RG-AP180 Series
Wireless Wall Plate AP Datasheet

Product Overview

Ruijie RG-AP180 Wall AP Series is a next-generation Wi-Fi 6 (802.11ax) with built-in IoT module wall plate wireless access point designed for hotels, offices and dormitories with Smart IoT integration demands. The RG-AP180 Series has design for universal socket standard with integrated multiple Gigabit Ethernet LAN ports for extended connectivty for IPTV or Office Equipment application purpose. Featuring an exquisite design and easy deployment, the AP can be installed on the junction box without damaging the wall finishes, which offers a better solution for wireless network deployment for scenarios like the hotels.

Ruijie RG-AP180 Wall AP can be centrally managed by Enterprise-grade Ruijie Cloud Service at Lifetime FREE, allowing fast provisioning, flexible authentication and stable wireless even at extreme envrionement.

The dual-radio dual-band RG-AP180 Series supports concurrent 802.11a/n/ac/ax and 802.11b/g/n/ax. Both 2.4G and 5G support 2 spatial streams concurrently. Equipped with the advanced 802.11ax RF chip, the AP supports MU-MIMO which improves the user experience for multi-user access. The RG-AP180 Series offers 4 100/1000Mbps RJ45 downlink ports, providing optimal wireless network coverage and additional wired network interfaces. The RG-AP180 also integrated with IoT module supporting Bluetooth 5.0 and Zigbee protocol for future Smart Living integration.

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.

Product Highlights

• **The 1st Wi-Fi 6 Enterprise Wall Plate Access Point**[1] with Wi-Fi 6 Alliance Certification

• **Built-in IoT Module (Built-in Bluetooth 5.0 and Zigbee)** for future Smart of Things integration

• **Hidden Status LED Design** – never disturbing your customer comfort

• **Universal wall plate design** – mount kit option available for US/EU standard socket

• **Guarantee High Definition (HD) IPTV Application** – upto 4 HD TV can be connected via the Gigabit LAN ports

• **OFDMA, MU-MIMO and BSS Technology** for minimal wireless signal interference

• **AI Wireless Optimization:** one-click optimization powered by Ruijie Cloud and 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

Note:
[1] As of Nov2019, Ruijie is the 1st Enterprise wireless vendor announced Wi-Fi 6 wall plate access point

- **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

The First Wi-Fi 6 Wall Plate Access Point

With latest 802.11ax 1024-QAM modulation technology, the dual-radio dual-band design RG-AP180 wall plate access point offers maximum access rate up to 1.2Gbps for 5G. If dual-band is enabled concurrently, the high-speed Wi-Fi can reach 1.7745Gbps, offering a high-speed network experience.

Wi-Fi 6 Brings You an Unprecedented Experience

Ruijie | Industry-focused Deepen-partnership 2.0

User performance increased by **4 times**
- Higher-order modulation (1024-QAM)
- Theoretical maximum speed (160M bandwidth, 8 spatial streams) increased from 6.9Gbps to 9.6Gbps

Overall network performance increased by **40%**
- Spatial reuse technology (SR)
- Significantly reduce the interference between APs, and improve access capacity and stability

AP performance increased by **75%**
- Uplink and downlink MU-MIMO
- Uplink and downlink OFDMA
- Improve concurrency and average speed of terminals in high-density deployment scenarios

Energy consumption reduced by **70%**
- Power-saving technology TWT (Target Wake Time)
- Reduce battery consumption and improve battery life

Wi-Fi 6's Stability as 4G ; Ultrafast as 5G

- **Intelligent Local Forwarding**

Employing Ruijie's intelligent local forwarding technology, the RG-AP180 breaks through the limitation of traffic bottleneck of wireless controllers. In collaboration with the RG-WS Wireless Controller Series, users can flexibly configure the data forwarding mode for RG-AP180. 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**

RG-AP180 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. RG-AP180 realizes timely and quantitative transmission of audio and video, and guarantees smooth operation of multi-media applications.

With the multicast-to-unicast technology, RG-AP180 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 networks.

Easy and Fast Deployment

The Ruijie AP180 Series Wall Plate AP adopts a wall-mounted design with 2-step easy deployment:

Step 1: Remove the original faceplate from the wall.

