

# UC-8200 Series

Arm Cortex-A7 dual-core 1 GHz IIoT gateways with built-in LTE Cat. 4, 1 mini PCIe expansion slot for a Wi-Fi module, 1 CAN port, 4 DIs, 4 DOs



## Features and Benefits

- Armv7 Cortex-A7 dual-core 1 GHz
- ISASecure IEC 62443-4-2 Security Level 2 certified with Moxa Industrial Linux 3 Secure
- Moxa Industrial Linux with 10-year superior long-term support
- LTE-ready computer with Verizon/AT&T certification and industrial-grade CE/FCC/UL certifications
- Dual SIM slots
- 2 auto-sensing 10/100/1000 Mbps Ethernet ports
- Integrated LTE Cat. 4 module with US/EU/APAC band support
- 1 CAN port supports CAN 2.0A/B
- microSD socket for storage expansion
- -40 to 85°C wide temperature range and -40 to 70°C with LTE enabled

## Certifications



## Introduction

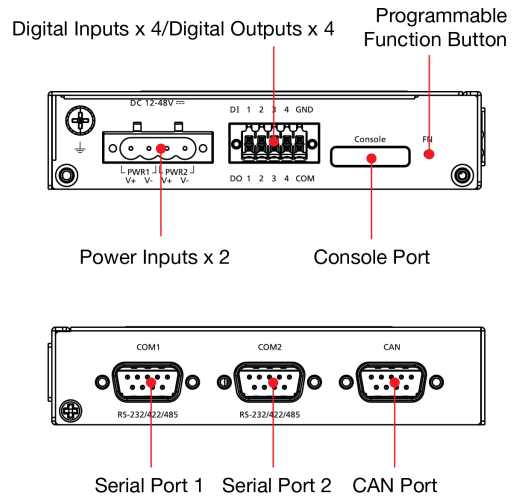
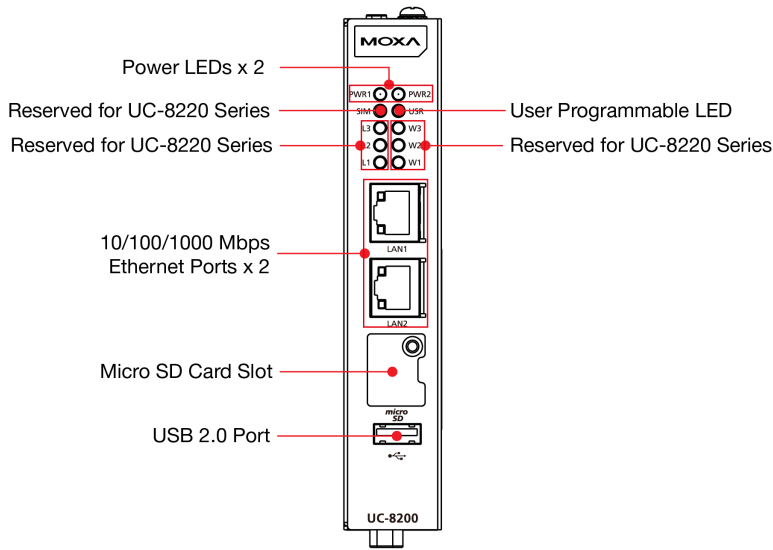
The UC-8200 computing platform is designed for embedded data acquisition applications. The computer comes with dual RS-232/422/485 serial ports, dual 10/100/1000 Mbps Ethernet ports, and one CAN port as well as dual Mini PCIe socket to support Wi-Fi/cellular modules. These versatile capabilities let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

The UC-8200 is built around a Cortex-A7 dual core processor that has been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communications platform for many other large-scale deployments.

