

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

## WA512GM-IP67

### Industrial Waterproof IP67 2.4G+5GHz 802.11ac 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.



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
- 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.

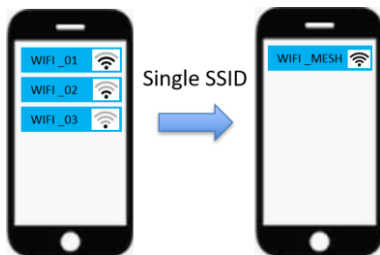
#### Industrial IoT Application

- 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.

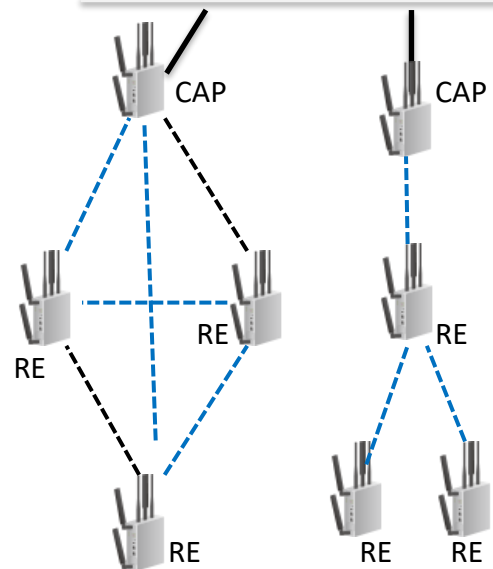


## ✓ MESH WiFi Structure

- 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 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

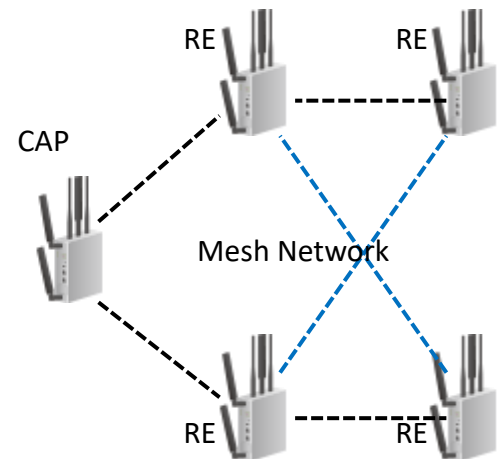
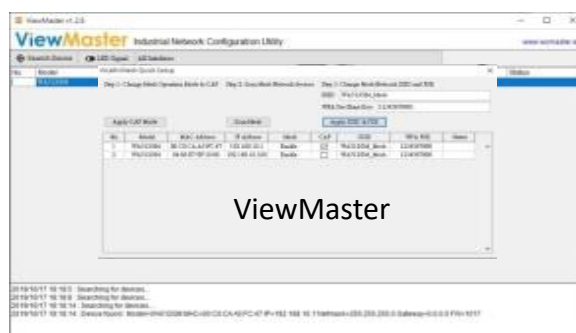


## Wireless Plant Network



## ✓ 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) \*



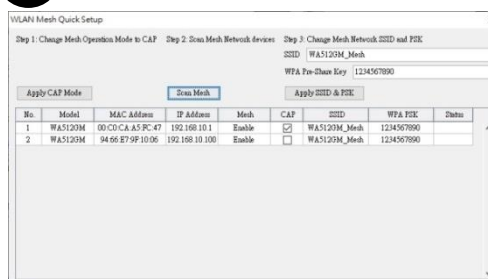
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### Select a CAP



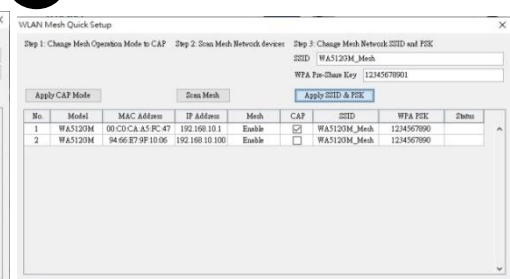
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### Auto Discovery RE



