World First IP67 Wireless 2.4G+5GHz MESH AP/Router

WA512GM-IP67

Industrial Waterproof IP67 2.4G+5GHz 802.1ac Wave 2 Mesh WLAN AP/Router

The WA512GM-IP67 is the first Industrial waterproof IP67 WiFi AP / Router in the world to adopt the latest MESH WiFi technology for the growing demands of the industrial WiFi network. The MESH WiFi features Self Organizing Network that automatically selects and links different wireless networking devices together by the mesh topology. The WA512GM-IP67 significantly improves network coverage in different corners in an industrial field environment with advanced security. Equipped with a high-performance quad-core ARM processor, it can serve dual channels 5GHz IEEE 802.11ac Wave 2 and 2.4G 802.11n WLAN radio at the same time and reaches up to 866M+300Mbps high throughput. Advanced cybersecurity features such as OpenVPN, IPSec, L2TP and GRE tunnel are supported. The waterproof IP67 protection grade for -40~70C wide operation temperature and PoE power input can be integrated easily into IoT applications.

5G 802.11ac/n   **2.4G** 802.11b/g/n   **MESH**   **IP67**   amazon web services   Microsoft Azure   MQTT

ViewMaster
NetMaster

Features & Benefits

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

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
- Client Based Fast Roaming Up to 100ms
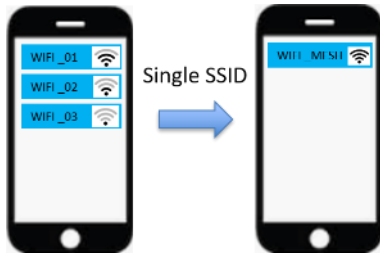
Cloud Management Service
- Support Amazon AWS & Microsoft Azure cloud service
- Support Private IoT cloud and proprietary ThingsMaster cloud service
- Interactive monitoring dashboard and map shows the status, signal strength*, location etc.
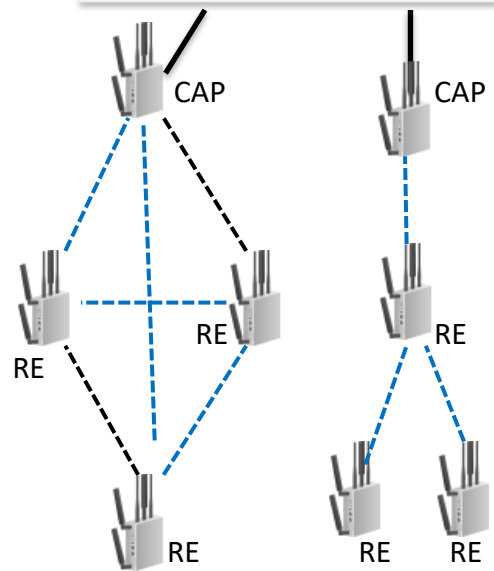
Industrial IoT Application
・Waterproof IP67 Production Design
・Effective heat dissipation design for operating in -40~70°C environments
・Power Input 802.3af PD by Industrial PoE switch as a complete wire/wireless solution.

Features & Benefits

✓ MESH WiFi Structure

- 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 seamless 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
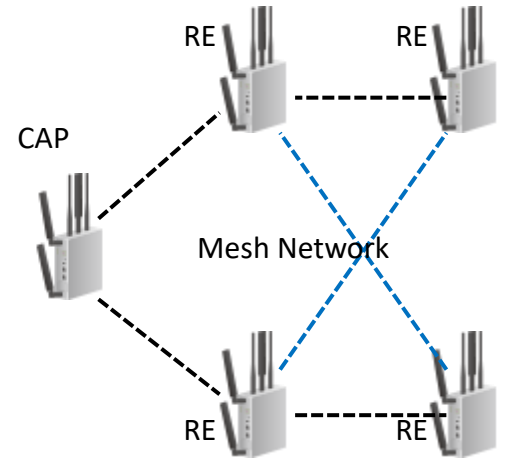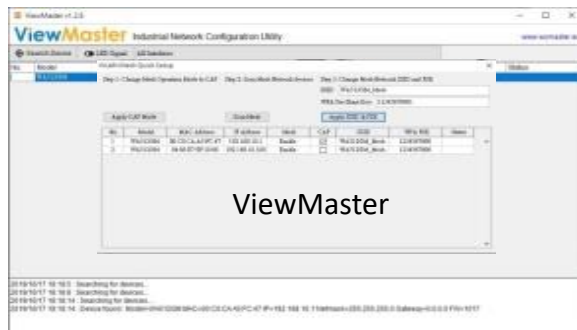- Optional Directional Long-Range antenna for long distance up to 10KM