Step 2: Directly install the plug-and-play Wall AP and connect with original UTP cable (PoE).

This breaks through traditional wireless network construction methods by reusing existing network cables and minimizes the impact of network construction on hotel or similar settings. As no additional cabling is required, the Wall AP delivers maximum business agility and investment protection. Ruijie also offers a wide range of optional accessories to meet your unique deployment needs.

Difficult to lay cable?

How to install AP in room?

Traditional challenges on laying additional cabling for AP installation

Full Signal Coverage

Traditional APs are installed in corridors (Ceiling) and the indoor network signals are weak or even completely degenerated after wall penetration. The Ruijie RG-AP180 series Wall Plate AP, on the other hand, can be installed inside the room and hence ensures full coverage anywhere for the best user experience of voice, video or Internet browsing.

Wall AP (left) vs Corridor AP (right) Design

Universal Compatible

The RG-AP180 wall plate AP provide an option of Universal Mount Kit for non-UK standard countries, such as S. Korea, Japan, Philippines. Europe, Russia, United States, etc.. (The universal mount kit sold separately)

Universal Mount Kit Installation on EU/US Junction Box (RG-AP180)

Note:
[2] Source: https://www.hotelwifi.com/wp-content/uploads/2019/02/WiFi_Whitepaper.pdf

High Definition IPTV Application

Nowadays, IPTV service especially VoD (Video on Demand) are widely adopted by hotel chain group to deliver premium entertainment experience for their loyal guest. To guarantee for high quality IPTV service, sufficient IP bandwidth and low latency IP Network is the essential.

Ruijie RG-AP180 is feature-customized for hotel IPTV application, upto 4 High Definition TV can be connected via the Gigabit (1000M) LAN ports, and fully support video streaming and multicast protocol such as QoS, IGMP Snooping, 802.1q, etc.

With Ruijie patent CPP (CPU Protection Policy) technology, which further protect CPUs from being abused and attacked, allowing the most stable IPTV service connectivity offering.

4 10/100/1000M LAN (Front)
1 10/100/1000M Uplink (PoE) (Rear)

Screen Mirroring Control

Trend of online content streaming today, 87%[2] of guests surveyed indicated that they would prefer the ability to cast their apps to a larger guestroom television screen.

However, the biggest challenges are lack of control measures to minimize personal smart device screen casting to other TV in another guest room or non-authorized device. And, network security breaches also increase due to same logical network segment (Layer 2) between the TV and the Guest's Smart Phone/Tablet terminal.
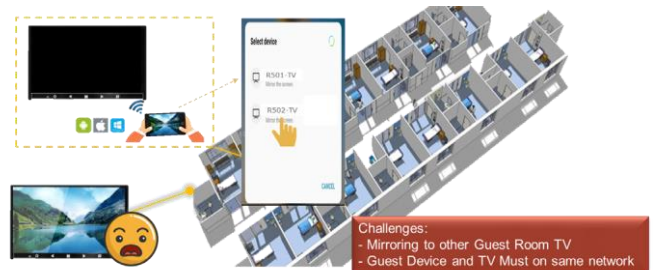
Mobile Casting/Mirroring Challenges Today

Ruijie introduced an Easy but Secure countermeasure on Personal Screen Casting/Mirroring, namely Screen Mirroring Isolation[3]. With the Ruijie Screen Mirroring Isolation, guest only limited to broadcast his/her screen on the authorized Smart TV.

As illustrated by below diagram, a QR-Code (generated by Ruijie WLAN Controller) will be displayed on the TV Screen (API integration needed with Hotel's TV Manufacturer), once the guest scan the QR-Code, the TV will be bound with the individual smart device, and the Smart TV will be available as the options for the screen casting. In the meanwhile, other TV will never be available for mirroring without QR-Code binding authorization procedure.
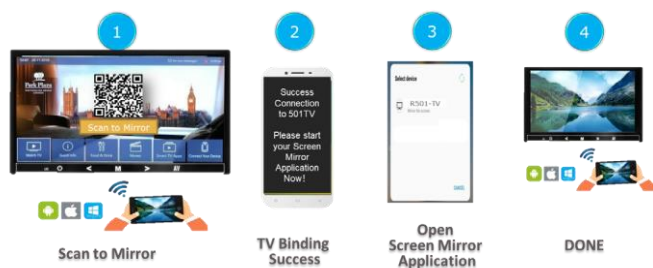
Screen Mirroring to TV procedures

Guarantee for Guest Comfort

Comfort is the MUST for guest relaxation. Traditional Wall AP with LED Status Indicator for engineer installation & troubleshooting use, the but light and LED status flashing will make disturbance on guest sleeping.

