data sheet

KEY FEATURES/BENEFITS

Scalability
Supports networks with tens of thousands of APs, hundreds of thousands of subscribers, and tens of Gbps of aggregate traffic.

Active/active flat cluster architecture for resiliency
Hot-swappable and redundant hardware level component architecture combined with the SCG 200's distributed and replicated software intelligence ensures highly available Wi-Fi control, management, and gateway services.

Bonjour gateway support
The SmartWay Bonjour Gateway allows customers to discover Bonjour services (such as AirPlay, Apple TV and other Apple network services) and other mDNS based products like ChromeCast across VLANs and subnets.

Hotspot 2.0 roaming support
The SCG 200 supports the Wi-Fi Alliance's Hotspot 2.0 release 1 specification and is Passpoint™ certified. This enables mobile devices to automatically discover and select APs for which a roaming arrangement exists.

Flexible authentication support
The SCG 200 supports authentication via EAP-SIM, EAP-AKA, EAP-TLS (x.509) and EAP-TTLS (username and password). The SCG also supports authentication via WISPr and captive portal technology.

SPoT location based services
SPoT can be used to allow the Wi-Fi network to locate users with great accuracy by triangulating in on probe requests coming from their Wi-Fi devices. This enables a host of services including mobile ads, navigation, and footfall analytics.

Multitenant capable
Highly desireable feature for managed services opportunities as it allows a single SCG 200 to support a large number of managed services customers. This greatly enhances the economics of a managed services offering.

SmartCell™ Gateway 200

CARRIER CLASS WLAN CONTROLLER WITH WLAN GATEWAY SUPPORT

The Industry's Most Scalable and Versatile WLAN Platform

The SmartCell Gateway (SCG) 200 represents the first in a new category of scalable and versatile WLAN controllers with support for WLAN gateway functionality. It has been designed to eliminate the difficulties that service providers and large enterprises are experiencing with building and managing large-scale WLAN networks. A whole host of new features have been recently added to the SCG, many of which target the enterprise along with the managed services opportunity.

Awarded the "Best Mobile Broadband Technology" by the GSMA, the Ruckus SmartCell Gateway 200 is capable of supporting tens of thousands of Ruckus Wi-Fi access points, hundreds of thousands of subscribers, and in excess of 20 Gbps of throughput. Ruckus has extended the traditional WLAN controller by adding WLAN gateway functionality, along with support for tunneling of traffic into the evolved packet core (EPC).

The SCG 200 serves both SIM and non SIM-based client devices using carrier friendly authentication protocols, such as 802.1X/EAP. When this is combined with policy-based data traffic steering, operators can optimize the forwarding of all user traffic. When backhauling to the evolved packet core, the WLAN gateway function implements the Trusted WLAN Access approach that was standardized by 3GPP in Release 11. This work is based on the SaMOG (S2a Mobility over GTP) program in 3GPP that utilizes 802.1x/EAP for authentication and 802.11i (AES) for airlink encryption, both of which are standard on today's smartphones.

The SCG 200 platform features a unique NEBS-3/ETSI compliant, dynamically scalable clustering model that maintains carrier-class availability and resiliency through active-active clustering by incorporating a distributed and replicated database optimized for real-time data management.

SmartCell™ Gateway 200

Unrivaled Flexibility and Versatility

The SCG 200 provides both WLAN controller and WLAN gateway functions integrated into a single compact platform and managed as a single entity, which reduces the number of boxes that must be deployed. This approach accelerates the return on investment and reduces the cost of on-going operations. The WLAN controller function can also be split out from the WLAN gateway function, if desired, and they can run on separate platforms. The WLAN gateway can tunnel traffic directly to the evolved packet core for subscriber management, or offload traffic directly to the Internet. The WLAN controller can also interoperate with WLAN gateways from 3rd party suppliers, which provides the network operator with a great deal of deployment flexibility.

