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MOXA UC-8200 Series Hardware Wireless Enabled Owner's Manual

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Contents

Introduction

The UC-8200 computing platform is designed for embedded data-acquisition applications. The UC-8200 platform comes with two RS-232/422/485 serial ports and dual 10/100/1000 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular and Wi-Fi modules. These versatile communication capabilities let users efficiently adapt the UC-8200 to a variety of complex communications solutions.

The following topics are covered in this chapter:

- Model Descriptions

- Package Checklist

- Product Features

- Product Specifications

Model Descriptions

The UC-8200 Series includes the following models:

- **UC-8210-T-LX:** Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, USB, micro SD socket, -40 to 85°C operating temperature range
- **UC-8210-T-LX-S:**Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, TPM, USB, micro SD socket, -40 to 85°C operating temperature range
- **UC-8220-T-LX:** Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, USB, micro SD socket, LTE, Wi-Fi, -40 to 85°C operating temperature range
- **UC-8220-T-LX-US-S:** Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, TPM, USB, micro SD socket, USA LTE band, Wi-Fi, -40 to 85°C operating temperature range
- **UC-8220-T-LX-EU-S:** Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, TPM, USB, micro SD socket, Europe LTE band, Wi-Fi, -40 to 85°C operating temperature range
- **UC-8220-T-LX-AP-S:** Industrial computing platform with 2 serial ports, 2 Ethernet ports, 1 CAN port, TPM, USB, micro SD socket, Asia/Pacific LTE band, Wi-Fi, -40 to 85°C operating temperature range

Package Checklist

Before installing a UC-8200 computer, verify that the package contains the following items:

- UC-8200 Series embedded computer
- Power jack
- Console cable
- DIN-rail mounting kit
- Quick installation guide (printed)
- Warranty card

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

Product Features

- Armv7 Cortex-A7 dual core 1 GHz
- 2 auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion
- Programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian 9 open platform
- -40 to 70°C wide temperature range with LTE enabled

Product Specifications

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

Hardware Introduction

The UC-8200 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-8200 Series comes 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
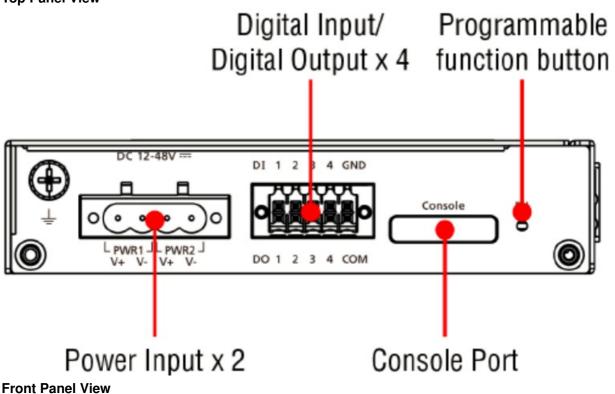
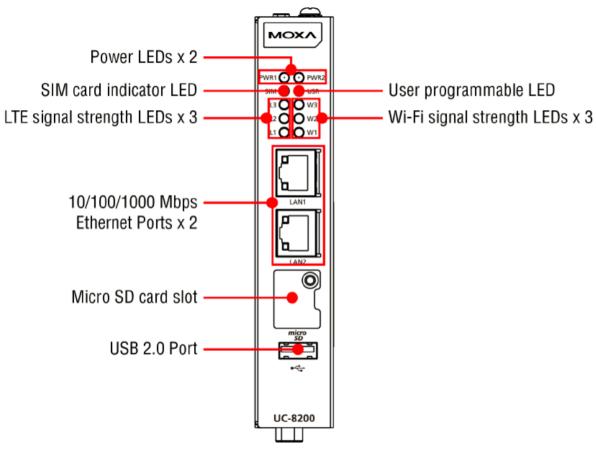about the embedded computer's hardware and its various components.

The following topics are covered in this chapter:

- Appearance
  - UC-8210 Series
  - UC-8220 Series
- Dimensions
- LED Indicators
- Reset to Default
- Real-time Clock
- Installation Options
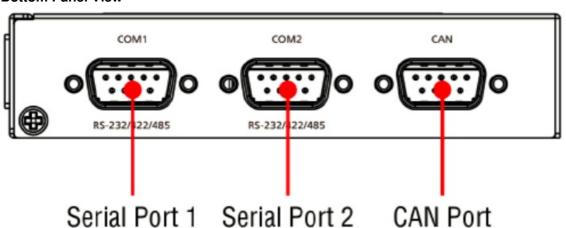 - DIN-rail Mounting
  - Wall Mounting (optional)

