DRP-A100 Series Hardware User Manual

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www.moxa.com/products

DRP-A100 Series Hardware User Manual

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Technical Support Contact Information

www.moxa.com/support

Table of Contents

1. Introduction

The DRP-A100 Series DIN-rail mountable computers are powered by either an Intel Atom® x6211E dual-core 1.30 GHz or an Intel Atom® x 6425E quad-core 2.0 GHz processor. The computers come with a rich set of interface options including up to 8 software-selectable RS-232/422/485 serial ports and up to 10 gigabit Ethernet ports. The communication interfaces are located on the front and rear sides of the product, enabling easy access and expansion for industrial applications. A dual-storage design that includes CFast and SD slots enables easy storage expansion. A unique battery-fastener cover secures the battery in place and ensures stability in all operating environments while a trap-door design for the battery slot enables easy battery swapping without having to remove the cover. The DRP-A100 Series is a reliable, durable, and versatile yet user-friendly computing platform for industrial applications.

The DRP-A100 compact computers come in a fanless design and can withstand a temperature range of -30 to 60°C, making them a good fit for harsh operating environments. The built-in TPM 2.0 module secures the platform from unauthorized access. The DRP-A100 Series is an intelligent computing solution that perfectly fulfills both OT and IT requirements of industrial environments.

Package Checklist

- DRP A100 Series computer with DIN-rail kit
- 2-pin terminal block for DC power
- Quick installation guide (printed)
- Warranty card

NOTE

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

Product Features

- DIN-rail mountable computers with fanless design
- Intel Atom® x6211E dual-core 1.30 GHz or Intel Atom® x 6425E quad-core 2.0 GHz processor
- Rich interface options for up to 8 serial and 10 LAN ports
- Compact size to fit most field applications
- -30 to 60°C operating temperature range

Hardware Specifications

NOTE

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

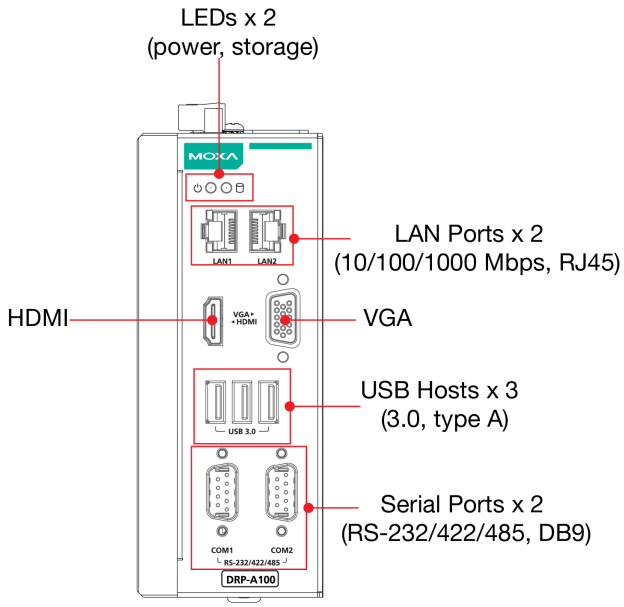
2. Hardware Introduction

In this chapter, we provide information about the DRP-A100 computer's hardware components.

