UC-8200 Series

INROI

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
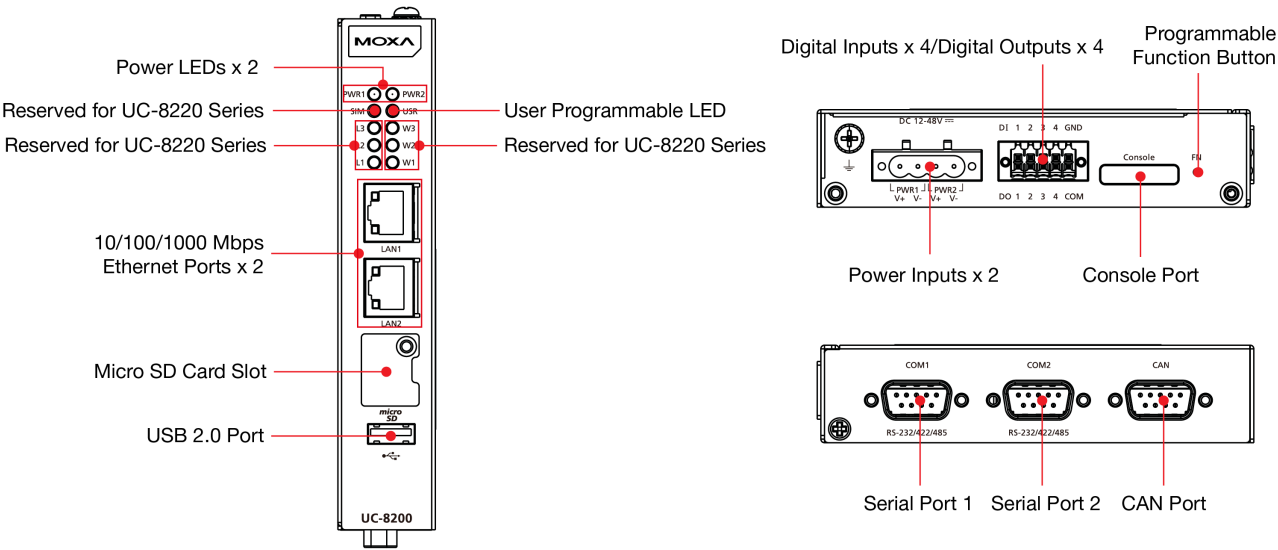
Certifications

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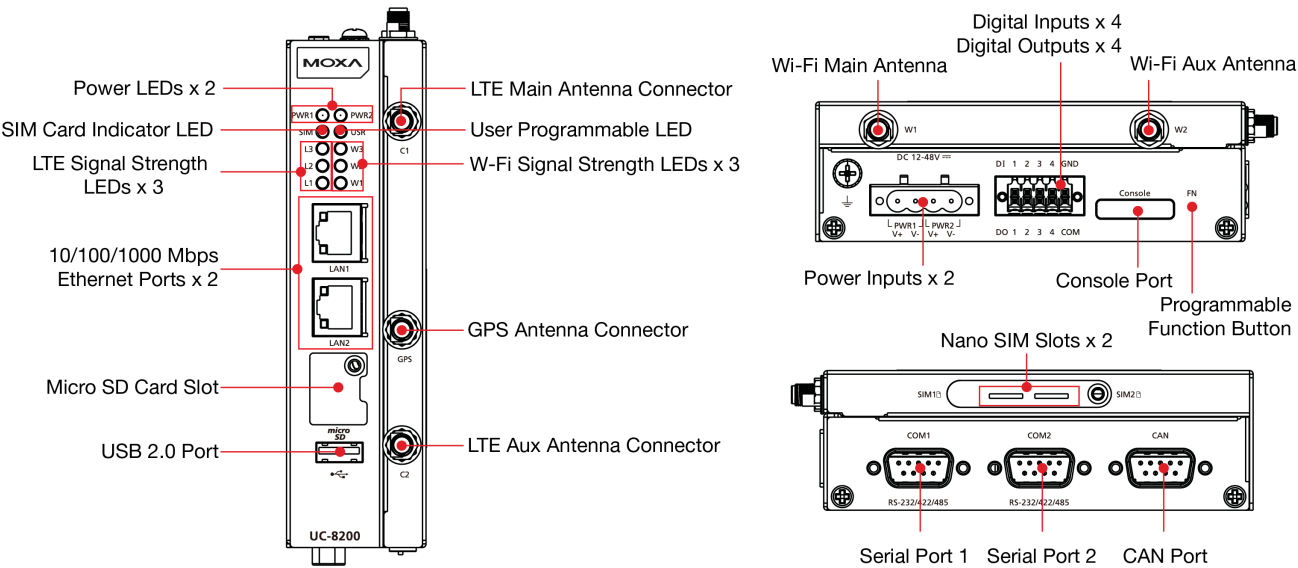
Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide-temperature applications.