All Ruijie SME Wall AP designed with coverable plate, make guarantee for the guest comfortability.

Device Status Lighting is covered by plate

Note:
[3] Ruijie WS6000 Series WLAN Controller with latest firmware required; Ruijie Cloud not support at the moment

Hybrid Management

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:

Standalone
Simple & basic connectivity

Private/ Public Cloud Management
Scalable for diversified customer sites

Powered by MACC

Hardware Controller
High performance for campus network

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)	Ruijie Public Cloud	Hybrid Cloud* (RG-WS6000 + Ruijie Cloud)	Private Cloud (RG-MACC)
Target Segment	Small Office (<10 Employees)	Enterprise, Education, Large Campus	Small and Medium-sized Enterprise (<500 Employees)	ISP/MSP, Gov, or MNC	ISP/MSP, Gov, or MNC
Deployment Mode	On-premises	On-premises	Cloud Service	On-premises + Cloud Service	Software-based
Device Capacity	N/A	Up to 5000	Virtually Unlimited	Up to 5000	Virtually Unlimited
Unified Management	N/A	AP only	AP, Switch and Gateway	AP, Switch and Gateway	AP, Switch and Gateway
Radio Optimization (powered by WIS)	N/A	Y	Y	Y	Y
Employee Authentication	Basic PSK	PSK, PPSK, 802.1x	PSK, PPSK, Access Code, Account, 802.1x	PSK, PPSK, 802.1x	PSK, PPSK, Access Code, Account, 802.1x
Guest Authentication	Basic PSK	Captive Portal	Captive Portal, One-click, Voucher	Captive Portal, One-click, Voucher**	Captive Portal, One-click, Voucher
Marketing Wi-Fi	N/A	N/A	Coming Soon*	Coming Soon*	Support
Reporting	N/A	N/A	Support	Support	Support
Mobile App	N/A	Coming Soon*	Support	Coming Soon*	Support

*new feature to be available in year 2020
**Ruijie EG Gateway required

Flexible Guest Access Policy

With Ruijie Cloud Service or RG-MACC Software controller, the RG-AP180 wall plate access point supports a wide range of authentication methods such as Guest Hotspot, 802.1x, 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.
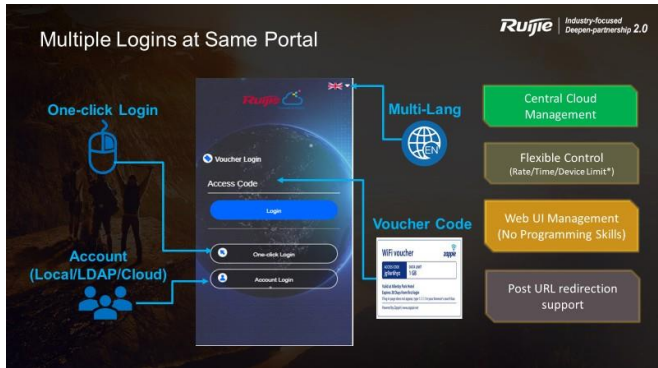
Multi authentication options for guests and employees

For Hotel scenario, Ruijie also provide a customized authentication feature, namely "Account" authentication, simulating a PMS-like login experience but no need for any complex 3rd party PMS integration. Guest will login with their assigned Room Nos and Surname, every account can limit access policy such as concurrent devices, duration, and speed limit, etc.
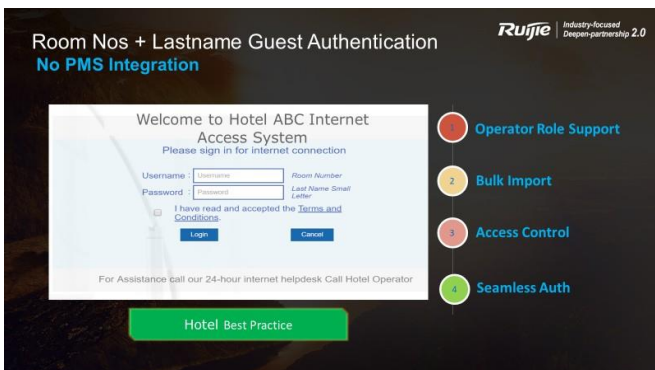

