Dual Core and Dual WLAN Secured and Rugged LTE Router for IIoT

WR312GR/322GR 2C Series

New industrial secure LTE router WR322GR 2C Series enhances routing performance with dual-core 880MHz CPU and support concurrent 2.4G+5GHz WLAN networks. The RS232/422/485 DB9 ports with Modbus and digital input and digital output interface can connect sensor and meter data to cloud wirelessly. The WR322GR router supports LTE to Ethernet WAN redundancy to guarantee continuous connections. To safeguard cybersecurity, security features such as Firewall, OpenVPN, GRE tunnel are supported. The embedded MQTTS, CoAP and RESTful API enables instant public cloud integration such as AWS or Azure. The ThingsMaster OTA can also be set up for an instant and secured access to receive data or manage devices remotely.

MQTT · CoAP

Lte · NB-IoT · 5GHz 802.11a/n/ac · LTE-M · 2.4GHz 802.11b/g/n · Cyber Security · VPN

-40~75°C · EN50121-4 · IEC61000-6-2 IEC61000-6-4

ThingsMaster OTA
ThingsMaster
NetMaster

Features & Benefits

High speed 4G LTE & Wi-Fi Network
• Dual Core High Speed Processor
• LTE Cat.4, 2x2 MIMO, 150M downlink and 50M uplink
• 4G/3G/2G full cellular network compatibility
• Support GPS for location services
• IEEE 802.11ac Wave 2 compliant & backward compatible with 802.11a/b/g/n
• Dual Radio 5GHz + 2.4GHz Wi-Fi for local coverage, up to 1166(866Mbps + 300Mbps) bandwidth

