

UC-5100 Series Quick Installation Guide

Version 1.3, March 2024

Technical Support Contact Information
www.moxa.com/support

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P/N: 1802051001013



Overview

The UC-5100 Series embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 full-signal serial ports with adjustable pull-up and pull-down resistors, dual CAN ports, dual LANs, 4 digital input channels, 4 digital output channels, an SD socket, and a Mini PCIe socket for wireless module in a compact housing with convenient front-end access to all these communication interfaces.

Model Names and Package Checklist

The UC-5100 Series includes the following models:

UC-5101-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, 4 DI, 4 DO, -10 to 60°C operating temperature range

UC-5102-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, Mini PCIe socket, 4 DI, 4 DO, -10 to 60°C operating temperature range

UC-5111-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, 2 CAN ports, 4 DI, 4 DO, -10 to 60°C operating temperature range

UC-5112-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, Mini PCIe socket, 2 CAN ports, 4 DI, 4 DO, -10 to 60°C operating temperature range

UC-5101-T-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, 4 DI, 4 DO, -40 to 85°C operating temperature range

UC-5102-T-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, Mini PCIe socket, 4 DI, 4 DO, -40 to 85°C operating temperature range

UC-5111-T-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, 2 CAN ports, 4 DI, 4 DO, -40 to 85°C operating temperature range

UC-5112-T-LX: Industrial computing platform with 4 serial ports, 2 Ethernet ports, SD socket, 2 CAN ports, Mini PCIe socket, 4 DI, 4 DO, -40 to 85°C operating temperature range

NOTE The operating temperature range of the wide temperature models is:
-40 to 70°C with an LTE accessory installed
-10 to 70°C with a Wi-Fi accessory installed

Before installing a UC-5100 computer, verify that the package contains the following items:

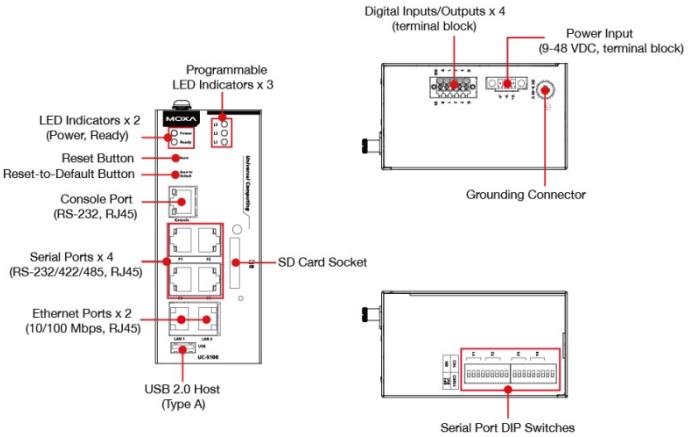
- UC-5100 Series computer
- Console cable
- Power jack
- Quick Installation Guide (printed)
- Warranty card

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

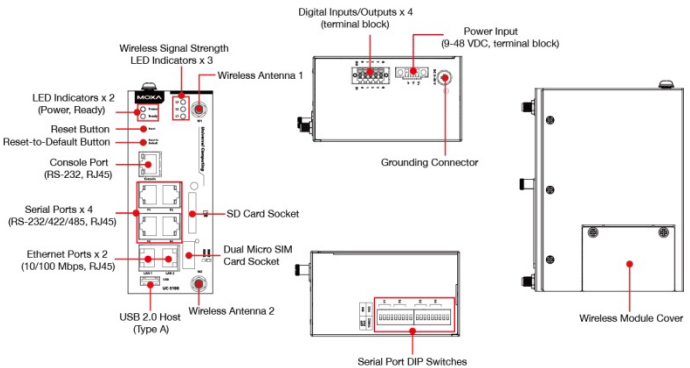
NOTE The console cable and power jack can be found beneath the molded pulp cushioning inside the product box.