Highly Scalable WLAN Controller

The SCG 200 can function as a very large-scale WLAN controller that can manage tens of thousands of Ruckus APs. The SCG 200 provides feature-rich management including control over their self-organizing smart networking behaviors such as RF management, load balancing, adaptive meshing, and backhaul optimization. The following are some of the capabilities that are enabled by the WLAN controller function.

Wi-Fi Radio Resource Management

The SCG 200 supports a variety of radio resource management techniques of which the most important is ChannelFly™ (SP).This algorithm allows APs to automatically select the optimum 2.4 and 5 GHz channels so as to maximize performance and minimize interference. When properly deployed, ChannelFly can double the capacity of a WLAN network in a high-density environment. The SCG 200 also manages dynamic mesh deployments that make use of the 5 GHz band to backhaul AP traffic to a point where wireline facilities are available. Mesh backhaul configurations can be dynamically reconfigured to reroute traffic over different paths as conditions change.

Seamless Low-Latency Wi-Fi Handoffs

The SCG 200 supports seamless handoff for subscribers as they move from one Wi-Fi AP to another in the coverage area. It is not necessary for the user to re-authenticate as they move about. Their credentials are passed from access point to access point. Handoffs are performed rapidly, and there is no impact on the application. The SCG 200 also supports Wi-Fi RAN load balancing.

Hotspot 2.0 support

Hotspot 2.0 enables seamless network discovery and selection along with seamless authentication using 802.1x/EAP. It represents the future of Wi-Fi roaming and has picked up a tremendous amount of support throughout the wireless industry. The SCG 200 supports Hotspot 2.0 by enabling Ruckus APs to exchange information with Wi-Fi devices pre-association. The information that is exchanged includes details on roaming consortiums that are support by that AP as well as information on backhaul capacity and loading. The Wi-Fi device then selects the best available AP and begins the authentication process. Hotspot 2.0 is automatic and requires no user intervention.

The SCG 200 can authenticate subscribers via WISPr using captive portal technology or with 802.1x/EAP authentication via EAP-SIM, EAP-AKA, EAP-TLS, and EAP-TTLS. For the first two EAP variants, credentials can be passed to the HLR/HHS using either the SIGTRAN interface or a AAA server.
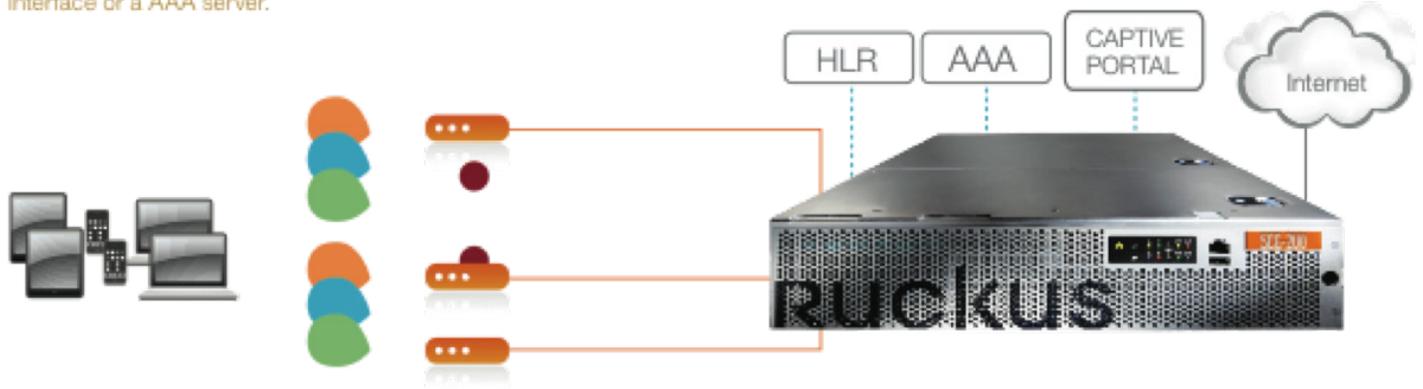
SmartCell™ Gateway 200

