

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 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 B1/3/5/7/8/20 (2100/1800/850/2600/900/800MHz)
TDD B38/40/41 (2600/2300/2500MHz)
- LTE-CN:
FDD B1/3/5/8 (2100/1800/850/900MHz)
TDD:B38/39/40/41 (2600/1900/2300/2500MHz)
- 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 with VLAN visualization* and ERPS* Ring
 - 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
- LLDP* for topology control, auto-topology drawing
- USB for easy field configuration and firmware update
- Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log

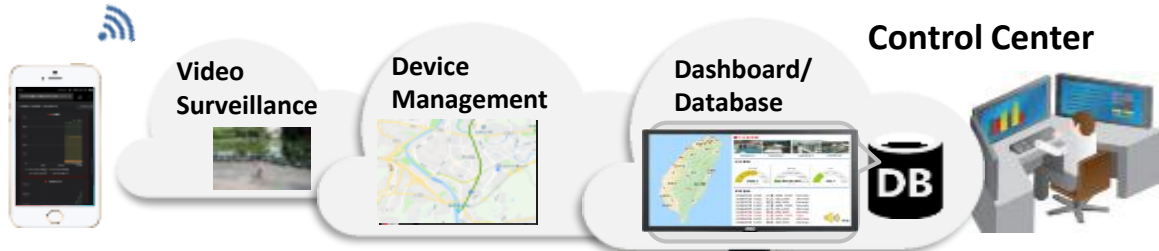


✓ Ready Total Solution for IoT

Cloud Service



ThingsMaster
ThingsMaster OTA



MQTT Router



Field Device



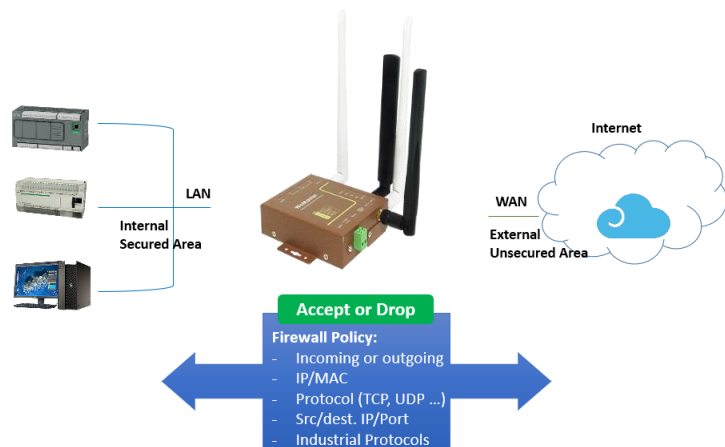
✓ Secured Remote Access by VPN

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.



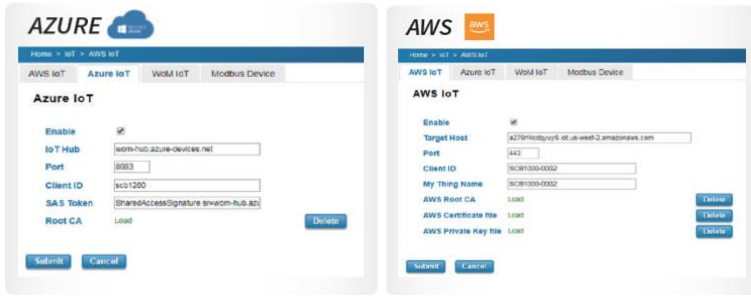
✓ Cyber Security Guard

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.