3

### Group Mesh Setting

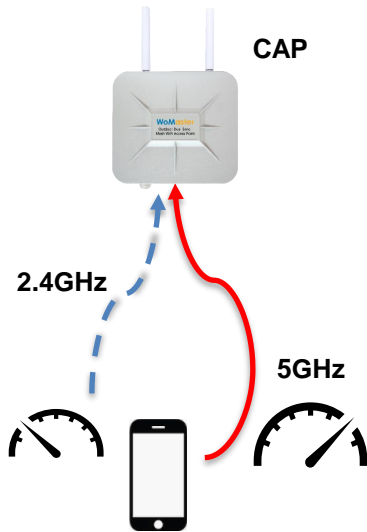




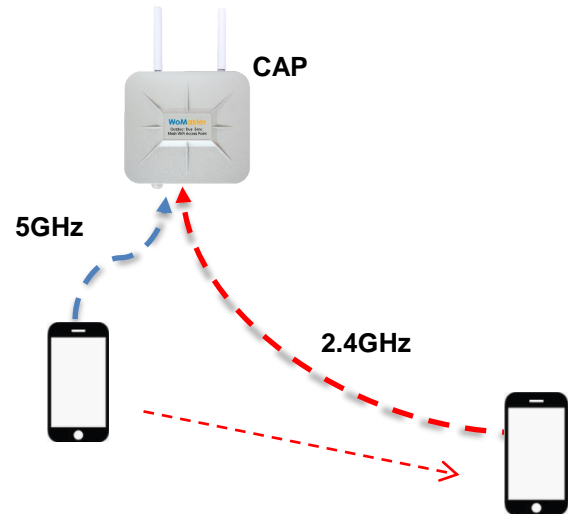
### ✓ Self-Organized Mesh Network

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

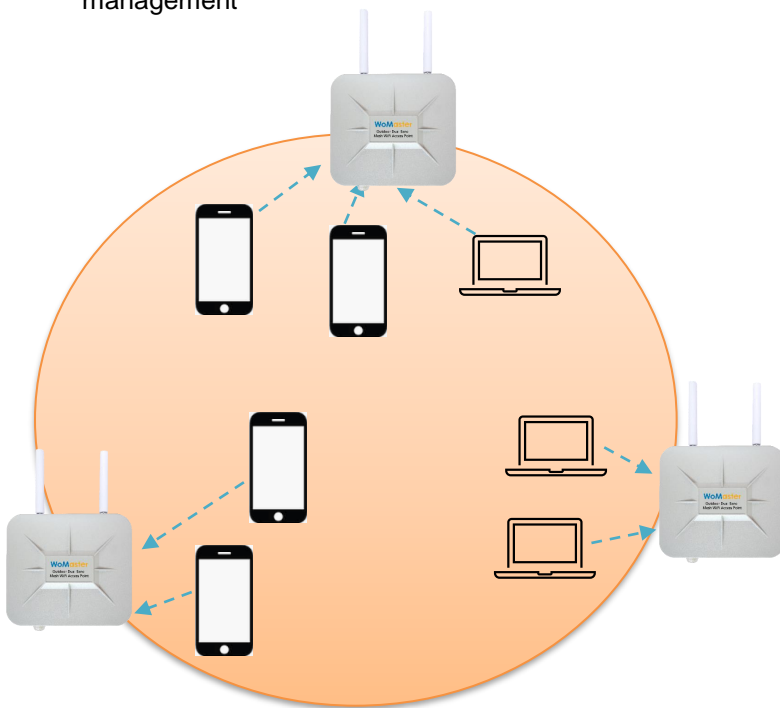
- Performance degradation detected- Change uplink to 5GHz



