 computer comes with a rack-mounting kit for installing the computer on a rack. The rack-mounting kit includes 2 rack-mounting ears and 8 screws (size: M4x8 mm), 4 screws for each mounting ear.



NOTE

The two rack-mounting ears are not identical. Refer to the diagram above to identify the correct left and right rack-mounting ears and ensure that you use them correctly to mount the computer.

Follow the instructions below to install the computer.

1. Attach the left rack-mounting ear to the left side of the DA-680 computer and secure the four screws.
2. Attach the other rack-mounting ear to the right side of the computer and secure it with the four 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.

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.

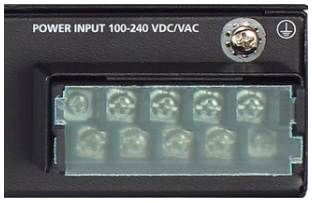
External metal parts of this equipment are extremely hot!! Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

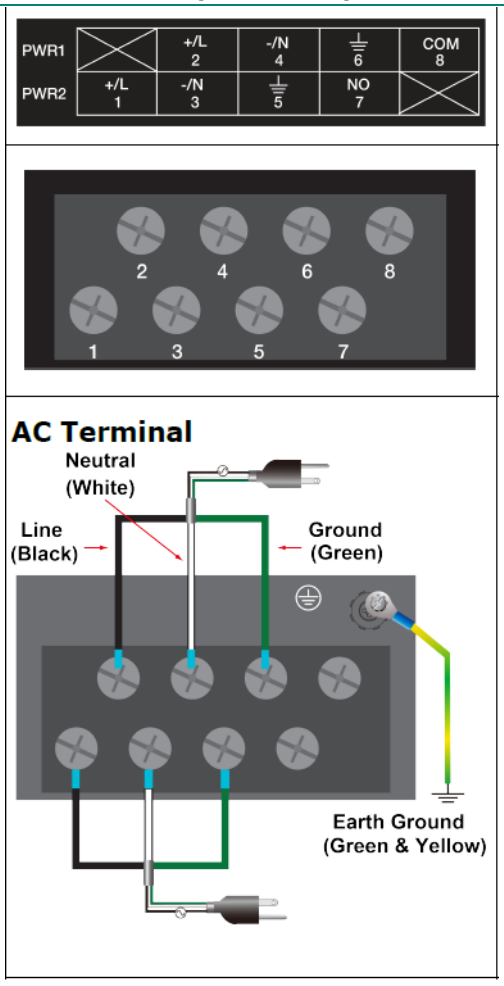
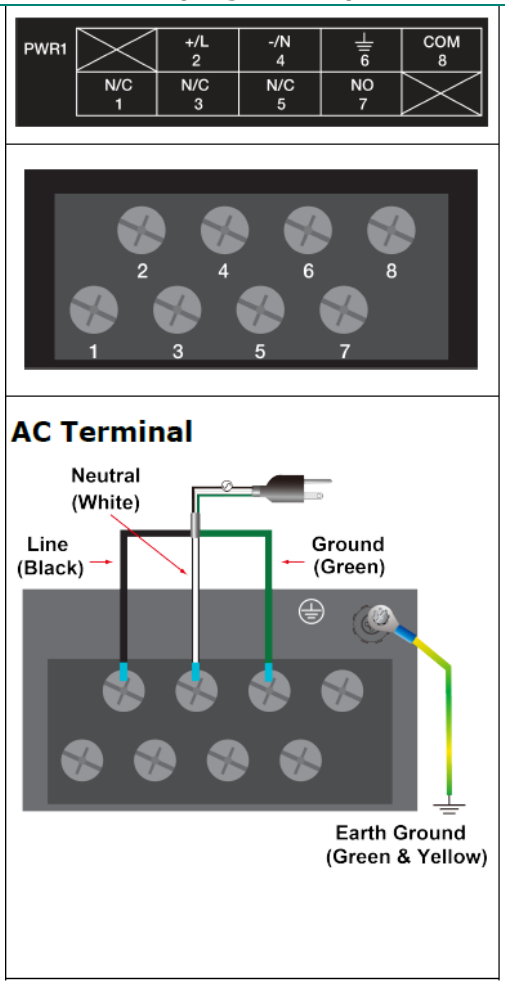
Connecting the Power

The DA-680 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-680, 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-680 computer. The table uses the reference numbers in the diagram to identify the lines in the terminal blocks.



HH (Dual Power)	H (Single Power)
	

H 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.

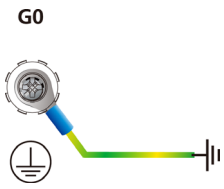
HH Model Power Terminal Block Pin Assignment

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 can be used to power the computer when it is in 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.

LED

There are 60 LED indicators on the front panel.

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

LED	Color	Description
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
Serial Port TX 1-12	Green	Serial port is transmitting data
	Off	Not operating
Serial Port RX 1-12	Yellow	Serial port is receiving data
	Off	Not operating
Programmable 1-6	Green	Defined by user

Connecting to Displays

The DA-680 comes with 1 VGA interface on the rear panel for connecting a display.

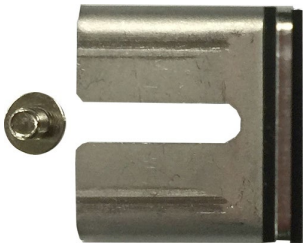
Connecting USB Devices

The DA-680 comes with 2 USB 2.0 ports on the front panel and 3 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.

Installing a USB Dongle Kit

You can use a USB dongle kit to secure your USB dongle inside your DA-680 computer.

The USB dongle kit includes a USB plate and a screw.

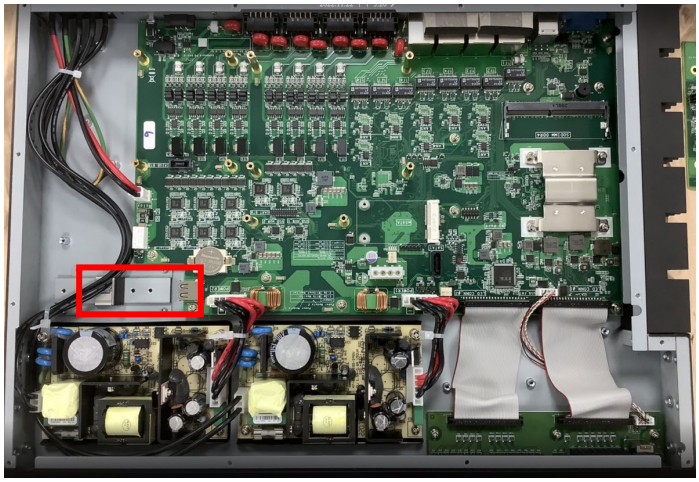


NOTE

The USB dongle kit is an optional accessory that can be purchased separately.

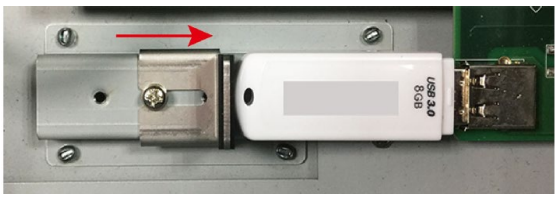
To install a USB dongle kit, do the following:

1. Power off the DA-680 computer and remove the top cover of the computer.
2. Find the location of the USB slot.



3. Attach the USB device to the USB port inside the DA-680 computer.

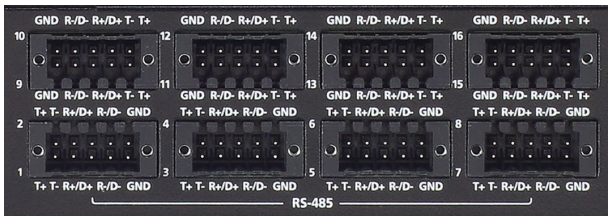
   Place the USB plate on the rail and push right to the USB device as close as possible. Finally, fasten the screw on the plate.



4. Put back the top cover of the computer.

Serial Ports

The DA-680 comes with 10 serial ports that support RS-485 mode that use terminal blocks. The pin assignments are printed on the rear cover of the product for your reference.

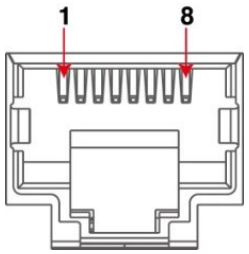


Gigabit LAN Ports

The DA-680 has 8 Gigabit LAN ports. When a LAN cable is properly connected, the LEDs on the front panel will glow to indicate the connection status.

Refer to the following figure and table for the pin sequence and definitions.

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)-



Digital Outputs

The DA-680 is provided with two digital outputs in a terminal block. Refer to the following figure for the location of the DO connectors.

Digital Output	
Output Channels	2 x sink type
Output Current	Max. 200 mA per channel
On-state Voltage	24VDC nominal, open collector to 30VDC
Isolation	3 KV optical isolation
Connector	Screw-fastened Terminal Block

Relay Output

The DA-680 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.

HH Model					
PWR1		+/L 2	-/N 4	⏚ 6	COM 8
PWR2	+/L 1	-/N 3	⏚ 5	NO 7	

H Model					
PWR1		+/L 2	-/N 4	⏚ 6	COM 8
	N/C 1	N/C 3	N/C 5	NO 7	

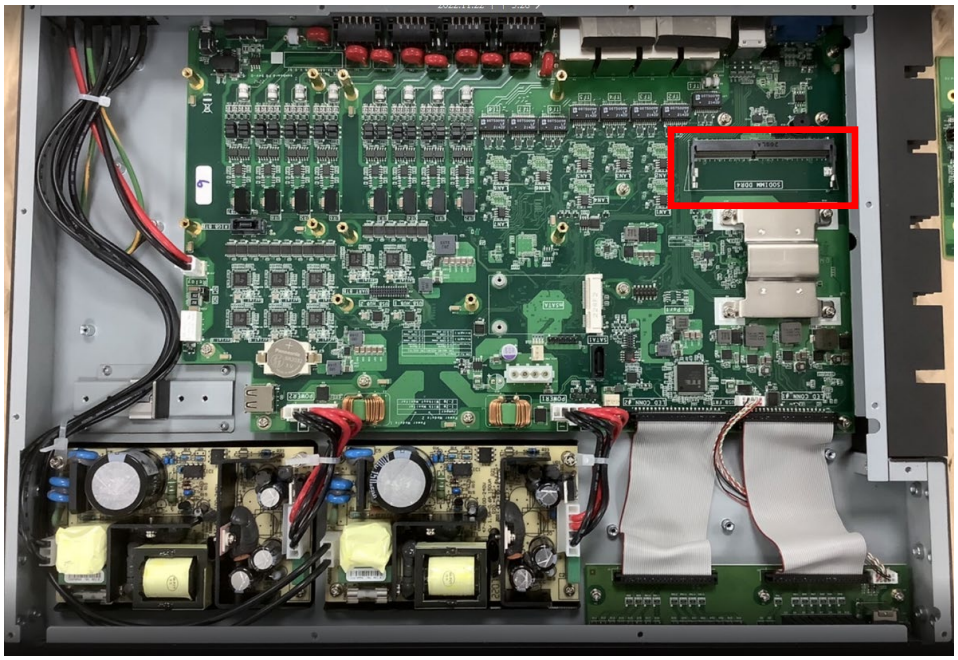
Terminal Number	Description	Note
7	NO	Normal open pin for the alarm relay.
8	COM	**COM** pin for the alarm relay.