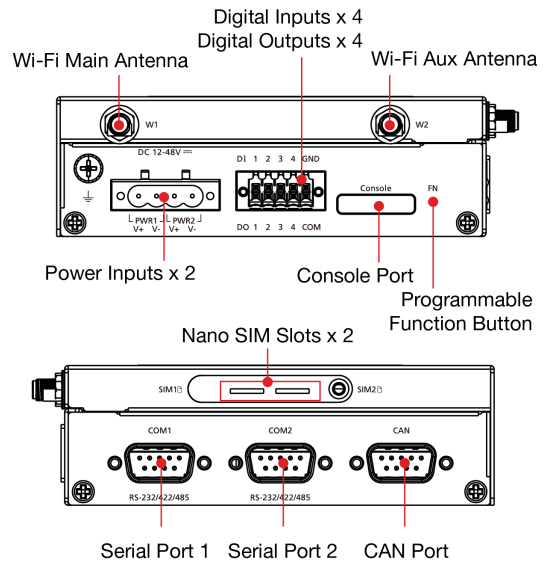
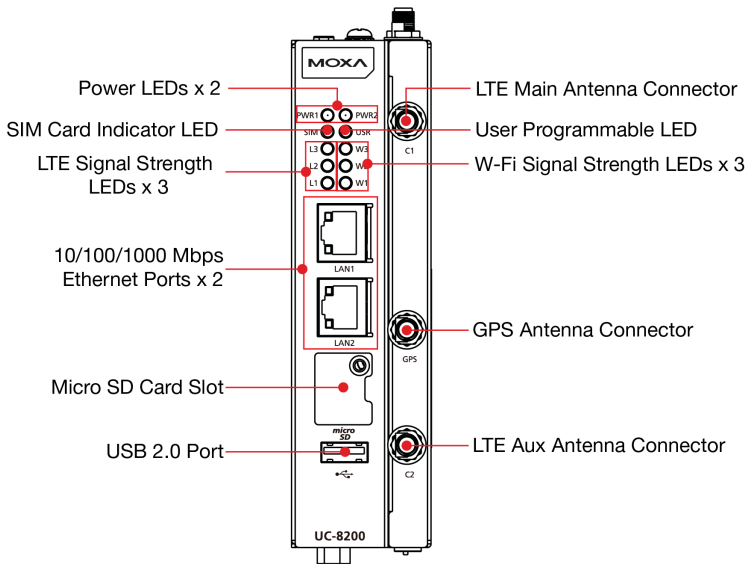
Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide-temperature applications.

# Appearance

## UC-8210



## UC-8220



# Specifications

## Computer

|                       |   |
|-----------------------|---|
| CPU                   | Arm v7 Cortex-A7 dual-core 1 GHz  |
| DRAM                  | 2 GB DDR3L  |
| Supported OS          | Moxa Industrial Linux 1 (Debian 9, kernel 4.4), 2027 EOL<br>Moxa Industrial Linux 3 <sup>1</sup> (Debian 11, kernel 5.10), 2031 EOL<br>See <a href="http://www.moxa.com/MIL">www.moxa.com/MIL</a> |
| Storage Pre-installed | 8 GB eMMC   |
| Expansion Slots       | MicroSD (SD 3.0) socket x 1   |

1. MIL3 OS is selectable via Moxa Computer Configuration System (CCS) for CTO models. For the model names, see the Ordering Information section of the datasheet PDF file.

## Computer Interface

|                            |  |
|----------------------------|--|
| Ethernet Ports             | Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 2                     |
| Serial Ports               | RS-232/422/485 ports x 2, software selectable (DB9 male)                     |
| CAN Ports                  | CAN 2.0 A/B x 1 (DB9 male)   |
| Digital Input              | DIs x 4  |
| Digital Output             | DOs x 4  |
| USB 2.0                    | USB 2.0 hosts x 1, type-A connectors   |
| Wi-Fi Antenna Connector    | UC-8220 Models: RP-SMA x 2   |
| Cellular Antenna Connector | UC-8220 Models: SMA x 2  |
| GPS Antenna Connector      | UC-8220 Models: SMA x 1  |
| Expansion Slots            | UC-8220-T-LX: mPCIe slot x 2<br>UC-8220-T-LX US/EU/AP Models: mPCIe slot x 1 |
| SIM Format                 | UC-8220 Models: Nano   |
| Number of SIMs             | UC-8220 Models: 2  |
| Buttons                    | Programmable button  |
| TPM                        | TPM v2.0   |

## Ethernet Interface

|                               |                   |
|-------------------------------|-------------------|
| Magnetic Isolation Protection | 1.5 kV (built-in) |
|-------------------------------|-------------------|

## Security Functions

|                         |  |
|-------------------------|--|
| Hardware-based Security | TPM 2.0<br>Hardware Root of Trust Secure Boot  |
| Intrusion Detection     | Host-based Intrusion Detection   |
| Security Tools          | Security Diagnostic Tool<br>Security Event Auditing<br>Secure Update                           |
| Disk Protection         | LUKS Disk Encryption   |
| Recovery                | One-step recovery to the last known secure state<br>Dual-system design with automatic fallback |
| Reliability             | Network Keep Alive<br>Network Failover and Failback  |