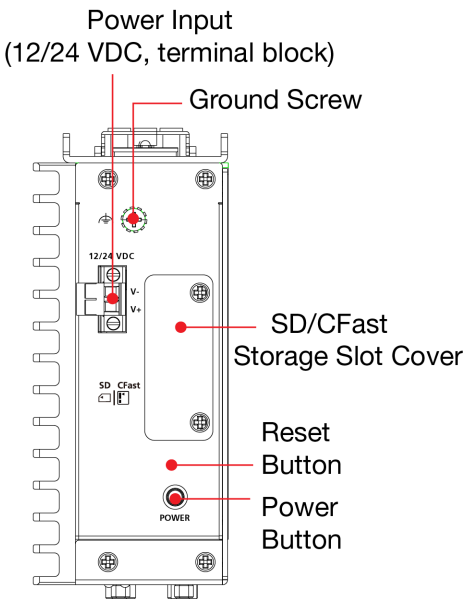
Appearance

DRP-A100-E2-T/DRP-A100-E4-T Models

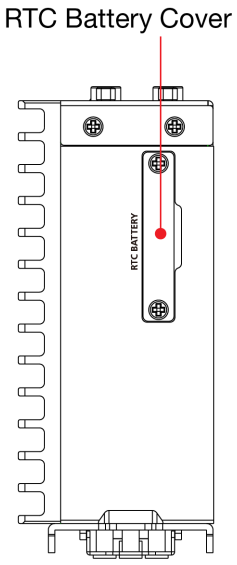
Front View



Top View

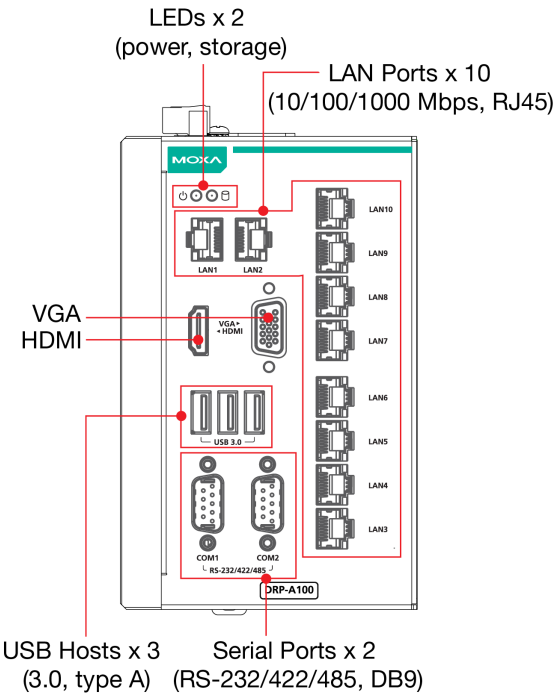


Bottom View

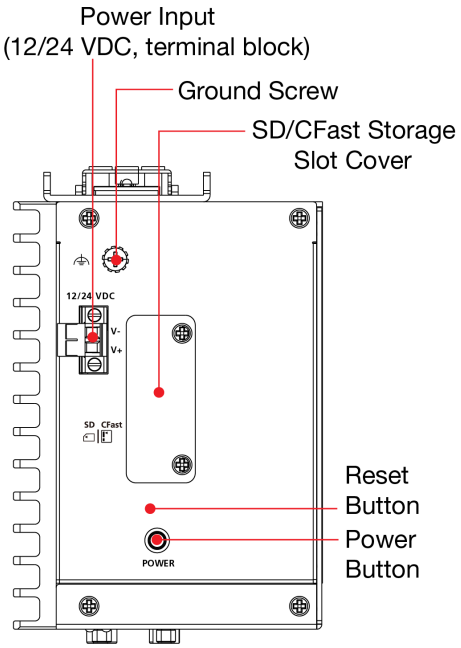


DRP-A100-E2-8L-T/DRP-A100-E4-8L-T Models

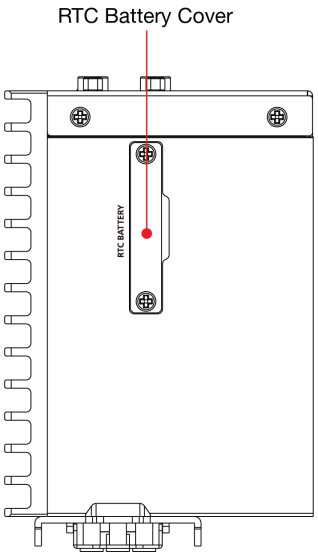
Front View



Top View

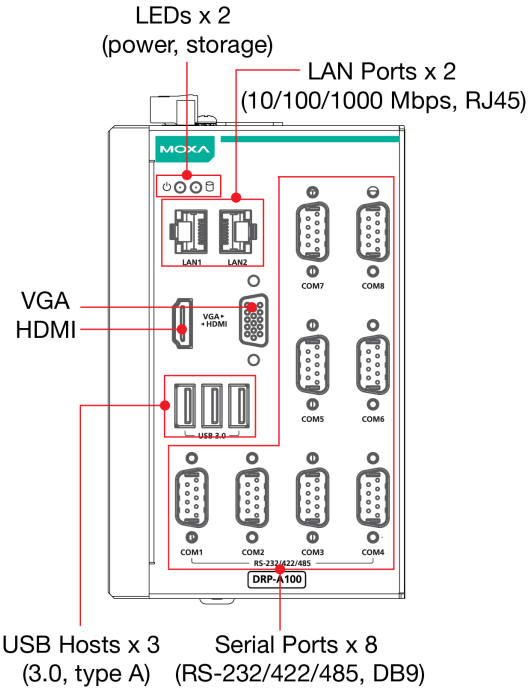


Bottom View

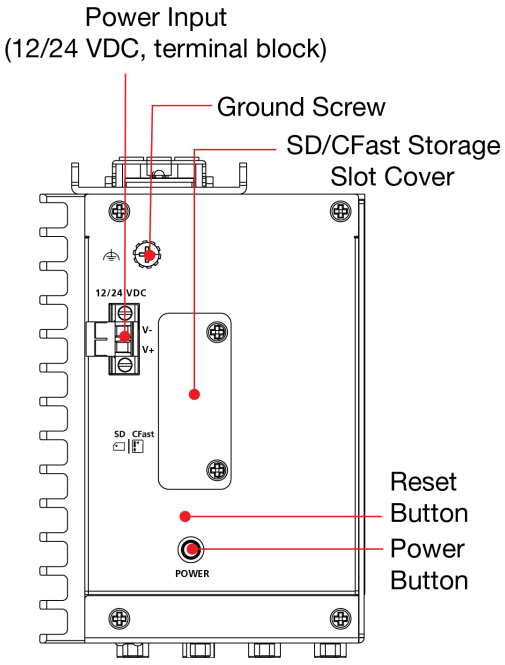


DRP-A100-E2-6C-T/DRP-A100-E4-6C-T Models

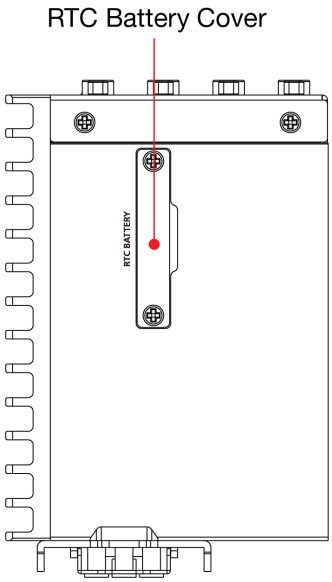
Front View



Top View

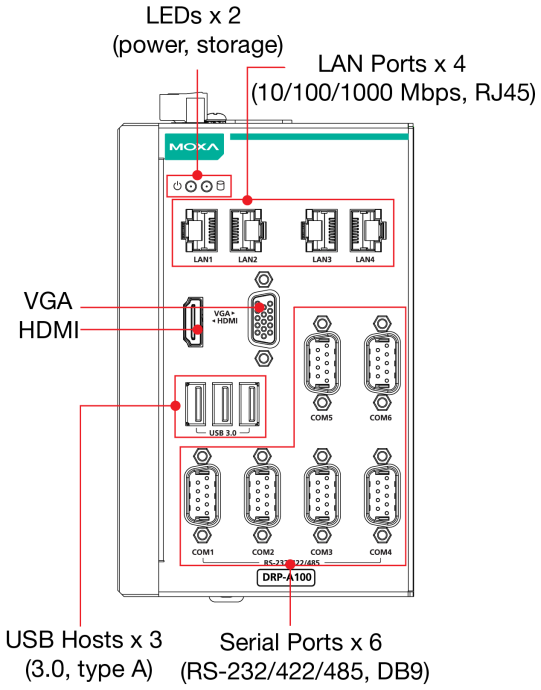


Bottom View

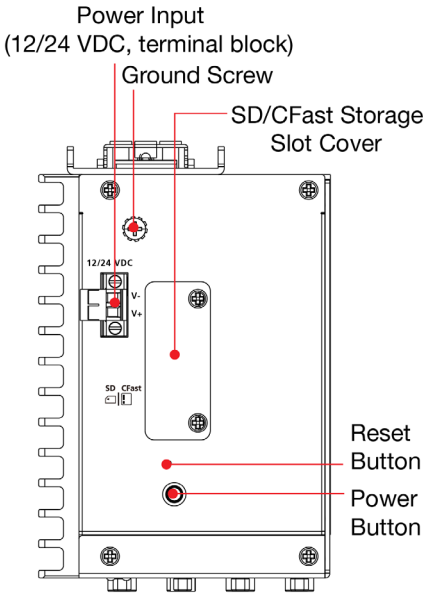


DRP-A100-E2-2L4C-T/DRP-A100-E4-2L4C-T Models

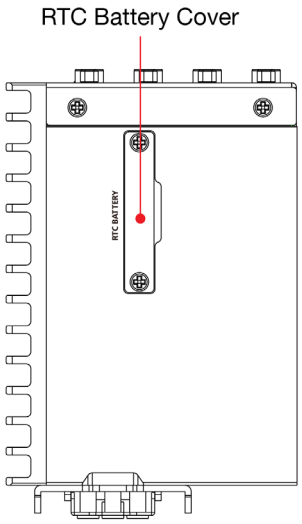
Front View



Top View



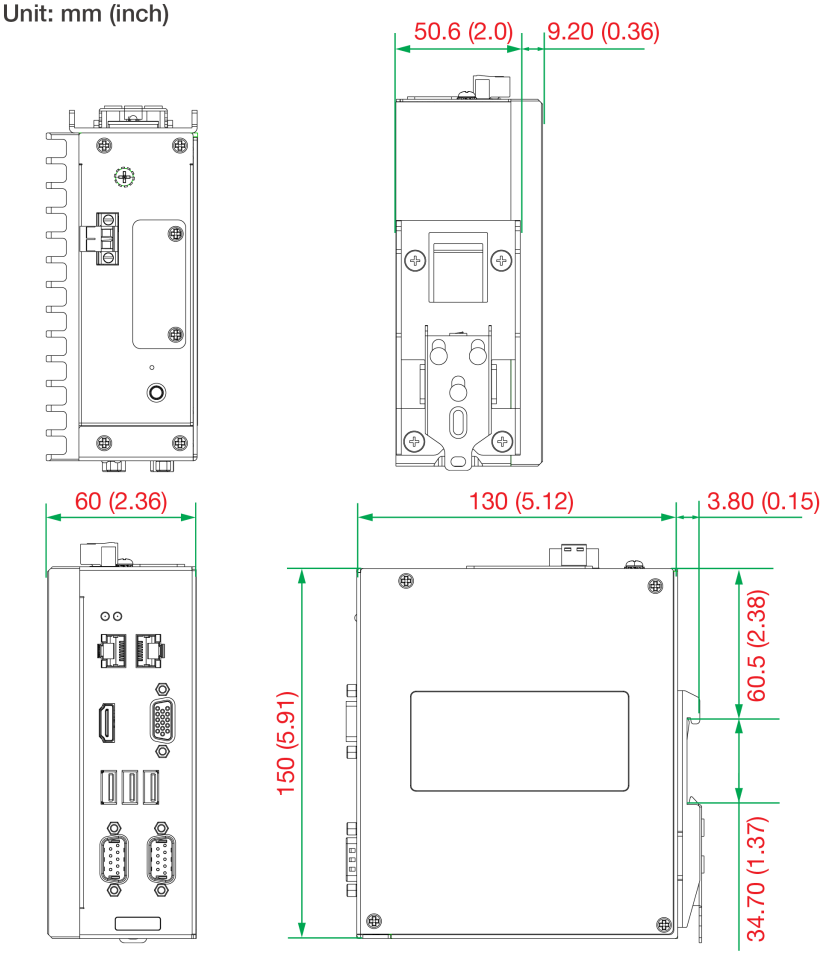
Bottom View



Dimensions

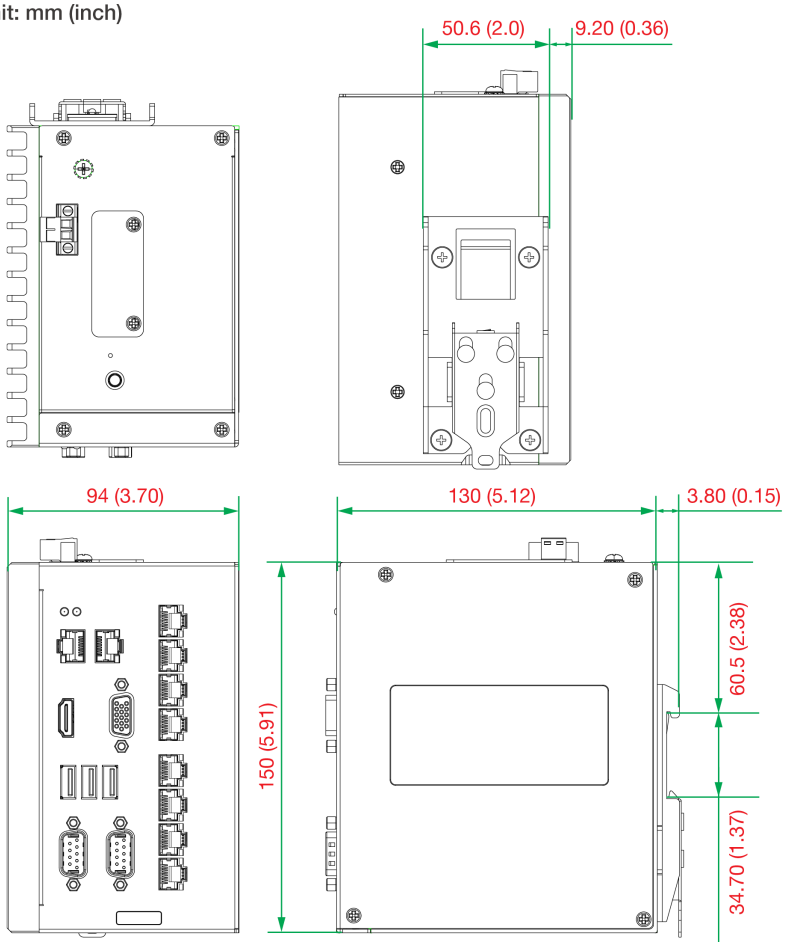
DRP-A100-E2-T/DRP-A100-E4-T Models

Unit: mm (inch)



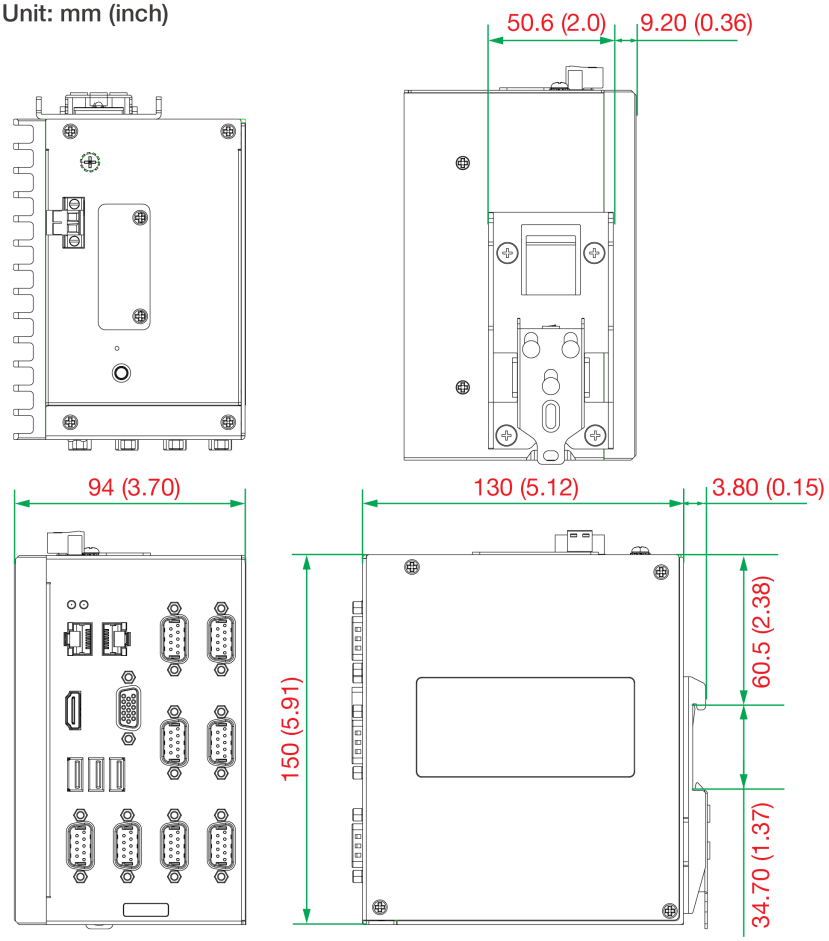
DRP-A100-E2-8L-T/DRP-A100-E4-8L-T Models

Unit: mm (inch)



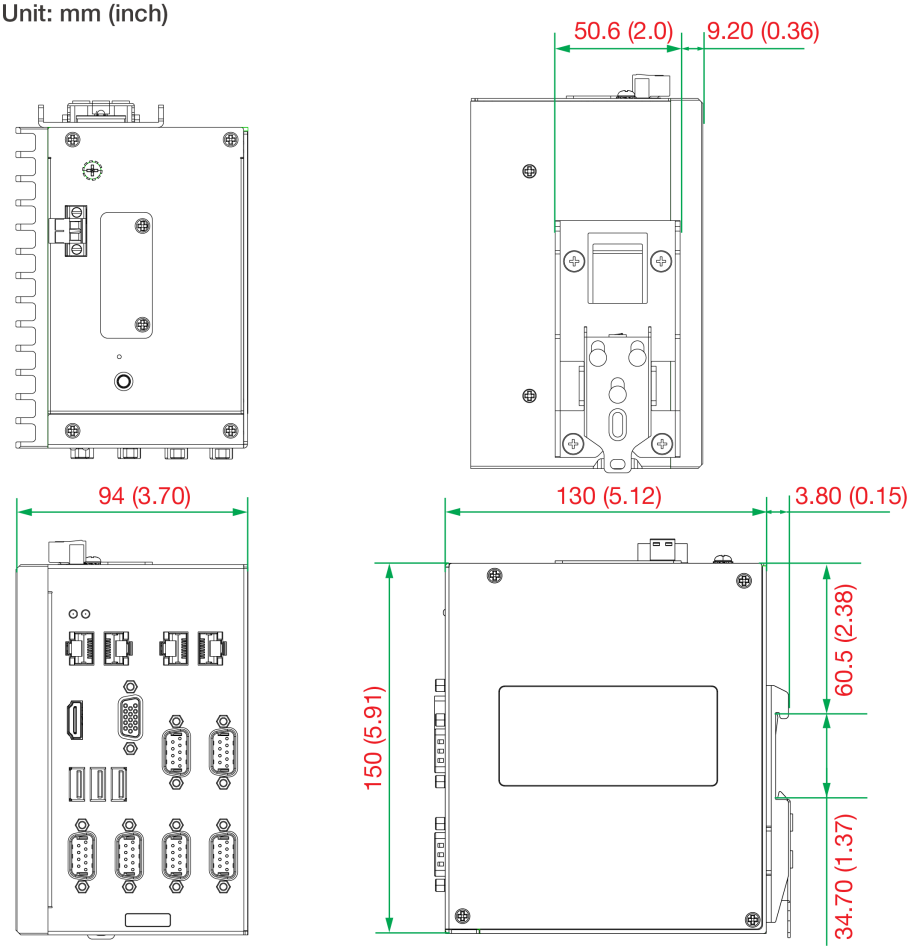
DRP-A100-E2-6C-T/DRP-A100-E4-6C-T Models

Unit: mm (inch)



DRP-A100-E2-2L4C-T/DRP-A100-E4-2L4C-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 Name	Status	Function
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 (CFast)	Yellow	Blinking: Data is being accessed from the CFast card
	OFF	Data is not being accessed from the CFast card

Reset Button

Press the Reset button on the front panel of the computer to reboot the system. Pushing the Reset button will restart the system immediately and any unsaved data will be lost.

NOTE

The DRP-A100 does not support a reset-to-default function.

Real Time Clock (RTC)

The DRP-A100's real-time clock is powered by a lithium battery. You can easily replace the battery yourself using an optional battery kit. Refer Replacing the RTC Battery section for details. However, please note that there is a risk of explosion if the battery is replaced by an incorrect type of battery. Contact a qualified Moxa support engineer if you have any questions about the RTC battery.

ATTENTION

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

3. Hardware Connection Description

In this chapter, we describe how to connect the DRP-A100 computer to the network and to various devices.

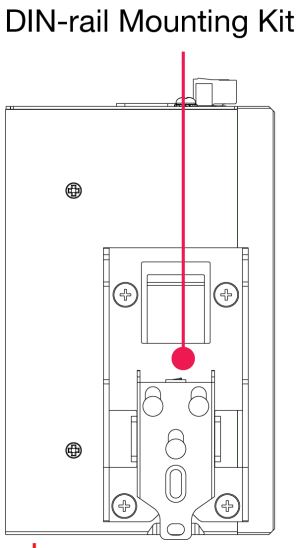
Installing the DRP A100

DIN-rail Mounting

The DRP A100 comes with a DIN-rail mounting kit for installing the computer on a DIN rail.

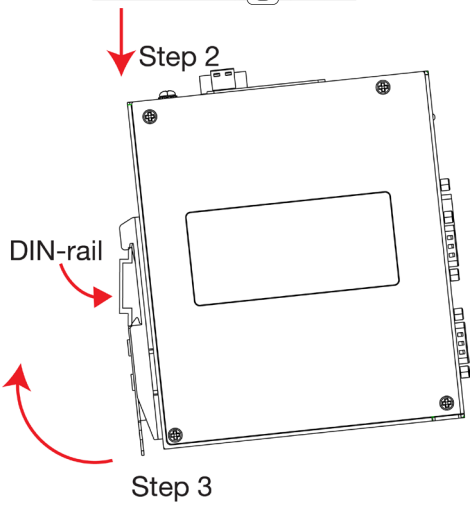
Installation

STEP 1:
Check the DIN-rail mounting kit that comes preinstalled on the rear panel of the computer.



STEP 2:
Insert the top of the DIN rail into the slot just below the upper hook of the DIN-rail mounting kit.

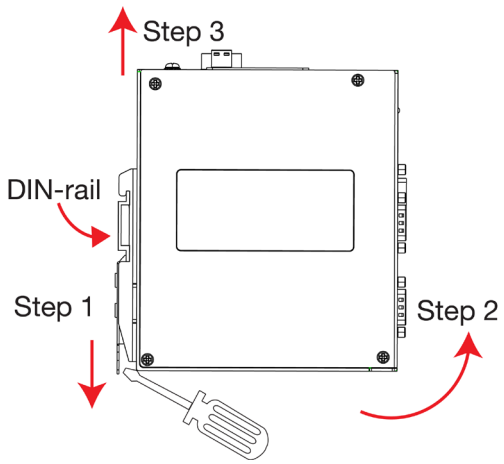
STEP 3:
Press the DRP computer towards the DIN rail until the mounting kit snaps into place.