Appearance

UC-8210 Series
Top Panel View

Front Panel View

Power LEDs x 2
SIM card indicator LED
LTE signal strength LEDs x 3
User programmable LED
Wi-Fi signal strength LEDs x 3
10/100/1000 Mbps Ethernet Ports x 2
Micro SD card slot
USB 2.0 Port

PWR1 PWR2
SIM USR
L3 W3
L2 W2
L1 W1

LAN1
LAN2

micro SD

UC-8200

Bottom Panel View

COM1
COM2
CAN

RS-232/422/485
RS-232/422/485

Serial Port 1   Serial Port 2   CAN Port

UC-8220 Series
Top Panel View

Front Panel View

Bottom Panel View

Dimensions

UC-8210 Series

Dimensions

UC-8220 Series

Dimensions

LED Indicators

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

LED Name	Status	Function		
PWR1/PWR2	Green	Power is on		
	Off	No power		
SIM	Green	SIM2 in use		
	Yellow	SIM1 in use		
USR	Green/Yellow	User programmable		
L1/L2/L3	Yellow	Cellular signal strength		
		L1+L2+L3: StrongL2+L3: Normal L3:Weak		
W1/W2/W3	Yellow	WLAN signal strength		
		L1+L2+L3: Strong L2+L3: NormalL3: Weak		
LAN1/LAN 2(RJ45 connector)	Green	Steady on	1000 Mbps Ethernet link	
		Blinking	Data is being transmitted	
	Yellow	Steady on	100 Mbps Ethernet link	
		Blinking	Data is being transmitted	
	Off	No Ethernet connection		

Reboot

To reboot the computer, press the programmable button for 1 second

Reset to Default

Press and hold the Programmable function (FN) button between 7 to 9 seconds to reset the computer to the factory default settings. When the reset button is held down, the User programmable (USR) LED will blink once every second and become steady after 7 to 9 seconds. Release the button within this period to load the factory default settings.

Real-time Clock

The UC-8200'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

Installation Options

DIN-rail Mounting
The aluminum DIN-rail attachment plate is already attached to the product's casing. To mount the UC-8200 on to a DIN rail, make sure that the stiff metal spring is facing upwards and follow these steps.
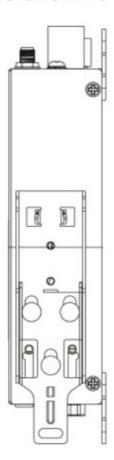
1. Pull down the bottom slider of the DIN-rail bracket located at the back of the unit
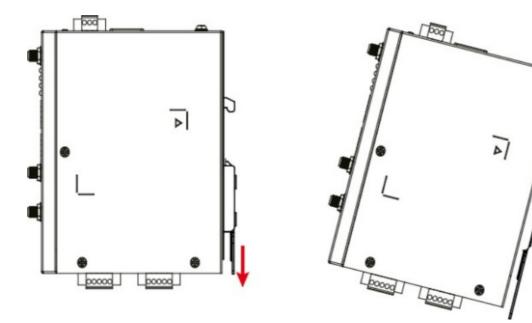
UC-8210

2. Insert the top of the DIN rail into the slot just below the upper hook of the DIN-rail bracket.
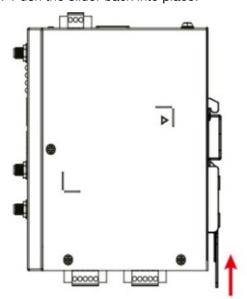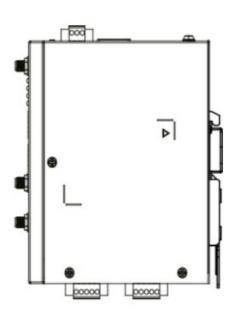
UC-8220

3. Latch the unit firmly on to the DIN rail as shown in the illustrations below.
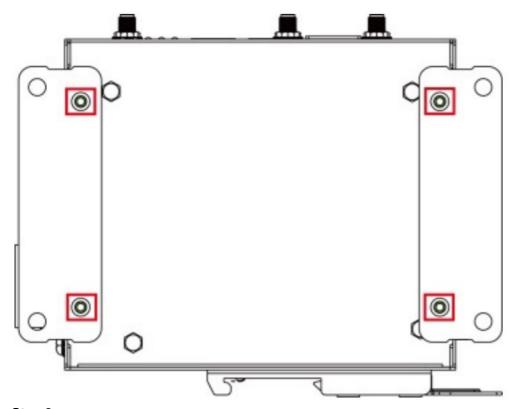
4. Push the slider back into place.