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 routing and bridging mode
· Close to wire-speed NAT routing performance
· 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 -40~70ºC environments
· CE Marking
· IEC61000-6-2/IEC61000-6-4 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)
· GRE tunnel
· 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 and RMON*
· 1:1 NAT, port forwarding and NAPT for local traffic protection
· 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 MQTTS/CoAP 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
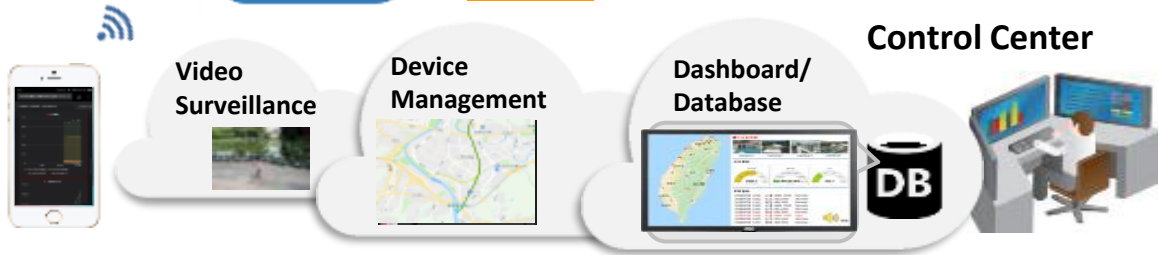· Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log
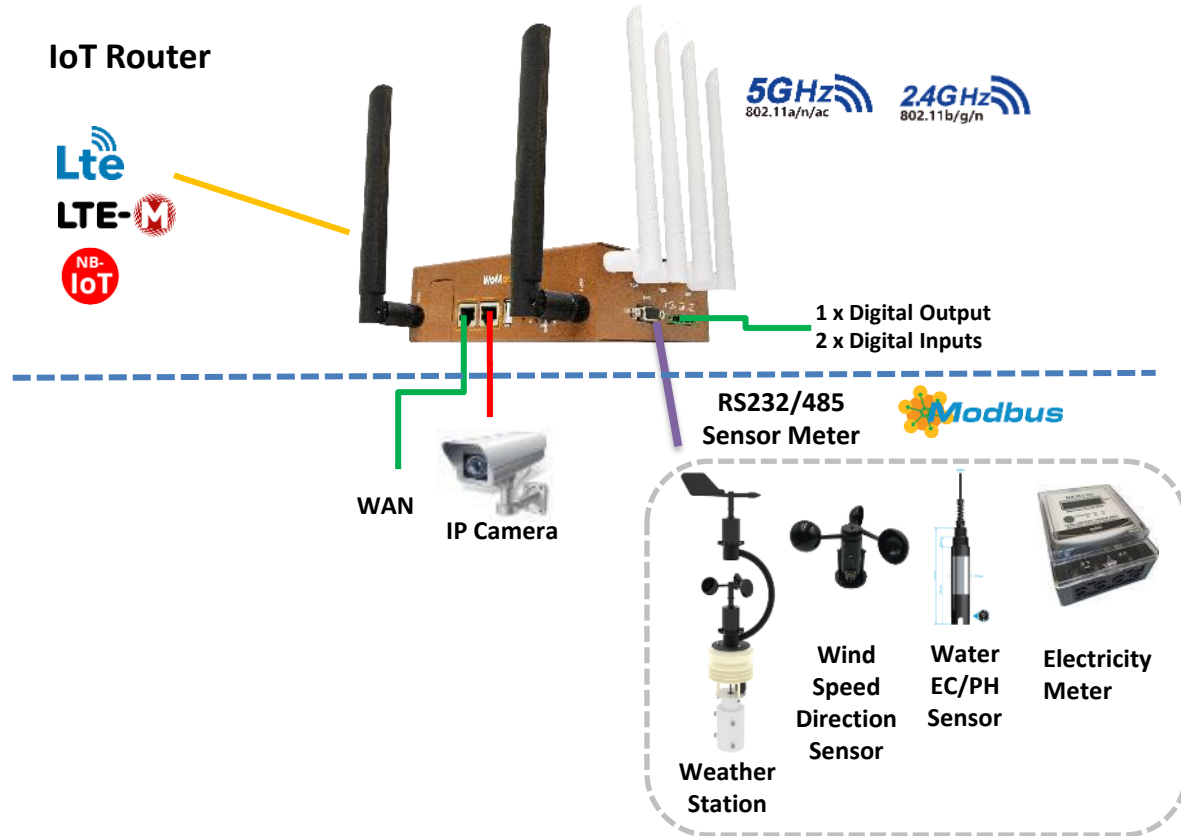
✓ **Ready Total Solution for IoT**

