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

- 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

- IEC 62443-4-2 Security Level 2 certified

- -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.
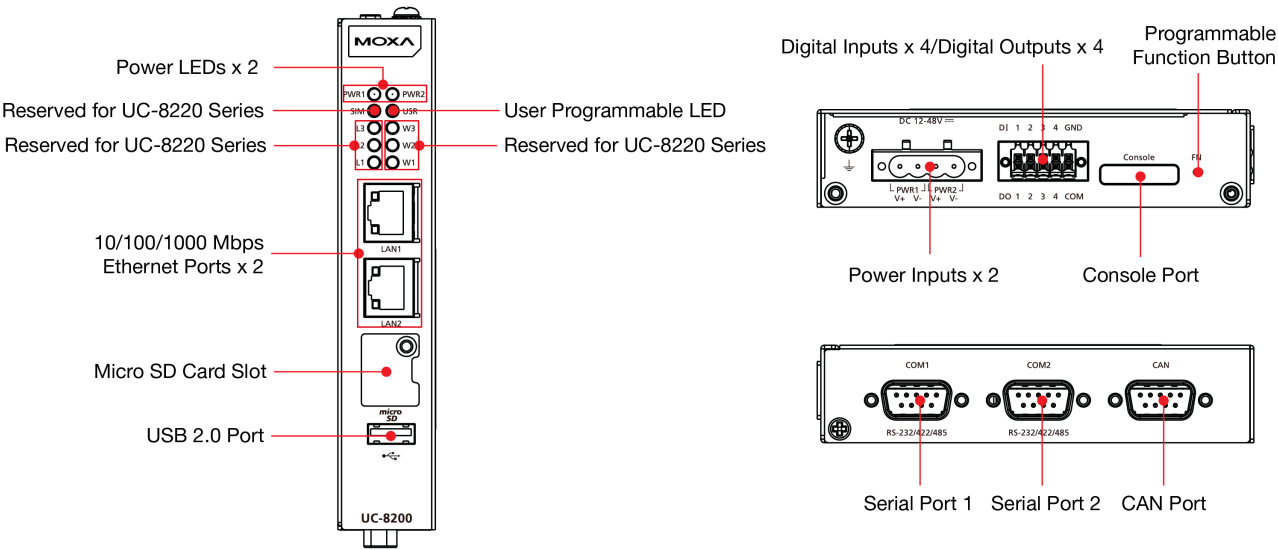
IEC 62443-4-2 Security Level 2 Certified

The UC-8200 Series models with Moxa Industrial Linux 3 (MIL3) are IEC 62443-4-2 Security Level 2 certified, making it easier for asset owners and system integrators to integrate IIoT applications by providing a secure platform that has already been tested and validated to protect IIoT data and infrastructure against cyberthreats.
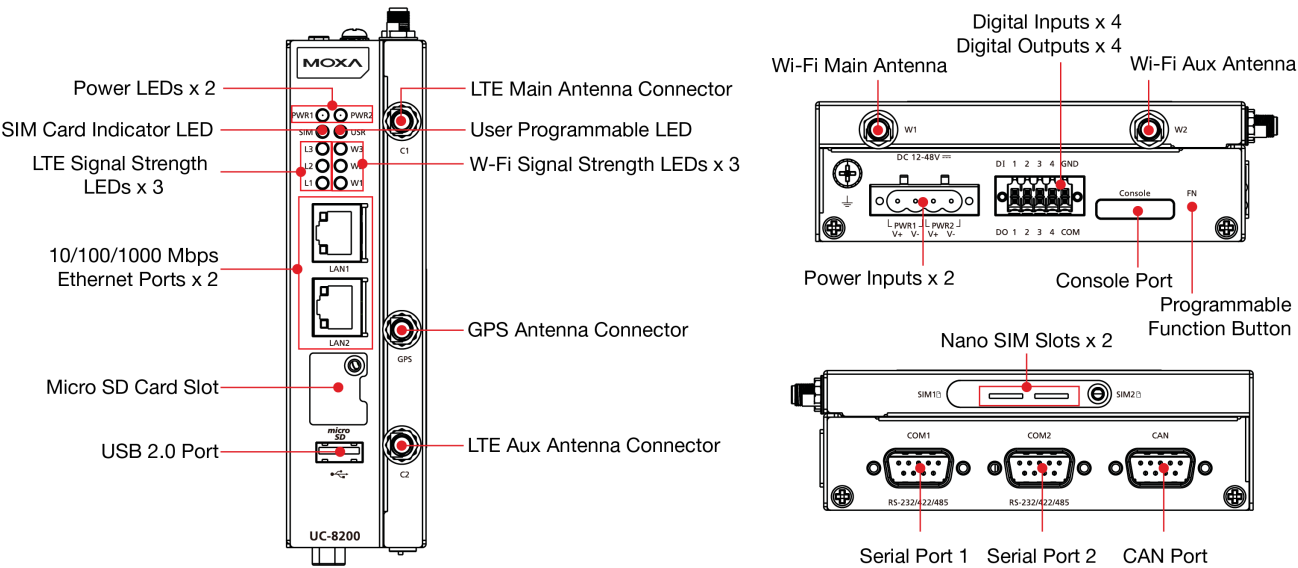
IEC 62443-4-2 Security Level 2 certificate:https://21577316.fs1.hubspotusercontent-na1.net/hubfs/21577316/2022%20ISA%20Website%20Redesigns/ISA%20Secure/PDFs/IEC-62443-4-2-Certified-Components/ISASecure-Moxa-UC-8200-CSA-Certificate.pdf

