UC-2100-W Series Hardware User's Manual

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UC-2100-W Series Hardware User's Manual

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Introduction

The UC-2100-W Series platform is designed for embedded data acquisition applications. The platform comes with one or two RS- 232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-2100-W Series platform to a variety of complex communications solutions.

The following topics are covered in this chapter:

- **Overview**
- **Model Descriptions**
- **Package Checklist**
- **Product Features**
- **Product Specifications**

Overview

The UC-2100-W Series computing platform is designed for embedded data acquisition and processing applications. The platform comes with up to two software-selectable RS-232/422/485 full-signal serial ports and single or dual Ethernet LAN ports. In addition, the Arm-based computing platform is available in various models that can fulfill diverse interface requirements, such as dual serial, LAN ports, and wireless connections. These versatile communication capabilities let users efficiently adapt the palm-sized UC-2100-W computing platform to a variety of complex communications solutions.

Model Descriptions

The UC-2100-W Series includes the following models:

UC-2114-T-LX: Palm-sized industrial computing platform with 2 serial ports, 2 Ethernet ports, 2 CAN ports, -40 to 75°C operating temperature with CAT.M1/NB-IoT built-in.

UC-2116-T-LX: Palm-sized industrial computing platform with 2 serial ports, 2 Ethernet ports, 2 CAN ports, -40 to 75°C operating temperature with CAT.M1/NB-IoT and GNSS built-in.

Package Checklist

Before installing a UC-2100-W Series platform, verify that the package contains the following items:

- UC-2100-W Series platform
- Console cable
- Power jack
- 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-A8 1000 MHz processor
- Integrated LTE Cat. M1/NB1 module with global band support
- Dual-SIM slots
- Moxa Industrial Linux with 10-year long-term support
- Dual auto-sensing Ethernet ports (10/100 Mbps and 10/100/1000 Mbps)
- Dual CAN ports with industrial CAN 2.0 A/B protocol supported
- microSD socket for storage expansion
- Programmable LEDs and a programmable button for easy installation and maintenance
- -40 to 75°C operating temperature range

For a complete set of specifications, refer to the product datasheet available on the Moxa Website.

Product Specifications

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

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Hardware Introduction

The UC-2100-W Series computing platform are compact and rugged, making them suitable for industrial applications. The LED indicators allow you to monitor performance and identify trouble spots quickly, and the multiple ports can be used to connect a variety of devices. The UC-2100-W 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 its various components.

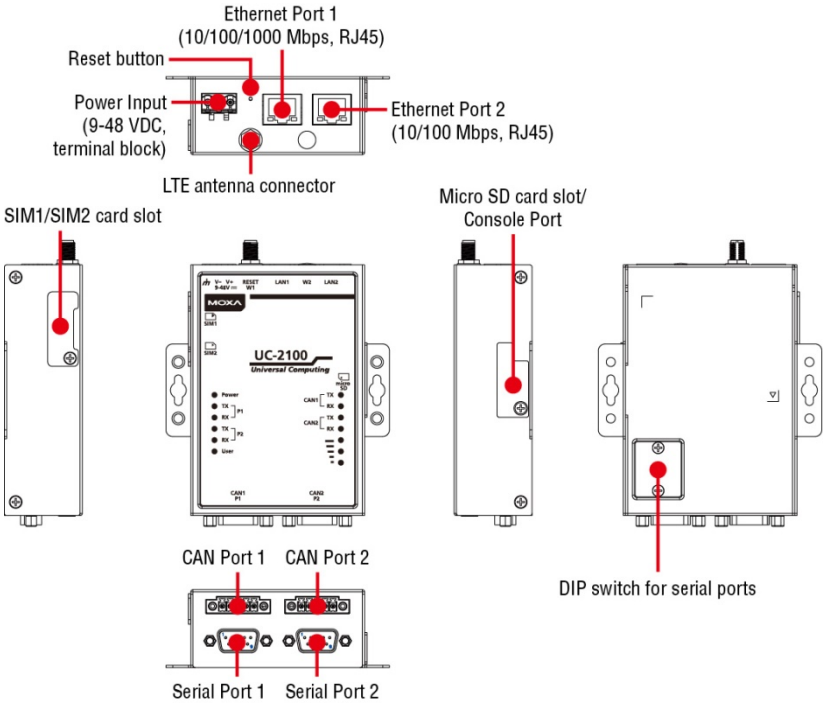
The following topics are covered in this chapter:

- **Appearance**
- **LED Indicators**
- **Reset Button**
- **Real-time Clock**
- **Placement Options**
  - Wall or Cabinet Mounting
  - DIN-rail Mounting (optional)

