AIG-302 系列

配備 Arm® Cortex™-A7 雙核心 1 GHz 處理器與 Azure IoT Edge 軟體、支援 -40 至 70°C 操作溫度的進階 IIoT 閘道

特色與優點

- 支援通用 MQTT 用戶端，以利透過為 Azure 雲端整合量身訂製的內建裝置 SDK 進行 MQTT 連線
- 支援 Modbus RTU/ASCII/TCP 用戶端
- 支援 Modbus TCP 伺服器
- 支援 Azure IoT Edge
- 內建網路流量監控和診斷工具，便於故障排除
- 提供強大的 OTA 功能，可防止軟體升級期間發生系統故障
- 配備安全開機功能，可防止惡意軟體注入攻擊
- -40°C 至 70°C 操作溫度範圍
- 提供 LTE Cat.4 US、EU 和 APAC 型號

認證

簡介

AIG-302 系列進階 IIoT 閘道將 Modbus RTU/ASCII/TCP 裝置連接到 Azure 雲端和 MQTT 等平台。這些閘道支援 Modbus TCP 伺服器模式，可同時將資料傳輸到雲端平台和您的本機 SCADA 系統。

透過 Azure IoT Edge 提升邊緣運算能力

AIG-302 支援 Azure IoT Edge，帶來眾多優勢，包括邊緣運算能力、降低頻寬成本、彈性和可擴展性、與 Azure 服務的無縫整合，以及易於管理和更新。具體而言，透過 AIG-302 在本機處理資料，它不僅提供快速回應和低延遲，還有效減少網路頻寬使用量，進而降低成本。此外，AIG-302 的模組化設計和 Azure IoT Edge 支援使您的系統兼具彈性和易於擴展性。同時，它與 Azure 雲端服務的無縫整合使您能夠輕鬆地將雲端功能擴展到邊緣裝置。

內建即用型資料預先處理功能，無需編寫程式碼

能源管理系統會收集例如平均發電量和能源效率等能源資料。然後，這些資料用於顯示現場狀況、觀察能源趨勢並最佳化能源使用。大多數能源管理系統需要有意義的資料，因此邊緣閘道需要將現場收集到的資料在傳輸到雲端應用程式之前進行預先處理。某些應用程式可能需要在短時間內對預先處理的資料執行特定動作。AIG-302 開箱即用 IIoT 閘道配備了增值功能和直覺式使用者介面，可將資料預先處理，並將分散式裝置管理簡化到只需按幾下即可完成。

安全遠端存取降低維護成本

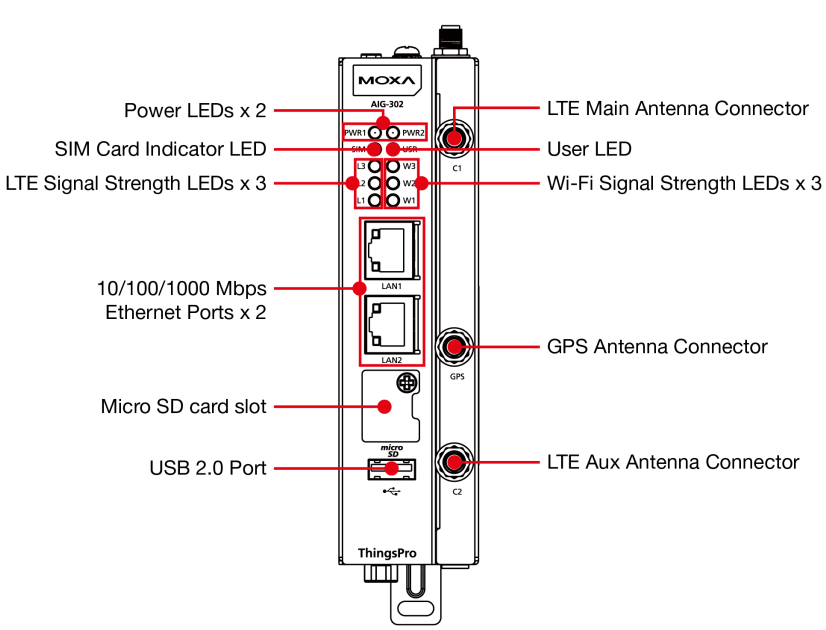
AIG-302 附帶強大的故障排除工具，用於診斷通訊協定狀態問題以及擷取和分析流量封包，使工程師能夠識別問題的根本原因並迅速讓營運恢復正常。此外，AIG-302 還提供安全遠端存取，允許維護工程師遠端修復問題，進而節省時間和精力，並減少能源管理系統的停機時間。外部連線可以使用 OpenVPN 或 TLS 進行加密，確保安全通訊。