Wall Mounting (optional)
The UC-8200 Series can be mounted on to a wall using a wall-mounting kit as shown in the following illustrations. The optional wall-mounting kit is not included in the product package and should be purchased separately.
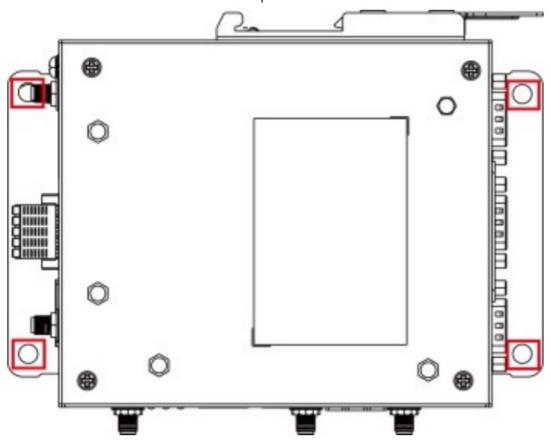
Follow these steps to mount the computer on to a wall:

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.

IMPORTANT!
The diameter of the screw heads should be greater than 7 mm and less than 14 mm; the diameter of the shafts should be less than 3 mm. The length of the screws should be greater than 6 mm.

NOTE

- Test the screw head and shank size by inserting the screws into one of the keyhole shaped apertures of the

wall-mounting plates before attaching the plate to the wall.

- Do not drive the screws in all the way—leave a space of about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

Hardware Connection Description

In this chapter, we describe how to connect the UC-8200 to a network and various devices.

The following topics are covered in this chapter:

- Wiring Requirements
    - Connecting the Power
    - rounding the Unit
- Connecting to the Network
- Connecting to a USB Device
- Connecting to Serial Ports
- Inserting the microSD Card
- Connecting to the Console Port
- Connecting the CAN Port
- Connecting the Digital Inputs and Digital Outputs
- Inserting the SIM Card
- Installing the Cellular Module
- Installing the Wi-Fi Module
- Connecting the Antennas

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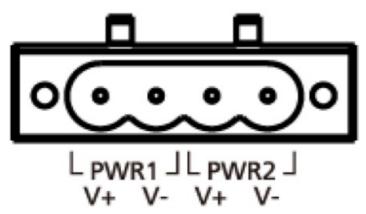If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

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.

Connecting the Power

Connect the power jack (in the package) to the UC-8200 Series' DC terminal block (located on the top panel), and then connect the power adapter. It takes about 30 seconds for the system to boot up. Once the system is ready, the Power LED will light up. Both models support dual power inputs for redundancy.

WARNING

- This product is intended to be supplied by a UL Listed Power Adapter or DC power source marked 'L.P.S." (or "Limited Power Source") rated 12-48 VDC, 0.25 A (minimum), and Tma= 85°C (minimum).
- The power adapter should be connected to a socket outlet with earthing connection.

  If you need further information or assistance, contact a Moxa representative.

Grounding the Unit

There is a grounding connector on the top panel of the computer. Use this connector to connect a well-grounded mounting surface, such as a metal panel. Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI).
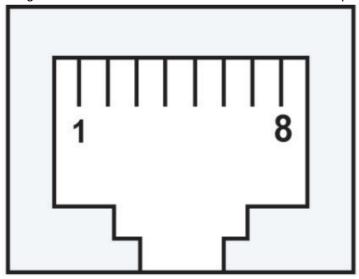
ATTENTION
A shielded power cord is required to meet FCC emission limits and also to prevent interference with nearby radio and television reception. It is essential that only the supplied power cord be used.
You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Connecting to the Network

The two Ethernet ports are located on the front panel of the UC-8200 computers. The pin assignments for the

Ethernet port are shown in the following figure. If you are using your own cable, make sure that the pin assignments on the Ethernet cable connector match the pin assignments on the Ethernet port.
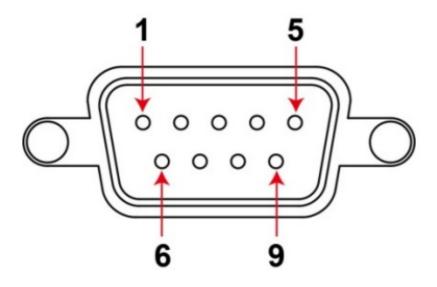

Pin	10/100 Mbps	10/100/1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	Rx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

Connecting to a USB Device

The UC-8200 Series computers come with a USB port located at the lower part of the front panel, allowing users to connect to a device with an USB interface. The USB port uses a type A connector. By default, the USB storage is mounted at /mnt/usbstorage.