Wireless Plant Network

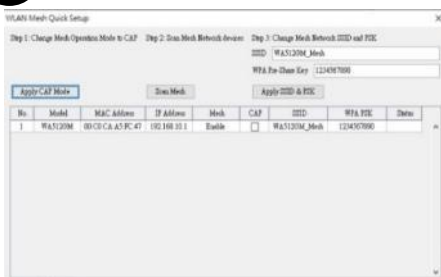## ✓ Self-Configuring by ViewMaster Utility

- 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
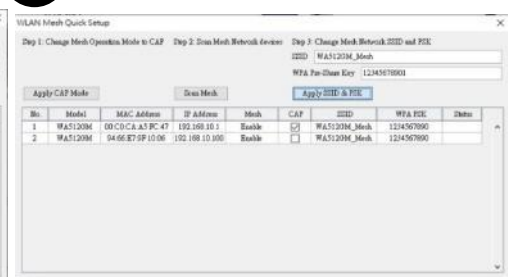- Mesh status (signal, channel, uplink) *

ViewMaster

Mesh Network

1 Select a CAP

2 Auto Discovery RE
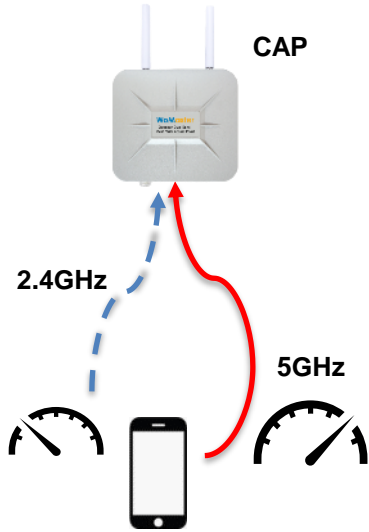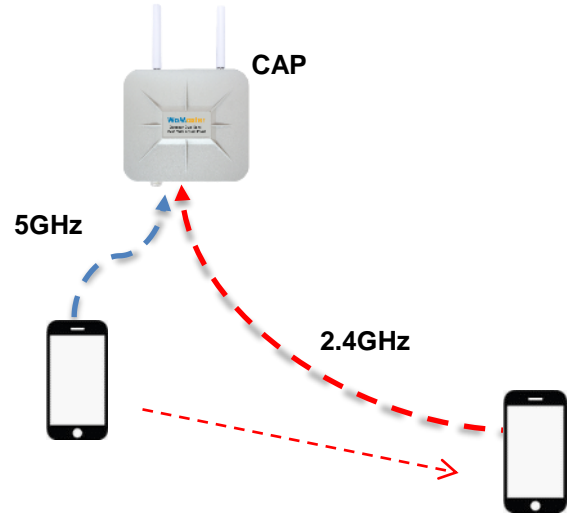

