

UC-2200A Series Hardware User Manual

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UC-2200A Series Hardware User Manual

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1. Introduction

The UC-2200A computing platform is designed for embedded data acquisition applications. The computer comes with dual RS-232/422/485 serial ports and dual 10/100/1000 Mbps Ethernet ports, as well as a Mini PCIe socket to support a wireless module. These versatile capabilities let users efficiently adapt the UC-2200A to a variety of complex communications solutions.

Package Checklist

Before installing the UC-2200A computer, verify that the package contains the following items:

- UC-2200A Series embedded computer
- 3 round stickers
- Quick installation guide (printed)
- Warranty card



IMPORTANT

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

Product Features

- Armv8 Cortex-A53 dual-core 1 GHz processor
- 2 auto-sensing 10/100/1000 Mbps Ethernet ports
- Rich programmable LEDs and a programmable button for easy installation and maintenance
- LTE-ready with Verizon and AT carrier approvals and CE, FCC, and UL certifications
- -40 to 75°C operating temperature range
- Long-term Linux support until 2027; includes bug fixes and security patches

Product Specifications



NOTE

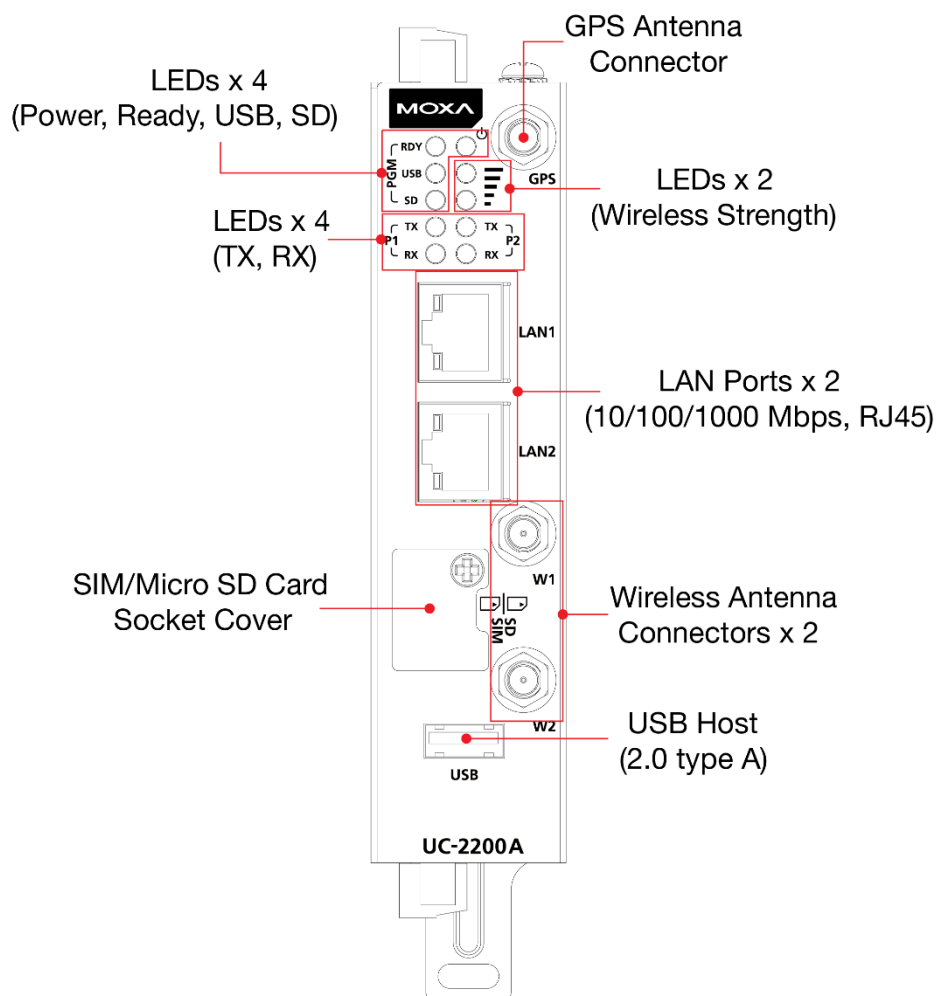
The latest specifications for Moxa's products can be found at <https://www.moxa.com>.

