RG-AP840-I

Wireless Access Point Datasheet

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Ruijie

Product Highlights

- **Max 5.2Gbps (Total 6 Spatial Streams) with Concurrent Dual-Band Design**
- **Max 1024 Client** connections
- **OFDMA, MU-MIMO and BSS Technology** for minimal wireless signal interference
- **IoT Ready:** Integrated with BLE module and one IoT extension port with PoE Out (passive)
- **AI Wireless Optimization:** one-click optimization powered by Ruijie WIS technology
- **Hybrid Management:** support standalone AP to over thousands of APs with deployment options of appliances, private cloud or public cloud service
- **Mobility Management:** Free mobile app available for RG-MACC-Base private cloud or Ruijie Public Cloud customers

Product Overview

RG-AP840-I is a high-performance Wi-Fi 6 enterprise AP designed for the majority of indoor scenarios. With the built-in IoT module, enterprise customers can be ready for future IoT expansion to boost the operational efficiency and customer experience.

The Ruijie RG-AP840-I supports concurrent dual-band dual-radio (2x2:2 in 2.4GHz, 4x4:4 in 5GHz), up to 6 total spatial streams and a maximum of 5.2Gbps wireless throughput. Taking the advantage of Wi-Fi 6 OFDMA Modulation, MU-MIMO, and BSS Color Spatial Reuse, the RG-AP840-I guarantees minimal signal interference and a maximum of 1024 client connections.

Additionally, RG-AP840-I is IoT ready with integrated module of BLE, without the need of external module and additional investment. With a total of 3 built-in Gigabit LAN ports, the LAN3 port is specially design for external IoT sensor connection with PoE out (passive) feature. Therefore, no extra power adaptor is needed for the sensor.

Upon the uprising challenges of management efficiency and wireless security, all Ruijie enterprise APs support hybrid management mode. Either deployed as standalone AP (Fat mode) or managed AP (Fit mode), the AP will detect the operation mode automatically without extra effort on firmware upgrade. For additional security and operation, we recommend the enterprise customers to choose either one of the below wireless controller options depending on the functionality and capacity:

• **Public Cloud: Ruijie Cloud** – Ruijie Public Cloud service (powered by RG-MACC) is targeted for the SME segment with integrated captive portal, authentication (such as PPSK for employees, Facebook, voucher, account, etc.), and reporting features. Together with Ruijie Cloud Mobile App (free download), SME customers can provision and manage their networks at fingertips.

• **Hybrid Cloud: RG-WS6000 Series Wireless Controller (on-premises) Plus Cloud Management (Optional)** – targeted for enterprise office and campus with single or multiple sites and high-density AP deployment. The controller

appliances are installed at the customer's site with fully integrated wireless management and authentication feature, supporting up to 5000 APs per cluster. Optionally, the cloud management platform allows for value-added features like centralized device configuration and monitoring, AI radio (RF) optimization, reporting, etc.

- **Private Cloud: RG-MACC Software Controller** – targeted for ISP/MSP, government, or multi-national corporation (MNC) with diverse customer sites and demand on integration of their billing, portal and security systems. The RG-MACC supports unified device management, not only for wireless access points, but also switches and gateway devices.

Product Features

High Expandability Design

With the design of 3 Gigabit Ethernet ports, the RG-AP840-I not only can expand uplink bandwidth, but can also extend the LAN port for PC, printer and other IP terminal connections. The LAN3 Port is specially design for external IoT sensor connection with PoE out (passive) feature. Therefore, no extra power adaptor is needed for the sensor.
Additionally, the RG-AP840-I is IoT ready enabled by the built-in BLE module, without the need of external module and extra investment.

RG-AP840-I built-in with 3 Gigabit Ethernet ports and BLE module

Wi-Fi 6 Technology

1024-QAM High-speed Access

The RG-AP840-I adopts the dual-radio dual-band design and 2G+5G is recommended. With the next-generation 802.11ax for 5G, the maximum access rate can reach 4.8Gbps. If dual-radio is enabled concurrently, the high-speed Wi-Fi can reach 5.2Gbps, offering the true high-speed experience.

OFDMA High-density User Access

The RG-AP840-I supports OFDMA of 802.11ax, which divides the WLAN channel into a plurality of narrower subchannels, with each user occupying one or more subchannels. By scheduling multiple users to receive and send packets concurrently via the AP, user competition and back-off can be reduced, thereby reducing network latency and improving network efficiency. In a high-density deployment environment, the average rate per user is increased to four times of 802.11ac.