**Cloud Service**

ThingsMaster
ThingsMaster OTA

Control Center

Video Surveillance

Device Management

Dashboard/ Database

IoT Router

Lte
LTE-M
NB-IoT

5GHz 802.11a/n/ac   2.4GHz 802.11b/g/n

1 x Digital Output
2 x Digital Inputs

RS232/485
Sensor Meter

Modbus

WAN

IP Camera

Weather Station

Wind Speed Direction Sensor

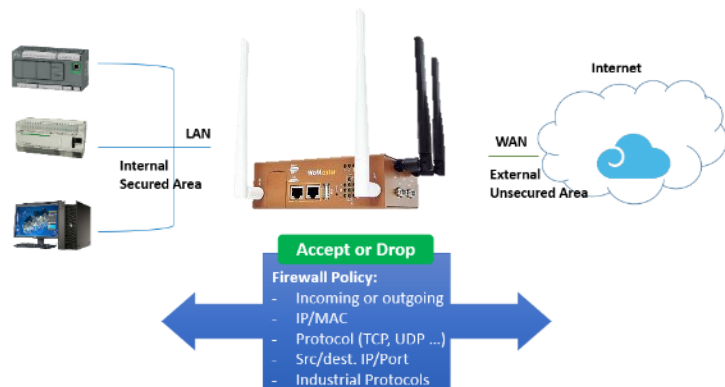Water EC/PH Sensor

Electricity Meter

✓ **Secured Remote Access by VPN**

WR322 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.
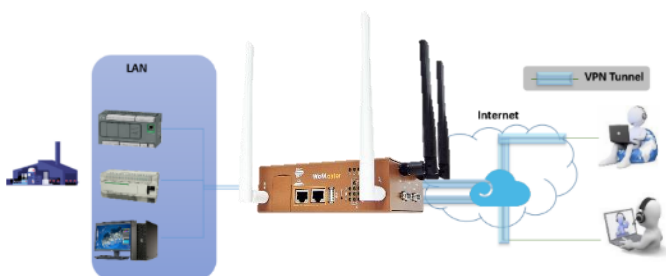
✓ **Cyber Security Guard**

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

LAN

VPN Tunnel

Internet

Internet

LAN

Internal Secured Area

WAN

External Unsecured Area

Accept or Drop

Firewall Policy:
- Incoming or outgoing
- IP/MAC
- Protocol (TCP, UDP ...)
- Src/dest. IP/Port
- Industrial Protocols

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**

Home > IoT > Modbus Device

AWS IoT | Azure IoT | Private IoT | **Modbus Device** | RMS

Modbus Logging

Modbus Logging	☑ Enable	
Name	Ex: CO2, Temperature	// Tag Name
Serial	1 ▼	
Slave ID	Ex:1	
PLC Address	Ex:1	
Function	03 Read Holding Registers ▼	// Slave Address
Data Type	uint16 ▼	

Submit   Cancel   // Data Address, Register Address

Modbus RTU Slave Tag List

Select	Name	Serial	Slave ID	Address	Function Code	Data Type	Edit	Alive	Value
☐	PM1	1	4	1	03	int16	Edit	Yes	10
☐	PM2_5	1	4	2	03	uint16	Edit	Yes	13
☐	PM10	1	4	3	03	uint16	Edit	Yes	13
☐	CO2	1	1	562	03	uint16	Edit	Yes	1107
☐	Temperature	1	1	564	03	int16	Edit	Yes	255
☐	Humidity	1	1	566	03	int16	Edit	Yes	629
☐	Temperature_f	1	1	1	03	float	Edit	Yes	25.486820

Delete Selected   Delete All   Refresh

Secured Multi-sites Management

N to N VPN

Latest TLS encryption and X.509 authentication

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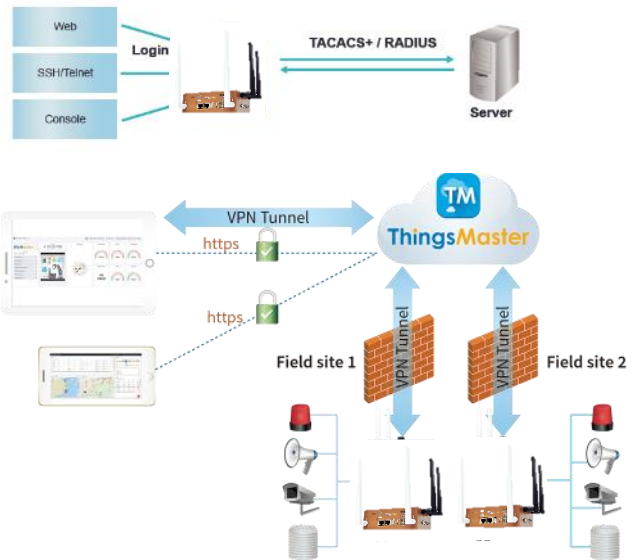
✓ **ThingsMaster OTA (device management over the air)**

