

Industrial LTE WLAN Router for Smart City Applications

WR224-WLAN+LTE and WR214-WLAN Industrial Compact LTE WLAN Router

Both the LTE and WLAN router WR224-WLAN+LTE and the Wireless LAN AP WR214-WLAN are designed for industrial and smart city applications.. The WR224 router supports LTE to WLAN/Ethernet-WAN redundancy and LTE/WLAN auto offload to guarantee continuous connections. To safeguard cybersecurity, security features such as Firewall, OpenVPN, GRE tunnel are supported. The embedded MQTT and RESTful API enables instant public cloud integration such as AWS or Azure. The private cloud platform ThingsMaster and ThingsMaster OTA can also be set up for an instant and secured access to receive data or manage devices remotely.



2.4GHz
802.11b/g/n



-40~70°C



NetMaster
ThingsMaster
ThingsMaster OTA



Features & Benefits

Dual Radio 4G LTE+ Wi-Fi Wireless Network

- LTE Cat.4, 2T2R MIMO provides 150M downlink and 50M uplink
- 4G/3G/2G full cellular network compatibility
LTE-E: FDD B1/3/7/8/20/28A
LTE-G: for worldwide bands
FDD B1/B2/B3/B4/B5/B7/B8/B12/
B13/B18/B19/B20/B25/B26/B28
TDD B38/B39/B40/B41
- Dual SIM Redundancy
- Cellular to Ethernet-WAN redundancy
- IEEE 802.11b/g/n for 2.4G 2T2R MIMO delivers up to 300Mbps throughput

Enhanced Cyber Security & Redundancy

- Support Firewall for inbound/outbound traffic
- OpenVPN (server/client)
- Support L2TP with PPP, PAP, CHAP(LCP, IPCP)
- Support GRE tunnel
- HTTPs/SSH secure login
- Support TACACS+ multi-user authentication for privileged user management

Rugged Design for Wayside Surveillance, ITS Application

- Effective heat dissipation design for operating in -40~70°C environments
- CE Marking
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC compliance

Industrial IoT LAN & Cloud Management

- Various configuration paths, including CGI WebGUI, CLI, SNMP and RMON*
- 1:1 NAT, port forwarding and NAPT for local traffic protection
- ARP response over 802.2 LLC SNAP
- Support SNMPv3 and entity-MIB (RFC4133), MIB II (RFC1213)
- NTP v3 time management
- WoMaster Software Utilities
 - NetMaster**: Network Management System
 - ViewMaster**: Configuration Management
 - ThingMaster**: Interactive monitoring dashboard to collect data from field devices
 - ThingMaster OTA**: Realtime map showing the status, signal strength, location of the remote devices, over-the-air batch device registration, configuration and *firmware upgrade**, alerts on critical events to prevent downtime
- Support MQTT protocol, ready to use AWS/Azure and Private Cloud Agent for cloud management
- Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log