3 Group Mesh Setting

✓ **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
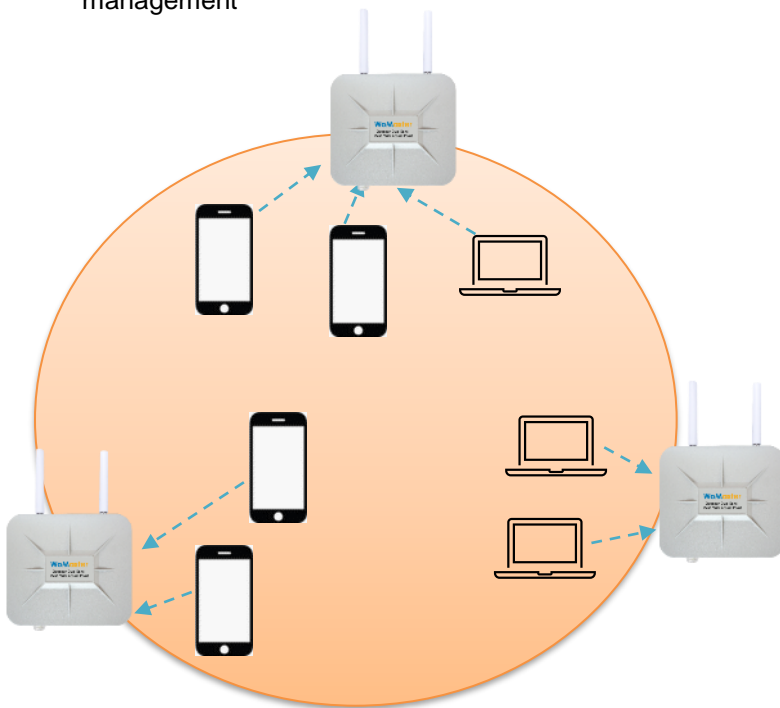
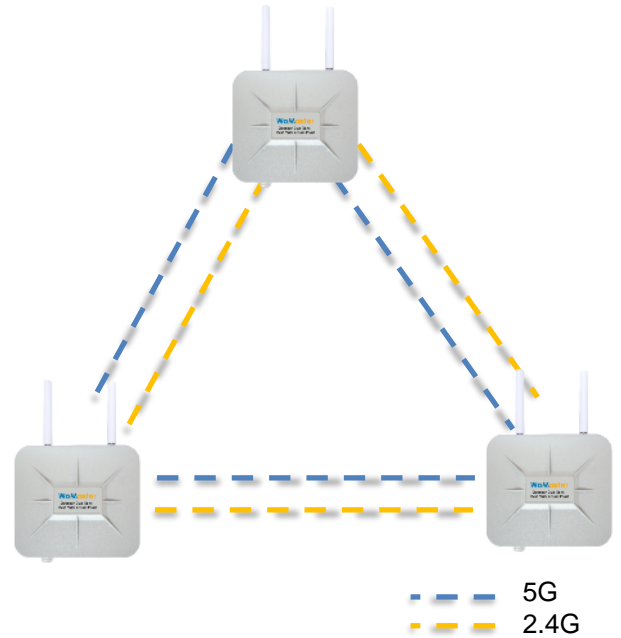• Performance degradation detected- Change uplink to 5GHz

• 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
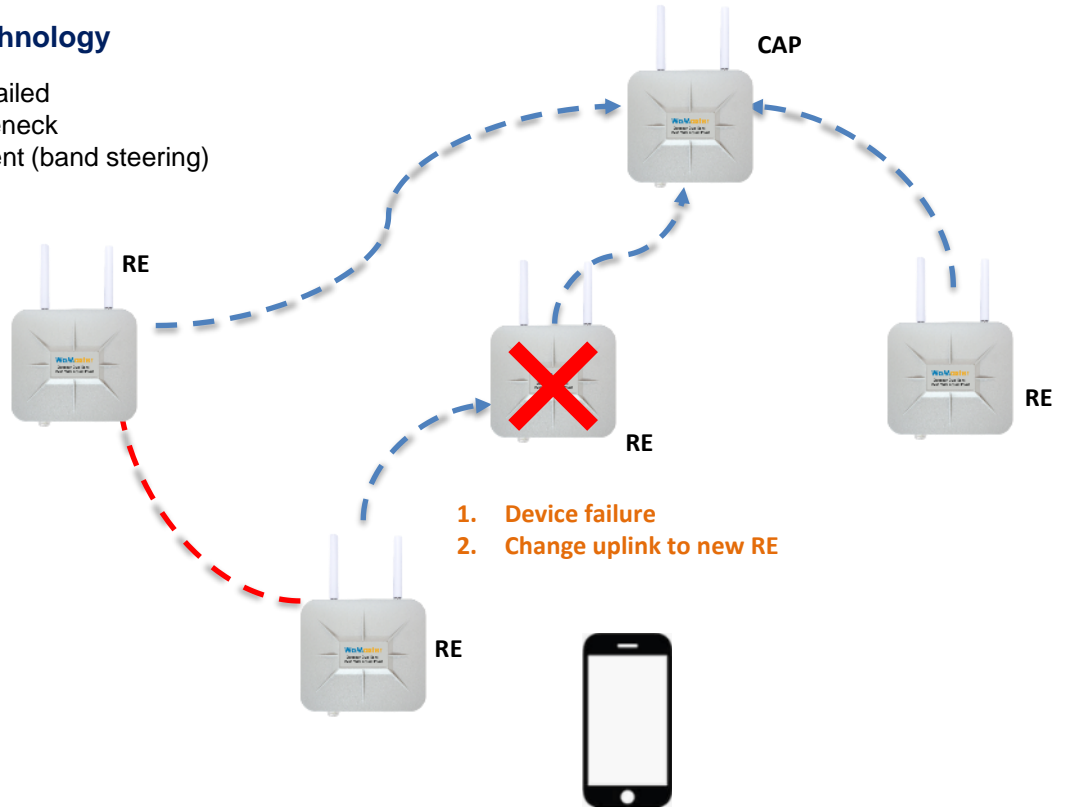

