

Industrial Rugged Dual LTE (Dual SIM Dual Active) WiFi 6 Router

WR312G/322GR 3D Series

The new WR312G/WR322GR 3D Series industrial secure LTE/2xLTE/LTE+WLAN router elevates its routing performance with a powerful dual-core 880MHz CPU. The **WR322GR-2xLTE** model supports dual LTE with Dual SIM Dual Active capability, while the **WR322GR-WLAN6+LTE** model offers LTE and high-speed WiFi 6 Dual Band 2.4GHz+5GHz concurrent network. It includes dual RS232/422/485 DB9 Modbus ports for seamless wireless serial data connectivity. Redundancy features such as Dual LTE WAN, LTE to Ethernet WAN, and LTE to WLAN auto-offload provide uninterrupted connectivity. To fortify cybersecurity, the router incorporates Firewall, OpenVPN, and GRE tunnel support. The router supports ThingsMaster OTA for Firmware and Configuration setup over the air. The embedded MQTTS, CoAP and RESTful API enable flexible public cloud integration such as AWS or Azure.



Features & Benefits

High speed Dual 4G LTE & LTE + Wi-Fi 6 Network

- Dual Core High Speed Processor
- LTE Cat.4, 2x2 MIMO, 150M downlink and 50M uplink
- 4G/3G/2G full cellular network compatibility
- Dual SIM Dual Active ensures dual LTE redundancy with non-stop carrier switch time
- Support GPS for location services (model with GPS)
- Support LTE + WLAN 6 network, features IEEE 802.11ax and backward compatible 802.11ac/n/g/b/a
- Dual Band Dual Concurrent 5GHz + 2.4GHz Wi-Fi frequency for local coverage, up to 1774(1200Mbps + 574Mbps) PHY Rate capacity
- Support OFDMA, Downlink/Uplink MU-MIMO, BSS Coloring, up to 80MHz channel bandwidth, WLAN AP and Client mode
- 802.11r Fast Roaming

Serial Communication & High Throughput Data Switching

- Serial ports with RS232/422/485 full functions for serial over LTE/Wi-Fi/Ethernet data switching
- 2-port Gigabit Ethernet supports high throughput NAT routing and bridging mode
- Hardware NAT for CPU utilization saving

Dynamic Routing with Redundancy Protection

- RIPv1&v2, OSPFv1&v2 for intra-domain routing within an autonomous system
- Efficient unicast/multicast* static routing
- VRRP guarantees sustainable routing in a single point of failure

Rugged Design for Wayside Surveillance, ITS Application

- EN50121-4 railway trackside EMC compliant design for Industrial IoT, ITS applications
- Effective heat dissipation design for operating in -40~70°C environments
- CE Marking
- IEC61000-6-2/4 heavy industrial EMC compliance

Enhanced Cyber Security & Redundancy

- Firewall for inbound/outbound traffic
- OpenVPN (server/client), and IPSec support AES256 for secure remote connection
- L2TP with PPP, PAP, CHAP(LCP, IPCP)
- HTTPs/SSH secure login
- TACACS+ multi-user authentication for privileged user management
- Cellular to WAN redundancy, dual SIM backup
- RSTP spanning tree protocol

Industrial IoT LAN & Cloud Management

- Embedded Amazon AWS & Microsoft Azure cloud service
- Various configuration paths, including CGI WebGUI, CLI, SNMP
- 1:1 NAT, port forwarding and NATP for local traffic protection
- Support SNMPv3 and entity-MIB (RFC4133), MIB II (RFC1213)
- NTP v3 time management
- WoMaster Software Utilities
 - NetMaster**: Network Management System
 - ViewMaster**: Configuration Management
 - 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 MQTTS/CoAP protocol, ready to use AWS/Azure and Private Cloud Agent for cloud management
- USB for easy field configuration and firmware update
- Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log

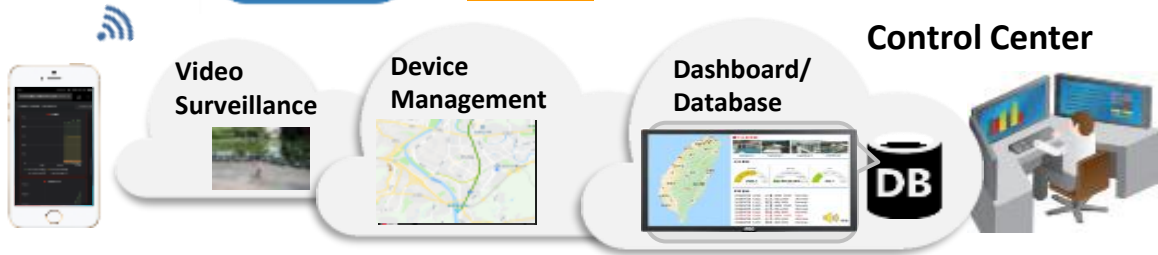


✓ Ready Total Solution for IoT

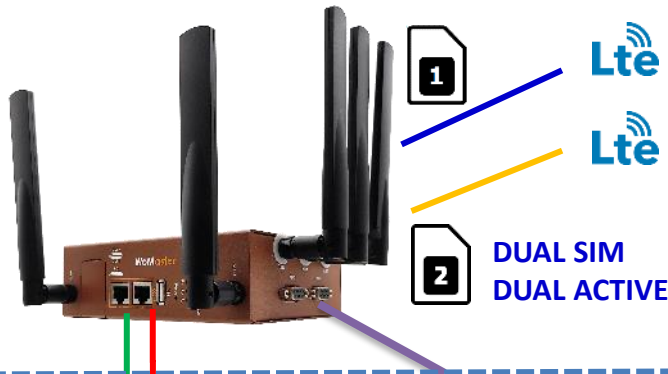
Cloud Service



ThingsMaster ThingsMaster OTA



IoT Router

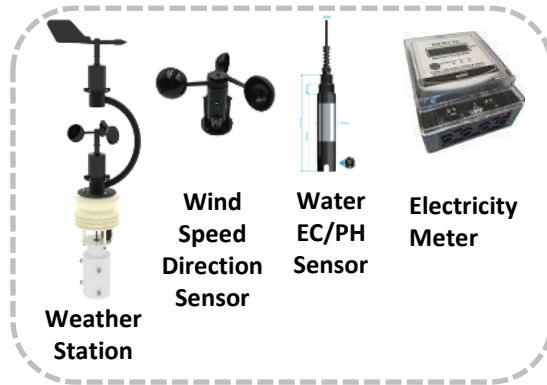


(Optional WLAN)



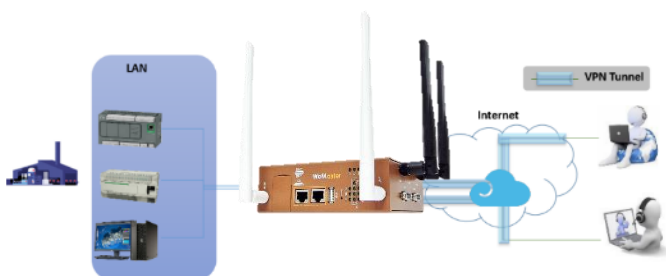
WAN IP Camera

2 x RS232/485
Sensor Meter



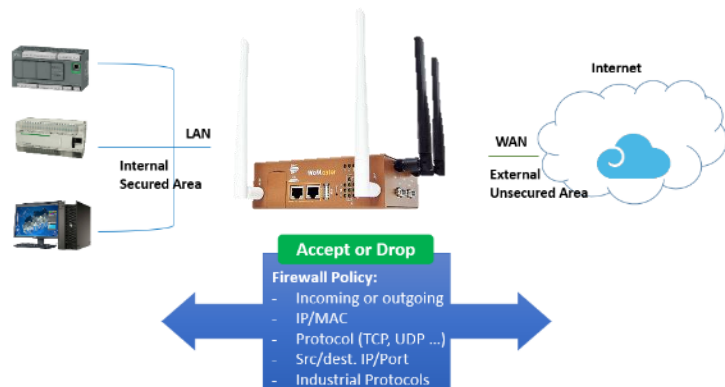
✓ Secured Remote Access by VPN

WR322GR can act as a VPN server for data encryption and dynamic remote access. Multiple VPN protocols are supported such as OpenVPN, DMVPN, and L2TP. The channels between multiple networks, ex. private/public/hybrid networks are fully secured and with authentication features.



