

AIG-302 Series

Advanced IIoT gateways with Arm® Cortex™-A7 dual-core 1 GHz processor, Azure IoT Edge software, -40 to 70°C operating temperature



Features and Benefits

- Supports generic MQTT client to facilitate MQTT connections via built-in device SDKs tailored for Azure cloud integration
- Supports Modbus RTU/ASCII/TCP client
- Supports Modbus TCP server
- Supports Azure IoT Edge
- Built-in network traffic monitoring and diagnostic tool for easy troubleshooting
- Provides robust OTA function to prevent system failure during software upgrades
- Equipped with secure boot to prevent malicious software-injection attacks
- -40 to 70°C operating temperature range
- LTE Cat. 4 US, EU, and APAC models available

Certifications



Introduction

The AIG-302 Series advanced IIoT gateways connect Modbus RTU/ASCII/TCP devices to clouds such as Azure, and MQTT platform. The gateways support the Modbus TCP server mode, enabling simultaneous transmission of data to a cloud platform and local SCADA system.

Boost Edge Computing Capabilities With Azure IoT Edge

AIG-302 supports Azure IoT Edge to bring in a multitude of benefits, including edge computing capabilities, reduced bandwidth costs, flexibility and scalability, seamless integration with Azure services, and ease of management and updates. Specifically, with the AIG-302 processing data locally, it not only offers rapid response and low latency but also effectively reduces network bandwidth usage, thereby cutting costs. Additionally, the modular design of AIG-302 supporting Azure IoT Edge makes your system both flexible and easily expandable. At the same time, its seamless integration with Azure cloud services allows you to effortlessly extend cloud capabilities to edge devices.

Built-in Ready-to-use Data Preprocessing Functions, No Coding Required

Energy Management Systems mainly collect energy data such as average power generation and energy efficiency. This data is then used to display on-site conditions, observe the energy trend, and optimize energy usage. Most energy management systems require meaningful data so gateways at the field site require to preprocess the edge collected data in advanced. For some applications, they even require to do actions within a short period of time after preprocessing the collected data. AIG-302 series have built in the intuitive UI enables to handle the data easily.

Secure Remote Access Reduces Maintenance Costs

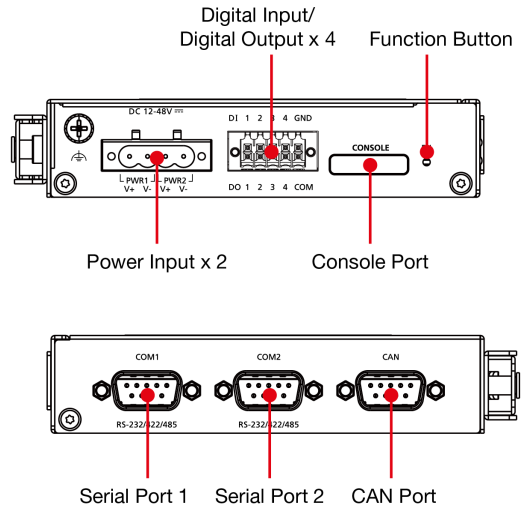
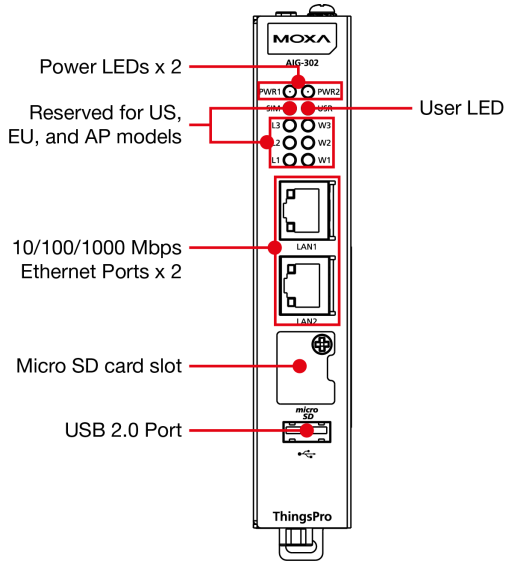
The AIG-302 comes with powerful troubleshooting tools to diagnose issues with protocol statuses and capture and analyze traffic packets, enabling engineers to remotely identify the root cause of issues and quickly bring the operation back to normal. Moreover, AIG-302 series provide secure remote access allowing maintenance engineers saving a lot of time and effort and reducing system downtime in energy management systems.

