MediaFlex™ 7000 Series

802.11n Multimedia Smart Wi-Fi Access Point and Receiver

Ruckus MediaFlex 7811 Multimedia Wireless Access Point

Ruckus MediaFlex 7111 Multimedia Wireless Adapter

The First Managed Smart Wi-Fi 802.11n System for Picture-Perfect Distribution of HD IPTV

The Ruckus Wireless MediaFlex 7000 series is the first carrier-class 802.11n multimedia system designed to reliably distribute High Definition (HD) IP-based video (IPTV) over Wi-Fi to every corner of the home. The Ruckus MediaFlex 7000 series is composed of the Ruckus MediaFlex 7811 access point and the Ruckus MediaFlex 7111 adapter.

Installed in minutes, the Ruckus MediaFlex 7000 series helps carriers eliminate costly and cumbersome cabling within subscriber homes, speed installation times, and enable robust remote management.

The MediaFlex 802.11n access point combines innovative, patent-pending smart antenna and traffic management technologies to break down the barriers that have prevented a single Wi-Fi network for supporting voice, video and data in the home.

The MediaFlex 7811 gives broadband operators a single system that reliably extends multimedia services throughout the home over standard 802.11n (5 GHz) Wi-Fi while delivering unprecedented visibility into and control over subscriber Wi-Fi environments.

Unlike any Wi-Fi system available today, the MediaFlex 7811 access point constantly monitors the wireless environment, steering RF signals around interference and prioritizing different traffic types for transmission over the air. With the Ruckus MediaFlex system, consumers now have complete freedom and flexibility to distribute and enjoy multimedia content anywhere in their homes — all without wires. Meanwhile, service providers can accelerate deployment, minimize installation costs and maximize service potential.

The MediaFlex 7811 access point delivers on the high-speed promise of 802.11n. Each access point integrates a state-of-the-art adaptive antenna system designed to exploit such advanced techniques as spatial multiplexing, channel bonding and frame aggregation,

BENEFITS

- **Unparalleled remote control**
  Remote visibility into and control over services associated with each subscriber, offer real-time monitoring of the in-home Wi-Fi environment.

- **Dramatic range and performance increase**
  Smart antenna system with six antennas and 63 unique antenna patterns ensure optimum signal paths and high data rates to support 3-5 simultaneous high-definition video streams.

- **No more dead spots**
  Antenna control software monitors the RF and switches antenna patterns dynamically to route signals farther and bypass interference for the best coverage and capacity.

- **Highest quality user experience**
  Precision and heuristic Quality of Service (QoS) management, combined with smart antenna system, delivers consistent, reliable bandwidth essential for high-definition TV.

- **Reliable Wi-Fi transmission of multicast IPTV**
  Unique traffic classification and smart multicast handling deliver multicast IPTV reliably to one or more set-top boxes.

- **Self-installing, automatic configuration**
  Comprehensive DHCP client support and automatic pairing of the MediaFlex access point and adapter enable plug-and-play installation.

- **Secure, central management and auto upgrades**
  Central management of MediaFlex routers through the Ruckus FlexMaster platform leveraging TR-069 for troubleshooting, bulk configuration, diagnostics and auto firmware upgrades.

RUCKUS WIRELESS

used within the 802.11n standard. The result is predictable and high performance transmission of high-definition IPTV streams.

Introducing the Ruckus MediaFlex 802.11n Access Point

A complete solution for video-grade, high-performance wireless networking, the Ruckus system includes the Ruckus MediaFlex 802.11n multimedia access point and Ruckus MediaFlex 802.11n multimedia Wi-Fi adapter. The system incorporates Ruckus patent-pending BeamFlex and SmartCast technologies to guarantee optimal range and performance for concurrent video and data traffic.

Attached to the broadband gateway, the Ruckus MediaFlex access point optimizes all 802.11n devices in the home, while enabling wireless video applications.

The Ruckus MediaFlex 7811 adapter provides video-grade, 802.11n connectivity to any Ethernet-equipped video server and video receiver, including set-top boxes, personal video recorders, media centers and media center extenders.

Most off-the-shelf Wi-Fi products are equipped with one or two antennas, offering little resilience or diversity in the event of a debilitated signal path. In contrast, the Ruckus MediaFlex access point is equipped with BeamFlex, a patent-pending MIMO smart antenna system.