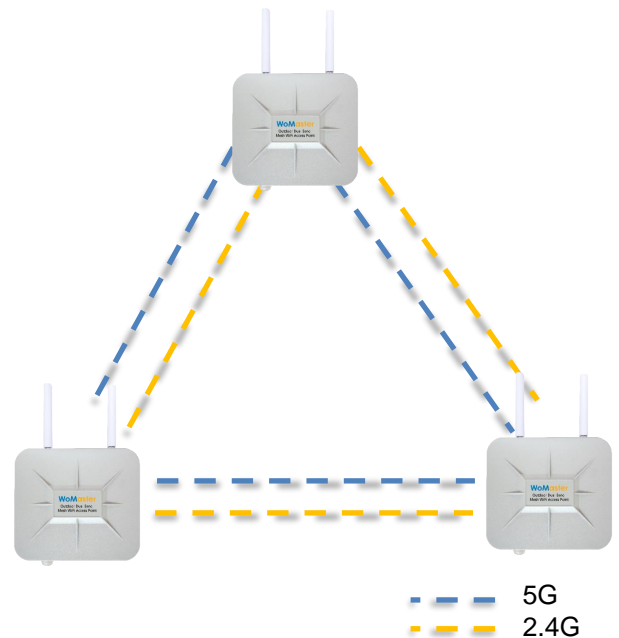
- Longer distance detected- Change uplink to 2.4GHz



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



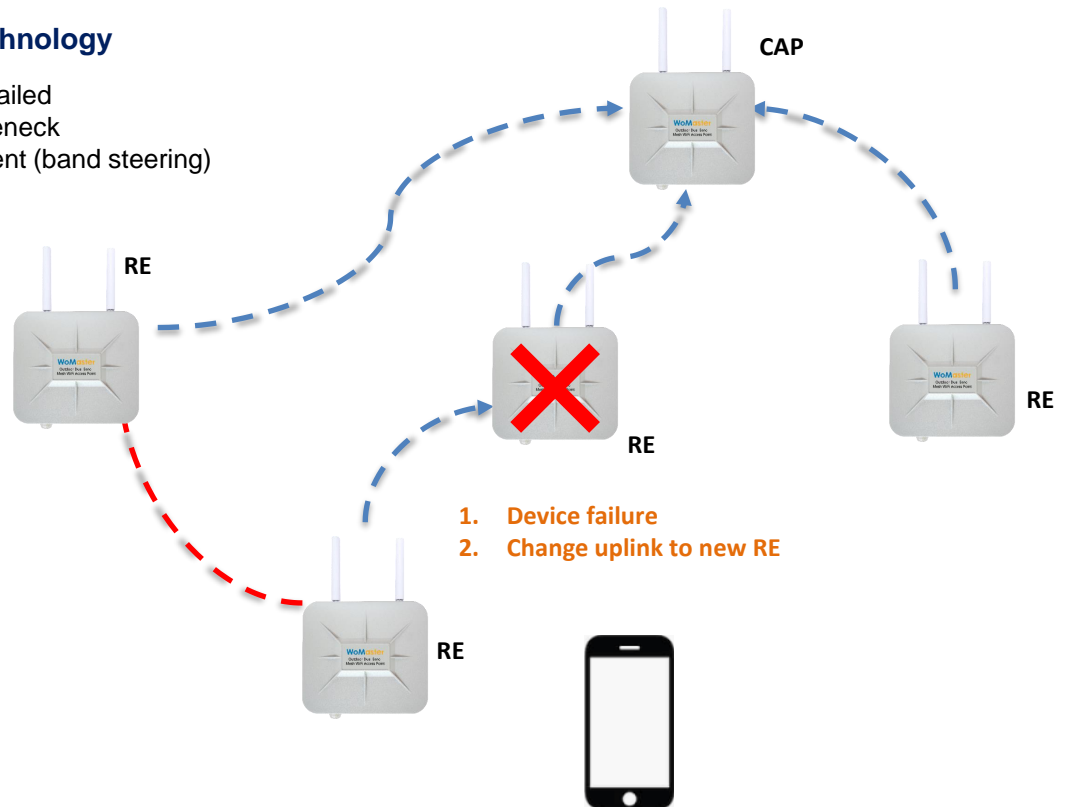
4. **Multiple Backhaul Links:** Failsafe and load-balancing backhaul links