✓ Cyber Security Guard

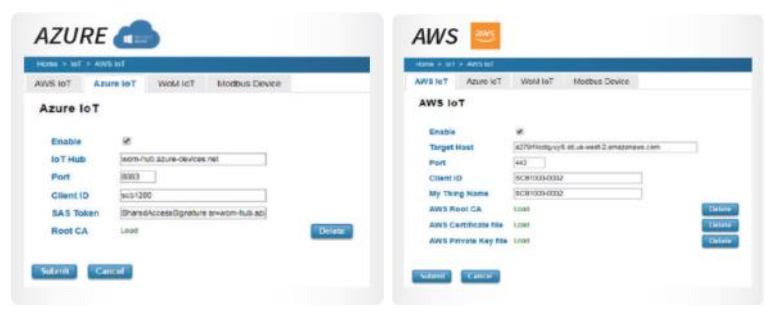
The stateful firewall can monitor the status of connection at all time.



Secure IoT Modbus Tags

- Tag-based data acquisition with MQTTS/CoAP support
- MQTT client acting as publisher and subscriber
- The latest TLS encryption and X.509 authentication
- Selectable serial port and data type. Sensor alive check and display sensor value.

✓ Built-in Microsoft Azure and Amazon AWS agent



Modbus Logging

Modbus Logging Enable

Name // Tag Name

Serial

Slave ID

PLC Address

Function // Slave Address

Data Type

// Data Address, Register Address

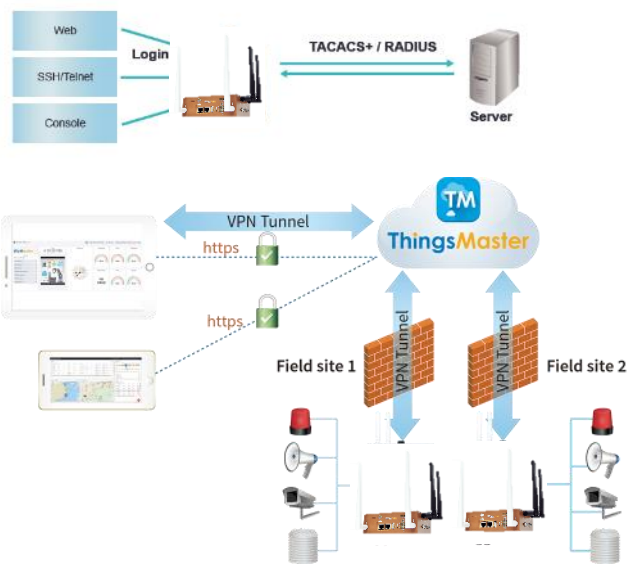
Modbus RTU Slave Tag List

Select	Name	Serial	Slave ID	Address	Function Code	Data Type	Edit	Alive	Value
<input type="checkbox"/>	PM1	1	4	1	03	int16	<input type="button" value="Edit"/>	Yes	10
<input type="checkbox"/>	PM2_5	1	4	2	03	uint16	<input type="button" value="Edit"/>	Yes	13
<input type="checkbox"/>	PM10	1	4	3	03	uint16	<input type="button" value="Edit"/>	Yes	13
<input type="checkbox"/>	CO2	1	1	562	03	uint16	<input type="button" value="Edit"/>	Yes	1107
<input type="checkbox"/>	Temperature	1	1	564	03	int16	<input type="button" value="Edit"/>	Yes	255
<input type="checkbox"/>	Humidity	1	1	566	03	int16	<input type="button" value="Edit"/>	Yes	629
<input type="checkbox"/>	Temperature_f	1	1	1	03	float	<input type="button" value="Edit"/>	Yes	25.498820

✓ 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.

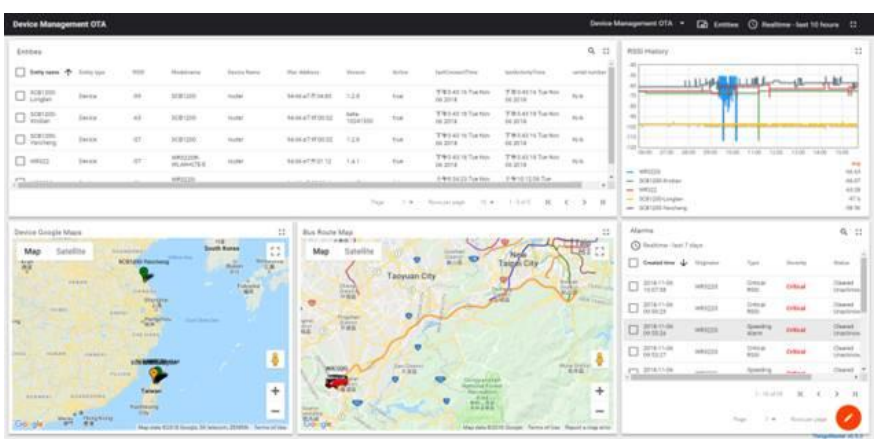


Secured Multi-sites Management

- N to N VPN
- Latest TLS encryption and X.509 authentication

✓ ThingsMaster OTA (device management over the air)

The embedded OTA agent 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 firmware upgrade, configuration reload, or device reboot can also be run by group.

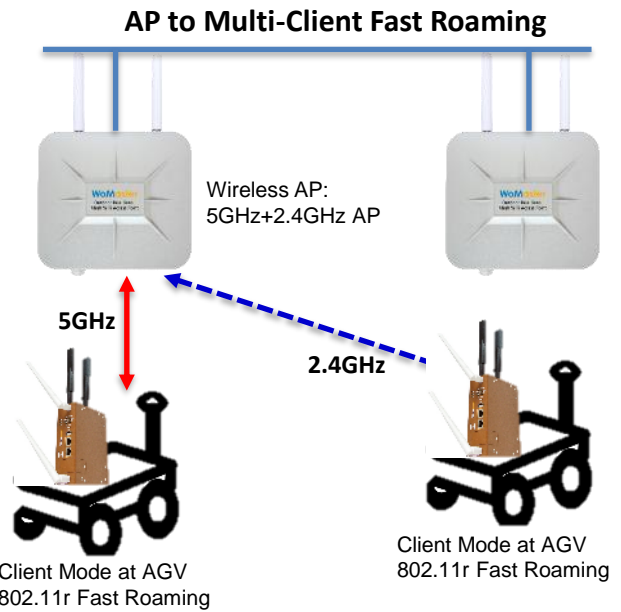
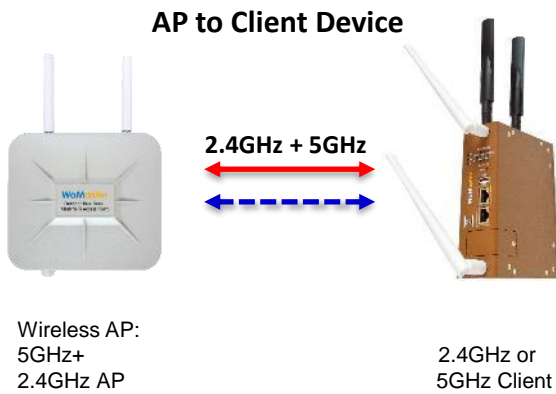
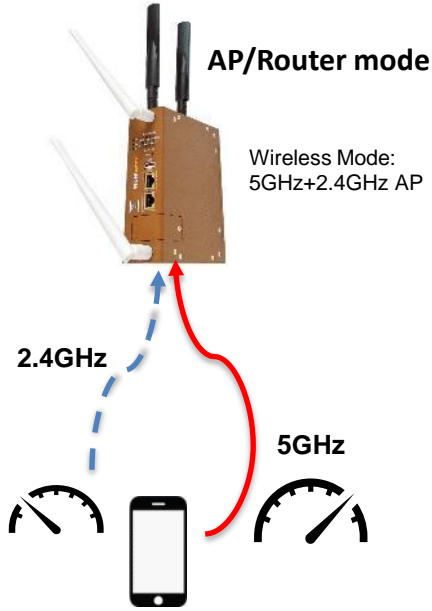