Appearance

UC-8210

Power LEDs x 2
Reserved for UC-8220 Series
Reserved for UC-8220 Series

User Programmable LED
Reserved for UC-8220 Series

10/100/1000 Mbps Ethernet Ports x 2

Micro SD Card Slot

USB 2.0 Port

Digital Inputs x 4/Digital Outputs x 4
Programmable Function Button

Power Inputs x 2
Console Port

Serial Port 1
Serial Port 2
CAN Port

UC-8220

Power LEDs x 2
SIM Card Indicator LED
LTE Signal Strength LEDs x 3

10/100/1000 Mbps Ethernet Ports x 2

Micro SD Card Slot

USB 2.0 Port

LTE Main Antenna Connector
User Programmable LED
W-Fi Signal Strength LEDs x 3

GPS Antenna Connector

LTE Aux Antenna Connector

Digital Inputs x 4
Digital Outputs x 4
Wi-Fi Main Antenna
Wi-Fi Aux Antenna

Power Inputs x 2
Console Port
Programmable Function Button

Nano SIM Slots x 2

Serial Port 1
Serial Port 2
CAN Port

Specifications

Computer

CPU	Armv7 Cortex-A7 dual-core 1 GHz
DRAM	2 GB DDR3L
Supported OS	Moxa Industrial Linux 1 (Debian 9, kernel 4.4), 2027 EOL Moxa Industrial Linux 3[1] (Debian 11, kernel 5.10), 2031 EOL See www.moxa.com/MIL
Storage Pre-installed	8 GB eMMC
Expansion Slots	MicroSD (SD 3.0) socket x 1

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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.

www.moxa.com

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 connector)
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 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 Hardware Root of Trust Secure Boot
Intrusion Detection	Host-based Intrusion Detection
Security Tools	Security Diagnostic Tool Security Event Auditing Secure Update
Disk Protection	LUKS Disk Encryption
Recovery	One-step recovery to the last known secure state Dual-system design with automatic failback
Reliability	Network Keep Alive 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 ADDC (automatic data direction control) for RS-485 RTS Toggle (RS-232 only)
Console Port	1 x 4-pin header to DB9 console port

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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 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 On: short to GND
Isolation	3K VDC
Sensor Type	Wet contact (NPN) Dry contact
Wet Contact (DI to COM)	On: 10 to 30 VDC 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	US Models: 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) UMTS/HSPA 850 MHz / 1900 MHz Carrier Approval: Verizon, AT&T EU Models: 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) UMTS/HSPA 850 MHz / 900 MHz / 1900 MHz / 2100 MHz AP Models: 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) UMTS/HSPA 850 MHz / 900 MHz / 1900 MHz / 2100 MHz

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GPS Interface

Receiver Types	GPS, GLONASS, BeiDou, Galileo, QZSS
Accuracy	Position: 2.0 m @CEP50
Time to First Fix (TTFF)	Hot start: 1.1 s Warm start: 22.1 s Cold start: 29.9 s
Sensitivity	Acquisition: -147 dBm Tracking: -160 dBm Cold starts: -145 dBm
Update Rate	1 Hz