Bi-Directional MU-MIMO

Compared with the previous Wi-Fi 5 (802.11ac) with only downlink MU-MIMO support, Wi-Fi 6 supports both uplink and downlink MU-MIMO (multi-user, multiple-input and multiple-output). Therefore, Ruijie RG-AP800 Series access points can connect clients simultaneously, significantly improving the wireless performance and experience.

TWT (Target Wake Time)

Target wake time (TWT) is used to help minimize contention between clients and reduce the amount of time a client in power save mode to be awake. Energy consumption is reduced by up to 70% of the battery consumption, thereby improving battery life.

Spatial Reuse with BSS Color

The RG-AP840-I supports spatial reuse with basic service set (BSS) color of 802.11ax to identify the BSSs of different WLANs in the network by different coloring (BSS color), and further divide them into internal and external BSS. Different packet receiving and sending thresholds can be maintained. When receiving packets, BSS coloring is used to quickly identify the packet of the external BSS. If the signal strength

is lower than the receiving threshold of the external BSS, the packet will be ignored. The transmission of the internal BSS packet will be not affected. This technology can implement channel reuse in a high-density scenario, greatly reducing the impact of co-channel interference for the actual network deployment.

Tolly Certified User Capacity

From latest Tolly Test Report, Tolly engineers verified Ruijie Wi-Fi 6 AP800 Series each supported up to 1024 Wi-Fi clients/ users on one AP with 512 Wi-Fi clients/users on each radio.

Ruijie Wi-Fi 6 Access Points User Capacity

	User Capacity
RG-AP880-I	1,024
RG-AP850-I(V2)	1,280 (the largest capacity test that Tolly has run to the test date)
RG-AP840-I	1,024
RG-AP820-L	1,024

Source: Tolly, January 2020 Table 2

Tolly Test Report on Ruijie Wi-Fi 6 AP800 Series User Capacity

Wi-Fi 6 Equipment For All Scenarios: Always One Option Fit For You

Ruijie is one of the leading enterprise networking suppliers worldwide and committed to providing the best Wi-Fi experience to our stakeholders. We are the first supplier to provide full-scenario Wi-Fi 6 access point solution in the market, ranging from indoor, wall plate to outdoor access points, guaranteeing perfect wireless experience in various situations.

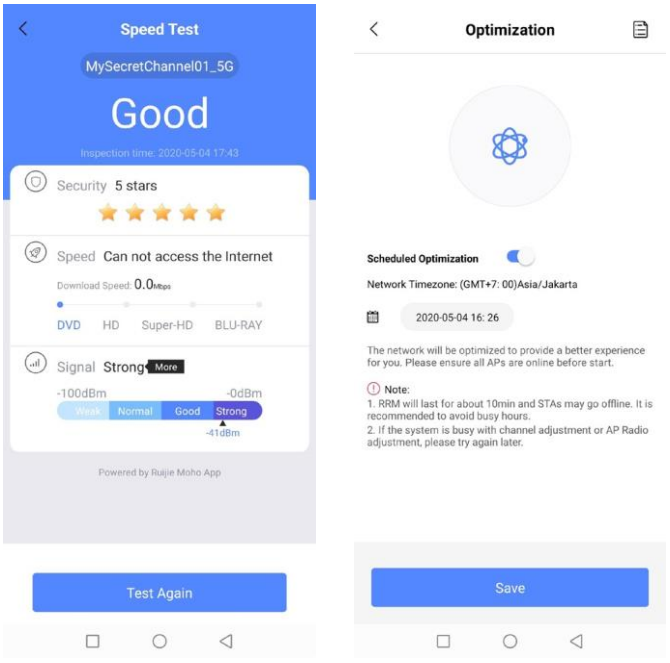
For details, please visit https://www.ruijienetworks.com/products/wireless-wifi6

AI Wireless Optimization

With advent of Ruijie Cloud AI Engine, this is an Lifetime Free service for all Ruijie Enterprise AP for WiFi optimization on the cloud. Not just the Cloud Managed AP, Ruijie Cloud also seamlessly integrated with Ruijie hardware Wireless Access Controller (AC) on premise, it helps to streamline Wi-Fi maintenance and operation support. With Ruijie Cloud AI Wireless Optimization you can achieve:

Ruijie Cloud AI Wireless Optimization

- 1-click Analysis and Wireless Optimization
- Scheduling Task for Optimization
- Smart mobile apps for optimization
- Report for optimization improvement
- and it is FREE!