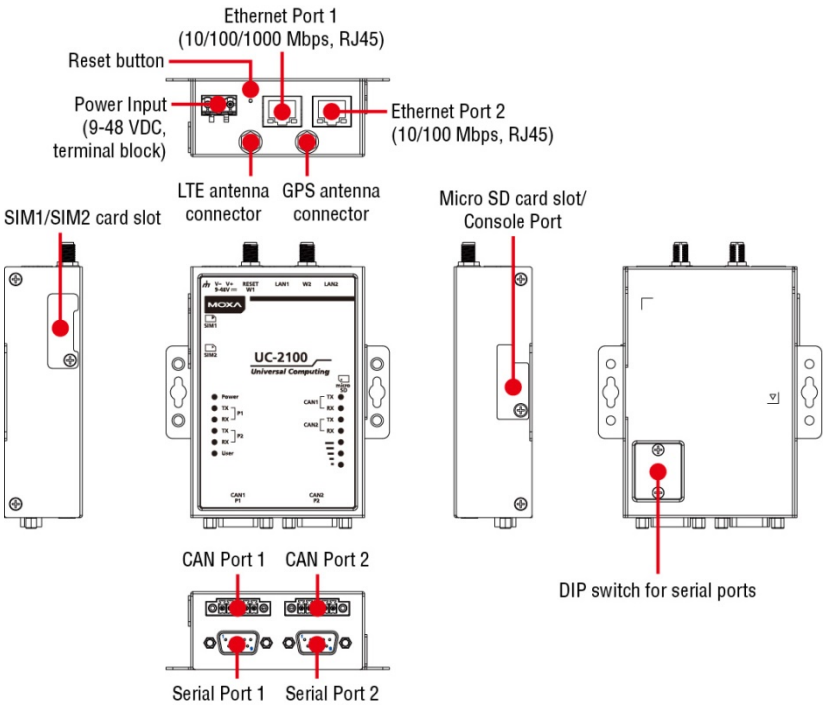
Appearance

Front View

UC-2114

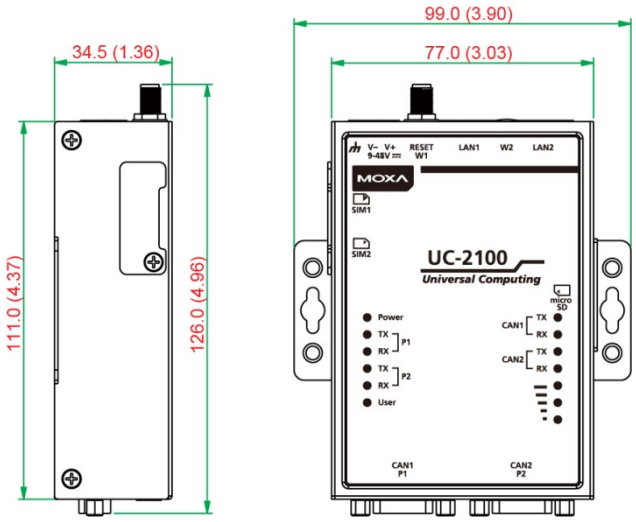


UC-2116

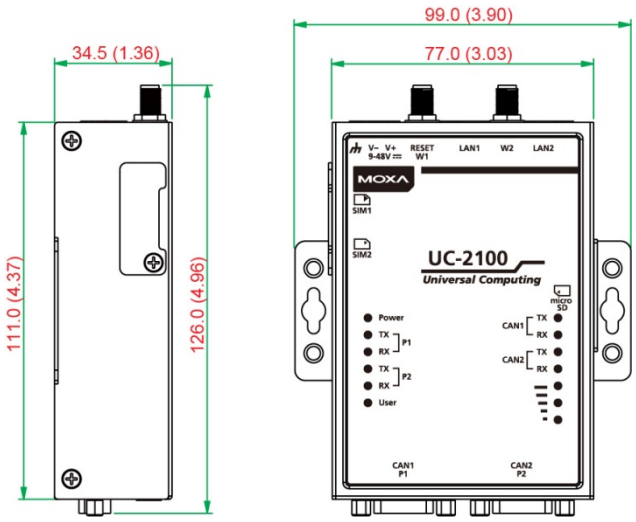


Dimensions [units: mm (in)]

UC-2114



UC-2116



LED Indicators

Refer to the following table for information about each LED.