LED Indicators

System	Power x 2 Programmable x 1 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) UC-8210 Models: 141.5 x 120 x 27 mm (5.7 x 4.72 x 1.06 in) 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) UC-8220 Models: 750 g (1.65 lb)
Housing	SECC Metal
IP Rating	IP30
Installation	DIN-rail mounting 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	BIS EN 55032/35 EN 61000-6-2/-6-4 KC RCM UKCA
EMI	EN 55032 Class A EN 61000-6-4 Class A FCC Part 15B Class A ICES-003 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; 1.4 GHz to 6 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: line-to-line: 0.5 kV; line-to-PE: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Industrial Cybersecurity	IEC 62443-4-2 Security Level 2
Hazardous Locations	Class I Division 2 ATEX
Carrier Approvals	Verizon AT&T PTCRB
Safety	UL 62368-1 EN 62368-1
Radio Frequency	UC-8220 FCC CE (RED) ISED RCM NCC
International Approval	FCC CE ISED UKCA RCM KC BIS
Green Product	RoHS, CRoHS, WEEE

MTBF

Time	UC-8210-T-LX-S: 708,581 hrs UC-8220-T-LX: 650,836 hrs 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 www.moxa.com/warranty

Package Contents

Device	1 x UC-8200 Series computer
Documentation	1 x quick installation guide 1 x warranty card

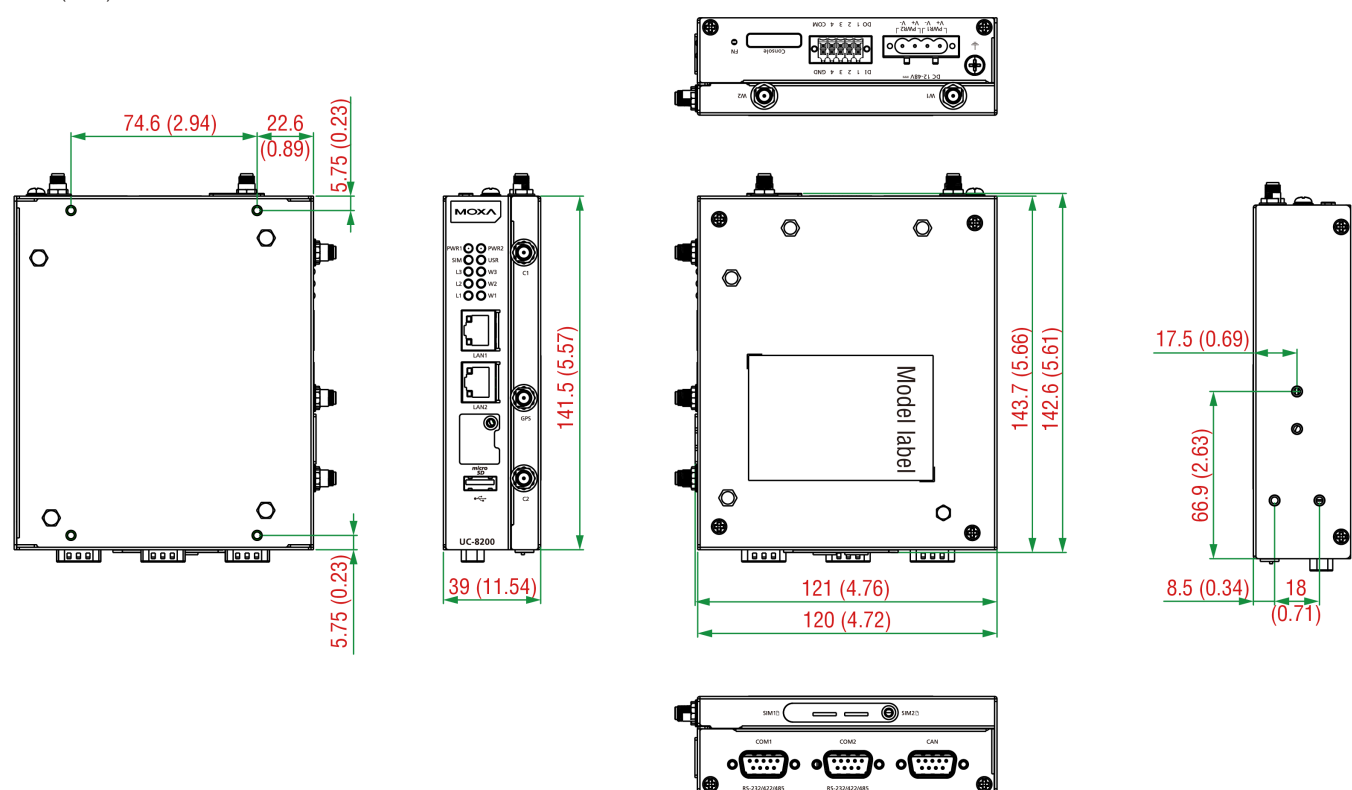| Installation Kit	1 x DIN-rail kit (preinstalled) 1 x power jack 6 x M2.5 mounting screws for the cellular module
Cable	1 x console cable

