

UC-3100 Series

Preliminary

RISC-based computing platform with wireless built in



- > ARMv7 Cortex-A8 1000 MHz processor
- > Integrated Wi-Fi 802.11a/b/g/n and LTE Cat.1 for the US, EU, AUS, and APAC regions
- > Supports TPM v2.0 (optional)
- > Industrial CAN 2.0 A/B protocol supported
- > -40 to 70°C system operating temperature
- > Meets the EN 61000-6-2 and EN 61000-6-4 standards for industrial EMC applications
- > Ready-to-run Debian 9 with 10-year long-term support
- > Supports Linux real-time OS mode
- > Robust Root File System to prevent the system from being bricked due to a firmware update failure



Introduction

Moxa's UC-3100 Series computers can be used as edge-field smart gateways for data pre-processing and transmission, as well as for other embedded data acquisition applications. The UC-3100 Series includes three models, each supporting different wireless options and protocols.

The UC-3100's advanced heat dissipation design makes it suitable for use in temperatures ranging from -40 to 70°C. In fact, the Wi-Fi and LTE connections can be used simultaneously in both cold and hot environments, allowing you to maximize your "data pre-processing" and "data transmission" capability in most harsh environments. In addition, TPM v2.0 uses a hardware chip to boost data security, making it highly unlikely that hackers will be able to steal your data, either remotely or locally.

The UC-3100 is more than just a hardware solution. In order to offer a better user experience with a Moxa RISC computer, the UC-3100 supports the following software features, allowing you to use the most suitable configuration based on your particular application.

- High VPN Performance: greater than 70 Mbps with AES-256 encryption Ethernet throughput
- Robust file system to prevent the system from being bricked due to a firmware upgrade interruption
- Cybersecurity auto-config system compliant with IEC 62443 Lv.2
- Real COM mode to provide a control interface with Moxa's NPort products

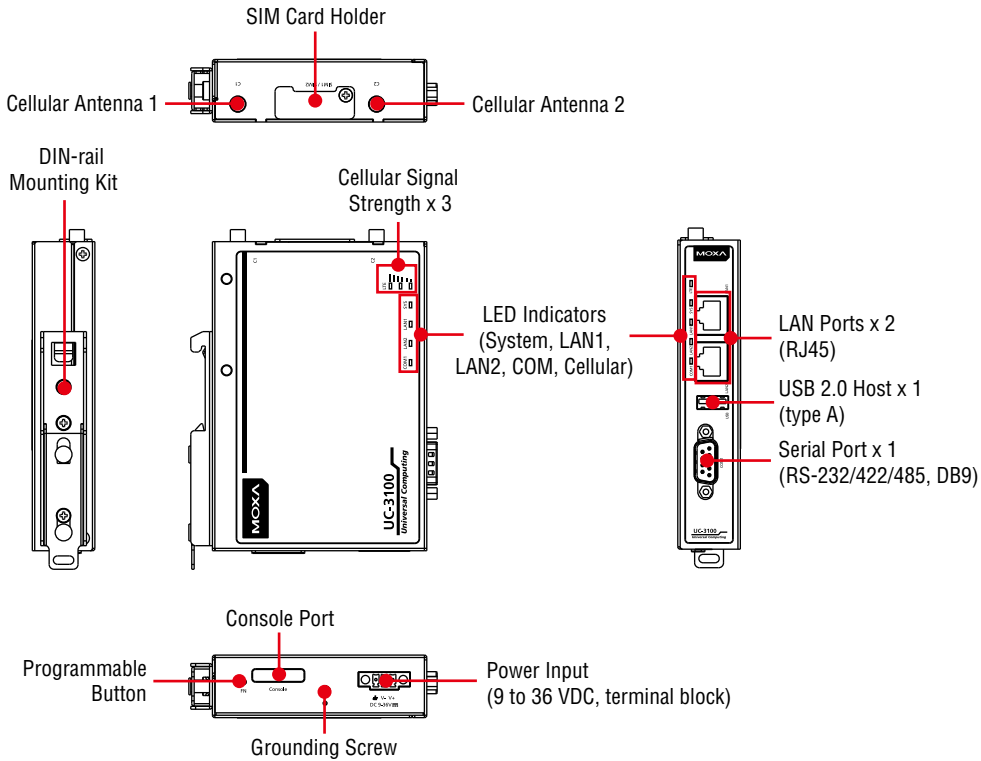
In addition, Moxa provides 10 years of Linux OS support from Moxa's customer support engineers. With a new version of the Debian repository released on average every 2 to 3 years, long-term Linux OS support helps you create a reliable solution that will be supported now and long into the future.

