RG-AP530-I(S1)

Wireless Access Point

Datasheet

Ruijie Networks Co., Ltd.

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RG-AP530-I(S1)

2 Product Overview

Ruijie RG-AP530-I(S1) is an 802.11ac AP customized for trackside applications. Supporting three spatial streams, each radio performs at 1,300Mbps and the AP offers an access rate of up to 2,600Mbps. Near Gigabit access totally solves the wireless performance bottleneck problem.

The RG-AP530-I(S1) AP offers a complete set of features on security, radio frequency (RF) control, mobile access, Quality of Service (QoS), and seamless roaming. Forming a wireless bridge with Ruijie RG-WS Wireless Controller Series (ACs), the AP enables high-speed communications between trains and rail officers in control rooms.

With the dual-radio 5G design, the AP supports concurrent 802.11ac. Installation modes include wall or pole mounting for easy and convenient deployment. The AP also supports local power supply of 220V and connection with optical fiber to reduce trackside components. The RG-AP530-I(S1) AP is designed rough for various railway applications, offering excellent capital and maintenance cost savings.

3 Product Features

Outstanding Performance and Stability

➢ **Ultra-speed 802.11ac wireless connection**

The RG-AP530-I(S1) AP supports dual 5GHz 802.11ac with access rates of up to 2.6Gbps. Teaming with vehicle access point, the trackside AP maintains access speeds of above 200Mbps per radio and above 400Mbps for dual radios when the train is moving at high speeds. The superior performance greatly enhances network experiences, concurrent user capacity, and coverage range.

➢ **Industry-leading Gigabit uplink flexibility**

The AP offers one 10/100/1000Base-T uplink port and two Gigabit SFP combo ports to adapt to various wired network scenarios. The wired access will not be an obstacle for wireless connectivity anymore, offering exceptional networking flexibility.

➢ **Versatile power supply designs**

The AP supports both 802.3at power standard and AC power supply of 110V to 286V. The AP can also get power from a PoE switch or PoE power adaptor leveraging Ethernet cables. Remote management allows administrator to monitor the device with ease. All the features reduce deployment complexity as well as installation costs.

➢ **Flexible WDS networking mode**

Wireless Distribution System (WDS) enables the wireless interconnection of access points or wireless bridge. It supports WDS bridging of up to 5 hops and long-range wireless bridge. Together with the point-to-multipoint technology, the AP fulfills client's Wi-Fi needs on large outdoor coverage and long-distance high-speed connection.

➢ **Industry-leading local forwarding technology**

Employing Ruijie industry-leading local forwarding technology, the AP eliminates the traffic bottleneck of ACs. In collaboration with Ruijie RG-WS Wireless Controller Series, users can pre-set a forwarding mode for the wireless device. The AP can determine whether to forward data to the AC, or directly send the data to a wired network for processing. The local forwarding technology can forward large-scale, delay-sensitive, and real-time data through the wired network. All the features alleviate the traffic pressure on ACs and fulfill the high traffic transmission requirements of 802.11ac network.

➢ **Seamless roaming experience**

Working with RG-WS wireless ACs, the AP enables wireless users to roam seamlessly on Layer 2 and Layer 3 networks without interruption.

➢ **Abundant QoS policies**

The AP supports an extensive array of QoS policies. For example, it provides bandwidth limitation in WLAN/AP/STA modes to guarantee key services with priority bandwidth.

➢ **Built to withstand harsh environments**

The IP67 rated AP offers a case that is absolutely water/dust/humidity resistant and flame retardant. It is built to work outdoors to withstand wind, rain, humidity, and moisture. The ruggedized design extends product life and lowers maintenance costs.

➢ **Wide temperature range**

The case and ruggedized components both operate well in extreme temperatures from -40 to 70℃.

Comprehensive Security Policies

➢ **Protect users with data encryption**

A complete set of data security mechanism and technologies including WEP, TKIP and AES is available. The features guarantee data transmission security of the wireless network.

➢ **Flexible virtual AP technology**

With the virtual AP technology, the AP provides up to 14 Extended Service Set IDs (ESSIDs) to support 14 802.1Q VLANs. Network administrators can separately encrypt and isolate subnets or VLANs that have the same SSID. They can also flexibly configure a separate authentication mode and encryption mechanism for each SSID.

➢ **Standard CAPWAP tunnel encryption**

The AP and RG-WS wireless ACs support international standard CAPWAP (Control And Provisioning of Wireless Access Points) for the highest levels of data transmission security.

➢ **RF security**

Working with Ruijie RG-SNC Smart Network Commander and RG-WS AC series, the AP can act as an RF probe to detect rogue access points and other interference sources. Alerts will be sent to network administrator for immediate action against all the potential threats.

➢ **User access control**

The AP supports multiple authentication methods, such as Web, 802.1x, MAC address, and local authentication for customers' choice. The AP also supports Ruijie's advanced Security Management Platform (SMP) BYOD Solution which complies with a standard access control system. The system has a set of control policies in terms of user access, authorization, host compliance check, network behavior monitoring, network attack defense, etc. All these control functions ensure that users are authenticated before access and enjoy the network services securely.