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. The pin assignments for the ports are shown in the following table:

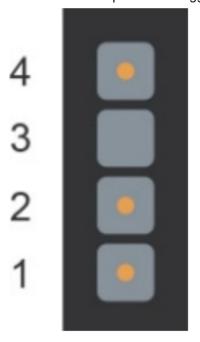| Pin	RS-232	RS-422/RS-485	RS-4852w
1	–	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–

Inserting the microSD Card

The UC-8200 Series comes with a microSD socket for storage expansion. The microSD socket is located at the lower part on the front panel. To install the card, remove the screw and the protection cover to access the socket, and then insert the microSD card into the socket directly. You will hear a click when the card is in place.

To remove the card, push the card in before releasing it.
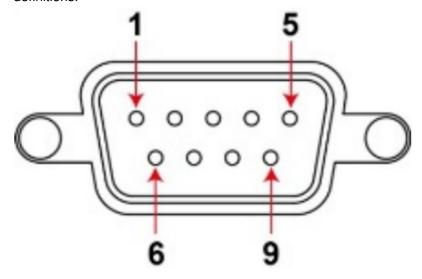

Connecting to the Console Port

The console port is an RS-232 port located on the top panel, and can be connected to a 4-pin pin header cable. You can use this port for debugging or firmware upgrade.

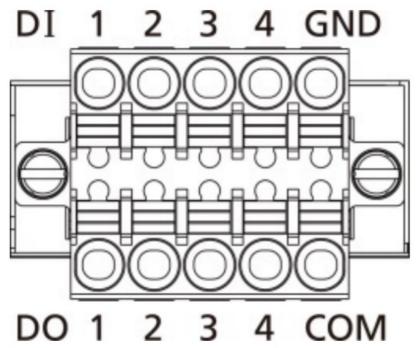| Pin	Signal
1	TxD
2	RxD
3	NC
4	GND

Connecting the CAN Port

There is a CAN port in DB9 interface, located on the bottom panel. Refer to the figure on the left for detailed pin definitions.

Pin	Definition
1	–
2	CAN_L
3	CAN_GND
4	–
5	(CAN_SHLD)
6	(GND)
7	CAN_H
8	–
9	(CAN_V+)

Connecting the Digital Inputs and Digital Outputs

There are four digital inputs and four digital outputs on the top panel. Refer to the figure on the left for detailed pin definitions.
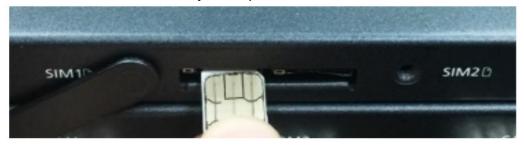

Inserting the SIM Card

The UC-8220 computer comes with a SIM card socket that allows users to install two SIM card for the cellular communication.

Step 1
Remove the screw on the SIM card holder cover located on the bottom panel of the UC-8220 computer.
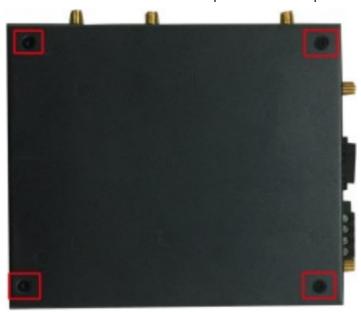

Step 2

Insert the SIM card into the socket. Make sure you insert in the right direction. To remove the SIM card, press the SIM card in to release and then you can pull out the SIM card.

Installing the Cellular Module

The UC-8220 Series comes with two PCIe sockets, allowing users to install a cellular and a Wi-Fi module. Some models have been shipped with a built-in cellular module inside the computer. However, if you purchase the UC-8200 Series without a cellular module, follow these steps to install the cellular module.

1. Remove the four screws on a side panel of the computer.

2. Remove the two screws on the other side panel to open the side cover of the computer.
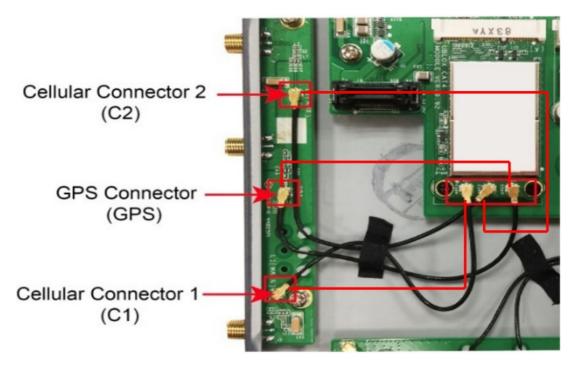