CARRIER CLASS WLAN CONTROLLER
WITH WLAN GATEWAY SUPPORT

Figure 2: Hotspot 2.0 enables automatic and secure Wi-Fi roaming
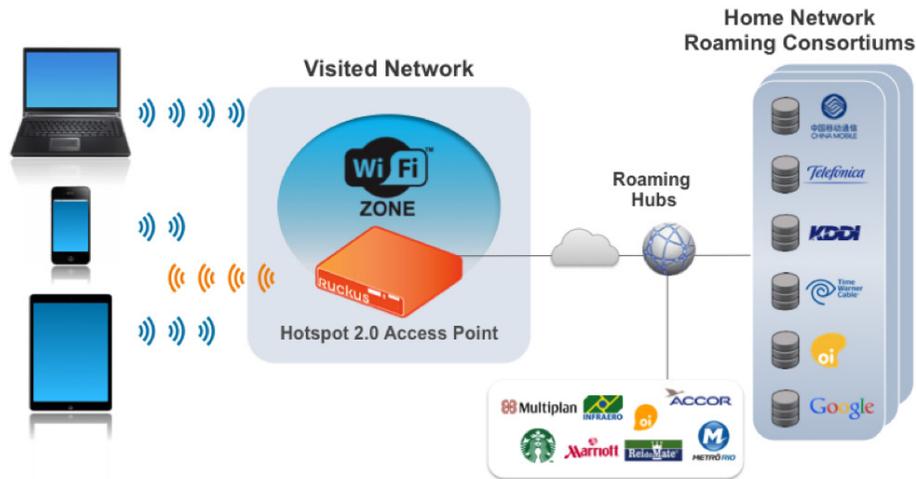
New Features

A whole host of new enterprise and service provider class features have been added to the platform including: ZoneFlex AP Auto Discovery, Ruckus SPoT Location Support, Ruckus SWIPE 2.0 Support, Capacity Based Client Admission Control, Band Balancing, SmartWay Bonjour Gateway, Zero-IT™ Onboarding with User Roles for BYOD (Supports 802.1x with external RADIUS server), JSON/RESTful based APIs for configuration and much more.

The following section describes some of these new SCG 200 features.

Easy Setup: UPnP Network Discovery and Installation Wizard
Out of the box, the SCG 200 provides Universal Plug and Play (UPnP) support for easy setup. Simply plug in the hardware and it can be discovered on a Windows network browser to provide one-click access to the Installation Wizard. The Installation Wizard allows step-by-step configuration for basic operations and unparalled ease of use in setting clustering support for N+1 redundancy.

ZoneFlex AP Auto Discovery
The SCG 200 can automatically discover Ruckus ZoneFlex access points, the same access points used by the Ruckus ZoneDirector WLAN controllers. This provides an easy migration for ZoneDirec-tor customers and allows the use of existing ZoneFlex access point inventory for building out an SCG 200 network.

Smart Positioning Technology (SPoT) Support
This release introduces support for Ruckus' Smart Positioning Technology (SPoT) location-based services. Ruckus SPoT™ is the industry's first cloud-based location technology suite that enables service providers and enterprise customers to deliver a wide range of location-based services. The solution works with ZoneFlex Access Points that track wireless device location by triangulating in on Wi-Fi probe requests. SPoT also includes a set of APIs that power a new generation of mobile applications that can enable a host of compelling location specific applications like mobile advertising, footfall analytics, and indoor navigation.