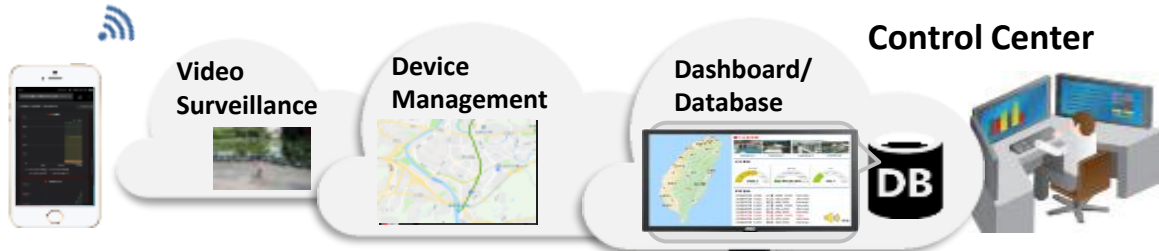


✓ Ready Total Solution for IoT

Cloud Service



ThingsMaster
ThingsMaster OTA



MQTT Router



Field Device



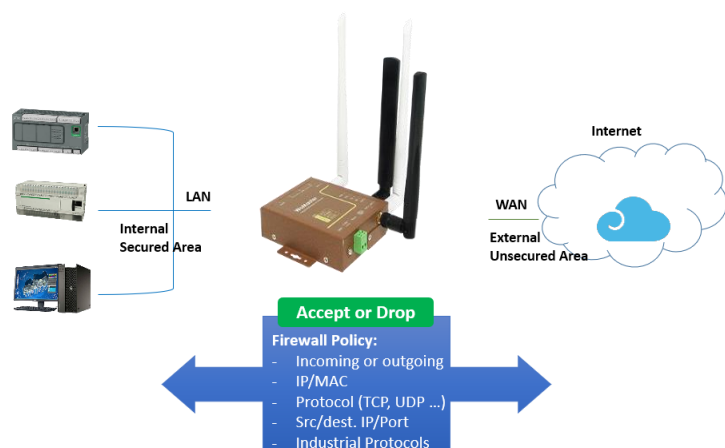
✓ Secured Remote Access by VPN

WR224/214 can act as VPN server for data encryption and dynamic remote access. Multiple VPN protocols are supported such as OpenVPN, GRE, and L2TP. The channels between multiple networks, ex. private/public/hybrid networks are fully secured and with authentication features.



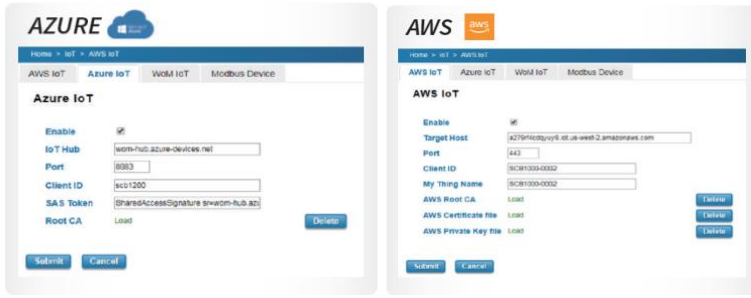
✓ Cyber Security Guard

The stateful firewall can monitor the status of connection at all time. Multiple industrial fieldbus protocols, ex. Modbus TCP*, EtherNet/IP* are also supported for factory automation applications.



*by request

✓ **Built-in Microsoft Azure and Amazon AWS agent**



✓ **Multi-Level User Passwords**

Different centralized authentication servers are supported such as RADIUS and TACACS+. Using a central authentication server simplifies account administration, when you have more than one switches in the network.

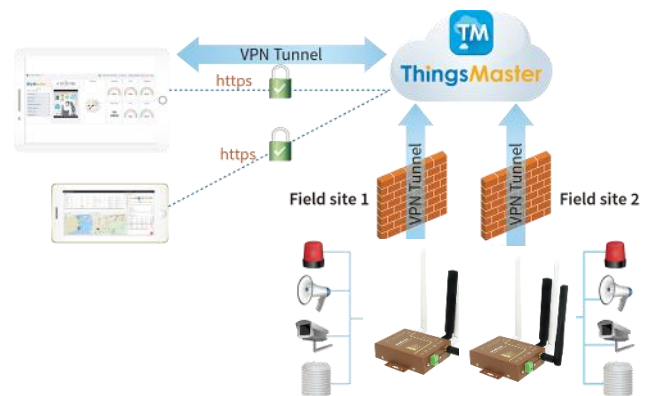
Authentication Chain is also supported. An authentication chain is an ordered list of authentication methods to handle more advanced authentication scenarios. For example, you can create an authentication chain which first contacts a RADIUS server, and then looks in a local database if the RADIUS server does not respond.