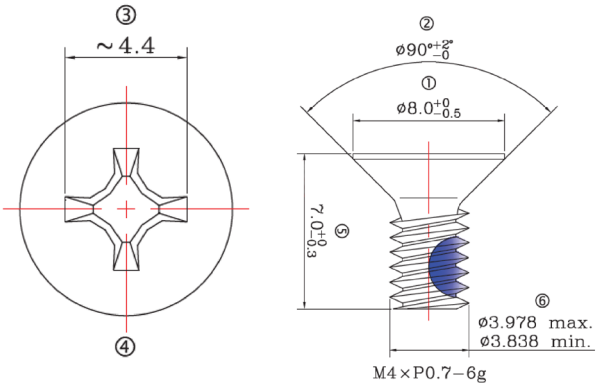
Removal

STEP 1:
Pull down the latch on the mounting kit with a screwdriver.

STEP 2 & 3:
Slightly pull the computer forward and lift it up to remove it from the DIN rail.



The specifications of the DIN-rail mounting screws are indicated in the illustration on the right. Adhere to these values if you need to buy replacement screws to attach and secure the DIN-rail bracket to the rear panel of the computer.



Cross recess No. 2
penetration depth.
2.33 max.
1.79 min.

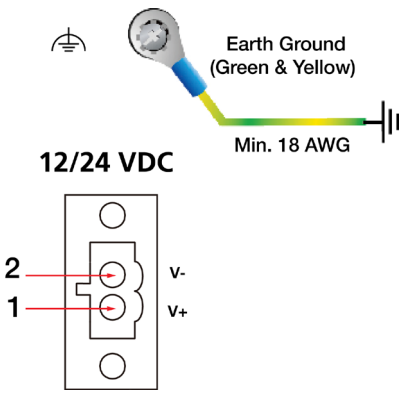
NOTE

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

Connecting the Power

The DRP A100 is provided with 2-pin power input connectors in terminal block on the front panel. Connect the power cord wires to the connectors and then tighten the connectors. 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-



ATTENTION

This product is intended to be supplied by a Listed Power Supply with output marked LPS and rated to deliver the power specification 12 VDC (max.) @ 5 A, 24 VDC (max.) @ 2.5 A and Tma=60°C minimum.

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

ATTENTION

Before connecting the DRP-A100 to the DC power input, ensure that the DC power source voltage is stable.

- The wiring for the input terminal block must be installed by qualified and experienced professionals.
  - Wire Type: Cu
  - Use 18-12 AWG wire size and a torque value of 0.5 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.

A 4 mm^2 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

為避免電磁干擾，本產品不應安裝或使用於住宅環境。

Wiring Requirements

- Be sure to read and follow these common safety precautions before proceeding with the installation of any electronic device:
- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the crossing point.

NOTE

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

- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- For future reference, label the wiring used for all your devices.

ATTENTION

Safety First!

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

Wiring Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

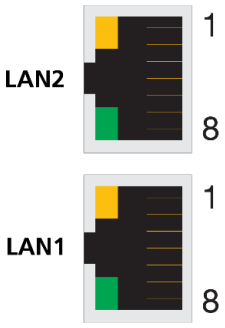
Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting to a Network

To connect the DRP A100 computer to a network, connect a network cable to one of the Ethernet ports and connect the other end of the cable to your Ethernet network. When the cable is properly connected, the LEDs on the Ethernet port turn ON to indicate a valid connection. The pin assignments of the Ethernet ports are shown below:

NOTE

For reliable Ethernet connections, we recommend enabling the ports in standard temperatures and keeping them enabled in high/low temperature environments. If you want to use your own Ethernet cable, ensure that you match the pin assignments of the ports to the connector on the Ethernet cable.



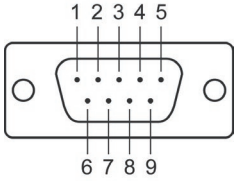
Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	ERx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

Connecting to a Serial Device

Use a serial cable to connect your serial device to the computer's serial port. The serial ports P1 to P2 come with male DB9 connectors and can be configured for RS-232, RS-422, or RS-485 communication. For information on configuring the serial port, refer to the *DRP A100 software manuals*.

The pin assignments of the serial ports are shown in the following table:

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



Connecting to a USB Device

The DRP A100 is provided with three USB 3.0 ports with type-A connectors 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 DRP-A100 has an HDMI connector and a VGA connector located on the front panel for an audio or video device.

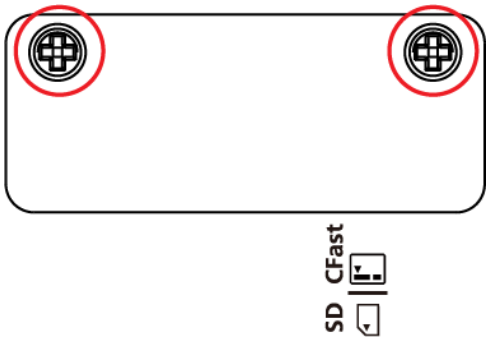
> **NOTE**
>
> Use an HDMI-certified cables for a reliable audio or video connection.

Inserting SD/CFast Card

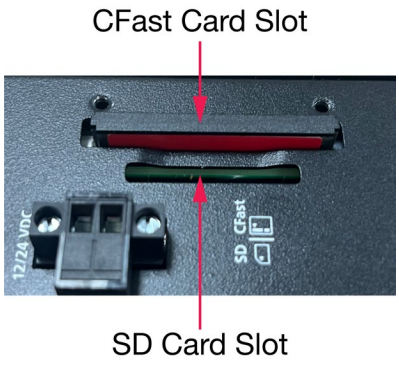
The DRP-A100 comes with two slots on the top panel, which can be used to install one SD card and one CFast card.

To install a card in the slots, do the following:

1. Unfasten the two screws on the slot cover located on the top panel.



2. Remove the cover and find the location of the SD and CFast card slots.



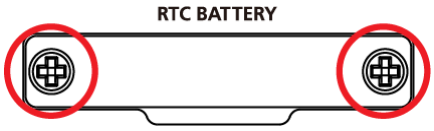
3. Insert the SD and CFast cards in the designated slots. Refer to the image printed beside the slots for the correct direction to insert the cards. When the cards are successfully inserted, you will hear a click.
4. To remove the cards, simply push them in to release them and take them out.

Replacing the RTC Battery

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

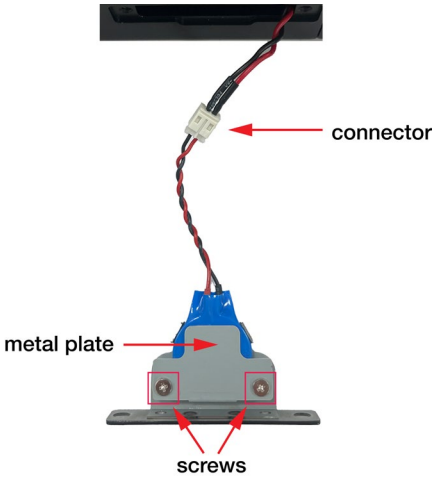
To replace the battery, do the following:

1. Unfasten the two screws on the battery cover.



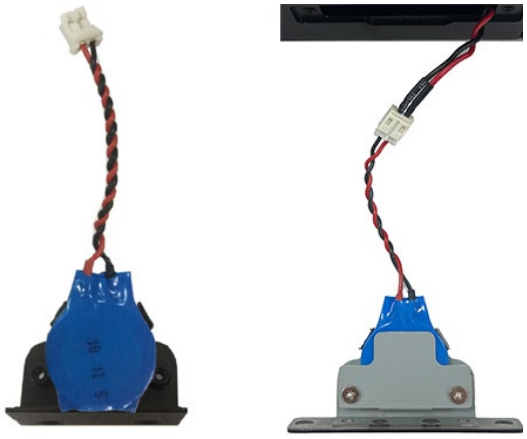
2. Take off the cover.

   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 battery 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 in fire or water and do not short external contacts.

4. BIOS Setup

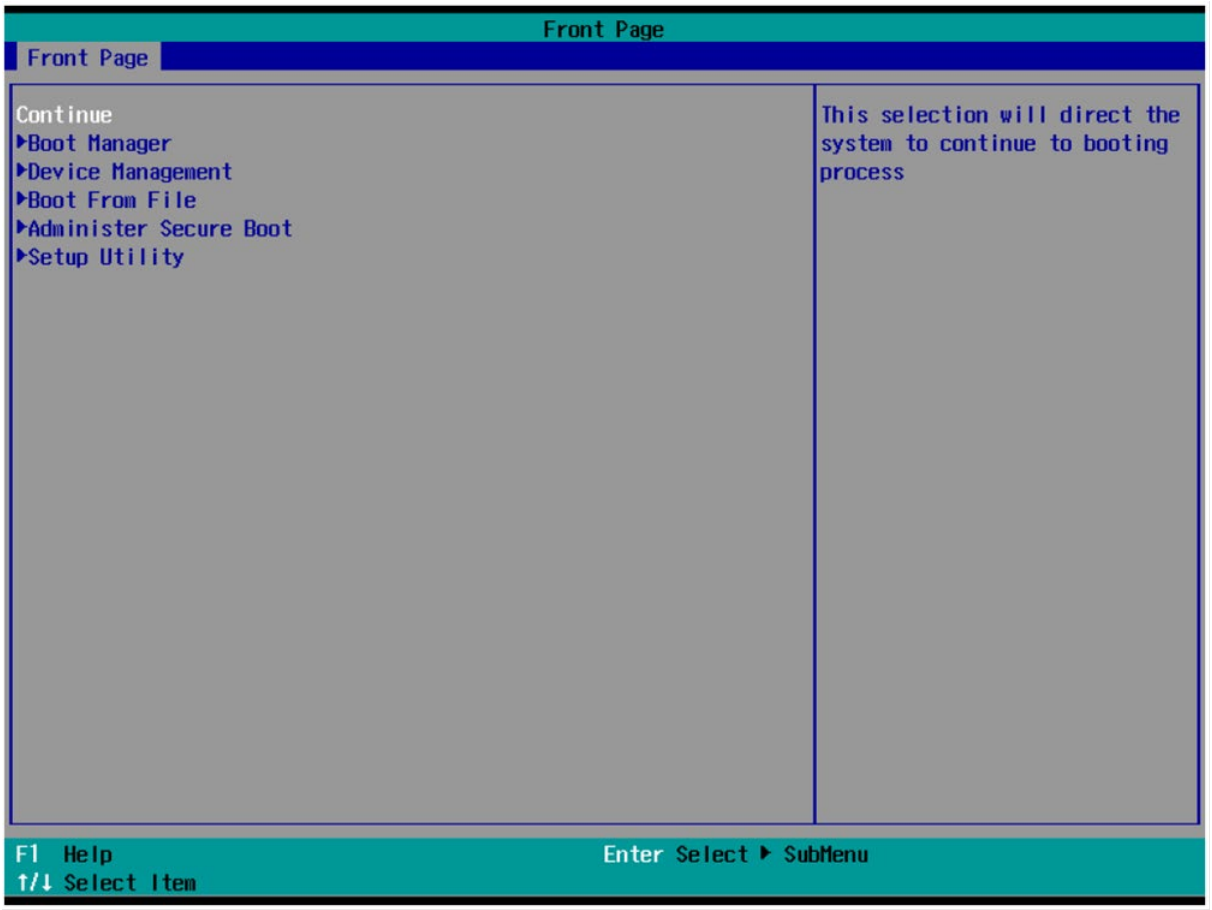
In this chapter, we describe the BIOS settings for the DRP A100 computer. The BIOS is a set of input/output control routines for peripherals to initialize the basic settings. The BIOS firmware helps boot the system before the operating system is loaded. The BIOS setup allows the user to modify the system configuration for basic input/output peripherals. All the configurations are stored in the CMOS RAM, which has a backup battery in case the computer is not connected to a power source. Consequently, the data stored in the CMOS RAM is retained when the system is rebooted, or the power is disconnected.