BeamFlex Extends Signal Coverage, Increases Reliability

Each Ruckus MediaFlex 7811 access point integrates BeamFlex, a compact, internal antenna array with six high-gain, directional antenna elements capable of forming 63 unique antenna patterns for massive diversity. Expert system control software continuously ranks the antenna patterns for each receiving device, using the inherent feedback mechanism built into the 802.11 MAC layer protocol.

BeamFlex enables client devices to communicate over longer distances at higher speeds than consumer-grade 802.11 products — delivering unprecedented reliability and diversity.

With BeamFlex, the Ruckus MediaFlex 7811 access point reconfigures itself in real-time, detecting and adjusting for both spectral and multipath interference as well as neighboring network noise.

By selecting the optimum antenna pattern for each receiving device, BeamFlex enables extended Wi-Fi range and higher communications speeds. This antenna diversity allows the Ruckus MediaFlex access point to find and instantly select from many quality signal paths in a changing environment. This provides the stability and sustained baseline performance essential for delay-sensitive voice and video applications.

Integrated smart antenna array

AC power adapter input

WAN port

Factory resets
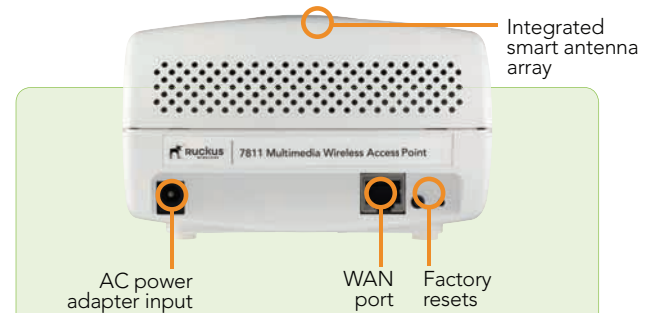
CAPABILITIES

- Supports the simultaneous distribution of multiple HD IPTV streams

- Enables whole-home video distribution without tedious and expensive wiring

- Locates media receivers anywhere in the home for more flexibility and convenience

- Provides standards-compliant 802.11n wireless connectivity for Ethernet-equipped media receivers including set-top-boxes and personal video recorders (PVRs)

- Enables reliable and flicker-free streaming of IPTV from broadband gateway to set top boxes

- Extends 802.11n range and coverage by up to 300 percent, maximizes throughput and minimizes interference

- Optimizes both unicast and multicast video

- Supports simultaneous video, voice and data traffic over the same wireless network with heuristic classification of each traffic type

- Offers remote management: TR-069, HTTP, SSH and HTTPS

- Allows auto firmware upgrade via TFTP, FTP, or HTTP

The high-gain directional antenna system specifically designed for spatial multiplexing, a technique used by 802.11n, provides multiple antenna elements that are controlled by an expert software system. This system determines the best antenna pair for any packet at any given time

Connectivity
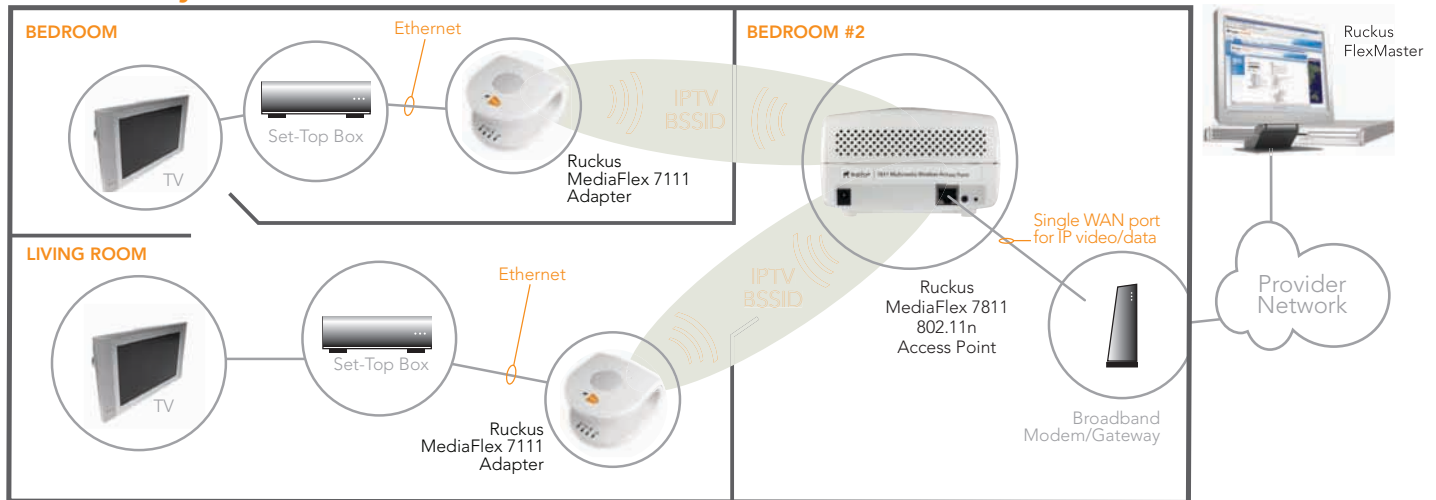
SmartCast Ensures Picture-Perfect Multimedia Viewing