Appearance

UC-8210

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.

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 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/Galileo State-of-the-art GNSS solution
Accuracy	Position: 2.0 m @CEP50
Acquisition	Hot starts: 1.1 sec Cold starts: 29.94 sec
Sensitivity	Cold starts: -145 dBm Tracking: -160 dBm
Time Pulse	0.25 Hz to 10 MHz

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	EN 55032/35 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 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 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-5 Surge: Power: 0.5 kV; Signal: 1 kV
Industrial Cybersecurity	IEC 62443-4-1 IEC 62443-4-2
Hazardous Locations	Class I Division 2 ATEX IECEx
Carrier Approvals	Verizon AT&T
Safety	UL 62368-1 EN 62368-1
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

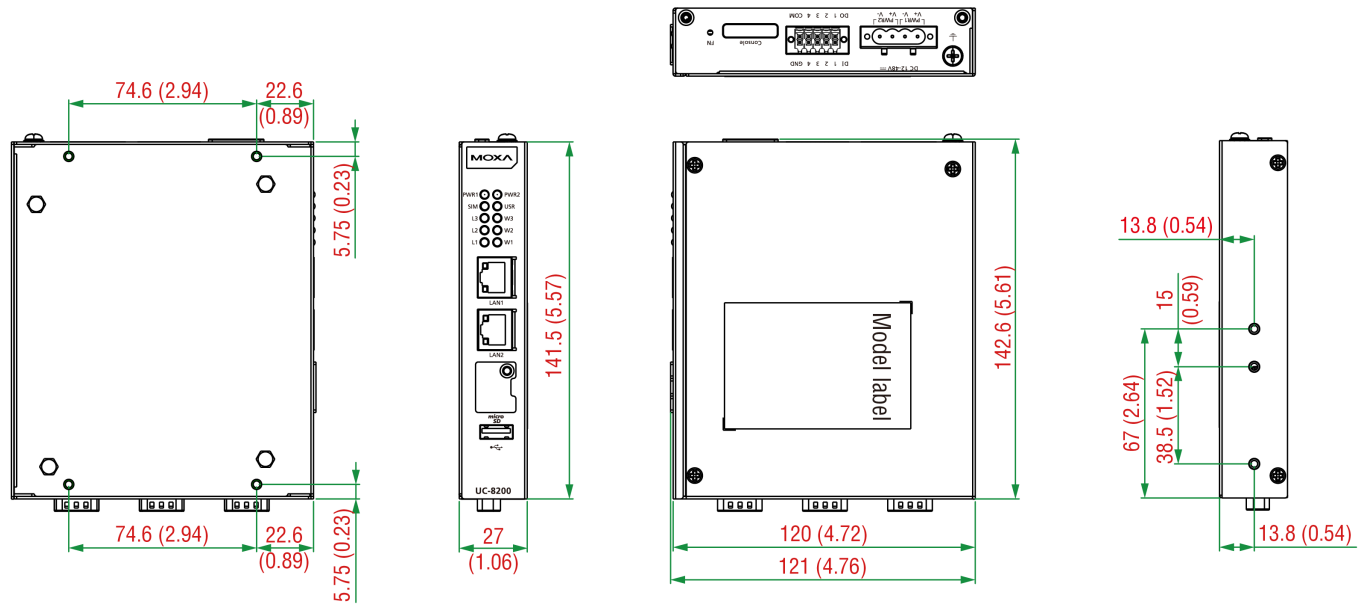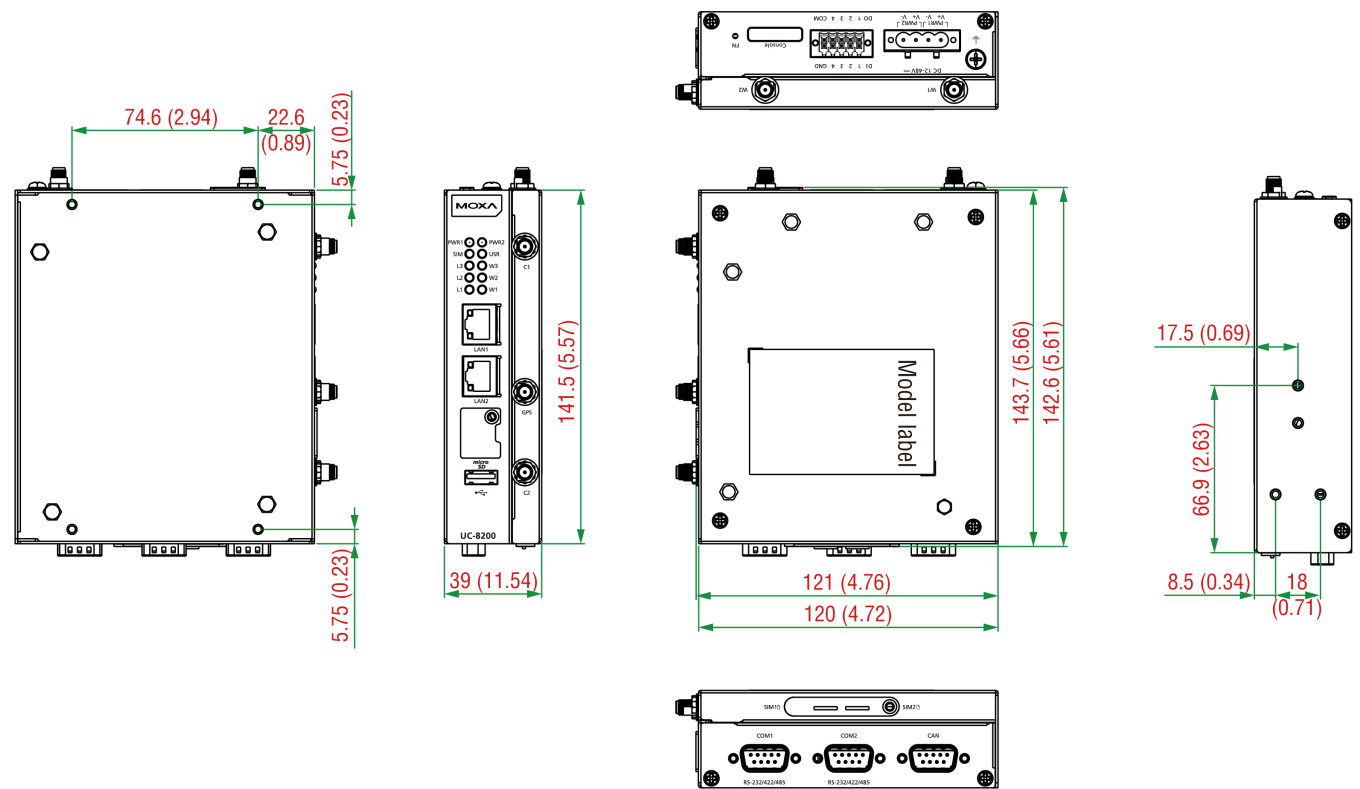|	
Device	1 x UC-8200 Series computer
Documentation	1 x quick installation guide 1 x warranty card
Installation Kit	1 x DIN-rail kit (preinstalled) 1 x power jack 6 x M2.5 mounting screws for the cellular module
Cable	1 x console cable

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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 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 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 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 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 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

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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