

# MediaFlex Router

Multi-Port, Multi-Zone Multimedia Wireless Services Platform



The Ruckus MediaFlex router is the first-of-its-kind wireless multimedia service platform that reliably distributes multimedia content over standard 802.11 Wi-Fi to every corner of the home.

The Ruckus MediaFlex router combines innovative, patent-pending smart antenna and traffic management technologies to break down the barriers that have prevented a single Wi-Fi network from simultaneously supporting voice, video and data in the home.

The Ruckus MediaFlex gives broadband operators a single system that reliably extends multimedia services throughout the home over standard 802.11 Wi-Fi while giving them unprecedented visibility into and control over subscriber Wi-Fi environments all the way down to end devices.

Unlike any Wi-Fi system on the market, the Ruckus MediaFlex router 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 installations costs and maximize service potential.

## The First Fully Managed, In-Home Wireless Services Platform for Multimedia Distribution

### BENEFITS

#### **Unparalleled remote control**

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

#### **Dramatic range and performance increases**

Smart antenna system with six antennas and 63 unique antenna patterns ensure optimum signal paths and high data rates to support up to 3 simultaneous 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 viewer experience**

Precision and heuristic QoS management combined with smart antenna system delivers consistent, reliable bandwidth essential for high-definition TV (HDTV)

#### **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

#### **Virtual access point supports multiple SSIDs**

Separate wireless domains and security modes segment service providers traffic, such as IPTV, from home user traffic, such as Internet browsing

#### **Self-installing, auto-configuration**

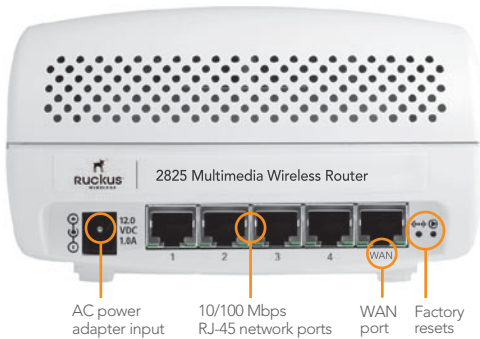
Comprehensive DHCP client and server support for both the service provider and home users. Port-based classification ensures separation of the data and video traffic

#### **Remote management and automatic upgrades**

SNMP for troubleshooting and diagnostics. Auto firmware upgrades ease deployment and remote management

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## CAPABILITIES

- Enables whole-home video distribution without tedious and expensive wiring
- Allows media receivers to be located anywhere in the home, giving consumers more flexibility and convenience
- Provides standards-compliant 802.11 wireless connectivity for Ethernet-equipped media receivers including set-top-boxes and personal video recorders (PVRs)
- Enables reliable streaming of IPTV from broadband gateway to set top boxes without costly and time-consuming cable installations
- Extends 802.11b/g range and coverage by up to 300 percent, maximizes throughput and minimizes interference
- Optimizes both unicast and multicast video
- Full routing functionality with DHCP client and server functionalities
- Simultaneous video, voice and data traffic over the same wireless network with heuristic classification of each traffic type
- Remote management: SNMP and HTTP
- Automatic firmware upgrade via TFTP, FTP, or HTTP
- Virtual AP support provides segregation of wireless domains for service providers and users
- Completely standards-based 802.11 system designed for compatibility with future 802.11 standards

## Introducing the Ruckus MediaFlex Router

A complete solution for video-grade, high performance wireless networking, the Ruckus system includes the Ruckus MediaFlex 802.11b/g multimedia router and Ruckus MediaFlex multimedia Wi-Fi adapter. The system incorporates 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 router optimizes all 802.11b/g devices in the home while enabling wireless video applications. The Ruckus MediaFlex adapter provides video-grade, 802.11b/g connectivity to any Ethernet-equipped video server and video receiver, including set top boxes, personal video recorders, media centers and media center extenders.

## Flexible System Architecture

The Ruckus MediaFlex router supports WAN ports and up to four LAN ports to also serve as a home gateway. The MediaFlex router has a flexible architecture that allows multiple ports to be defined as WAN ports to be connected to the multi-port broadband gateway. Many service providers have designed their network to separate the video traffic from the data traffic by pre-configuring the broadband gateway to send out video traffic on one port and the data traffic on a separate port. The MediaFlex architecture allows the home users to plug in the MediaFlex router directly to the broadband gateway using separate video and data ports.

## BeamFlex

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. The Ruckus MediaFlex router is equipped with BeamFlex, a patent-pending MIMO-G smart antenna system. BeamFlex enables client devices to communicate over longer distances at higher speeds than consumer-grade 802.11 products - delivering unprecedented reliability and diversity.

Each Ruckus MediaFlex router 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.



Six high-gain directional antenna elements controlled by an expert software system determines the best antenna pair for any packet at any given time

With BeamFlex, the Ruckus MediaFlex router is able to reconfigure itself in real-time, detecting and adjusting for both spectral and multi-path 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. The massive diversity of the BeamFlex antenna systems allows the Ruckus MediaFlex router to find and instantly select from many quality signal paths in a changing environment. This provides the stability and sustained baseline performance essential for voice and video applications.