Appearance

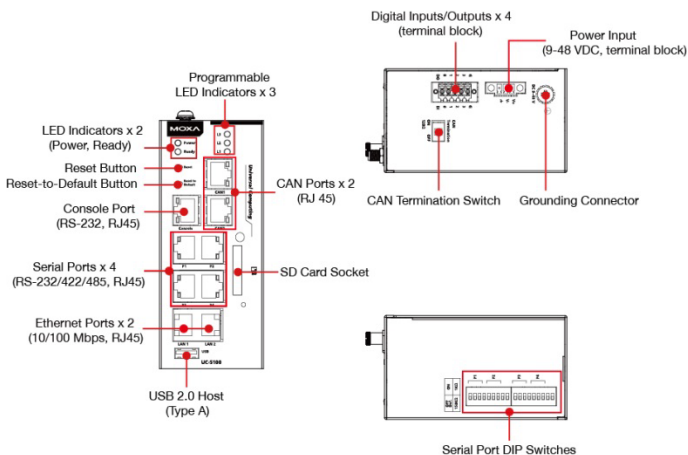
UC-5101



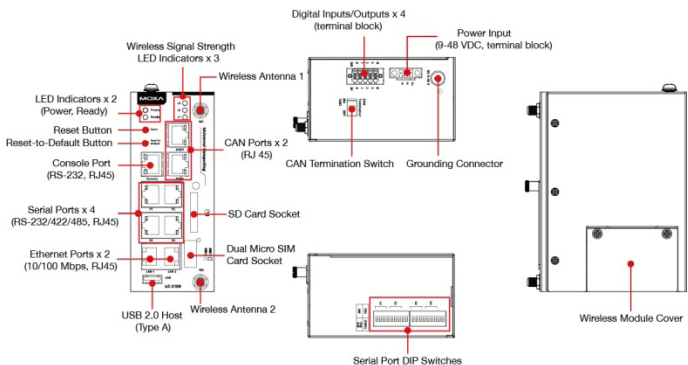
UC-5102



UC-5111



UC-5112



LED Indicators

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

LED Name	Status	Function
Power	Green	Power is on and the device is functioning normally
	Off	Power is off
Ready	Yellow	OS has been successfully enabled and the device is ready
Ethernet	Yellow	Steady On: 10 Mbps Ethernet link Blinking: Data transmission is in progress
	Green	Steady On: 100 Mbps Ethernet link Blinking: Data transmission is in progress
	Off	Transmission speed below 10 Mbps or the cable is not connected
Serial (Tx)	Green	Serial port is transmitting data
	Off	Serial port is not transmitting data

LED Name	Status	Function
Serial (Rx)	Yellow	Serial port is receiving data
	Off	Serial port is not receiving data
L1/L2/L3 (UC-5102/5112)	Yellow	The number of glowing LEDs indicates the signal strength. All LEDs: Excellent L1 & L2 LEDs: Fair L1 LED: Poor L1 LED Blinking: Very poor
	Off	No connection or no wireless module detected
L1/L2/L3 (UC-5101/5111)	Yellow/Off	Programmable LEDs defined by users

Reset Button

The UC-5100 computer is provided with a **Reset** button, which is located on the front panel of the computer. To reboot the computer, press the reset button for 1 second.

Reset to Default Button

The UC-5100 is also provided with a **Reset to Default** button which can be used to reset the operating system back to the factory default status. Press and hold the **Reset to Default** 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.

Installing the Computer

DIN-rail Mounting

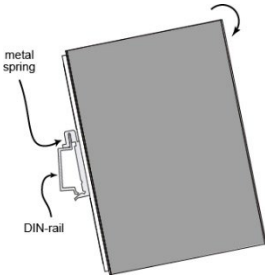
The aluminum DIN-rail attachment plate comes attached to the product casing. To mount the UC-5100 on to a DIN rail, make sure that the stiff metal spring is facing upwards and follow these steps.

DIN-rail Mounting Bracket Screw Specification:

3.9 mm; 2.9 mm diameter (2 screws).

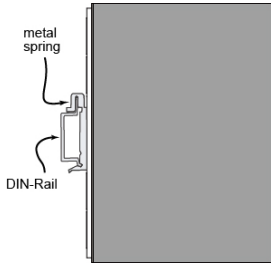
Step 1

Insert the top of the DIN rail into the slot just below the stiff metal spring in the upper hook of the DIN-rail mounting kit.



Step 2

Push the UC-5100 towards the DIN rail until the DIN-rail attachment bracket snaps into place.



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 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 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.
- It is strongly advised that you label wiring to all devices for easy identification.



