

UC-2100 Series

Preliminary

Palm-size industrial computing platform for IIoT applications



- > ARMv7 Cortex-A8 600, 1000 MHz processor
- > 1 or 2 auto-sensing 10/100 Mbps Ethernet ports
- > Gigabit Ethernet supported by the UC-2112
- > Up to 2 software-selectable RS-232/422/485 ports supporting all signals
- > Moxa Industrial Linux with 10-year superior long-term support
- > Mini PCIe socket for Wi-Fi/Cellular module (UC-2104)
- > MicroSD socket for storage expansion (UC-2111/UC-2112)
- > Supports TPM v2.0
- > -40 to 75°C wide-temperature model available



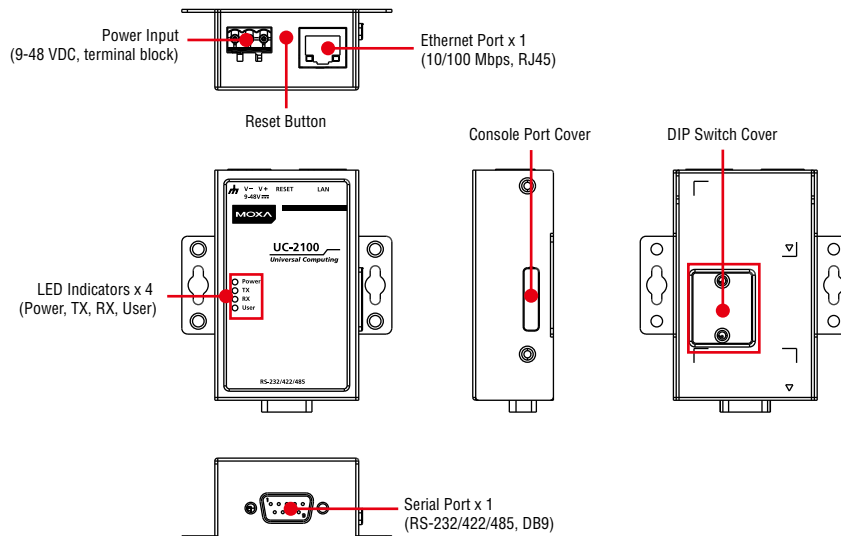
Overview

The UC-2100 Series computing platform is designed for embedded data acquisition and processing applications. The computer comes with up to two software selectable RS-232/422/485 full-signal serial ports and single or dual Ethernet LAN ports. This palm-size series of RISC computing platforms includes a variety of models for a wide range of interface requirements, such as single-to-dual serial and LAN ports, Gigabit Ethernet, and wireless connections. The versatile communication capabilities allow users to efficiently adapt the UC-2100 for a variety of complex communications solutions running on a compact palm-size computer.

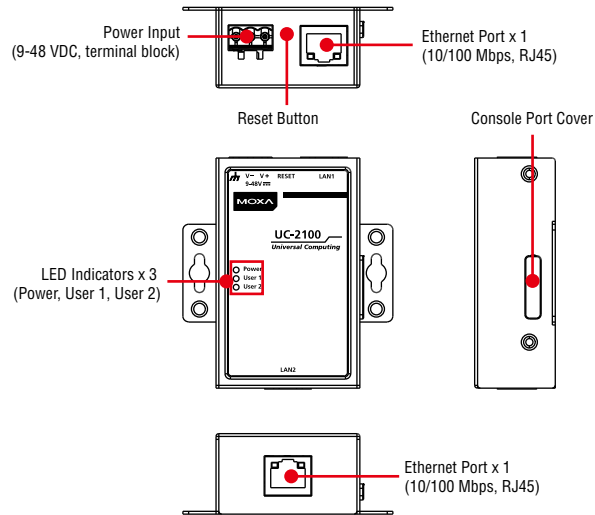
The UC-2100 Series has a built-in Cortex-A8 RISC processor that has been optimized for a variety of industrial solutions. With flexible interface options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites and is a useful communication platform for many other large-scale deployments. Models designed for wide temperature applications are available for extreme environment applications such as those found in the Oil & Gas industry. Furthermore, all models use Moxa's industrial-grade Linux platform, which provides optimized software features and superior long-term support.