Entering the BIOS Setup

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

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

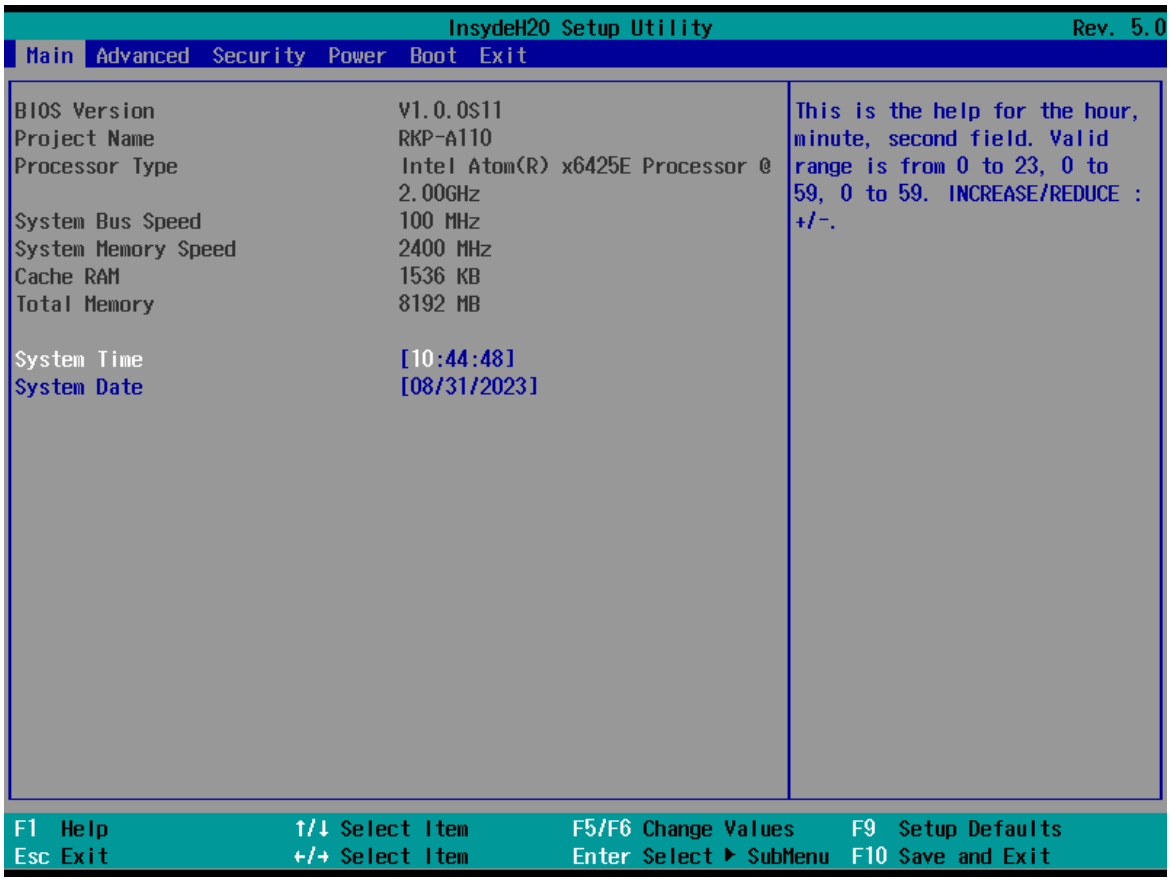
Select **F2** to enter the **BIOS configuration**.



When you enter the **Setup Utility**, a basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to use them.

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

The BIOS configuration screen will be shown when you enter the **Setup Utility** option.

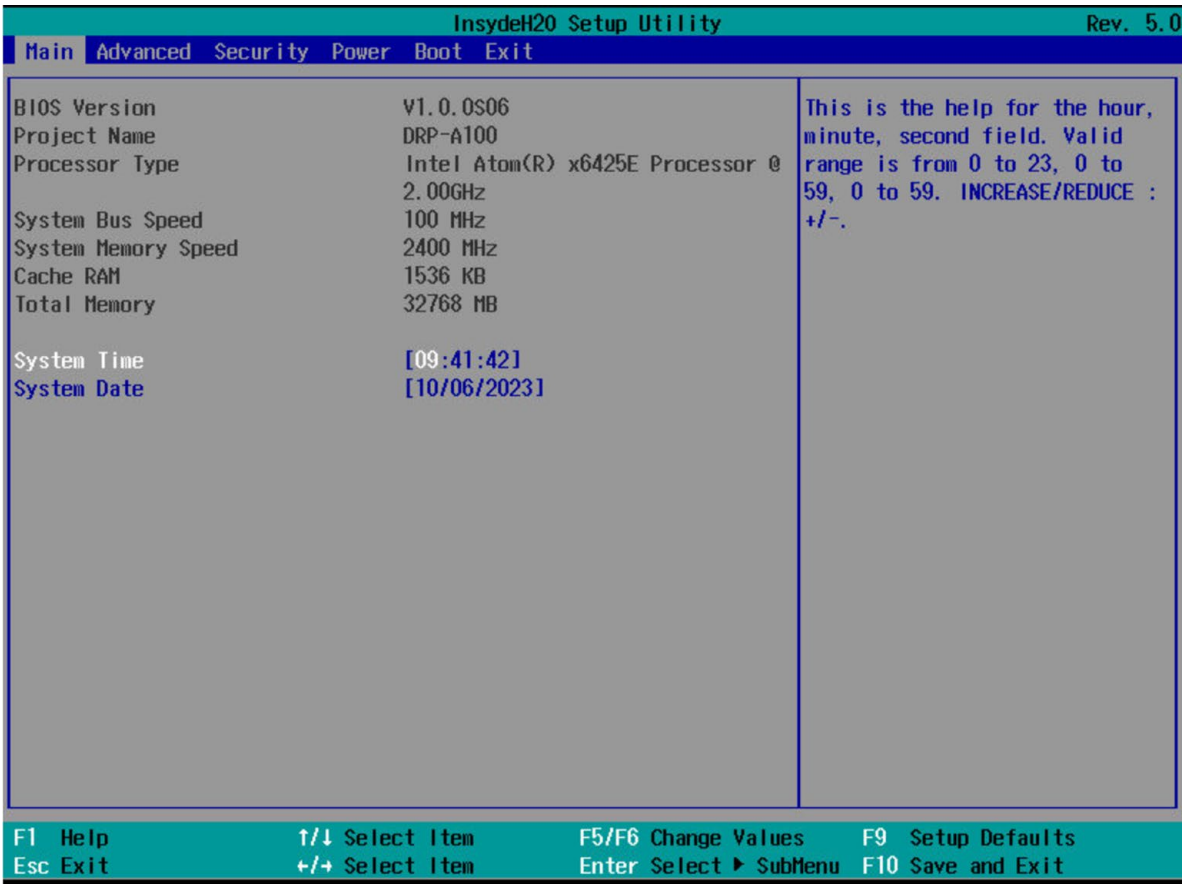


NOTE

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

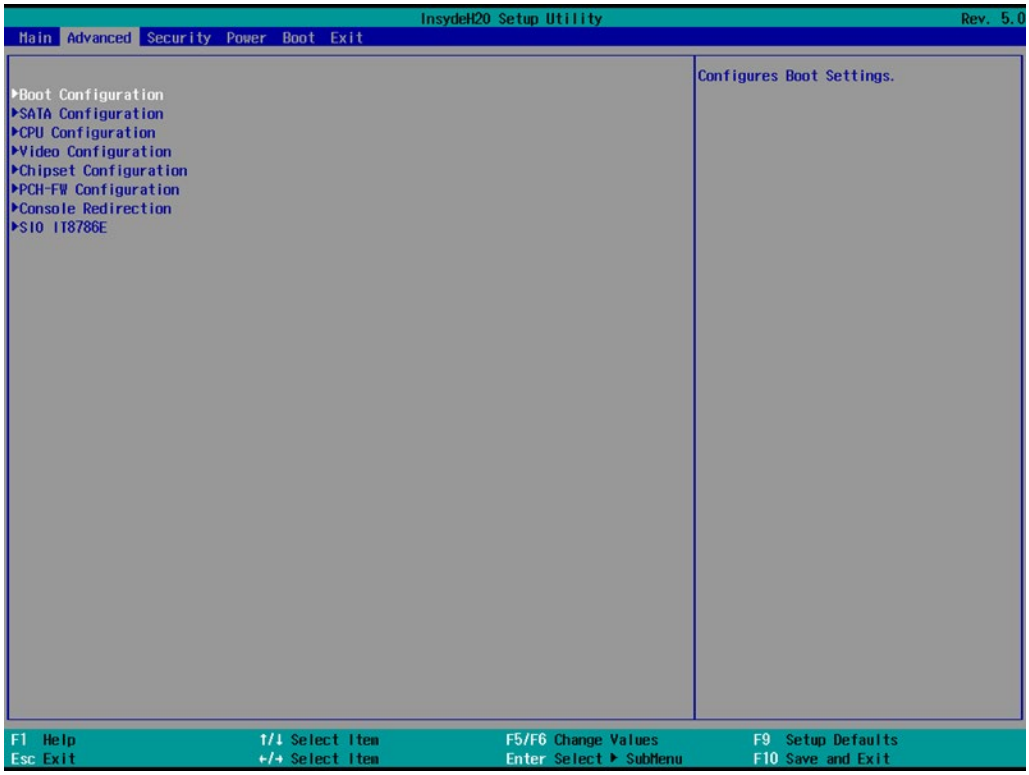
Main Page

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



Advanced Settings

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



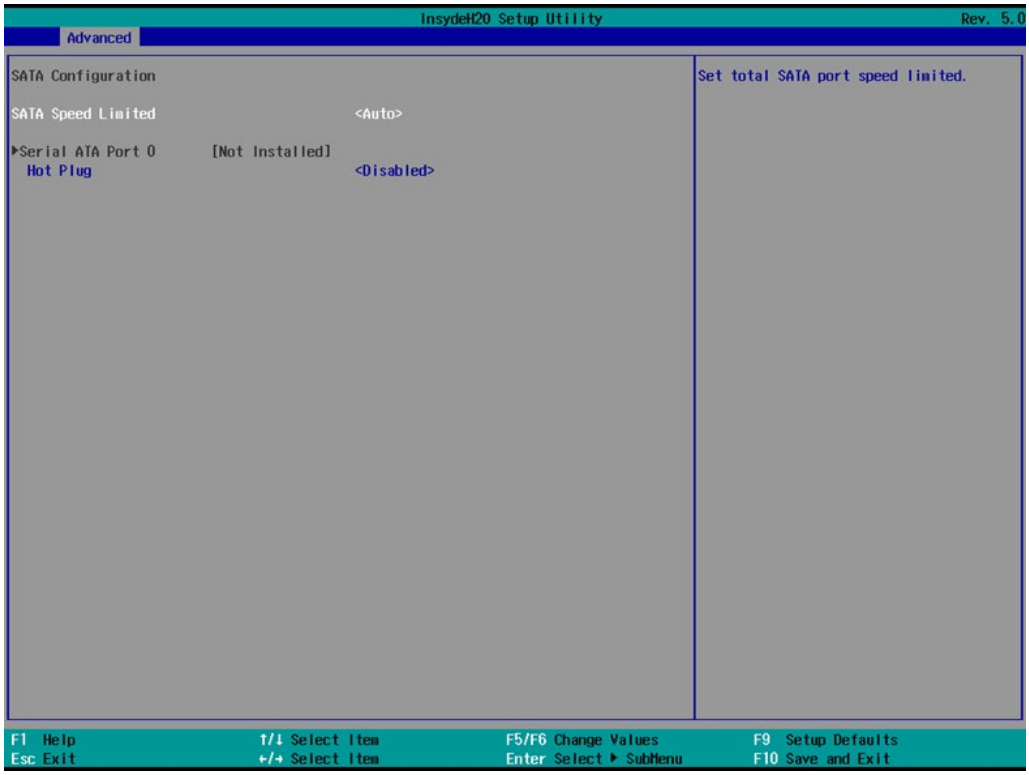
Boot Configuration

The **Numlock** option allows configuration of the Numlockvalue.

Options: On (default), Off.

SATA Configuration

This section allows you to select the SATA speed limit and hot plug setting.



SATA Speed Limited

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

Serial ATA Port

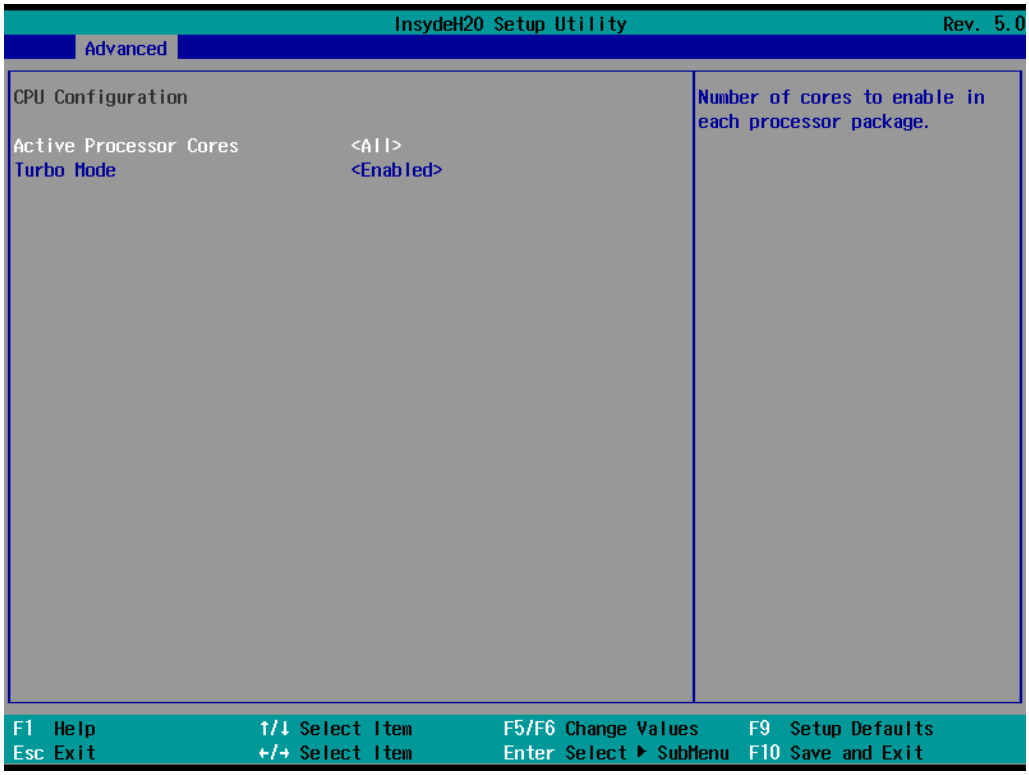
This setting displays information on the installed drives.

SATA Port Hot Plug

This setting allows you to enable/disable hot-plugging capabilities (the ability to remove the drive while the computer is running) that are configured by software for installed storage drives.

Options: Disabled (default), Enabled

CPU Configuration



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).