ATTENTION

SAFETY FIRST

Be sure to disconnect the power cord before installing and/or wiring your UC-5100 Series computers.

There is a risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

To reduce the risk of fire or burns, do not short external contacts and do not disassemble, crush, or puncture the battery or dispose it in fire or water.



ATTENTION

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. This equipment is intended to be supplied by a certified External Power Supply, the output of which meets SELV and LPS regulations.

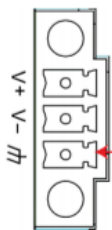
- The wiring for the input terminal block must be installed by qualified and experienced professionals.
 - Wire Type: Cu, FW2.
 - Use 28 to 14 AWG wire size and a torque value of 0.2 N-m.
- Use only one conductor in a clamping point between the DC power source and the power input.

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.

This equipment is intended for installation in Restricted Access Locations.

Connecting the Power



Connect the 9 to 48 VDC power line to the terminal block, which is connector to the UC-5100 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 contact at the bottom of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the wire to an appropriate grounded metal surface or to the grounding screw on top of the device.



ATTENTION

The product is intended to be supplied by a UL Listed Power Supply (LPS) suitable for use at $T_{ma} = 75^{\circ}\text{C}$ whose output meets ES1 and PS2/LPS rated 9 to 48 VDC, 0.95 A (min.), or 48 VDC, 0.23 A (min.).



ATTENTION

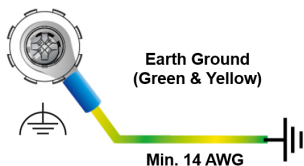
Altitude Requirement

This product and the listed power supply (LPS) adapter(s) used with it are UL-certified for operation at 2,000 meters. Although the product is tested at 5,000 meters, it is not UL-certified for this altitude. For reliable performance of the product in high-altitude installations of over 2,000 meters (e.g., 5,000 meters), use a suitable adapter that is tested and certified at the altitude (i.e., 5,000 meters).

Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the terminal block connector to the grounding surface prior to connecting the power. Note that this product is intended to be mounted on a well-grounded mounting surface, such as a metal panel.

The power cord adapter should be connected to a socket outlet with an earthing connection.

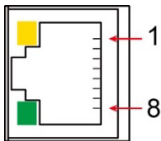


ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Use the green-and-yellow cable type minimum with American Wire Gauge (AWG) 14 (2.5 mm²) for grounding.

Connecting to the Console Port

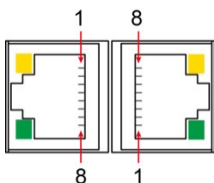
The UC-5100's console port is an RJ45-based RS-232 port located on the front panel. It is designed for connecting to serial console terminals, which are useful for viewing boot up messages, or for debugging system boot up issues.



PIN	Signal
1	-
2	-
3	GND
4	TxD
5	RxD
6	-
7	-
8	-

Connecting to the Network

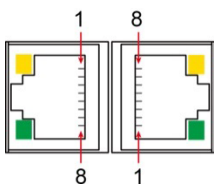
The Ethernet ports are located on the front panel of the UC-5100. The pin assignments for the Ethernet port are shown in the following figure. If you are using your own cable, make sure that the pin assignments on the Ethernet cable connector match the pin assignments on the Ethernet port.



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

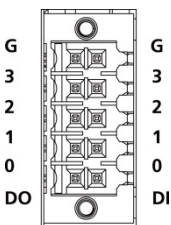
Connecting to a Serial Device

The serial ports are located on the front panel of the UC-5100 computer. Use a serial cable to connect your serial device to the computer's serial port. These serial ports have RJ45 connectors and can be configured for RS-232, RS-422, or RS-485 communication. The pin location and assignments are shown in the table below.

