

Industrial MESH WLAN 2.4G+5GHz 802.11ac Wave 2 AP/ Router with Add-On 5GNR/LTE6 Cellular



WA512GM-D/WA512GM-D-M2

The WA512GM-D adopts the latest MESH WiFi technology for the growing demands of the industrial WiFi network. The MESH WiFi features Self Organizing Network that can automatically select and link to different AP in mesh topology. The WA512GM-D significantly improves network coverage in isolated corners in large warehouses or automated factory with AGV. Thanks to the high-performance quad-core ARM processor, WA512GM-D can serve dual channels 5GHz IEEE 802.11ac Wave 2 and 2.4G 802.11n WLAN radio at the same time and delivers up to 866M+300Mbps high throughput.

5GNR or LTE6 cellular module can add on WA512GM-D-M2 for applications required high speed 5GNR or LTE6 cellular WAN network, Advanced cybersecurity features such as OpenVPN, IPSec, L2TP and GRE tunnel are supported. The industrial designs such as slim din-rail mounting, extended -40~70C operation temperature, and PoE power input integrate easily into IoT applications.



Features & Benefits

5GNR / LTE6 Cellular + Dual Bands Wireless LAN

- Quad-Core ARM Processor
- IEEE 802.11ac Wave 2, compatible with 802.11a/b/g/n
- Concurrent dual-band 2.4 G+5GHz radio, up to 866Mbps + 300Mbps Bandwidth
- Dual Gigabit Ethernet ports in Router mode for WLAN/LAN to Eth-WAN routing
- Dual 2.4G+5GHz Radio in One Antenna
- Optional Add-On 5GNR / LTE6 modules

Qualcomm® Wi-Fi SON Technology

- Self-Healing auto rerouting through multi-hop (up to 4 layers and 7 hops for optimum performance)
- Self-Configuring Plug-and-play via Wireless network with ViewMaster utility
- Easy MESH setup and Group MESH setup
- MESH Network Status Monitoring
- Autonomous performance optimization (802.11k)
- Interference management via band steering (802.11v)
- Seamless roaming
- Self-defending (Round-the-clock security)*

Enhanced Cyber Security & Redundancy

- Support Firewall for inbound/outbound traffic
- OpenVPN Server/Client and Key Generation
- IPsec VPN for secure remote connection
- IPsec Performance >150Mbps @256-bit encryption
- Support L2TP with PPP, PAP, CHAP(LCP, IPCP)
- Support GRE* tunnel
- HTTPs/SSH secure login
- Support TACACS+ multi-user authentication for privileged user management*

Management Features

- Various configuration paths, including Web GUI, Telnet, LAN Utility (ViewMaster) and NMS (NetMaster)
- Support First login password management
- Web GUI for Wireless LAN Setting, Radio On/Off, Band and Frequency selection, SSID/Multiple SSID, SSID Broadcast On/Off
- 1:1 NAT, port forwarding for local traffic protection
- Support SNMPv3 and entity-MIB (RFC4133), MIB II (RFC1213)
- NTP v3 time management
- Wireless Client Router mode for LAN to Wireless WAN NAT
- Up to 100ms Seamless Roaming

Cloud Management Service

- Support Amazon AWS & Microsoft Azure cloud service
- Support Private IoT cloud and proprietary ThingsMaster cloud service
- Interactive monitoring dashboard and map shows the status, signal strength*, location etc.

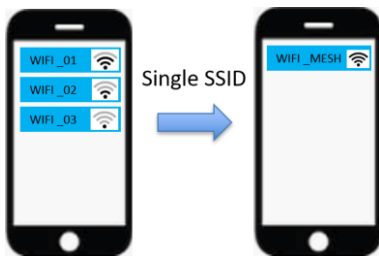
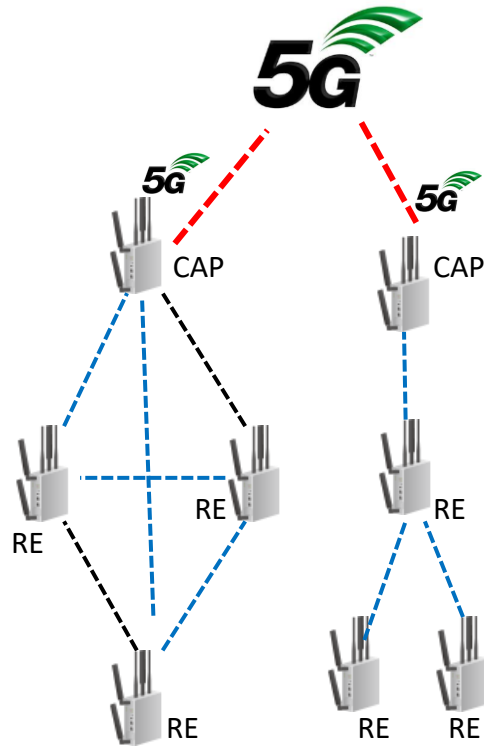
Slim & Rugged Design for Industrial IoT Application