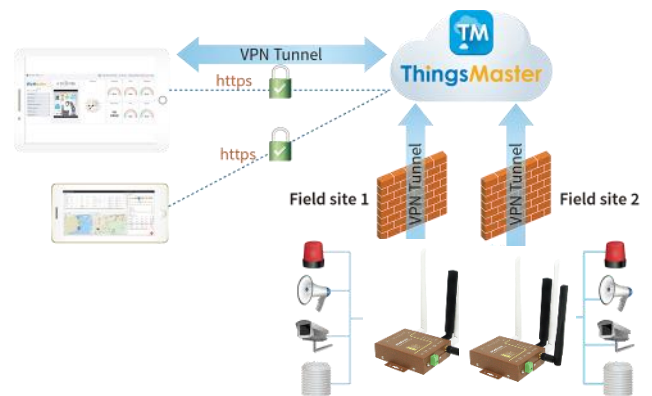
Authentication Chain is also supported. An authentication chain is an ordered list of authentication methods to handle more advanced authentication scenarios. For example, you can create an authentication chain which first contacts a RADIUS server, and then looks in a local database if the RADIUS server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



Secured Multi-sites Management

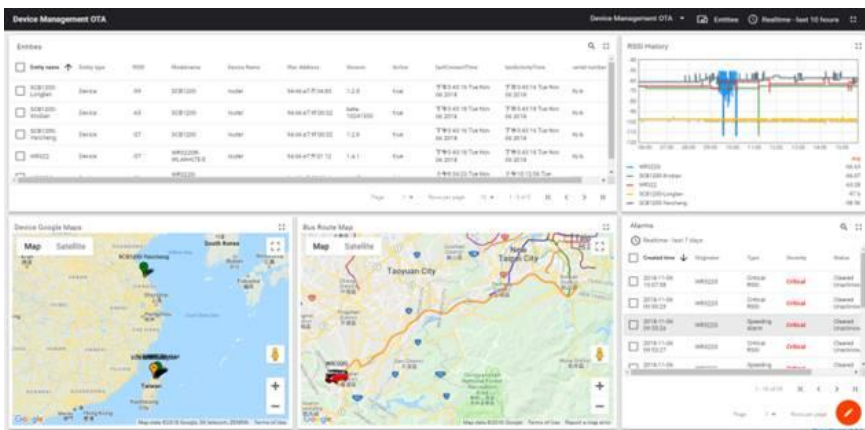
N to N VPN

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

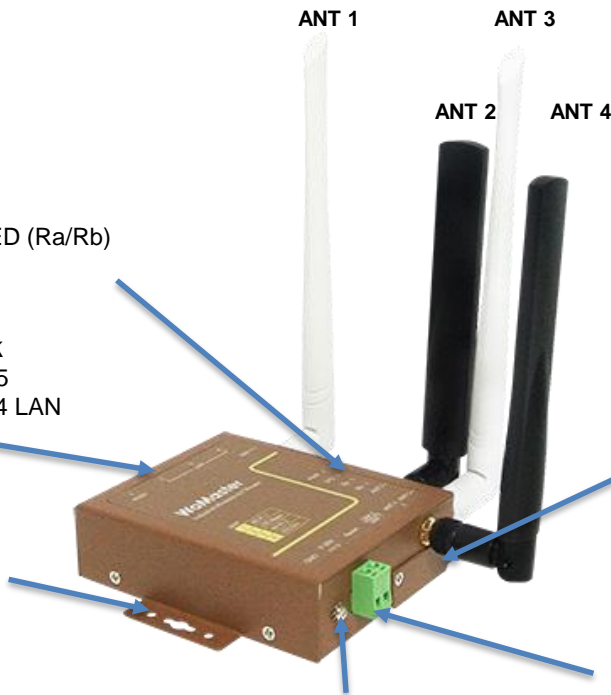
System LED

- 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

SIM Card

- 2x SIM for redundancy

Integrated Power Connector

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

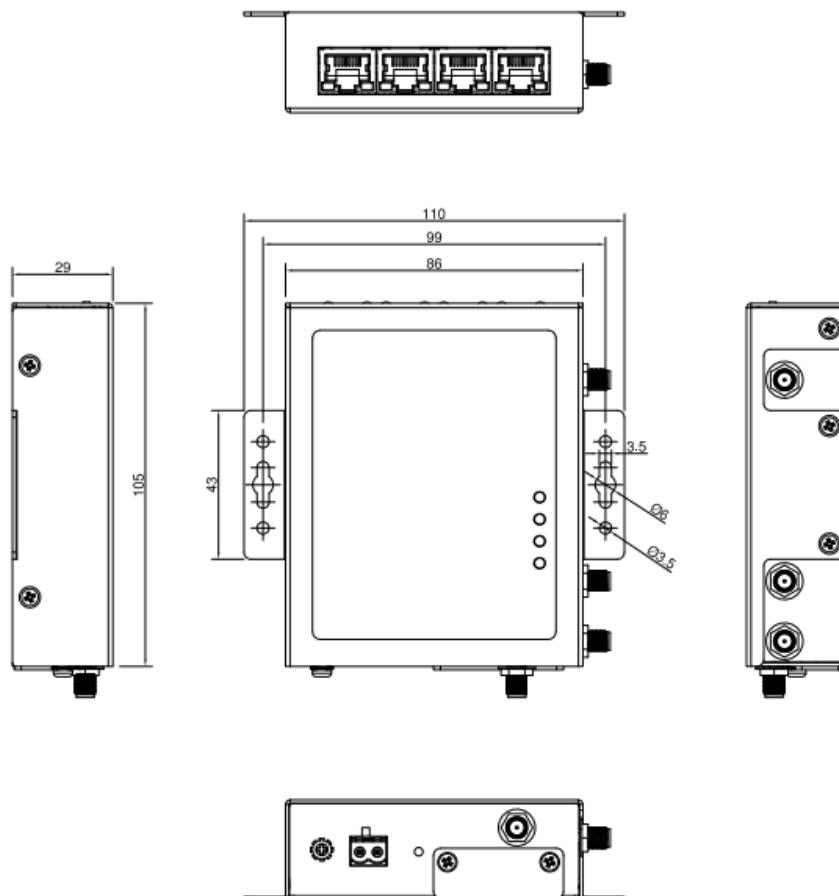
	WR224-WLAN-LTE
ANT 1	Wi-Fi 1
ANT 2	LTE-Main
ANT 3	Wi-Fi 2
ANT 4	LTE-Diversity

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



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 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 RP-SMA Female (without Nylok) ANT1/3 for Wi-Fi 2T2R, ANT2/4 for LTE 2T2R (Main/Div)