PMS-like Login Experience for Hotel Scenario

High Availability Design

Authentication Offload and Acceleration
Powered by Ruijie Cloud and EasyGate (EG) security gateway, captive portal and account & voucher authentication

can be managed by Cloud, but all security policy and enforcement will be processed locally at EG security gateway. It not only accelerates the overall authentication processing, and also provide additional service availability protection in case of Cloud or WLAN Controller is unreachable, all authentication service still un-interrupted.
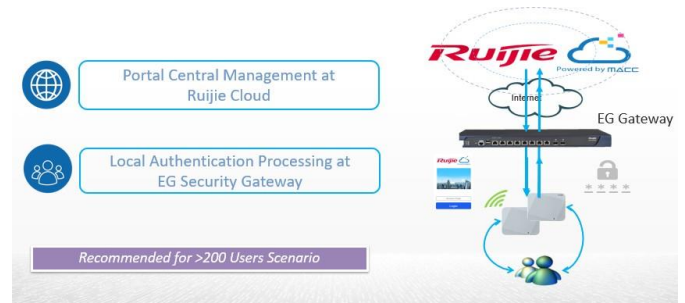
Ruijie EG's Authentication Offload and Acceleration

Remote Intelligent Perception Technology (RIPT)
In the traditional network architecture where FIT APs are centrally managed by a wireless controller, packets received by the AP must be transmitted to the controller before being forwarded. When the wireless controller becomes faulty, the APs will fail to work properly causing whole network breakdown.
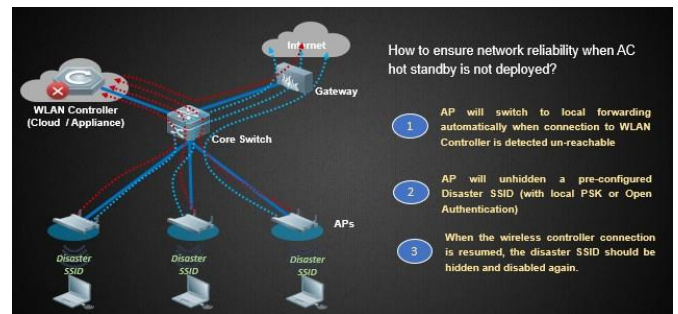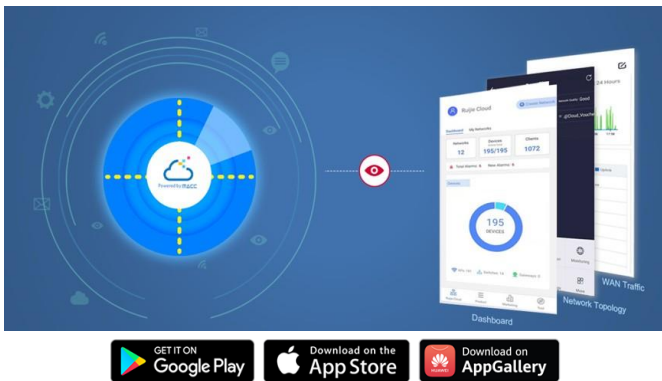

RIPT Disaster Recovery

Ruijie's latest RIPT provides you a complete disaster recovery solution and enables the Wireless Controller Series to implement intelligent link perception. Once the faulty controller is detected, the APs will quickly switch to the intelligent mode to continue data forwarding, ensuring the high availability of the wireless network and keeping wireless users always online.

Mobile Monitoring and Optimizing

Ruijie is committed to providing more simple networking experience for customers by launching a free mobile app[4] (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

Warranty Information

The Ruijie RG-AP180 Access Point come with 3 year warranty. For more details, please visit https://www.ruijienetworks.com/support/servicepolicy.