Applications

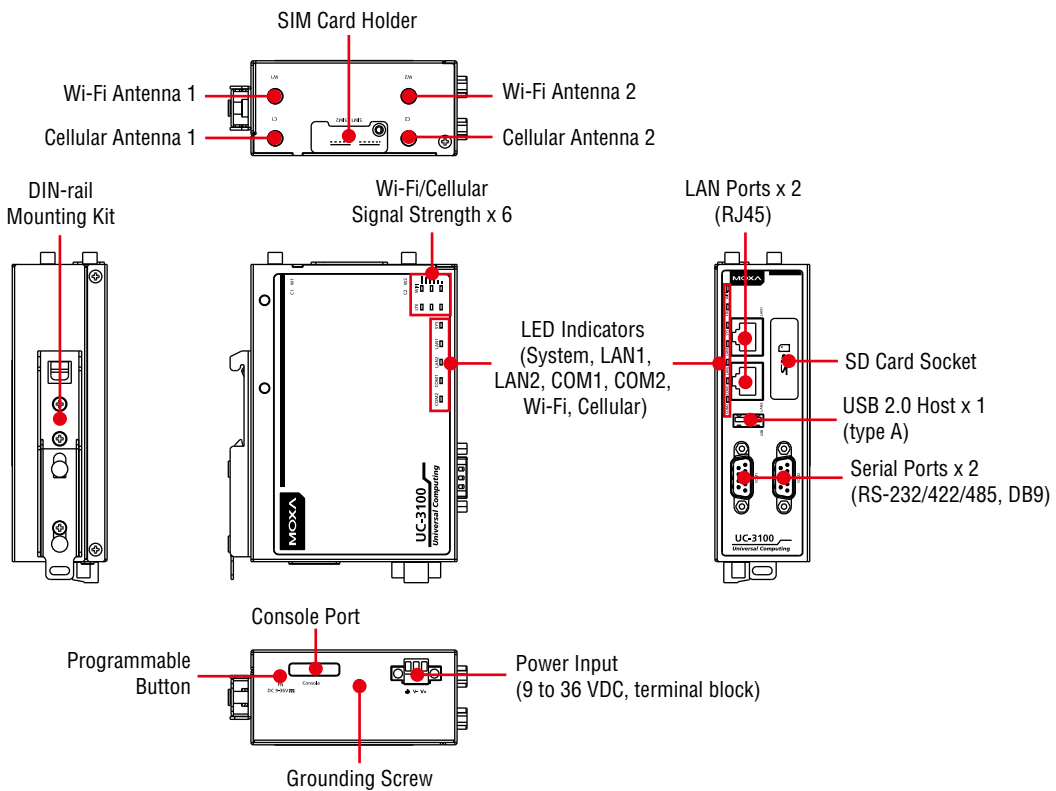
- Remote Terminal Unit (RTU)
- Data acquisition
- M2M communication (smart gateway)
- Digital signage
- Factory automation
- In-vehicle monitor/data logger (transportation)
- Programmable router
- Energy usage optimization
- Predictive maintenance
- Asset management

