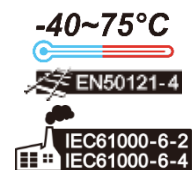


Secured and Rugged LTE Router for Vehicle and Railway

WR322A-M12 2C Series

Industrial Secure M12 Cellular IIoT Router

The ruggedized vibration-proof LTE WLAN router WR322A-M12 2C Series is designed for vehicle and railway with dual-radio high-speed LTE routing and 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 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 MQTT 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.



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 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
- Optional 4G LTE Cat.4 Global Band

Serial Communication & High Throughput Data Switching

- 1 port 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, Railway applications
- Effective heat dissipation design for operating in -40~70°C environments
- 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*

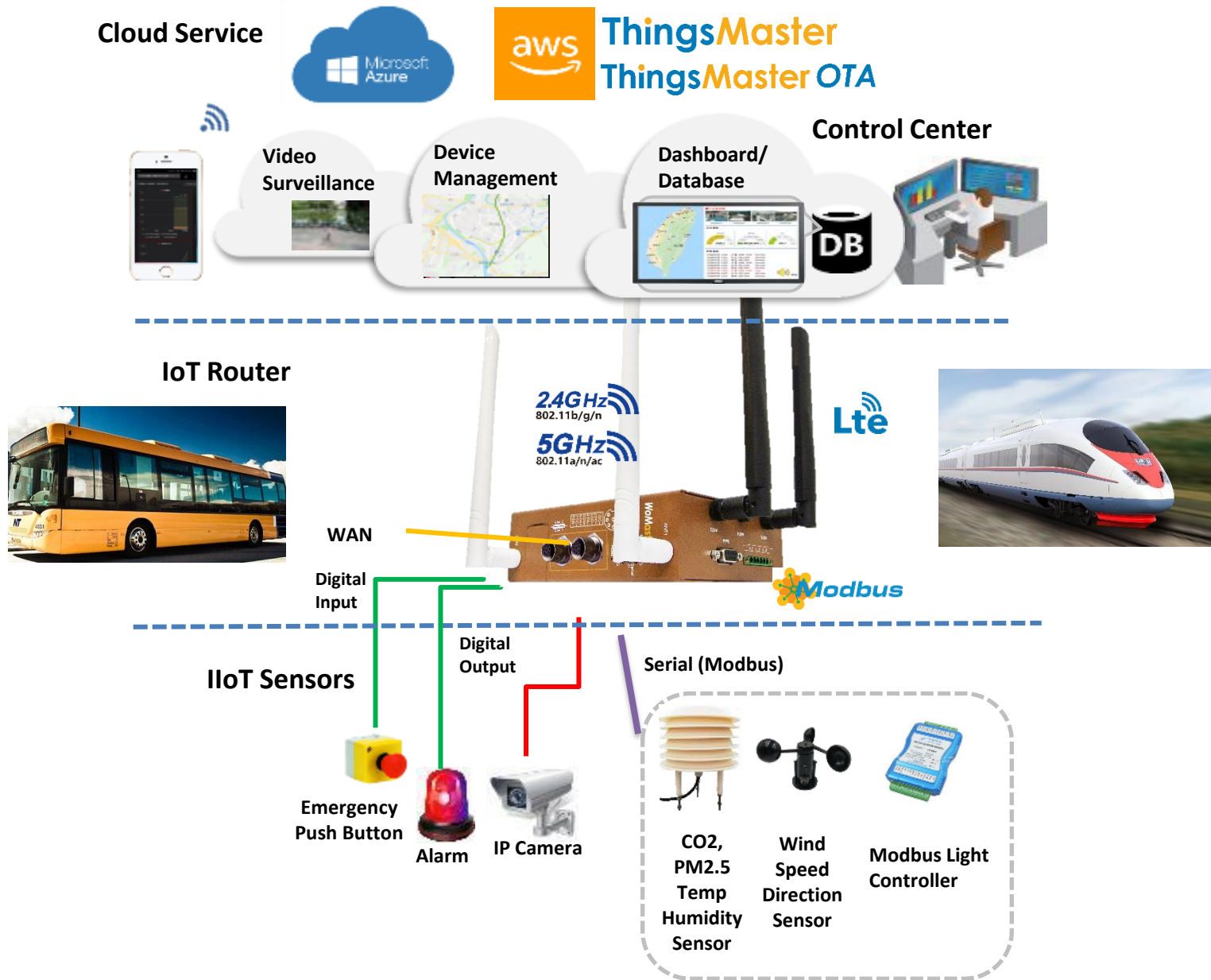
Industrial IoT LAN & Cloud Management