3. The socket is located on the main board of the computer.

4. Install the cellular module onto the socket, and fasten the two screws on the module.
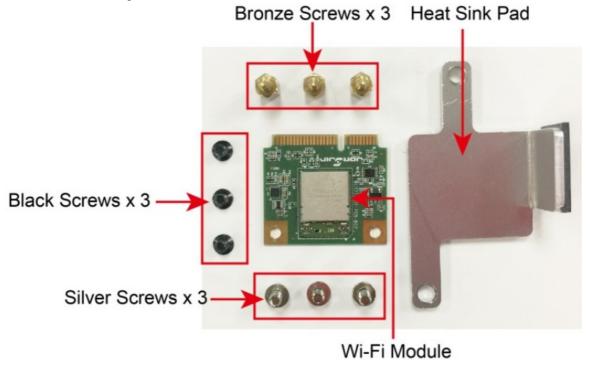

5. Connect the antenna cables to the antenna connectors.

Cellular Connector 2
(C2)

GPS Connector
(GPS)

Cellular Connector 1
(C1)

6. The UC-8220 Series supports two cellular antennas and a GPS antenna. Connect the cables to the correct antenna connectors.

7. When finished, replace the side cover and put the screws back to secure the cover.

Installing the Wi-Fi Module

The Wi-Fi module is not included in the package, you need to purchase separately. The Wi-Fi module package includes the following items.

Bronze Screws x 3   Heat Sink Pad

Black Screws x 3

Silver Screws x 3

Wi-Fi Module

Follow these steps to install the Wi-Fi module for the UC-8220 Series.

1. Remove the side cover of the computer to expose the Wi-Fi module socket. The Wi-Fi socket is located beside the cellular module socket

2. Remove the two silver screws on the socket

3. Install the Wi-Fi module in the socket and fasten two black screws on the module. Also, fasten the two bronze screws on the board.
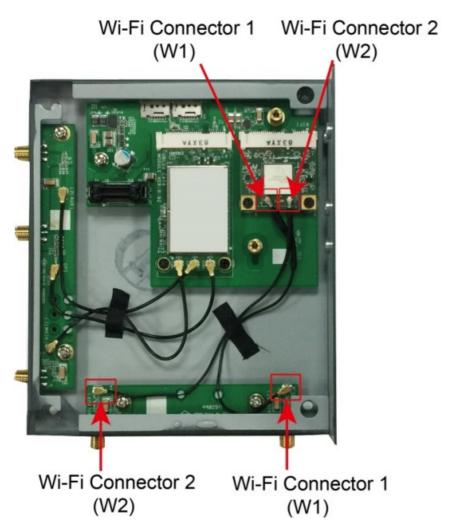
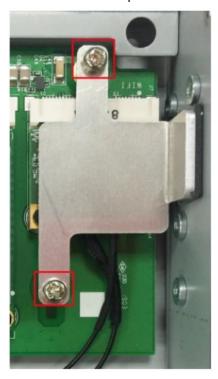4. Remove the plastic protection covers on the antenna connectors.

5. Connect the antenna cables to the antenna connectors.

   The Wi-Fi module supports two antenna connectors; connect the cables to the correct antenna connectors.

Wi-Fi Connector 1 (W1)   Wi-Fi Connector 2 (W2)

Wi-Fi Connector 2 (W2)   Wi-Fi Connector 1 (W1)

6. Install the heat sink pad on the module and then fasten two silver screws.

7. Replace the side cover.

Connecting the Antennas

There are two cellular antenna connectors (C1 and C2) on the front panel of the UC-8220 Series. In addition, a GPS connector is provided for the GPS module. All three connectors are of SMA type. Connect the antennas to

these connectors as shown below.

There are two Wi-Fi antenna connectors (W1 and W2) on the top panel of the UC-8220 Series. Connect the antennas on the connectors as shown below. Both W1 and W2 connectors are of RP-SMA type.

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.

C€ European Community

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.

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Documents / Resources

UC-8200 Series Hardware User's Manual Edition 1.0, August 2019 www.moxa.com/product **MOXA**	**MOXA UC-8200 Series Hardware Wireless Enabled** [pdf] Owner's Manual UC-8200 Series Hardware Wireless Enabled, UC-8200, Series Hardware Wireless Enabled, Hardware Wireless Enabled, Wireless Enabled, Enabled

References

- ™ **Moxa - Your Trusted Partner in Automation**
- **User Manual**