2. Hardware Introduction

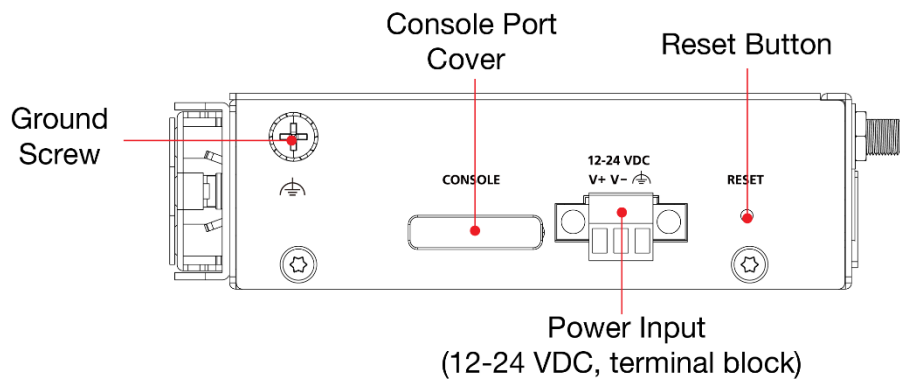
The UC-2200A embedded computers are compact and rugged, making them suitable for industrial applications. The LED indicators allow you to monitor device performance and quickly identify issues, and the multiple ports can be used to connect a variety of devices. The UC-2200A computers come with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. In this chapter, we provide basic information about the embedded computer's hardware and its various components.