Secured Multi-sites Management

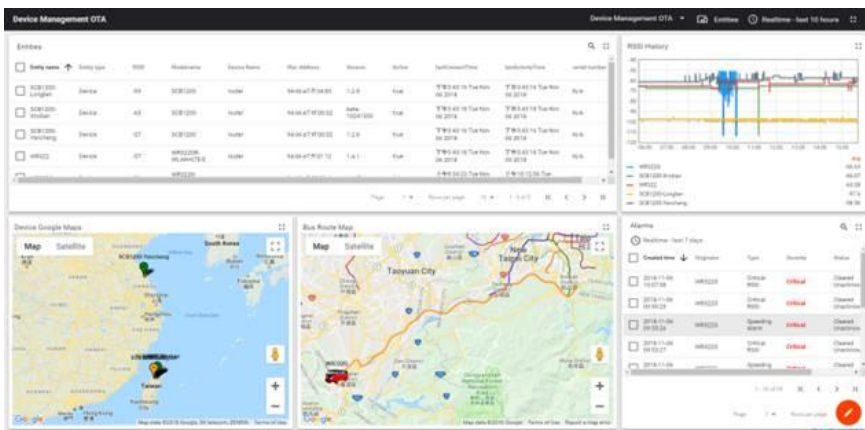
N to N VPN

Latest TLS encryption and X.509 authentication



✓ **ThingsMaster OTA (device management over the air)**

The OTA agent embedded in WR224/214 upgrades device management over the air, anywhere you are and any time you want over your mobile devices. ThingsMaster OTA is a secured local OTA software that can be installed in a private or public server or even QNAP NAS (network attached storage). With OTA, all device information such as location, warning event can be shown in real time. The maintenance such as configuration reload, or device reboot can also be run by group.





Interfaces

* Antennas are optional accessory and are not included in the package

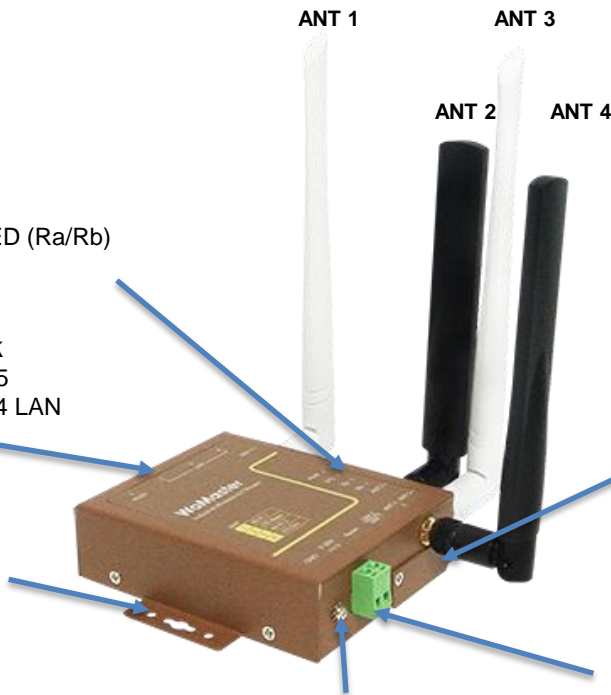
System LED

- 1 x Power
- 1 x System Status
- 2 x Radio Status LED (Ra/Rb)

Ethernet Network

- 4-port 10/100M RJ45
- 1 WAN + 3 LAN, or 4 LAN

Wall/DIN Mounting Clip (Both Sides)