## Serial Interface

|              |   |
|--------------|---|
| Baudrate     | 300 bps to 921.6 kbps   |
| Data Bits    | 7, 8  |
| Stop Bits    | 1, 2  |
| Parity       | None, Even, Odd, Space, Mark  |
| Flow Control | RTS/CTS, XON/XOFF<br>ADDC (automatic data direction control) for RS-485<br>RTS Toggle (RS-232 only) |
| Console Port | 1 x 4-pin header to DB9 console port  |

## Serial Signals

|           |  |
|-----------|--|
| RS-232    | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422    | Tx+, Tx-, Rx+, Rx-, GND                |
| RS-485-2w | Data+, Data-, GND                      |

## CAN Interface

|                      |  |
|----------------------|--|
| No. of Ports         | 1  |
| Connector            | DB9 male                                     |
| Baudrate             | 10 to 1000 kbps                              |
| Industrial Protocols | CAN 2.0A<br>CAN 2.0B                         |
| Isolation            | 2 kV (built-in)                              |
| Signals              | CAN_H, CAN_L, CAN_GND, CAN_SHLD, CAN_V+, GND |

## Digital Inputs

|                         |                                     |
|-------------------------|-------------------------------------|
| Connector               | Screw-fastened Euroblock terminal   |
| Dry Contact             | Off: open<br>On: short to GND       |
| Isolation               | 3K VDC                              |
| Sensor Type             | Wet contact (NPN)<br>Dry contact    |
| Wet Contact (DI to COM) | On: 10 to 30 VDC<br>Off: 0 to 3 VDC |

## Digital Outputs

|                |  |
|----------------|--|
| Connector      | Screw-fastened Euroblock terminal        |
| Current Rating | 200 mA per channel                       |
| I/O Type       | Sink                                     |
| Voltage        | 24 VDC nominal, open collector to 30 VDC |

## Cellular Interface

|                    |   |
|--------------------|---|
| Cellular Standards | LTE Cat. 4  |
| Band Options       | <p>US Models:<br/>LTE Band 2 (1900 MHz) / LTE Band 4 (1700 MHz) / LTE Band 5 (850 MHz) / LTE Band 13 (700 MHz) / LTE Band 17 (700 MHz)<br/>UMTS/HSPA 850 MHz / 1900 MHz<br/>Carrier Approval: Verizon, AT&amp;T</p> <p>EU Models:<br/>LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 5 (850 MHz) / LTE Band 7 (2600 MHz) / LTE Band 8 (900 MHz) / LTE Band 20 (800 MHz)<br/>UMTS/HSPA 850 MHz / 900 MHz / 1900 MHz / 2100 MHz</p> <p>AP Models:<br/>LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 5 (850 MHz) / LTE Band 7 (2600 MHz) / LTE Band 8 (900 MHz) / LTE Band 28 (700 MHz)<br/>UMTS/HSPA 850 MHz / 900 MHz / 1900 MHz / 2100 MHz</p> |

| GPS Interface                          |  |
|--|--|
| Receiver Types                         | GPS/GLONASS/Galileo<br>State-of-the-art GNSS solution  |
| Accuracy                               | Position: 2.0 m @CEP50   |
| Acquisition                            | Hot starts: 1.1 sec<br>Cold starts: 29.94 sec  |
| Sensitivity                            | Cold starts: -145 dBm<br>Tracking: -160 dBm  |
| Time Pulse                             | 0.25 Hz to 10 MHz  |
| LED Indicators                         |  |
| System                                 | Power x 2<br>Programmable x 1<br>SIM card indicator x 1  |
| Wireless Signal Strength               | Cellular/Wi-Fi x 6   |
| Power Parameters                       |  |
| No. of Power Inputs                    | Redundant dual inputs  |
| Input Voltage                          | 12 to 48 VDC   |
| Power Consumption                      | 10 W   |
| Input Current                          | 0.8 A @ 12 VDC   |
| Reliability                            |  |
| Alert Tools                            | External RTC (real-time clock)   |
| Automatic Reboot Trigger               | External WDT (watchdog timer)  |
| Physical Characteristics               |  |
| Dimensions                             | UC-8220 Models: 141.5 x 120 x 39 mm (5.7 x 4.72 x 1.54 in)<br>UC-8210 Models: 141.5 x 120 x 27 mm (5.7 x 4.72 x 1.06 in)<br>141.5 x 120 x 27 mm (5.7 x 4.72 x 1.06 in) |
| Weight                                 | UC-8210 Models: 560 g (1.23 lb)<br>UC-8220 Models: 750 g (1.65 lb)   |
| Housing                                | SECC<br>Metal  |
| IP Rating                              | IP30   |
| Installation                           | DIN-rail mounting<br>Wall mounting (with optional kit)   |
| Environmental Limits                   |  |
| Operating Temperature                  | -40 to 70°C (-40 to 158°F)   |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F)   |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)  |
| Shock                                  | IEC 60068-2-27   |
| Vibration                              | 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without USB devices attached)   |