Appearance

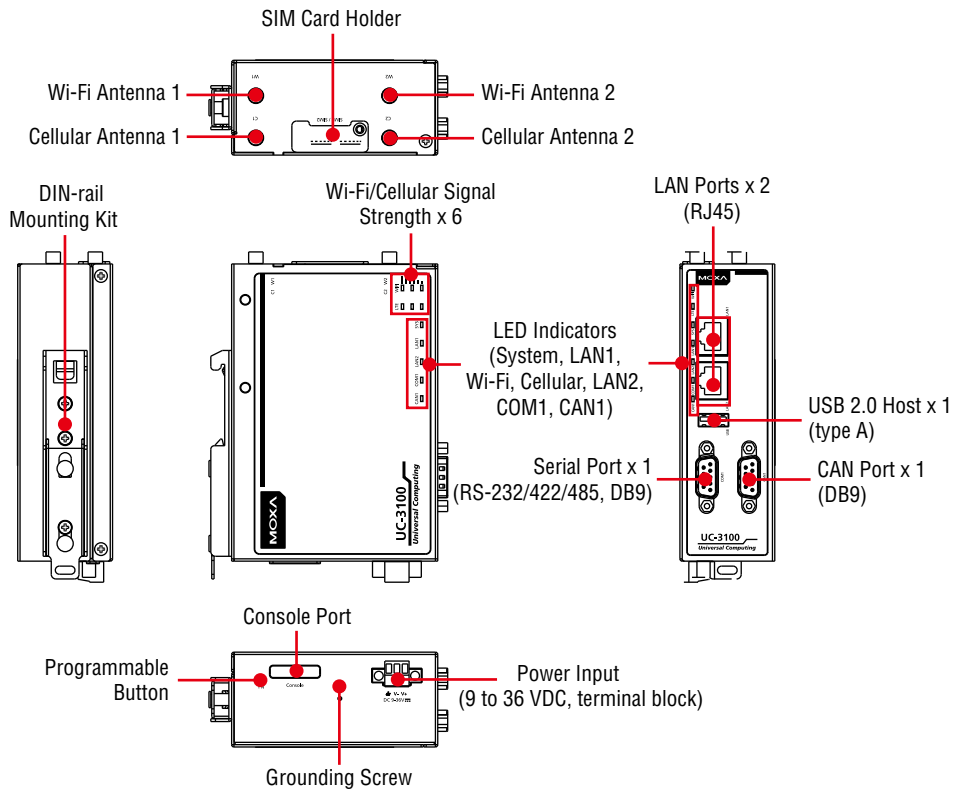
UC-3101



UC-3111



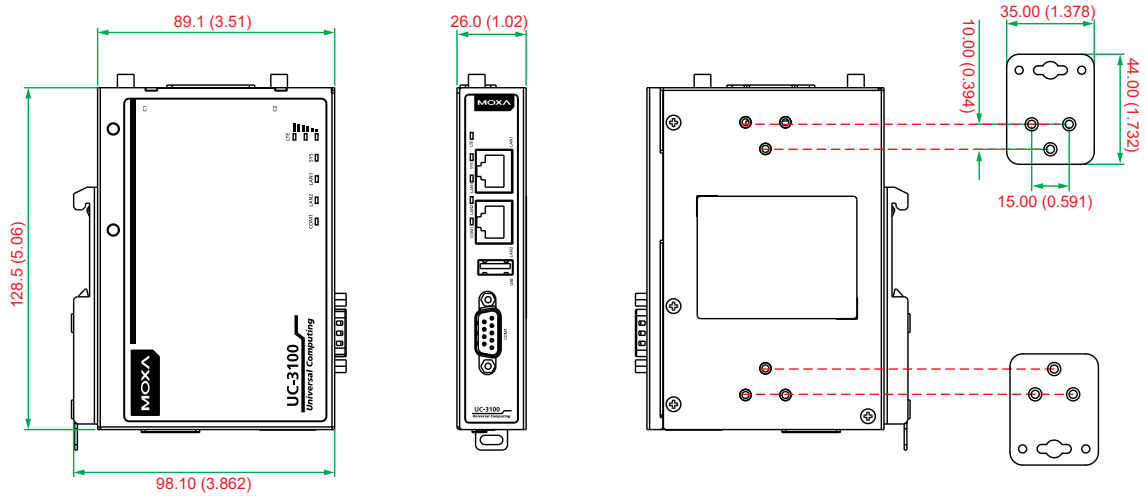
UC-3121



Dimensions

Unit: mm (inch)