Appearance

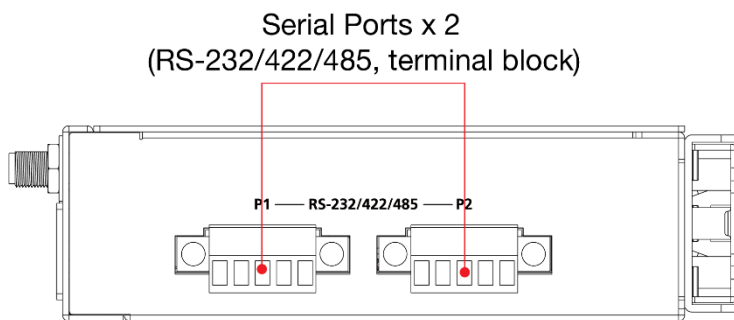
Front View



Top View

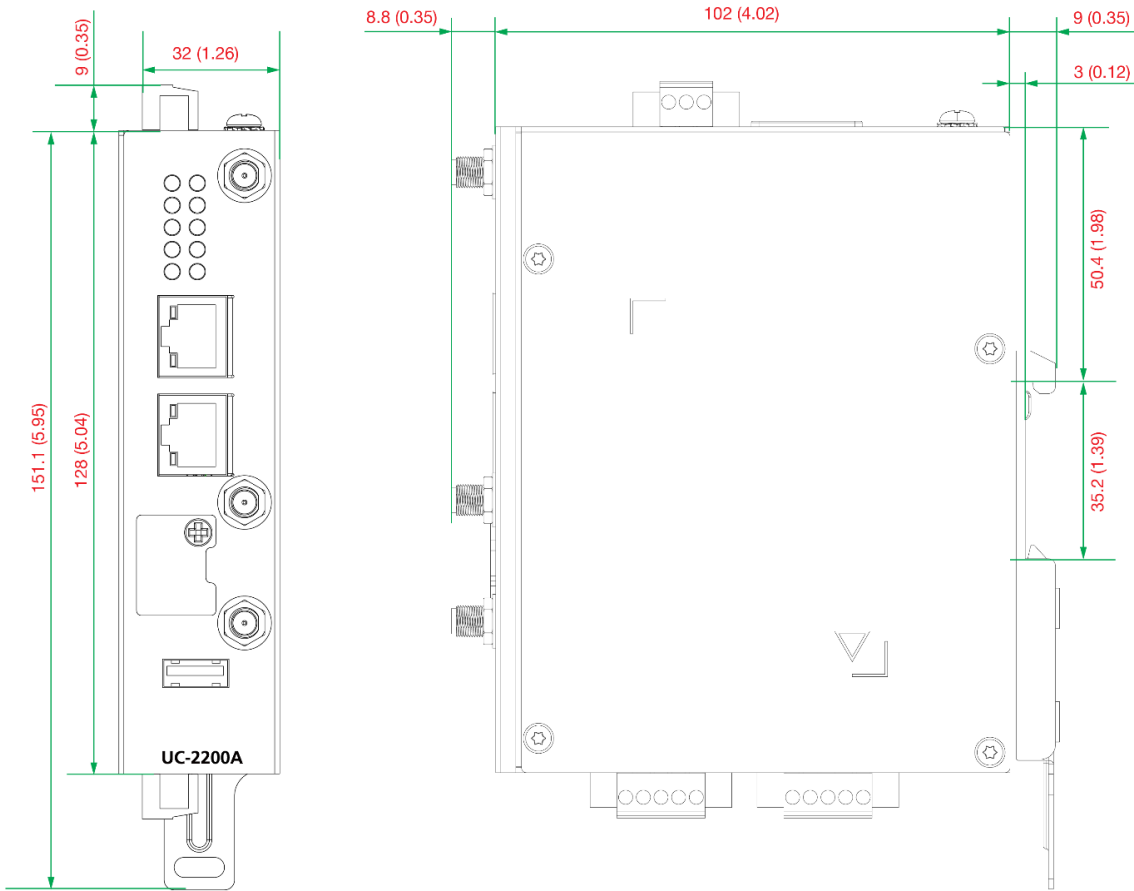


Bottom View



Dimensions

Unit: mm (inch)



LED Indicators

The function of each LED is described in the table below:

LED	Status	Function
Power	Green	Power is ON
	OFF	Power is OFF
SW Ready/Programmable	Yellow	System is ON and working normally
	OFF	System is not ready
USB/Programmable	Green	USB device is connected and working normally
	OFF	USB device is not connected
SD/Programmable	Green	Micro SD card inserted and working normally
	OFF	Micro SD card is not detected
Wireless Signal Strength/Programmable	Yellow	The number of glowing LEDs indicates the signal strength: 2 (Yellow + Yellow) Excellent 1 (Yellow): Poor 1 (Yellow Blinking, heartbeat): Very Poor
	OFF	Wireless module is not detected
Serial Tx	Green	Steady ON: Serial 1/2 working normally Blinking: Serial 1/2 transmitting normally
	OFF	Serial 1/2 is not used.
Serial Rx	Yellow	Steady ON: Serial 1/2 working normally Blinking: Serial 1/2 receiving normally.
	OFF	Serial 1/2 not in use