### ✓ Self-Healing Mesh Technology

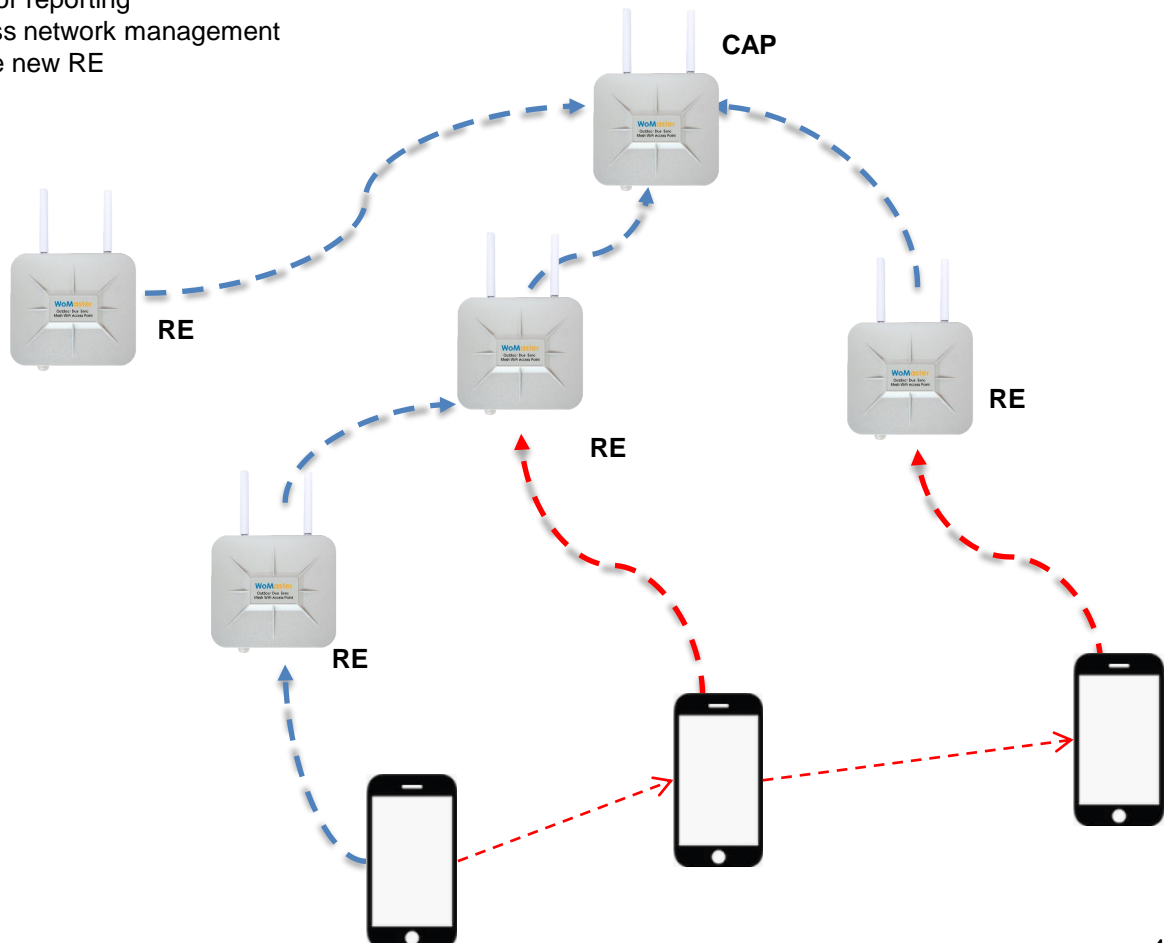
- Auto reroute when AP failed
- Eliminate network bottleneck
- Interference management (band steering)
- Airtime fairness
- Seamless roaming