## Standards and Certifications

|                          |  |
|--------------------------|--|
| EMC                      | EN 55032/35<br>EN 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<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m<br>IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF<br>IEC 61000-4-5 Surge: Power: 0.5 kV; Signal: 1 kV |
| Industrial Cybersecurity | IEC 62443-4-1<br>IEC 62443-4-2   |
| Hazardous Locations      | Class I Division 2<br>ATEX<br>IECEX  |
| Carrier Approvals        | Verizon<br>AT&T  |
| Safety                   | UL 62368-1<br>EN 62368-1   |
| Green Product            | RoHS, CRoHS, WEEE  |

## MTBF

|           |  |
|-----------|--|
| Time      | UC-8210-T-LX-S: 708,581 hrs<br>UC-8220-T-LX: 650,836 hrs<br>UC-8220-T-LX-US-S/EU-S/AP-S: 528,574 hrs |
| Standards | Telcordia (Bellcore) Standard TR/SR  |

## Warranty

|                 |  |
|-----------------|--|
| Warranty Period | 5 years  |
| Details         | See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a> |

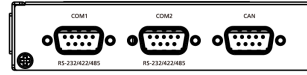
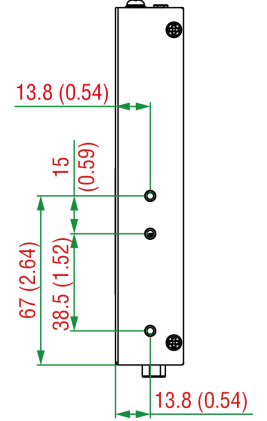
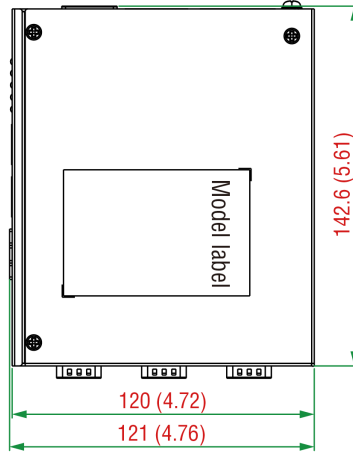
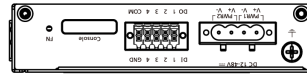
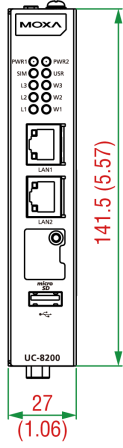
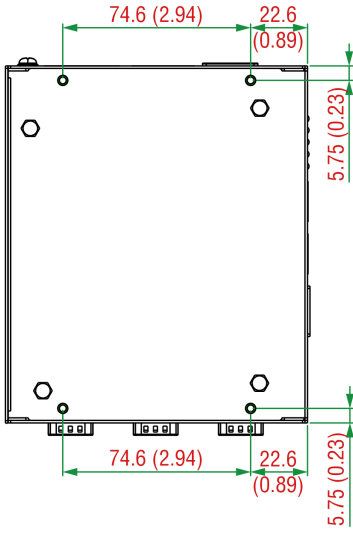
## Package Contents

|                  |   |
|------------------|---|
| Device           | 1 x UC-8200 Series computer   |
| Documentation    | 1 x quick installation guide<br>1 x warranty card   |
| Installation Kit | 1 x DIN-rail kit (preinstalled)<br>1 x power jack<br>6 x M2.5 mounting screws for the cellular module |
| Cable            | 1 x console cable   |