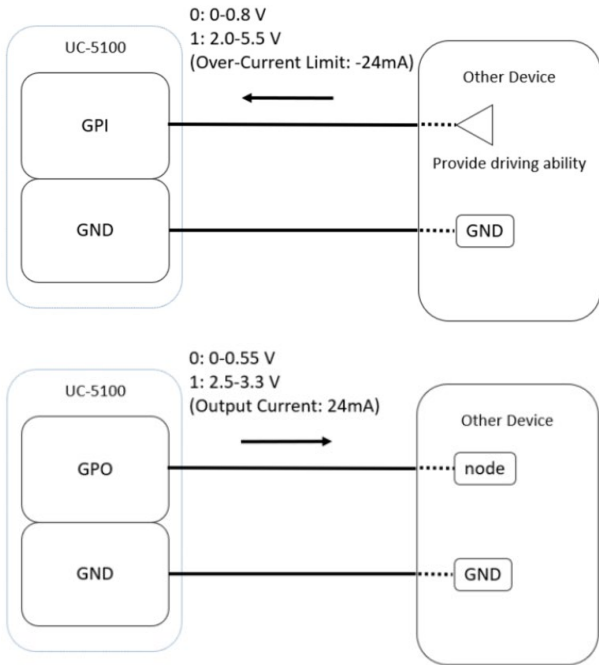


Pin	RS-232	RS-422	RS-485
1	DSR	-	-
2	RTS	TxD+	-
3	GND	GND	GND
4	TxD	TxD-	-
5	RxD	RxD+	Data+
6	DCD	RxD-	Data-
7	CTS	-	-
8	DTR	-	-

Connecting to a DI/DO Device

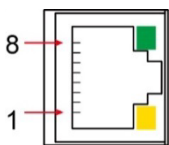


The UC-5100 Series computer comes with 4 general-purpose input connectors and 4 general-purpose output connectors. These connectors are located on the top panel of the computer. Refer to the diagram on the left for the pin definitions of the connectors. For the wiring method, refer to the following figures.



Connecting to a CAN Device

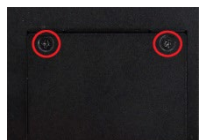
The UC-5111 and UC-5112 are provided with 2 CAN ports, allowing users to connect to a CAN device. The pin location and assignments are shown in the following table:



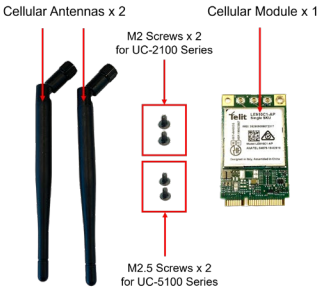
PIN	Signal
1	CAN_H
2	CAN_L
3	CAN_GND
4	-
5	-
6	-
7	CAN_GND
8	-

Connecting the Cellular/Wi-Fi Module and Antenna

The UC-5102 and UC-5112 computers come with one Mini PCIe socket for installing a cellular or Wi-Fi module. Unfasten the two screws on the right panel to remove the cover and find the location of the socket.

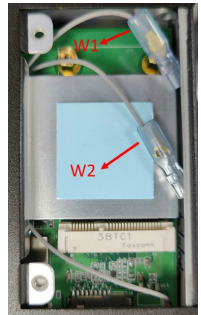


The cellular module package includes 1 cellular module, and 2 screws. The cellular antennas should be purchased separately to fit your installation requirements.



To install a cellular module, do the following:

1. Connect the two antenna cables to W1 and W2 connectors as shown here.
2. Insert the cellular module into the socket and fasten two screws (included in the package) on to the top of the module. We recommended using a tweezer when installing or removing the module.



3. Connect the free ends of the two antenna cables to the RX diversity antenna (labeled **D**) and the main RF antenna (labeled **M**) as shown here. You can connect the main RF antenna to either **W1** or **W2**.

The W1 and W2 antenna connectors with cables attached are shown in the figure.

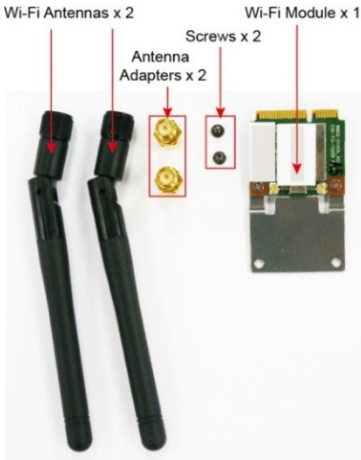
For the cellular connection to function correctly, it is mandatory to connect both antennas. A single antenna connection will not suffice for cellular network operations.

4. Replace the cover and secure it using two screws.
5. Connect the cellular antennas to the connectors.

Antenna connectors are located on the front panel of the computer.