	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-680 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-680 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.

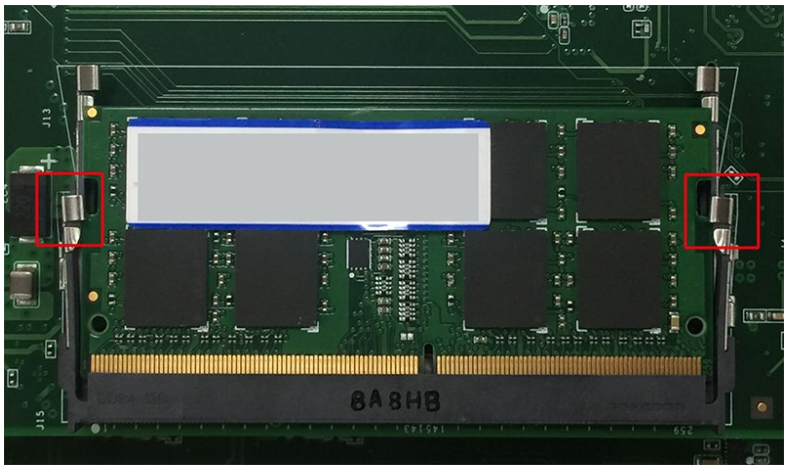


4. Install the new memory module in the slot.

   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.

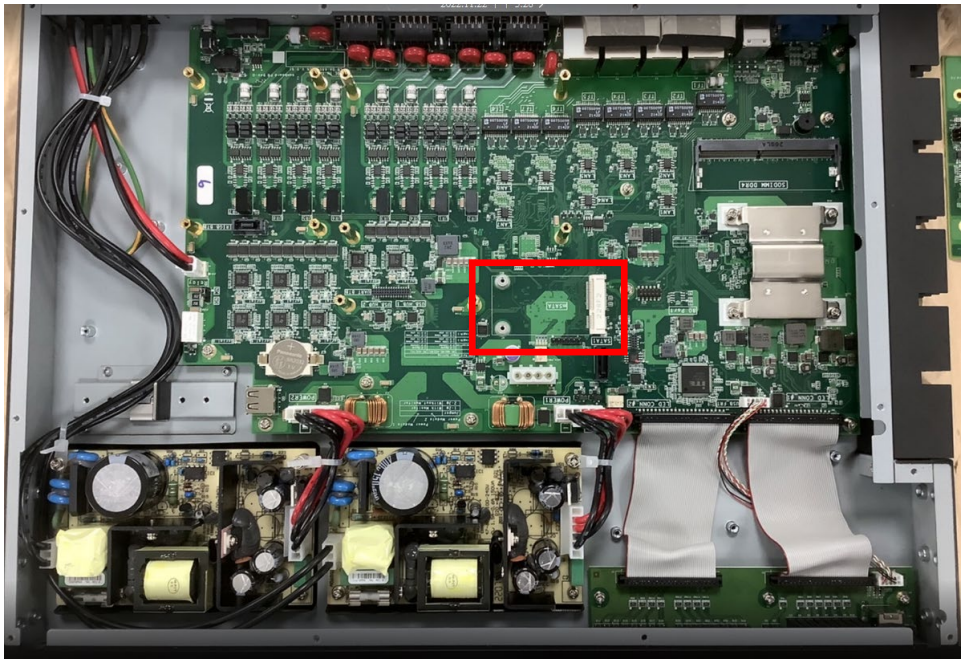


5. Replace the top cover of the computer and fasten the screws.

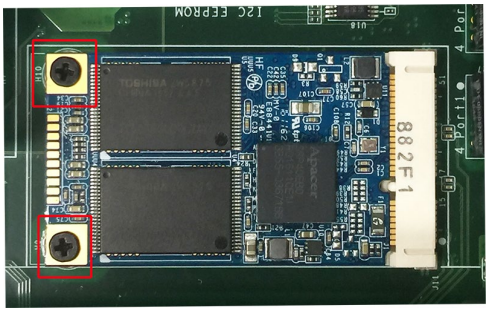
Installing a mSATA Storage Card

The DA-680 embedded computer comes with a mSATA slot. To install a mSATA storage card, do the following:

1. Disconnect the DA-680 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.



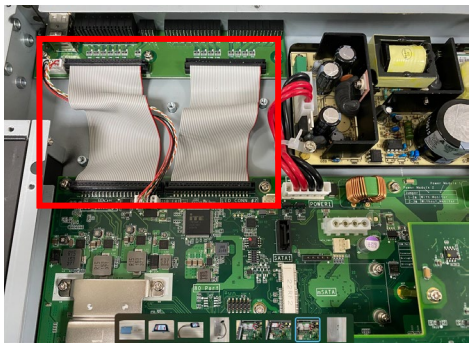
5. Replace the top cover of the computer and fasten the screws.

> **ATTENTION**
>
> The DA-680 rackmount computer does not support hot swap and plug and play functions for the mSATA storage card. You must disconnect the power source from the computer before inserting or removing the mSATA storage card.

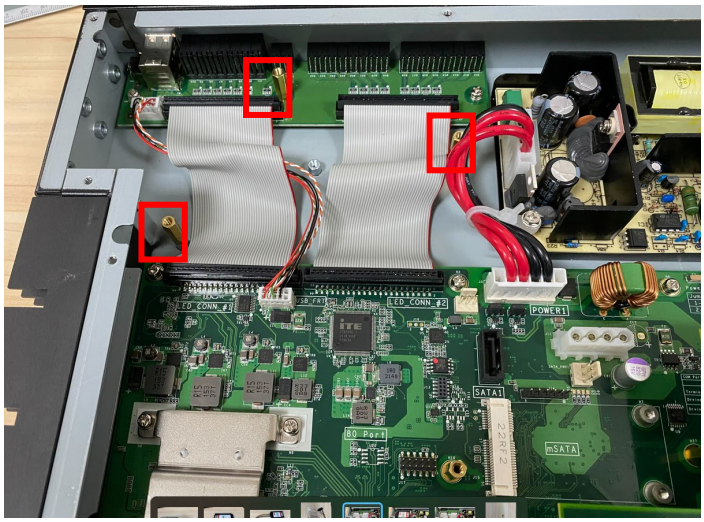
Installing SATA Hard Disks

The DA-680 comes with one SATA slot that allows users to install a 2.5” SATA HDD/SSD. Follow these steps to install a SATA disk.

1. Disconnect the DA-680 from its power source.
2. Unfasten the screws on the top of the computer, and then take off the top cover.
3. Find SATA HDD/SSD location.

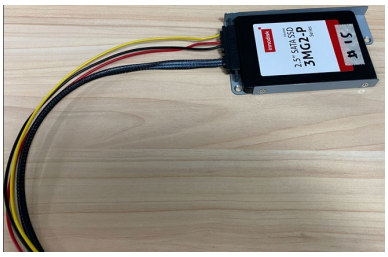


4. Remove screw and install 3 copper pillars as follow:

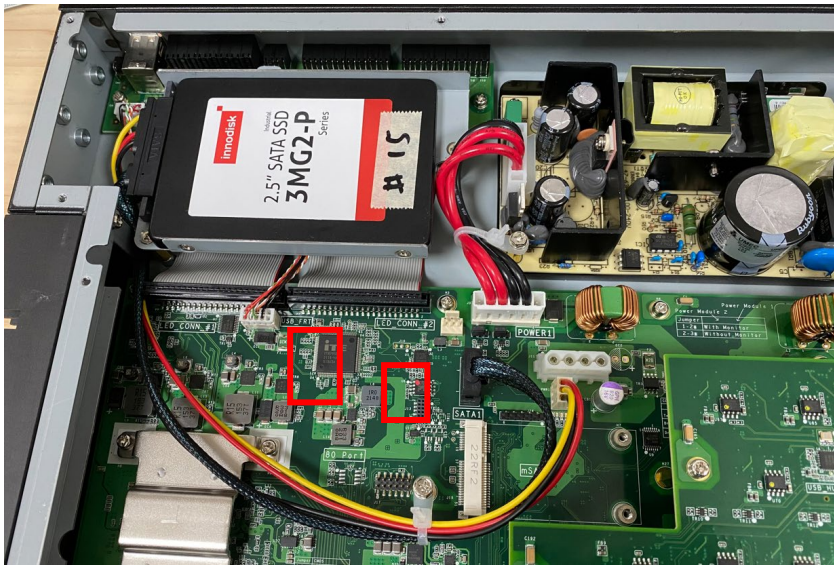


5. You should order the accessory kit and it will include tray, screw and cables as follow:

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



7. Put this tray on the pillars and screw. Connect the cable to the PCB board as follow:



3. BIOS Setup

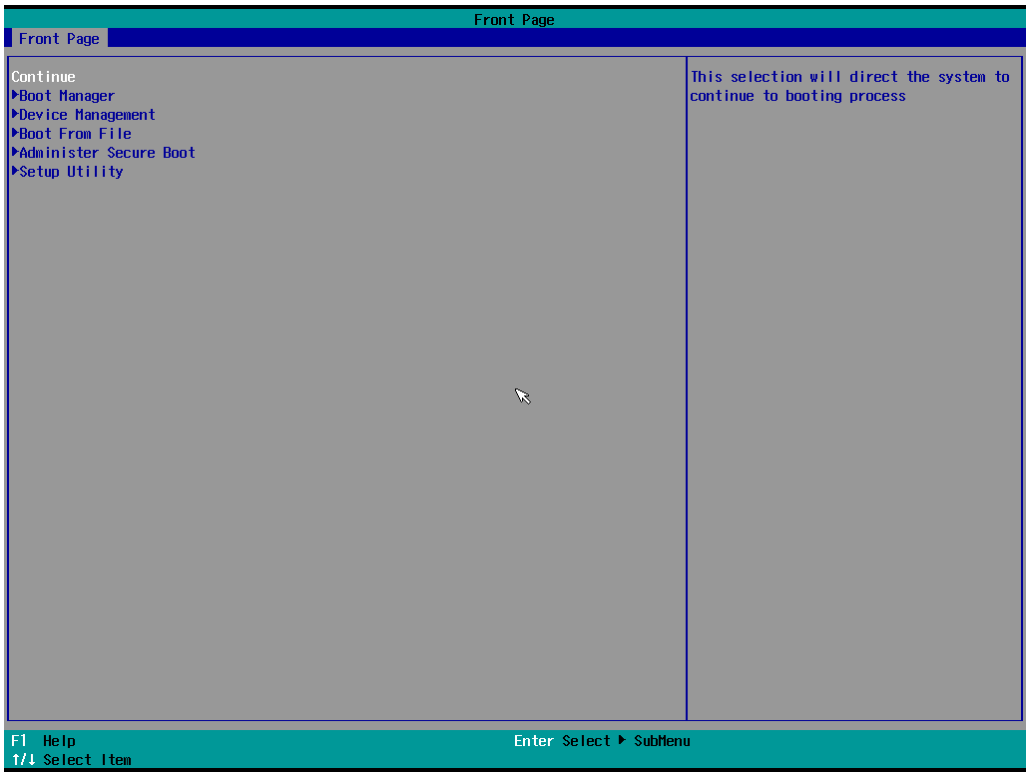
This chapter describes the BIOS settings of the DA-680 computer. The BIOS is a set of input/output control routines for peripherals, which are used to initialize system peripherals before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these peripherals' 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
- **Administer Secure Boot:** Enter the secure boot menu
- **Setup Utility:** Enter the BIOS configuration menu
- **Intel® Management Engine BIOS Extension:** Enter the AMT configuration menu