Ground Screw

	WR224-WLAN-LTE
ANT 1	Wi-Fi 1
ANT 2	LTE-Main
ANT 3	Wi-Fi 2
ANT 4	LTE-Diversity

*Antenna: Wi-Fi in White; LTE in Black

SIM Card

- 2x SIM for redundancy

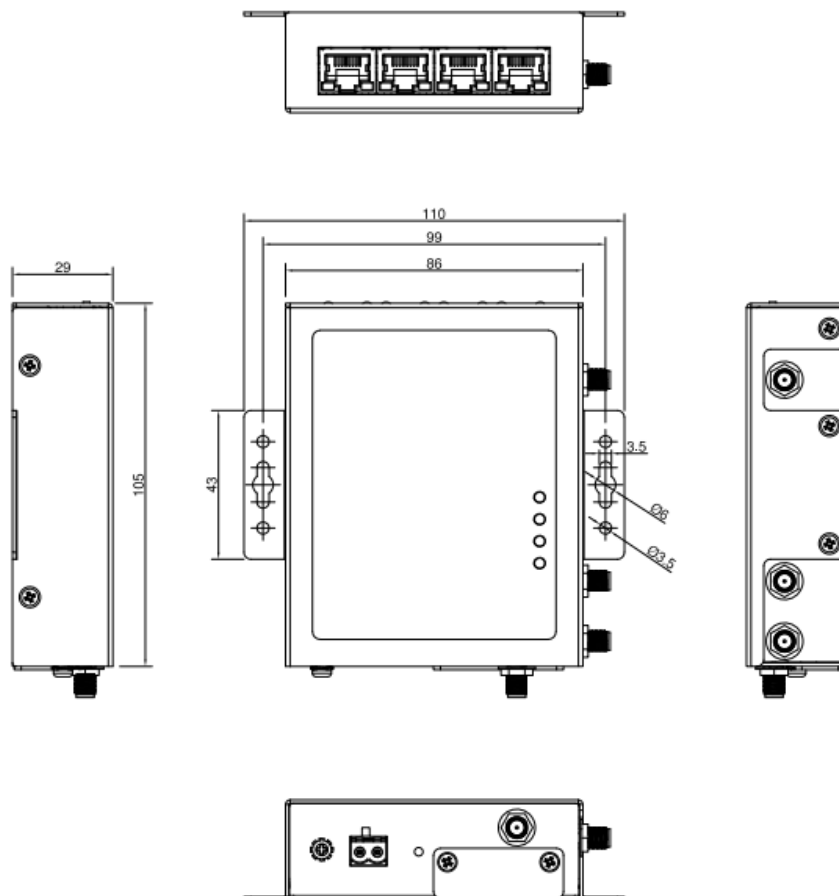
Integrated Power Connector

- 1 x 2-pin terminal block for 9~30V power input



Dimensions

(mm)



Technology	
Standard	3GPP Release 11 Long Term Evolution (LTE), fallback 3GPP Release 7,8,9 for HSPA/UMTS
	IEEE 802.11b/g/n for Wireless LAN
	IEEE 802.11i for Wireless Security
	IEEE 802.3 10Base-T Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
Interface	
Ethernet Port	4 x 10/100Base-TX RJ45, Auto Negotiation, Auto MDI/MDI-X, Full Duplex Router Mode: 1 WAN + 3 LAN, Bridge Mode: 4 LAN
System LED	1 x Power: Green ON 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x Ra: 4G connection: Green On, 2/3G connection: Green Blinking, disconnected: Off 1 x Rb: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off
Reset	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)
SMA Socket	Up to 4 x SMA (without Nylok) ANT1/3 for Wi-Fi 2T2R (RP-SMA), ANT2/4 for LTE 2T2R (Main/Div, SMA-Female)
SIM Socket	2 x Nano, SIM1: Main, SIM2: Redundant
Power Input	2-Pin Removable Terminal Block Connector for V+/V-
Cellular Properties	
Standard	GSM/GPRS/EDGE 3GPP Release 6 UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 11
Data Rate	LTE Cat.4: LTE-FDD: DL: Max. 150 Mbps, UL: Max. 50 Mbps, 2x2 DL MIMO LTE-TDD: DL: Max. 130 Mbps, UL: Max. 35 Mbps, 2x2 DL MIMO HSPA: DL: Max. 42 Mbps, UL: Max. 5.76 Mbps EDGE: DL: Max. 236.8 kbps, UL: Max. 236.8 kbps GPRS: DL: Max. 85.6 kbps, UL: Max. 85.6 kbps
Band Information: LTE-EUX	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41 WCDMA: FDD B1/B8 GSM: B3/B8
Band Information: LTE-ECGA	LTE: FDD B1/B3/B7/B8/B20/B28A WCDMA: FDD B1/B8 GSM: B3/B8
Band Information: LTE-AU*	LTE: FDD B1/B2*/B3/B4/B5/B7/B8/B28 LTE: TDD B40 WCDMA: FDD B1/B2/B5/B8, GSM: B2/B3/B5/B8
Band Information: LTE-G (Global)	LTE: FDD B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE: TDD B38/B39/B40/B41 WCDMA: FDD B1/B2/B4/B5/B6/B8/B19, GSM: B2/B3/B5/B8
Wi-Fi Properties	
Standard	IEEE 802.11b/g/n, Up to 2T2R MIMO
Data Rate	802.11b: 11Mbps / 802.11g: 54Mbps / 802.11n: MCS0 ~ 15, max. 300Mbps
Frequency	ISM Band, 2.412GHz ~ 2.462GHz (CH1~11), programmable by regional regulation
RSSI	17.67db (Max. output power: 15.17dbm/802.11b, 12.66dbm/802.11g, 12.42dbm/802.11n20M, 11.48dbm/802.11n40M + 2.5dBi default antenna) Check detail TX/RX information in User Manual or contact us
Antenna (Default in package)	
LTE Antenna	Frequency: 704~960/1710~2690 MHz
	Gain: 2 dBi
	Direction: Omni-directional
	Dimension: 161xΦ13 mm
Wi-Fi Antenna	Frequency: 2400~2500/ 4900~5900 MHz
	Gain: 2.4GHz: 2.5±0.5 dBi, 5GHz: 3±0.5 dBi
	Direction: Omni-directional
	Dimension: 196xΦ13 mm