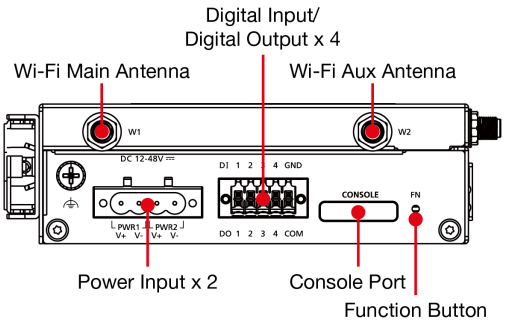
為偵測安全問題而最佳化的安全儀表板

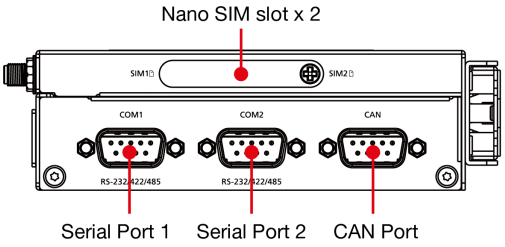
安全儀表板利用裝置掃描，從多個角度識別潛在的網路安全威脅，例如在帳戶設定管理、應用程式網路連線、應用程式資源使用監控、產品憑證部署、服務設定修改和系統狀態檢查期間。一旦偵測到威脅，就會建議緩解計畫來解決問題。

外觀

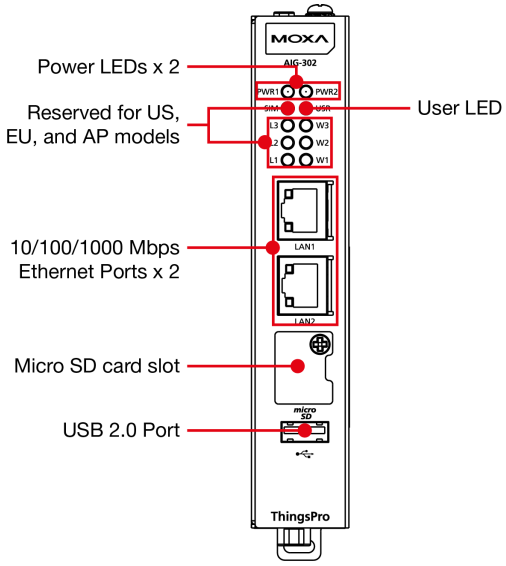
AIG-302-T US、EU、AP 型號

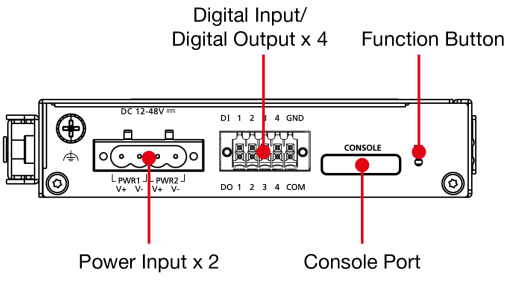


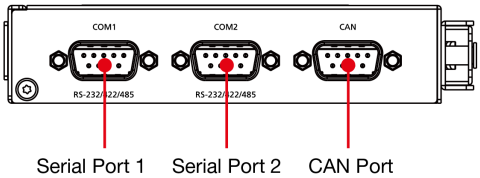




AIG-302-T-AZU-LX







規格

Computer

CPU	Armv7 Cortex-A7 dual-core 1 GHz
DRAM	2 GB DDR3L
Storage Pre-installed	32 GB eMMC
Pre-installed OS	Moxa Industrial Linux (Debian 11, kernel 5.10.x)
No. of Tags Supported	3000

Computer Interface

Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 2
Serial Channels	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	RP-SMA x 2 (excluding AIG-302-T-AZU-LX)
Cellular Antenna Connector	SMA x 2 (excluding AIG-302-T-AZU-LX)
GPS Antenna Connector	SMA x 1 (excluding AIG-302-T-AZU-LX)
Expansion Slots	mPCIe slots x 1 (excluding AIG-302-T-AZU-LX)
SIM Format	Nano (excluding AIG-302-T-AZU-LX)
Number of SIMs	2
Buttons	Reset button Reset to factory default
TPM	TPM v2.0

Ethernet Interface

Magnetic Isolation Protection	1.5 kV (built-in)
10/100/1000BaseT(X) Ports (RJ45 connector)	2