4. **Multiple Backhaul Links:** Failsafe and load-balancing backhaul links
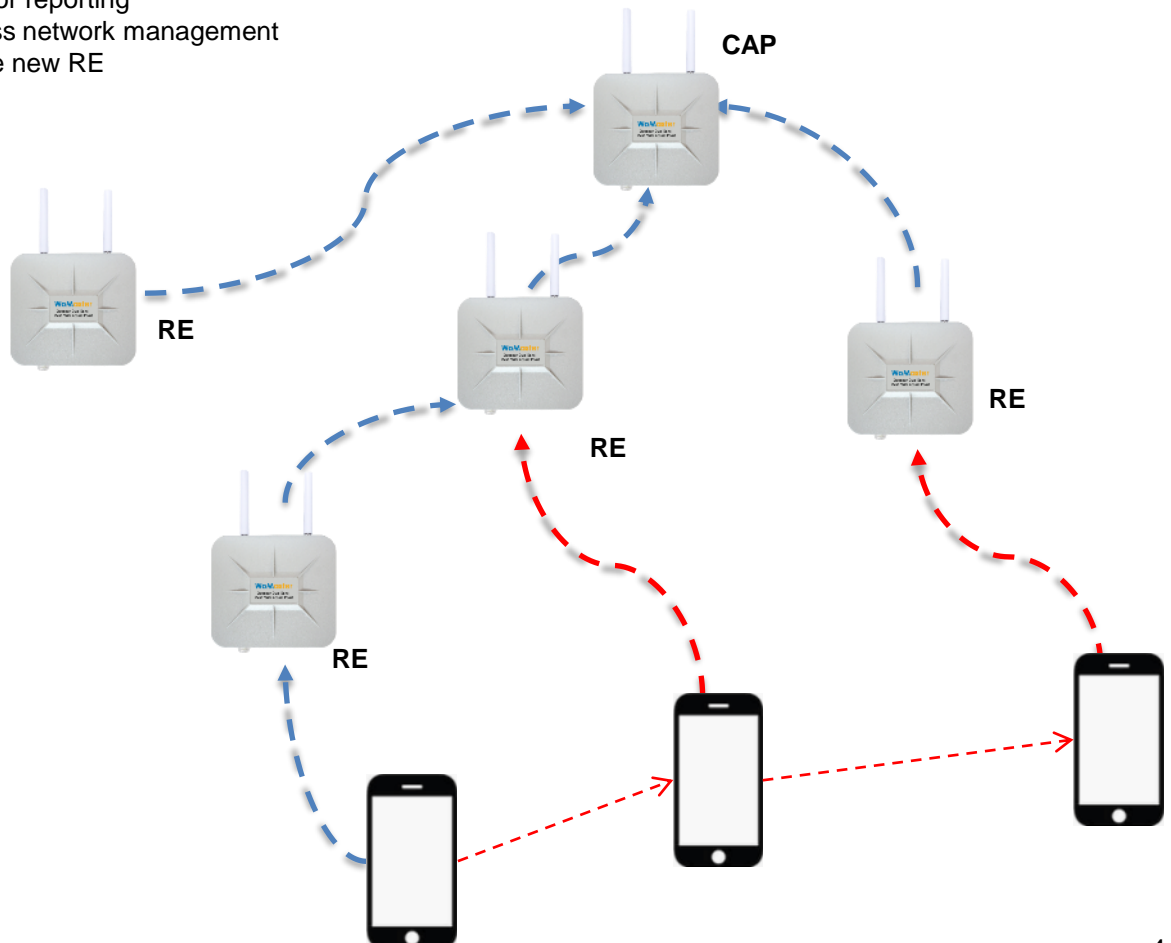
✓ Self-Healing Mesh Technology