LAN	Green	Steady ON: 10/100M link established Blinking: Receiving or transmitting data
	Yellow	Steady ON: 1000M link established Blinking: Receiving or transmitting data
	OFF	No Ethernet connection

Reset Button

To reboot the computer, press the Reset button for 1 second.

Reset to Default

The UC-2200A is also provided with a Reset to Default function which can reset the operating system back to the factory default status. Press and hold the Reset button between 7 to 9 seconds to reset the computer to the factory default settings. When the reset button is held down, the Ready LED will blink once every second. The Ready LED will become steady when you hold the button continuously for 7 to 9 seconds. Release the button within this period to load the factory default settings.

Real-time Clock

The UC-2200A's real time clock is powered by a non-chargeable battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.



WARNING

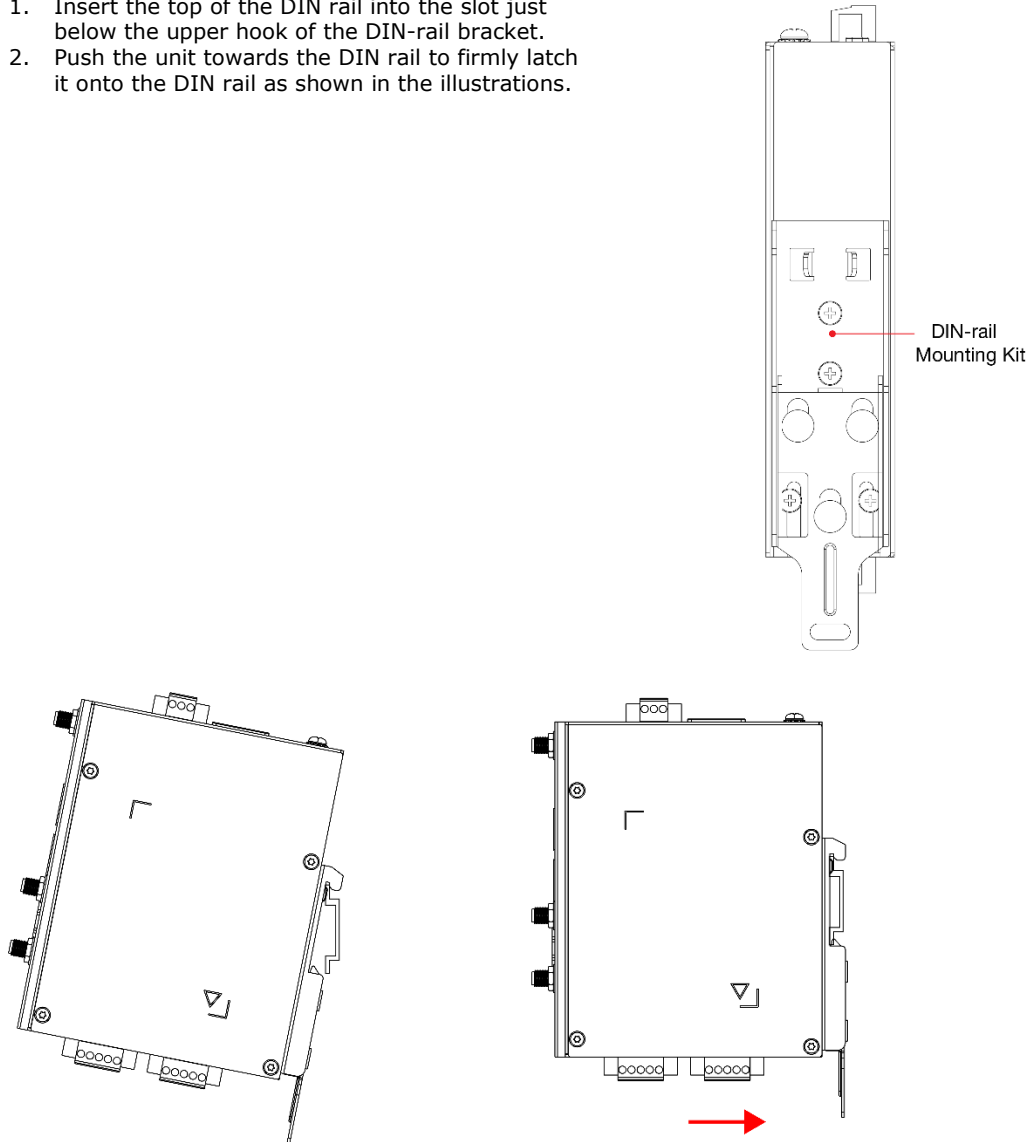
There is a risk of explosion if the battery is replaced with an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Installation Options