Ruijie Cloud App for Wi-Fi Inspection (Left) & Wireless Optimization (Right)

As part of the Ruijie Cloud solution, Ruijie Cloud App is a mobile App designed to carry out Ruijie managed device management at your fingertips. Comprehensive monitoring, configuration and troubleshooting tools including Network Inspection, 1-click Optimization, Device Topo, etc. are available in the Ruijie Cloud App, which can be freely downloaded from the iOS App Store and Google Play.

Industry-leading Local Forwarding Technology

Employing an industry-leading local forwarding technology, the RG-AP840-I breaks through the limitation of traffic bottleneck of wireless controllers. In collaboration with the RG-WS Wireless Controller Series, users can flexibly pre-configure the data forwarding mode for RG-AP840-I. The AP also controls whether the data will be forwarded via the wireless controller according to the SSID or user VLAN, or directly sent to the wired network for data exchange.

The local forwarding technology can classify and forward delay-sensitive data which requires real-time transmission through the wired network to greatly alleviate the traffic pressure on the wireless controllers and better meet the high traffic transmission requirements of the 802.11ax network.

Abundant QoS Policies

The RG-AP840-I supports a wide variety of QoS policies. For example, it provides WLAN/AP/STA-based bandwidth limitations and Wi-Fi multimedia (WMM) which defines different priorities for different service data. The RG-AP840-I realizes timely and quantitative transmission of audio and video, and guarantees smooth operation of multi-media applications.

With the multicast-to-unicast technology, the RG-AP840-I resolves the video lagging problem due to packet loss or high latency in the wireless network, and highly enhances user experience of the multicast video services of wireless network.

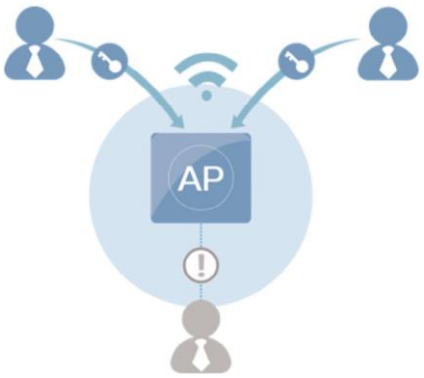
Comprehensive Security Protection

Secure User Access

The RG-AP840-I supports a wide range of authentication methods such as web, 802.1x, PPSK (one-time dynamic password for staff), voucher/ access code, user account, and social authentication. Complying with the standard network access control, it offers a set of control policies in terms of user access, authorization, equipment compliance check, network behavior monitoring, network attack prevention, etc. All these control features guarantee high network security for authenticated users.

Various enterprise authentication options for guests and employees

Personal Pre-shared Keys (PPSK)



Simple and Effective Wireless Security Practice

Traditional Pre-shared Keys (PSK) are shared by all users on a WLAN, giving it potential risk of PSK leak-out.

Ruijie Personal PSK (PPSK) is an easy-to-setup wireless authentication method with enterprise-grade security level. Credentials can be created and revoked individually. Each PPSK can also be tied to a unique user/ machine.

With PPSK, you can enjoy the benefits of:

- High security by using different passwords for each user and device for individual SSID
- Simple deployment with batch account creation
- Ease of use, offering the same experience as WPA / WPA2-PSK
- Out-of-box feature in AC
- No additional AAA required

Virtual AP Technology

With the virtual AP technology, the RG-AP840-I supports up to 48 ESSIDs. Network administrator can separately encrypt and isolate VLANs or subnets of the same SSID, thereby enabling specified authentication mode and encryption mechanism for each SSID.

Comprehensive Wireless Protection

Coupled with RG-WS6000 Series or RG-MACC Wireless Controllers, the RG-AP840-I offers a breadth of security features including WIDS (Wireless Intrusion Detection System), RF interference tracking, rogue AP containment, anti-ARP spoofing, DHCP protection and beyond for all-around security protection.