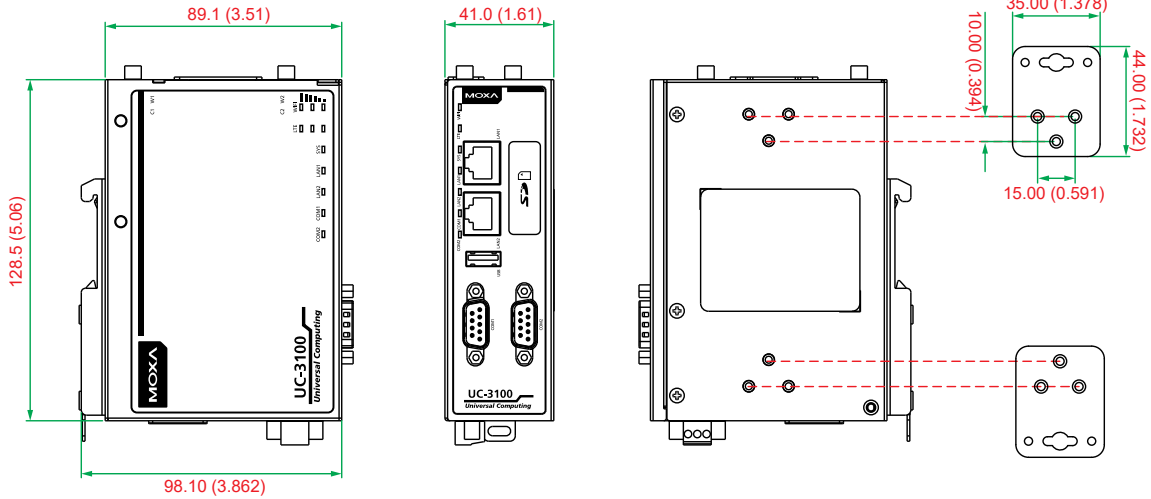
UC-3101



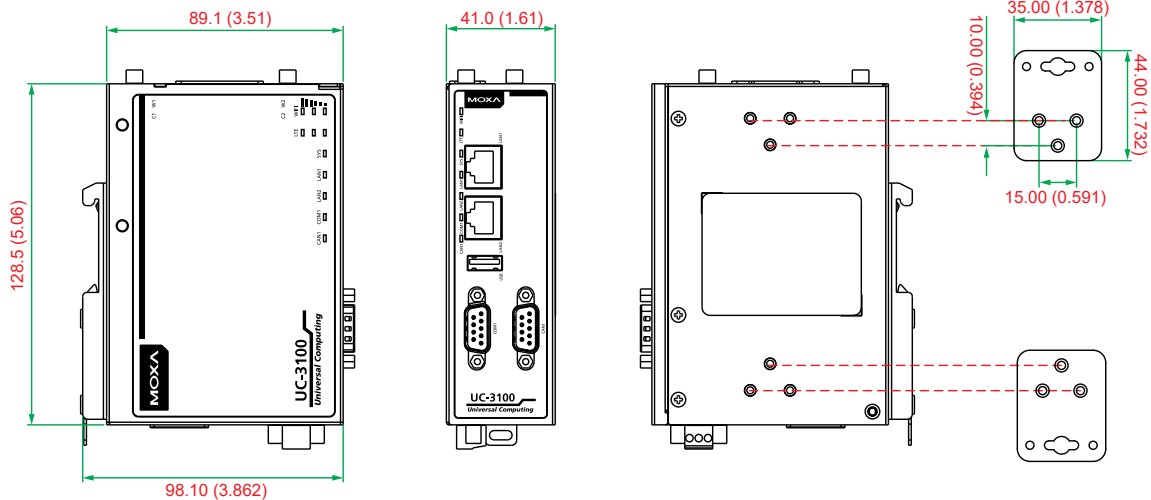
Dimensions

Unit: mm (inch)