Security Dashboard Optimized for Detecting Security Issues

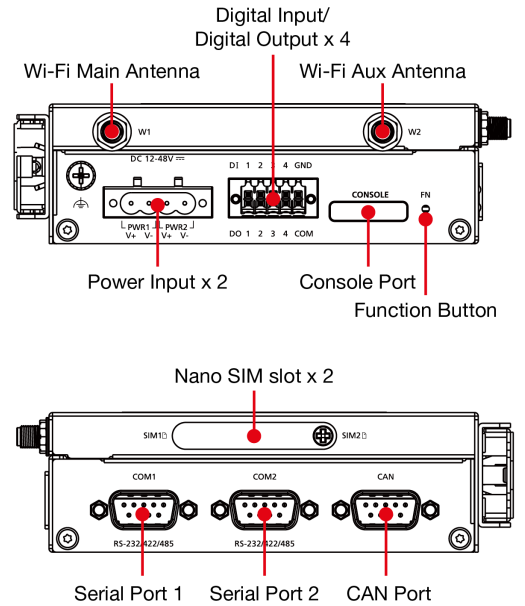
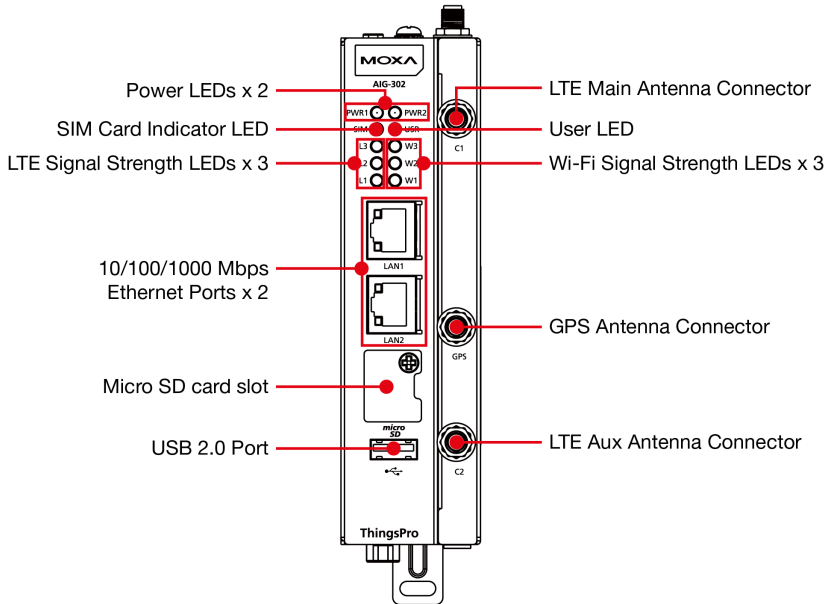
The security dashboard utilizes device scanning to identify potential cybersecurity threats from multiple angles, such as during account settings management, application networking, application resource usage monitoring, product certificates deployment, service settings modifications, and system status checks. Upon detecting threats, a mitigation plan is recommended to resolve issues.

Appearance

AIG-301-T-AZU-LX



AIG-301 US, EU, AP, and CN Models



Specifications

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

TPM	TPM v2.0
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)
Buttons	Reset button Reset to factory default
Digital Input	DIs x 4
Digital Output	DOs x 4
Number of SIMs	2
SIM Format	Nano (excluding AIG-302-T-AZU-LX)

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 (HTTP/HTTPS) AIG QuickON
Time Management	NTP Server/Client GPS
Security	OpenVPN Client, SSH HTTPS/SSL TLS Firewall

Serial Interface

Console Port	1 x 4-pin header
No. of Ports	2
Connector	DB9 male
Baudrate	300 bps to 921.6 kbps
Data Bits	7, 8
Flow Control	ADDC (automatic data direction control) for RS-485, RTS/CTS, XON/XOFF
Parity	None, Even, Odd, Space, Mark
Stop Bits	1, 2

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
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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)	LTE Band 2 (1900 MHz) / LTE Band 4 (1700 MHz) / LTE Band 5 (850 MHz) / LTE Band 12 (700 MHz) / LTE Band 13 (700 MHz) / LTE Band 14 (700 MHz) / LTE Band 66 (1700 MHz) / LTE Band 71 (600 MHz) UMTS/HSPA 850 MHz / 1900 MHz Carrier Approval: Verizon, AT&T
Band Options (EU)	LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 7 (2600 MHz) / LTE Band 8 (900 MHz) / LTE Band 20 (800 MHz) UMTS/HSPA 900 MHz / 1800 MHz / 2100 MHz
Band Option (APAC)	LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 5 (850 MHz) / LTE Band 8 (900 MHz) / LTE Band 28 (700 MHz) UMTS/HSPA 850 MHz / 900 MHz / 2100 MHz