Appearance

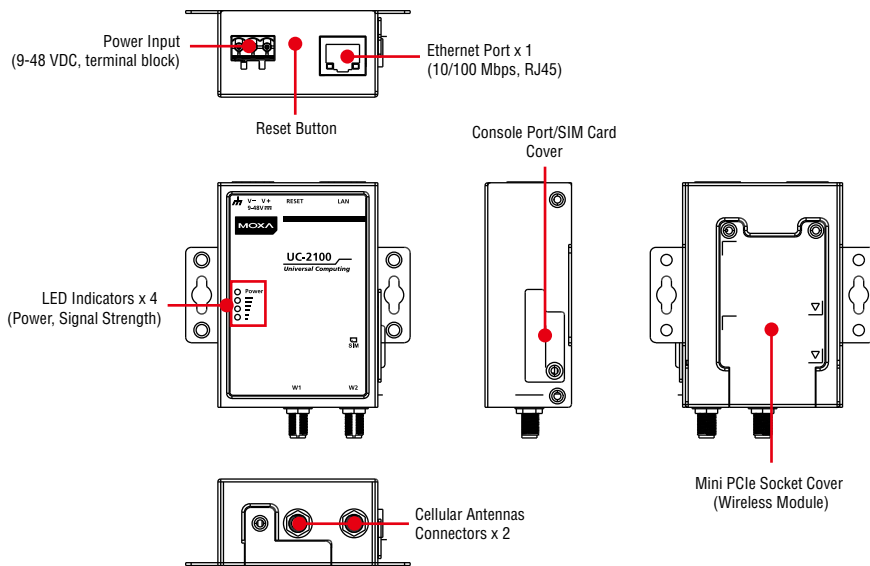
UC-2101



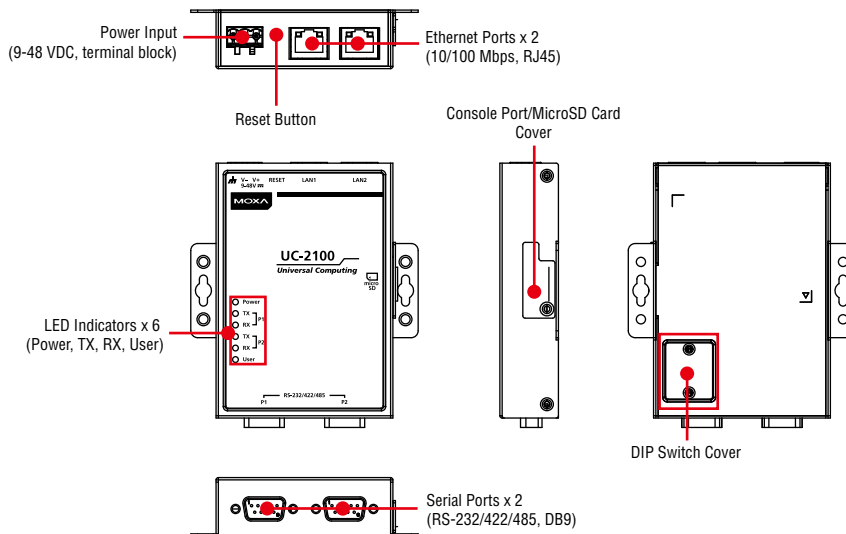
UC-2102



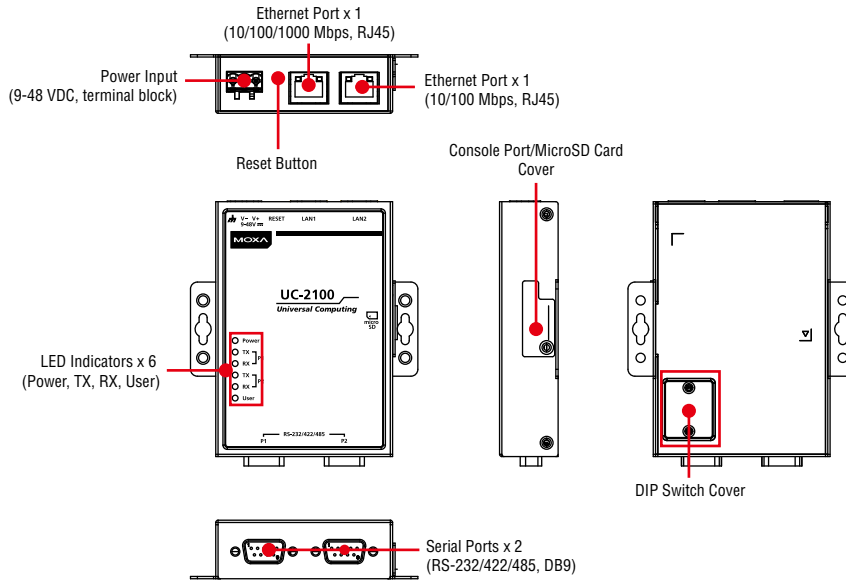
UC-2104



UC-2111



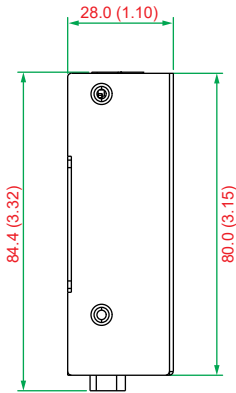
UC-2112



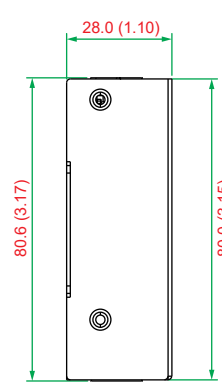
Dimensions

Unit: mm (inch)

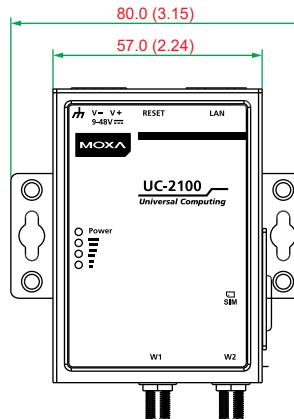
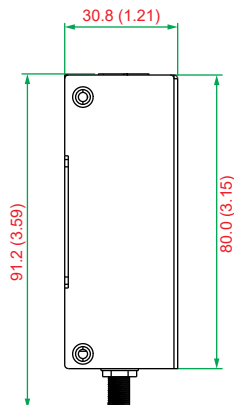
UC-2101



UC-2102



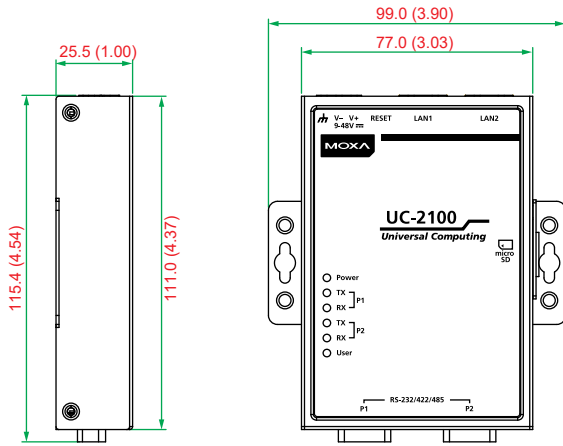
UC-2104



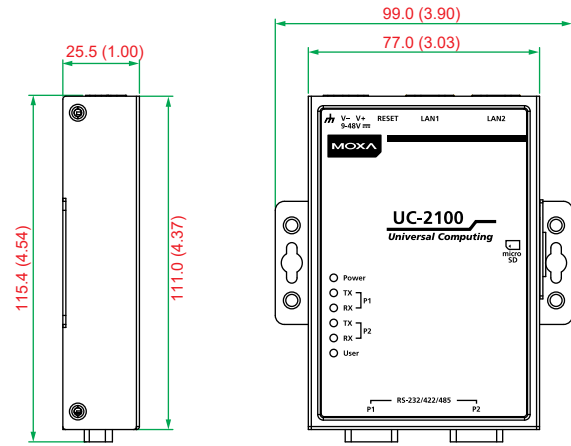
Dimensions

Unit: mm (inch)

UC-2111



UC-2112



Hardware Specifications

Computer

CPU:

UC-2101/2102/2104/2111: ARMv7 Cortex-A8 600 MHz

UC-2112: ARMv7 Cortex-A8 1000 MHz

OS (pre-installed): Moxa Industrial Linux (Debian 9, Kernel 4.4)

DRAM:

UC-2101/2102/2104: 256 MB DDR3 SDRAM

UC-2111/2112: 512 MB DDR3 SDRAM

Storage

Built-in: 8 GB eMMC flash with OS pre-installed

Storage Expansion: SDHC/SDXC socket for storage expansion

(UC-2111/2112 only)

Other Peripherals

TPM: v2.0 by request (SPI interface)

Ethernet Interface

LAN:

UC-2101/2104: 1 auto-sensing 10/100 Mbps port (RJ45)