Figure 3: The Ruckus Smart Positioning Technology (SPoT) enables a host of different location based services.
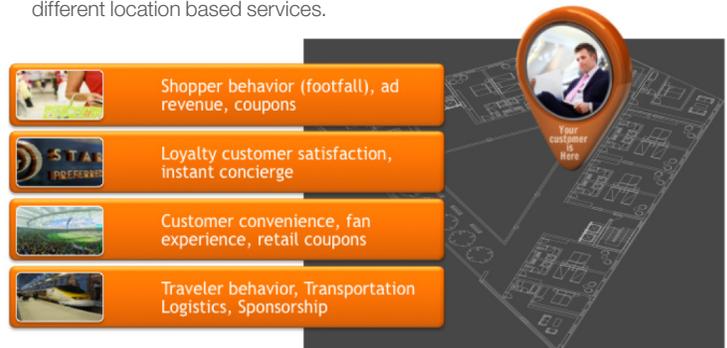
Ruckus SWIPE 2.0 Support
The SCG 200 supports Ruckus Smart Wireless Installation & Provisioning Engine (SWIPE) version 2.0, a mobile application running on Apple iOS and Android mobile devices. SWIPE makes deploying a new AP as simple as scanning the barcode of the AP (serial number and MAC address), entering the AP name, taking a

SmartCell™ Gateway 200

CARRIER CLASS WLAN CONTROLLER WITH WLAN GATEWAY SUPPORT

picture of the AP once installed, using a default WLAN to automatically download the IP address of the SCG 200 to the AP, and uploading the correct zone for that AP to the chosen SCG 200 via a standard cellular modem. The AP will then automatically connect to that SCG 200 using that IP address and get its configuration downloaded.

This makes it possible for the technician to go to the designated location, take an AP out of the truck and mount it, have that AP automatically connect to the correct SCG 200, and get itself automatically configured. All of which greatly simplifies the installation procedure. Nothing needs to be pre-configured, APs can be shipped from the factory directly to the site for install by semi-skilled workers.

Call Admission Control
This new feature helps to ensure existing Wi-Fi customers' quality of experience is maintained when the maximum load of the access point is reached. A minimum bandwidth per client can be configured and enforced by monitoring user counts, radio load and average user throughput. When the access point detects thresholds are exceeded that could impact the minimum bandwidth per client it will stop accepting new client connections. This will force the new client to connect to either cellular or another nearby Wi-Fi access point.

SmartWay Bonjour Gateway Support
The SmartWay Bonjour Gateway allows customers to discover Bonjour services (such as AirPlay, Apple TV and other Apple network services) and other mDNS based products like ChromeCast across VLANs and subnets. Additionally, the SmartWay Bonjour Gateway provides filtering services to limit which Bonjour services are allowed to be shared across network segments. The SCG 200 is preconfigured with the common Bonjour service types, making configuration of the SmartWay Bonjour Gateway extremely simple. The Bonjour Gateway service can be enabled at the AP to support flexible deployment options supporting larger and more complex networks with Layer 3 isolation between the SCG 200 and the access point.

AP Survivability for 802.1x, Guest Access and Captive Web-Auth Portal
The SCG 200 provides a robust architecture designed to be WAN friendly and to provide basic access point functionality when connectivity to the SCG is lost. In addition to providing continuous service to existing and new clients for open and PSK WLANs, the SCG 200 introduces AP survivability operation for 802.1x, Guest Access, and Captive Web-Auth Portal WLANs. To enable secure access, credentials are cached for Guest Access operation while a local, onsite AAA server is required for Web-Auth and 802.1x secure access.

WIDS/WIPS Rogue AP Detection and Prevention
The SCG 200 adds Wireless Intrusion Detection and Prevention System (WIDS/WIPS) functionality for rogue AP detection and prevention. Rogue access points can be automatically detected and flagged as malicious when they pose a significant threat to wireless networks. Malicious rogue access points are identified as being connected to the Ruckus network or those spoofing an SSID or BSSID of any Ruckus connected access point. Once identified as malicious, and if enabled, Ruckus access points can automatically start defending the network.

Guest Access Enhancements
Guest access on the SCG 200 has been enhanced to provide added functionality and ease of use. Guest credentials can be delivered via SMS using Twillio or email. The guest access authentication page can use a customized logo with welcome text in multiple languages. To support multiple guest WLANS and managed services, multiple guest access templates can be created and used in multiple WLANs. Finally, guest passes can be imported to support events and large groups.