The OTA agent embedded in WR322 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.
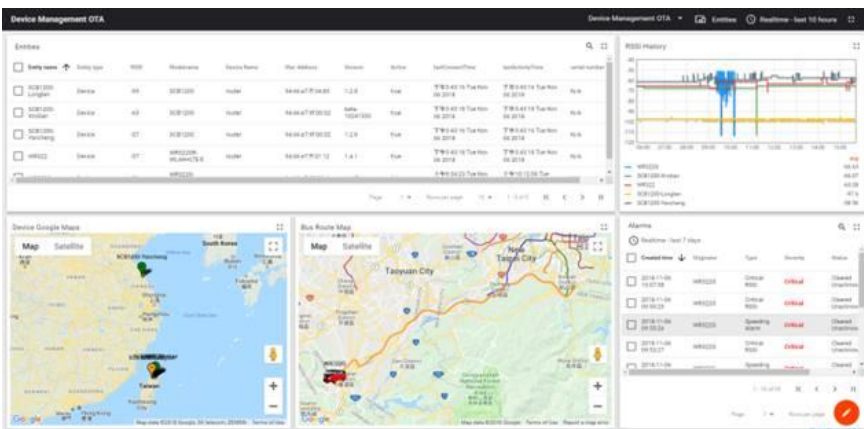
System LED
- 1 x Power
- 1 x System Status
- 1 x DO(Relay)
- 2 x Ethernet Port
- 1 Serial Port
- 3 x Radio LED (Ra~Rc)

USB Extension Port
- USB for Configuration/ Firmware update
- External Storage

	WR312GR-LTE	WR322GR-WLAN+LTE
Ant 1	LTE-Main	LTE-Main
Ant 2	LTE- Diversity/ GPS (by model)	LTE- Diversity/ GPS (by model)
Ant 3	-	Wi-Fi 5 Main
Ant 4	-	Wi-Fi 4 Main
Ant 5	-	Wi-Fi 5 Div.
Ant 6	-	Wi-Fi 4 Div.

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

Gigabit Ethernet
- 2-port 10/100/1000M RJ45
- 1 WAN + 1 LAN

SIM Card
- 2 x SIM

DIN Clip

ANT2

ANT1

ANT3/4/5/6

Integrated Power Connector
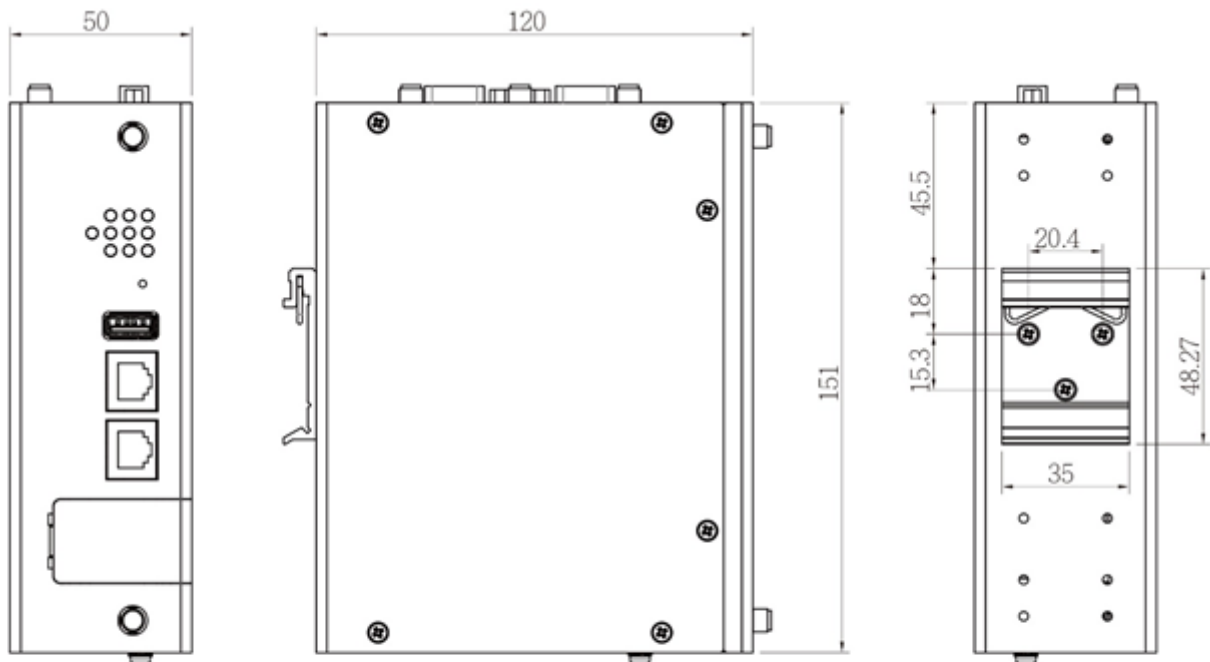-4 pin for redundant power
-2 pin Relay Output
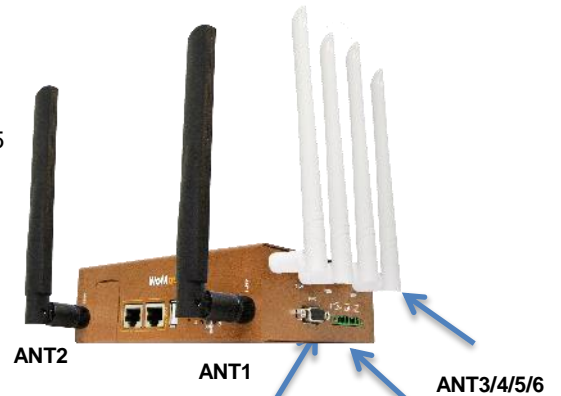
Serial Communication
- RS232/422/485 Full functions
- DB9 female