# Dimensions

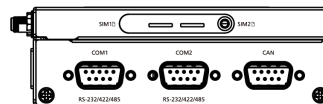
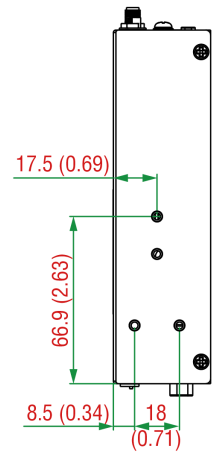
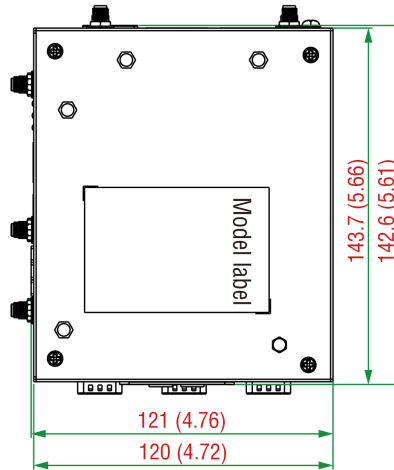
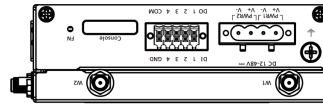
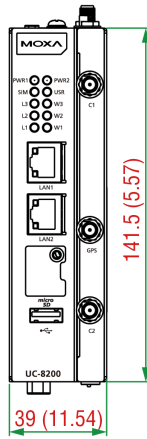
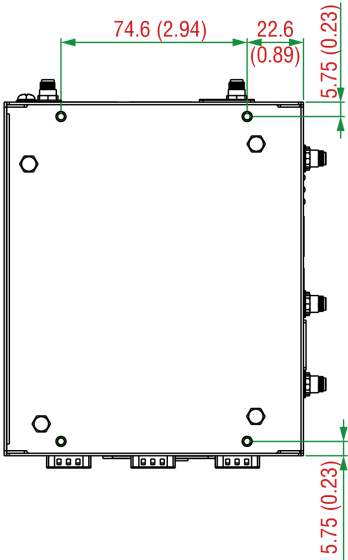
## UC-8210

Unit: mm (inch)



## UC-8220

Unit: mm (inch)



## Ordering Information

| Model Name              | Operating System  | IEC 62443-4-2    | CPU             | TPM      | mPCIe Slot 1 for LTE Module           | mPCIe Slot 2 for Wi-Fi Module | Operating Temperature |
|-------------------------|---|------------------|-----------------|----------|---------------------------------------|-------------------------------|-----------------------|
| UC-8210-T-LX-S          | Default: MIL1 (-Debian 9), 2027 EOL<br>Order With Model UC-8210-T-LX-S (CTO): MIL3 (Debian 11) Secure/Standard, 2031 EOL    | With MIL3 Secure | 1 GHz Dual Core | Built in | -                                     | -                             | -40 to 85°C           |
| UC-8220-T-LX            | Default: MIL1 (-Debian 9), 2027 EOL<br>Order With Model UC-8220-T-LX (CTO): MIL3 (Debian 11) Secure/Standard, 2031 EOL      | With MIL3 Secure | 1 GHz Dual Core | Built in | Reserved                              | Reserved                      | -40 to 70°C           |
| UC-8220-T-LX-US-S       | Default: MIL1 (-Debian 9), 2027 EOL<br>Order With Model UC-8220-T-LX-US-S (CTO): MIL3 (Debian 11) Secure/Standard, 2031 EOL | With MIL3 Secure | 1 GHz Dual Core | Built in | US region LTE module preinstalled     | Reserved                      | -40 to 70°C           |
| UC-8220-T-LX-EU-S       | Default: MIL1 (-Debian 9), 2027 EOL<br>Order With Model UC-8220-T-LX-EU-S (CTO): MIL3 (Debian 11) Secure/Standard, 2031 EOL | With MIL3 Secure | 1 GHz Dual Core | Built in | Europe region LTE module preinstalled | Reserved                      | -40 to 70°C           |
| UC-8220-T-LX-AP-S       | Default: MIL1 (-Debian 9), 2027 EOL<br>Order With Model UC-8220-T-LX-AP-S (CTO): MIL3 (Debian 11) Secure/Standard, 2031 EOL | With MIL3 Secure | 1 GHz Dual Core | Built in | APAC region LTE module preinstalled   | Reserved                      | -40 to 70°C           |
| UC-8210-T-LX-S (CTO)    | MIL3 (Debian 11) Secure or Standard, 2031 EOL   | With MIL3 Secure | 1 GHz Dual Core | Built in | -                                     | -                             | -40 to 85°C           |
| UC-8220-T-LX (CTO)      | MIL3 (Debian 11) Secure or Standard, 2031 EOL   | With MIL3 Secure | 1 GHz Dual Core | -        | Reserved                              | Reserved                      | -40 to 70°C           |
| UC-8220-T-LX-US-S (CTO) | MIL3 (Debian 11) Secure or Standard, 2031 EOL   | With MIL3 Secure | 1 GHz Dual Core | Built in | US region LTE module preinstalled     | Reserved                      | -40 to 70°C           |