DIN-rail Mounting

The aluminum DIN-rail attachment plate comes attached to the product's casing. To mount the UC-2200A on to a DIN rail, make sure that the metal spring extension is facing upwards and follow these steps.

1. Insert the top of the DIN rail into the slot just below the upper hook of the DIN-rail bracket.
2. Push the unit towards the DIN rail to firmly latch it onto the DIN rail as shown in the illustrations.

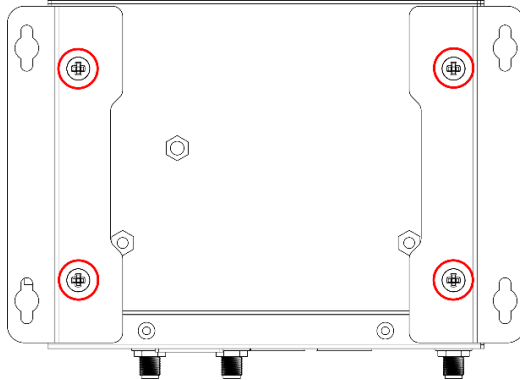


Wall Mounting (optional)

The UC-2200A can be mounted on to a wall using a wall-mounting kit as shown in the following illustrations:

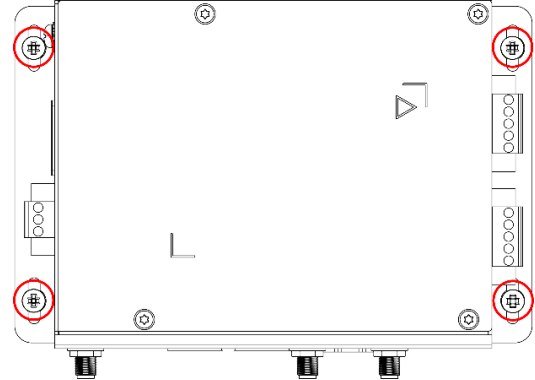
Step 1:

Use four screws to fasten the wall-mounting brackets on the left panel of the computer.



Step 2:

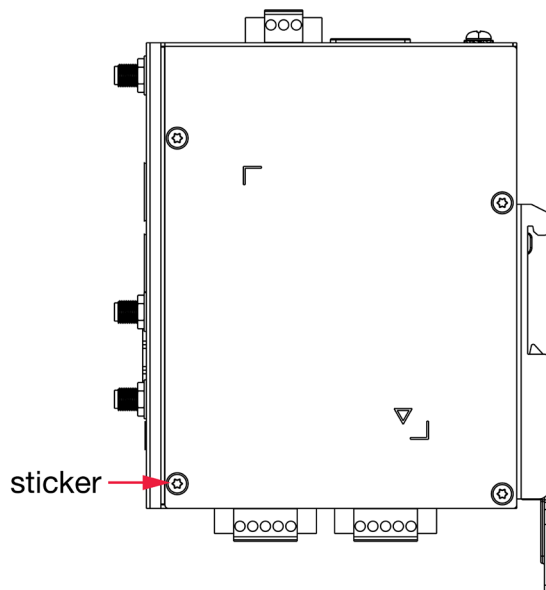
Use another four screws to mount the computer on a wall or a cabinet.