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: GPRS: DL: Max. 85.6 kbps, UL: Max. 85.6 kbps EDGE: DL: Max. 236.8 kbps, UL: Max. 236.8 kbps HSPA: DL: Max. 42 Mbps, UL: Max. 5.76 Mbps 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
Band Information: LTE-E	LTE: FDD B1/B3/B5/B7/B8/B20 (2100/1800/850/2600/900/800MHz) LTE: TDD B38/B40/B41 (2600/2300/2500MHz) WCDMA: FDD B1/B5/B8 (2100/850/900MHz) GSM: B3/B8 (1800/900MHz)
Band Information: LTE-AU	LTE: FDD B1/B2/B3/B4/B5/B7/B8/B28 (2100/1900/1800/1700/850/2600/900/700MHz) LTE: TDD B40 (2300MHz) WCDMA: FDD B1/B2/B5/B8 (2100/1900/850/900MHz) GSM: B2/B3/B5/B8 (1900/1800/850/900MHz)
Band Information: LTE-U	LTE: FDD B2/B4/B12 (1900/1700/700MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz)
Band Information: LTE-CN	LTE FDD: B1/B3/B5/B8 (2100/1800/850/900MHz) LTE TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) TD-SCDMA: B34/B39 (2000/1900MHz) WCDMA: B1/B8 (2100/900MHz) CDMA: BC0 GSM: 900/1800MHz
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 Check detail TX/RX information in User Manual
Frequency	ISM Band, 2.412GHz ~ 2.462GHz (CH1~11), programmable by regional regulation
RSSI	≤20db, compliant with CE request