✓ Dual Band Dual Concurrent WLAN 6

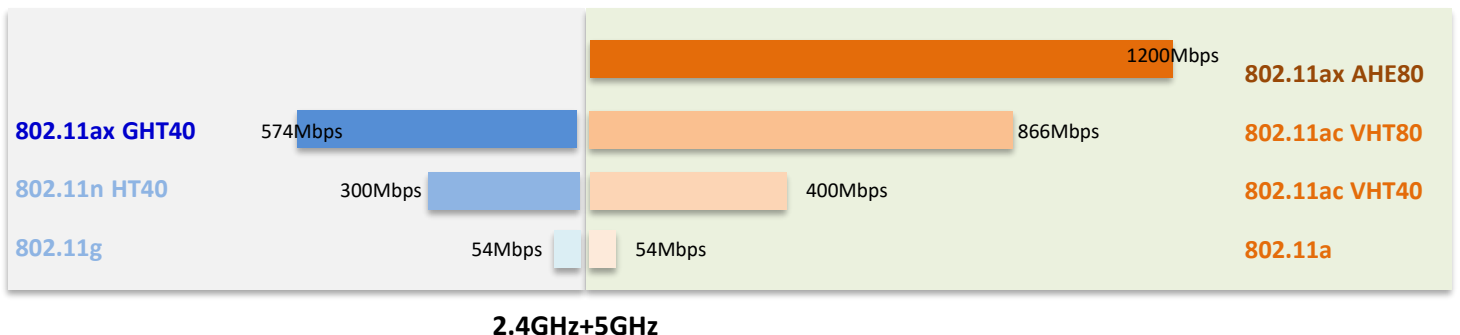
- IEEE 802.11ax is compatible with 802.11ac/n/g/b/a
- Dual Band Dual Concurrent (DBDC) 2.4G+5GHz radio delivers up to 1200Mbps + 574Mbps Bandwidth
- Failsafe when either 2.4GHz or 5GHz Radio fails
- Dual 2.4G+5GHz Radios integrated Antenna
- Supports both Wireless AP, Client modes

Model	Wi-Fi 5	Wi-Fi 6
Standard	802.11ac/n	802.11ax
Frequency	5GHz 802.11ac + 2.4GHz 11n	5GHz+2.4GHz (6GHz by request)
Max. Rate	866Mbps+300Mbps	1200Mbps + 574Mbps
DBDC	DBDC	DBDC
MIMO	DL MIMO	UL+DL MIMO
PHY	QAM 256	QAM 1024
Modulation	OFDM	OFDMA
Bandwidth	20/40/80MHz	20/40/80MHz *Up to 160M
BSS	-	BSS Coloring
TWT time	-	Yes



✓ 802.11ax Powerful Performance

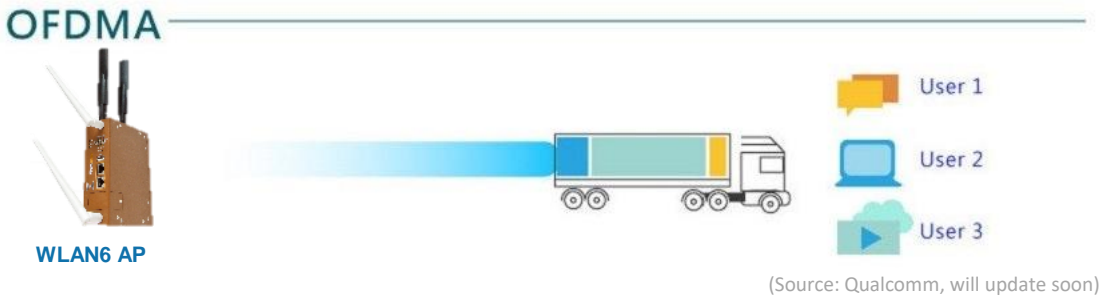
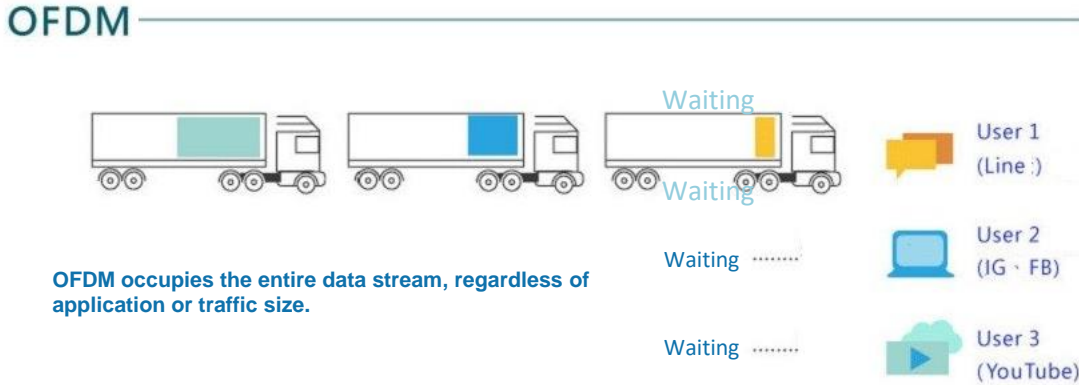
- 1.The **5GHz** band of **802.11ax** is **1.37 times faster** than **802.11ac**.
- 2.The **2.4GHz** band of **802.11ax** is **1.91 times faster** than **802.11n**.
- 3.In **DBDC (dual-band, dual-concurrent)** mode, **802.11ax** with both **5GHz+2.4GHz** is **1.52 times faster** than the combination of **5GHz 802.11ac + 2.4GHz 802.11n**.



✓ **OFDMA**

OFDMA is applied in Wi-Fi 6 (IEEE 802.11ax). It is a user access technology that allows spectrum to be simultaneously allocated to multiple users or devices, enabling the transmission of multiple data streams on the same frequency band, thereby enhancing network efficiency.

It can also be adjusted according to demand or priority, achieving more flexible network resource management. By dividing the spectrum into small subcarriers, OFDMA can also reduce interference between adjacent users, making the signal more reliable and stable. This is one of the latest key technologies in Wi-Fi 6.



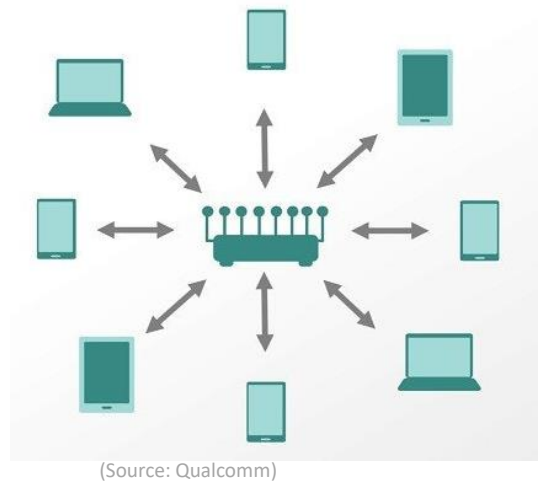
✓ **Downlink & Uplink MU-MIMO**

In 802.11ac, basic Downlink MU-MIMO was introduced, allowing wireless access points (such as routers) to simultaneously transmit data to multiple client devices.

However, in Wi-Fi 6, MU-MIMO technology has been further developed to communicate simultaneously with multiple devices in both the Downlink and Uplink directions.

This means that whether sending data from the access point to devices or from devices to the access point, multiple device data streams can be processed simultaneously.

This enables faster and more reliable wireless connections, while also improving network throughput and efficiency.