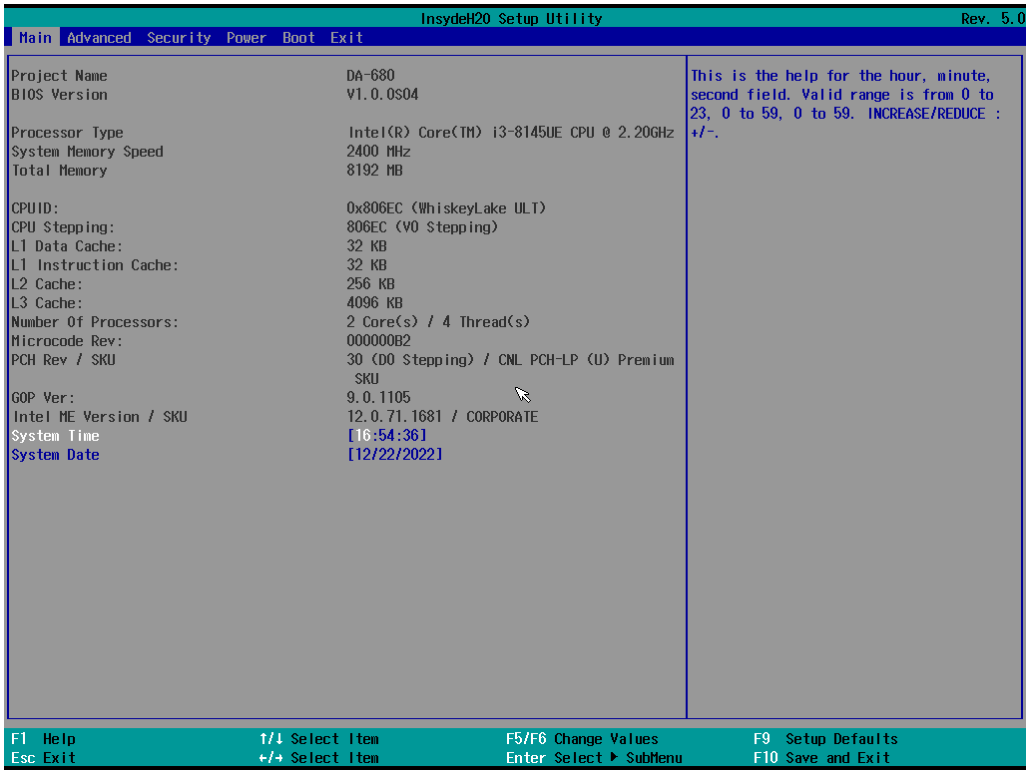
Select **F2** to enter the **BIOS configuration**.



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.

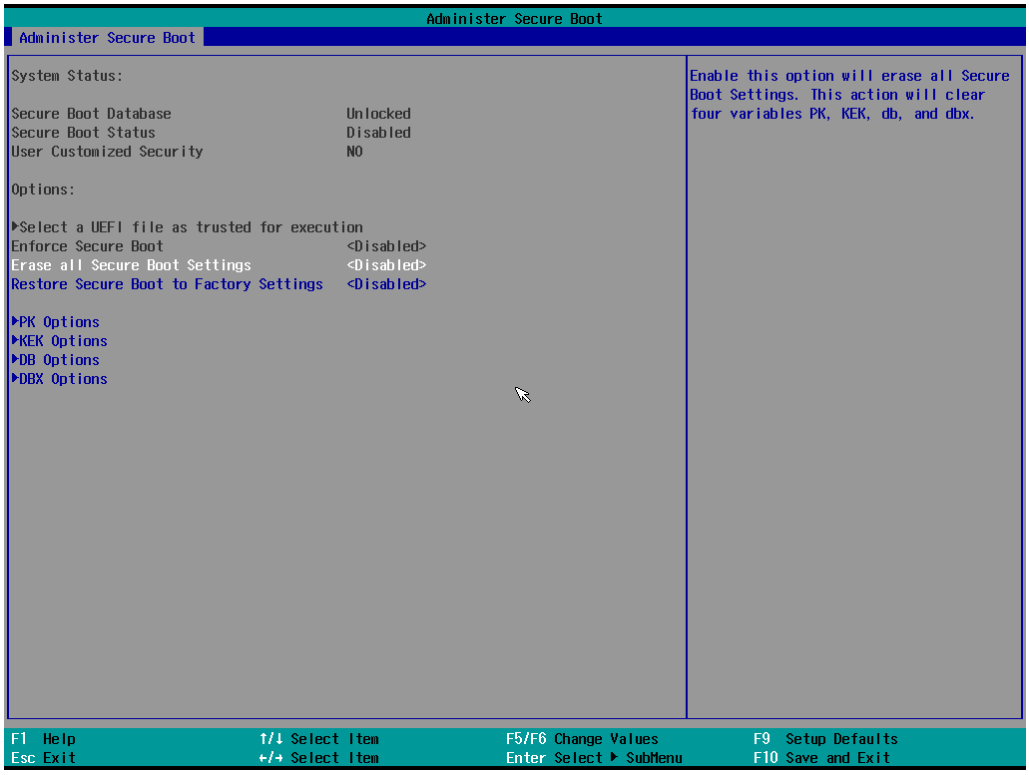


NOTE

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

Administer Secure Boot

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

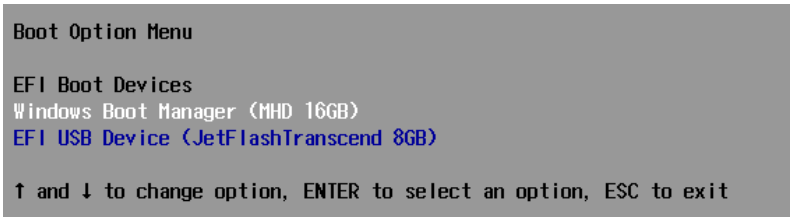


UEFI Secure Boot enable

Please set as “enabled” in “Restore Secure Boot to Factory Settings” under Administer Secure Boot menu.

Press F10 as save and exist.

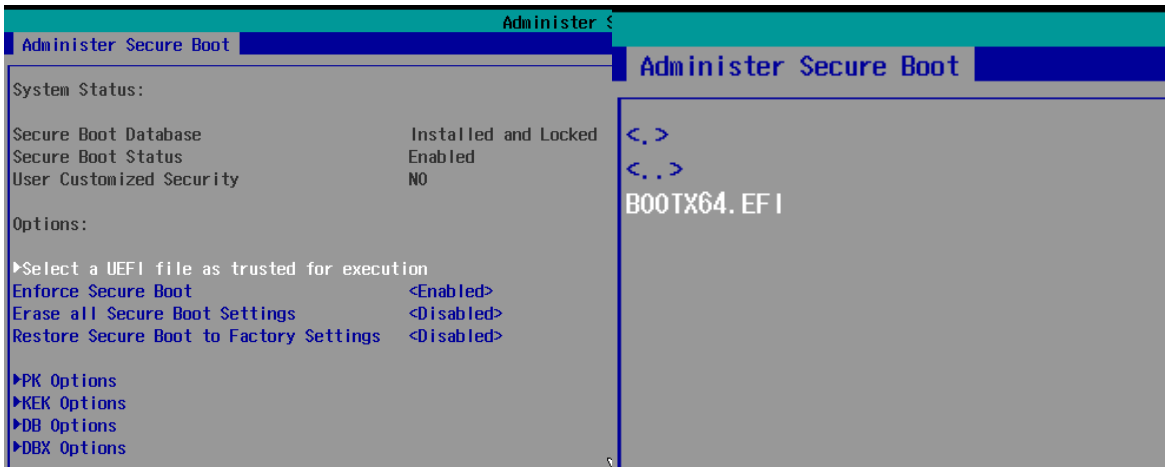
Moxa has included the Microsoft key in the BIOS by default. If you cannot boot up the computer using a non-Windows OS, use the following examples.



Enroll EFI Image

Enter into "Administer Secure Boot" once again and see "Select a UEFI file as trusted for execution", put loader into database which named and followed 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)