### ✓ Seamless Roaming

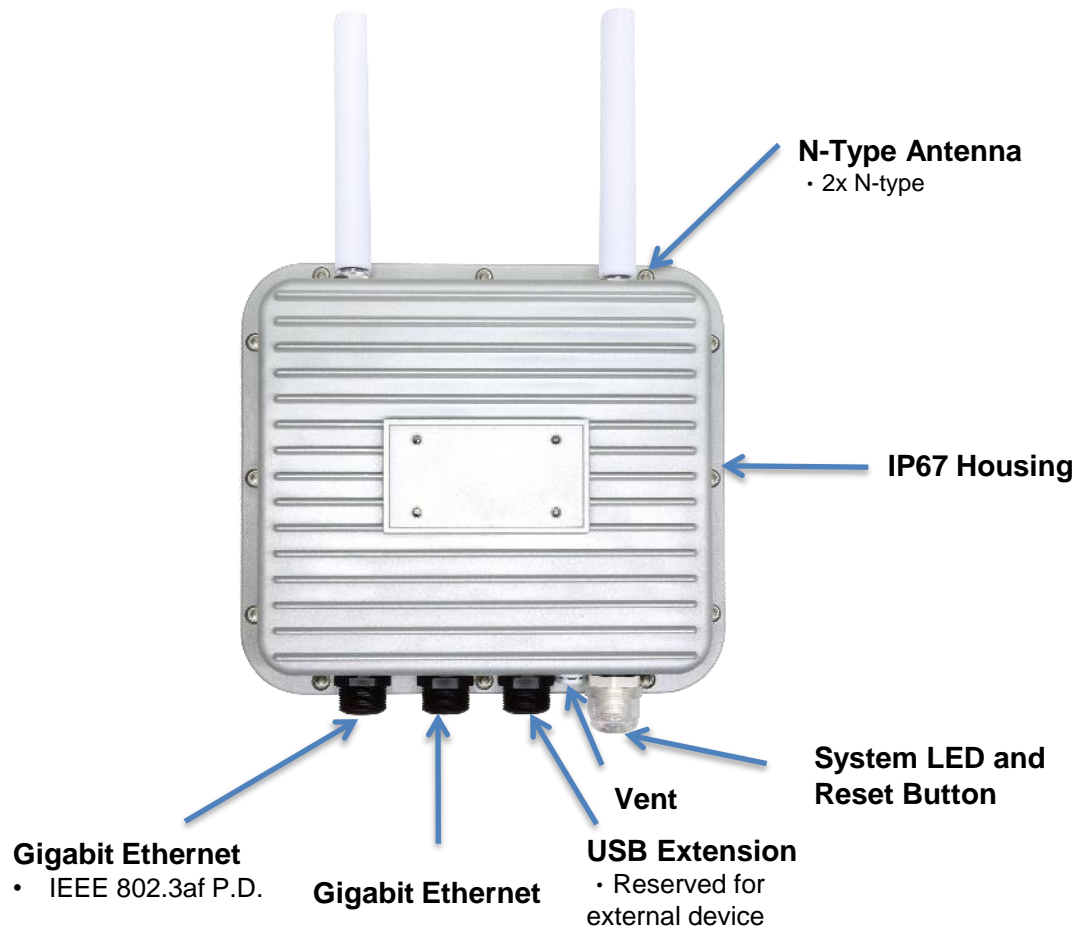
- 802.11k (Radio Resource Measurement): Sends Clients list of neighbors.
- 802.11v (BSS Transition Management Frames): BSS Transition sends clients the new best AP.
- IEEE 1905.1: Enable AP auto-configuration and join the network with a unified security procedure.