Hybrid Management

Flexible Management Options

All Ruijie enterprise APs support hybrid management mode. Either deployed as standalone AP (Fat mode) or managed AP (Fit and MACC mode), the AP will detect the operation mode automatically without extra effort on firmware upgrade. For additional security and operation, we recommend the enterprise customers to choose either one of below wireless controller options depending on the functionality and capacity:

Below are the summarized feature highlights for various Ruijie management system options which target for specific industry segments:

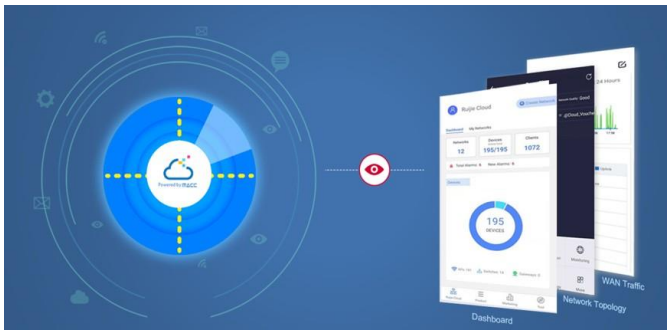
Category	Standalone AP	Hardware Controller (RG-WS6000)	Public Cloud	Private Cloud (RG-MACC Base)
Target Segment	Small Office	Enterprise, Education, Large Campus	Small & Medium Business, Managed Service Provider	Operator, Gov
Deployment Mode	On-premises	On-premises	Cloud Service	Software-based
Device Capacity	N/A	Up to 5000	Virtually Unlimited	Virtually Unlimited
Unified Management	N/A	AP only	AP, Switch, Gateway	AP, Switch, Gateway
Radio Optimization	N/A	Y (required to enable AC Hybrid Mode)	Y	Y
Employee Authentication	Basic PSK	PSK, PPSK, 802.1x	PSK, PPSK, 802.1x, Access Code, Account	PSK, PPSK, 802.1x
Guest Authentication	Basic PSK	Basic Captive Portal	Captive Portal (Customized), Social Login, Voucher	Basic Captive Portal
Reporting	N/A	N/A	Y	Y
Mobile App (Free)	N/A	Y (required to enable AC Hybrid Mode)	Y	Y

Web and CLI Management Interface

The RG-AP840-I provides both web and command-line interface (CLI) for the AP and wireless controller, suitable for application in different scenarios. CLI design allows the networking professionals to perform fast troubleshooting, bulk configuration import or modification. Web GUI mangaement should be perfect for the majority of general scenarios to plan, operate and maintain the wireless network without the need of customization.

Mobile Monitoring and Optimizing

Ruijie is committed to providing more simple networking experience for customers by launching a free mobile app[1] (namely Ruijie Cloud) for unified device lifecycle managmeent, which is not only for Ruijie access points, but also for switches and security gateways, from provisioning, monitoring, configurations to optimization. For details, please visit our official website at https://www.ruijienetworks.com/products/smb/cloud-service/cloud-service/ruijie-cloud-solution/mobile-app



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Note:
[1] Ruijie Cloud mobile app is compatible with Ruijie Cloud service, RG-MACC or RG-WS6000 Series wireless controller

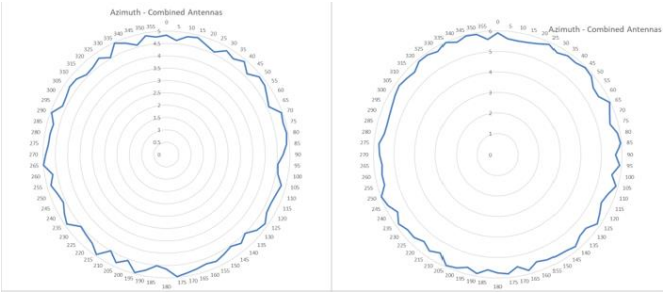
Warranty Information

The Ruijie RG-AP840-I Access Point come with 3 year warranty or extended as Limited Lifetime Warranty[2] (LLW). For more details, please visit https://www.ruijienetworks.com/support/servicepolicy.