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	CGI WebGUI, Command Line Interface (CLI), IPv4/IPv6*, 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
Filter	IEEE802.1Q VLAN*
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, NAPT(SNAT/DNAT), DMZ Firewall: Stateful Inspection firewall, IP/Port Filter, MAC Filter VPN: OpenVPN, L2TP, GRE
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	5 years

Approval	
Safety	EN60950-1 Compliance
EMC	EN61000-6-2/EN61000-6-4
EMI	CISPR 22, FCC part 15B Class A
EMS	EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field
Radio	RED Compliance Safety: EN 62368-1 EN 50385/EN62311 MPE assessment EN 301 489-1/17/19, EN 55032/55024 EN 300 328 EN 301 908-1 FCC Part 15B



Ordering Information

Model Name	Description
WR214-WLAN	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN (no antennas included)
WR224-WLAN+LTE	Industrial Wireless IIoT Field Router, 4FE, 802.11b/g/n WLAN, LTE-E, 2SIM (no antennas included)
	*LTE-AU/LTE-U/LTE-CN Cat.4 by request *GPS support by request
	Package List
	1 x Product Unit
	1 x 2-pin Removable Terminal Connector
	NOTE: Antennas are not included in the package. Please order the antennas from the optional accessories.
	1 x Quick Installation Guide
Band Information: LTE-E	LTE: FDD B1/B3/B5/B7/B8/B20 (2100/1800/850/2600/900/800MHz) LTE: TDD B38/B40/B41 (2600/2300/2500MHz) WCDMA: FDD B1/B5/B8 (2100/850/900MHz) GSM: B3/B8 (1800/900MHz)
Band Information: LTE-AU	LTE: FDD B1/B2/B3/B4/B5/B7/B8/B28 (2100/1900/1800/1700/850/2600/900/700MHz) LTE: TDD B40 (2300MHz) WCDMA: FDD B1/B2/B5/B8 (2100/1900/850/900MHz) GSM: B2/B3/B5/B8 (1900/1800/850/900MHz)
Band Information: LTE-U	LTE: FDD B2/B4/B12 (1900/1700/700MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz)
Band Information: LTE-CN	LTE FDD: B1/B3/B5/B8 (2100/1800/850/900MHz) LTE TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) TD-SCDMA: B34/B39 (2000/1900MHz) WCDMA: B1/B8 (2100/900MHz) CDMA: BC0 GSM: 900/1800MHz



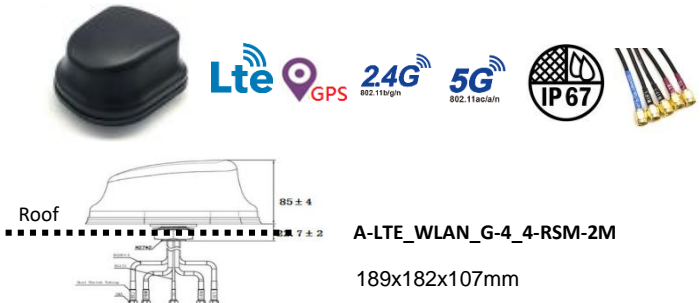
Ordering Information

A-LTE_WLAN_G-4_4-RSM-2M	Combo IP67 Antenna, LTE WW 4dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 4/4dBi, GPS 1561-1670MHz 28dBi, RP-SMA male, 2M
A-LTE_WLAN_G-3_2-RSM-2M	Combo IP67 Antenna, LTE WW 3dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 2/2dBi, GPS 1575-1610MHz 28dBi, RP-SMA male, 2M
A-LTE-3-NM	LTE Antenna, LTE WW 3dBi, N-type male
A-WLAN-6-NM	Wi-Fi Antenna, Wi-Fi 2.4/5GHz dual band Omni-directional 4/6dBi, N-type male
A-GPS-27-RSM-3M	GPS Antenna, GPS 1575MHz 27dBi, RP-SMA male, 3M
C-RF-R-RSF_RSM-1M	RF cable, RP-SMA female to RP-SMA male, 1M
C-RF-C2-NF_RSM-2M	RF cable, N-type female to RP-SMA male, CFD200, 2M