Antenna Patterns

Horizontal planes (top view)

Below are the RG-AP180 2.4GHz and 5GHz azimuth antenna patterns:

RG-AP180 2.4GHz (Left) and 5GHz (Right) Azimuth Antenna Patterns

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

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

Below are the RG-AP180 2.4GHz and 5GHz elevation antenna patterns:
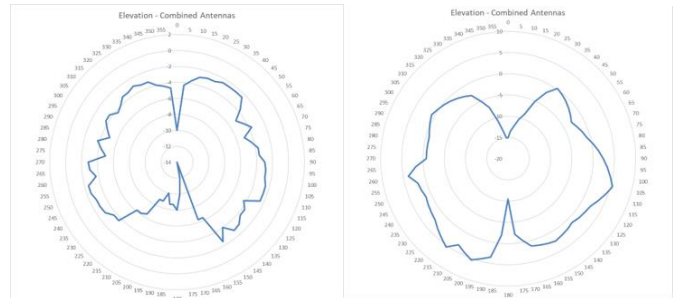
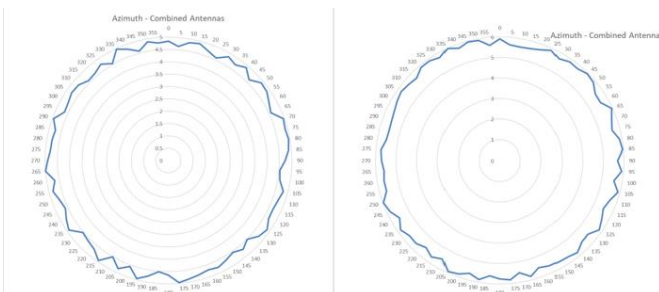RG-AP180 2.4GHz (Left) and 5GHz (Right) Elevation Antenna Patterns

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

Technical Specifications

| Model	RG-AP180
Hardware specifications	
Radio	Dual-radio dual-band: Radio 1: 2.4G 11ax: 2×2 MIMO Radio 2: 5G 11ax: 2x2 MIMO
Protocol	Support concurrent 802.11a/n/ac/ax and 802.11b/g/n/ax
Operating Bands	802.11b/g/n/ax: 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	4 spatial streams, 2x2 MIMO
Max Throughput	Maximum throughput of 2.4G: 574Mbps Maximum throughput of 5G: 1.2Gbps Maximum throughput per AP: 1.775Gbps
Modulation	11b: DSS:CCK@5.5/11Mbps,DQPSK@2Mbps,DBPSK@1Mbps 11a/g: OFDM:64QAM@48/54Mbps,16QAM@24Mbps,QPSK@12/18Mbps,BPSK@6/9Mbps 11n: MIMO-OFDM:BPSK,QPSK,16QAM,64QAM 11ac: MIMO-OFDM:BPSK,QPSK,16QAM,64QAM,256QAM 11ax: MIMO-OFDM:BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM
Transmit Power	≤100mw (20dBm, radio transmit power only)
Dimensions	116mm * 86mm *40mm
Weight	0.37kg
Service Ports	Front: 4 10/100/1000Mbps Ethernet ports Rear: 1 10/100/1000Mbps uplink port
Power Supply	Support PoE Support local power supply (DC Power adapters should be purchased from third-party vendors separately if needed)
11ax Feature	Support 802.11ax Support MU-MIMO
Management Port	1 Micro USB port (hidden)
Reset	Support (hidden)
LED indicator	Support (hidden) The indicator can be switched off
Built-in Antenna	Built-in low-radiation omnidirectional antenna (antenna gain 3.5dBi)
IoT Protocol	Support Bluetooth5.0 (BLE), Zigbee
Power Consumption	<10W
IP Rating	IP41
MTBF	250,000 hours
Anti-theft	Standard: ordinary screws
Color of AP Enclosure	White
Wi-Fi Alliance	· Wi-Fi CERTIFIED™ a, b, g, n, ac · Wi-Fi CERTIFIED 6™ · WPA3™-Enterprise, Personal · Wi-Fi Enhanced Open™ · Wi-Fi Agile Multiband™ · WMM®