Per WLAN Access Control Lists (L2/L3/L4)
Access control lists can be created and deployed per WLAN to control device access and IP traffic flows. Layer 2 MAC address black lists/white lists can be created to permit or deny individual device access based on MAC addresses of mobile devices. User IP Traffic Profiles allow control over L3 and L4 network traffic flows.

Device Policy Enforcement
Administrators can now apply rules to allow, deny, rate limit, or assign devices to specific VLANs based on the device operating system. Completely managed by the SCG 200, this allows segregating network access on a single SSID without the need to maintain user roles or RADIUS/Active Directory attributes.

Multi-Hop SpeedFlex™ Mesh Traffic Testing
The SpeedFlex™ tool now supports multiple test topologies to provide detailed mesh performance and testing capabilities. SpeedFlex can provide automatic testing of each hop along the mesh tree, reporting each access point to access point hop and edge access point to SCG 200 hop. This detailed analysis of the mesh topology provides easy determination of performance issues and eliminates the need for a truck roll to evaluate performance issues.

SmartCell™ Gateway 200

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RESTful API for configuraton and data export

The SCG 200 introduces a RESTful API for access to common configuration and monitoring functions. The API enables the SCG to integrate into existing automated backend systems and provide a 'headless' interface for WLAN system control and monitoring.

Flexible WLAN Gateway

The SCG 200 can also provide the WLAN gateway function, which connects the Wi-Fi access network to the Internet (or the evolved packet core). When offloading traffic to the Internet, the SCG 200 can provide services such as authentication, address assignment, billing support, and more. When traffic is backhauled to the EPC, these subscriber management functions are provided in the core. The SCG 200 supports policy based steering of traffic to either the Internet or the EPC. It also allows operators to dynamically configure and manage network and subscriber QoS/policy rules, in addition to being able to authorize, account and bill Wi-Fi users.

Operations and Administration (OAM)

Element Management System

With the built-in EMS, the SCG 200 supports rapid deployment and eliminates the need for separate and expensive management systems. The built-in EMS provides user-friendly full-fledged FCAPS support and can be easily integrated with existing OSS/BSS systems via a variety of interfaces ranging from traditional SNMP or CLI based interfaces to web programming friendly secure API based methods (RESTful JSON).
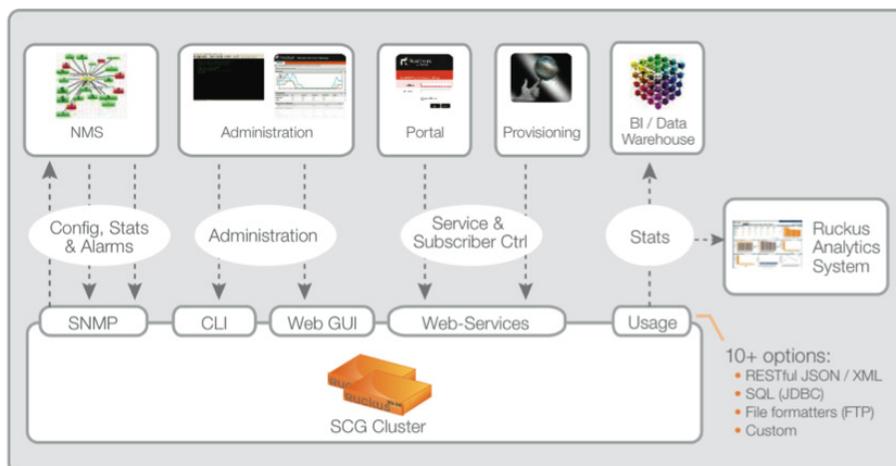
Statistics, KPIs and Reports

The SCG 200's built-in EMS provides rich near real-time statistics on subscribers (including client fingerprinting), APs, SSIDs, backhaul (Mesh), and the SCG 200 cluster itself. Reports ranging from hours to years can be generated for a variety of key performance indicators (KPIs) and exported out in multiple formats. For operators seeking richer information, Ruckus also provides the SmartCell Insight (SCI) software appliance for long-term storage, sophisticated data mining and analysis, and richer complex reporting, allowing network operations to leverage dedicated external reporting systems to generate complex reports.