UC-3111



UC-3121



Hardware Specifications

Computer

- CPU:** ARMv7 Cortex-A8 1000 MHz
- OS (pre-installed):** Debian 9 (Kernel 4.4)
- Main Storage:** 4 GB eMMC with OS pre-installed
- Expansion Storage (UC-3111 only):** 1 SDHC/SDXC socket
- DRAM:** 512 MB DDR3 SDRAM

Storage

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- Expansion Storage (UC-3111 only):** 1 SDHC/SDXC socket

Other Peripherals

- TPM:** v2.0 reserved (SPI interface)
- SIM:** 2 nano SIM slots

Ethernet Interface

- LAN:** 2 auto-sensing 10/100 Mbps ports (RJ45)
- Magnetic Isolation Protection:** 1.5 kV built-in

Cellular Interface

Standard: LTE (FDD) 3GPP Rel.9 Compliant

Regional Variants:

- **US Model:**
 LTE Bands: 1, 3, 8, 20, 28* (700*, 800, 900, 1800, 2100 MHz)
 GSM Bands: 900 and 1800 MHz
 Carrier Approval: AT&T
- **VZW Model:**
 LTE Bands: 4, 13 (1700/2100 AWS, 700 MHz)
 Carrier Approval: Verizon
- **EU Model:**
 LTE Bands: 2, 4, 5, 12 (700, 850, 1700/2100 (AWS) and 1900 MHz)
 UMTS Bands: 5, 4, 2 (WCDMA/FDD 850, 1700/2100 (AWS) and 1900 MHz)
- **AU/NZS Model:**
 LTE Bands 3, 5, 8, 28 (1800, 850, 900, 700 MHz)
 UMTS Bands 1, 5, 8 (WCDMA/FDD 2100, 850, 900 MHz)
 Carrier Approval: Telstra, Optus

WLAN Interface (UC-3111/3121 only)

Standards:

- IEEE 802.11a/b/g/n for Wireless LAN
- IEEE 802.11i for Wireless Security

Supported Bands: 2.4 GHz and 5 GHz

Serial Interface

Standards: 1 or 2 RS-232/422/485 ports, software-selectable

Connector Type: DB9 male

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: 921600 bps (max.)

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND

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

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

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

CAN Interface

Standards: 1 CAN port, CAN2.0A/2.0B compliant

Signals: CAN_H, CAN_L, CAN_GND, CAN_SHLD, CAN_V+, GND

Isolation: 2 kV digital isolation

Speed: 10 kbps to 1 Mbps

Connector Type: DB9 male

Console Interface

Standards: 1 RS-232 port

Signals: TxD, RxD, GND

Connector Type: 4-pin header output (115200, n, 8, 1)

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: Al 5052

Weight: 550 g (1.22 lb)

Dimensions:

UC-3101: 128.5 x 89.1 x 26 mm (5.06 x 3.51 x 1.02 in)

UC-3111, UC-3121: 128.5 x 89.1 x 41 mm (5.06 x 3.51 x 1.61 in)

Mounting: Wallmount, DIN-rail

Software Specifications

Linux

OS: Debian 9 (Kernel 4.4)

Web Server (Apache): Supports PHP and XML

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

Kernel: GNU/Linux 4.4

System Shell: DASH (default), BASH

Text Editor: vim, nano

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

Programming Language Support: PHP, Perl, Python

Internet Security Suite: OpenVPN, IPTables

Cryptographic Hardware Accelerators: AES, SHA, OpenSSL

Linux Board Support Packages (BSP):

- GCC C/C++ cross development tool chain
- Bootloader/ Kernel/ filesystem

Cellular Networking:

- WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
- MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.
- Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).