- 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 MQTT/CoAP protocol, ready to use AWS/Azure and Private Cloud Agent for cloud management
- LLDP* for topology control, auto-topology drawing
- Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log

*Future release/by project request



✓ Ready Total Solution for IoT



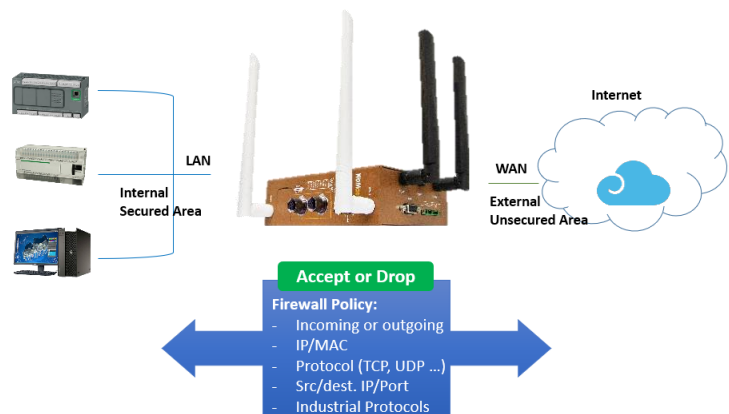
✓ Secured Remote Access by VPN

WR322A-M12 can act as a 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.



Secure IoT Modbus Tags

- Tag-based data acquisition with MQTT 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.



Modbus Logging

Enable
Name: // Tag Name
Serial:
Slave ID:
PLC Address:
Function: // Slave Address
Data Type:
 // Data Address, Register Address

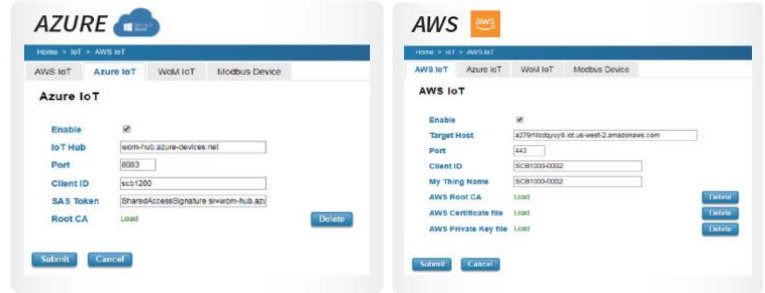
Modbus RTU Slave Tag List

| 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 | 25.490820 |

Secured Multi-sites Management

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

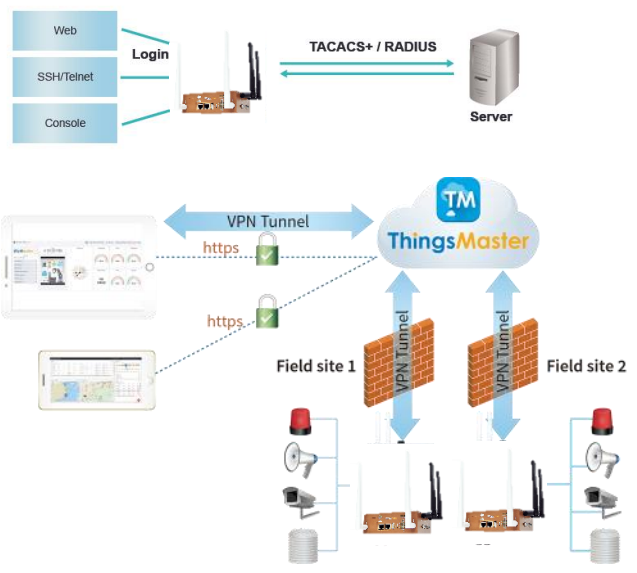
✓ Built-in Microsoft Azure and Amazon AWS agent