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



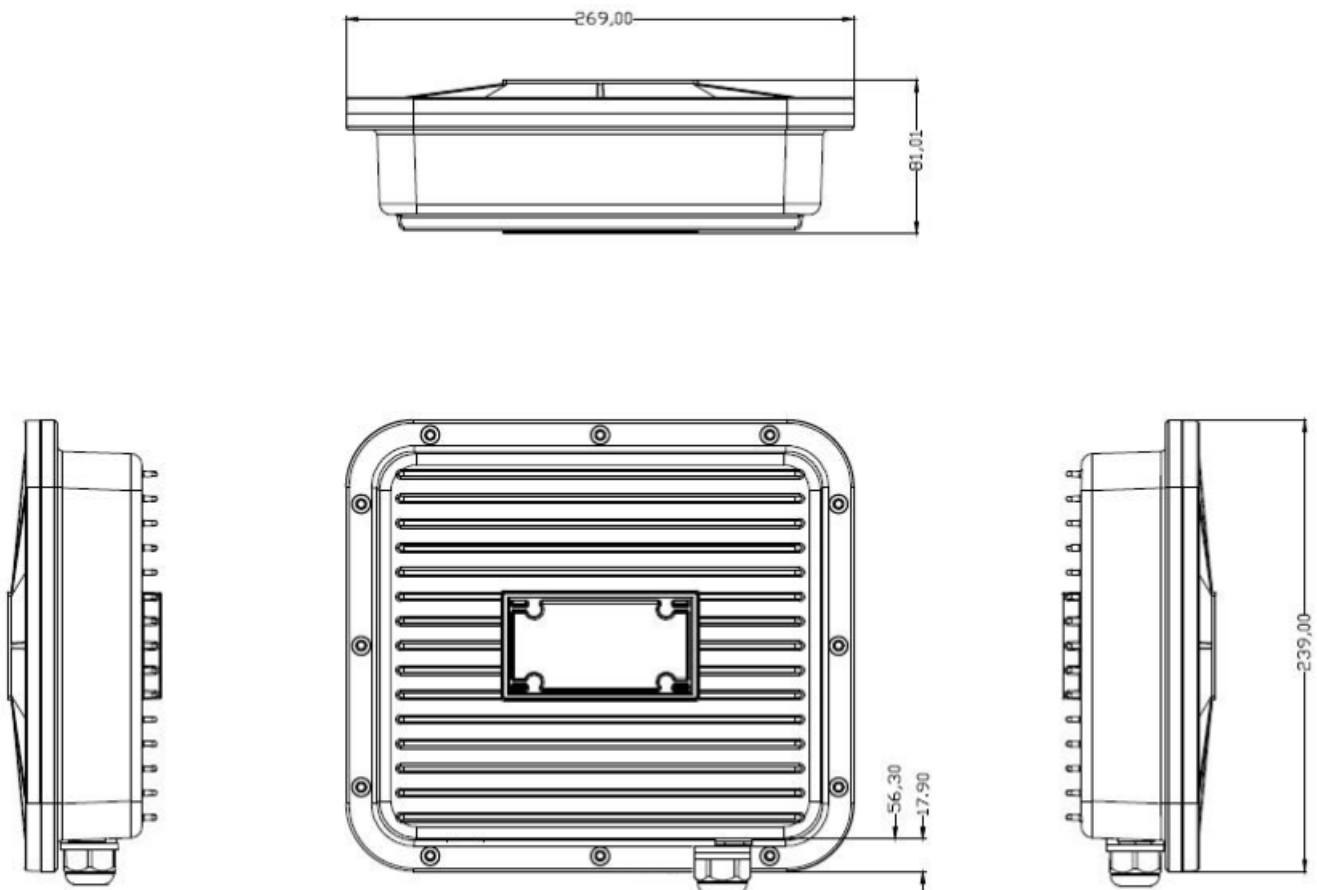


## Interfaces



## 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	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.	≤20db@2.4G, ≤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	<b>Frequency:</b> 2400~2500/ 5150~5850 MHz
	<b>Peak Gain(max.):</b> 2.4GHz: 4.35 dBi, 5GHz: 8.16dBi@Band 1, 6.87dBi@Band 4
	<b>Direction:</b> Omni
	<b>Connector:</b> N Type Male
	<b>Dimension:</b> 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+*, Multi-user authentication
Time Management	NTP, SNTP
WAN/Routing/NAT/Firewall/VPN	Routing: RIPv2, OSPFv2, VRRPv2* NAT: 1-1 NAT, NAT(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
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 40° full cycle
Warranty	3 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
<b>WA512G-IP67-U</b>	Industrial Dual Radio 2.4G +5GHz Concurrent Wireless AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, US-plug
<b>WA512G-IP67-E</b>	Industrial Dual Radio 2.4G +5GHz Concurrent Wireless AP, 802.11ac Wave 2 + 802.11b/g/n WLAN, 2GE, USB, IP67 Enclosure, EU-plug
<b>WA512GM-IP67-U</b>	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
<b>WA512GM-IP67-E</b>	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
<b>Package List</b>	
1x Product Unit	
1x Quick Installation Guide	
2 x WLAN Outdoor Antenna A-WLAN-6-NM	
1x PoE Injector	
1x Mounting kit	