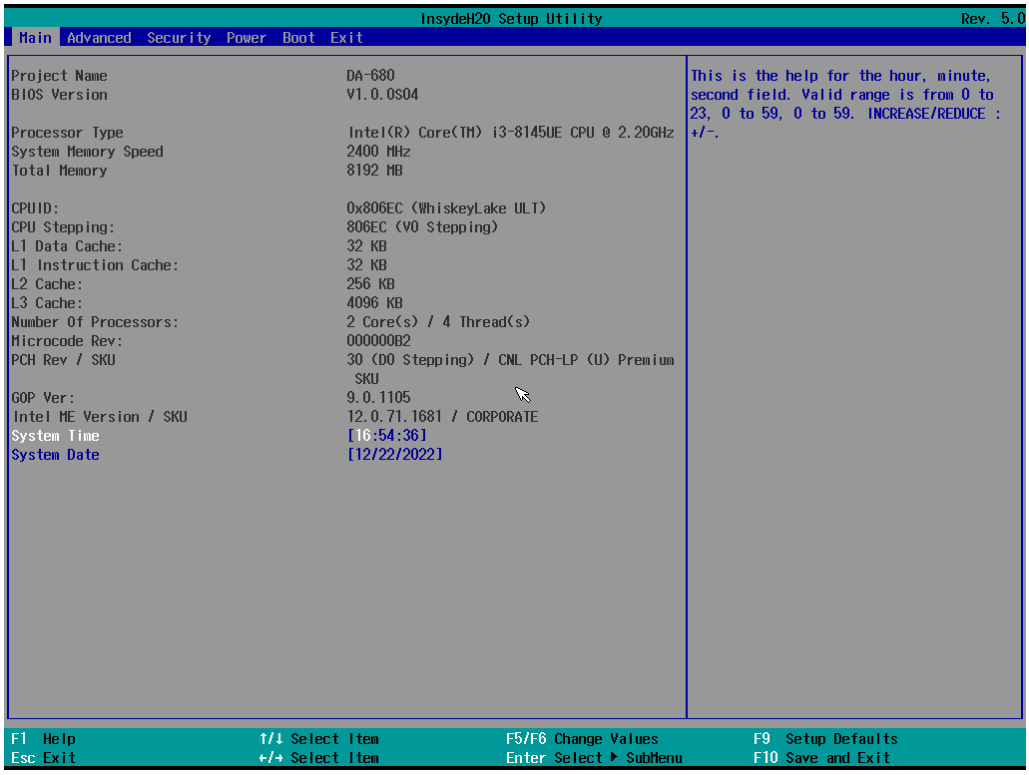


Enroll Customer Key

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

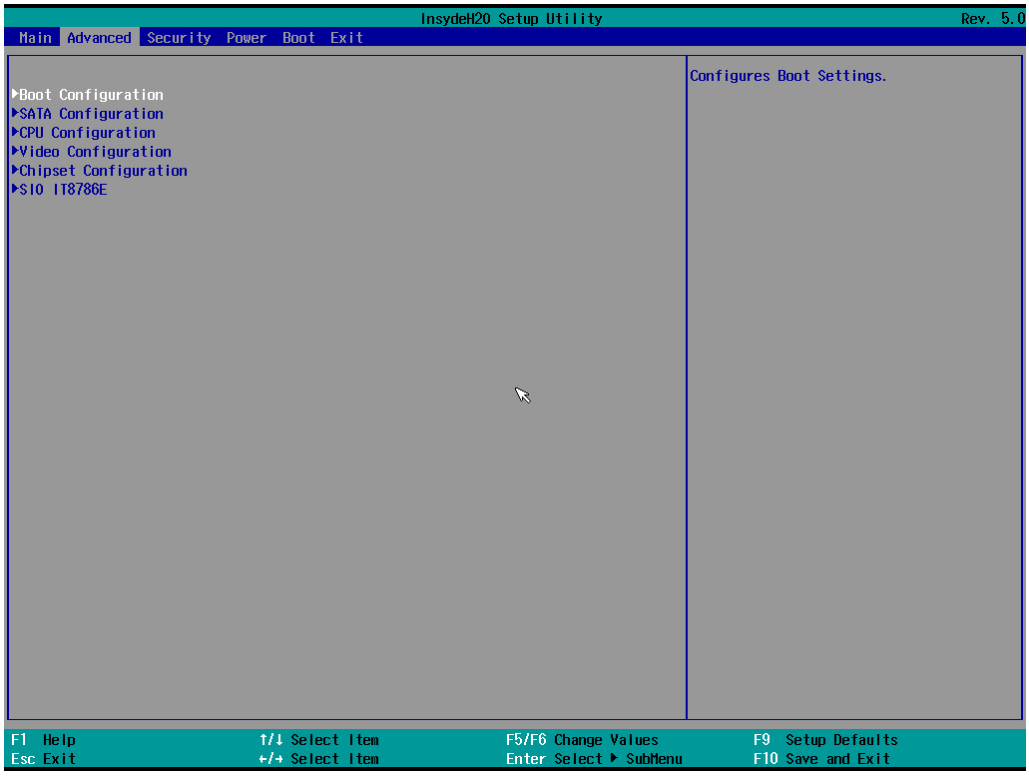
Main Page

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.



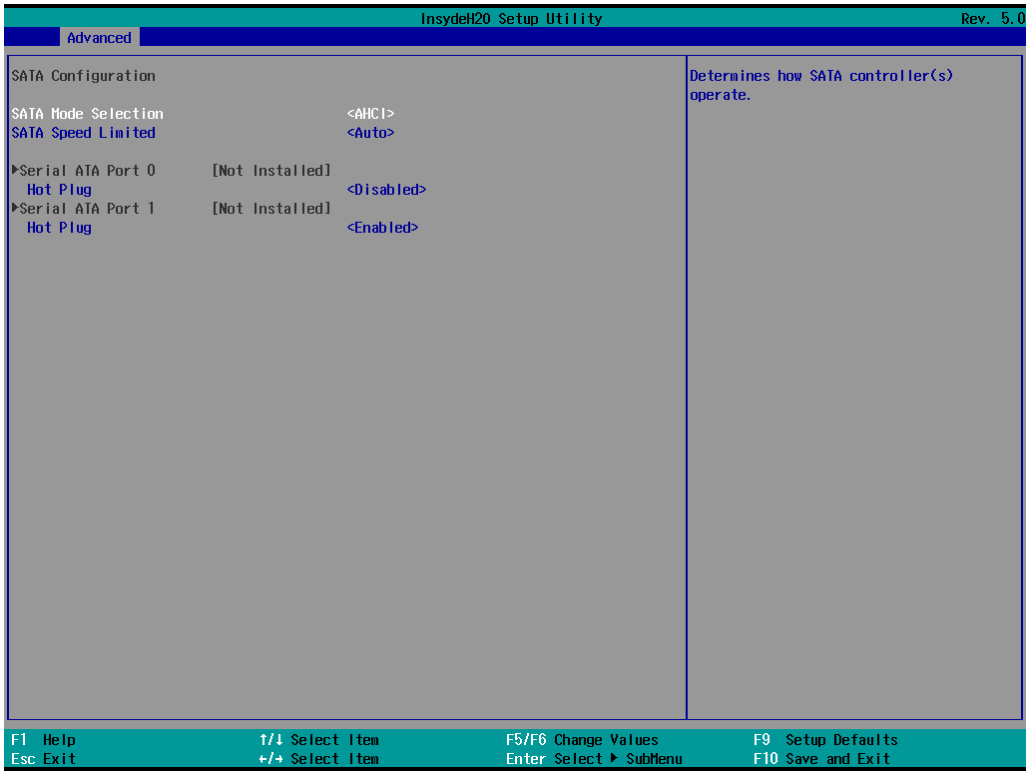
Boot Configuration

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.



SATA Speed

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

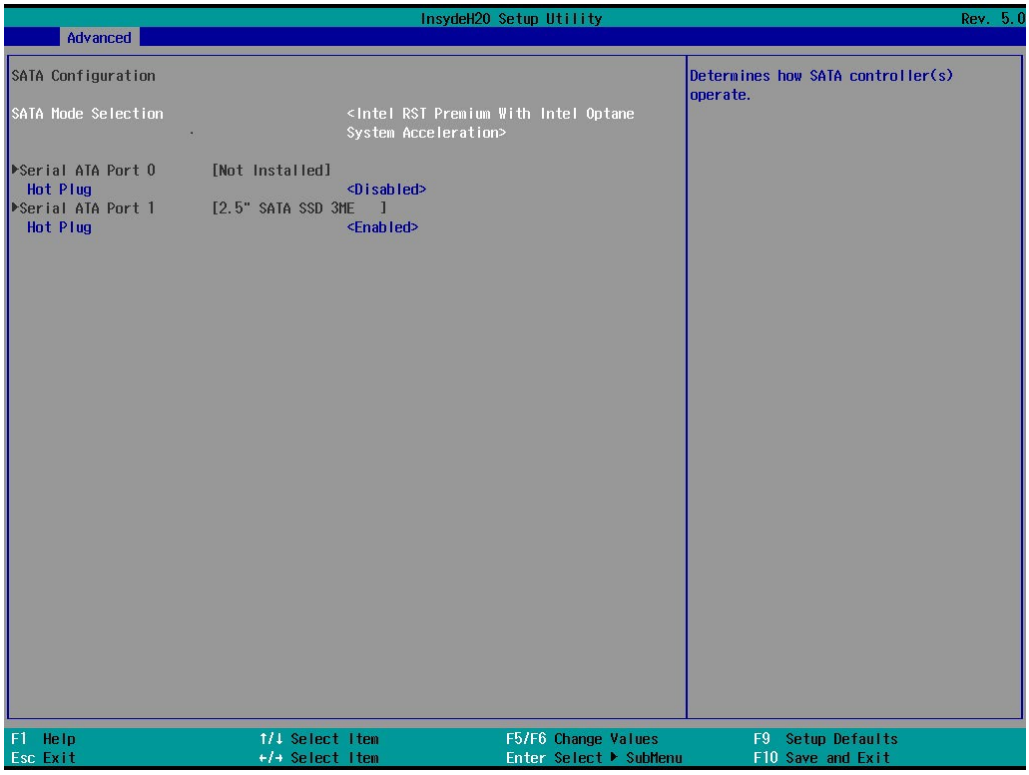
Serial ATA Port

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

SATA Port—Hot Plug

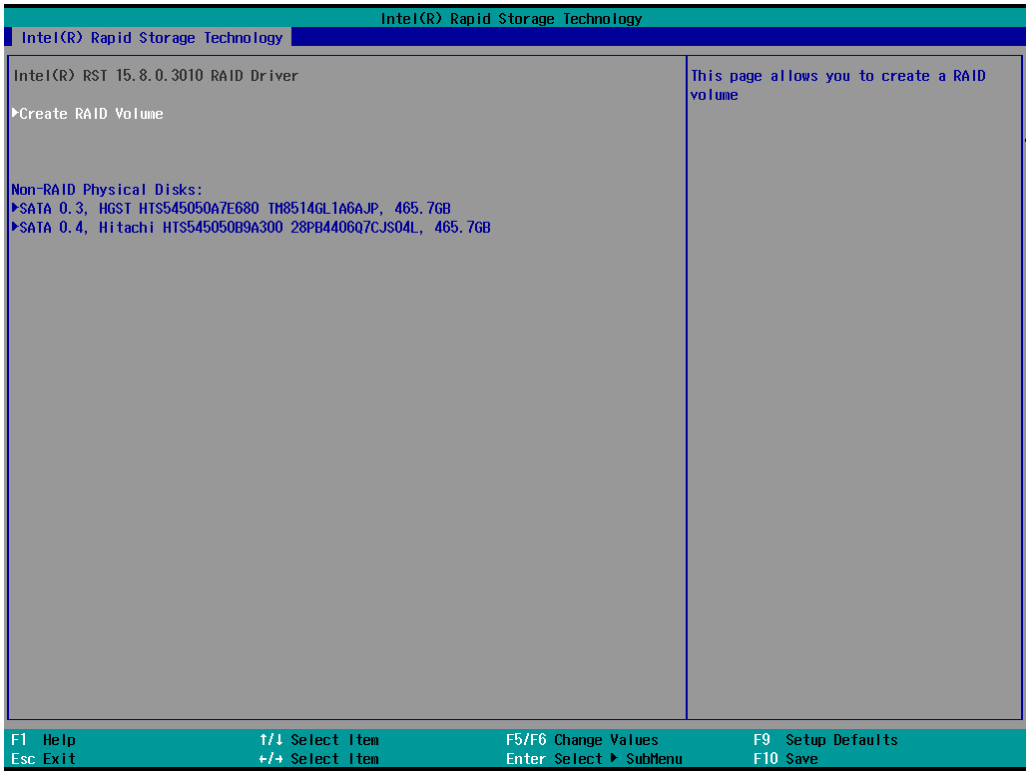
This item allows you to enable/disable hot-plugging capabilities (the ability to remove the drive while the computer is running) for the storage drives installed.