Ethernet Software Features

Industrial Protocols	Modbus TCP Client / Server Generic MQTT Azure IoT Device Azure IoT Edge
Configuration Options	Web Console (HTTPS) RESTful APIs AIG QuickON
Time Management	NTP Client GPS
Security	OpenVPN Client, SSH HTTPS/SSL TLS Firewall

Serial Interface

No. of Ports	2
Connector	DB9 male
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
Console Port	1 x 4-pin header

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

Serial Software Features

Industrial Protocols	Modbus RTU/ASCII Master

CAN Interface

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

Digital Inputs

Connector	Spring-type Euroblock terminal
Sensor Type	Wet contact (NPN) Dry contact
Dry Contact	Off: open On: short to GND
Wet Contact (DI to COM)	On: 10 to 30 VDC Off: 0 to 3 VDC
Isolation	3K VDC

Digital Outputs

Connector	Spring-type 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)	4G: Band 2 (1900 MHz)/ Band 4 (1700 MHz)/ Band 5 (850 MHz)/ Band 12 (700 MHz)/ Band 13 (700 MHz)/ Band 14 (700 MHz)/ Band 66 (1700 MHz)/ Band 71 (600 MHz) 3G: Band 2 (1900 MHz)/ Band 4 (1700 MHz)/ Band 5 (850 MHz) Carrier Approvals: Verizon, AT&T

Band Options (EU)	4G: Band 1 (2100 MHz)/ Band 3 (1800 MHz)/ Band 7 (2600 MHz)/ Band 8 (900 MHz)/ Band 20 (800 MHz)/ Band 28A (700 MHz) 3G: Band 1 (2100 MHz)/ Band 3 (1800 MHz)/ Band 8 (900 MHz)
Band Options (APAC)	4G: Band 1 (2100 MHz)/Band Band 3 (1800 MHz)/ Band 5 (850 MHz)/ Band 8 (900 MHz)/ Band 9 (1800 MHz)/ Band 18 (850 MHz)/Band 19 (850 MHz)/ Band 26 (850 MHz)/ Band 28 (700 MHz) 3G: Band 1 (2100 MHz)/ Band 5 (850 MHz)/ Band 6 (850 MHz)/ Band 8 (900 MHz)/ Band 19 (850 MHz)

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	Cold starts: -145 dBm Acquisition: -147.0 dBm Tracking: -160 dBm
Update Rate	1 Hz

Azure IoT Edge

Versions Supported	v1.4.20
Authentication Methods	Manual / Connection String DPS / Symmetric Encryption DPS / X.509 Certificate DPS / TPM
Azure Direct Methods	Reboot Software Upgrade Remote API Invocation
Azure Module Twin	Device Configuration
Moxa Functions	Custom Payload Message Group

Generic MQTT Client

Versions Supported	v3.1.1 v3.1
QoS Levels	0, 1, 2
Authentication Methods	Username and password
Secure Transmission	TLS 1.0 TLS 1.1 TLS 1.2
Native Capabilities	Keep Alive Retain Message Clean Session Will and Testament
Moxa Functions	Store and Forward Custom Payload Remote API Invocation

Azure IoT Device

Connection Protocols Supported	MQTT MQTT over WebSockets AMQP AMQP over WebSockets
Authentication Methods	Symmetric Key X.509 Certificate
Azure Direct Methods	Reboot Software Upgrade Remote API Invocation

Modbus RTU/ASCII

Mode	Client (Master)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	256 per port
Max. No of Connected Devices	62

Modbus TCP

Mode	Client/Server
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Server Connections	64
Max. No. of Client Connections	4
Max. No. of Commands	3000

LED Indicators

System	Power x 2 User x 1 SIM card indicator x 1
LAN	2 per port (10/100/1000 Mbps)
Wireless Signal Strength	Cellular/Wi-Fi x 6

Power Parameters

No. of Power Inputs	Redundant dual inputs
Input Voltage	12 to 48 VDC
Input Current	1 A @ 12 VDC
Power Consumption	12 W
Power Connector	4-pin terminal block

Reliability

Automatic Reboot Trigger	External WDT (watchdog timer)

Physical Characteristics

Housing	Metal SECC
IP Rating	IP30
Weight	AIG-302-T-AZU-LX: 560 g (1.23 lb) All other models: 750 g (1.65 lb)