➢ **Comprehensive wireless security protection**

Together with RG-SNC and RG-WS wireless ACs, the AP provides a full range of wireless security features including Wireless Intrusion Detection System (WIDS), RF interference location, rogue AP countermeasures, anti-ARP spoofing, and DHCP. The AP offers a truly secure and reliable wireless network for various application scenarios.

➢ **Wireless IPv6 access**

The AP supports all the IPv6 features and implements IPv6 forwarding on a wireless network. Both IPv4 and IPv6 users can automatically connect to the ACs over tunnels, enabling IPv6 applications to be borne on the wireless network.

Diverse Management Policies

➢ **Flexible switching between the FAT and FIT modes**

The AP can flexibly switch between FAT and FIT modes. The FAT mode enables independent network construction. In the FIT mode, the APs can be centrally managed by the RG-WS wireless ACs to achieve unified control, security, traffic, QoS, and IP management. The smooth transition from one mode to anther offers clients with unparalleled investment protection.

➢ **Simple zero configuration installation**

In FIT mode, no preconfiguration is required. On-site installation, maintenance and replacement also do not require reconfiguration. The AC can store the configurations and automatically upgrade the AP to reduce maintenance workload and costs.

➢ **End-to-end remote management**

All operating parameters including channel number, power ranking, SSID setup, security management, and VLAN configuration can be remotely completed on RG-WS wireless ACs. It can minimize local management resources and improves security and management efficiency.

4 Technical Specifications

4.1 Hardware Specifications

Model	RG-AP530-I (S1)		
Operating Bands	Support 2 concurrent 5GHz RF【5.150GHz to 5.350GHz, 5.47GHz to 5.725 GHz, 5.725GHz to 5.850GHz depending on the regional regulations】		
MIMO Standard	IEEE 802.11ac 3x3, 3 spatial streams		
Maximum Output Power	27±1.5dBm (The maximum power may be limited by the regional regulations)		
Transmission Power Dynamic Range	Support at least 5 adjustable power levels: 100%, 50%, 25%, 12.5%, 6.25%		
Transmission Modulation Accuracy EVM	Comply with IEEE 802.11		
Spectrum Emission Mask	Comply with IEEE 802.11		
Occupied Bandwidth	Comply with IEEE 802.11		
Receiver Sensitivity	Comply with IEEE 802.11		
Adjacent Channel Rejection Ratio of Receiver	Comply with IEEE 802.11		
Maximum Reception Level of Receiver	Comply with IEEE 802.11		
Static Throughput Performance (Integrate with automotive AP)	802.11ac HT20	≥120Mbps	
	802.11ac HT40	≥240Mbps	
	802.11ac HT80	≥500Mbps	
Mobile Throughput Performance (Integrate with automotive AP)	Single-link 80km/h	≥200Mbps, Packet loss rate ≤0.5%, (Average figure when the train continues to move for 1km, same below)	
	Dual-link 80km/h	≥400Mbps, Packet loss rate ≤0.5%	
	Dual-link 120km/h	≥300Mbps, Packet loss rate ≤1%	
Network Ports	Support 2 1000BASE-X ports (SFP), 1 10/100/1000BASE-T port (M12 port)		

Power Interfaces	Support AC 220V direct power supply (M16 port), 110V to 286V, 50Hz-60Hz
LED Indicators	The LED indicates device power, operation status and network status
Management Port	1 RJ45 console port
Antenna Port	6 N-type female connector
Power Consumption	≤25W
Weight	≤5kg
Dimensions (D x W x H)	275mm×245mm×70mm (The height only includes the chassis without the rack)
Installation Mode	Mount the device on the tunnel wall by 4 M8 screws/ pole mounting on the high rack
Protection Rating	Full metal cover plate, support IP67 protection
Operating Temperature	-40℃ to 70℃
Operating Humidity	5% to 95% (non-condensing)
Storage Temperature	-40℃ to 85℃
EMC Standards	GB9254, EN301489
Sefety Standards	GB4943, EN/IEC 60950-1
Lightning Protection	The antenna supports built-in lightning protection, ≥2kV
	The Ethernet supports built-in lightning protection, ≥6kV
Wind Resistence	≥160km/h
Mechanical Oscillation	GB/T25119, EN50155 (EN61373)
RF Network	Wireless transmission equipment approval, EN300 328, EN301 893

4.2 Software Specifications

| Model		RG-AP530-I (S1)
Management Configuration	AP Zero-configuration	After pre-configuration on the AC, the AP supports plug-and-play with zero-configuration
	Auto Connection Recovery	After AP restart, users can restore their connection automatically
RF Security	RF Transmission Control	Before configuration from the AC or lost connection with the AC, the AP disables the RF to prevent signal interference