- Slim size Din-Rail mounting design
- Dual radio in one antenna to save cost for antenna, RF cabling and space of the field cabinet
- Effective heat dissipation design for operating in -40~70°C environments
- Power Input 802.3af PD by Industrial PoE switch as a complete wire/wireless solution.
- 24VDC Power input with 9~50V range



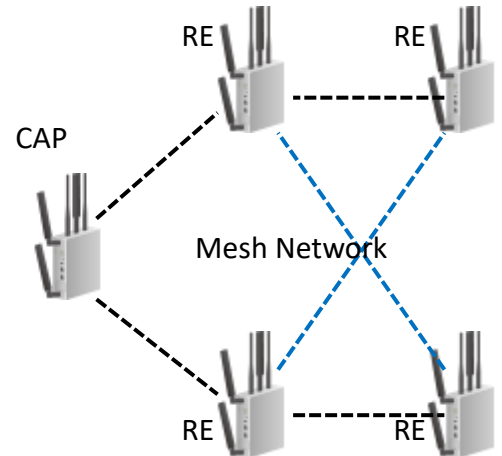
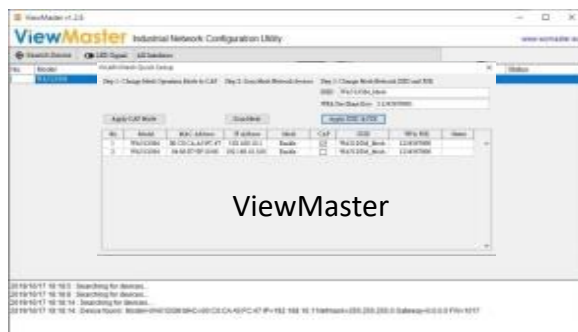
✓ Cellular 5G and MESH WiFi Dual Wireless

- Each Mesh AP communicates with each other to automatically find best path for packets transmission.
- CAP- Central AP with WAN connection
- RE- Range Extender connected to CAP directly or indirectly
- Single SSID for all CAP/RE for easy/fast roaming
- 1 CAP extends up to 7 Range extenders or up to 4 layers for minimum performance
- All devices can be configured as CAP or RE (by default)
- Hop Distance- Max 50M with default omni antenna
- Optional Directional Long-Range antenna for long distance up to 10KM



✓ Self-Configuring by ViewMaster Utility

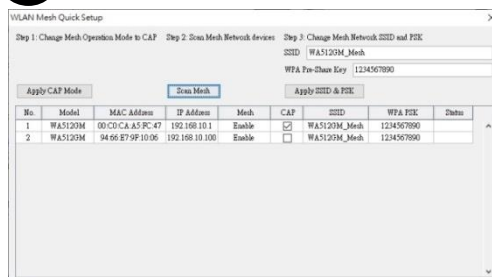
- Simple configuration with 3 steps
 1. Select a CAP (Central AP)
 2. Auto discovery RE (Range Extender)
 3. Group Mesh setting
- Group Mesh SSID and WPA PSK setting
- Mesh status (signal, channel, uplink) *