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

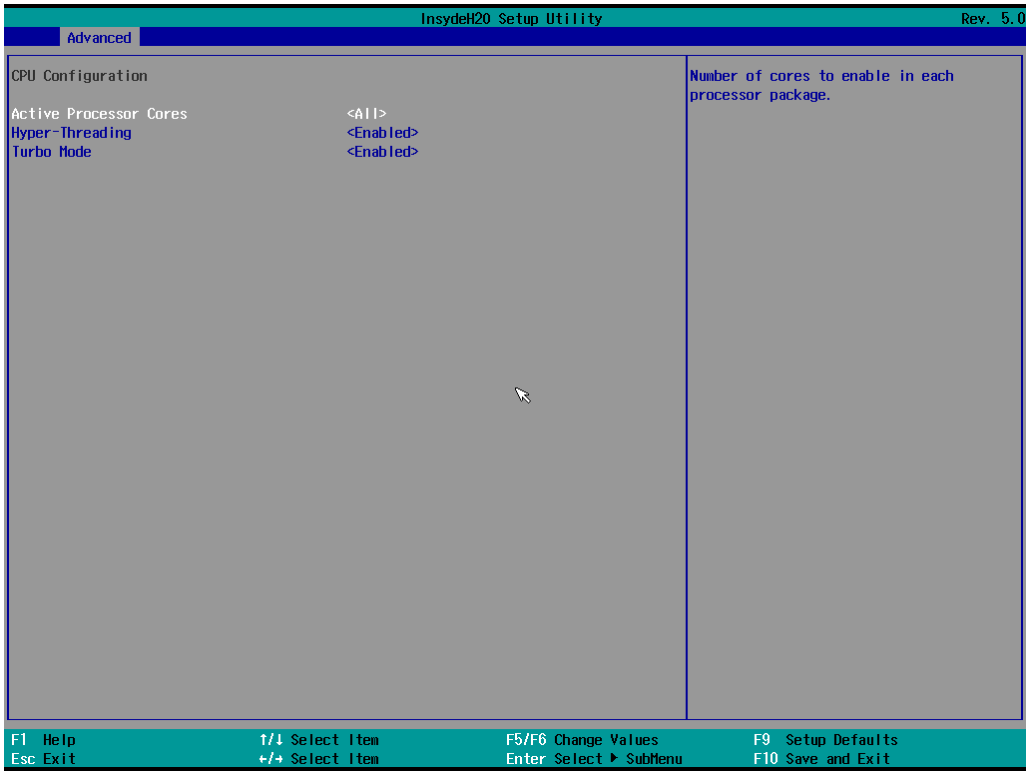


Intel Rapid Storage Technology

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.

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.

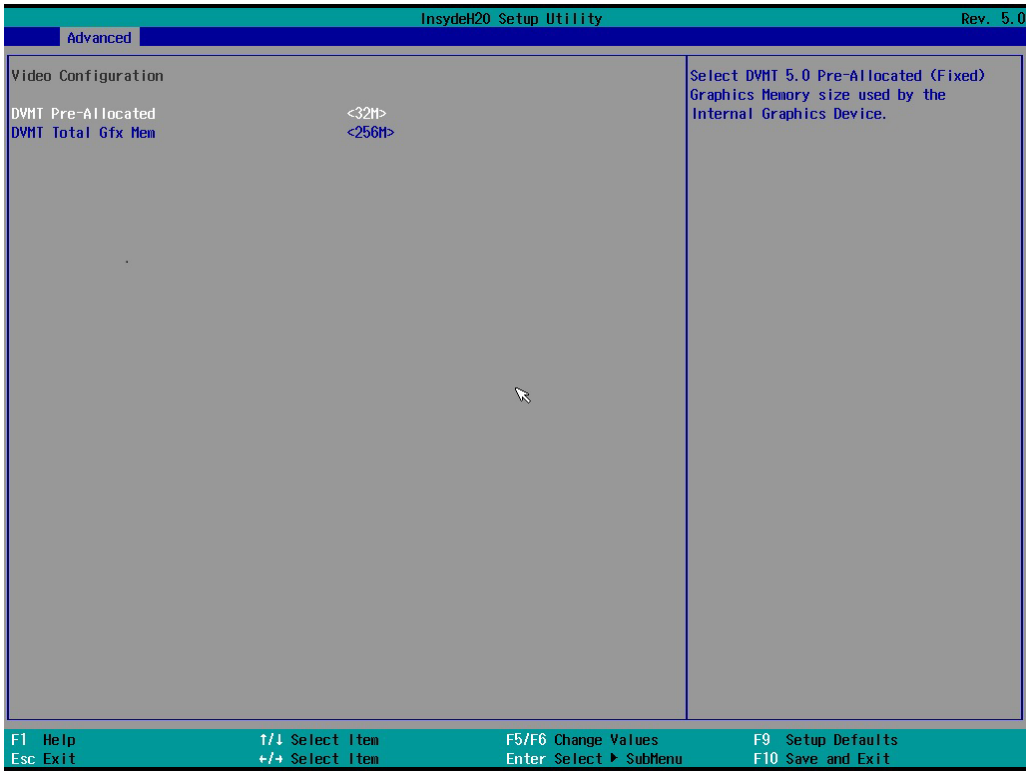
Options: Disabled, Enabled (default)

Turbo Mode

Enable/Disable processor Turbo Mode.

Options: Disabled, Enabled (default)

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.

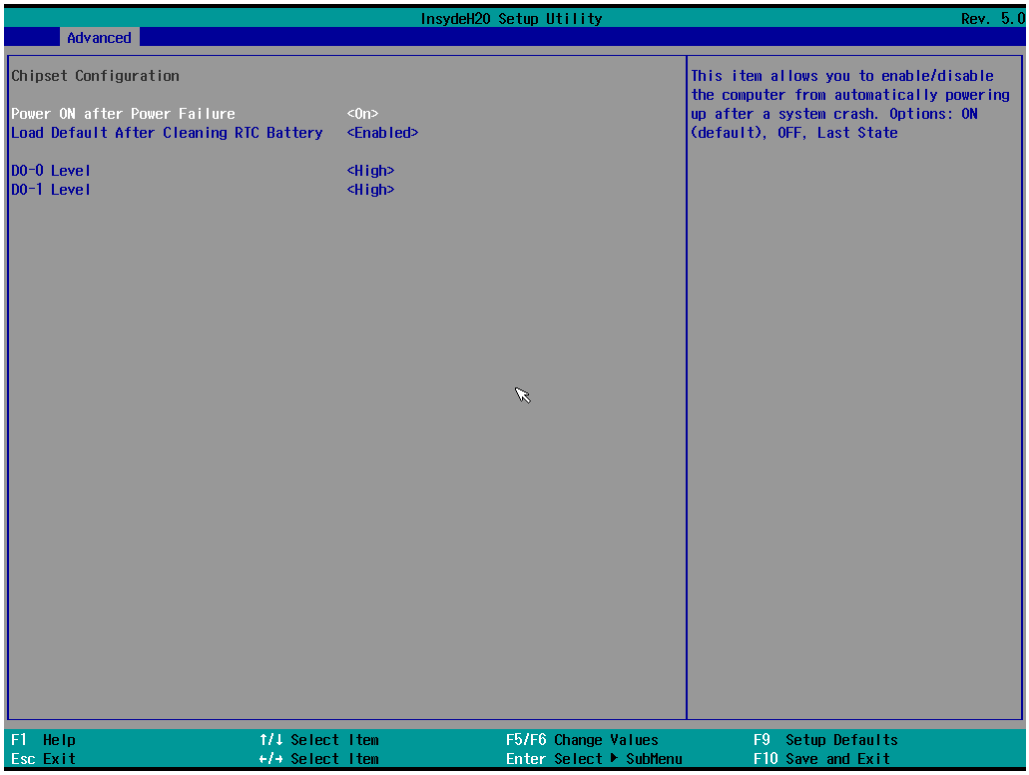
DVMT Total Gfx Mem

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

Load Default After Cleaning RTC Battery

System will load the default when RTC battery loss is detected.

Options: Disabled, Enabled (default)

DO-0 Level

This option allows users to set the DO-0 level.

Options: High (default), Low

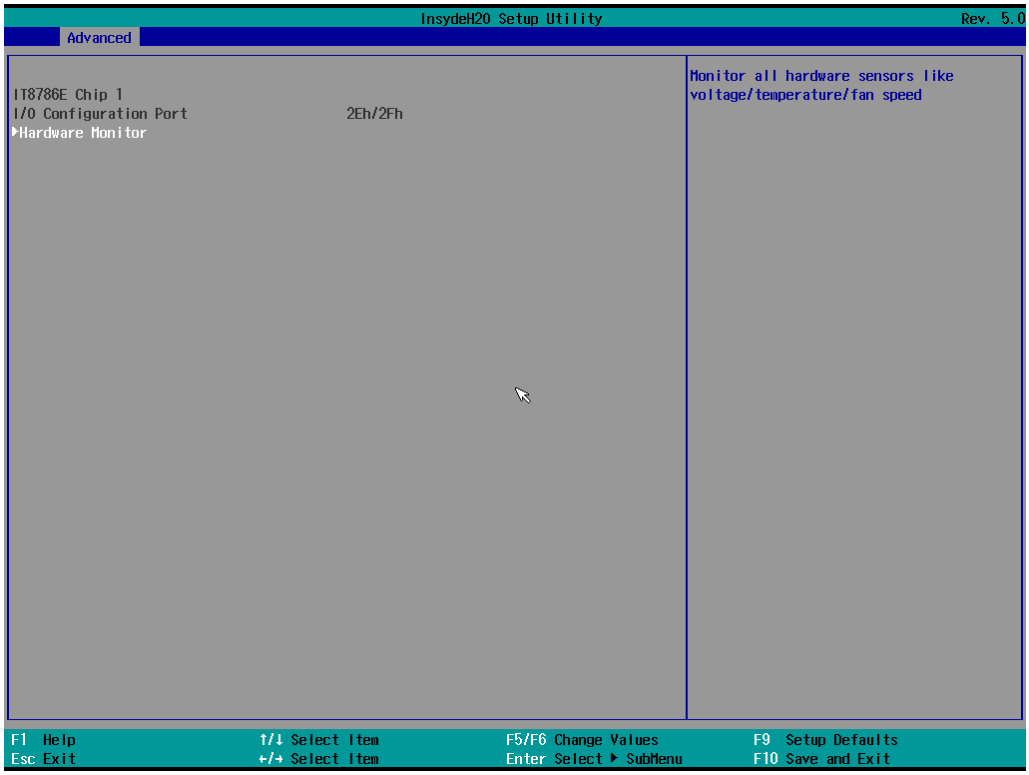
DO-1 Level

This option allows users to set the DO-1 level.