Antenna Patterns

Horizontal planes (top view)

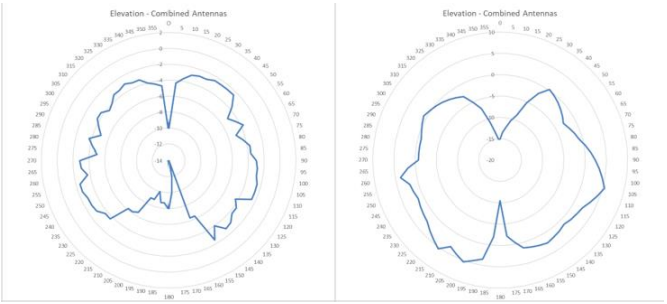
Below are the RG-AP840-I 2.4GHz and 5GHz azimuth antenna patterns:



RG-AP840-I 2.4GHz (Left) and 5GHz (Right) Azimuth Antenna Patterns

Vertical (elevation) planes (side view, AP facing down)

Below are the RG-AP840-I 2.4GHz and 5GHz elevation antenna patterns:



RG-AP840-I 2.4GHz (Left) and 5GHz (Right) Elevation Antenna Patterns

Technical Specifications

Model	RG-AP840-I
Hardware specifications	
Radio	Dual-radio dual-band (2.4G+5G): 2.4G 2×2 MIMO + 5G 4×4 MIMO
Protocol	Supports standard 802.11ax, dual-radio dual-band, concurrent 802.11ax and 802.11a/b/g/n/ac
Operating Bands	802.11b/g/n: 2.4G ~ 2.483GHz 802.11a/n/ac/ax: 5.150~5.350GHz, 5.47~5.725GHz, 5.725~5.850GHz (vary depending on different countries)
Spatial Streams	Up to 6: 2×2:2 in 2.4GHz , 4×4:4 in 5GHz
Max Throughput	Maximum throughput of 2.4G: 400Mbps Maximum throughput of 5G: 4.8Gbps Maximum throughput per AP: 5.2Gbps
Modulation	OFDM: BPSK@6/9Mbps, QPSK@12/18Mbps, 16-QAM@24Mbps, 64-QAM@48/54Mbps DSSS: DBPSK@1Mbps, DQPSK@2Mbps, and CCK@5.5/11Mbps MIMO-OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024QAM OFDMA (up to 1024-QAM)

Note:
[2] For country availability, please visit official website for details

Model	RG-AP840-I
Receiver Sensitivity	11b: -96dBm (1Mbps), -93dBm (5Mbps), -89dBm (11Mbps) 11a/g: -91dBm (6Mbps), -85dBm (24Mbps), -80dBm (36Mbps), -74dBm (54Mbps) 11n: -90dBm (MCS0), -70dBm (MCS7), -89dBm (MCS8), -68dBm (MCS15) 11ac HT20: -88dBm (MCS0), -63dBm (MCS9) 11ac HT40: -85dBm (MCS0), -60dBm (MCS9) 11ac HT80: -82dBm (MCS0), -57dBm (MCS9) 11ax HT80: -82dBm (MCS0), -57dBm (MCS9), -52dBm (MCS11) 11ax HT160: -80dBm (MCS0), -49dBm (MCS11)
Antenna	Integrated antenna design
Antenna Gain	2.4G: 3dBi 5G: 3dBi
Service Ports	3 10/100/1000M Ethernet ports (The LAN1 Port supports PoE in, LAN3 Port supports LAN & IoT module expansion with PoE out)
Management Port	1 console port
USB	1 USB 2.0 port
IoT Capability	BLE
Reset Button	Support
Anti-theft Lock	Support
LED Indicator	1 LED indicator (Supports red, green, blue, orange and flashing mode, which indicates device access. The indicator can be switched off to silent mode.)
Transmit Power	≤100mw (20dBm) (vary depending on different countries)
Adjustable Power	1dBm
Power Supply	Local power supply (DC 48V/1A) (DC Power adapters should be purchased from third-party vendors separately if needed.) PoE+ (802.3at) PoE (802.3af) – Not recommended: 5G radio is degraded to 2x2 MIMO, and the PoE out of the LAN3/ IoT port is disabled
Power Consumption	<25.4W
Physical Specifications	
Temperature	Operating Temperature: -10°C to 50°C
	Storage Temperature: -40°C to 70°C
Humidity	Operating Humidity: 5% to 95% (non-condensing)
	Storage Humidity: 5% to 95% (non-condensing)
Installation Mode	Ceiling/wall-mountable
Dimensions (W x D x H)	220mm ×220mm x48.85mm (Height of the AP only, excluding the mount kit)
Weight	1.30kg
IP Rating	IP41
Certifications and Compliance	
Safety Standard	GB4943, EN/IEC 60950-1
EMC Standard	GB9254, EN301 489 EN 55032, EN 61000, EN 55035
Health Standard	EN 62311
Radio Standard	SRRC, EN300 328, EN301 893