The optional wall-mounting kit is not included in the product box and should be purchased separately.

Placing the Round Stickers on the Screws

Three round stickers are included in the product package. Stick one of them on to an external screw as indicated in the figure below to help detect unauthorized access and tampering.



To place the sticker, do the following:

1. Use a cloth to clean the surface of the screw with a 75% alcohol solution.
2. Use a tweezer to place the sticker on the screw.
3. Press the sticker down on to the screw for at least 15 seconds with a pressure of about 15 psi (pound/square inch)
4. Keep the device at room temperature for 24 hours before deploying it.



NOTE

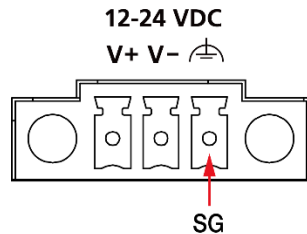
- Place the sticker carefully on the screw because it is thin and fragile.
- The ideal environment to store the stickers is at 22°C (72°F) and less than 50% relative humidity.
- Keep the extra two stickers in a safe place so that only authorized persons can access them.

3. Hardware Connection Description

In this chapter, we describe how to connect the UC-2200A to a network and various devices.

Connecting the Power

Terminal Block



Connect the 12 to 24 VDC power line to the terminal block, which is connector to the UC-2200A Series computer. If the power is supplied properly, the "Power" LED will glow a solid green light. The power input location and pin definition are shown in the adjacent diagram. SG: The Shielded Ground (sometimes called Protected Ground) contact is the bottom contact of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.

Wiring Requirements

In this section, we describe how to connect various devices to the embedded computer. 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 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.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, it is strongly advised that you label the wiring to all devices in the system.



ATTENTION

Safety First!

Be sure to disconnect the power cord before doing installations and/or wiring.

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.

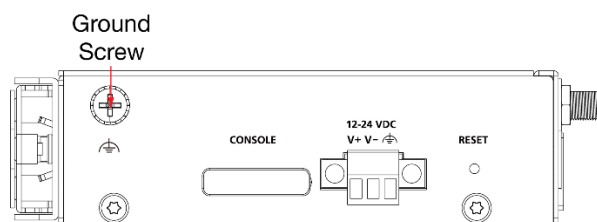
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

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.

Grounding the Unit

A grounding screw is provided on the top panel of the computer. Use this to connect the computer to a well-grounded mounting surface such as a metal panel.



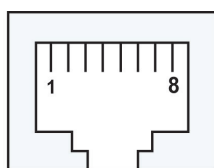
ATTENTION

A shielded power cord is required to meet FCC emission limits and to prevent interference from nearby radio and television reception. It is essential that only the power cord supplied with the device is used.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Connecting to the Network

The Ethernet ports are located on the front panel of the UC-2200A computers. The pin assignments for the Ethernet port are shown in the following figure. If you are using your own cable, ensure that the pin assignments of the Ethernet cable connector match the pin assignments on the Ethernet port.



10/100 Mbps

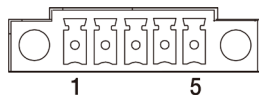
Pin	Signal
1	Tx+
2	Tx-
3	Rx+
4	-
5	-
6	Rx-
7	-
8	-

1000 Mbps

Pin	Definition
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(2)-
6	TRD(1)-
7	TRD(3)+
8	TRD(3)-

Connecting to Serial Ports

The two serial ports (P1 and P2) use terminal connectors. Each port can be configured by software for RS-232, RS-422, or RS-485 mode. The pin assignments for the ports are shown in the following figure:



Pin	RS-232	RS-422	RS-485
1	TXD	TXD+	-
2	RXD	TXD-	-
3	RTS	RXD+	D+
4	CTS	RXD-	D-
5	GND	GND	GND

Connecting to a USB Device

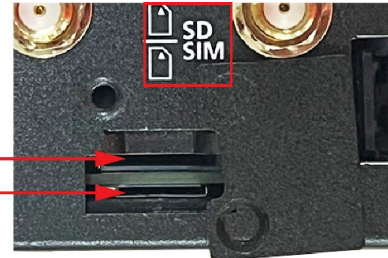
The UC-2200A computers come with a USB port located on the lower part of the front panel for connecting to a device with a USB interface. The USB port uses a type A connector. By default, the USB storage connected to this interface is mounted at `/mnt/usbstorage`.