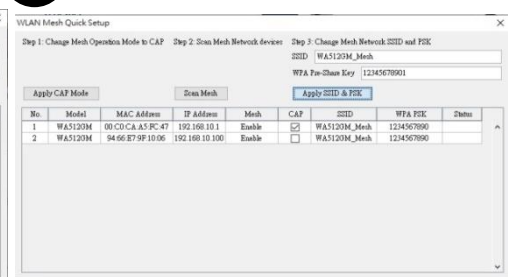
1 Select a CAP



2 Auto Discovery RE



3 Group Mesh Setting

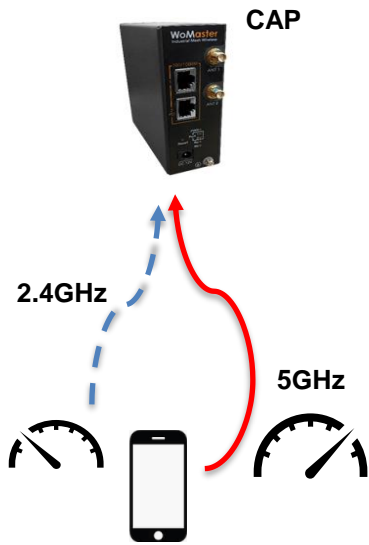




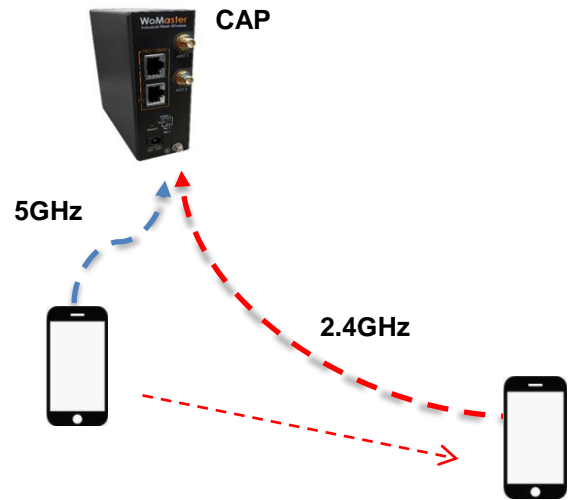
✓ Self-Organized Mesh Network

- 1. **Band Steering:** Auto select the best performance band and path.
- 2. **Concurrent 2.4G+5GHz:** AP offers concurrent services of 2.4GHz and 5GHz Bands for different clients with default omni antennas

- Performance degradation detected- Change uplink to 5GHz

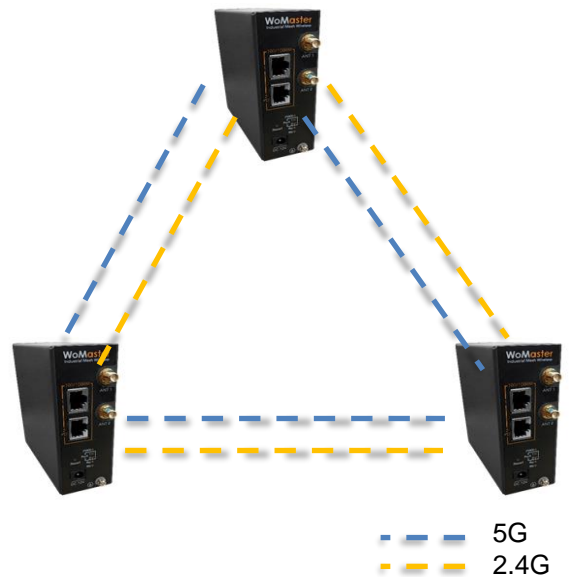
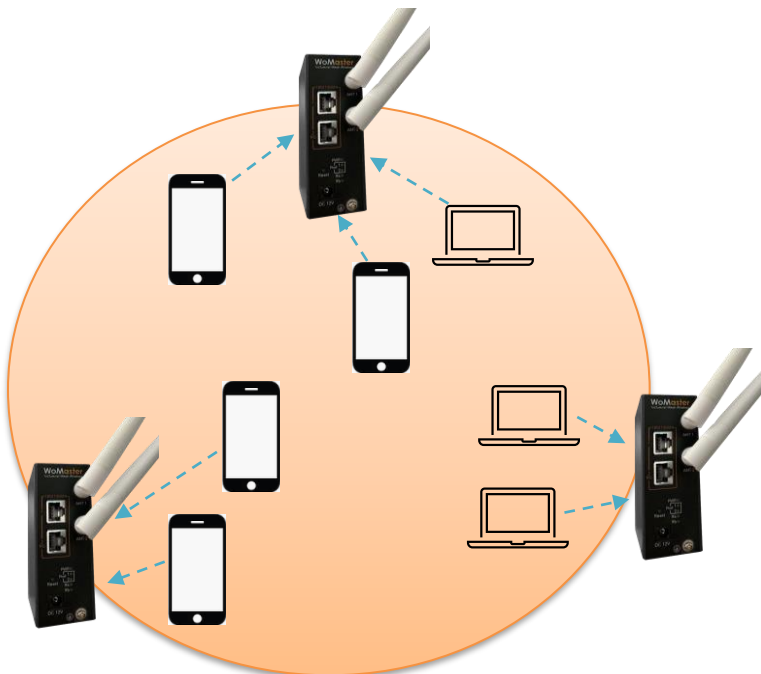


- Longer distance detected- Change uplink to 2.4GHz



3. **AP Steering:** the wireless devices are always connected in the best AP via 802.11v Wireless network management