Model		RG-AP840-I
Software Specifications		
WLAN	Maximum clients per AP	1024
	BSSID capacity	Up to 32
	SSID hiding	Support
	5G Priority (Band Steering)	Support
	Configuring the authentication mode, encryption mechanism and VLAN attributes for each SSID	Support
	Remote Intelligent Perception Technology (RIPT)	Support
	Intelligent device recognition technology	Support
	Intelligent load balancing based on the number of users or traffic	Support
	STA control	SSID/radio-based
	Bandwidth control	STA/SSID/AP-based bandwidth control
	Data encryption	WPA (TKIP), WPA-PSK, WPA2 (AES), WPA3, WEP (64/128 bits)
	PSK and web authentication	Support
	PPSK authentication (For Employee)	Support (require wireless controller)
	802.1x authentication	Support
	PEAP authentication	Support
	Data frame filtering	Whitelist, static/dynamic blacklist
	User isolation	Support
	Rogue AP detection and countermeasure	Support
	Dynamic ACL assignment	Support
	RADIUS	Support
	CPU Protection Policy (CPP)	Support
	Network Foundation Protection Policy (NFPP)	Support
IP	IPv4 and IPv6 address	Support
	Multicast routing	Multicast to unicast conversion
	DHCP service	DHCP Snooping, Option 82, Server, Client

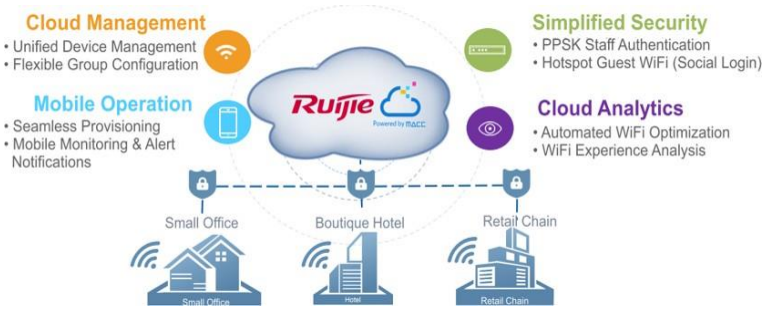
Model		RG-AP840-I
Management and Maintenance	Supported wireless LAN controllers	Ruijie WS Series Wireless Controller Ruijie MACC-Base Software Controller Ruijie Cloud (Public Cloud)
	Management protocol	Telnet, SSH, TFTP, Web
	Wireless Intelligent AI Optimization Service (WIS)	Support
	SNMP	SNMPV1,V2c,V3
	Syslog / Debug	Support
	FAT/FIT/MACC mode switching	Factory default firmware supports FAT (standalone) or FIT mode (WS controller) or MACC mode (Ruijie MACC-Base or Ruijie Cloud) management

Application Scenarios

Public Cloud for SMEs

With Ruijie Public Cloud Service adoption, the Ruijie AP800 Wi-Fi 6 series access point is perfect for various SME scenarios including small offices, boutique hotel, retail store and etc. Ruijie Cloud is the only vendor offering Enterprise Cloud at Lifetime FREE, which significantly streamline the IT operational efficiency, as well as reducing the Wi-Fi deployment complexity with cost effective approach for SMEs.

The Ruijie Cloud service provide equipment deployment, monitoring, network optimization and operational lifecycle management; enabling customers with simple plug and play deployment and operation and maintenance. Meeting the needs for automatic cloud RF planning and user experience monitoring, it also supports mobile monitoring and alert, and fast provisioning by QR-Code scanning. At the same time, it provides flexible wireless user access control features, including high security “One person, one machine and one password” PPSK, built-in cloud Portal and Facebook social login.



Ruijie Cloud Solution Highlights

Key Features:

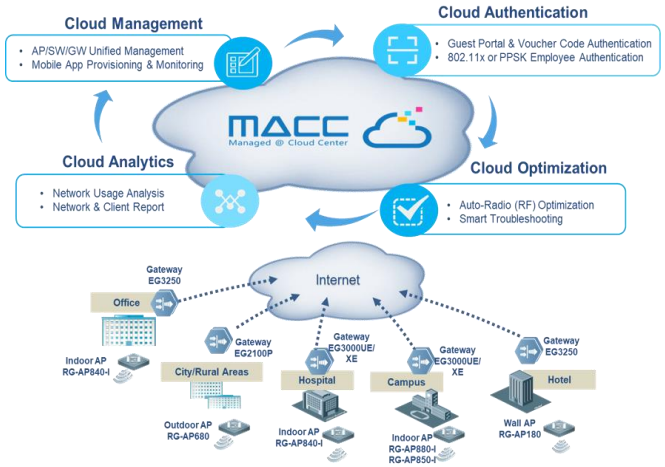
- Unified Device Management
- Fast Provisioning by Mobile APP
- Secure PPSK Authentication for Staff
- Captive Portal & Social Authentication for Guest
- Mobile APP Monitoring & Alert