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

1. **Device failure**
2. **Change uplink to new RE**

✓ MESH 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

N-Type Antenna
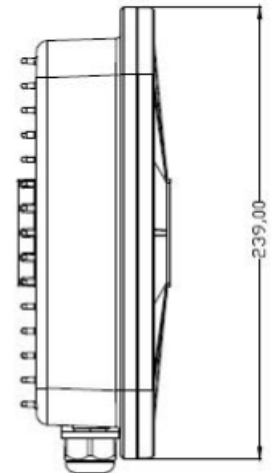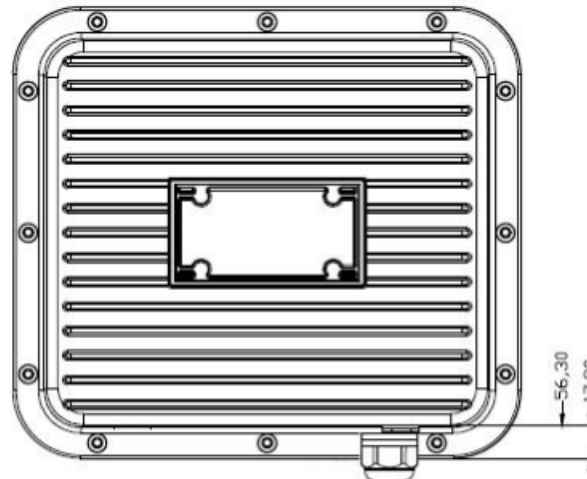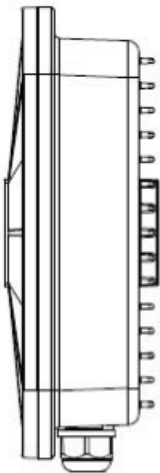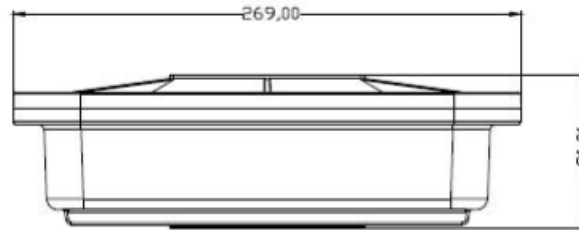· 2x N-type

IP67 Housing

System LED and Reset Button

Vent

USB Extension
· Reserved for external device

Gigabit Ethernet
· IEEE 802.3af P.D.

Gigabit Ethernet

Dimensions

(mm)

269,00

91,01

56,30

17,90

239,00

⚙ Specifications

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	1x 10/100/1000Base-T Gigabit WAN PoE (P.D.) port, RJ45 water-proof cable gland 1x 10/100/1000Base-T Gigabit LAN, RJ45 water-proof cable gland
System LED + Reset	Water-proof cable gland, with 1x Power 1x 2.4G 1x 5G 1x Reset button
SMA Socket	2x N-type female
USB	1x USB, type A water-proof cable gland
Power Input	802.3af PD

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.	$\leq$20db@2.4G, $\leq$23db@5G B1, compliant with CE request

Power Requirement	
Input Voltage	IEEE 802.3af PD Powered Device
Power Consumption	9W full traffic, suggest to reserve 15% tolerance

Antenna	
WLAN Waterproof Antenna A-WLAN-6-NM	**Frequency:** 2400~2500/ 5150~5850 MHz
	Peak Gain(max.): 2.4GHz: 4.35 dBi, 5GHz: 8.16dBi@Band 1, 6.87dBi@Band 4
	Direction: Omni
	Connector: N Type Male
	Dimension: 187xΦ20 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+*, Mutli-user authentication
Time Management	NTP, SNTP
WAN/Routing/NAT/Firewall/ VPN	Routing: RIPv2, OSPFv2, VRRPv2* NAT: 1-1 NAT, NAPT(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
Client Based Fast Roaming	Up to 100ms
IEEE 802.11r*	Fast BSS Transition (FT)*
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

Mechanical

Installation	Ceiling/Wall/Pole mount
Enclosure Material	Steel Metal
Dimension	239mm(H) x 269mm(H) x 68mm(D)
Ingress Protection	IP67
Weight	≒2.4Kg

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 40º full cycle
Warranty	1 years
Attached PoE Injector	Input: 90~264Vac, 47~63Hz, Max. 0.55A Output: Passive 48V, 500mA (RJ45 Output Pin 4/5: V+, Pin 7/8: V-) Operating Temperature: 0~40°C Storage Temperature: -20~85°C

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

*By Request

Ordering Information

Model Name	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
	Package List
	1x Product Unit
	1x Quick Installation Guide
	2 x WLAN Outdoor Antenna A-WLAN-6-NM
	1x PoE Injector
	1x Mounting kit

Din-Rail Model	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 TB
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 TB

WA512G/ WA512GM-IP67	WA512G-D/ WA512GM-D
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

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