Inserting the Micro SD Card and SIM Card

The UC-2200A comes with a Micro SD socket for storage expansion and a SIM card socket for cellular communication. The Micro SD card/SIM card sockets are located on the lower part of the front panel. To install the cards, remove the screw and the protection cover to access the sockets, and then insert the Micro SD card or the SIM card into the sockets. You will hear a click when the cards are in place. To remove the cards, push the cards in before releasing them.



Micro SD Card Socket
SIM Card Socket



Connecting to the Console Port

The console port is an RS-232 port that can be connected to a 4-pin pin header cable. You can use this port for debugging or firmware upgrade.

	Pin	Signal
4	1	TxD
3	2	RxD
2	3	NC
1	4	GND

Connecting the Antennas



There are three antenna connectors on the front panel of the UC-2200A. W1 and W2 are for cellular modules. The GPS antenna connector is located on the top of the front panel. All three connectors are of SMA type.

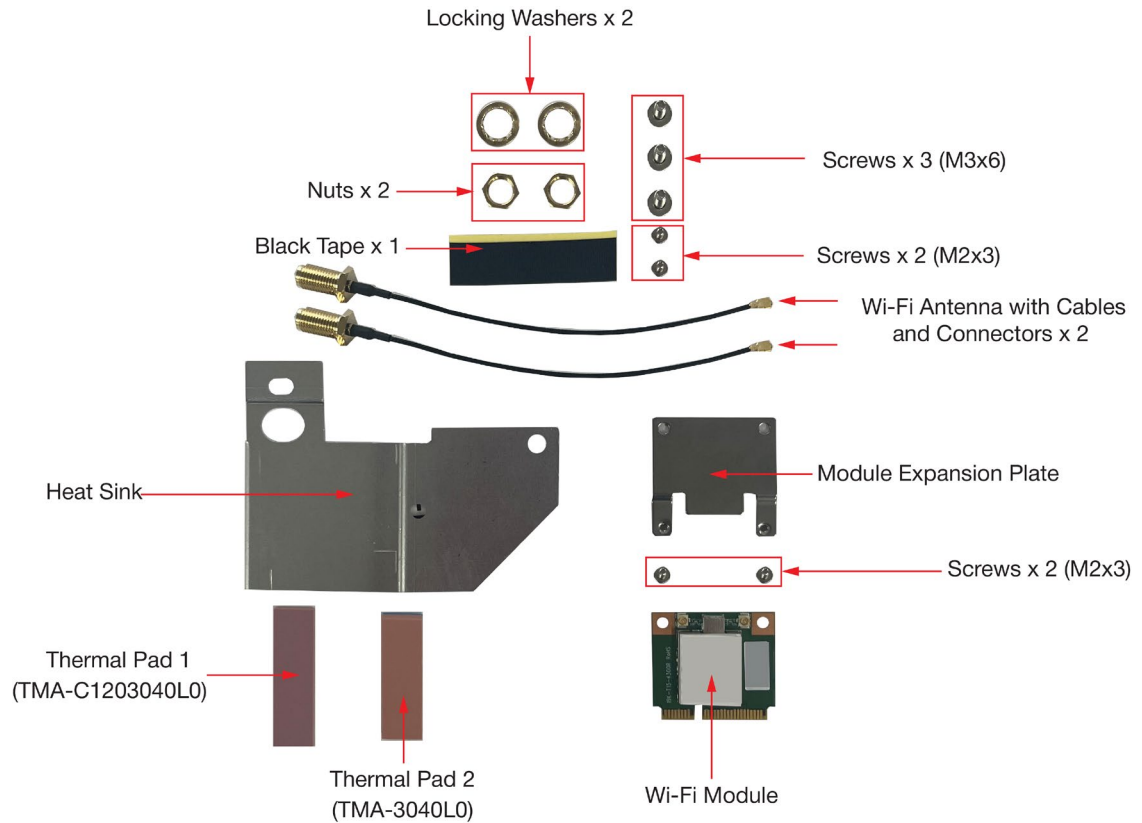


Installing the Wi-Fi Module

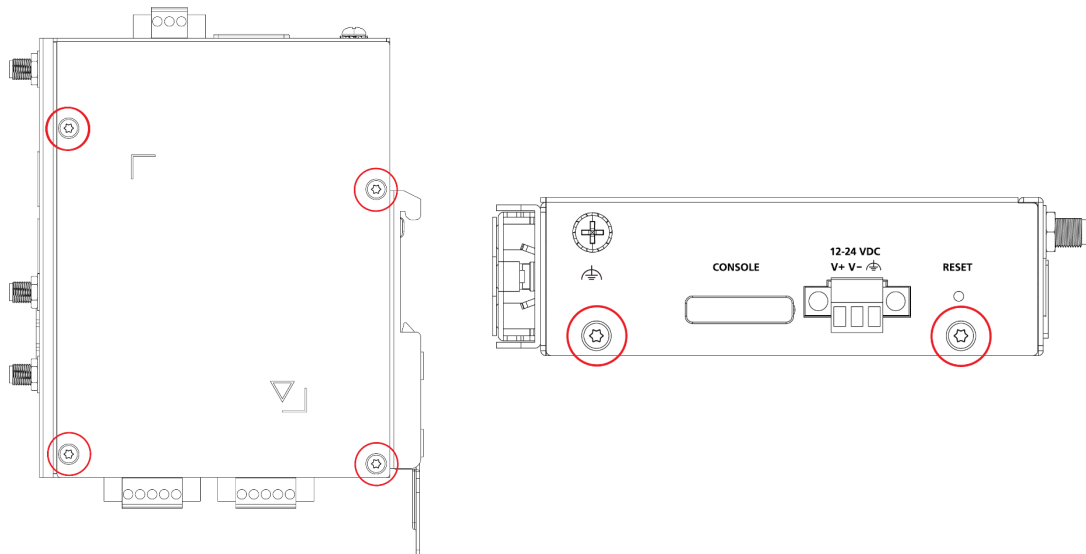
The UC-2200A comes with a Mini PCIe socket to support a wireless module. The module is not included in the product package and needs to be purchased separately.

To install the Wi-Fi module, do the following:

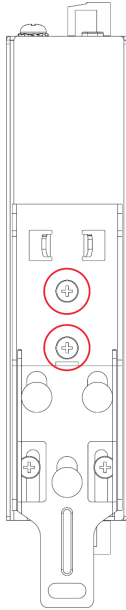
1. Check the Wi-Fi module package items and confirm the items list here are included.



2. Remove the four screws on the side panel, and the two screws on the top panel.



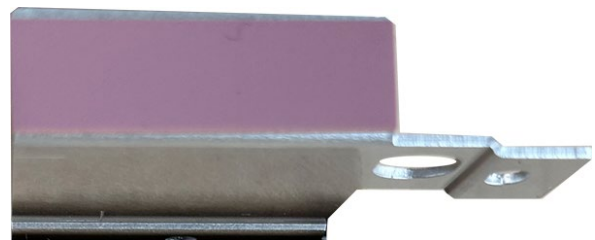
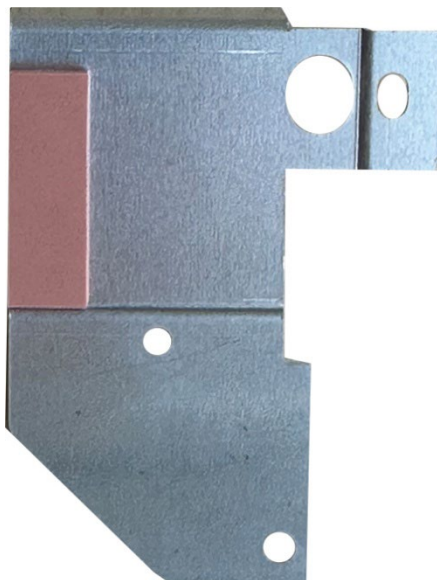
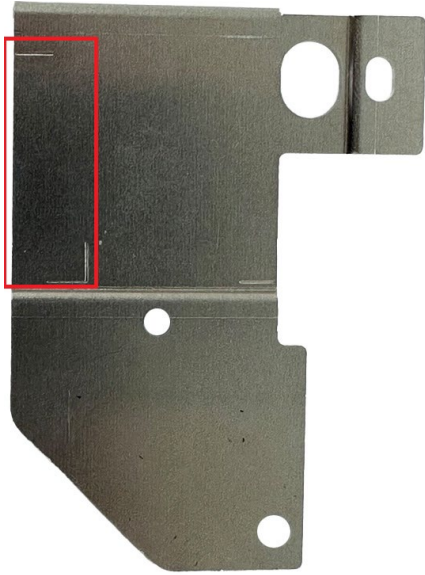
For a smooth installation, we strongly suggest you loosen the two screws on the DIN-rail mounting kit.