GPS Interface

Receiver Types	GPS/GLONASS/BeiDou/Galileo/QZSS
Accuracy	2.0 m
Acquisition	-147 dBm
Sensitivity	Cold starts: -145 dBm Tracking: -160 dBm

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

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

AWS IoT Core

QoS Levels	0,1
Authentication Methods	X.509 Certificate Private Key Trusted Root CA
Native Capabilities	Keep Alive
Moxa Functions	Store and Forward Custom Payload
Commands Invokable Via Jobs	Reboot Software Upgrade Remote API Invocation

Modbus RTU/ASCII

Mode	Client
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

Power Parameters

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

Reliability

Automatic Reboot Trigger	External WDT (watchdog timer)
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Physical Characteristics

Housing	Metal SECC
Installation	DIN-rail mounting Wall mounting (with optional kit)
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)

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
Safety	UL 62368-1 EN 62368-1
Radio	NCC KC RCM
Carrier Approvals	AT&T Verizon ¹ PTCRB
RED	EN 301 489-1/19/52 EN 301 908-1 EN 303 413 EN 62311
Green Product	RoHS, CRoHS, WEEE
Hazardous Locations	Class I Division 2, ATEX

1. Certification process on going.

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/warranty

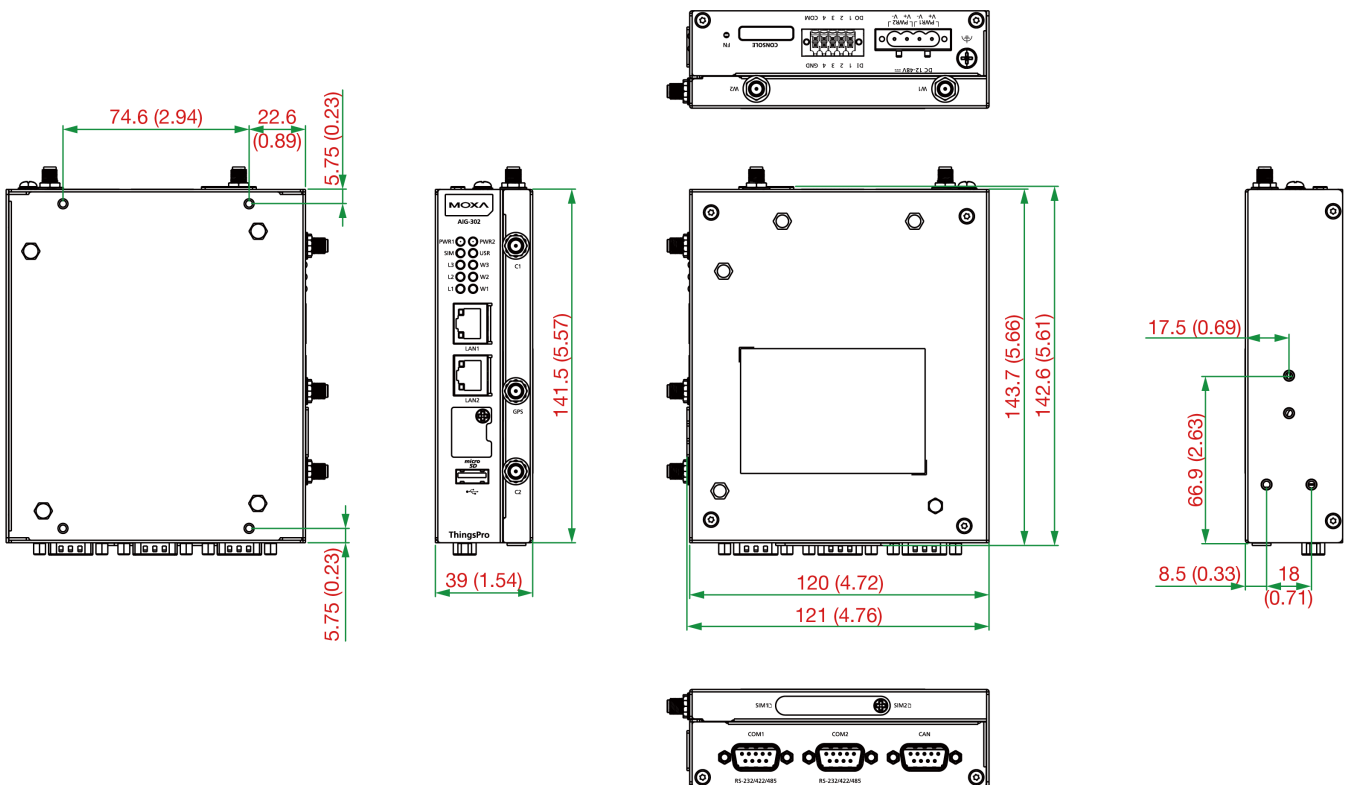
Package Contents

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

Dimensions

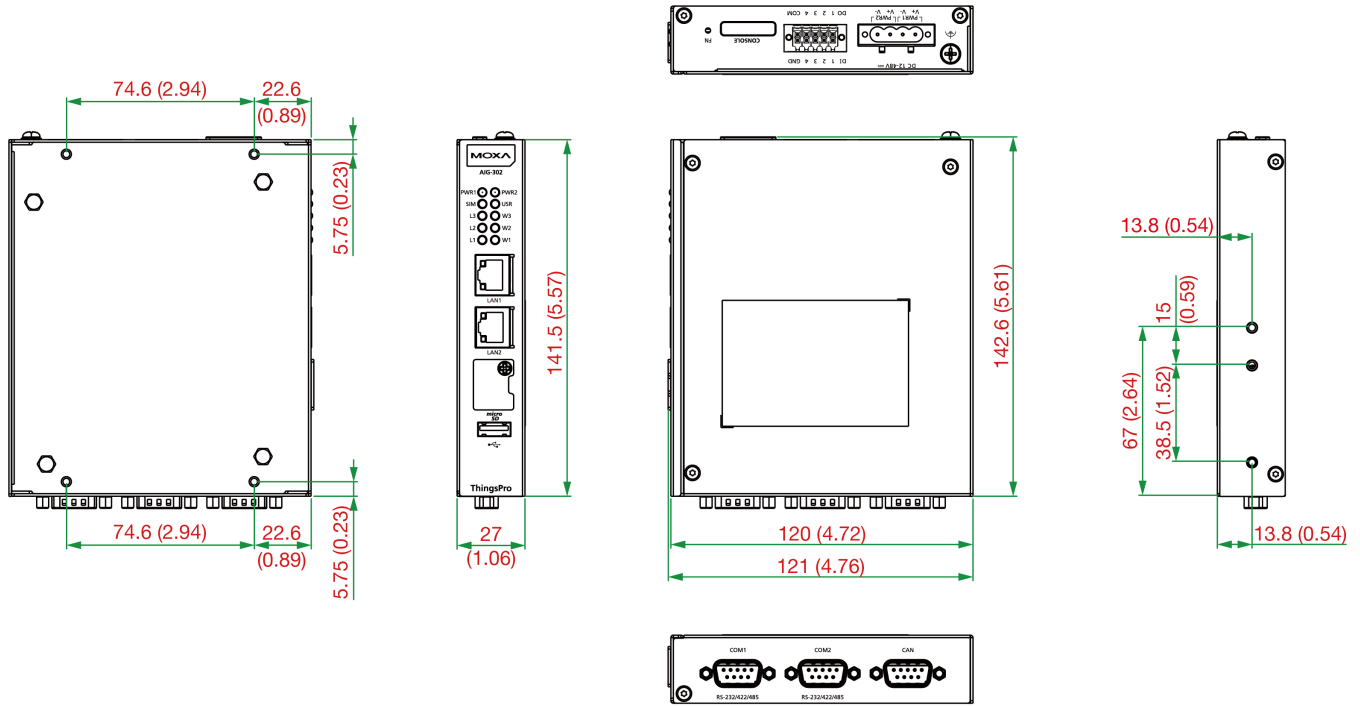
AIG-302 US, EU, and AP Models

Unit: mm (inch)



AIG-302-T-AZU-LX

Unit: mm (inch)



Ordering Information

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

Accessories (sold separately)

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
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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
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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
ANT-GPS-OSM-03-3m BK	3 dBi at 1575.42 MHz, SMA (male), omnidirectional magnetic-base passive GPS antenna, 3 m cable
ANT-GPS-OSM-05-3M	26 dBi at 1575.42 MHz, SMA (male), omnidirectional active GPS antenna, 3 m cable

Wall-Mounting Kits

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