802.11n/ac	A-MPDU	Support transmission/ receiving A-MPDU
	Short GI	Support Short GI
	20/40/80MHz Bandwidth	Support 20/40/80MHz bandwidth
	WDS Bridging	Support WDS bridging with Train AP
	Support 11n/ac User Access Only	Support 11n/ac User Access Only
	Spatial Streams	Support 3 spatial streams
Basic Features	NTP Synchronization	Support NTP server clock synchronization
	Automatic Power Control	Support automatic power control. When one of the APs in the network fails, the surrounding APs can automatically increase the transmission power and expand the coverage to compensate for the coverage of the failed AP. After receoovery of the failed AP, the surrounding APs reduce their output power.
	P2P Relay	Support P2P Relay
	Point to Multipoint Relay	Support Point to Multipoint Relay
	AC Broadcast Discovery	Support Layer 2 protocol-based broadcast discovery
	DHCP Option 43 AC Discovery	Support DHCP option 43 Discovery

	Uplink Integrity Test	Support uplink detection and determine whether to provide WLAN access service according to the uplink status
	AP Software Remote Upgrade	Support remote software upgrade
High-Speed Mobile Switching	AP switching time is less than 50ms at 120km/h Packet loss rate between Train AP and Station AC <1%	
Energy Saving	Automatically or remotely disable the RF to reduce power consumption	

5 Typical Applications

Network Topology of the Passenger Information System (PIS)
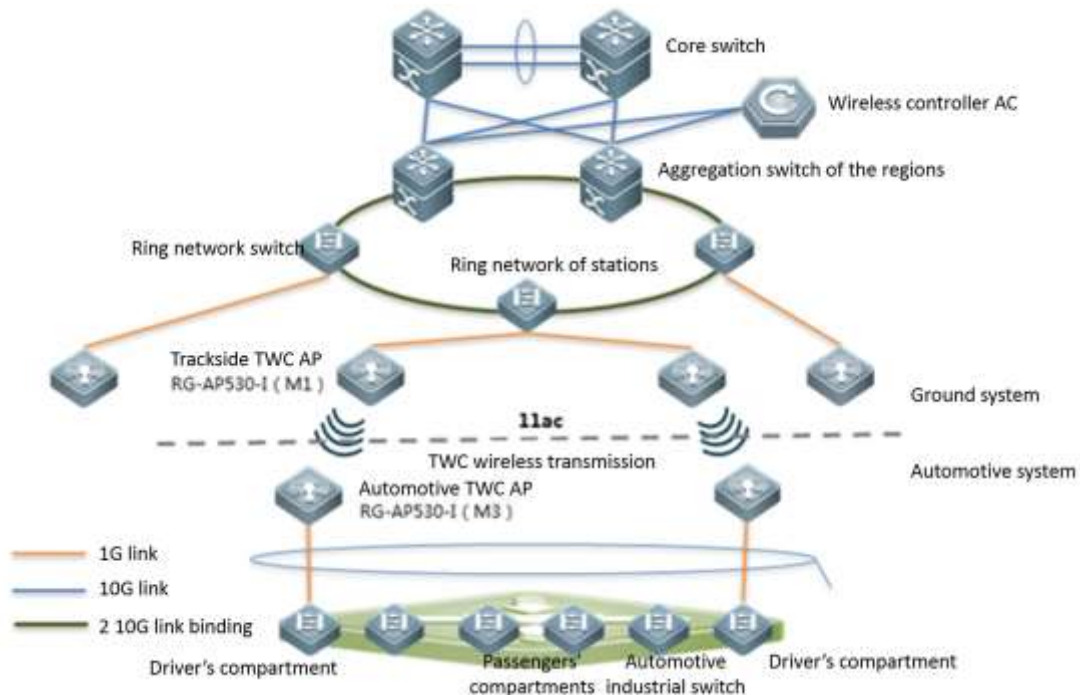
Application Features:

- Support WDS (Wireless Distribution System) technology and wireless coverage mode or multi-level wireless bridge mode

- Designed for the strong electromagnetic environment for the industry to meet the EN50121 electromagnetic compatibility design requirements

- Designed for wall-mounting/ pole-mounting with aviation plug connector

- Full metal cover plate to meet the fire retardant safety requirements

- Operating temperature -40℃ to 70℃, operating humidity 5% to 95%, IP67 protection

- Support 220V AC power supply

6 Ordering Information

Model	Description	Remarks
RG-AP530-I(S1)	RG-AP530-I(S1) Train Communication AP (For trackside)	
RG-ANT-GP-N3M	3×3 MIMO cylindrical antenna, 3 N-type female connectors, support 5GHz, directional, with low air resistance casing, bracket mounting	Optional
RG-AP530-I(S1) wall rack	Trackside AP rack, RG-AP530-I(S1) wall rack	Optional
RG-PL-M16-2M	Trackside AP 220V AC power supply M16 power cord, 2020mm, low smoke zero halogen cable	Optional
RG-Cab-NJ-3m	Trackside feeder, 3m NJ to NJ, Trackside AP feeder connecting the antenna	Optional

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