Dimensions	AIG-302-T-AZU-LX: 141.5 x 120 x 27 mm (5.7 x 4.72 x 1.06 in) All other models: 141.5 x 120 x 39 mm (5.7 x 4.72 x 1.54 in)
Installation	DIN-rail mounting Wall mounting (with optional kit)

Environmental Limits

Operating Temperature	AIG-302-T-AZU-LX: –40 to 85°C (-40 to 185°F) All other models: -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 to 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 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Cybersecurity	EN 18031-1
Hazardous Locations	Class I Division 2, ATEX
Safety	UL 62368-1 EN 62368-1
Radio	NCC KC RCM TELEC
Carrier Approvals	AT&T Verizon PTCRB
RED	EN 301 489-1/19/52 EN 301 908-1 EN 303 413 EN 62311
Green Product	RoHS, CRoHS, WEEE

MTBF

Time	AIG-302-T-AZU-LX: 1,772,745 All other models: 1,403,998
Standards	Telcordia (Bellcore) Standard TR/SR

Warranty

Warranty Period	5 years
Details	See www.moxa.com/tw/warranty

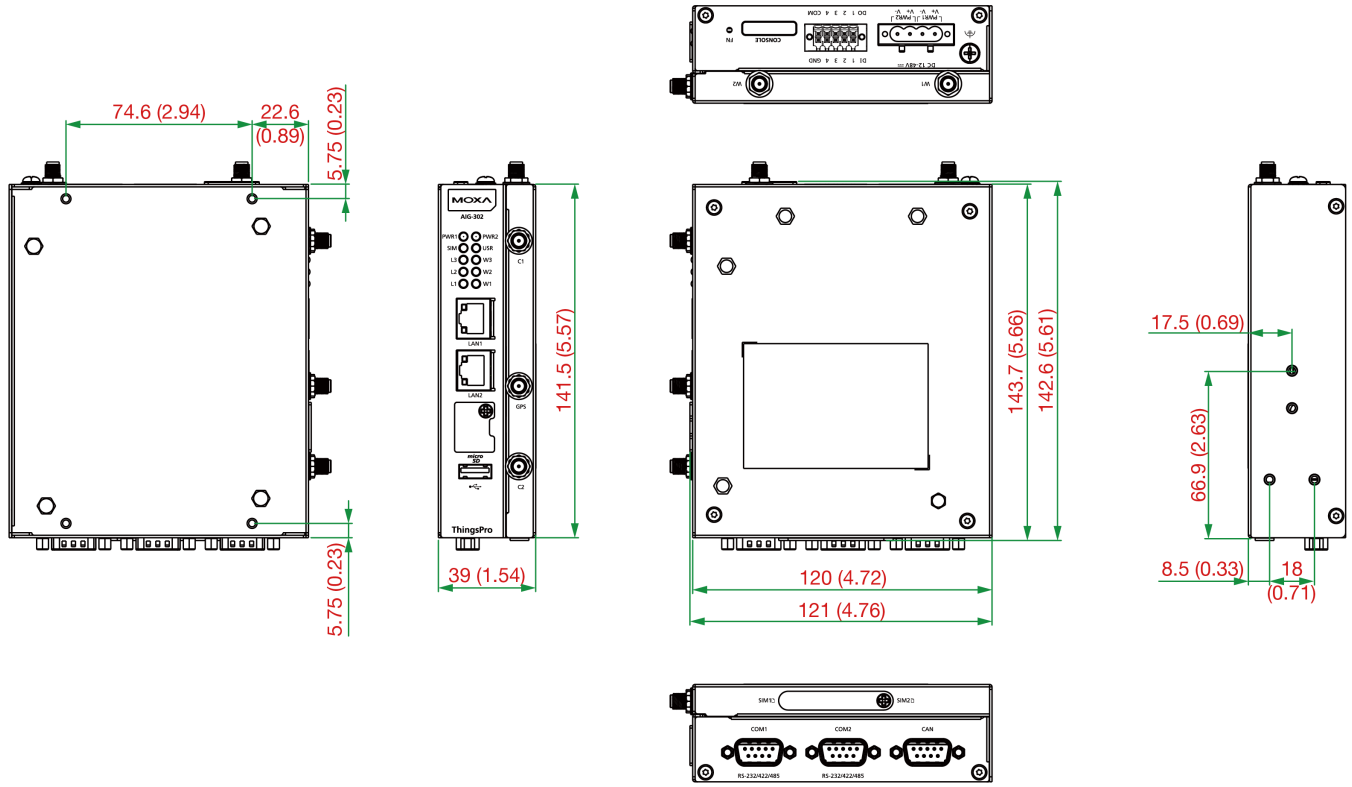
Package Contents

Device	1 x AIG-302 Series advanced IIoT gateway
Cable	1 x terminal block to power jack converter
Installation Kit	1 x DIN-rail kit
Documentation	1 x quick installation guide 1 x warranty card