The Wi-Fi module package includes 1 Wi-Fi module, and 2 screws. The antenna adapters and Wi-Fi antennas should be purchased separately to fit your installation requirements.



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

1. Set the antenna cables aside for convenience of installation and clear the wireless module socket as shown in the figure.
2. Insert the cellular module into the socket and fasten two screws (included in the package) on to the top of the module. We recommended using a tweezer when installing or removing the module.
3. Connect the free ends of the two antenna cables next to the screws as shown in the figure.
4. Replace the cover and secure it with two screws.
5. Connect the antenna adapters to the connectors on the front panel of the computer.



6. Connect the Wi-Fi antennas to the antenna adapters.



Installing Micro SIM Cards

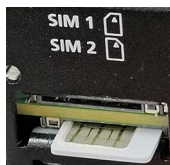
You will need to install a Micro SIM card on your UC-5100 computer. Follow these steps to install the Micro SIM card.

1. Remove the screw on the cover located on the front panel of the UC-5100.
2. Insert the Micro SIM card into the socket. Make sure you place the card in the right direction.



To remove the Micro SIM card, simply push the Micro SIM card and release it.

Note: There are two Micro SIM card sockets allowing users to install two Micro SIM cards simultaneously. However, only one Micro SIM card can be enabled for use.

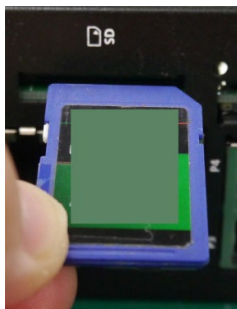


Installing the SD Card

The UC-5100 Series computers come with a socket for storage expansion that allows users to install an SD card.

Follow these steps to install the SD card:

1. Unfasten the screw and remove the panel cover.
The SD socket is located on the front panel of the computer.
2. Insert the SD card into the socket. Ensure that the card is inserted in the right direction.
3. Replace the cover and fasten the screw on the cover to secure the cover.

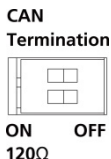


To remove the SD card, simply push the card in and release it.

Adjusting the CAN DIP Switch

The UC-5111 and UC-5112 computers come with one CAN DIP switch for users to adjust the CAN termination resistor parameters. To set up the DIP switch, do the following:

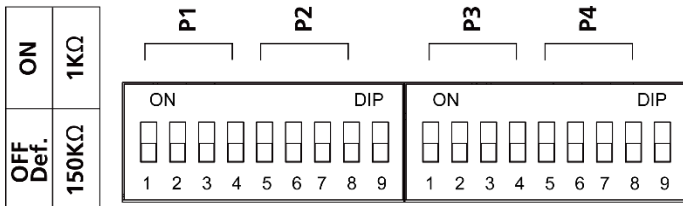
1. Find the DIP switch location on the top panel of the computer
2. Adjust the setting as required. The ON value is 120 Ω , and the default value is OFF.



Adjusting the Serial Port DIP Switch

The UC-5100 computers come with a DIP switch for users to adjust the pull-up/pull-down resistors for the serial port parameters. The serial port DIP switch is located on the bottom panel of the computer.

Adjust the setting as required. The ON setting corresponds to 1 K Ω and the OFF setting corresponds to 150 K Ω . The default setting is OFF.



Each port consists of 4 pins; you must switch all 4 pins of a port simultaneously to adjust the value of the port.

Specifications

Input Current	0.95 A @ 9 VDC, 0.23 A @ 48 VDC
Input Voltage	9 to 48 VDC
Power Consumption	11 W
Operating Temperature	<p>Standard Models:</p> <p>-10 to 60°C (14 to 140°F)</p> <p>Wide Temp. Models:</p> <p>Product Only:</p> <p>-40 to 85°C (-40 to 185°F)</p> <p>With LTE Accessory:</p> <p>-40 to 70°C (-40 to 158°F)</p> <p>With Wi-Fi Accessory:</p> <p>-10 to 70°C (14 to 158°F)</p>
Storage Temperature	<p>Standard Models:</p> <p>-20 to 70°C (-4 to 158°F)</p> <p>Wide Temp. Models:</p> <p>-40 to 85°C (-40 to 185°F)</p>