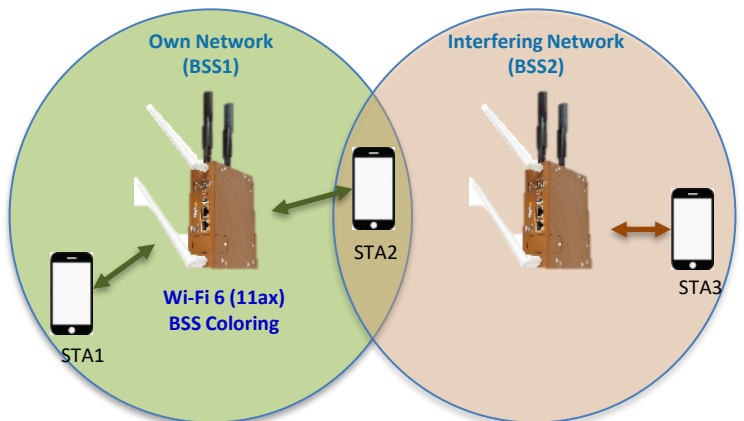


✓ **BSS Coloring**

BSS Coloring is a feature introduced in the 802.11ax Wi-Fi standard, which helps reduce interference from neighboring Access Points (APs) and improves coexistence between multiple APs.

The basic idea behind BSS Coloring is that each BSS or AP is assigned a unique color, which is added to the preamble of each transmitted data packet. When a client device receives a packet, it can check the color of the received preamble and use this information to differentiate signals from different APs.

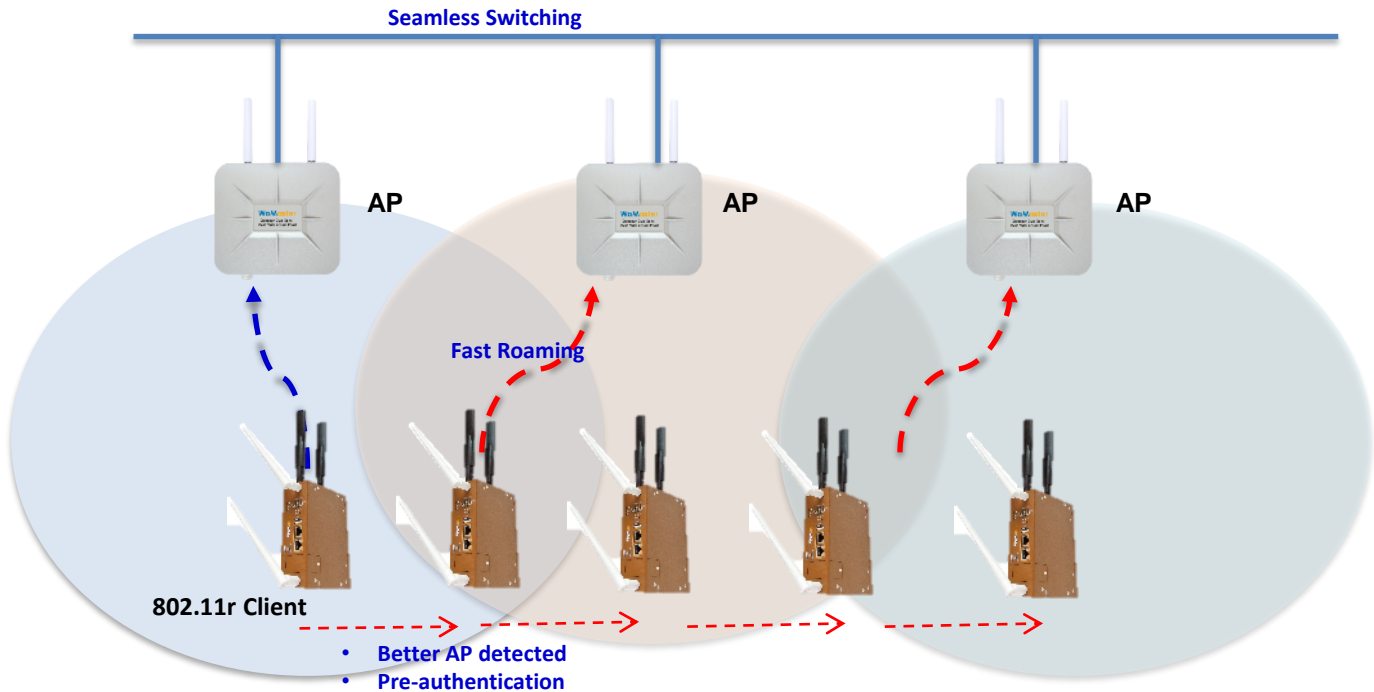
BSS Coloring helps prevent unnecessary retransmissions and conflicts caused by neighboring networks, thereby improving overall network efficiency and potentially extending the available range of IoT devices.





✓ 802.11r Fast Roaming Technology

- IEEE 802.11r (Fast Basic Service Set Transition) is a wireless network standard aimed at achieving fast roaming without the need for complete re-authentication.
- Fast Roaming: 802.11r allows mobile devices to transition faster from one access point (AP) to another AP without the need for complete re-authentication and connection processes.
- Seamless Switching: By reducing the need for re-authentication, 802.11r achieves a seamless roaming experience. Users can naturally switch to access points with stronger signals or better quality while moving, without the need to manually reconnect to the network or input credentials again.
- Pre-authentication: Before actual movement occurs, mobile devices can pre-authenticate to potential target APs, enabling quick switching to the AP when needed, further reducing connection interruption time during the switching process.



✓ WPA3 Data Encryption

- WPA3 (Wi-Fi Protected Access 3) is a latest standard used to protect Wi-Fi network security, and it's also implemented in Wi-Fi 6 networks.
- WPA3 adopts advanced encryption algorithms such as Simultaneous Authentication of Equals (SAE) to replace the Pre-Shared Key (PSK) mode used in WPA2, thus resisting password cracking and dictionary attacks.
- WPA3 also includes some improved security configurations and protocols to enhance network security and protection levels, providing a more secure Wi-Fi network protection.

✓ Discover & Configuring by ViewMaster Utility

- Discovery & Configuring IP Address
 1. Select the Network Interface Card
 2. Auto discovery
 3. One AP: Change IP, DHCP Client Enable
Multi-AP: Auto Assign IP, DHCP Client Enable
- Firmware Upgrade
- Configuration Backup/Restore
- Open Web GUI
- Reboot



ViewMaster

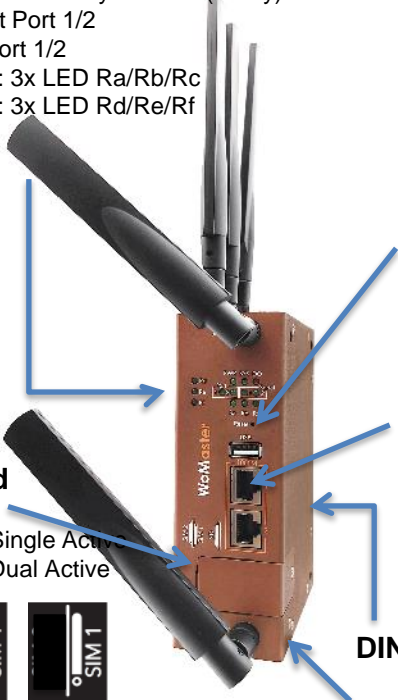


Interfaces

WR312G-3D-LTE/WR322GR-3D-2xLTE

System LED

- System: Power/System/DO(Relay)
- Ethernet Port 1/2
- Serial Port 1/2
- Radio 1: 3x LED Ra/Rb/Rc
- Radio 2: 3x LED Rd/Re/Rf



USB Extension Port

- USB for Configuration/ Firmware update
- External Storage

Gigabit Ethernet

- 2-port 10/100/1000M RJ45
- WAN + LAN configurable

SIM Card

- 2 x SIM
- 1xLTE: Single Active
- 2xLTE: Dual Active



Board No.	SIM No.	WR312G-3D-LTE	WR322GR-3D-2xLTE
1 (Right)	1	Primary	Active
	2	Standby	-
2 (Left)	1	-	Active
	2	-	-

DIN Clip

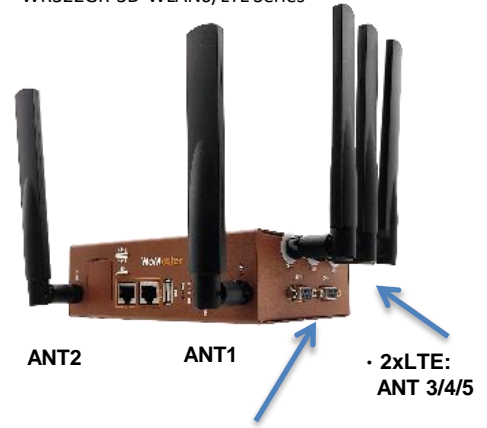
Integrated Power Connector

- 4 pin for redundant power
- 2 pin Relay Output

	WR312G-3D-LTE	WR322GR-3D-2xLTE	WR322GR-3D-WLAN6+LTE
Ant 1	LTE-Main	LTE1-Main	LTE-Main
Ant 2	LTE-Diversity	LTE1-Diversity	LTE-Diversity
Ant 3	-	LTE2-Main	Wi-Fi 6/5 Main
Ant 4	-	LTE2-GPS/GNSS	GPS
Ant 5	-	LTE2-Diversity	Wi-Fi 6/5 Div.