## SmartCast

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 and 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.

Multimedia 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.

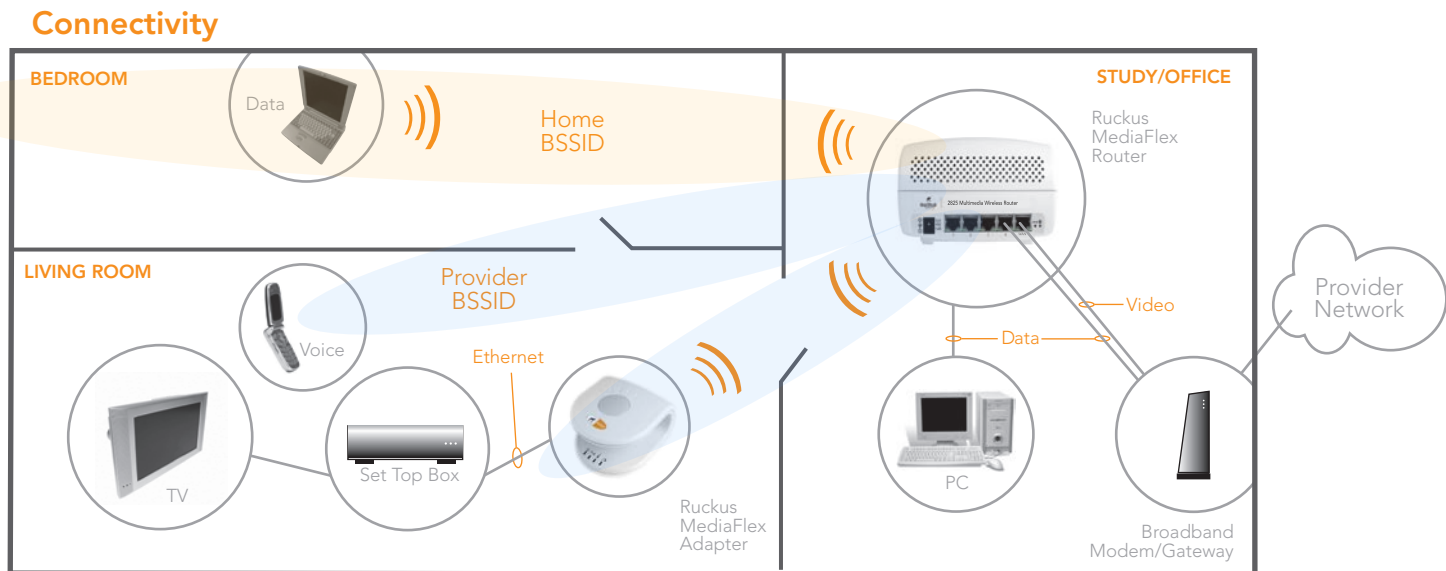
Automatic type-of-service (ToS) tagging eliminates complex QoS configurations, while automatic management of lower speed 802.11b devices assures bandwidth availability for prioritized video applications. Four priority queues per station result in high granularity of traffic prioritization and precision for multiple concurrent video streams. All packets are queued/de-queued by specialized schedulers optimized for the corresponding 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 to ensure the best user experience.

## FEATURES

- 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 ToS tagging
- 20Mb/s consistent video throughput in typical 2500 ft<sup>2</sup> residence (230m<sup>2</sup>)
- DHCP or static IP addresses for self install, self-configuration or remote-configuration
- Web-based user interface
- Monitoring of the Wi-Fi network and application performance, including throughput, error rates, retransmissions
- Real-time monitoring, providing 30-minutes of 1-second interval statistics
- Historical monitoring, providing 24 hours of 1-minute stats and 30 days of 1-hour stats

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## InTune

InTune is an innovative wireless service management technology that provides access to vital statistics, performance and RF information necessary to manage triple play services. InTune uniquely provides the ability to perform inventory audits for all the devices within the home wireless environment. Multi-tiered user and provider management domains delivers complete customization and the utmost flexibility. In-Tune also provides remote execution of diagnostics from within the home. InTune provides two distinctive management views for every device. The service provider view delivers detailed information on logging, statistics, quality of service, status of the device for the IPTV streams delivered to the household. The home user view provides simple to use, Web management for configuring basic wireless data networking for home PC's.

### Simple Installation, Reduced Support Costs

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

### Proven Performance

A Ruckus-powered multimedia network is optimized to ensure transmission of 20 Mbps of guaranteed throughput for streaming video throughout a typical 2,500-3,000 square foot (230 square meter) home. The Ruckus MediaFlex 802.11g system supports up to three simultaneous DVD-quality standard definition (SD) MPEG-2 IPTV video streams, six MPEG-4 SD streams or one to two HD-quality WMV streams while supporting concurrent data and voice applications.