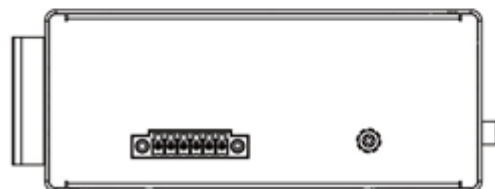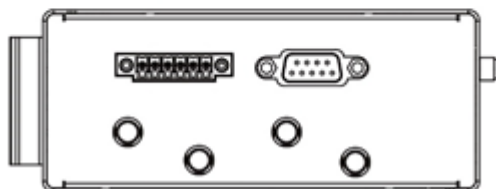2xDigital Input
1xDIgital Output
*Optional Serial 2
by request.

Dimensions

(mm)

50

120

151

45.5
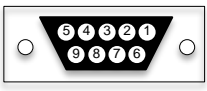
20.4

18

15.3

48.27

35

Top

Bottom

⚙ Specifications

Technology	
Standard	3GPP Release 11/12 Long Term Evolution (LTE), fallback 3GPP Release 7,8,9 for HSPA/UMTS
	IEEE 802.11ac wireless local area network (WLAN), Backward support 802.11n/g/a/b Wireless LAN
	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-2C:** 3 x Radio (Ra, Rb, Rc): Radio status 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-WLAN+LTE-2C:** 3 x Radio (Ra, Rb, Rc): Radio status Ra: Cellular Connected: Green On, Poor Coverage: Green Blinking, Not Connected/Disabled: Off Rb: 802.11ac AP mode: Green ON, Client Mode: Green Blinking, Not Enabled: OFF Rc: 802.11n AP mode: Green ON, Client Mode: Green Blinking, Not Enabled: OFF
USB	1 x USB for Configuration/Firmware Update
Reset	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)
SMA Socket	**WR312GR-LTE-2C:** Up to 2 x SMA-Female LTE 2T2R: ANT1 for LTE Main, ANT2 for LTE Aux. **WR322GR-WLAN+LTE-2C:** Up to 6 x SMA LTE 2T2R: ANT1 for LTE Main, ANT2 for LTE Aux or GPS(By Request) Wi-Fi 5 802.11ac 2T2R: ANT3 for Wi-Fi 5 Main, ANT5 for Wi-Fi 5 Div. Wi-Fi 4 802.11n 2T2R: ANT4 for Wi-Fi 4 Main, ANT6 for Wi-Fi 4 Div.
SIM Socket	2 x Nano SIM with redundancy
MicroSD	Internal mSD socket can be pre-installed with SD card for field diagnostic data logging.