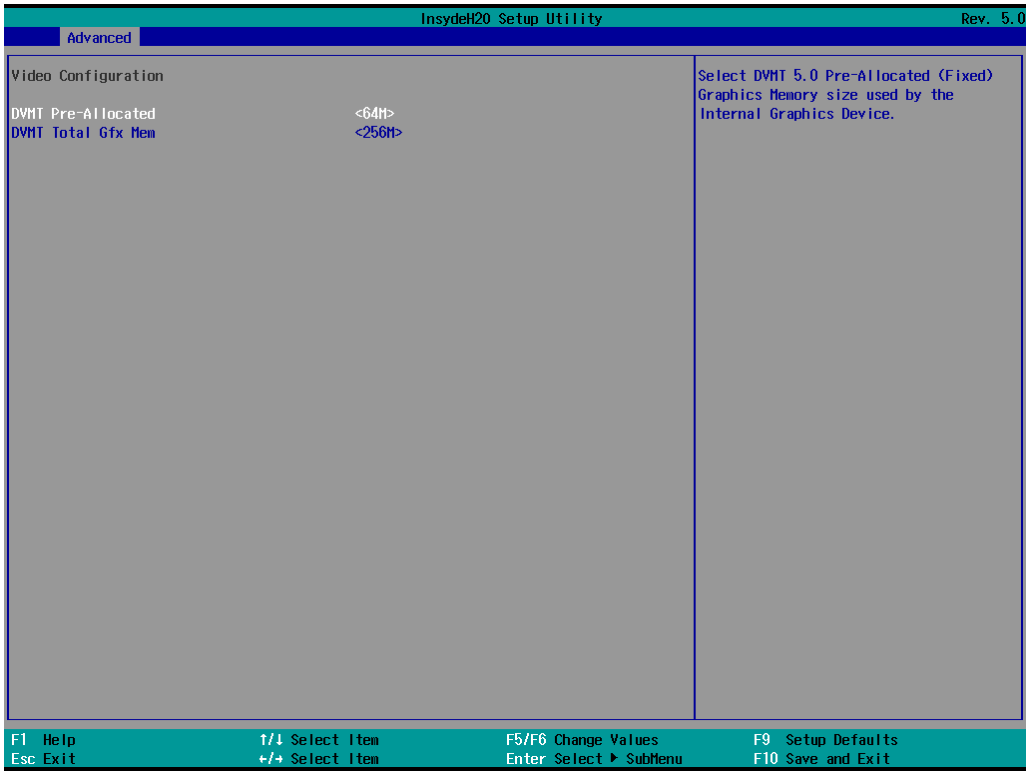
Options: All (default), 1, 2, 3

Turbo Mode

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

Options: Disabled, Enabled (default)

Video Configuration



DVMT Pre-Allocated

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

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

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

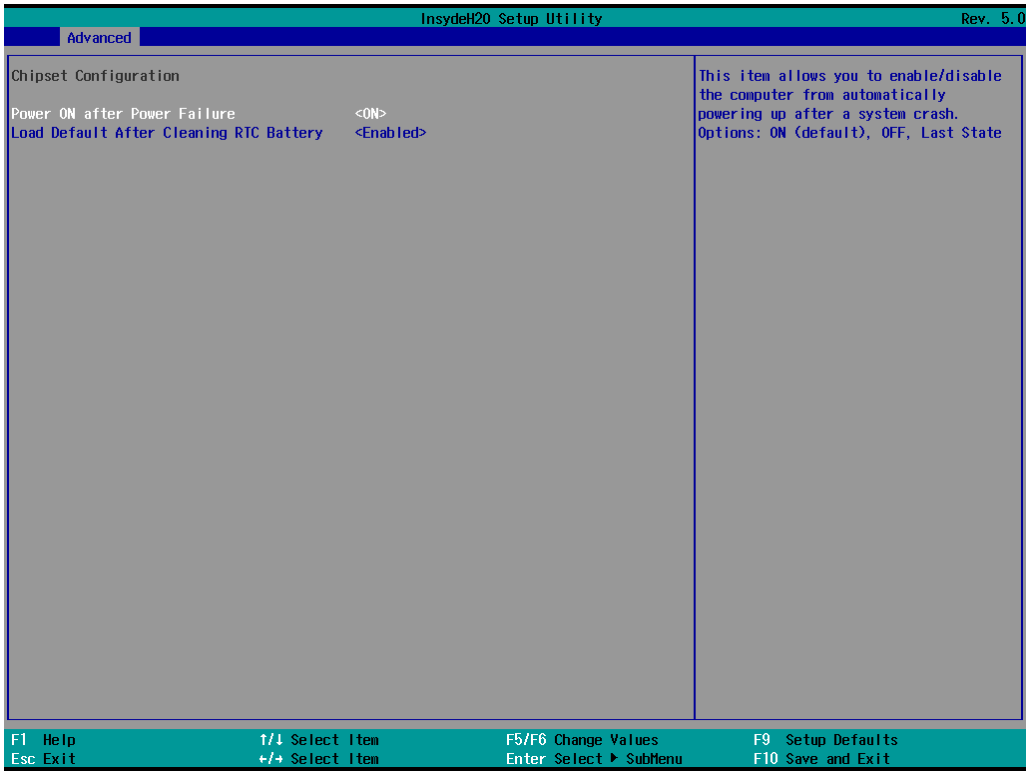
DVMT Total Gfx Mem.

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

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

Chipset Configuration

This section allows you to configure the chipset settings.



Power ON fter Power Failure

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

Options: ON (default), OFF, Last State

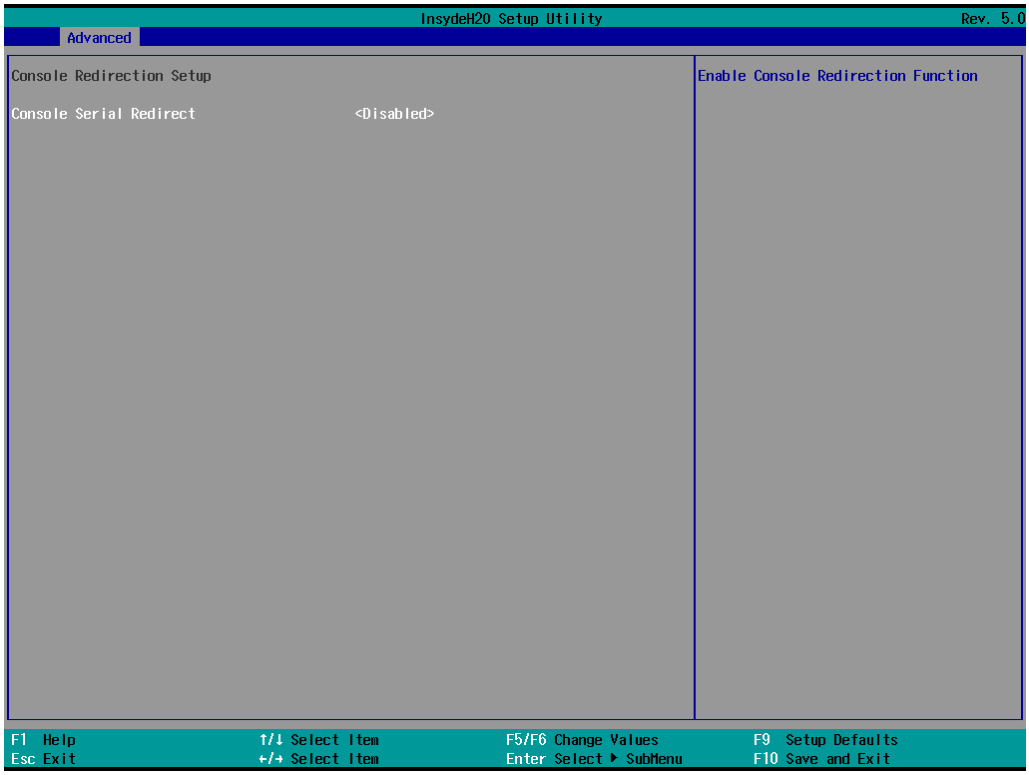
Load Default After Cleaning RTC Battery

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

Options: Disabled, Enabled (default)

Console Redirection

This section allows you to configure the console redirection settings.



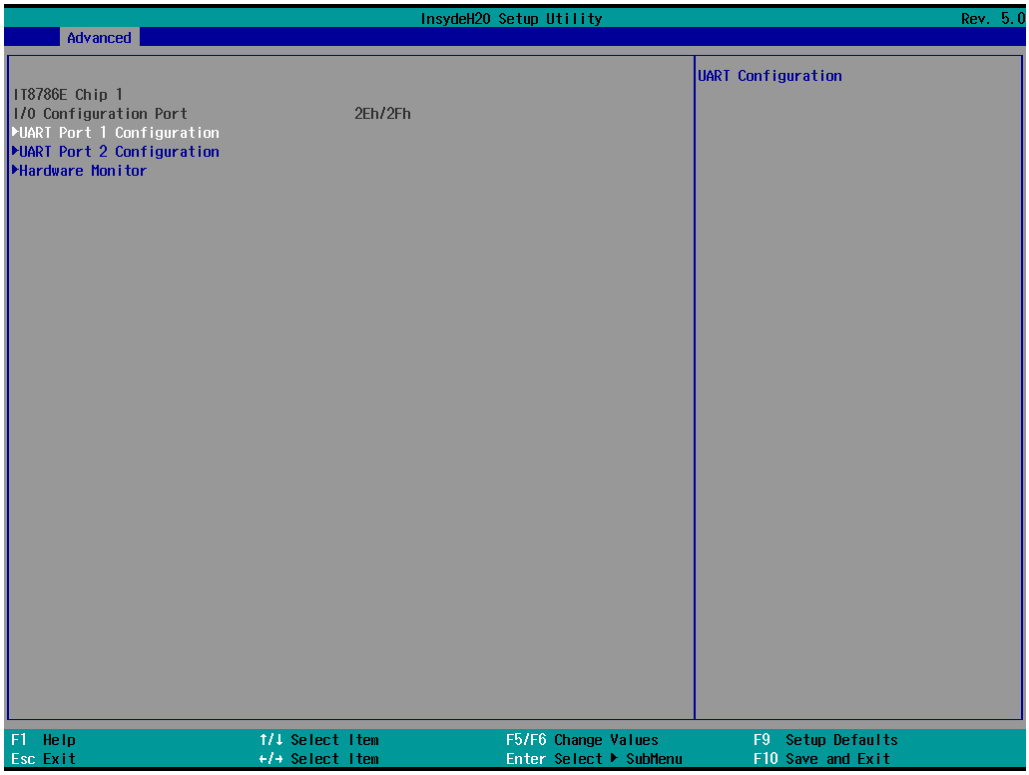
Console Serial Redirect

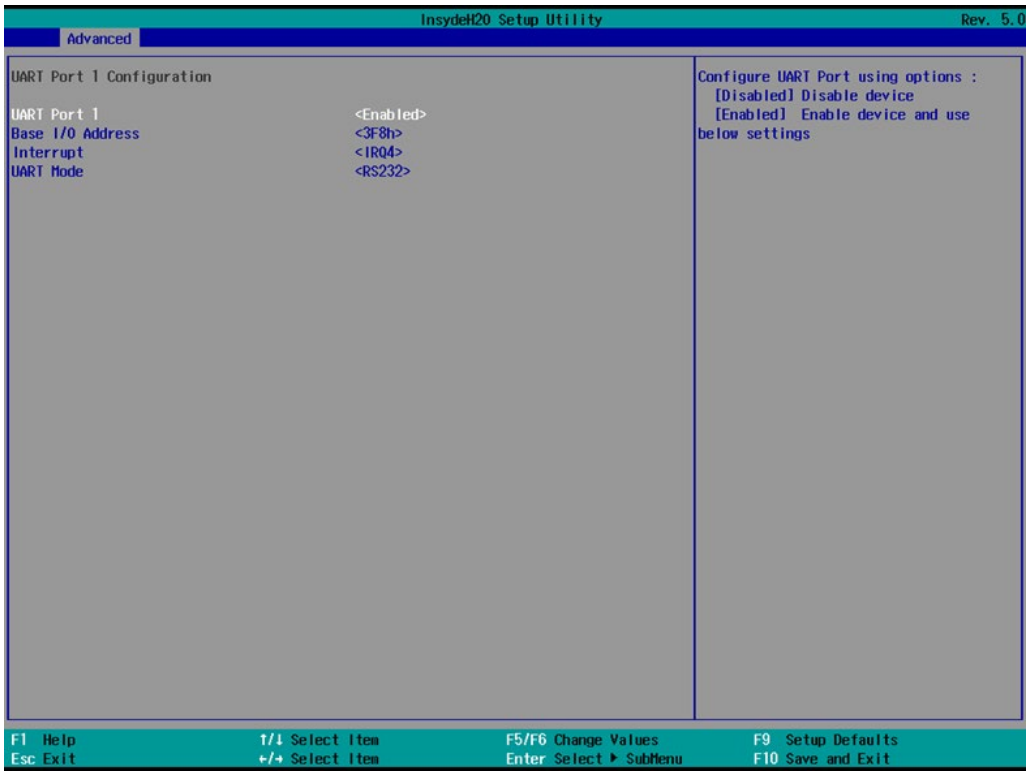
When the Console Redirection Function is enabled, the console information will be sent to the display monitor and the serial port (COM1).

Options: Disabled (default), Enabled

SIO ITE8786E

This section allows users to configure SIO settings.