Power Requirement	
Input Voltage	24V (9~30VDC)
Reverse Polarity Protect	Yes
Input Current	WR224-WLAN+LTE: 0.18A@24V
Power Consumption	WR224-WLAN+LTE: Max 4.32W@24VDC full traffic, suggest to reserve 15% tolerance
Software	
Management Interface/ Protocol	CGI WebGUI, Command Line Interface (CLI), IPv4/IPv6*, TCP/IP, UDP, Telnet, SNMP v1/v2c/v3, DDNS, DHCP server/client, DHCP Relay, TFTP, System Log, SMTP, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy)
Traffic Management	Flow Control*, Traffic shaping
Security	IEEE 802.1X/RADIUS, TLS v1.2, HTTPs/SSH, First login password management WLAN AP Security: Share Key, WPA/WPA2-PSK(Pre-Shared Key), WPA/WPA2 Enterprise Encryption: 64/128-bit WEP(Wired Equivalent Privacy), TKIP(WPA-PSK), AES(WPA2-PSK)
Advanced Security	TACACS+, Multiple-user authentication
Time Management	NTP, SNTP, Cellular Time
Redundancy Protocol	WAN/LTE Redundancy
WAN/Routing/NAT/Firewall/ VPN	Routing: Static Route NAT: 1-1 NAT, NATP(SNAT/DNAT), DMZ Firewall: Stateful Inspection firewall, IP/Port Filter, MAC Filter VPN: OpenVPN, L2TP, GRE, , IPsec (WR224A series)
IIoT Industrial Protocol	MQTT, RESTful API
Private Cloud	ThingsMaster, ThingMaster OTA
Public Cloud	AWS Agent, Azure Agent
Location	Google map, Baidu map
MIB	MIB-II, Entity MIB, WoMaster Private MIB
Utility	ViewMaster, NetMaster, Ping, Traceroute
Cellular Configuration	Radio on/off, 2G, 3G and 4G modes configurable, SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning, Backup SIM Retry (1-10 times)
WLAN Configuration	WLAN Basic Settings: Radio on/off, AP/client mode, 2.4G 11n Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, Cellular to WLAN Auto Offload and advanced WLAN settings, 802.1X
Wi-Fi Max. Client	Up to 20
Mechanical	
Installation	Wall Mount/DIN Rail (DIN bracket not included)
Enclosure Material	Steel Metal
Dimension	86 x 105 x 29mm(W x D x H) / without mounting Clip
Ingress Protection	IP30
Weight	Around 350g without package/antenna
Environmental	
Operating Temperature & Humidity	-40°C~70°C , 5%~95% Non- Condensing
Storage Temperature	-40°C~85°C
MTBF	>200,000 hours
Warranty	3 years
Approval	
CE	RED Compliance Safety: EN 62368-1 EN 62311 MPE assessment EN 301 489-1/17/52, EN 55032/55024 EN 300 328 EN 301 908-1
FCC	FCC part 15B Class A Compliance FCC Approved LTE/WLAN Module

*by request



Ordering Information

Model Name	Description
WR214-WLAN	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN
WR224-WLAN+LTE-EUX	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN, 2SIM, LTE-EUX FDD B1/3/7/8/20/28A, TDD B38/40/41
WR224-WLAN+LTE-ECGA	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN, 2SIM, LTE-ECGA, FDD B1/3/7/8/20/28A
WR224-WLAN+LTE-G	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN, 2SIM, LTE-G
	*LTE-AU/LTE-U/LTE-CN/NB2+M1 can be purchased by request *GPS support by request
Package List	
1 x Product Unit	
1 x 2-pin Removable Terminal Connector	
1 x Din Clip Mounting Kit	
Default Enclosed Antennas:	
WR224-WLAN+LTE/ WR224A-WLAN+LTE: 2xLTE Antennas, Black+ 2xWi-Fi Antennas, White	
WR214-WLAN/ WR214A-WLAN: 2 x Wi-Fi Antennas, White	
WR224-WLAN+NB1+M1/ WR224A-WLAN+NB1+M1: 1xLTE Antennas, Black+2xWi-Fi Antennas, White	
WR224-WLAN+NB2+M1/ WR224A-WLAN+NB2+M1: 1xLTE Antennas, Black+2xWi-Fi Antennas, White	
1 x Quick Installation Guide	