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

*The table is applied to WR312G-3D/322GR-3D-2xLTE/WR322GR-3D-WLAN6/LTE Series

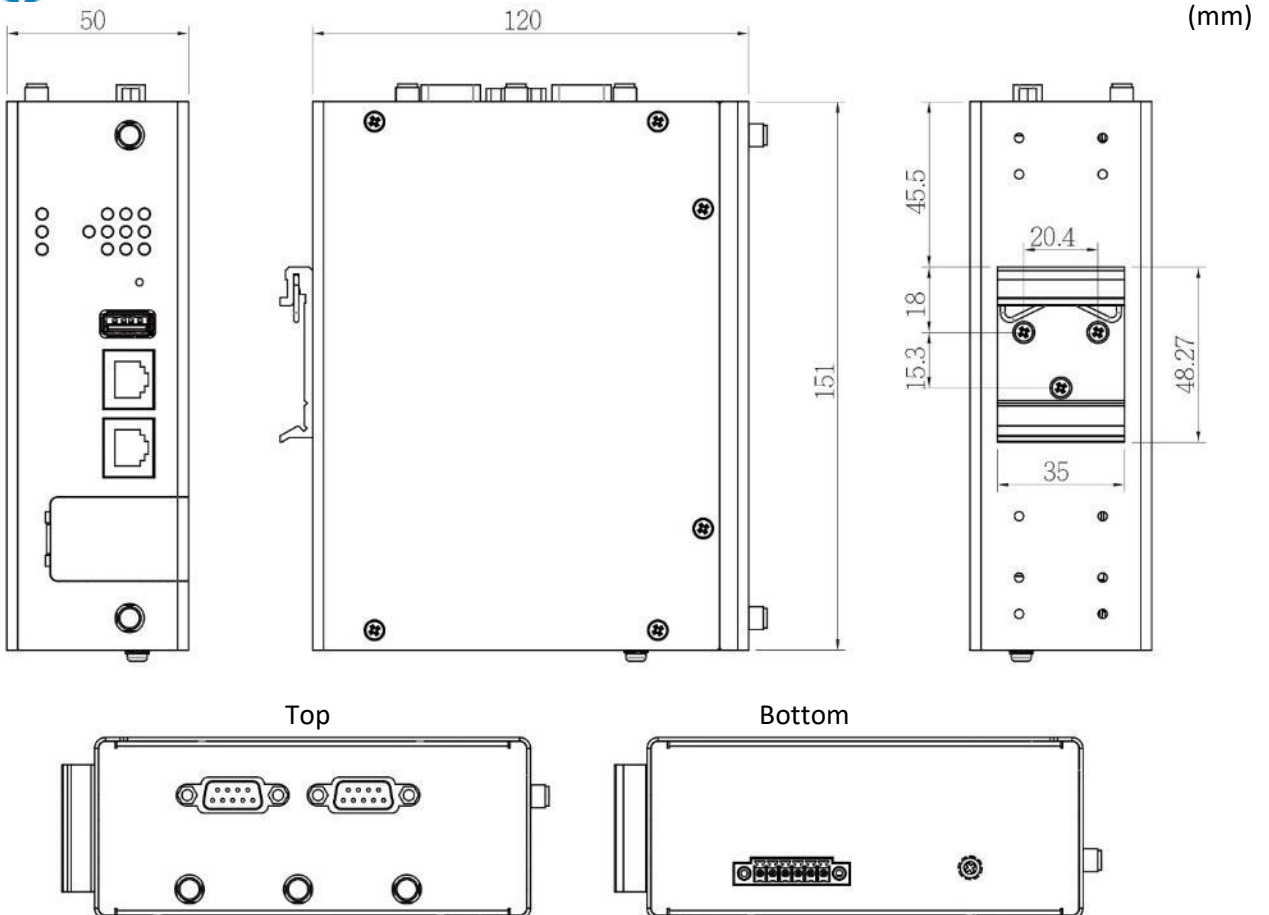


Serial Communication

- RS232/422/485 Full functions
- 1/2 DB9 female by model



Dimensions





Interfaces

WR322GR-3D-WLAN/WLAN6+LTE

System LED

- System: Power/System/DO(Relay)
- Ethernet Port 1/2
- Serial Port 1/2
- Radio 1: 3x LED Ra/Rb/Rc
- Radio 2: 3x LED Rd/Re/Rf

USB Extension Port

- USB for Configuration/ Firmware update
- External Storage

Gigabit Ethernet

- 2-port 10/100/1000M RJ45
- WAN + LAN configurable

SIM Card

- WR322GR-WLAN/WLAN6+LTE: 2x SIM



Board No.	SIM No.	WR312GR-3D-WLAN+LTE
1 (Right)	1	-
	2	-
2 (Left)	1	Primary
	2	Standby

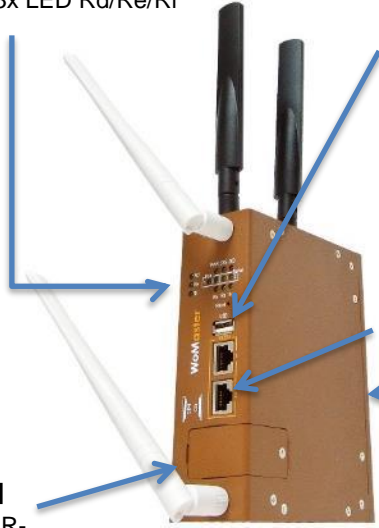
Integrated Power Connector

- 1 x 6-pin terminal block
- 4 pin for redundant power
- 2 pin DO

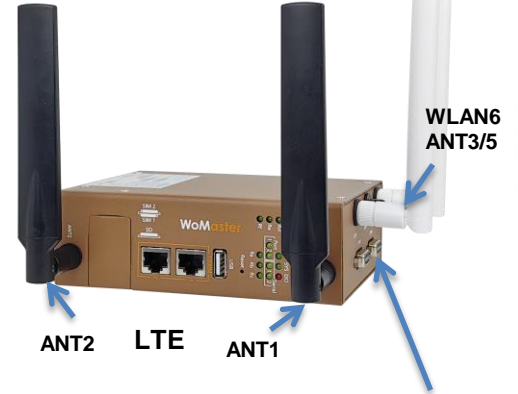
	WR312G-3D-LTE	WR322GR-3D-2xLTE	WR322GR-3D-WLAN6+LTE
Ant 1	LTE-Main	LTE1-Main	LTE-Main
Ant 2	LTE-Diversity	LTE1- Diversity	LTE- Diversity
Ant 3	-	LTE2-Main	Wi-Fi 6/5 Main
Ant 4	-	LTE2-GPS/GNSS	GPS
Ant 5	-	LTE2- Diversity	Wi-Fi 6/5 Div.