✓ Multi-Level User Passwords

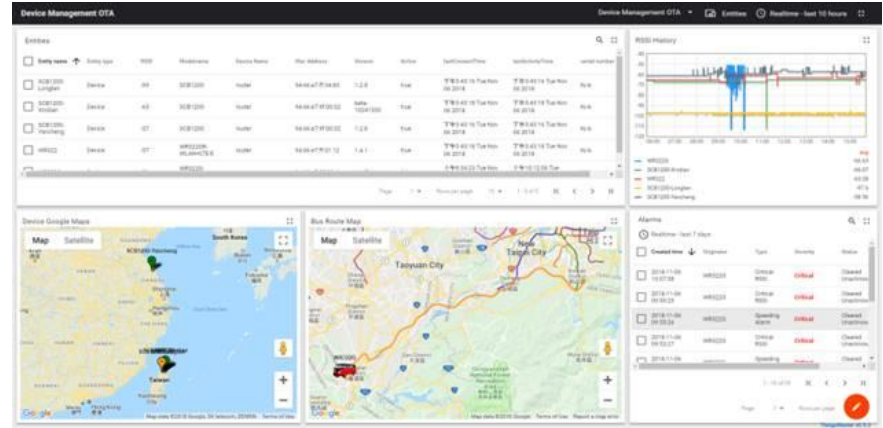
Different centralized authentication servers are supported such as RADIUS and TACACS+. Using a central authentication server simplifies account administration, when you have more than one switches in the network.

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.



✓ ThingsMaster OTA (device management over the air)

The OTA agent embedded in WR322A-M12 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

System LED

- 1 x Power
- 1 x System Status
- 1 x DO(Relay)
- 2 x Ethernet Port
- 1 or 2 x Serial Port (By Model)
- 3 x Radio LED (Ra~Rc)

| | WR322A-M12-WLAN+LTE 2C | WR322A-M12-WLAN+GPS+LTE-2C |
|-------|------------------------|----------------------------|
| Ant 1 | LTE-Main | LTE-Main |
| Ant 2 | LTE- Diversity | LTE- Diversity |
| Ant 3 | Wi-Fi 5 Main | Wi-Fi 5 Main |
| Ant 4 | Wi-Fi 4 Main | Wi-Fi 4 Main |
| Ant 5 | Wi-Fi 5 Div. | Wi-Fi 5 Div. |
| Ant 6 | Wi-Fi 4 Div. | GPS |

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

Gigabit Ethernet

- 2-port 10/100/1000M M12 A/X-code
- WAN + LAN configurable

SIM Card

- 2 x SIM



Integrated Power Connector

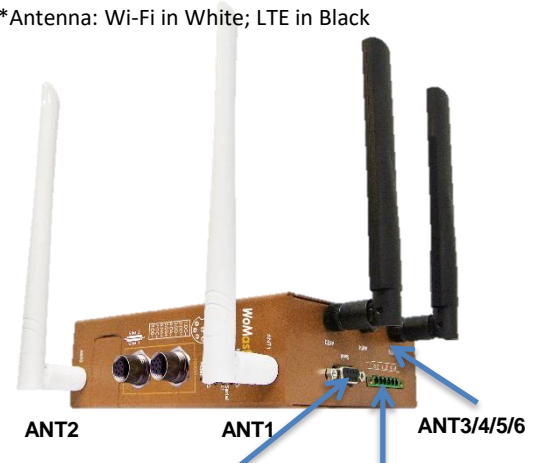
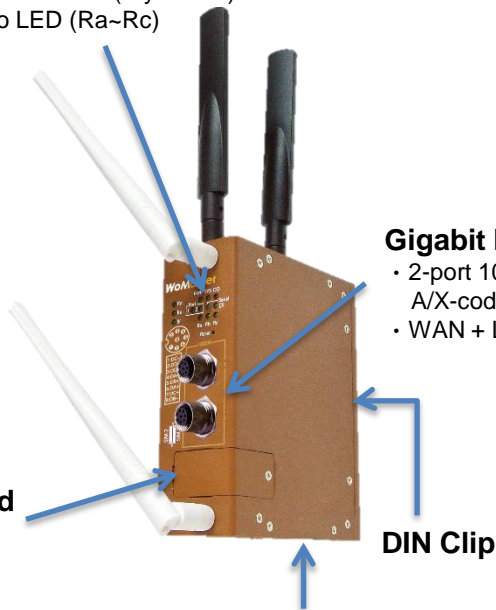
- M12 4 pin D-Code Male