Band/Frequency	Description
Band Information: LTE-EUX	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41 WCDMA: FDD B1/B8 GSM: B3/B8
Band Information: LTE-ECGA	LTE: FDD B1/B3/B7/B8/B20/B28A WCDMA: FDD B1/B8 GSM: B3/B8
Band Information: LTE-AU*	LTE: FDD B1/B2*/B3/B4/B5/B7/B8/B28 LTE: TDD B40 WCDMA: FDD B1/B2/B5/B8, GSM: B2/B3/B5/B8
Band Information: LTE-G (Global)	LTE: FDD B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE: TDD B38/B39/B40/B41 WCDMA: FDD B1/B2/B4/B5/B6/B8/B19, GSM: B2/B3/B5/B8





Outdoor WLAN Directional Antennas

- 2.4Ghz / 5.8Ghz Wireless Access Point to Point
- High Gain, Long Distance Coverage
- Vertical Polarization, 50Ω **Input Impedance**
- IP65 Protection Enclosure and Prevention of Rust
- -40°C ~ +60°C operation temperature
- 190 * 190*30 mm (L x W x H)
- N Type Female Connector
- Two 1-meter RF Cables (C-RF-LMR200-NM_NM-1M)






Model	Frequency	Transmission	Gain	Max. Distance	Beam
A-D1T1R-2.4GHZ-14DB-6KM-NF	2.4 GHz	1T1R	14dBi	6KM	30° for Horizontal Plane and 28° Vertical
A-D1T1R-5GHZ-12DB-5KM-NF	5.8Ghz	1T1R	12dBi	5KM	40° for Horizontal Plane and 38° Vertical
A-D2T2R-5GHZ-15DB-6KM-NF	5.8Ghz	2T2R	15dBi	6KM	35° for Horizontal Plane and 16° Vertical
A-D2T2R-5GHZ-19DB-8KM-NF	5.8Ghz	2T2R	19dBi	8KM	90° for Horizontal Plane and 4° Vertical

Outdoor Omni Antennas

Model		Frequency	Gain	Enclosure	Dimension	RF Cable
A-2.4/5GHZ-2-RSM-2Mx2		2400-2500/5150~5850	2dBi	IP67	Φ80×15mm	Two 2-meter RG174 cables RP SMA male connector
A-LTE-2-SM-2M		700~960/1710~2690 /2900~3600	2dBi	IP67	Φ80×15mm	Two 2-meter RG174 cables SMA male connector
A-GPS-38-SM-3M		GPS 1575	38dBi	outdoor	50×38×17mm	3M RG174 cable SMA male
A-LORA433-7-SM-3M		433	7dBi	outdoor	Φ30×175mm	3M RG174 cable SMA male
A-LORA850-925-7-SM-3M		850~925	7dBi	outdoor	Φ30×290mm	3M RG174 cable SMA male

Outdoor Combo Antennas

Model		Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)
A-LTE_WLAN_G-4_4-RSM-2M		LTE: 698~960/1710~2690/2900~3600 WLAN: 2400~2483.5/4900~5825 GNSS: 1561.1~1610 (GPS/GLONASS/GALILEO/BEIDOU)	4 4 28	3x SMA Male (LTE/GPS) 2x RP-SMA Male (Wi-Fi)	189x182x107	2
A-LTE_WLAN_G-3_2-RSM-2M		LTE: 698~960/1710~2690 WLAN: 2400~2483.5/4900~5825 GNSS: 1575.42~1610 (GPS/GLONASS)	3 2 28	3x SMA Male (LTE/GPS) 2x RP-SMA Male (Wi-Fi)	110x110x80	2
A-LTE_WLAN_G-5_5-RSM-1M		LTE: 700~2700 WLAN: 2400~2500 GNSS: 1575.42	5 5 28	2x SMA Male (LTE/GPS) 1x RP-SMA Male (Wi-Fi)	70x70x15	1