Serial

1 x RS232/422/485, DB9
*2 x RS232/422/485 is optional upon request.

DB9 Female

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	-	-

Digital Input/ Digital Output	6-Pin Removable Terminal Block Connector:
	  4 Pins for 2x DI with isolation
	    High: DC 2~30V, Low: DC 0~1V
	  2 Pins for 1x DO: 0.1A/24V with isolation
	*The model with 2xSerial ports doesn't support this feature.

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	24VDC (9~48VDC)
Reverse Polarity Protect	Yes
Input Current	**WR312GR-LTE-2C:** 0.34A@24V **WR322GR-2xWLAN+LTE-2C:** 0.4A@24V
Power Consumption	**WR312GR-LTE-2C:** Max. 8.16W@24VDC full traffic, suggest to reserve 15% tolerance **WR322GR-2xWLAN+LTE-2C:** Max. 9.6W@24VDC full traffic, suggest to reserve 15% tolerance

Cellular Properties	(LTE Cat. 4)
Standard	GSM/GPRS/EDGE 3GPP Release 6 UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 11
Data Rate	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 Cat.4: DL: max. 150 Mbps, UL: max. 50 Mbps, 2x2 DL MIMO LTE-TDD Cat.4: DL: max. 130 Mbps, UL: max. 35 Mbps, 2x2 DL MIMO
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 (By MoQ Request)	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
	The product can support other variants 4G LTE Cat.4 Cellular module upon project request, if you have other needs, please contact our sales.

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 Properties	
Standard	IEEE 802.11ac/a/b/g/n, 2T2R MIMO 802.11ac Wave 2: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
Data Rate	802.11ac: MCS0 ~ 9, max. 866Mbps 802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: MCS0 ~ 15, max. 300Mbps Check detail TX/RX information in User Manual
Frequency	ISM Band, 2.412GHz ~ 2.472GHz, 5.150GHz ~ 5.250GHz
RSSI	≤20db/≤23db, compliant with CE 2.4G/5G request

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-LTE series is by request

Software

Management	CGI WebGUI, Command Line Interface (CLI), IPv4/IPv6*, Telnet, SNMP v1/v2c/v3, DDNS, DHCP server/client, DHCP Relay, Fixed IP, TFTP, FTP(active/passive), System Log, SMTP, Proxy ARP, DNS (client/proxy), PPPOE*
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+, Mutli-user authentication
Time Management	NTP, SNTP, Cellular Time
Redundancy Protocol	WAN/LTE Redundancy, Rapid Spanning Tree Protocol (RSTP)
WAN / Routing / NAT/ Firewall / VPN	Routing: RIPv2, OSPFv2, VRRPv2 NAT: 1-1 NAT, NAPT(SNAT/DNAT), Port Forwarding, DMZ Firewall: Stateful Inspection firewall(SIP), IP/Port Filter, MAC ACL VPN: IPSec, OpenVPN (Multipoint VPN), L2TP, GRE, PPTP*, DMVPN*, mGRE*
Watchdog	Hardware watchdog for system status monitoring Software cellular watchdog/ ping watchdog for connection monitoring
IIoT Industrial Protocol	Modbus RTU, MQTTS, CoAP, RESTful API*
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, DLMS*
Cellular Configuration	Radio on/off, 2G, 3G and 4G modes configurable, SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning (by model), Backup SIM Retry (1-10 times)
WLAN Configuration	WLAN Basic Settings: Radio on/off, AP/client mode, 2.4G 11n and 5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, VLAN ID, advanced WLAN settings, WLAN Access Control, 802.1X Radius

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: ~600g without package WR322GR: ~660g 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 40º full cycle
Warranty	3 years

Approval

CE	CE RED Compliance Safety: EN 62368-1:2014/AC:2017 EN 62311 MPE assessment EN 301 489-1/17/19/52, EN 55032/55024 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 EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field EN61000-4-12/16/17/18/29 for power application
Environmental	Shock/Vibration: EN 50155:2017/EN 61373:2010 Railway Shock/Vibration Shock: IEC60068-2-27 Compliance Free fall: IEC60068-2-31 Compliance Vibration: IEC 60068-2-6 Compliance

*Future Release/By Project Request.