尺寸

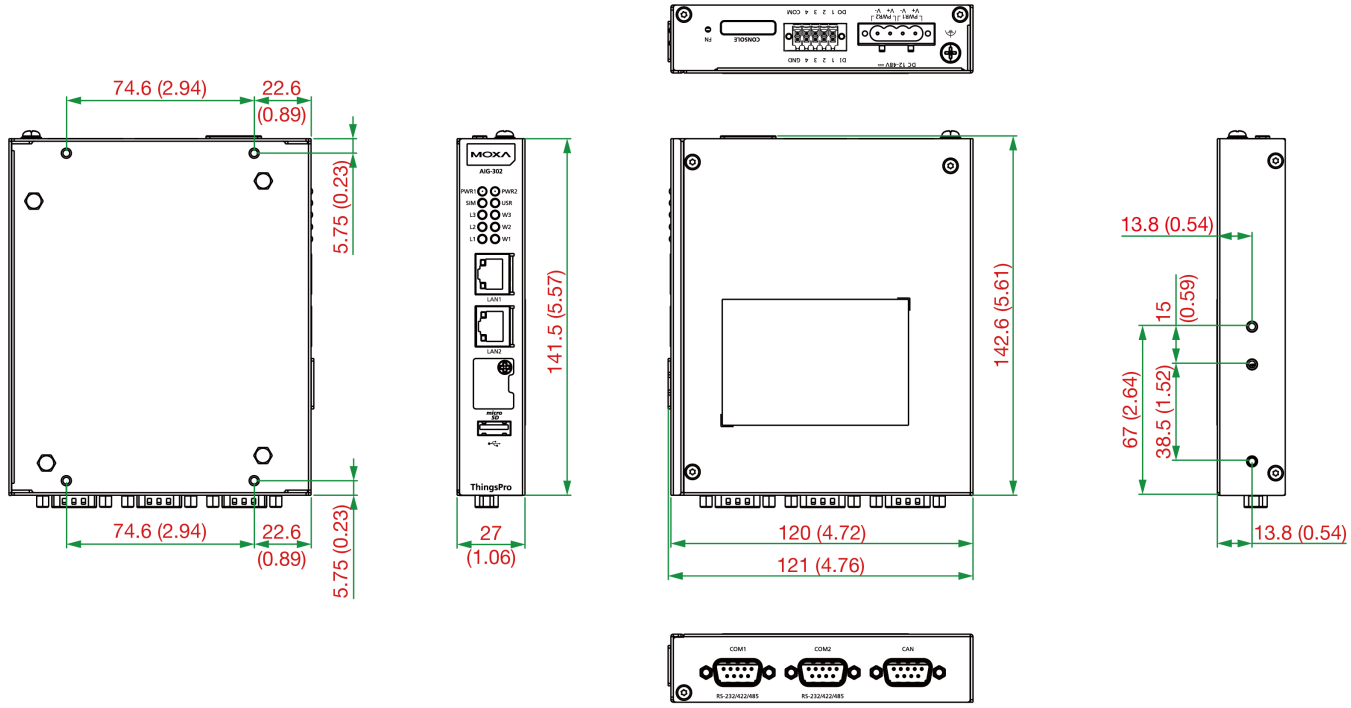
AIG-302 US、EU 和 AP 型號

單位：公釐（英吋）



AIG-302-T-AZU-LX

單位：公釐（英吋）



訂購資訊

Model Name	mPCIe Slot 1 for LTE Module	mPCIe Slot 2 for Wi-Fi Module	Operating Temperature
AIG-302-T-AZU-LX	–	–	-40 to 85°C
AIG-302-T-US-AZU-LX	US region LTE module preinstalled	Reserved	-40 to 70°C
AIG-302-T-EU-AZU-LX	Europe region LTE module preinstalled	Reserved	-40 to 70°C
AIG-302-T-AP-AZU-LX	APAC region LTE module preinstalled	Reserved	-40 to 70°C

配件（選購）

Power Wiring

CBL-PJTB-10	Non-locking barrel plug to bare-wire cable
Mini DB9F-to-TB	DB9 female to terminal block connector

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-5G-OSM-04	4 dBi LTE/5G NR dipole antenna with SMA (male) connector
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

Wall-Mounting Kits

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