Options: High (default), Low

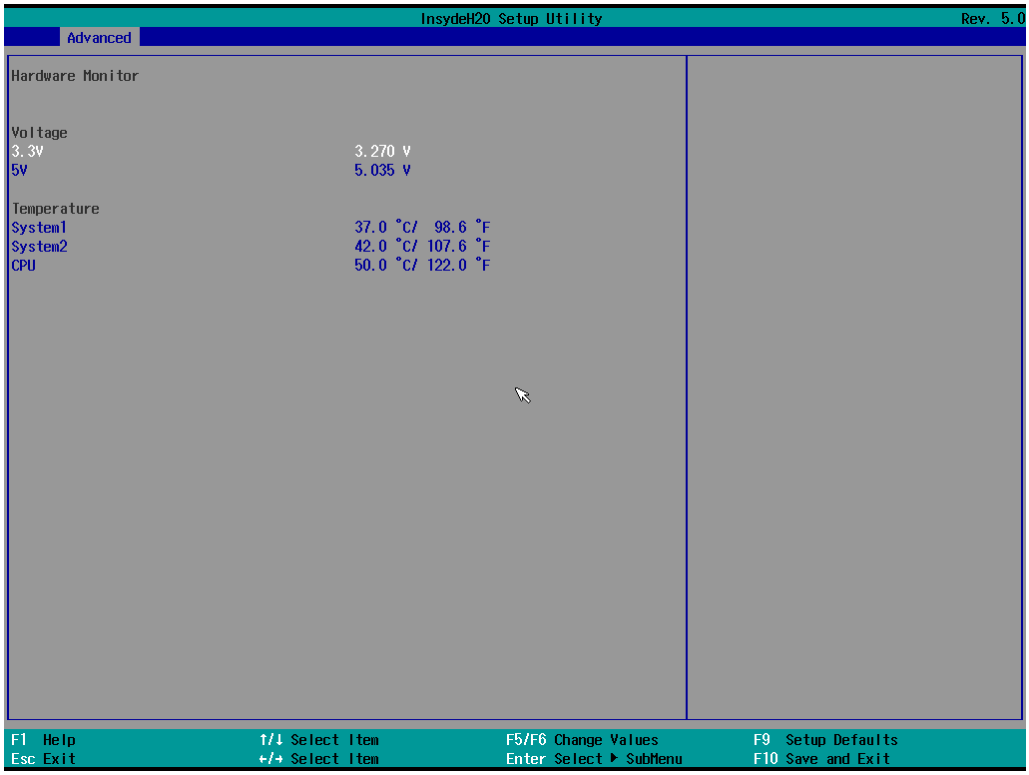
SIO ITE8786E

This option allows users to configure serial port settings.



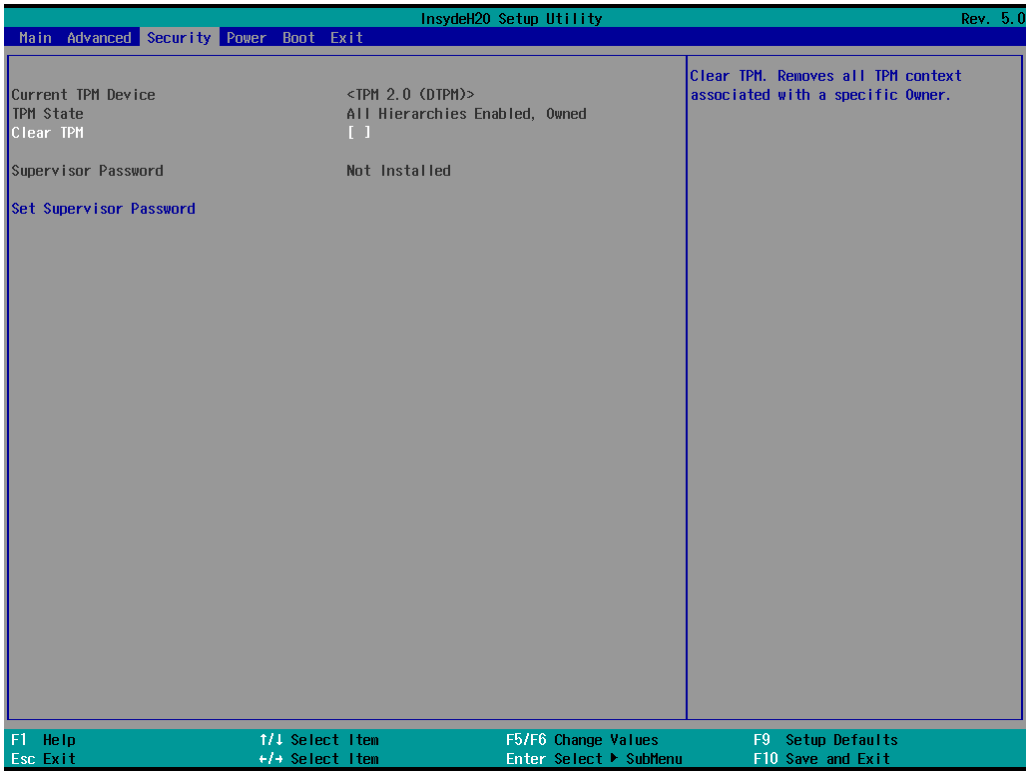
Hardware Monitor

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.

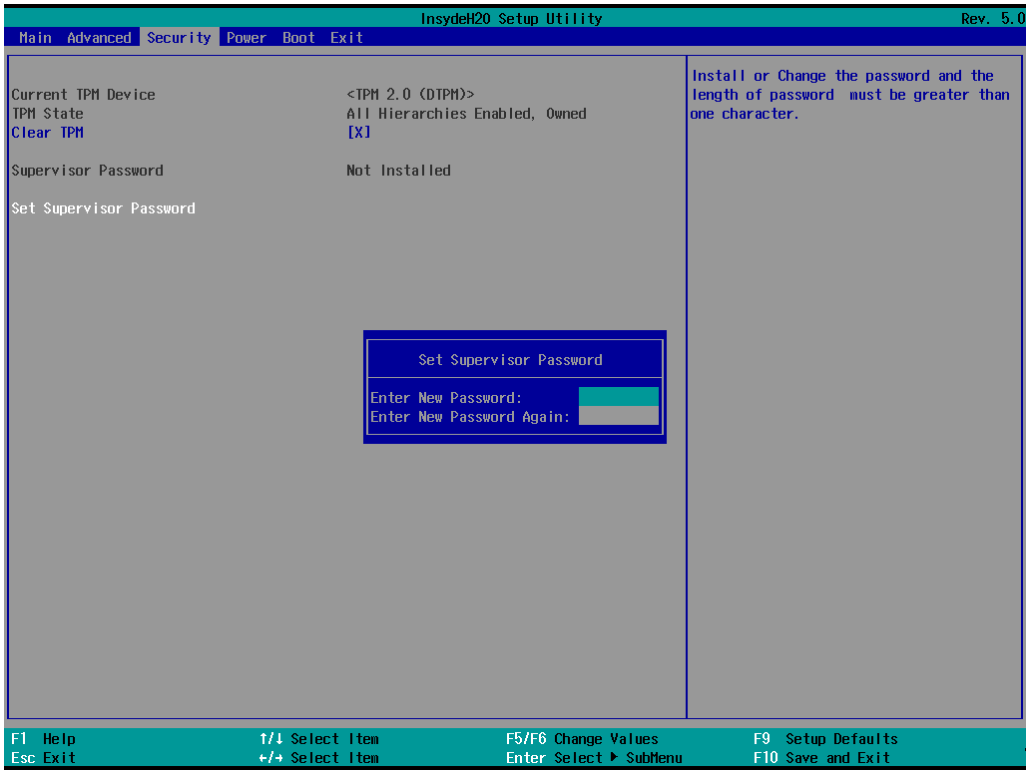
Clear TPM

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

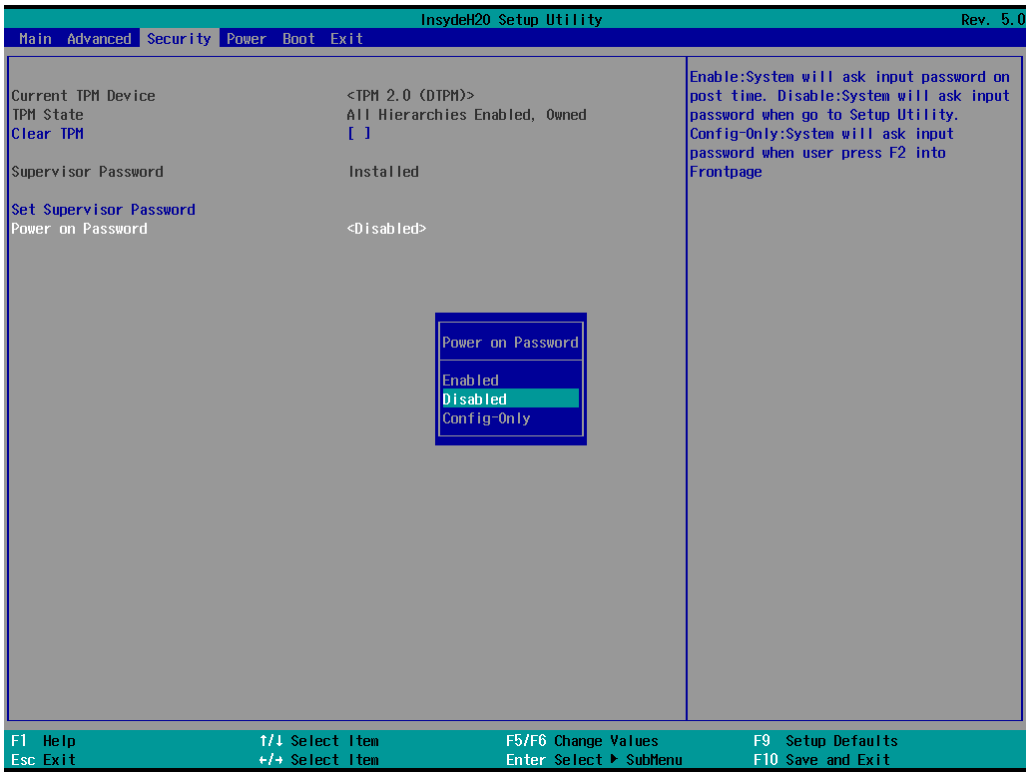
Set Supervisor Password

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.