Environmental Limits

Operating Temperature:

Standard Temp. Models: -10 to 60°C (14 to 140°F)

Wide Temp. Models: -40 to 70°C (-40 to 158°F)

Storage Temperature: -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, 30 ms

Power Requirements

Input Voltage: 9 to 36 VDC (3-pin terminal block, V+, V-, SG)

Input Current: 500 mA @ 12 VDC

Power Consumption: 6 W (with cellular module active)

Standards and Certifications

Safety: UL 60950-1

Hazardous Environments: C1D2, IECEx, ATEX

EMC: IEC 61000-6-2/6-4

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, 10 V/m

IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV

IEC 61000-4-5 Surge: DC Power: 0.5 kV; Signal: 1 kV

IEC 61000-4-6 CS: 10 V

IEC 61000-4-8 PFMF: 30 A/m

Green Product: RoHS, CRoHS, WEEE

Cellular: CE: EN 301511 (2G), EN 301908-1 (4G), MPE SAR, EN 301489-1-1 (2G), EN 301489-24 (4G), FCC, PTCRB, AS/NZS S042, AS/NZS 60950

Wi-Fi: EN 301489-1-17 (EMC), EN 300328 (2.4G), EN 301893 (5G)

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

Cybersecurity:

- Security Update of Existing Software Packages: All software packages installed on the UC-3100 can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.
- USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.
- SD Write Protection: Provides a mechanism for disabling write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

Package Checklist

- 1 x UC-3100 RISC computer
- 1 x DIN-rail mounting kit (pre-installed)
- 1 x Power jack
- 1 x 3-pin terminal block for power
- 1 x CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- 1 x Quick installation guide (printed)
- 1 x Warranty card

Ordering Information

Region	Model Name	Carrier Approval	Wi-Fi	CAN	SD	Serial	CPU	RAM	eMMC	LAN	USB	LTE	SIM slot
-40 to 70°C Operating Temperature													
US	UC-3101-T-US-LX	AT&T	–	–	–	1	1 GHz	512 MB	4 GB	2	1	Cat.1	2
	UC-3111-T-US-LX		–	–	✓	2							
	UC-3121-T-US-LX		✓	1	–	1							
VZW	UC-3101-T-VZW-LX	Verizon	–	–	–	1							
	UC-3111-T-VZW-LX		–	–	✓	2							
	UC-3121-T-VZW-LX		✓	1	–	1							
EU	UC-3101-T-EU-LX	–	–	–	–	1							
	UC-3111-T-EU-LX		–	–	✓	2							
	UC-3121-T-EU-LX		✓	1	–	1							
AU/NZS	UC-3101-T-AU-LX	Telstra, Optus	–	–	–	1							
	UC-3111-T-AU-LX		–	–	✓	2							
	UC-3121-T-AU-LX		✓	1	–	1							

Optional Accessories (sold separately)

Power Adapters, Power Cords, Console Cables

Model Name	Package Contents	Description
PWR-24270-DT-S1	• 1 x Power adapter	Power adapter Input: 100-240 VAC, 50-60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W for testing and system development in the office under ambient temperatures
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
CBL-F9DPF1x4-BK-100	• 1 x Console cable	Console cable with 4-pin connector

Mounting Kits

Model Name	Package Contents	Description
UC-3100 Wall-Mounting Kit	• 2 x Wall-mounting brackets • 8 x Screw	Wall-mounting brackets with screws
UC-3100 DIN-Rail Kit	• 1 x DIN-rail kit • 4 x Screw	DIN-rail kit with screws

Antennas

Model Name	Package Contents	Description
ANT-LTE-ASM-02	• 1 x LTE antenna	LTE stick antenna that covers 790 to 960 MHz, 1710 to 2170 MHz, 2500 to 2700 MHz
ANT-WDB-ARM-02	• 1 x Wi-Fi antenna	Dual-band omni-directional 2.4 and 5 GHz indoor rubber duck antenna
ANT-LTEUS-ASM-01	• 1 x LTE antenna	LTE stick antenna that covers 698 to 960 MHz, 1710 to 2170 MHz, 2300 to 2700 MHz; for Verizon (700 MHz, Band 13)