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

*The table is applied to WR312G-3D/322GR-3D-2xLTE/WR322GR-3D-WLAN6/LTE series



DIN Clip

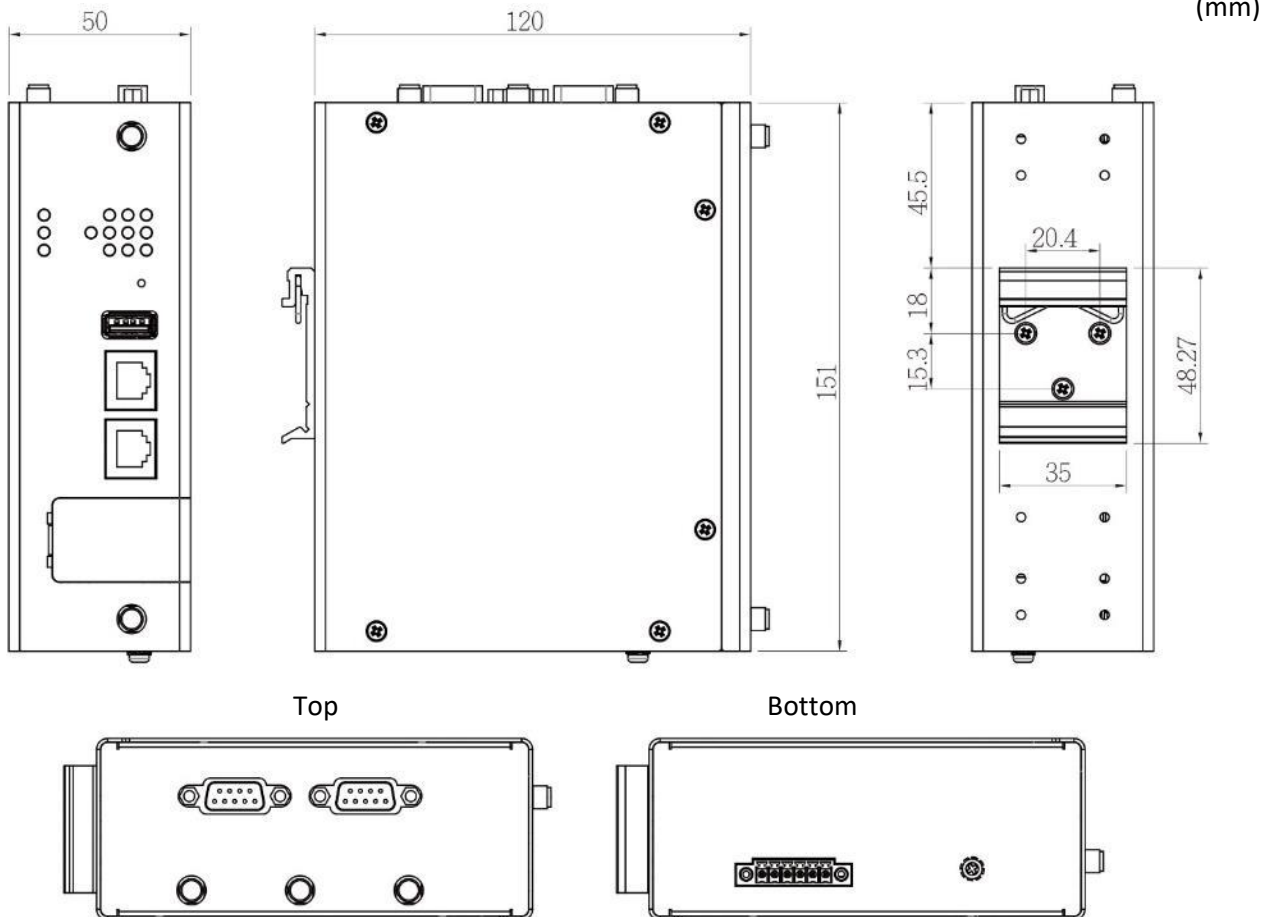



Serial Communication

- RS232/422/485 Full functions
- 2 DB9 female



Dimensions



Technology																																									
Standard	3GPP Release 11/12 Long Term Evolution (LTE), fallback 3GPP Release 7,8,9 for HSPA/UMTS																																								
	IEEE 802.11ax wireless local area network (WLAN), Backward support 802.11ac/n/g/b/a Wireless LAN																																								
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	IEEE 802.3 10Base-T Ethernet																																								
	IEEE 802.3u 100Base-TX Fast Ethernet																																								
	IEEE 802.3ab 1000Base-T Gigabit Ethernet Copper																																								
Interface																																									
Ethernet Port	2 x 10/100/1000MBase-T RJ45, Auto Negotiation, Auto-MDI/MDIX																																								
System LED	1 x PWR: Green On 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x DO(Relay): Red On 2 x Ethernet Ports: Link: Green On, Activity: Green Blinking 2 x Serial Ports (Serial 1/2, by model): Activity: Green Blinking WR312G-LTE-3D/ WR322GR-2xLTE-3D 1st Radio: Ra: SIM detected: Green On, SIM not inserted: Off Rb: 2G/3G/4G Signal Strength: Signal Good: Green On, Medium: Green Blinking, Low: Off Rc: 2G/3G/4G connection: Connected: Green On, Not Connected: Off WR322GR-2xLTE-3D 2nd Radio / WR322GR-3D-WLAN+LTE: Rd: SIM detected: Green On, SIM not inserted: Off Re: 2G/3G/4G Signal Strength: Signal Good: Green On, Medium: Green Blinking, Low: Off Rf: 2G/3G/4G connection: Connected: Green On, Not Connected: Off WR322GR-WLAN6/WLAN+LTE-3D: Ra: 802.11ac AP mode: Green ON, Client Mode: Green Blinking, Not Enabled: OFF Rb: 802.11n AP mode: Green ON, Client Mode: Green Blinking, Not Enabled: OFF Rc: Reserved																																								
USB	1 x USB for Configuration/Firmware Update																																								
Reset	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)																																								
SMA Socket	WR312G-LTE-3D: Up to 2 x SMA-Female LTE 2T2R: ANT1 for LTE Main, ANT2 for LTE Div. WR322GR-2xLTE-3D: Up to 5 x SMA 1st LTE 2T2R: ANT1 for LTE 1 Main, ANT2 for LTE 1 Div. 2nd LTE 2T2R: ANT3 for LTE 2 Main, ANT 4 for GPS/GNSS, ANT5 for LTE 2 Div. WR322GR-WLAN6/WLAN+LTE-3D: Up to 5 x SMA (WLAN is RP-SMA) WLAN6/WLAN: ANT1 for Wi-Fi 6/5 Main, ANT2 for Wi-Fi 6/5 Div. LTE 2T2R: ANT3 for LTE Main, ANT 4 for GPS/GNSS, ANT5 for LTE Div. Note: Due to the different number of antennas used by LTE/WLAN models, the unused antenna positions may be covered by caps.																																								
SIM Socket	Dual Nano SIM with redundancy for single LTE Model Dual Nano SIM Dual Active in 2x LTE model Supports GSMA's eUICC compliance M2M SIM. Blank solder chip SIM(MFF2), LPA profile download upon customized request																																								
Serial	2 x RS232/422/485 DB9 *1x RS233/422/485 DB9 by request <div style="text-align: center;">  <p>DB9 Female</p> </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Pin</th> <th>RS232</th> <th>RS485-4w/422</th> <th>RS485-2w</th> </tr> </thead> <tbody> <tr><td>1</td><td>DCD</td><td>TX-</td><td>Data-</td></tr> <tr><td>2</td><td>TXD</td><td>RX+</td><td>-</td></tr> <tr><td>3</td><td>RXD</td><td>TX+</td><td>Data+</td></tr> <tr><td>4</td><td>DSR</td><td>-</td><td>-</td></tr> <tr><td>5</td><td>GND</td><td>GND</td><td>GND</td></tr> <tr><td>6</td><td>DTR</td><td>RX-</td><td>-</td></tr> <tr><td>7</td><td>CTS</td><td>-</td><td>-</td></tr> <tr><td>8</td><td>RTS</td><td>-</td><td>-</td></tr> <tr><td>9</td><td>RI</td><td>-</td><td>-</td></tr> </tbody> </table>	Pin	RS232	RS485-4w/422	RS485-2w	1	DCD	TX-	Data-	2	TXD	RX+	-	3	RXD	TX+	Data+	4	DSR	-	-	5	GND	GND	GND	6	DTR	RX-	-	7	CTS	-	-	8	RTS	-	-	9	RI	-	-
Pin	RS232	RS485-4w/422	RS485-2w																																						
1	DCD	TX-	Data-																																						
2	TXD	RX+	-																																						
3	RXD	TX+	Data+																																						
4	DSR	-	-																																						
5	GND	GND	GND																																						
6	DTR	RX-	-																																						
7	CTS	-	-																																						
8	RTS	-	-																																						
9	RI	-	-																																						
Power Input, Digital Output	6-Pin Removable Terminal Block Connector 4 Pin for Redundant Power, 24VDC 2 Pin for DO (Relay Alarm) DO: Dry Relay Output with 1A/24V DC																																								
Power Requirement																																									
Input Voltage	Typical 24VDC (9~48VDC)																																								
Reverse Polarity Protect	Yes																																								
Input Current	WR312G-LTE-3D: 0.4A@24V WR322GR-WLAN+LTE-3D: 0.48A@24V WR322GR-2xLTE-3D: <u>0.53A@24V</u>																																								
Power Consumption	WR312G-LTE-3D: Max. 9.6W@24VDC in typical, suggest to reserve 15% tolerance WR322GR-WLAN+LTE-3D: Max. 11.6W@24VDC in typical, suggest to reserve 15% tolerance WR322GR-2xLTE-3D: Max. 12.6W@24VDC in typical, suggest to reserve 15% tolerance																																								