UART Port 1

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

Disable: Disable the UART port 1 connection

Enable: Enable the UART Port 1 connection (default)

UART Port 2

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

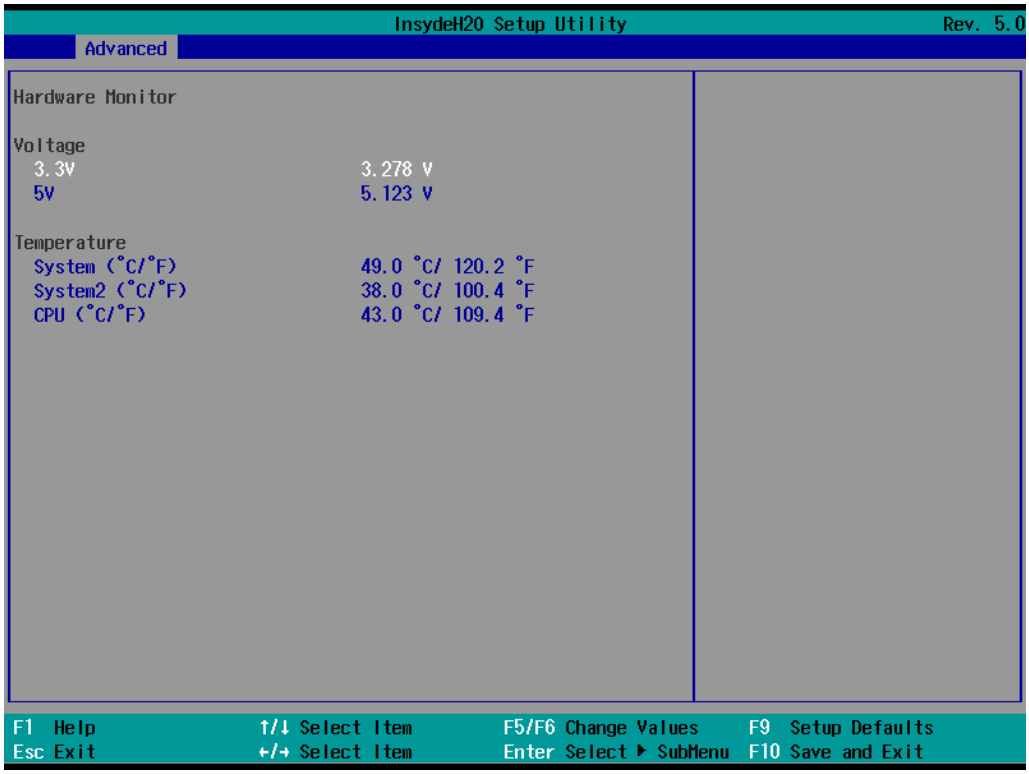
Disable: Disable the UART port 2 connection

Enable: Enable the UART Port 2 connection (default)

> **NOTE**
>
> All other UART ports can only be configured by the OS utility.

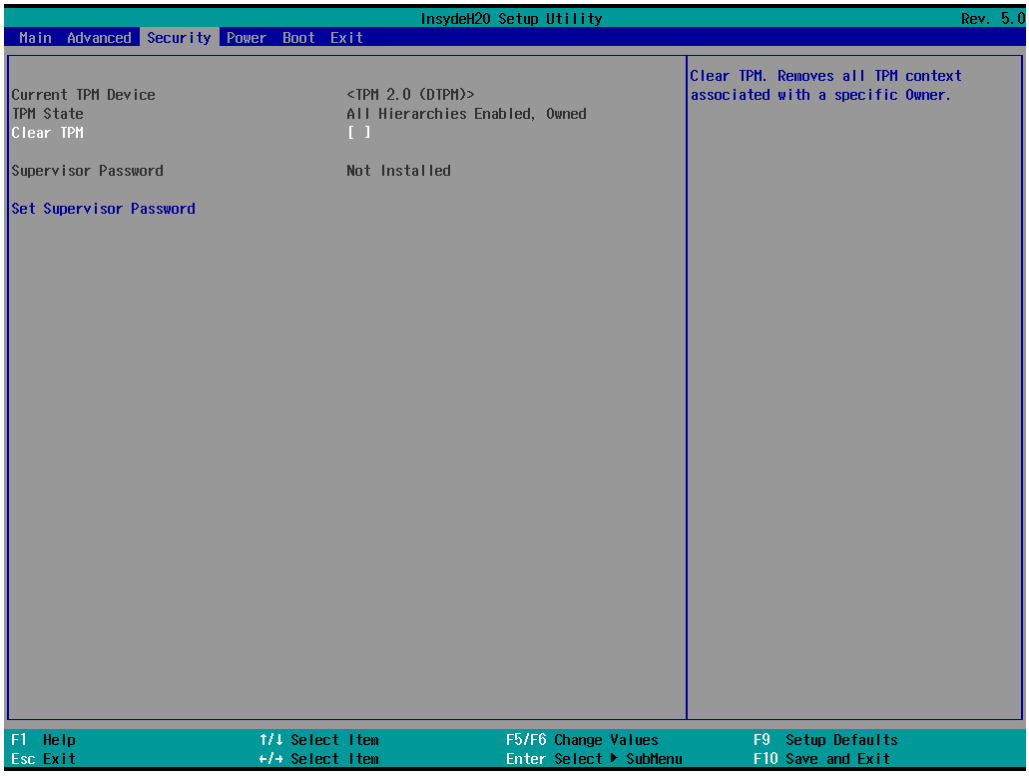
Hardware Monitor

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



Security Settings

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



Current TPM Device

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

TPM State

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

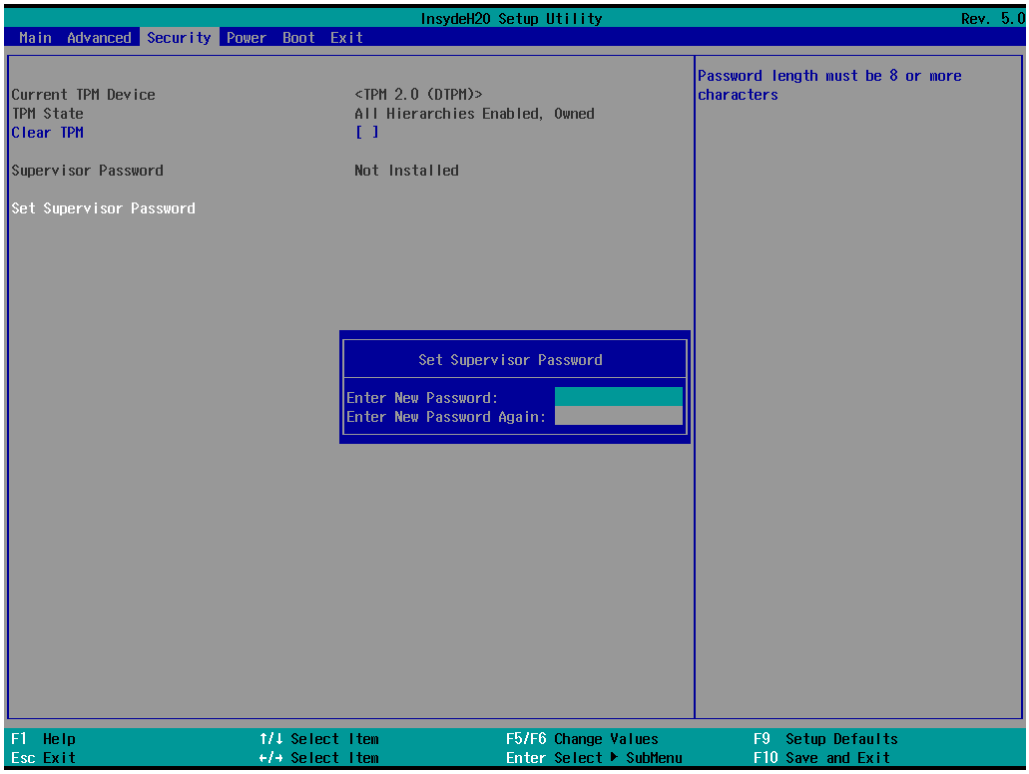
Clear TPM

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

Set Supervisor Password

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

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



After setting the supervisor password, users can choose when the input password screen should be displayed.

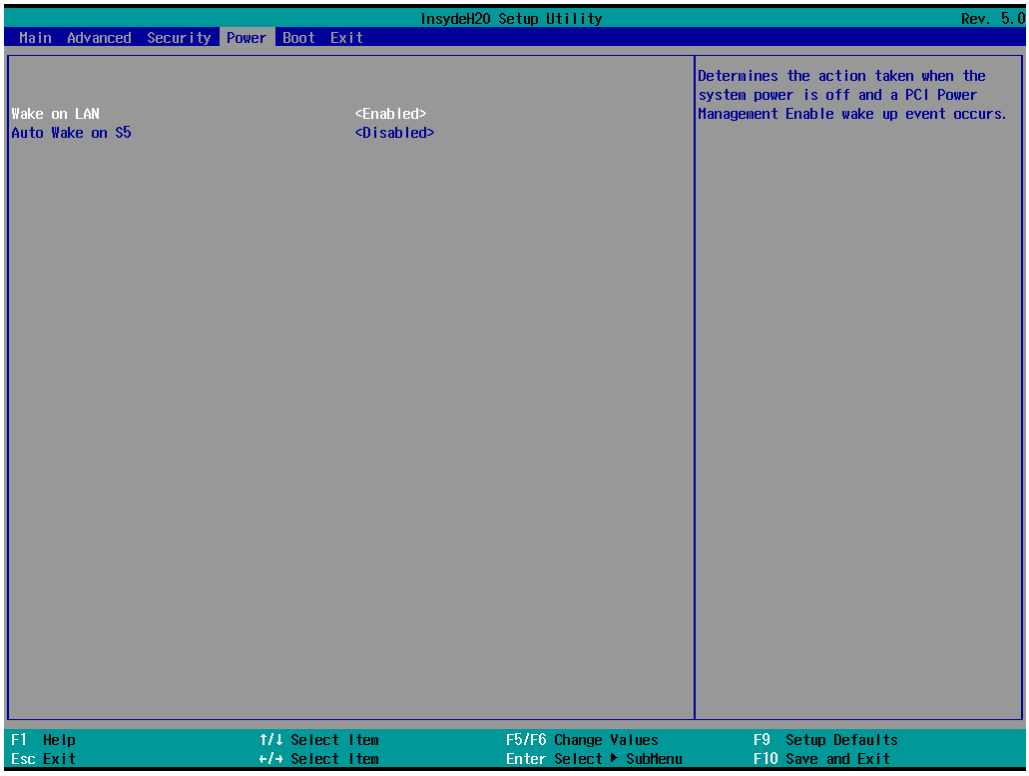
Enable: System will ask for the password on post time

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

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

Power Settings

This section allows users to configure power settings.



Wake on LAN

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

Options: Enabled (default), Disabled

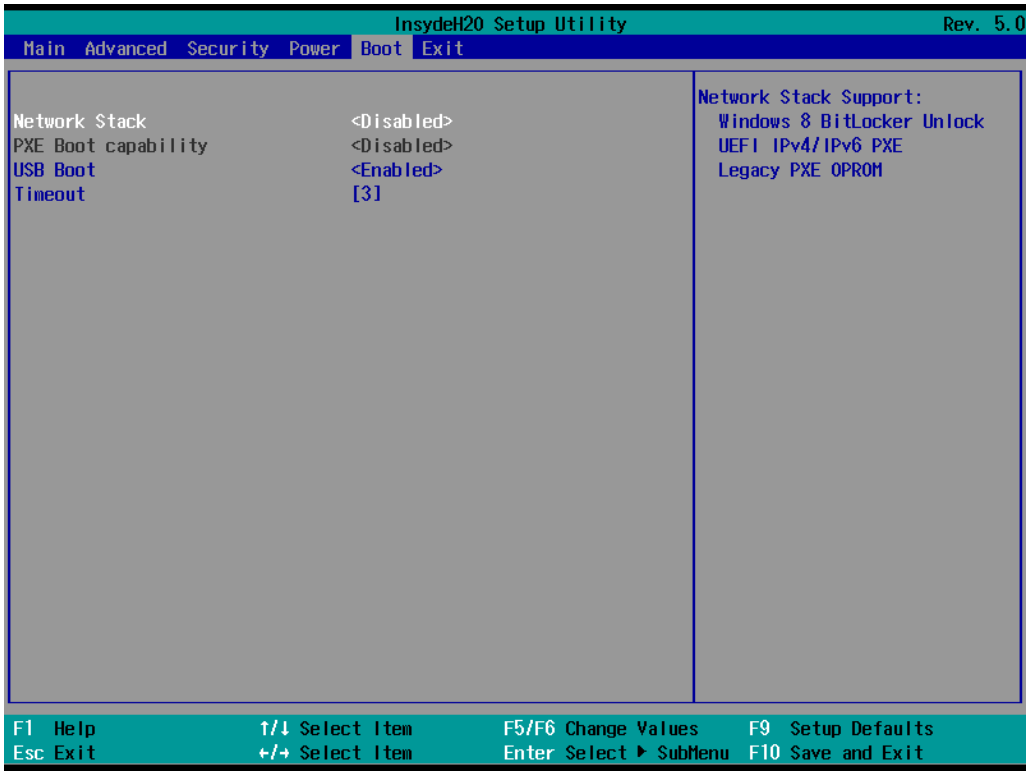
Auto Wake on S5

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

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

Boot Settings

This section allows users to configure boot settings.



NOTE

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

Network Stack

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

Options: Disabled (default), Enabled

PXE Boot capability

This item will be shown only when you have enabled the Network Stack. PXE Booting is booting a system over a network. This item allows users to start PXE over IPv4 or IPv6

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

USB Boot

Set booting to USB boot devices capability.