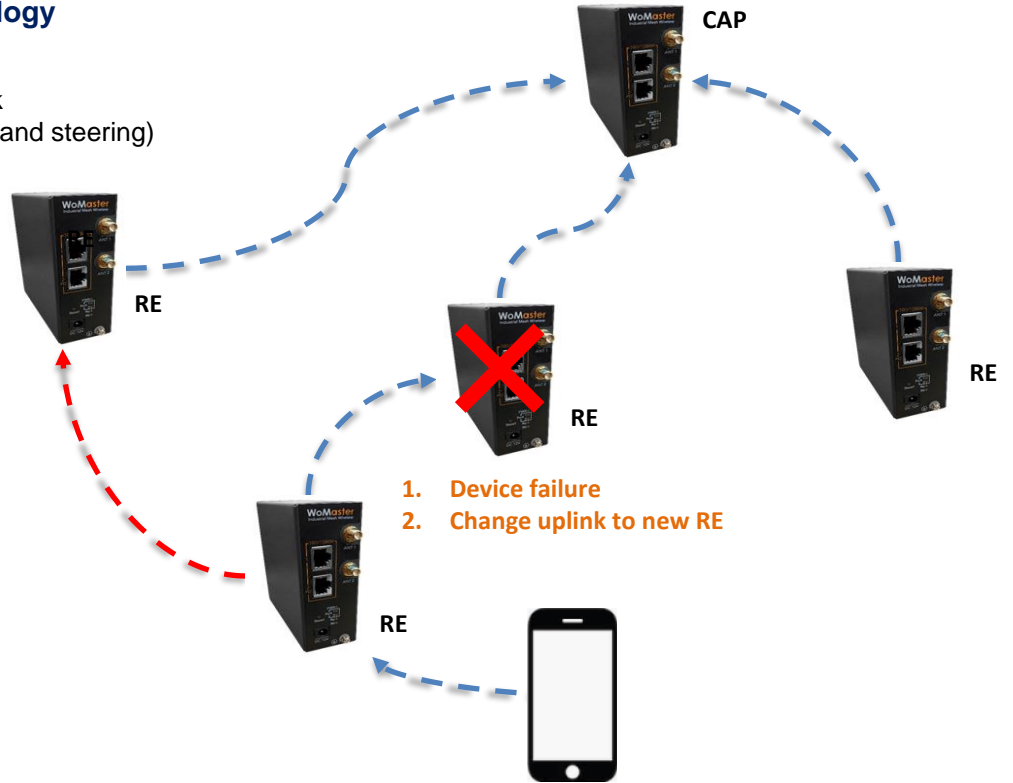
4. **Multiple Backhaul Links:** Failsafe and load-balancing backhaul links





✓ Self-Healing Mesh Technology

- Auto reroute when AP failed
- Eliminate network bottleneck
- Interference management (band steering)
- Airtime fairness
- Seamless roaming



✓ Seamless Roaming

- 802.11k (Radio Resource Measurement): Sends Clients list of neighbors.
- 802.11v (BSS Transition Management Frames): BSS Transition sends clients the new best AP.
- IEEE 1905.1: Enable AP auto-configuration and join the network with a unified security procedure.

1. Automatically find the optimal path by fewer hops/ less loading
 - b. 802.11k neighbor reporting
 - c. 802.11v Wireless network management
2. Change uplink to the new RE





Interfaces

WA512G-D WA512GM-D

GbE Ethernet 1

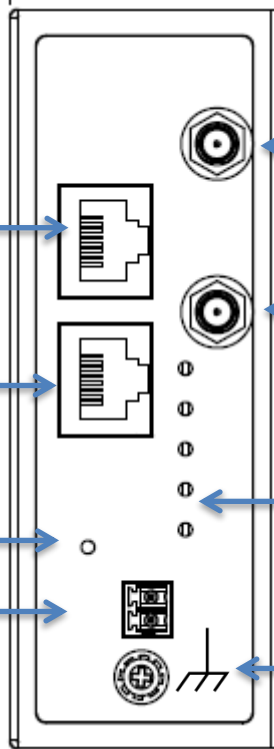
- 2-port 10/100/1000M RJ45
- WAN/LAN configurable

GbE Ethernet 2 /PD Input

- 802.3af PD PoE Ethernet
- 10/100/1000M RJ45

Reset to Default

DC Input Terminal block



Antenna 1

- 2.4G+5GHz Dual Concurrent Bands
- WLAN-Main

Antenna 2

- 2.4G+5GHz Dual Concurrent Bands
- WLAN-Diversity

| | WA512G-D |
|-------|------------------------------------|
| Ant 1 | WLAN-Main 2.4/5G Dual Band |
| Ant 2 | WLAN-Diversity 2.4/5G Dual Band |