Wholesale/MVNO operations

The SCG 200's fully functional GUI provides concurrent role-based access control (RBAC) for viewing the Wi-Fi system resources and performance. With the support of partitioning for access in a secure manner, the SCG allows Wi-Fi service providers to wholesale SSIDs to other service operators such as virtual network operators (VNOs), and to enable VNO admins to administer and monitor only the SSIDs over which they have control.

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Specifications

PHYSICAL CHARACTERISTICS

POWER	• Dual (redundant) AC or DC hot-swappable power supplies
	• DC input requirements
	  - Voltage: -48 to -60VDC
	  - Current: 13A
	• AC input requirements (auto-range)
	  - 50/60Hz
	  - 100 to 127VAC/maximum current 6A
	  - 200 to 240VAC/maximum current 3A

PHYSICAL SIZE	• 2RU rack mountable • 8.76 cm (H), 43.53 cm (W), 50.8 cm (D)
WEIGHT	• 40 lbs. (18.14 kilograms)
CONNECTIONS	• Control: Six 10/100/1000 Mbps RJ-45 ports • Data: Four 10 GigE data ports • Serial ports, RJ-45 (one front, one back)
LED DISPLAY	• See User Guide for details
FANS	• Six redundant, field-swappable fan sets

ENVIRONMENTAL CONDITIONS	• Operating Temperature: 41°F (5°C) —104°F (40°C)
	• Operating Humidity: Up to 95% Non-condensing at 73°F (23°C) – 104°F (40°C)
	• Acoutic Emission:
	  - Sound power: 7 bels max at 25°C ambient
	  - Sound power: 8.9 bels at max fan speed
	• Power consumption and Heat output:
	  - Min: 235W (802 BTU/hr)
	  - Typical: 255W (870 BTU/hr)
	  - Max: 300W (1024 BTU/hr)

REGULATORY/CERTIFICATIONS

MISCELLANEOUS	• WFA Certified • NEBS level 3 compliant
SAFETY	• UL60950-1/CSA 60950-1 (USA/Canada) • EN60950-1 (Europe) • IEC60950-1 (International), CB Certificate & Report including all international deviations • GS Certificate (Germany) • GOST R Approval (Russia) • CE-Low Voltage Directive 73/23/EEE (Europe) • CCC Certification (China)
EMC	• FCC/ICES-003-Emissions (USA/Canada) • CISPR 22-Emissions (International) • EN55022-Emissions (Europe) • EN55024-Immunity (Europe) • EN61000-3-2-Harmonics (Europe) • EN61000-3-3-Voltage Flicker (Europe) • CE-EMC Directive 89/336/EEC (Europe) • VCCI Emissions (Japan) • AS/NZS: CISPR 22 Emissions (Australia/New Zealand) • BSMI CNS13438 Emissions (Taiwan) • GOST R Approval Emissions and Immunity (Russia) • KCC Approval (Korea) • CCC Certification (China)

SUPPORTED CONFIGURATIONS

MANAGED APs	• Up to 10,000 per SCG • Up to 30,000 per cluster of 4
CONCURRENT MOBILES (UEs) / STATIONS	• Up to 100,000 tunneled concurrent sessions per SCG • Up to 300,000 per cluster of 4
WLANs	• 65,534 per SCG
CONTROLLER EXPANSION	• Up to 4 controllers in 4/4 active mode, supporting non-disruptive capacity expansion. Future releases will validate larger clusters.
CONTROLLER REDUNDANCY	• Distributed data preserving with 3:1 redundancy