UC-2102/2111: 2 auto-sensing 10/100 Mbps ports (RJ45)

UC-2112: 1 auto-sensing 10/100 Mbps port (RJ45), 1 auto-sensing 10/100/1000 Mbps port (RJ45)

Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards:

UC-2101: 1 RS-232/422/485, software selectable port (DB9)

UC-2111/2112: 2 RS-232/422/485, software selectable port (DB9)

Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output

(115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

UC-2101:

System: Power x 1

LAN: LED located on the RJ45 connector, 10M/Link x 1, 100M/Link x 1

Serial: TxD x 1, RxD x 1

User Programmable: User x 1

UC-2102:

System: Power x 1

LAN: LED located on the RJ45 connector, 10M/Link x 2, 100M/Link x 2

User Programmable: User x 2

UC-2104:

System: Power x 1

LAN: LED located on the RJ45 connector, 10M/Link x 1, 100M/Link x 1

Wireless: Signal Strength x 3

UC-2111:

System: Power x 1

LAN: LED located on the RJ45 connector, 10M/Link x 2, 100M/Link x 2

Serial: TxD x 2, RxD x 2

User Programmable: User x 1

UC-2112:

System: Power x 1

LAN: LED located on the RJ45 connector

- LAN1: 100M/Link x 1, 1000M/Link x 1

- LAN2: 10M/Link x 1, 100M/Link x 1

Serial: TxD x 2, RxD x 2

User Programmable: User x 1

Switches and Buttons

Push Button: Initially configured to reboot and to reset the device to factory defaults

Dip Switch: For configuring the serial port Pull-High/Pull-Low and termination resistors

Physical Characteristics

Housing: SECC

Weight:

UC-2101/2102: 190 g (0.42 lb)

UC-2104: 220 g (0.49 lb)

UC-2111/2112: 290 g (0.64 lb)

Dimensions:

UC-2101: 50 x 80 x 28 mm
 UC-2102: 50 x 80 x 28 mm
 UC-2104: 57 x 80 x 30.8 mm
 UC-2111/2112: 77 x 111 x 25.5 mm

Mounting: Wall, DIN rail (with optional kit)

Environmental Limits

Operating Temperature:

Standard Models: -10 to 60°C (14 to 140°F)
 UC-2104: -10 to 70°C (14 to 158°F) w/ wireless module
 Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature:

Standard Models: -20 to 70 °C (-4 to 158°F)
 Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)

Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage: 9 to 48 VDC (3-pin terminal block, V+, V-, SG)

Input Current:

UC-2101: 200 mA (max.)
 UC-2102: 330 mA (max.)
 UC-2104: 800 mA (max.)
 UC-2111: 350 mA (max.)
 UC-2112: 450 mA (max.)

Power Consumption: 4 W (max.) (without cellular module)

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1

EMC: 55032/24, RCM, VCCI, EAC

EMI: CISPR 32, FCC Part 15B Class A

EMS:

IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
 IEC 61000-4-3 RS: 80 MHz to 1 GHz, 3 V/m
 IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
 IEC 61000-4-5 Surge: DC Power: 0.5 kV; Signal: 1 kV
 IEC 61000-4-6 CS: 3V
 IEC 61000-4-8 PFMF: 1 A/m

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: External RTC (real-time clock)

Automatic Reboot Trigger: External WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

OS: Moxa Industrial Linux (Debian 9)

Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML

Terminal Server (SSH): Provides secure encrypted communications between two untrusted hosts over an insecure network

Kernel: GNU/Linux 4.4 CIP + RT-patch

System Shell: DASH (default), BASH

Text Editor: vim, nano

File System: JFFS2, NFS, Ext3, Ext4, VFAT, OverlayFS, NTFS

Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, v3, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL, SCP

Programming Language Support: PHP, Perl, Python

Internet Security Suite: OpenVPN, Netfilter/iptables, IPsec

Cryptographic Hardware Accelerators: AES, SHA, OpenSSL, random generator

Application Development Software:

- Toolchain ARM GNUeabi6 6.3
- GNU C/C++ cross-compiler
- GNU C library
- GDB source-level debugging server

Cellular Networking (UC-2104):

- WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet
- QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol
- Modem Manager
- Cellular Management Utility
- Wi-Fi Management Utility

Moxa Industrial Linux

Robust File system: Moxa Industrial Linux is integrated with OverlayFS to mitigate the chance of system corruption

Cybersecurity:

- MX-security utility for creating a protection mechanism to meet cybersecurity requirements
- Security Update of Existing Software Packages: All software packages installed on the UC-2100 Series can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server

Real COM Mode: Support NPort's Real COM mode driver to communicate with NPort device servers

Ordering Information

Model	CPU	RAM	Storage	Serial	Ethernet	Micro SD	Mini PCIe	Operating Temperature
UC-2101-LX	600 MHz	256 MB	8 GB	1	1	–	–	-10 to 60°C
UC-2102-LX	600 MHz	256 MB	8 GB	–	2	–	–	-10 to 60°C
UC-2104-LX	600 MHz	256 MB	8 GB	–	1	–	1	-10 to 70°C
UC-2111-LX	600 MHz	512 MB	8 GB	2	2	1	–	-10 to 60°C
UC-2112-LX	1000 MHz	512 MB	8 GB	2	2 (1 Giga LAN)	1	–	-10 to 60°C
UC-2112-T-LX	1000 MHz	512 MB	8 GB	2	2 (1 Giga LAN)	1	–	-40 to 75°C

Optional Accessories (can be purchased separately)

Power Adapters, Power Cords

Model Name	Package Contents	Description
PWR-24270-DT-S1	• 1 x Power adapter	Power adapter for testing and system development indoors under ambient temperature conditions (input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A; output: 24 VDC, 2.7 A, 60 W)
PWC-C7US-2B-183	• 1 x Power cord	10A/125V North American (US) power cord, 183 cm
PWC-C7EU-2B-183	• 1 x Power Cord	10A/250V Continental European (EU) power cord, 183 cm
PWC-C7UK-2B-183	• 1 x Power Cord	10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C7AU-2B-183	• 1 x Power Cord	2.5A/250V Australian (AU) power cord, 183 cm
PWC-C7CN-2B-183	• 1 x Power Cord	10A/250V China (CN) power cord, 183 cm

Wireless Packages

Model Name	Package Contents	Description
UC-LTE-CAT1-EU	• 1 x Cellular module • 2 x Mini PCI/e mount screw sets	LTE regions: Asia, Europe Penta-Band LTE: Bands 1, 3, 8, 20, 28 (700, 800, 900, 1800, 2100 MHz), Dual-Band GSM 900 and 1800 MHz
UC-LTE-CAT1-AUS	• 1 x Cellular module • 2 x Mini PCI/e mount screw set	LTE regions: Australia, New Zealand Quad-Band LTE: Bands 3, 5, 8, 28 (1800, 850, 900, 700 MHz), Tri-Band UMTS: Bands 1, 5, 8 (WCDMA/FDD 2100, 850, 900 MHz)
UC-LTE-CAT4-CN	• 1 x Cellular module • 2 x Mini PCI/e mount screw set	LTE(FDD): B1,B3,B8; LTE(TDD): B39,B40,B41(38), all bands with diversity DC-HSPA+: B1,B9,B5,B8; TDS: B34, B39, all bands with diversity GSM: 1800/900MHz
UC-WiFi-USB	• 1 x WiFi module • 2 x Mini PCI/e mount screw set	Operating Frequency: 802.11 ac/a/b/g/n ISM Band 2.412 GHz to 2.472 GHz, 5.180 MHz to 5.825 MHz (Subject to local regulations) Modulation: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)

Antennas and Internal Antenna Cables

Model Name	Package Contents	Description
ANT-WDB-ARM-0202	• 1 x WiFi antenna	1.8/1.8 dBi, RP-SMA (male) antenna
ANT-LTE-OSM-03-3m BK	• 1 x LTE antenna	Multi-band antenna that covers 700-2700 MHz. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
ANT-LTE-ASM-04 BK	• 1 x LTE antenna	LTE Stick antenna that covers 704-960/1710-2620 MHz providing omnidirectional radiation with a gain of 4.5 dBi.
ANT-LTE-ASM-05 BK	• 1 x LTE antenna	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
ANT-LTE-OSM-06-3m BK MIMO	• 1 x LTE antenna	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.
SMA-Adapter	• 2 x SMA adapter	SMA Adapter for UC-2104 to convert to SMA male connector

DIN-Rail Kits

Model Name	Package Contents	Description
DK35A	• 2 x Mounting kit	DIN-rail kit with screws

Package Checklist

- UC-2100 embedded computer
- Power jack
- Console cable
- Quick installation guide (printed)
- Warranty card