DIN Clip /Back

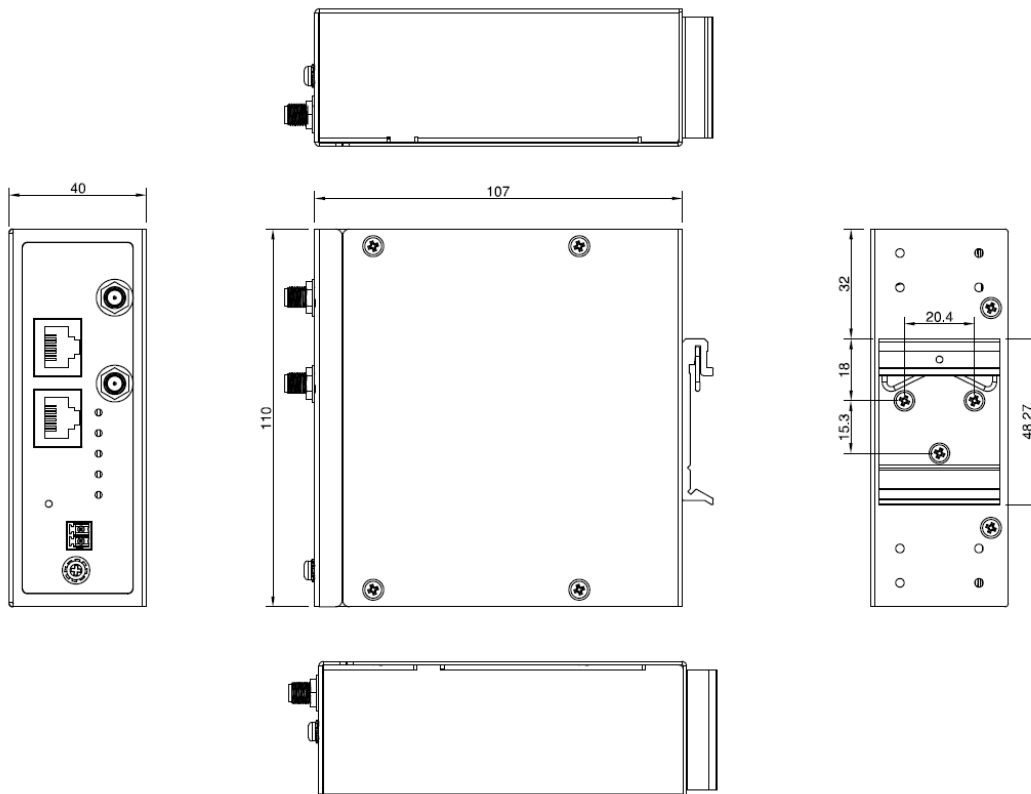
System LED

- 1 x Power
- 2 x Ethernet Port
- 2 x Radio LED (Ra/Rb)

Chassis Ground



Dimensions



(mm)



Interfaces

WA512G-D-M2 WA512GM-D-M2

GbE Ethernet 1

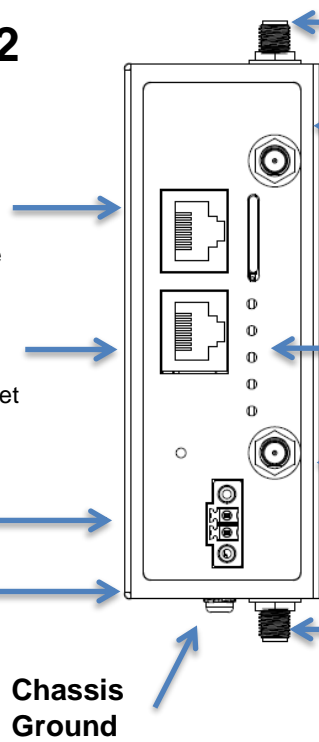
- 2-port 10/100/1000M RJ45
- WAN/LAN configurable

GbE Ethernet 2 /PD Input

- 802.3af PD PoE Ethernet
- 10/100/1000M RJ45

Reset to Default

DC Input Terminal block



5G NR Antenna-Main x2

Antenna 1

- 2.4G+5GHz Dual Concurrent Bands
- WLAN-Main

Dual SIM

System LED

- 1 x Power
- 2 x Ethernet Port
- 1 x Radio LED Ra WLAN
- 1 x Radio LED Ra Cellular