Cellular Properties (LTE Cat. 4)	
Band Information: LTE-EUX (Europe)	LTE: FDD B1/B3/B7/B8/B20/B28A LTE: TDD B38/B40/B41 WCDMA: FDD B1/B8, GSM: B3/B8 GNSS GP/GLONASS/BeiDou(Compass)/Galileo (Only in LTE _x 2 model)
Band Information: LTE-AUX (South America)	LTE: FDD B1/B2*/B3/B4/B5/B7/B8/B28 LTE: TDD B40 WCDMA: FDD B1/B2/B4/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

GPS Properties*	
GNSS	GPS/GLONASS/BeiDou/Galileo
Performance	Cold start: 18s, Warm start: 2.2s, Hot start: 1.8s
Sensitivity	Cold start: -146dBm, Reacquisition: -157dBm, Tracking: -157dBm
Accuracy	<1.5M
GNSS Frequency	GPS/Galileo: 1575.42±1.023 MHz GLONASS: 1597.5~1605.8 MHz BeiDou: 1561.098±2.046 MHz
Antenna (Optional Accessory-A-GPS-27-RSM-3M)	Frequency range: 1561~1615MHz Polarization: RHCP or linear VSWR: <2 (Typ.) Passive antenna gain: >0dBi

Wi-Fi 6 Properties	
Standard	IEEE 802.11ax/ac/b/g/n 5GHz and 2.4GHz, also known as Wi-Fi 6
Frequency	2.4GHz and 5GHz Dual Band Dual Concurrent ISM Band, 2.412GHz ~ 2.472GHz, 5.180MHz ~ 5.825MHz
Operation Channel	Channel Bandwidth: 20MHz, 40MHz, 80MHz 2.4GHz: Europe ETSI: CH1~13, US/FCC: CH1~11 5GHz Non-DFS Band 1/4: 36, 40, 44, 48, 149,153,157,161,165 5GHz DFS support *5GHz channel and DFS may be different by countries.
Data Rate (PHY Rate)	802.11ax 5GHz: MCS0 ~ MCS11 max. 1200Mbps 802.11ax 2.4GHz: MCS0 ~ 9, max. 574Mbps 802.11ac 5GHz: MCS0 ~ 9, max. 866Mbps 802.11n 2.4GHz: MCS0 ~ 7, max. 300Mbps 802.11a 5GHz/11g 2.4GHz: max. 54Mbps
EIRP	≤20db/≤23db, compliant with CE 2.4G/5G request Check other detail TX/RX information in User Manual
	*Wi-Fi 5 by request. Wi-Fi 5 supports 5GHz IEEE 802.11ac and 2.4GHz IEEE 802.11n, 2T2R MIMO, up to 866Mbps in 5GHz + 300Mbps in 2.4GHz.

Antenna	
LTE Default Antenna	Frequency: 690~960/1710~2700 MHz
	Peak Gain: 3.15dBi 690MHz: 1.36dBi, 960MHz: 1.37dBi, 1710MHz: 3.12dBi, 1800MHz: 1.29dBi 1900MHz: 2.63dBi, 2100MHz: 1.47dBi, 2170MHz: 1.14dBi, 2500MHz: 3.15dBi 2600MHz: 2.46dBi, 2700MHz: 1.89dBi
	Direction: Omni
	Connector: SMA Male
	Dimension: 158x17.6xΦ13 mm
Wi-Fi Default Antenna	Frequency: 2400~2500/5150~5850MHz
	Peak Gain: 2.4G: 3.55dBi, 5GHz: 5.28dBi 2400~2500MHz: 2.4~3.55dBi 5150~5850MHz: 3.41~5.28dBi
	Direction: Omni-directional
	Connector: SMA Male Reverse
	Dimension: 200xΦ13 mm

*1: GPS support for WR312G-3D-LTE series is by request

Software	
Management	CGI WebGUI, Command Line (CLI), IPv4, Telnet/SSH, Console*, SNMP v1/v2c/v3, SMS remote management, DDNS, DHCP server/client, DHCP Relay, Fixed IP, FTP, Event logging using System Log, Syslog over TLS*, SMTP, ARP/Proxy ARP, ARP response over 802.2 LLC SNAP*, DNS (client/proxy), self diagnostic and alarm DO, Ethernet Port VLAN setting, network diagnostic by iperf/Netconf*
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), MAC Filter
Advanced Security	TACACS+, Multi-user authentication
Time Management	NTP, SNTP, Cellular Time
Redundancy Protocol	WAN/LTE Redundancy
WAN / Routing / NAT/ Firewall / VPN	Routing: RIPv2, OSPFv2, VRRPv2 NAT: 1-1 NAT, NATP(SNAT/DNAT), Port Forwarding, DMZ Firewall: Stateful Inspection firewall, IP/Port Filter, MAC ACL VPN: IPSec, OpenVPN (Multipoint VPN), L2TP, GRE
Watchdog	Hardware watchdog for system status monitoring Software cellular watchdog/ ping watchdog for keep-alive connection monitoring, the keep-alive parameters include IP/Port* of the Keep-alive server, Time interval, Maximum number of retries
IIoT Industrial Protocol	Modbus RTU, MQTTS, CoAP
Private Cloud	ThingsMaster, ThingsMaster OTA
Public Cloud	AWS Agent, Azure Agent
Location	Google map, Baidu map
MIB	MIB-II, Entity MIB, WoMaster Private MIB for monitoring
Utility	ViewMaster, NetMaster, Ping, Traceroute
Serial communication	TCP Server/TCP Client/UDP mode, TCP Alive check, Force TX Delimiter/Timeout/interval/length, Long Distance Termination
Cellular Configuration	Radio on/off, 2G, 3G and 4G modes configurable, Dual SIM, Dual SIM Dual Active(LTE _x 2), SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning (by model), Backup SIM Retry (1-10 times), GPS positioning (by model)
WLAN Configuration	WLAN Basic Settings: Radio on/off, AP/client mode, 802.11ax/ac/n/g/b mode selection, 2.4GHz/5GHz Band and Frequency selection, SSID/Multi-SSID* configuration, SSID broadcast, VLAN ID*, advanced WLAN settings, WLAN Access Control, 802.1X Radius, WLAN to LAN Link fault pass-through*, Advanced WLAN parameter settings, 802.1X, Cellular to WLAN Auto Offload*(model with LTE)
Fast Roaming	802.11r compliant Fast Roaming* *802.11k/v by request
Mechanical	
Installation	DIN Rail
Enclosure Material	Steel Metal
Dimension	50 x 151 x 120 mm(W x H x D) / without DIN Rail Clip
Ingress Protection	IP30
Weight	WR312G-3D: ~800g without package WR322GR-3D: ~900g without package
Environmental	
Operating Temperature & Humidity	-40°C~70°C , 5%~95% Non- Condensing
Storage Temperature	-40°C~85°C
MTBF	>200,000 hours at 40° full cycle
Warranty	3 years
Approval	
CE	CE RED Compliance, 2014/53/UE compatibility Safety: EN 62368-1:2014/AC:2017, EMC: EN 301 489-1/17/19/52 Radio Module: EN 62311 MPE assessment, EN 300 328/EN 301 893, EN 301 908-1*
FCC	FCC part 15B Class A Compliance, FCC Approved LTE/WLAN Module
EMC	Railway Roadside EN 50121-1/4, EN61000-6-4, 2014/30/EU Compatibility EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field
Environmental	Shock/Vibration: EN 50155:2017/EN 61373:2010 Railway Shock/Vibration Above 50% recyclable sources to complaint with ISO14021/UNE-EN15543