KEY FUNCTIONALITY

DATA OFFLOAD	• Trusted WLAN Access using 3GPP TS 23.402 (802.1x/EAP) • Untrusted WLAN Access using 3GPP TS 23.234 (TTG/PDG) • Local offload of traffic directly to the Internet
AUTHENTICATION PROTOCOLS	• Open, 802.1x/EAP, PSK, WISPr, WPA, WPA2-AES, WPA-TKIP, WEP • Fast EAP-SIM re-authentication • EAP-SIM, EAP-AKA, EAP-AKA' over WLAN for 802.1x Wi-Fi Locations with the SCG AAA-Proxy functionality enabled
AAA SERVICE	• Incorporates on-board EAP-server enabling SIGTRAN based authentication with external HLR/HSS • RADIUS (AAA) PROXY
WISPr SUPPORT	• WISPr 1.0 authentication
ELEMENT MANAGEMENT	• Secure multi-operator login (RBAC) • Large scale (bulk) AP management tools • Configuration audit trails • Alarm and event notification (SNMP V2 / V3) • Extensive statistics and reporting • Integrated on-board remote accessible EMS • RESTful APIs (JSON) • CLI

Product Ordering Information

MODEL	DESCRIPTION
SmartCell Gateway 200 Carrier Scale Wireless Controller	
901-S20J-WW10	SmartCell Gateway 200 with redundant AC power. Includes (6) GigE ports, and (2) data plane cards with (4) 10GigE ports. Does not include power cords (ordered separately).
901-S20J-WW00	SmartCell Gateway 200 with redundant DC power. Includes (6) GigE ports, and (2) data plane cards with (4) 10GigE ports.
Ruckus Access Point Management Licenses	
909-0100-SG00	SCG License supporting 100 Ruckus APs
909-0500-SG00	SCG License supporting 500 Ruckus APs
909-001K-SG00	SCG License supporting 1,000 Ruckus APs
909-010K-SG00	SCG License supporting 10,000 Ruckus APs
Ruckus Gateway Licenses	
909-0001-RMAP	**SCG MAP Gateway License.** The RMAP license is a flat license (not subscriber-based). This license enables user authentication utilizing SIGTRAN protocol requiring EAP-SIM/AKA SIGTRAN signaling to an external HLR. This license applies to Ruckus APs and/or 3rd party APs.
909-010K-RWAG	**SCG 3rd Party APs License.** The RWAG tunnel type license is a subscriber-based license. This license controls the number of concurrent subscriber/client/UE data traffic attaching to 3rd party Wi-Fi APs via Q-in-Q or L2oSoft-GRE and requiring traffic tunneling northbound towards core via VLAN and Q-in-Q (L2). This license is applicable in increments of 10k subs.
909-010K-RMNO	**SCG 3GPP Tunneling License.** The RMNO tunnel type license is a subscriber-based license. This license controls the number of concurrent subscriber/client/UE traffic attaching over Ruckus APs or over 3rd party Wi-Fi APs and requiring traffic tunneling onward to a 3GPP GGSN (GTPv1) or a 3GPP LTE PGW element (GTPv1/v2). This license is applicable in increments of 10k subs.
909-0100-RXGW	**SCG Direct Tunnel License.** The RXGW license will allow tunneling of data traffic directly from Ruckus APs to an external gateway (e.g. ALU 7750). This license is applicable in increments of 100 APs.
Accessories and Spares	
902-0179-AC00	770-67104-001, Power Supply AC
902-0175-DC00	770-67105-001, Power Supply DC
902-0176-0000	756-00001-001, FAN set of 6
902-0178-0000	KIT, SPARE, Rack Mount Kit, ZD5000/SCG
902-0187-0000	CABLE, CONSOLE, RJ45 to DB9-F, 1800 +/-20mm Lg
902-0188-0000	Hard Drive, 600GB, 10K RPM, 64MB Cache 2.5 SAS 6Gb/s, Internal
902-0190-0000	10GBASE-SR SFP+ Module

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