Patent-pending SmartCast technology from Ruckus Wireless combines innovative multicast traffic handling techniques, smart QoS and application-aware traffic classification capabilities to ensure the highest reliability for all transmissions over Wi-Fi.

SmartCast differentiates and manages multicast video frames separately from all other traffic types. This provides a robust wireless transport for IPTV streams from the broadband gateway to the set-top box. SmartCast detects a receiver tuning to an IPTV channel, then directs the associated multicast video packets to each receiver, using the optimum data rate and signal path for that receiver. This ensures the best performance possible while enabling reliable delivery of IPTV packets.

Optimized traffic management algorithms guarantee performance for multiple broadcast quality video streams, while maintaining adequate bandwidth for data applications. SmartCast automatically classifies all traffic based on UDP/TCP port and other application attributes, and manages each traffic type (voice, video, data) according to its classified priority and characteristics.

Automatic Type-of-Service (ToS) tagging eliminates complex QoS configurations, while automatic management of lower speed 802.11a devices assures bandwidth availability for prioritized video applications. Four priority queues per station result in a high granularity of traffic prioritization and precision for multiple concurrent video streams.

All packets are queued/de-queued by special schedulers that correspond to each traffic type. Each scheduler takes into account the delay/jitter tolerance and bandwidth requirements of the traffic, and the changing performance characteristics of each station, on the WLAN for the best user experience.

802.11n and BeamFlex™: A Winning Combination

A fundamentally new approach to Wi-Fi, 802.11n exploits advances and new techniques, such as spatial multiplexing, channel bonding and frame aggregation, to deliver dramatically higher data rates.

Ruckus BeamFlex optimizes the parameters to reliably achieve a high throughput to enable the streaming of multiple HD videos.

- Beamsteering provides active interference avoidance to ensure spatial multiplexing and the best possible paths used for spatial streams.

- Signal path selection control and mitigating interference make channel bonding possible.

- Optimizing the path to each client, reducing packet loss and better receive sensitivity increase effective throughput, enabling more frames to be aggregated.

FlexMaster Remote Service Management

The Ruckus MediaFlex 7000 series is managed by the Ruckus FlexMaster system, the industry's first complete managed service platform. FlexMaster lets service providers securely control, monitor and upgrade Ruckus MediaFlex and ZoneFlex Wi-Fi systems anywhere in the world, whether over the Internet or a private IP network.

Simple to install and easy to use with an intuitive look and feel, FlexMaster provides a comprehensive solution for configuration, fault detection, audit, and performance management.

It fits seamlessly into existing provider OSS network management architectures, uniquely leveraging a variety of industry-standard protocols such as SNMP, TR-069, and HTTP/S.

FlexMaster also provides the carrier-grade scalability expected for large service infrastructures.

Simple Installation, Reduced Support Costs

Self-installable, the Ruckus MediaFlex access point and adapter attach to their respective modem or media devices using standard Ethernet. A Web UI allows for easy configuration as well as firmware upgrades. Three LEDs provide status information on power, Ethernet connectivity, and wireless association. A fourth LED provides a wireless video quality indicator that allows at-a-glance monitoring of wireless network performance. Remote management is provided through Telnet (CLI), SSH, HTTP, HTTPS, SSH and TR-069 protocols.

Proven Performance

A Ruckus-powered 802.11n multimedia network ensures transmission of 30-50 Mbps of guaranteed throughput for streaming video throughout a typical 2,500-3,000 square foot (230 square meter) home. The Ruckus MediaFlex 802.11n system can handle three to five MPEG-2 HD IPTV streams and significantly higher number of concurrent standard definition (SD) IPTV streams.