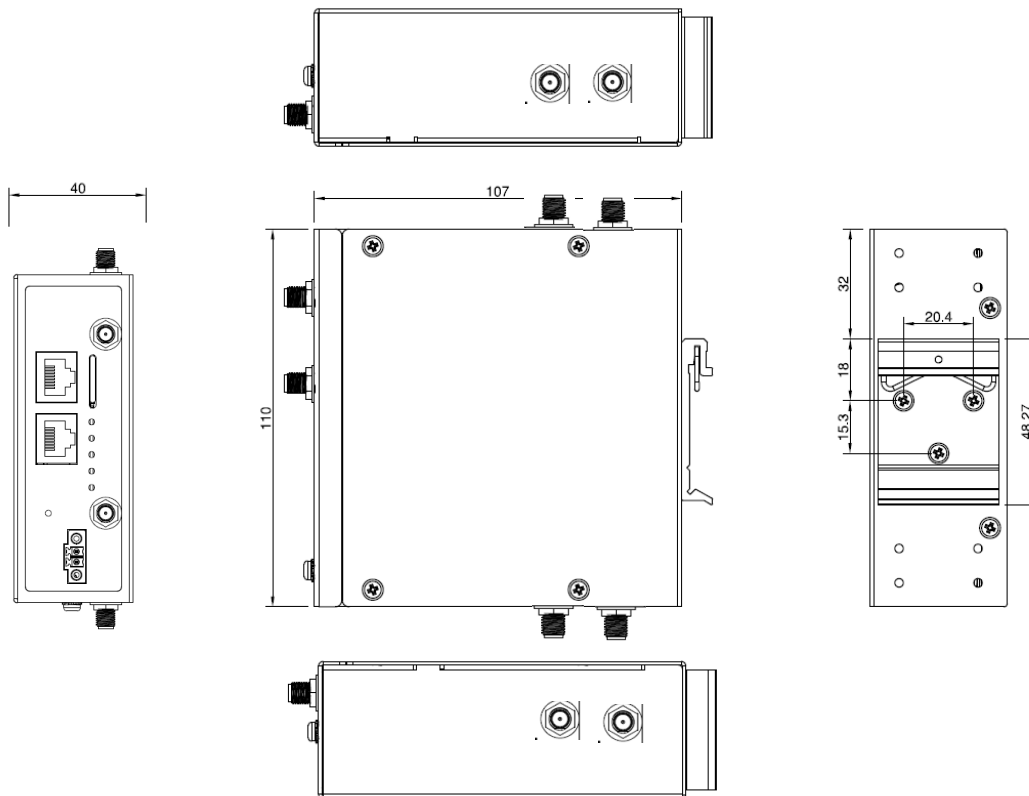
Antenna 2

- 2.4G+5GHz Dual Concurrent Bands
- WLAN-Diversity

5G NR Antenna -Div. x2



Dimensions



(mm)

| Technology | |
|---|--|
| Standard | 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 |
| | IEEE 802.3af PoE |
| Interface | |
| Ethernet Port | 2 x 10/100/1000MBase-T RJ45, Auto Negotiation, Auto-MDI/MDIX 1x802.3af PD compliant, Bridge/Router mode Bridge Mode: 1: LAN, 2/PD: LAN, Router Mode: 1: LAN, 2/PD: WAN |
| System LED | 1x PWR: Green On 2 x Ethernet Ports: Link: Green On, Activity: Green Blinking RF LED in AP/Client mode: 1x Ra (2.4GHz): AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off 1x Rb (5GHz): AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off RF LED in Mesh mode: (WA512GM Series) 1x Ra: Mesh Status: Green On: Uplink existing (for both CAP/RE), Green Blinking: no uplink 1x Rb: Mesh Signal Status: Green ON: signal strong, Green Blinking: signal weak, Off: signal low (need to change position) CAP(Central AP): With connection to internet through Ethernet RE(Range Extender): mesh node with mesh uplink through wireless RF LED in WA512GM-D-M2 Series: 1x Ra: WLAN Dual WLAN 2.4GHz + 5GHz: Green ON Single WLAN 2.4GHz or 5GHz: Green Blinking Disable: Off 1x Rb: Cellular Cellular Turn On/Capable of Transmitting: Green ON Cellular Turn Off/Incapable of Transmitting: OFF |
| Reset | System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds) |
| SMA Socket | 2x RP-SMA Female for WLAN: Dual 2.4G+5GHz Radio in One Antenna 4x SMA Female for Expansion Module (WA512GM-D-M2 Series) |
| SIM Socket | 2x Nano SIM tray, fool-proof (WA512GM-D-M2 Series) |
| Power Input | Typical 24VDC (9~50VDC) , 2-pin Terminal block Or 802.3af PD for WLAN model only |
| WLAN Properties | |
| Processor | Quad-Core CPU, 4x ARM Cortex A7 at 716.8MHz |
| Standard | Dual Band 2x2 2.4GHz 802.11n + 2x2 5GHz 802.11ac Radio IEEE 802.11ac/a/b/g/n wave2 MU-MIMO 802.11ac: 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, 2.4GHz: 2.412GHz ~ 2.472GHz 5GHz: 5.180MHz ~ 5.240MHz, 5.745 ~ 5.825MHz(CE: Band 1, FCC: Band 1, 4) 802.11ac 80MHz@5210MHz/5770MHz 2x SMA connector for simultaneous dual bands concurrent |
| MIMO | 2.4/5GHz: 2T2R MU-MIMO DBDC (Dual Band Dual Concurrent) |
| Max. E.I.R.P. | ≤20db@2.4G, ≤23db@5G B1, compliant with CE request |
| WLAN Antenna | |
| WLAN Default Antenna A-WLAN-3-RSM | Frequency: 2400~2500/ 4900~5900 MHz |
| | Peak Gain: 2.4GHz: 1.92dBi@2450MHz, 5GHz: 3.4dBi@5150MHz |
| | Direction: Omni |
| | Connector: RP SMA Male |
| | Dimension: 196xΦ13 mm |