Product Selection Guide

Model	CPU	Series	Serial	ETH	Radio 1	Radio 2	USB	SD	SIM	GPS By request	Relay	DI/DO
WR302G-2C	2-Core	-	1	1 x GE LAN + 1 x GE WAN	-	-	1	1	0	-	1	2/1
WR312GR-LTE*-2C			1		LTE Cat.4 EUX/ECGA/AU/G	-	1	1	2	By request		2/1
WR322GR-WLAN-2C			1		5Ghz 11ac	2.4Ghz 11n	1	1	0	-		2/1
WR322GR-WLAN+LTE-2C			1		LTE Cat.4 EUX/ECGA/AU/G	2.4Ghz 11ac + 5Ghz 11n	1	1	2	By request		2/1
WR312G-LTE*-2C (C Series)		C	1		LTE Cat.4 EUX/ECGA/AU/G	-	0	0	2	-		0
WR312G-LTE*-2C (D Series)		D	2		LTE Cat.4 EUX/ECGA/AU/G	-	1	0	2	-		0
WR302G	1 Core	-	2		-	-	1	1	0	-		0
WR312G-LTE			2		LTE Cat.4 EUX/ECGA/AU/G	-	1	1	1	By request		0
WR312G-WLAN			2		5Ghz 11ac /or 2.4Ghz 11n	-	1	1	0	-		0
WR322GR-WLAN+LTE			2		LTE Cat.4 EUX/ECGA/AU/G	5Ghz 11ac /or 2.4Ghz 11n	1	1	1	YES		0
WR312G-LTE* (C Series)		C	1		LTE Cat.4 EUX/ECGA/AU/G	-	0	0	2	-		0
WR312G-LTE* (D Series)		D	2		LTE Cat.4 EUX/ECGA/AU/G	-	1	0	2	-		0

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 (By MoQ Request)	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 (By MoQ Request)	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

Model	Description
WR302G-2C	Industrial Secure Serial Router, **Dual Core**, 2GbE+1COM+2DI+1DO, USB, SD, 1 Relay
WR312GR-LTE-2C	Industrial Secure Serial Router, **Dual Core**, 2GbE+1COM+2DI+1DO, USB, SD, 1 Relay 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region)
WR322GR-WLAN-2C	Industrial Secure Serial Router, **Dual Core,** 2GbE+1COM+2DI+1DO, USB, SD, 1 Relay 802.11ac + 11n Dual WLAN
WR322GR-WLAN+LTE-2C	Industrial Secure Serial Router, **Dual Core,** 2GbE+1COM+2DI+1DO, USB, SD, 1 Relay 802.11ac + 11n Dual WLAN, 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region)
WR312G-LTE-2C (C Series)	Industrial Secure Serial Router, **Dual Core,** 2GbE+1COM, 1 Relay 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region)
WR312G-LTE-2C (D Series)	Industrial Secure Serial Router, **Dual Core,** 2GbE+2COM, USB, 1 Relay 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region)
8GSD-preinstall	Industrial 8G SD card, pre-installed inside the housing
	The micro SD socket is reserved inside the housing, SD card can be pre-installed according to the order. Please contact our sales. *LTE-G/LTE-AU Cat.4 by MoQ request *GPS support for WR312G-LTE series by request

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: **WR312GR-LTE-2C**: 2 x LTE Antennas, Black **WR312GR-WLAN-2C**: 4 x Wi-Fi Antennas, White **WR322GR-WLAN+LTE-2C**: 2 x LTE Antennas, Black + 4 x Wi-Fi Antennas, White

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