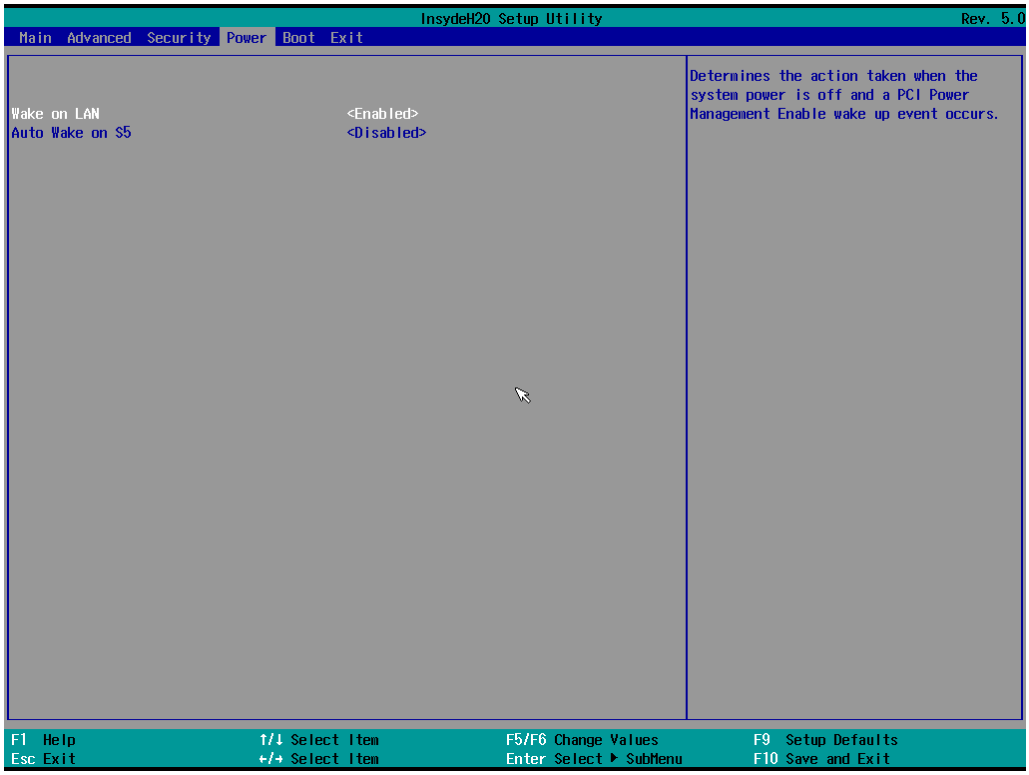
Enable: System will ask input password during post time.

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

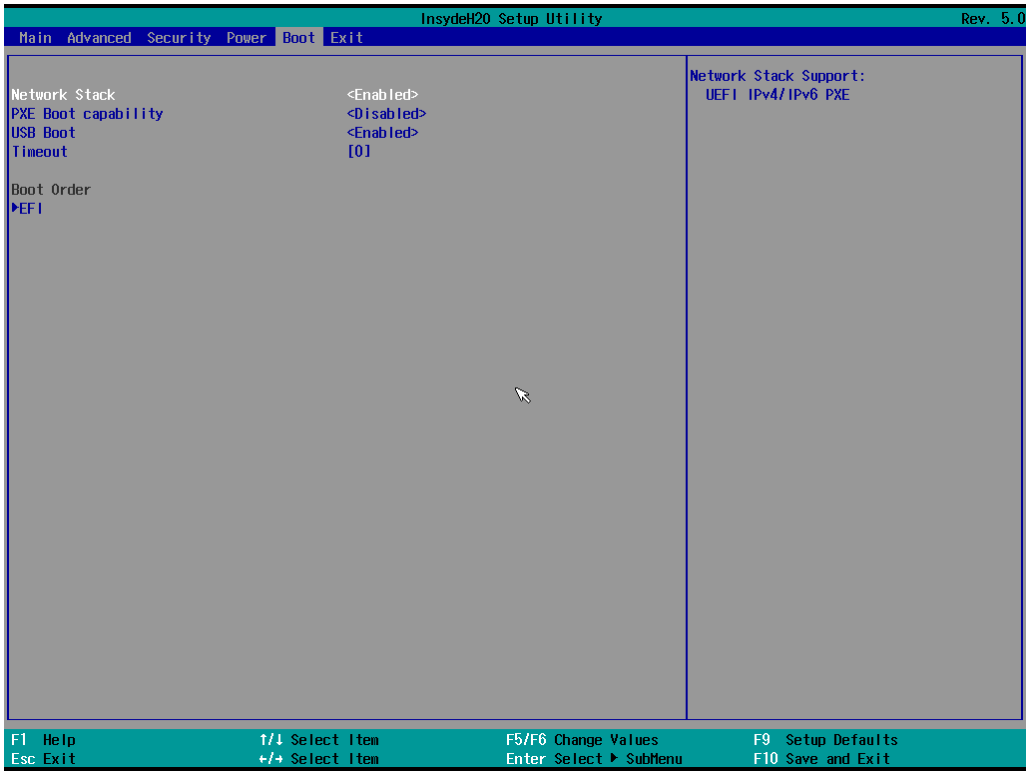
Auto Wake on S5

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

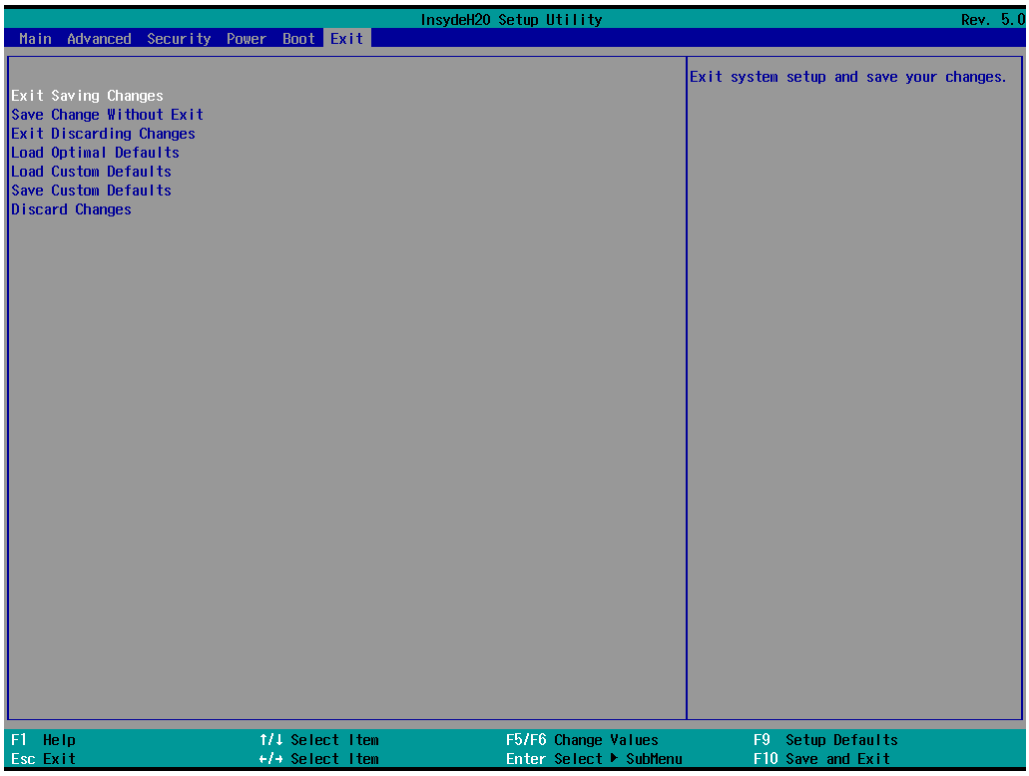
This option allows users to set the number of seconds that the firmware will wait before booting the system with the default boot selection.

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.