Dimensions

UC-8210

Unit: mm (inch)

UC-8220

Unit: mm (inch)

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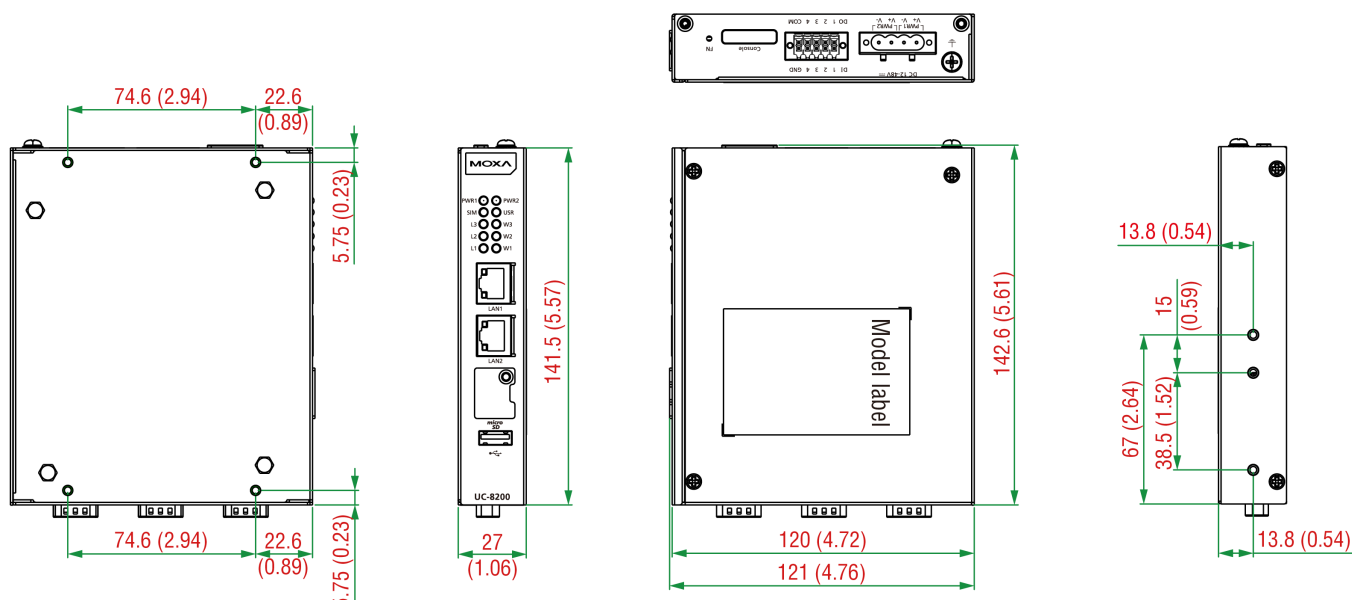
Ordering Information

Model Name	Operating System	IEC 62443-4-2 Security Level 2	CPU	mPCIe Slot 1 for LTE Module	mPCIe Slot 2 for Wi-Fi Module	Operating Temperature
UC-8210-T-LX-S	Default: MIL1 (Debian 9) Order MIL3 Standard/Secure (Debian 11) via UC-8200 (CTO)	With MIL3 Secure	1 GHz Dual Core	–	–	-40 to 85°C
UC-8220-T-LX	Default: MIL1 (Debian 9) Order MIL3 Standard/Secure (Debian 11) via UC-8200 (CTO)	With MIL3 Secure	1 GHz Dual Core	Reserved	Reserved	-40 to 85°C
UC-8220-T-LX-US-S	Default: MIL1 (Debian 9) Order MIL3 Standard/Secure (Debian 11) via UC-8200 (CTO)	With MIL3 Secure	1 GHz Dual Core	U.S. region LTE Cat. 4 module preinstalled	Reserved	-40 to 70°C
UC-8220-T-LX-EU-S	Default: MIL1 (Debian 9) Order MIL3 Standard/Secure (Debian 11) via UC-8200 (CTO)	With MIL3 Secure	1 GHz Dual Core	Europe region LTE Cat. 4 module preinstalled	Reserved	-40 to 70°C
UC-8220-T-LX-AP-S	Default: MIL1 (Debian 9) Order MIL3 Standard/Secure (Debian 11) via UC-8200 (CTO)	With MIL3 Secure	1 GHz Dual Core	APAC region LTE Cat. 4 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-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
ANT-5G-OSM-04	4 dBi LTE/5G NR dipole antenna with SMA (male) connector

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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