Private Cloud for ISP/MSP & Government

For enterprises with high demand on security, billing and portal system integration, along with diverse customer sites, the Ruijie RG-MACC private cloud solution is recommended, especially for ISP/MSP and government sector.

The Ruijie RG-MACC (Managed @ Cloud Center) is a revolutionary cloud management platform which supports unified management and configuration of APs, switches and gateway devices, as well as value-added marketing features and survey, etc. The RG-MACC is designed for education, retail chain stores, shopping malls, hotels, transportation, small and medium-sized enterprises, network operators and settings alike. The RG-MACC is consisted of various feature modules, such as management, marketing, AAA (authentication, authorization and accounting) and diagnostic tools, etc. The platform supports multi-tenancy feature, which is an ideal choice for ISP to deliver cost-effective managed service solution for massive SME customers.

RG-MACC Private Cloud typical solution architecture:

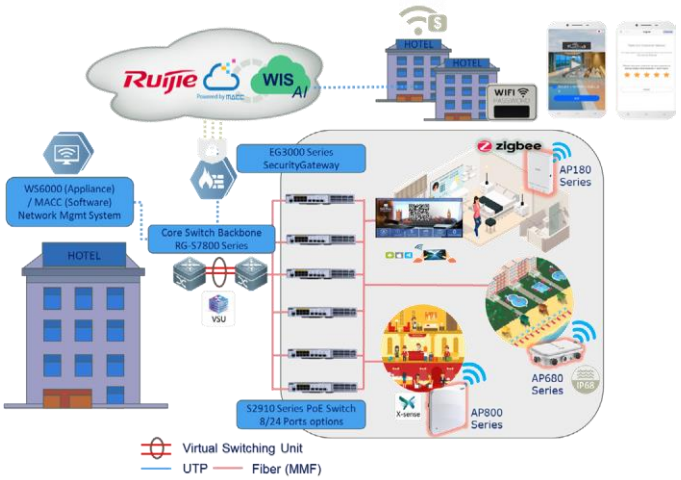


Solution Benefits:

- Support multi-tenant management
- Support cloud computing virtualization deployment
- Support unified networking device management, including access points, switches and gateway devices
- Support mobile app management
- Open API available for 3rd party integration

Hybrid Cloud for Enterprise & Campus

For enterprise office and campus with single or multiple sites and high-density AP deployment, Ruijie RG-WS6000 Series Wireless Controllers (on-premises) plus cloud management (optional) is recommended. The wireless controller appliances are installed at the customer's site with fully integrated wireless management and authentication feature, supporting up to 5000 APs per cluster. Optionally, the cloud management platform allows for value-added features like centralized device configuration and monitoring, AI radio (RF) optimization, reporting, etc.



Solution Benefits:

- Support centralized device management and reporting service by Ruijie Cloud (optional)
- Support ultra-seamless roaming management
- Support one-click AI radio (RF) optimization powered by WIS engine
- High performance and security with all user authentication and traffic forwarding handled locally
- Support flexible authentication options, such as 802.1x, PPSK employee authentication, guest hotspot and voucher access code, etc.
- Support all series of Ruijie wireless access points

Ordering Information

Model	Description
RG-AP840-I	High-density Wi-Fi 6 (802.11ax) indoor wireless access point, concurrent dual-band dual-radio (2x2:2 in 2.4GHz, 4x4:4 in 5GHz), up to 6 total spatial streams and maximum 5.2Gbps wireless throughput, 3 Gigabit Ethernet ports (LAN3 port supports IoT sensor extension), integrated with BLE, support PoE+ and local power supply (PoE+ adapters are sold separately, which could be purchased from Ruijie while DC Power adapters should be purchased from third-party vendors separately if needed)
RG-E-130(GE)	1-port PoE adapter (1000Base-T, PoE+/ 802.3at)