Model		RG-AP180
Relevant Standard	Safety Standard	EN/IEC 62368-1
	EMC Standard	EN301 489, EN55032, EN55035
	Health Standard	EN 62311
	Radio Standard	EN300 328, EN301 893
Environment		Operating temperature: 0°C~45°C
		Storage temperature: -40°C~70°C
		Operating humidity: 5%~95% (non-condensing)
		Storage humidity: 5%~95% (non-condensing)
Installation Mode		Compatible with UK/US/EU Junction box *Universal Mount Kit need to purchase separately for US/EU junction box
Software Specifications		
WLAN	Maximum clients per AP	1024
	BSSID capacity	8 (recommended to configure a maximum of 5 BSSIDs per radio in actual application)
	SSID hiding	Support
	Configuring the authentication mode, encryption mechanism and VLAN attributes for each SSID	Support
	Remote Intelligent Perception Technology (RIPT)	Support
	Intelligent load balancing based on the number of users or traffic	Support
	STA control	SSID/radio-based
	Bandwidth control	STA/SSID/AP-based speed control
Security	PSK, Web, and 802.1x authentication	Support
	Data encryption	WPA (TKIP), WPA2 (AES), WPA-PSK, and WEP (64 or 128 bits)
	QR code authentication	Support (integration with RG-WS series wireless controller)
	SMS authentication	Support (integration with RG-WS series wireless controller)
	PEAP authentication	Support (integration with RG-WS series wireless controller)
	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

Model		RG-AP180
Security	Network Foundation Protection Policy (NFPP)	Support
	Wireless Intrusion Detection System (WIDS)	Support
Routing	IPv4 address	Static IP address or DHCP
	IPv6	Support
	Multicast – IGMP Snooping	Support
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

Typical Application

Hotel and Dormitory Scenarios

For hotel and dormitory wireless deployment, either on-premises Ruijie RG-WS6000 Series Wireless Controllers or Cloud management or even hybrid mode (WS6000 appliance plus Cloud Management) can be adopted. 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 are offering at Lifetime Free which allows for value-added features like centralized device configuration and monitoring, AI radio (RF) optimization, reporting, etc.
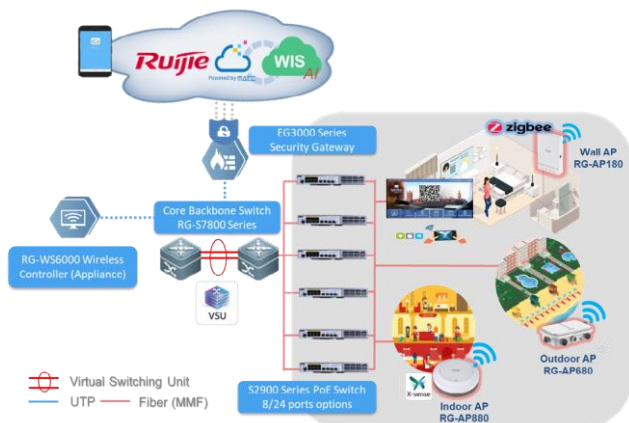
Solution Benefits:

• One-stop Networking Solution from switches, wireless to internet gateway

• Centralized device management and reporting service by WS6000 Controller (appliances) or Ruijie Cloud (Public Cloud)

• Support ultra-seamless L2 or L3 roaming

• Support one-click AI radio (RF) optimization powered by Ruijie Cloud or WIS AI platform

• High performance and security with all user authentication and traffic forwarding handled locally

• Support flexible authentication options, such as 802.1x, PMS-like account authentication, guest hotspot and voucher access code, etc.

• Support all series of Ruijie wireless access points

Ordering Information

Model	Description
RG-AP180	Wall Plate Wi-Fi 6 (802.11ax) Access Point, standard size of 86-type faceplate, built-in antenna, dual-radio dual-band, support 574.5Mbps @2.4G and 1.2Gbps @5G, up to 4 spatial streams and 1774.5Mbps access rate per AP, support concurrent 802.11a/b/g/n/ac and 802.11ax, FAT/FIT mode, PoE and local power supply, bundled with Ruijie Cloud Service lifetime license (Power adaptors for PoE, 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, US/EU mount kit are sold separately)
Optional Accessories	
RG-AP180-MNT	Universal Mount Kit (US/EU Junction Box) for AP180, 10 unit per set