3. Attach the Wi-Fi module to the expansion plate by fastening two screws (M2x3).



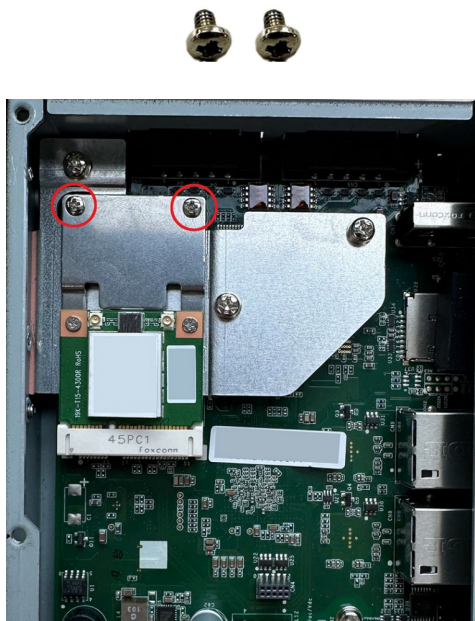
4. Place one thermal pad (marked as TMA-3040L0) on the heat sink and place the other thermal pad (marked as TMA-C1203040L0) on the side of the heat sink.
- On the left side of the heat sink there are two lines indicating the location to place the thermal pad TMA-3040L0.



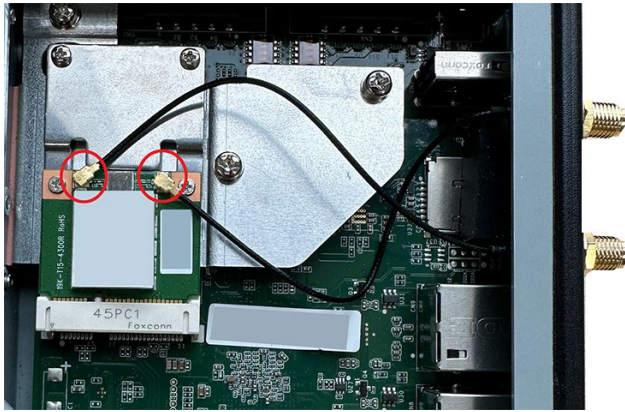
5. Place the heat sink in the location indicated and fasten the three screws (M3x6) as shown in the following figure:



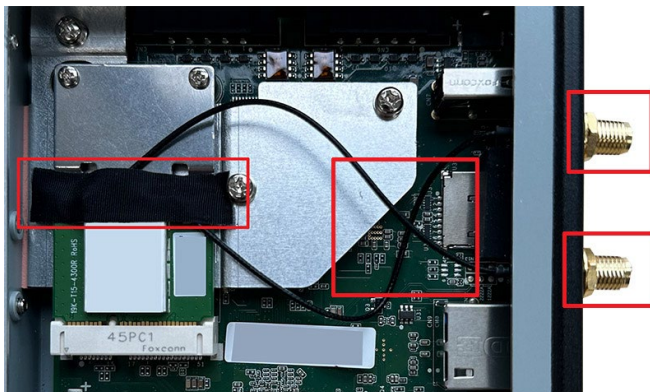
6. Insert the Wi-Fi module into the socket and fasten two screws (M2x3) to secure the module as shown in the following figure:



7. Attach the SMA antenna cables as shown in the figure.



8. Place the black tape in the package on the connectors and ensure they are connected properly.
9. Insert the connector into the connector holes marked W1 and W2 on the front panel.
We recommend crossing the wires going into W1 and W2 before inserting them.



10. On the front panel, pass the antenna mount's threaded connection ring through the mounting hole, hold the locking washer against the front panel and secure the antenna connector by tightening the nut onto the threaded protection ring.



11. Connect the antenna onto the connector.
12. Replace the chassis and fasten the six screws on the cover.

A. Regulatory Approval Statements



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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

This device and its antenna must not be co located or operating in conjunction with any other antenna or transmitter.



European Community

The radiated output power of this wireless device is below the Innovation, Science, and Economic Development Canada (ISED) radio frequency exposure limits. The wireless device should be used in such a manner that the potential for human contact during normal operations is minimized.

This device has also been evaluated and shown to be compliant with the ISED RF Exposure limits under mobile exposure conditions (antennas at more than 20 cm from a human body).

La puissance de sortie rayonnée du dispositif sans fil est inférieure aux limites d'exposition aux radiofréquences d'Innovation, Sciences et Développement économique Canada (ISED). Le dispositif sans fil doit être utilisé de manière à minimiser le potentiel de contact humain pendant le fonctionnement normal.

Cet appareil a également été évalué et montré conforme aux limites d'exposition RF ISED dans des conditions d'exposition mobiles. (Les antennes sont à plus de 20 cm du corps d'une personne).



WARNING

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