FEATURES

- FlexMaster management for firmware upgrade, remote monitoring, and bulk configuration updates

- Internal 6-element antenna array, with 63 dynamic configurations

- Real-time learning of RF, station, network and application conditions

- IGMP snooping for station-channel multicast group association detection

- Support for 32 multicast groups and 48 stations

- Wireless multicast optimization with guaranteed packet delivery

- Differentiated handling of multicast IPTV traffic from general multicast and broadcast traffic

- Automatic traffic classification by well-known UDP/TCP port number and IPTV attributes

- Heuristic QoS classification of voice and video streams to the appropriate queues

- Priority queuing for voice, video, best-effort and background traffic

- Per-station, per-traffic type packet queuing and scheduling

- Four queues per station

- Automatic Type-of-Service (ToS) tagging

- 40-60Mbps consistent video throughput in typical 2500 sq. ft. residence (230m^2)

- DHCP or static IP addresses for self install, self configuration or remote configuration

- Web-based user interface

- Automatic monitoring of the Wi-Fi network and application performance, including throughput, error rates, and retransmissions

Specifications

PHYSICAL CHARACTERISTICS

POWER	• External power adapter • Input: 110–240V AC (country specific), 220-240V AC (country specific) • Output: 12V DC, 1A
PHYSICAL SIZE	• 14.2cm(L), 12.2cm(W), 7.5cm(H)
WEIGHT	• 200 grams
ANTENNA	• Internal software-configurable antenna array with six directional, high-gain elements and 63 unique omni antenna patterns
ETHERNET PORTS	• 1 port, auto MDX, auto-sensing 10/100 Mbps, RJ-45
LED DISPLAY	• Power/status, Ethernet status, wireless status, wireless network quality indicator
ENVIRONMENTAL CONDITIONS	• Operating Temperature: 32°F (0°C)–104°F (40°C) • Operating humidity: 15%–95% non-condensing

PERFORMANCE AND SUPPORTED CONFIGURATIONS

TARGET UDP THROUGHPUT	• 40-60 Mbps sustainable throughout a 2500 square foot (230m²) home
SIMULTANEOUS VIDEO	• 4-6 MPEG-4 HDTV IPTV streams (10 Mbps data rate) • 6-10 MPEG-2 standard definition IPTV streams (5 Mbps data rate)

TRAFFIC MANAGEMENT AND QUALITY OF SERVICE

CLASSES OF SERVICE	• Voice, video, best effort and background
HARDWARE QUEUES	• 4
SOFTWARE QUEUES	• 4
AUTOMATIC TRAFFIC CLASSIFICATION	• Automatic type of service tagging for multicast video packets
HEURISTIC CLASSIFICATION	• Available

MULTICAST VIDEO (IPTV)

IGMP SNOOPING	• Up to 32 multicast groups • Up to 48 receiving stations
MULTICAST OPTIMIZATION	• Directs multicast IPTV packets to each receiving station within the designated multicast group using the optimum data rate and antenna selection • Automatic classification into video queues • Ensures reliable transmission of multicast video packets

MANAGEMENT

CONFIGURATION	• Web user interface, CLI (Telnet), SSH, HTTPS, HTTP, and TR-069 (7811 only), statistics interface, DHCP client support
LOGIN	• User • Admin
AUTO CONFIGURATION	• Supported
STATISTICS	• LAN, wireless and associated stations • Accessible via Web UI
SOFTWARE UPDATE	• FTP or TFTP, remote auto available • Accessible via Web UI
OTHER UTILITIES	• Configuration dump (admin only) • Simple support info transfer to provider • Pre-installed X.509 v3 certificates

Wi-Fi

STANDARDS	• 802.11n (5 GHz operation), WPA , WPA2 (AES)
CHANNELS	• Country dependent for the following channel ranges: 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165
CHANNELIZATION	• 40 MHz channel bonding supported
RF POWER OUTPUT	• (Country dependent for the following RF power ranges at various channel ranges) 200 mW EIRP and 1 W EIRP • Country-specific power settings are configurable
TRANSMIT POWER CONTROL	• Supported
CERTIFICATIONS	• FCC (U.S.), IC (Canada), CE (EU)
MAC ADDRESS TABLE	• 128 entries

Product Ordering Information

Model	Description
901-7811-XX00	1-port 802.11n Multimedia Smart Wi-Fi Access Point
901-7111-XX00	1-port 802.11n Multimedia Smart Wi-Fi Adapter

PLEASE NOTE:
When ordering you must specify the destination region by indicating -US -EU or -UN following the model number.

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