Product Selection Guide

Model	CPU	Series	Serial	ETH	Radio 1	Radio 2	USB	SD	SIM	GPS	Relay	DI/DO
WR312G-LTE-(Region)-3D	2-Core	3D	2	1x GE LAN + 1x GE WAN	LTE Cat.4 EUX/AUX/G	-	1	-*	2	-	1	0
WR322GR-2xLTE-(Region)-3D			2		LTE Cat.4 EUX/AUX/G	LTE Cat.4 EUX/AUX/G	1	-*	2 (DSDA)	Yes	1	0
WR312G-WLAN-3D			2		2.4Ghz+5Ghz Wi-Fi 6 (11ax)	-	1	-*	2	-	1	0
WR322GR-WLAN6+LTE-(Region)-3D			2		2.4Ghz+5Ghz Wi-Fi 6 (11ax)	LTE Cat.4 EUX/AUX/G	1	-*	2	Yes	1	0
WR322GR-WLAN+LTE-(Region)-3D (By MoQ)			2		2.4Ghz 11ac + 5Ghz 11n	LTE Cat.4 EUX/AUX/G	1	-*	2	Yes	1	0
WR312G-M1+NB-3D			2		LTE Cat.M1/NB-loT	-	1	-*	2	-	1	0
WR312G-LTE-(Region)	1-Core	-	2	1x GE LAN + 1x GE WAN	LTE Cat.4 EUX/AUX/G	-	1	1	1	-	1	0
WR312G-M1+NB		-	2		LTE Cat.M1/NB-loT	-	1	1	1	-	1	0
WR312G-LTE-(Region) (D)		D	2		LTE Cat.4 EUX/AUX/G	-	1	-	2	-	1	0
WR312G-LTE-(Region) (C)		C	1		LTE Cat.4 EUX/AUX/G	-	-	-	2	-	1	0

Note 1: HW V1.0x is produced according to the order.

Note 2: In HW 3.0, the micro SD socket design is reserved inside the housing. It is customized feature (SD socket and SD Card pre-installed) according to the order. Please contact our sales.



Ordering Information

WR312G-LTE-(Region)-3D	Industrial Secure Serial Router, Dual Core , 2GbE+2COM, 1 Relay, 2SIM, LTE-(Region EUX/AUX/G) (choose one by region)
WR322GR-2xLTE-(Region)-3D	Industrial Secure Serial Router, Dual Core , 2GbE+2COM, 1 Relay, 2SIM DSDA , 2x LTE-(Region EUX/AUX/G) (choose one by region)
WR312G-WLAN6-3D	Industrial Secure Wireless Router, Dual Core, 2GbE+2COM, USB, 1 Relay, 802.11ax/ac WLAN
WR322GR-WLAN6+LTE-(Region)-3D	Industrial Secure Serial Router, Dual Core , 2GbE+2COM, 1 Relay, 2SIM, 802.11ac/n WLAN, LTE-(Region EUX/AUX/G) (choose one by region)
WR322GR-WLAN+LTE-(Region)-3D	Industrial Secure Serial Router, Dual Core , 2GbE+2COM, 1 Relay, 2SIM, 802.11ac/n WLAN, LTE-(Region EUX/AUX/G) (choose one by region)
WR312G-M1+NB-3D	Industrial Secure Serial Router, Dual Core , 2GbE+2COM, 1 Relay, 2SIM, LTE-CatM1+NB2

*Choose one by region EUX/AUX/G: EUX for EU countries, AUX for Latin America/Australia, G for Global Worldwide. For other frequency bands not listed, please inquire with our sales.

*The micro SD socket design is reserved inside the housing for customization service

Package List

1 x Product Unit

1 x 6-pin Removable Terminal Connector

1 x Quick Installation Guide

1 x Attached Din Clip

Default Enclosed Antennas:

WR312G-LTE-3D: 2 x LTE Antennas, Black;

WR322GR-2xLTE-3D: 4 x LTE Antennas, Black

WR322GR-WLAN6+LTE-3D: 2 x LTE Antennas, Black + 2 x Wi-Fi Antennas, White

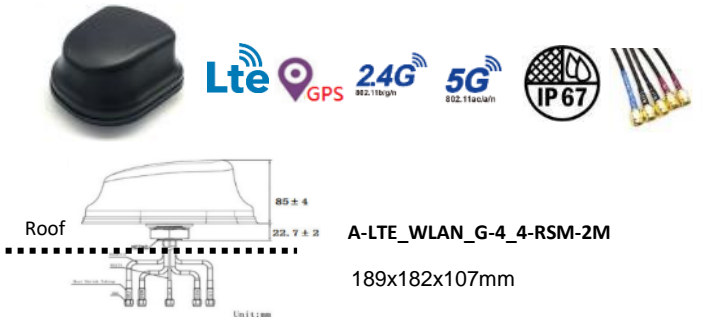
Band Information: LTE-EUX	LTE: FDD B1/B3/B7/B8/B20/B28A LTE: TDD B38/B40/B41 WCDMA: FDD B1/B8, GSM: B3/B8 GNSS GP/GLONASS/BeiDou(Compass)/Galileo (Only in LTEx2 model)
Band Information: LTE-AUX	LTE: FDD B1/B2*/B3/B4/B5/B7/B8/B28 LTE: TDD B40 WCDMA: FDD B1/B2/B4/B5/B8, GSM: B2/B3/B5/B8
Band Information: LTE-G	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

Ordering Information

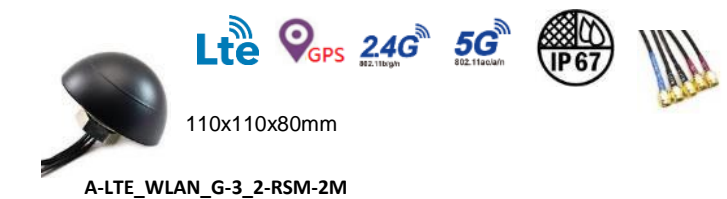
A-LTE_WLAN_G-4_4-RSM-2M	Combo IP67 Antenna, LTE WW 4dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 4/4dBi, GPS 1561-1670MHz 28dBi, RP-SMA male, 2M
A-LTE_WLAN_G-3_2-RSM-2M	Combo IP67 Antenna, LTE WW 3dBi, Wi-Fi 2.4/5GHz dual band Omni-directional 2/2dBi, GPS 1575-1610MHz 28dBi, RP-SMA male, 2M
A-LTE-3-NM	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
A-GPS-2-NM	GPS Antenna, GPS 1575MHz 2dBi, N-Type male
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 (optional)	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 (optional)	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 (Default)	Omni	690~960/1710~2700	3	SMA Male	158x17.6Φ13	-	-10°C~ 70°C	Indoor
	A-LTE-3-NM (optional) (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 (Default)	Omni	2400~2500 5150~5850	3.5 5	RP SMA Male	200xΦ13	-	-10°C~ 70°C	Indoor
	A-WLAN-6-NM (optional) (require RF cable)	Omni	2400~2500 5150~5850	4 6	N-Type Male	187xΦ20	-	-20°C~ 65°C	Outdoor

GPS Antenna

	Model	Type	Frequency (MHz)	Gain (dBi)	Connector	Dimension (mm)	Cable (M)	Operating Temp.	Application
	A-GPS-27-RSM-3M (optional)	Omni	1575.42	27	RP SMA Male	36x36x13.9	3	-20°C~ 65°C	Indoor
	A-GPS-2-NM (optional) (require RF cable)	Omni	1575.42	2	N-Type Male	187xΦ20	-	-20°C~ 65°C	Outdoor