Expansion 5G NR M2 (WA512GM-D-M2 + WM-5GNR/LTE6)

| | |
|--------------------------------------|--|
| Standard | 5G/4G/3G Multi-mode, 3GPP Rel.15 5G NSA and SA mode LTE Cat.16 3G HSPA+ |
| WM-5GNR-M2Q-E Frequency Bands | 5G NR n1/n2/n3/n5/n7/n8/n12/n20/n28/n40/n41/n48/n66/n71/n77/n78/n79 LTE FDD B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71 LTE TDD B34/B38/39/B40/B41/B42/B48 LAA B46 WCDMA B1/B2/B3/B4/B5/B6/B8/B19 GNSS GP/GLONASS/BeiDou(Compass)/Galileo |
| 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: 1575.42/1176.45 MHz GLONASS: 1597.5~1605.8 MHz BeiDou: 1561.098±2.046 MHz |

Expansion 4G LTE Cat.6 M2 Module (WA512GM-D-M2 + WM-5GNR/LTE6)

| | |
|--------------------------------|---|
| Standard | UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 12 (LTE Cat.6) |
| Data Rate | TD-SCDMA: DL Max 4.2Mbps, UL: Max 2.2Mbps HSPA: DL: Max. 42 Mbps, UL: Max. 5.76 Mbps WCDMA: DL: Max 384Kbps, UL: Max 384Kbps LTE-FDD: DL: Max. 300 Mbps, UL: Max. 50 Mbps, 2x2 DL MIMO LTE-TDD: DL: Max. 226 Mbps, UL: Max. 28 Mbps, 2x2 DL MIMO |
| Band Information: LTE-E | LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 (*B32 for receiving only...) LTE-TDD: B38/B40/B41 2xCA: B1+ B1/B5/B8/B20/B28; B3 + B3/B5/B7/B8/B20/B28; B7 + B5/B7/B8/B20/B28; B20+B32, B38+B38, B40+B40, B41+B41 WCDMA: B1/B3/B5/B8 GNSS: GPS/GLONASS/BeiDou(Compass)/Galileo/QZSS(Optional) |
| Band Information: LTE-U | LTE-FDD: B2/B4/B5/B7/B12/B13/B17/B25/B26/B29/B30/B66 (*B29 for receiving only...) LTE-TDD: B41 2xCA: B2+ B2/B5/B12/B13/B29; B4 + B4/B5/B12/B13/B29; B7 + B5/B7/B12/B26; B30+B5/B12/B29, B66+B5/B12/B13/B29/B66 WCDMA: B2/B4/B5 GNSS: GPS/GLONASS/BeiDou(Compass)/Galileo/QZSS(Optional) |

Cellular Antenna (WA512GM-D-M2 + WM-5GNR/LTE6)




| | |
|--|--|
| Cellular 5G NR Default Antenna | Frequency: 700~5000 MHz |
| | Gain: 4.12dBi @ 3500MHz 690~960MHz: 0.73~3.04dBi, 1700~1900MHz: 2.2~3.11dBi, 3300~3800MHz: 4.12~5.95dBi, 4000~5000MHz: 3.16~5.97dBi |
| | Direction: Omni |
| | Connector: SMA Male |
| Cellular 4G LTE Default Antenna | Dimension: 220x27mmΦ13mm |
| | Frequency: 704~960/1710~2690 MHz |
| | Gain: 2 dBi |
| | Direction: Omni |
| | Connector: SMA Male |
| | Dimension: 161xΦ13 mm |