LED Name	Status	Function
Power	Green	Power is on, and the device is functioning normally
	Off	Power is off
Ethernet (10/100 Mbps)	Green	Steady On: 10 Mbps Ethernet link Blinking: Data transmission is in progress
	Yellow	Steady On: 100 Mbps Ethernet link Blinking: Data transmission is in progress
	Off	Speed lower than 10 Mbps or the cable is not connected
Ethernet (10/100/1000 Mbps)	Green	Steady On: 100 Mbps Ethernet link Blinking: Data transmission is in progress
	Yellow	Steady On: 1000 Mbps Ethernet link Blinking: Data transmission is in progress
	Off	Speed lower than 10 Mbps or the cable is not connected
Serial (Tx)	Green	Serial port is transmitting data
	Off	Serial port is not transmitting data
Serial (Rx)	Yellow	Serial port is receiving data
	Off	Serial port is not receiving data
User	Green/Yellow	User Programmable
LEDs that indicate the Wireless signal strength	Yellow	The number of glowing LEDs indicates the signal strength 3 LEDs: Excellent 2 LEDs : Good 1 LED : Poor
	Off	Wireless module is not detected
CAN1/CAN2 (Tx)	Green	CAN port is transmitting data
	Off	CAN port is not transmitting data
CAN1/CAN2 (Rx)	Green	CAN port is receiving data
	Off	CAN port is not receiving data

Reset Button

The UC-2100-W is provided with a reset button, which is located on the side panel. To reboot the device, press the reset button less than 1 second. Press and hold the reset button between 7 to 9 seconds to reset the device to the factory default settings. When the reset button is held down, the **User** LED will blink twice every second. The **User** 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.

ATTENTION

Reset to Default preserves user's data

The **Reset to Default** function will NOT format the user directory and erase the user's data. Using the Reset to default function will only load the configuration file. The rest of the user's data stored in the Flash ROM will remain intact.

Real-time Clock

The UC-2100-W'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 (rma@moxa.com).

WARNING

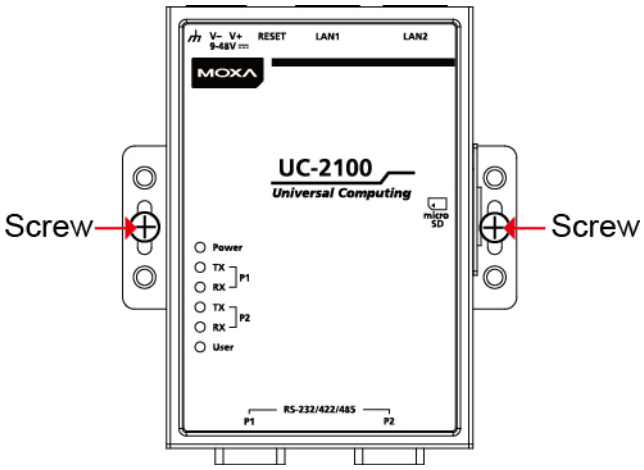
There is a risk of explosion if the battery is replaced by an incorrect type.

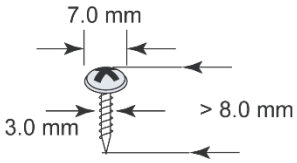
Placement Options

There are two sliders on the back of the unit for DIN-rail and wall mounting.

Wall or Cabinet Mounting

Mounting UC-2100-W on to a wall requires 2 screws. The heads of the screws should be less than 7.0 mm in diameter, the shafts should be less than 3 mm in diameter, and the length of the screws should be more than 8 mm, as shown in the figure at the bottom.

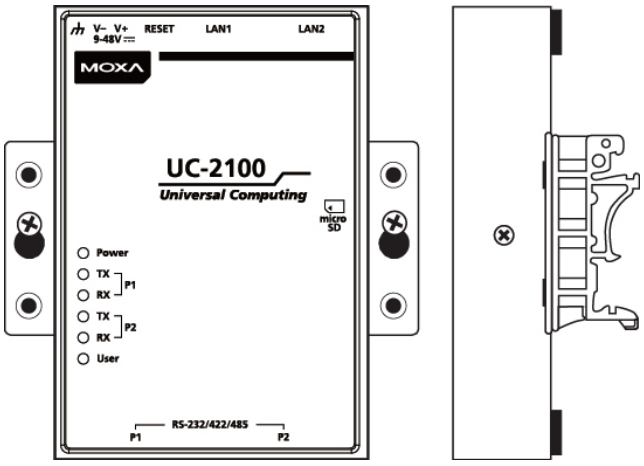




NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates.