Outdoor Vehicle Combo Antenna

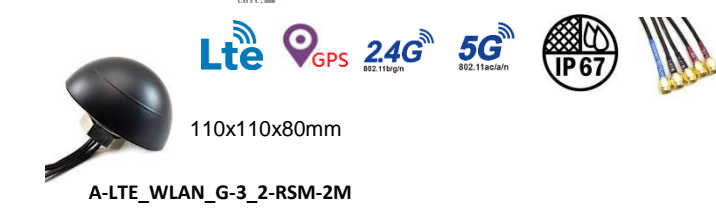
A-LTE_WLAN_G-4_4-RSM-2M

- 5 RF cables, LTE MIMO, Wi-Fi MIMO, GPS/GLONASS/GALILEO/BEIDOU
- 4dBi gain for LTE and 4dBi gain for 2.4G/5G WIFI RF
- High WLAN gain is perfect for train to ground vehicle application
- 5 x 2-meter cables in RP SMA male connector
- Outdoor high gain, IP67 waterproof and -40°~85°C wide temperature design
- 189x182x107mm



A-LTE_WLAN_G-3_2-RSM-2M

- 5 RF cables, LTE MIMO, Wi-Fi MIMO, GPS&GLONASS
- 3dBi gain for LTE and 2dBi gain for 2.4G/5G WIFI
- Suitable for in-vehicle, roadside box and short-range coverage WLAN to LTE communication environment
- 5 x 2-meter cables in RP SMA male connector
- Outdoor IP67 waterproof and -40°~85°C wide temperature
- 110x110x80mm slim size



	Model	Type	Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)	Operating Temp.	Application
	A-LTE_WLAN_G-4_4-RSM-2M	Omni	LTE: 698~960/1710~2690/2900~3600 WLAN: 2400~2483.5/4900~5825 GNSS: 1561.1~1610 (GPS/GLONASS/GALILEO/BEIDOU)	4 4 28	5x RP SMA Male	189x182x107	2	-40°C~85°C	Outdoor
	A-LTE_WLAN_G-3_2-RSM-2M	Omni	LTE: 698~960/1710~2690 WLAN: 2400~2483.5/4900~5825 GNSS: 1575.42~1610 (GPS/GLONASS)	3 2 28	5x RP SMA Male	110x110x80	2	-40°C~85°C	Outdoor

LTE Antenna

	Model	Type	Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)	Operating Temp.	Application
	A-LTE-2-RSM	Omni	704~960/1710~2690	2	RP SMA Male	161xΦ13	-	-20°C~ 65°C	Indoor
	A-LTE-3-NM (require RF cable)	Omni	704~960 1710~2700	2 3	N-Type Male	187xΦ20	-	-20°C~ 65°C	Outdoor

Wi-Fi Antenna

	Model	Type	Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)	Operating Temp.	Application
	A-WLAN-3-RSM	Omni	2400~2500 4900~5900	2.5 3	RP SMA Male	196xΦ13	-	-40°C~ 65°C	Indoor
	A-WLAN-6-NM (require RF cable)	Omni	2400~2500 5150~5850	4 6	N-Type Male	187xΦ20	-	-20°C~ 65°C	Outdoor

GPS Antenna (optional)

	Model	Type	Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)	Operating Temp.	Application
	A-GPS-27-RSM-3M	Omni	1575.42	27	RP SMA Male	36x36x13.9	3	-20°C~ 65°C	Indoor