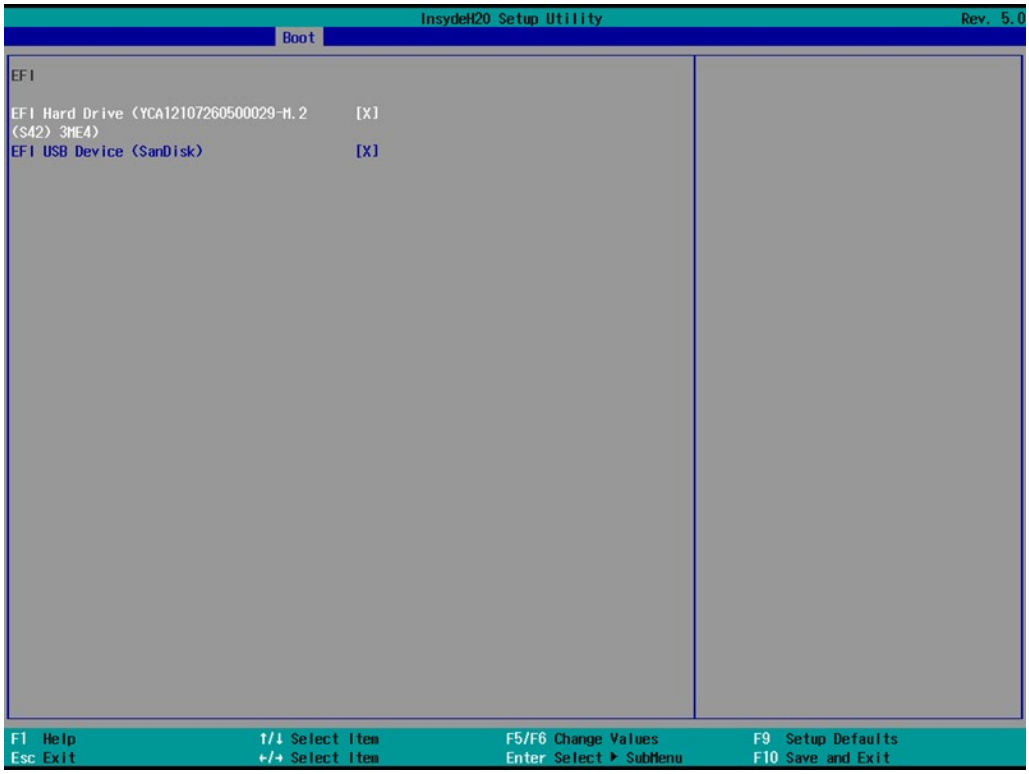
Options: Enabled (Default), Disabled

Timeout

This item sets the number of seconds that the firmware will wait before booting from the default boot selection

EFI

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



Exit Settings

The section allows users to exit the BIOS environment.

Exit Saving Changes

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

Options: Yes (default), No

Save Change Without Exit

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

Options: Yes (default), No

Exit Discarding Changes

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

Options: Yes (default), No

Load Optimal Defaults

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

Options: Yes (default), No

Load Custom Defaults

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

Options: Yes (default), No

Save Custom Defaults

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

Options: Yes (default), No

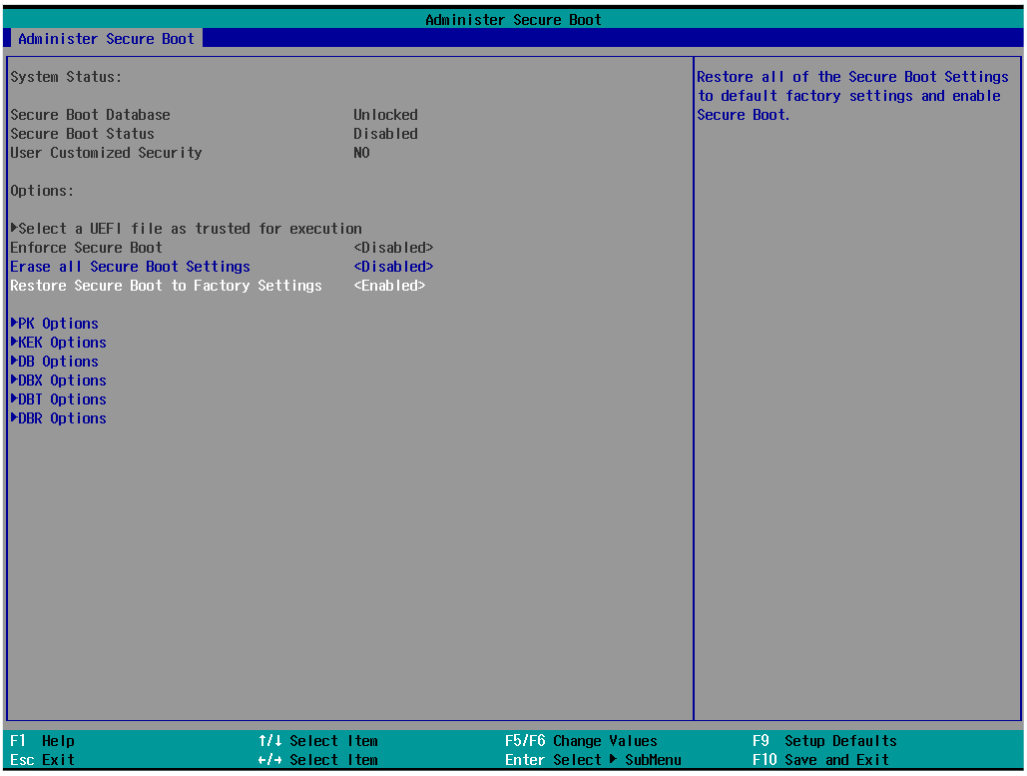
Discard Changes

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

Options: Yes (default), No

Administering Secure Boot

Press **F2** to go to the Administer Secure Boot.



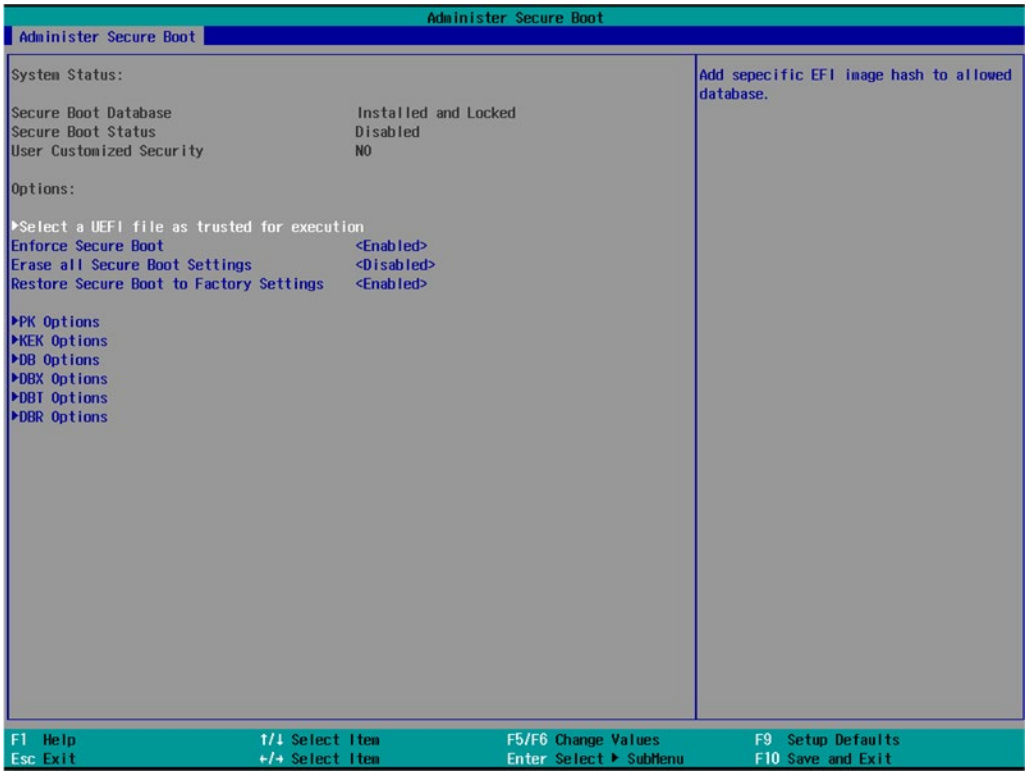
Secure Boot helps computers resist attacks and infection from malware. The feature defines an interface between the operating system and BIOS. It detects tampering with boot loaders, key operation system files, and unauthorized option ROMs by validating their digital signatures.

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.

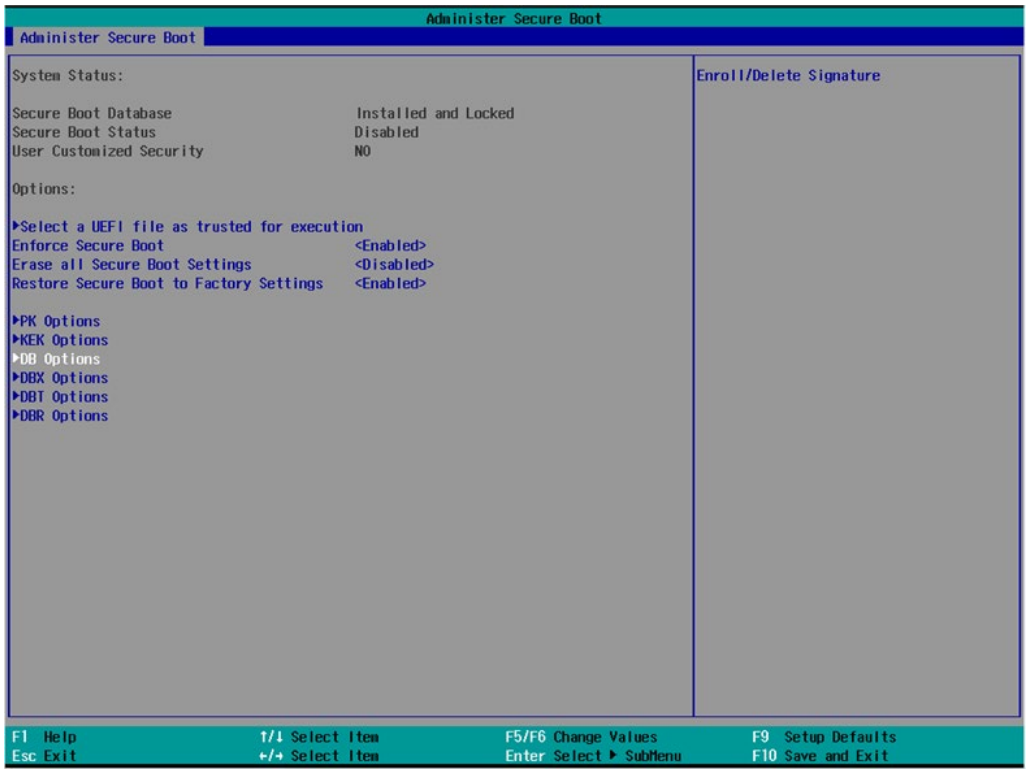
Moxa has put Microsoft key in BIOS in default; if users cannot boot up by "Non Windows OS", use the following example.

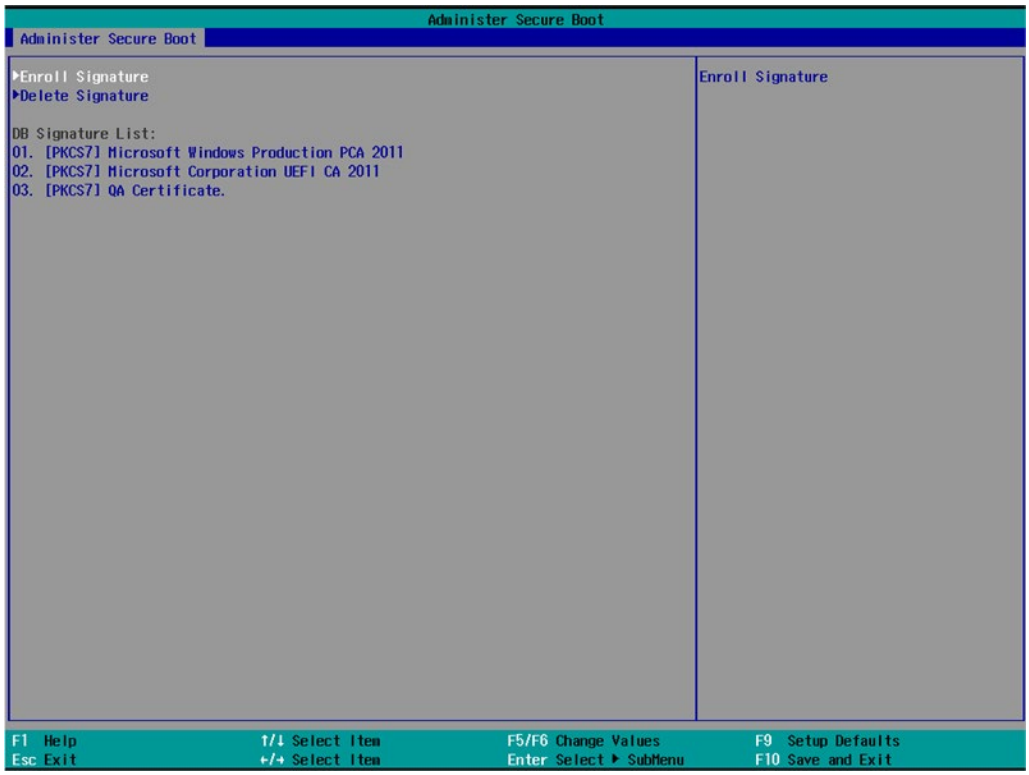
Enroll EFI Image



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





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.