| Software | |
|--|---|
| Management | CGI WebGUI, Command Line Interface (CLI)*, IPv4/IPv6*, Telnet, SNMP v1/v2c/v3, DDNS*, DHCP server/client, DHCP Relay*, TFTP, FTP(active/passive)*, System Log, SMTP*, Proxy ARP*, DNS (client/proxy) , PPPOE* |
| MESH Wi-Fi | Qualcomm® Wi-Fi SON Technology, Self-healing by auto rerouting through multi-hop, Self-configuring Plug-and-play via ViewMaster, Mesh SSID/WPA PSK Mesh Network Status/Monitor (signal/channel/uplink) |
| Traffic Management | Traffic shaping, Flow Control* |
| 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 |
| WAN/Routing/NAT/Firewall/VPN | Routing: RIPv2, OSPFv2, VRRPv2* NAT: 1-1 NAT, NATP(SNAT/DNAT), Port Forwarding, DMZ Firewall: Stateful Inspection firewall, DMZ, IP/Port Filter, MAC ACL* VPN: IPSec, OpenVPN, L2TP, PPTP*, GRE*, >150Mbps IPSec Performance @256-bit encryption, DMVPN*, NHRP*, mGRE* Wireless WAN for LAN to Wireless WAN NAT |
| Seamless Roaming | Up to 100ms |
| IIoT Industrial Protocol | MQTTs, CoAP*, RESTful API* |
| Private Cloud | ThingsMaster, ThingMaster OTA |
| Public Cloud | AWS Agent, Azure Agent |
| MIB | MIB-II, Entity MIB*, WoMaster Private MIB |
| Utility | ViewMaster, NetMaster, Ping, Traceroute |
| WLAN Configuration | WLAN Basic Settings: Radio on/off, 2.4G 11n/5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast and advanced WLAN settings |
| Cellular Configuration (WA512GM-D-M2 + WM-5GNR/LTE6) | Radio on/off, Cellular Mode Setup, Dual SIM, SIM Security, Connection Status, GPS positioning*, Cellular Time, Cellular to WAN Redundancy Cellular Mode: NR5G/NR5G NSA/LTE Only/3G/Auto |
| Power Requirement | |
| Input Voltage | Terminal Block : Typical: 24VDC, Range: 9.6~50VDC 802.3af PD: 44~57VDC (For WLAN models only) |
| Power Consumption | Max. 12W/48VDC Normal load Max. 20W/24VDC with expansion 5GNR module (WA512GM-D-M2 Series) |
| Mechanical | |
| Installation | DIN Rail |
| Enclosure Material | Steel Metal |
| Dimension | 40 x 110 x 107 mm(W x H x D) / without DIN Rail Clip |
| Ingress Protection | IP30 |
| Weight | 660g |
| Environmental | |
| Operating Temperature & Humidity | -40°C~70°C (PD mode) 5%~95% Non- Condensing Note: Power the device by Industrial PoE Switch for high temperature environment. |
| Storage Temperature | -40°C~85°C |
| MTBF | >200,000 hours at 40° full cycle |
| Warranty | 3 years |
| Approval | |
| CE | CE RED Compliance EN 55032/55035/EN61000-3-2/EN61000-3-3 EN 301 489-1/17 EN 300 328 EN 301 893: B1 EN 62311 MPE |
| FCC | FCC Part 15C (15.247) FCC Part 15E (15.407): B1,B4 CFR 2.1091, FCC Part 15B |
| Safety | IEC/EN 62368-1, UL62368-1 |



| Model Name | Description |
|--------------------------|--|
| WA512GM-D | Industrial 802.11ac Din-Rail Dual Radio 2.4+5GHz Concurrent Wireless Mesh AP, 802.11ac Wave 2 +802.11b/g/n WLAN, 2GE, Din-Rail, 24VDC Terminal Block |
| WA512G-D | Industrial 802.11ac Din-Rail Dual Radio 2.4+5GHz Concurrent Wireless AP/Client, 802.11ac Wave 2 +802.11b/g/n WLAN, 2GE, Din-Rail, 24VDC Terminal Block |
| WA512G-D-M2 | Industrial Din-Rail Wireless Router with M2 expansion slot, 802.11ac Wave 2+802.11b/g/n WLAN MESH, 2GE, 2SIM, M2+4SMA, 24VDC |
| WA512GM-D-M2 | Industrial Din-Rail Wireless Router with M2 expansion slot, 802.11ac Wave 2+802.11b/g/n WLAN MESH, 2GE, 2SIM, M2+4SMA, 24VDC |
| | Package List |
| | 1 x Product Unit |
| | 2 x WLAN Antenna, White A-WLAN-3-RSM |
| | 1 x Quick Installation Guide |
| | 1 x Attached Din Clip |
| Cellular Module | |
| WM-5GMR-M2Q-E Kit | Wireless 5GMR M2 Module Kit, 5GMR Module, Heat Pad, 4xAntennas, Screws, QIG, EU Bands |
| WM-LTE6-M2Q-E Kit | Wireless LTE Cat6 M2 Module kit, LTE Cat6 Module, Heat Pad, 2xAntennas, Screws, QIG, EU Bands |

| Outdoor Model | Description |
|-----------------------|---|
| WA512G-IP67-U | Industrial Dual Radio 2.4G +5GHz Concurrent Wireless AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, US-plug |
| WA512G-IP67-E | Industrial Dual Radio 2.4G +5GHz Concurrent Wireless AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, EU-plug |
| WA512GM-IP67-U | Industrial Dual Radio 2.4+5GHz Concurrent Wireless MESH AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, US-plug |
| WA512GM-IP67-E | Industrial Dual Radio 2.4+5GHz Concurrent Wireless MESH AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, EU-plug |

| WA512G/ WA512GM-IP67 | WA512G-D/ WA512GM-D | WA512G-D/ WA512GM-D-M2 |
|---|---|---|
|  |  |  |
| 269 x 239 x 68mm (W x H x D) IP67 Enclosure | 40 x 110 x 107 mm(W x H x D) Din-Rail Mount | 40 x 110 x 107 mm(W x H x D) Din-Rail Mount |





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 |