## Specifications

### Physical Characteristics

Power	<ul style="list-style-type: none"> <li>External power adapter</li> <li>Input: 110-240V AC</li> <li>Output: 12V DC, 1A</li> </ul>
Physical size	<ul style="list-style-type: none"> <li>14.2cm (L), 12.2cm (W), 7.5cm (H)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>200 grams</li> </ul>
Antenna	<ul style="list-style-type: none"> <li>Internal software-configurable antenna array with six directional, high-gain elements and 63 unique omni antenna patterns</li> </ul>
Ethernet ports	<ul style="list-style-type: none"> <li>5 ports, auto MDX, auto-sensing 10/100 Mbps, RJ-45</li> </ul>
LED display	<ul style="list-style-type: none"> <li>Power/status, Ethernet status, wireless status, wireless network quality indicator</li> </ul>
Environmental conditions	<ul style="list-style-type: none"> <li>Operating temperature: 32°F (0° C) - 104° F (40° C)</li> <li>Operating humidity: 15% - 95% non-condensing</li> </ul>

### Performance and Supported Configurations

Concurrent stations	<ul style="list-style-type: none"> <li>Up to 48 (for Open, WEB or WPA-AES)</li> <li>Up to 22 (for WPA-TKIP)</li> </ul>
Target UDP throughput	<ul style="list-style-type: none"> <li>15-20 Mbps sustainable throughout a 2500 square foot (230m<sup>2</sup>) home</li> </ul>
Simultaneous video streams	<ul style="list-style-type: none"> <li>2-3 simultaneous MPEG-2 or 4-6 MPEG-4 standard definition streams or single 10 Mbps+ HD stream at 50 feet (18m) with concurrent background traffic</li> </ul>

### Traffic Management and Quality of Service

Classes of service	<ul style="list-style-type: none"> <li>Voice, video, best effort and background</li> </ul>
Hardware queues	<ul style="list-style-type: none"> <li>4</li> </ul>
Software queues	<ul style="list-style-type: none"> <li>4</li> </ul>
Automatic traffic classification	<ul style="list-style-type: none"> <li>Automatic type of service tagging for multicast video packets</li> </ul>
Heuristic classification	<ul style="list-style-type: none"> <li>Available</li> </ul>

### Multicast Video (IPTV)

IGMP snooping	<ul style="list-style-type: none"> <li>Up to 32 multicast groups</li> <li>Up to 48 receiving stations</li> </ul>
Multicast optimization	<ul style="list-style-type: none"> <li>Directs multicast IPTV packets to each receiving station within the designated multicast group using the optimum data rate and antenna selection</li> <li>Automatic classification into video queues</li> <li>Ensures reliable transmission of multicast video packets</li> </ul>

### Management

Configuration	<ul style="list-style-type: none"> <li>Web user interface, CLI (Telnet), SNMP statistics interface (TR-069 future)</li> </ul>
Login	<ul style="list-style-type: none"> <li>User</li> <li>Admin</li> </ul>
Auto configuration	<ul style="list-style-type: none"> <li>Supported</li> </ul>
Statistics	<ul style="list-style-type: none"> <li>LAN, wireless and associated stations</li> <li>Accessible via Web UI</li> </ul>
Software update	<ul style="list-style-type: none"> <li>FTP or TFTP, remote auto available</li> <li>Accessible via Web UI</li> </ul>
Other utilities	<ul style="list-style-type: none"> <li>Configuration dump (admin only)</li> <li>Simple support info transfer to provider</li> </ul>

### Wi-Fi

Standards	<ul style="list-style-type: none"> <li>802.11b/g, WEP, WPA (PSK)</li> </ul>
Supported data rates	<ul style="list-style-type: none"> <li>54,48,36,24,18,12,11,5.5,2,1 Mbps</li> <li>Atheros SuperG Turbo (108 Mbps) not supported for video</li> </ul>
Channels	<ul style="list-style-type: none"> <li>US/Canada: 1-11</li> <li>Europe (ETSI X30): 1-13</li> <li>Japan X41: 1-13</li> </ul>
Auto channel selection	<ul style="list-style-type: none"> <li>Supported</li> </ul>
RF power output	<ul style="list-style-type: none"> <li>23 dBm for wireless-B</li> <li>23 dBm for wireless-G</li> <li>Country-specific power settings are configurable</li> </ul>
Transmit power control	<ul style="list-style-type: none"> <li>Supported</li> </ul>
Certifications	<ul style="list-style-type: none"> <li>FCC (U.S.), IC (Canada), CE (EU), VCCI (Japan), Telec (Japan), C-Tick (Aus/NZ), OFTA (Hong Kong), iDA (Singapore), MIC (Korea), DGT (Taiwan)</li> </ul>
Wireless security	<ul style="list-style-type: none"> <li>WEP, WPA – TKIP, WPA2 - AES</li> </ul>
Routing	<ul style="list-style-type: none"> <li>DHCP client support, DHCP server support, NAT and PPPoE</li> </ul>

### Others

MAC address table	<ul style="list-style-type: none"> <li>128 entries</li> </ul>
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## Product Ordering Information

Model	Description
2211 - (US, UE, UK)	1-port metro Wi-Fi gateway
2825 - (US, UE, UK)	5-port multimedia Wi-Fi router
2111 - (US, UE, UK)	1-port multimedia Wi-Fi adapter

### PLEASE NOTE:

When ordering you must specify the destination region by indicating -US -UE or -UK following the model number.

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