## Optional Accessory

Outdoor Long-Range Antenna	
A-D1T1R-2.4GHZ-19DB-10KM-NF	2.4Ghz Directional Antenna, 1T1R, 19Dbi, 10KM, vertical polarization, N-Type Female, Pole Mounting, 373*373*15mm (LxWxH), IP67
A-D1T1R-5GHZ-23DB-10KM-NF	5Ghz Directional Antenna, 1T1R, 23Dbi, 10KM, vertical polarization, N-Type Female, Pole Mounting, 373*373*15mm (LxWxH), IP67

Din-Rail Model	Description
<b>WA512GM-D</b>	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
<b>WA512G-D</b>	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



## 2.4GHz 1T1R Outdoor Directional Panel 19dBi Pole Mount Antenna

### A-D1T1R-2.4GHZ-19DB-10KM-NF

- 2.4Ghz Wireless Access Point to Point
- High Gain 19dBi, 18° for H Plane and 18° E Plane long distance coverage
- Long Distance up to 10KM coverage
- IP67 Protection Enclosure and Prevention of Rust
- Fiberglass Light Weight Pole Mounting



## Specifications

Electrical	
Frequency Range	2.4 ~ 2.5GHz
Transmission	1T1R
Network	Wireless 2.4Ghz Network IEEE 802.11n , IEEE 802.11b/g
Gain	19dBi
Max. Distance	8km-10Km
V.S.W.R	≤ 1.5
Max. Distance	10km
Beam Width-H Plane	18°
Beam Width-E Plane	18°
Polarization	Vertical
Input Impedance	50Ω
Lightning Protection	DC Grounded
Mechanical	
Connector	N-Type Female
Wind Resistance	245km/h
Mount	Pole Mounting Kit ( U-Clamps )
Pole Mounting Kit Angle	Up 30°
Op. Temperature	-50°C – + 85°C
Ingress Protection	IP67
Dimension	373 * 373 *15 mm ( L x W x H )
Weight	1.09kg
*Optional RF Cables	C-RF-CFD400-NM_NM-1M (N Male and N Male, 1 Meter) C-RF-CFD400-NM_NM-3M (N Male and N Male, 3 Meter)

## 5GHz 1T1R Outdoor Directional Panel 23dBi Pole Mount Antenna

### A-D1T1R-5GHZ-23DB-10KM-NF

- 5Ghz Wireless Access Point to Point
- High Gain 23dBi, 10° for H Plane and 10° E Plane long distance coverage
- Long Distance up to 10KM coverage
- IP67 Protection Enclosure and Prevention of Rust
- Fiberglass Light Weight Pole Mounting



## Specifications

Electrical	
Frequency Range	5.1~5.9 GHz
Transmission	1T1R
Network	Wireless 5Ghz Network IEEE 802.11a/an/ac
Gain	23dBi
Max. Distance	8km-10Km
V.S.W.R	≤ 2
Max. Distance	10km
Beam Width-H Plane	10°
Beam Width-E Plane	10°
Polarization	Vertical
Input Impedance	50Ω
Lightning Protection	DC Grounded
Mechanical	
Connector	N-Type Female
Wind Resistance	210km/h
Mount	Pole Mounting Kit ( U-Clamps )
Pole Mounting Kit Angle	Up 30°
Op. Temperature	-50°C – + 85°C
Ingress Protection	IP67
Dimension	373 * 373 *15 mm ( L x W x H )
Weight	1.54kg
*Optional RF Cables	C-RF-CFD400-NM_NM-1M (N Male and N Male, 1 Meter) C-RF-CFD400-NM_NM-3M (N Male and N Male, 3 Meter)