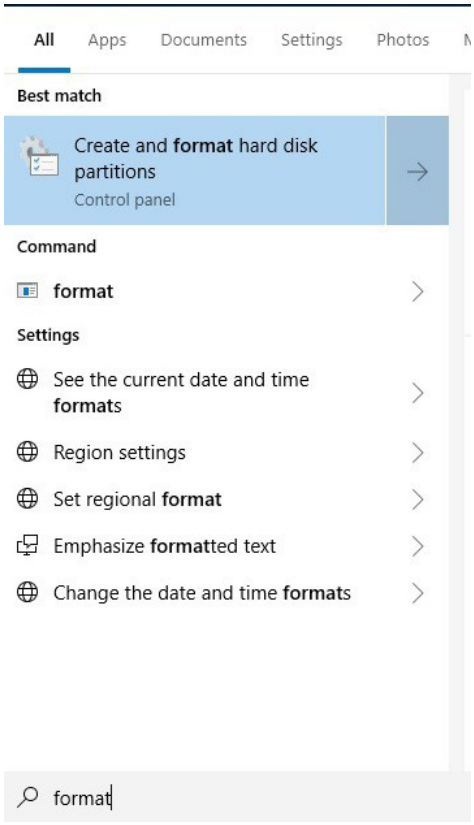
NOTE

It is possible to permanently damage the computer when upgrading the BIOS. We strongly recommend that you contact Moxa's technical support staff for assistance to obtain all the necessary tools and the most current advice before attempting to upgrade the BIOS on any Moxa device.

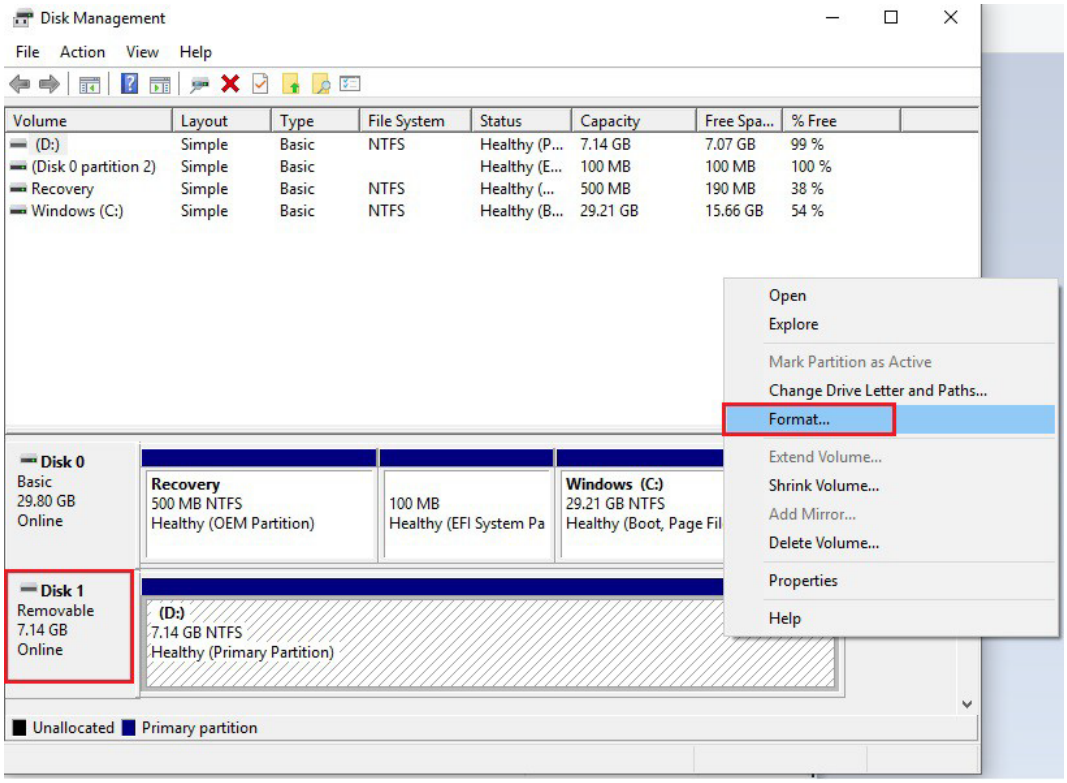
Step 1: Create a Bootable USB Disk

Before upgrading the BIOS, you must create a bootable USB drive as a system boot device for use in the future.

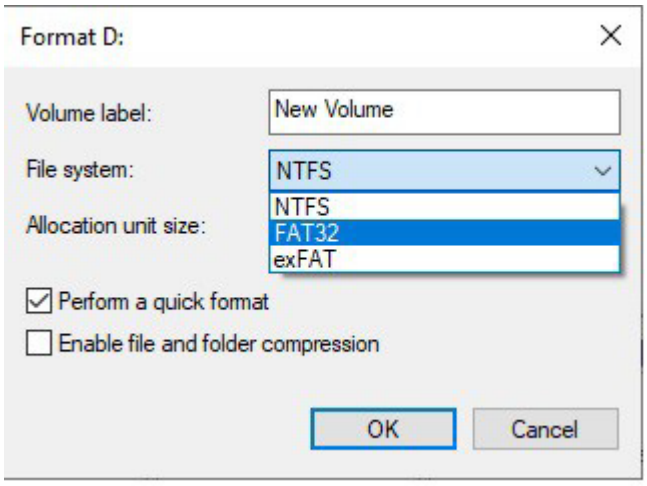
1. Insert a USB disk in the computer's USB drive.
2. Search for "format" and select **Create and format hard disk partitions**.



3. Right-click on the USB disk item and select **Format**.



4. Select **FAT32** and click **OK** to start formatting the disk.



Step 2: Prepare the Upgrade File

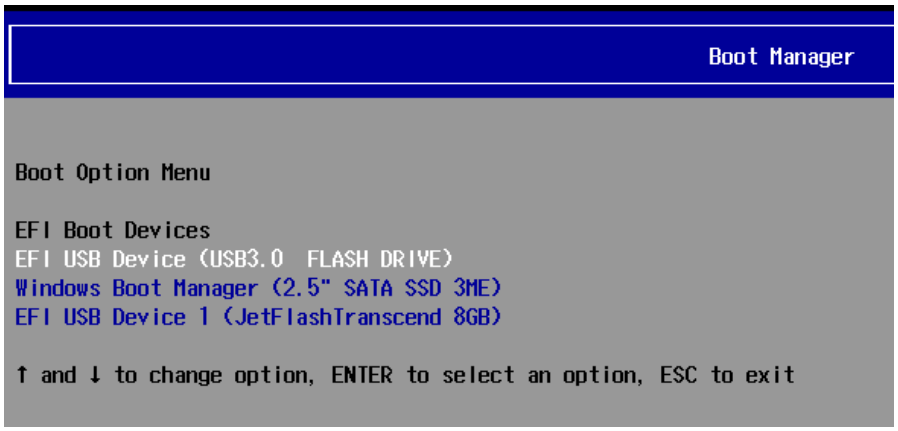
You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance. The BIOS upgrade file includes an **efi** folder and an **xxxx.efi** file. Copy the **efi** folder and **xxxx.efi** file to the bootable USB disk.

Step 3: Run the Upgrade Program on Your Computer

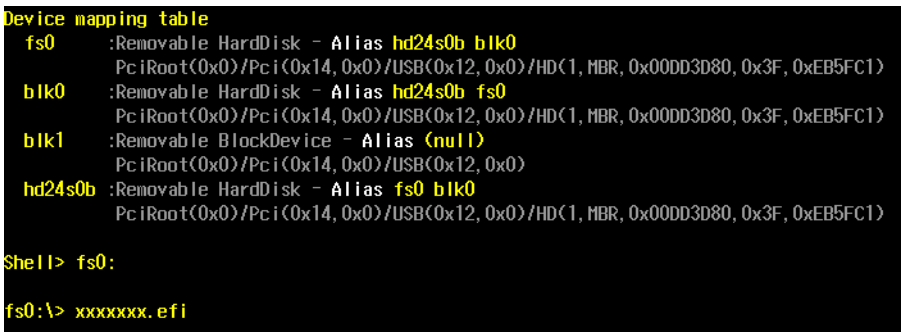
1. Reboot the computer with the boot disk and press F2 to go to the Boot Manager.

   If the BIOS cannot recognize the USB drive as the boot-up device, the USB drive might not have a partition table. Use the Windows command line tool **diskpart** to rebuild the partition table.

2. Select the USB Disk.



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

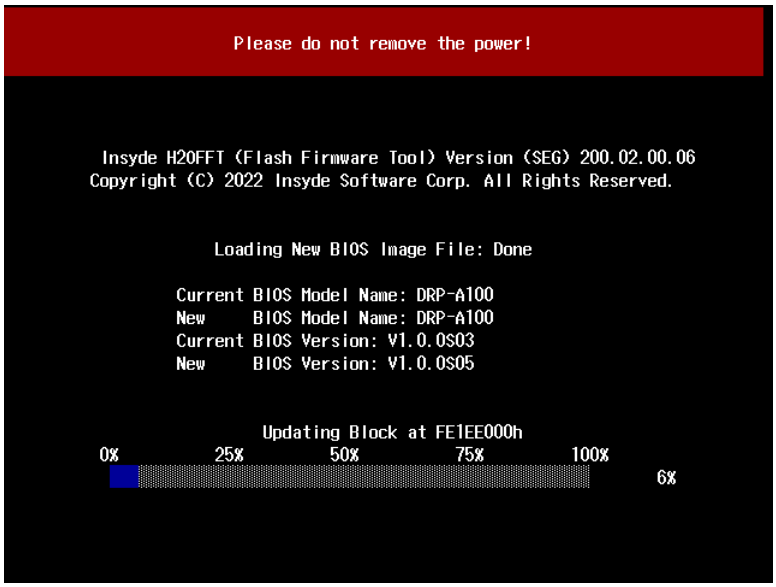


4. Wait until the upgrade procedure is completed.

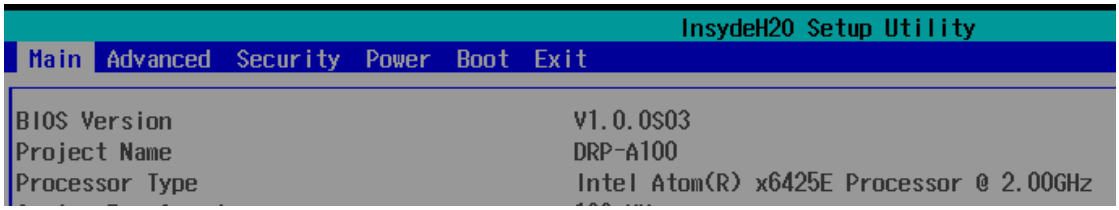
ATTENTION

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

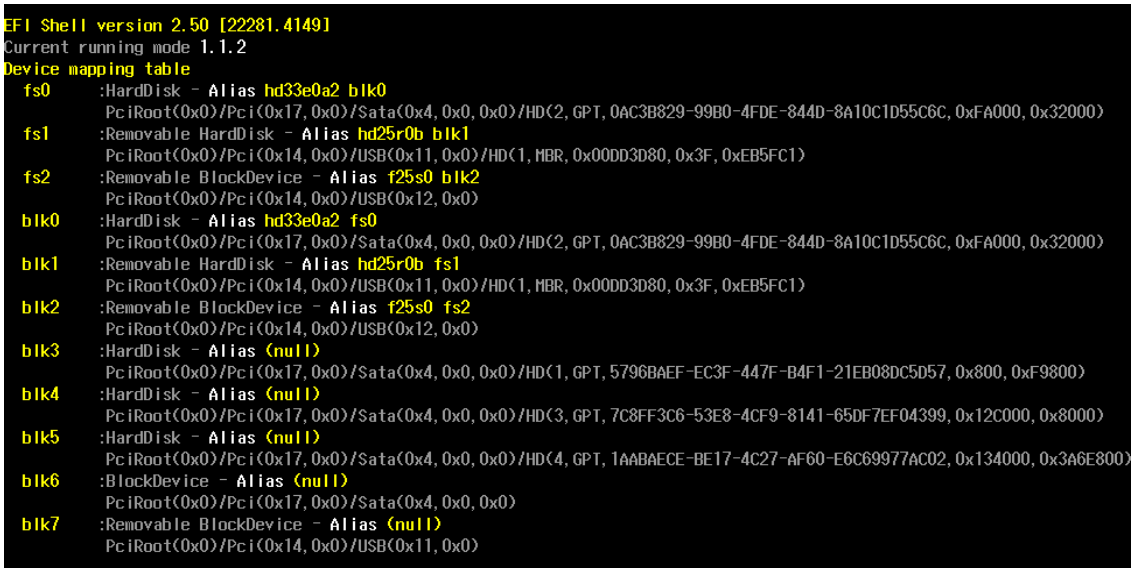
When the upgrade is finished, the computer will automatically reboot.



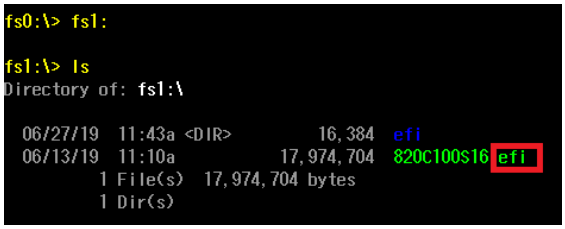
You can check BIOS version on the Main page to confirm the upgrade.



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



5. Go to each fsx (x stands for the number) and type ls to view the content of the boot device. If you find an upgrade file, run it.



A. Regulatory Approval Statement

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

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

European Community

Warning:
This is a class A product. If used in a domestic environment, this product may cause undesirable radio interference, in which case the user may be required to take adequate measures to prevent the interference from affecting nearby devices.