DIN-rail Mounting (optional)

The UC-2100-W comes with an optional DIN-rail mounting kit for users to install the device onto a DIN rail. Install the DIN-rail mounting kit on the device's two mounting ears, then install the computer onto a DIN-rail rack.



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Hardware Connection Description

In this chapter, we describe how to connect the UC-2100-W to a network and various devices for first time testing purposes.

The following topics are covered in this chapter:

- **Wiring Requirements**
  - Connecting the Power
  - Grounding the Unit
- **Connecting to the Console Port**
- **Connecting to the Network**
- **Connecting to a Serial Device**
- **Inserting the SIM Card**
- **Inserting a MicroSD Card (UC-2114/2116 only)**
- **Adjusting the DIP Switch**

Wiring Requirements

In this section, we describe how to connect various devices to the platform. You should heed the following 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.

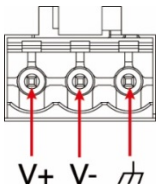
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

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

Terminal Block



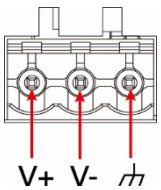
Connect the 9 to 48 VDC power line to the terminal block connector on the UC-2100-W Series platform. If the power is supplied properly, the "Power" LED will glow a solid green. The power input location and pin definition are shown in the adjacent diagram.

Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.



SG: The Shielded Ground (sometimes called Protected Ground) contact is the right-most 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.

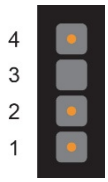
ATTENTION

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 Console Port

The UC-2100-W's console port is a 4-pin pin-header RS-232 port located on the top panel of the case. It is designed for serial console terminals, which are useful for identifying the boot up message, or for debugging when the system cannot boot up.

Serial Console Port & Pinouts

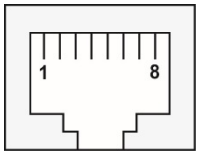


Pin	Signal
1	TxD
2	RxD
3	NC
4	GND

Serial Console Cable

Connecting to the Network

The Ethernet ports are located on the top or bottom side of the UC-2100-W platform. The pin assignments for the Ethernet port are shown in the following figures. 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.

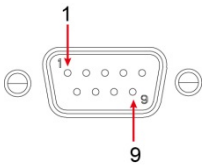


Pin	10/100 Mbps	10/100/1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	–	TRD(2)+
5	–	TRD(2)-
6	Rx-	TRD(1)-
7	–	TRD(3)+
8	–	TRD(3)-

Connecting to a Serial Device

The serial ports are located on the bottom panel of the UC-2100-W Series platform. Use a serial cable to connect your serial device to the computer's serial port. These serial ports have male DB9 connectors and can be configured for RS-232, RS-422, or RS-485 communication. The pin location and assignments are shown in the following table.

DB9 Connector



RS-232/422/485 Pinouts

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	–	–	–

Inserting the SIM Card

You will need to install a SIM card on your UC-2100-W Series platform. Follow these steps to install the SIM card.

1. Remove the screw on the cover located on the right panel of the UC-2100-W platform.

2. Insert the SIM card into the socket. Make sure you place the chip-side on the bottom.
3. To remove the SIM card, push in the SIM card and then release it to allow the card to pop out.

ATTENTION

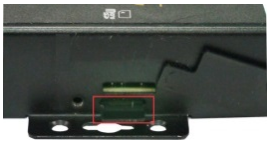
The UC-2100-W does not support SD hot swap and PnP (Plug and Play) functionality. You must remove the power source first before inserting or removing the SD card.

Inserting a MicroSD Card (UC-2114/2116 only)

Both the UC-2114 and UC-2116 computers come with a storage socket that allows users to install one MicroSD card. Follow these steps to install the MicroSD card:

1. The MicroSD socket is located below the right panel of the device. Unfasten the screw and remove the right panel cover.

2. Insert the MicroSD 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.



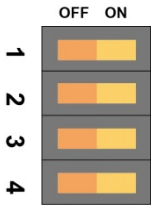
To remove the MicroSD card, push the card in and release it to allow the card to pop out.

Adjusting the DIP Switch

The UC-2114 and UC-2116 models come with one DIP switch for users to adjust the serial port parameters. To set up the DIP switch, do the following:

1. Remove the screws on the DIP switch cover located on the rear panel of the device.

2. Remove the thin film on the DIP switch and adjust the settings as required. Refer to the table below for the DIP switch settings. The default value is OFF.



SW	1	2	3	4
	Low	High	Term.	–
ON	1 KΩ	1 KΩ	120 Ω	–
OFF	150 KΩ	150 KΩ	–	–

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.

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.