DIN Clip

Serial Communication

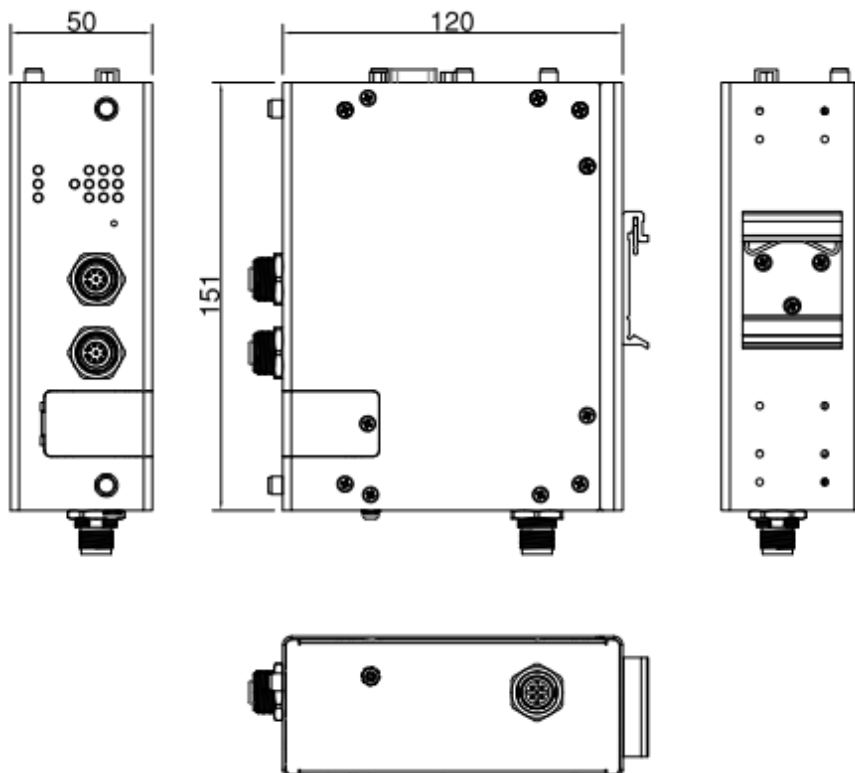
- RS232/422/485 Full functions
- DB9 female

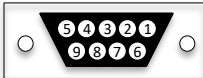

- 2xDigital Input
- 1xDigital Output
- *Optional Serial 2 by request.



Dimensions

(mm)