| Model Name               | Operating System                              | IEC 62443-4-2    | CPU             | TPM      | mPCIe Slot 1 for LTE Module           | mPCIe Slot 2 for Wi-Fi Module | Operating Temperature |
|--------------------------|---|------------------|-----------------|----------|---------------------------------------|-------------------------------|-----------------------|
| UC-8220-T-LX-EU-S (CTO)  | MIL3 (Debian 11) Secure or Standard, 2031 EOL | With MIL3 Secure | 1 GHz Dual Core | Built in | Europe region LTE module preinstalled | Reserved                      | -40 to 70°C           |
| UC-8220-T-LX- AP-S (CTO) | MIL3 (Debian 11) Secure or Standard, 2031 EOL | With MIL3 Secure | 1 GHz Dual Core | Built in | APAC region LTE module preinstalled   | Reserved                      | -40 to 70°C           |

## Accessories (sold separately)

### Power Adapters

|                     |  |
|---------------------|--|
| PWR-12150-EU-SA-T   | Locking barrel plug, 12 VDC, 1.5 A, 100 to 240 VAC, EU plug, -40 to 75°C operating temperature   |
| PWR-12150-UK-SA-T   | Locking barrel plug, 12 VDC, 1.5 A, 100 to 240 VAC, UK plug, -40 to 75°C operating temperature   |
| PWR-12150-USJP-SA-T | Locking barrel plug, 12 VDC 1.5 A, 100 to 240 VAC, US/JP plug, -40 to 75°C operating temperature |
| PWR-12150-AU-SA-T   | Locking barrel plug, 12 VDC, 1.5 A, 100 to 240 VAC, AU plug, -40 to 75°C operating temperature   |
| PWR-12150-CN-SA-T   | Locking barrel plug, 12 VDC, 1.5 A, 100 to 240 VAC, CN plug, -40 to 75°C operating temperature   |

### Power Wiring

|             |  |
|-------------|--|
| CBL-PJTB-10 | Non-locking barrel plug to bare-wire cable |
|-------------|--|

### Cables

|                     |   |
|---------------------|---|
| CBL-F9DPF1x4-BK-100 | Console cable with 4-pin connector, 1 m |
|---------------------|---|

### Wi-Fi Wireless Modules

|                   |   |
|-------------------|---|
| UC-8200-WLAN22-AC | Wireless package for UC-8200 V2.0 or later with Wi-Fi module, 2 screws, 2 spacers, 1 heat sink, 1 pad |
|-------------------|---|

### Antennas

|                           |  |
|---------------------------|--|
| ANT-LTEUS-ASM-01          | GSM/GPRS/EDGE/UMTS/HSPA/LTE, 1 dBi, omnidirectional rubber-duck antenna                                |
| ANT-LTE-ASM-04 BK         | 704 to 960/1710 to 2620 MHz, LTE omnidirectional stick antenna, 4.5 dBi                                |
| ANT-LTE-OSM-03-3m BK      | 700-2700 MHz, multiband antenna, specifically designed for 2G, 3G, and 4G applications, 3 m cable      |
| ANT-LTE-ASM-05 BK         | 704-960/1710-2620 MHz, LTE stick antenna, 5 dBi  |
| ANT-LTE-OSM-06-3m BK MIMO | Multiband antenna with screw-fastened mounting option for 700-2700/2400-2500/5150-5850 MHz frequencies |
| ANT-WDB-ARM-0202          | 2 dBi at 2.4 GHz or 2 dBi at 5 GHz, RP-SMA (male), dual-band, omnidirectional antenna                  |

### DIN-Rail Mounting Kits

|                               |  |
|-------------------------------|--|
| UC-8210 DIN-rail Mounting Kit | DIN-rail mounting kit for UC-8210 with 4 M3 screws |
| UC-8220 DIN-rail Mounting Kit | DIN-rail mounting kit for UC-8220 with 4 M3 screws |

### Wall-Mounting Kits

|                           |  |
|---------------------------|--|
| UC-8200 Wall-mounting Kit | Wall-mounting kit for UC-8200 with 4 M3 screws |
|---------------------------|--|

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