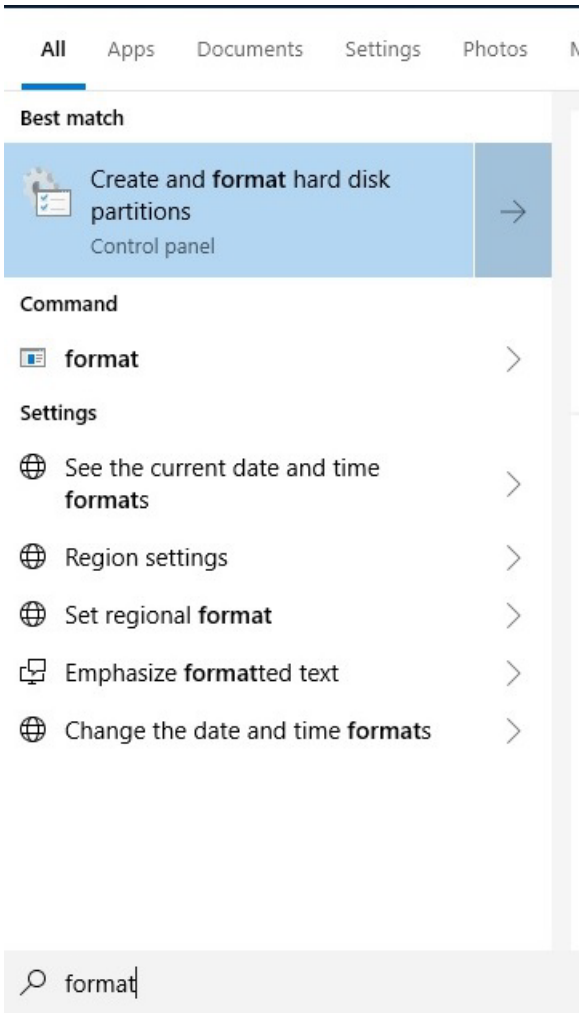
NOTE

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

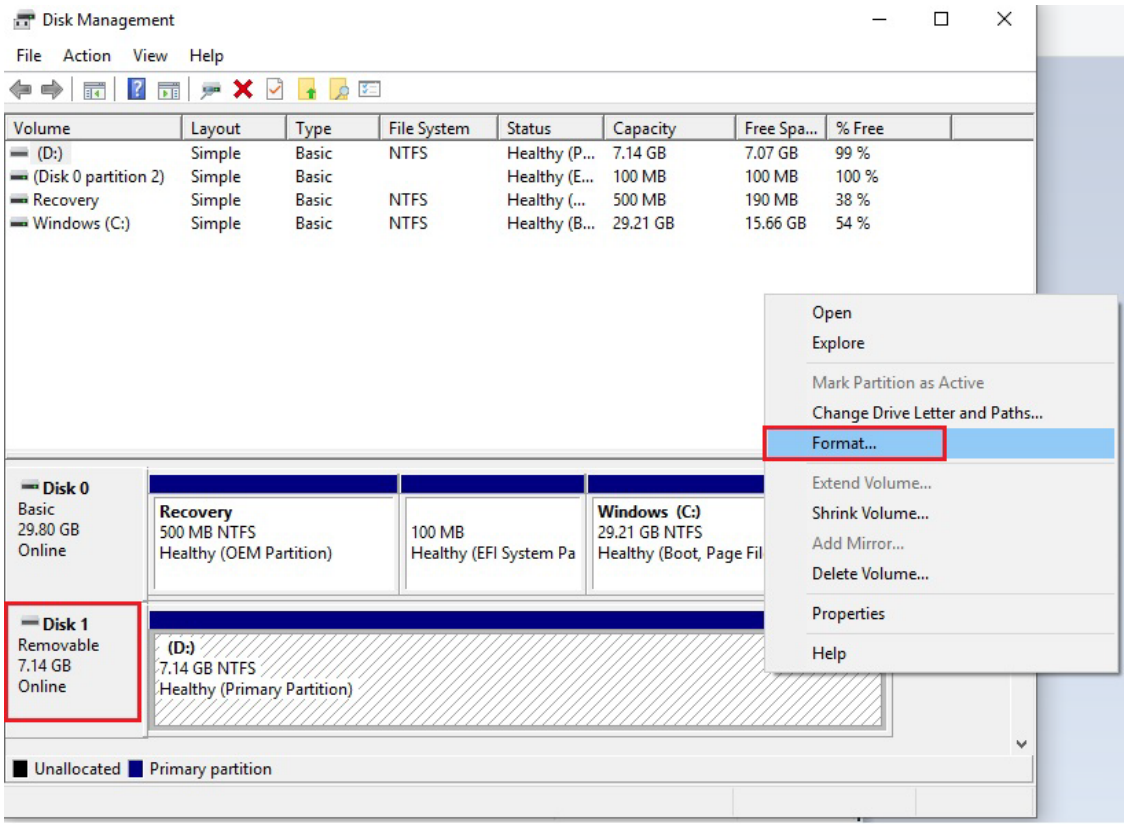
Step 1: Create a Bootable USB Disk

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

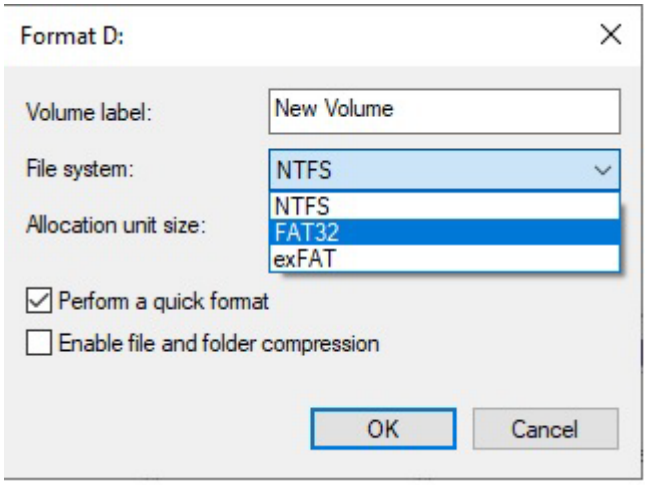
1. Search for "format" and select Create and format hard disk partitions.



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.

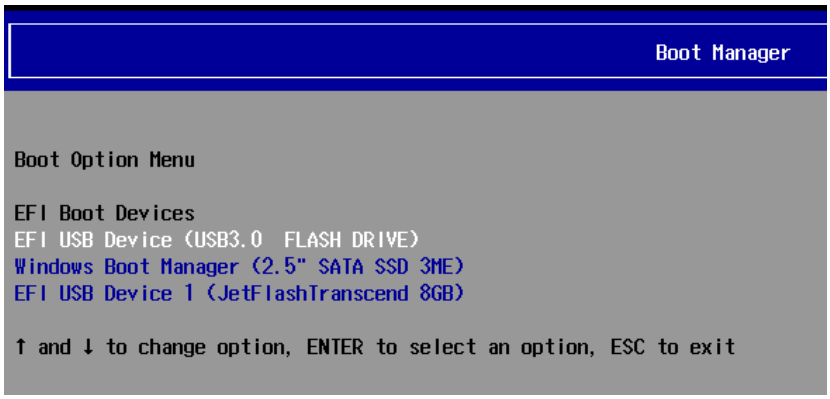
1. Get the BIOS upgrade file (includes an **efi** folder and an **xxxx.efi** file)
2. Copy the **efi** folder and **xxxx.efi** file to the bootable USB disk.

Step 3: Run the Upgrade Program on the Computer

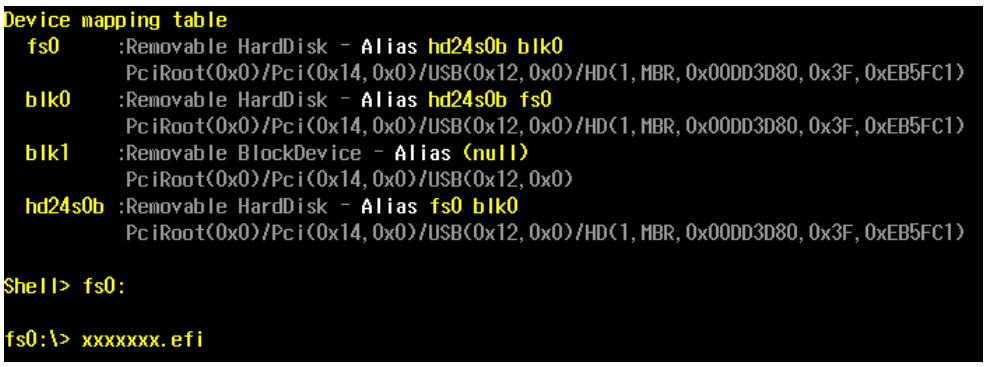
1. Reboot the computer from the USB device and press **F2** while it is booting up to go to the Boot Manager.

   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.

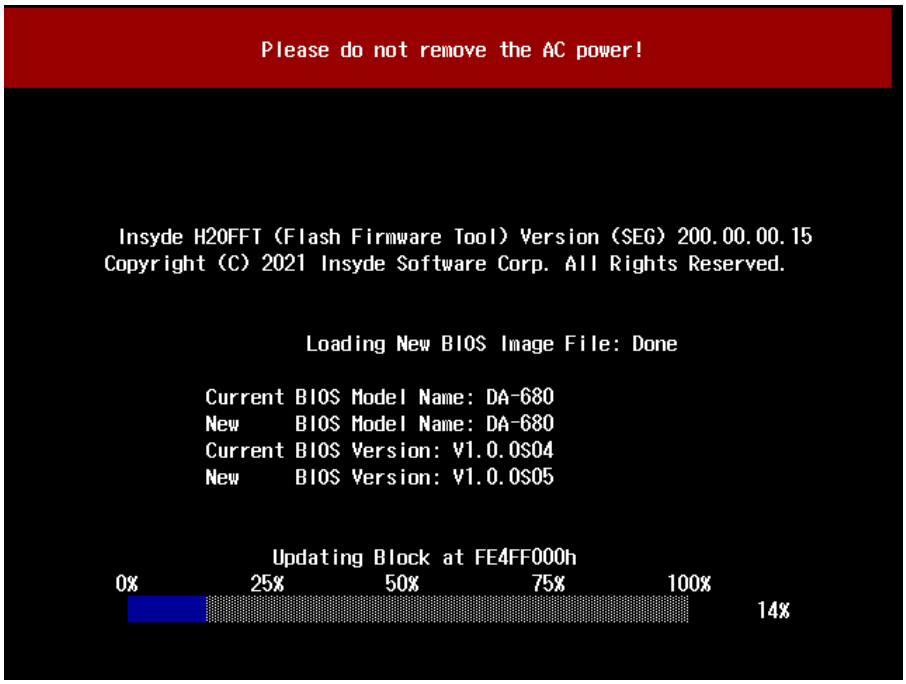
2. Select the USB disk to boot from.



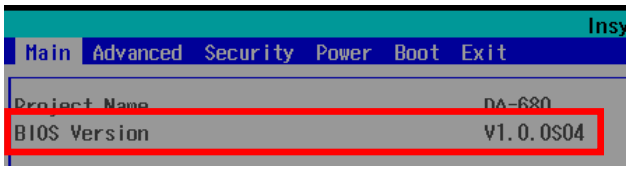
3. In the SHELL environment console, type **fs0:**, then go to the directory where the upgrade file is located and type **xxxxxx.efi** (the name of the file is based on the upgrade file you get from Moxa).



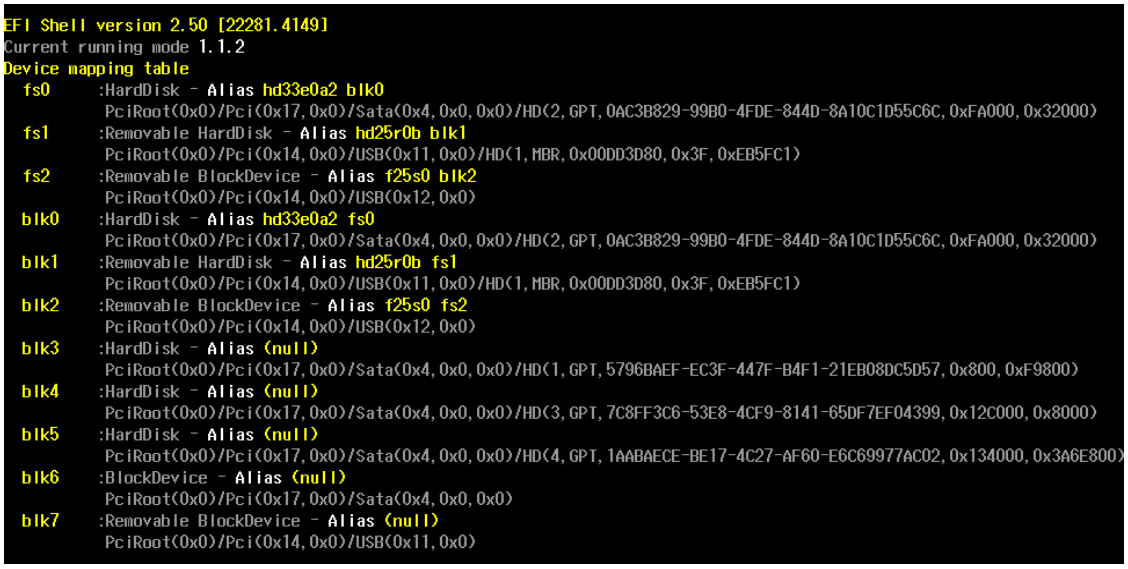
4. The upgrade program will run automatically. Wait for the process to complete.



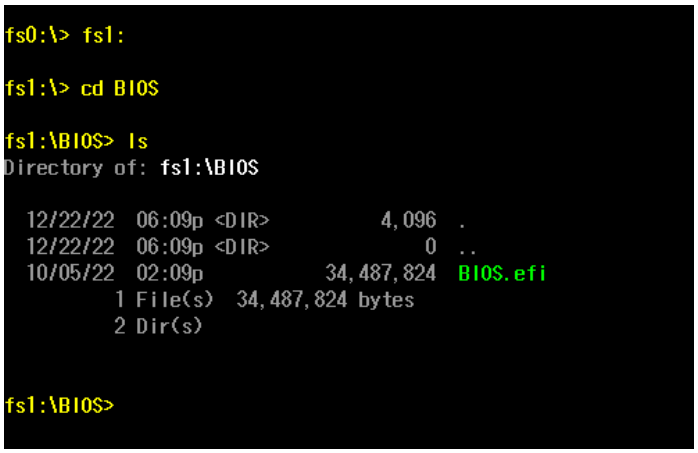
5. When the upgrade is finished, the computer will automatically reboot.
   You can check the BIOS version on the Main page



   If the system has more than one boot device, you will see more than one fsx (x represents the number of devices).



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.



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).