| 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 M12 A-code, Auto-Negotiation, Auto-MDI/MDIX (X-code by default) Pin Definition: 8 pin X-Code Female: #1 (D1+), #2 (D1-), #3 (D2+), #4 (D2-), #5 (D4+), #6 (D4-), #7 (D3-), #8 (D3+) 8 pin A-Code Female:#1 (D3-), #2 (D4+), #3 (D4-), #4 (D1-), (By Request) #5 (D2+), #6 (D1+), #7 (D3+), #8 (D2-) Cable: 1000 Base-T: 4-pair Cat.5E/Cat.6 FTP/STP cable, EIA/TIA 568B 100Ohm, 100Meters *Recommended uses FTP/STP cable for the railway on-board application | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 WR312A-M12-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 WR322A-M12-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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 WR312A-M12-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 WR322A-M12-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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reset | System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SMA Socket | WR312A-M12-LTE-2C: 2x SMA-Female: ANT1 for LTE Main, ANT2 for LTE Aux. WR322A-M12-WLAN+LTE-2C: LTE 2T2R: ANT1 for LTE Main, ANT2 for LTE Aux. 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MicroSD | Internal mSD socket can be pre-installed with SD card for field diagnostic data logging. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Serial | 1 x RS232/422/485, DB9 female | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <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 | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | M12 4 pin D-Code Male with polarity reverse protection Pin Definition: <table border="1"> <thead> <tr> <th>Pin</th> <th>DESC</th> </tr> </thead> <tbody> <tr><td>1</td><td>V1 +</td></tr> <tr><td>2</td><td>V2 +</td></tr> <tr><td>3</td><td>V2 -</td></tr> <tr><td>4</td><td>V1 -</td></tr> </tbody> </table>  | Pin | DESC | 1 | V1 + | 2 | V2 + | 3 | V2 - | 4 | V1 - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pin | DESC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | V1 + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | V2 + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | V2 - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | V1 - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power Requirement | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input Voltage | Typical 24VDC WR302G/WR312G-LTE-2C: 24V(9~55VDC) WR312G-WLAN-2C/WR322-WLAN+LTE-2C: 24V(9~36VDC) Note: The models with WLAN feature can support up to 36VDC. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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-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 |
| Wi-Fi Default Antenna | Dimension: 158x17.6xΦ13 mm |
| | 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 |

| Software | |
|---|--|
| Management | CCGI 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+, Multi-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, NATP(SNAT/DNAT), Port Forwarding, DMZ Firewall: Stateful Inspection firewall, IP/Port Filter 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, MQTT, 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 |
| 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 with Aluminum |
| Dimension | 50 x 151 x 120 mm(W x H x D) / without DIN Rail Clip |
| Ingress Protection | IP30 |
| Weight | WR312A: ~600g without package WR322A: ~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 40° 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 |
| 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.

*by request

| Model Name | Description |
|--|---|
| WR302A-M12-2C | Industrial Secure M12 IloT Router, Dual Core, 2GbE M12 X-code, 1COM+2DI+1DO, SD |
| WR312A-M12-LTE-(Region)-2C | Industrial Secure M12 Cellular IloT Router, Dual Core, 2GbE M12 X-code, 1COM+2DI+1DO, SD, 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region) |
| WR322A-M12-WLAN-2C | Industrial Secure M12 Cellular IloT Router, , Dual Core, 2GbE M12 X-code, 1COM+2DI+1DO, SD, 802.11ac + 11n Dual WLAN |
| WR322A-M12-WLAN+LTE-(Region)-2C | Industrial Secure M12 Cellular IloT Router, , Dual Core, 2GbE M12 X-code, 1COM+2DI+1DO, SD, 802.11ac + 11n Dual WLAN, 2SIM, LTE-EUX/ECGA/AU/G*(choose one by region) |
| WR322A-M12-WLAN+GPS+LTE-(Region)-2C | Industrial Secure M12 Cellular IloT Router, , Dual Core, 2GbE M12 X-code, 1COM+2DI+1DO, SD, 802.11ac + 11n 1T1R Dual WLAN, 2SIM, GPS, LTE-EUX/AU/G*(choose one by region) |
| 8GSD-preinstall | Industrial 8G SD card, pre-installed inside the housing |
| | <p>The micro SD socket is reserved inside the housing, SD card can be pre-installed according to the order. Please contact our sales.</p> <p>*LTE-G/LTE-AU Cat.4 by MoQ request</p> <p>*GPS support for WR312G-LTE series by request</p> <p>*M12 A-code Ethernet Port by Request</p> |
| | <p>Package List</p> <p>1 x Product Unit</p> <p>1 x 6-pin Removable Terminal Connector</p> <p>1 x Quick Installation Guide</p> <p>1 x Attached Din Clip</p> <p>Default Enclosed Antennas: WR312A-M12-LTE-2C: 2 x LTE Antennas, Black WR322A-M12-WLAN-2C: 4 x Wi-Fi Antennas, White WR322A-M12-WLAN+LTE-2C: 2 x LTE Antennas, Black + 4 x Wi-Fi Antennas, White</p> |
| LTE Band Info | |
| 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-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 |





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 |