

# Next Generation Wireless Broadband Router

Actiontec continues its string of impressive technological advances with the introduction of its next generation Wireless Broadband Router. The First “Smart Home Gateway”, the Wireless Broadband Router, packs in more features and performance capabilities that any other home router on the market. It is the first device to feature a dual-core, 64-bit processor that allows it to support home networking speeds up to 1 Gbps and permits digital entertainment and information content to be transmitted and distributed to multiple devices in the home over coaxial cable.

## The First “Smart Home Gateway”

Actiontec’s next generation Wireless Broadband Router sets a new industry benchmark for performance. As a result, service providers can increase service speeds up to 1 Gbps to meet the needs of an increasingly sophisticated consumer market. Able to support multiple value-added, bandwidth-intensive applications, this router has become more than just a simple router. It can handle multiple high-throughput media streams simultaneously, including standard and HDTV-based video programming and feed personal video recording functionality from multiple HD set top boxes or other digital storage devices to multiple TVs in the house. It can also administrate most Internet activities including parental controls, online gaming, music, live sports, children’s entertainments and on demand movies. The Wireless Broadband router also supports Ethernet and Wi-Fi as well as coax networking, and it allows telcos to assign bandwidth priorities for data, video on demand and voice over IP traffic to ensure quality of service in triple and quad play environments.

## The Industry’s First Dual-core 64-bit Processor

Actiontec’s router features an advanced hardware design including an industry-first 64-bit, dual core processor. The



Model # MI424WR Rev. E

router’s 64-bit architecture provides a substantial performance improvement over the 32-bit devices sold today. The router’s latest MIPS core offers further performance improvement and additional instructions for networking applications reducing the number of cycles needed for even greater CPU efficiency.

Additionally, the router features hardware-level Quality of Service (QoS) with eight input channels and eight output channels. This innovative design frees the CPU for other bandwidth needs, and ensures that providers can deliver multiple high quality video streams without any dropped frames, frozen frames, or other performance issues that can degrade IP video services.

## Protection and Security

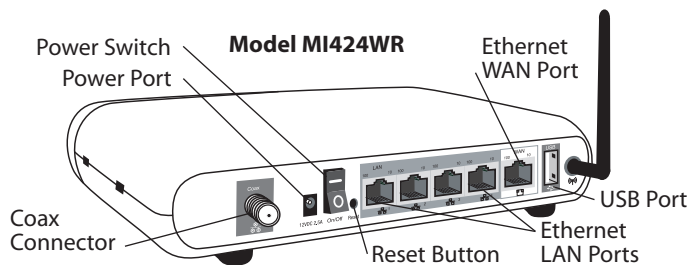
With all that data coming in, the security features had better be first rate, and the Wireless Broadband Router doesn’t disappoint. The router ships with wireless encryption using WEP turned on by default and supports WPA and WPA2 encryptions. The router offers enterprise-level security, including a fully customizable firewall with Stateful Packet Inspection, denial of service protection, content filtering, and intrusion detection to keep unwanted visitors from accessing the user’s network. The Wireless Broadband Router also offers Parental control capabilities, including user-defined site blocking by URL and keyword, the ability to customize filtering policies for each computer, and user notification of attempted access to restricted sites.

## Wireless Broadband Router

### Features

- Dual-core 64-bit processor
- Supports multiple networking standards
  - WAN: Gigabit Ethernet (optional) and Next Generation MoCA interfaces
  - LAN: 802.11g, 802.11b, 10/100 Ethernet, MoCA
  - LAN: Future proof for Ultra Wide Band, Gig E LAN, and 802.11n
- MoCA Data rate up to 170 Mbps
  - MoCA 1.0/1.1 compliant
- Integrated Wireless Networking with 802.11g Access Point
  - 802.11g enabled to support speeds up to 54 Mbps wirelessly
  - 802.11b backward compatible
  - WEP, WPA, WPAII
  - External RADIUS Server support
  - One SSID (multiple SSID available upon request)
  - WPS, WMM, WMM PowerSave (available upon request)
- Enterprise Level Security
  - Fully customizable firewall with Stateful Packet Inspection
  - Content Filtering including URL Keyword-Based Filtering, Parental Control, Customizable Filtering Policies per Computer, and Email Notification
  - Denial of Service Protection including IP Spoofing Attacks, Intrusion and Scanning Attacks, IP Fragment Overlap, Ping of Death, Fragmentation Attacks
  - Syslog & Firewall Logging with persistent writes to non-volatile memory
  - Intrusion Detection
  - MAC Address Filtering
  - NAT
  - Access Control
  - Advanced Wireless Protection: WPA, WEP 64/128 bit Encryption, 802.1x authentication, MAC Address Filtering
  - VLAN
- Other Features
  - DHCP Server Option
  - DHCP Server/PPPoE Server Auto Detection
  - DNS Server
  - DMZ Hosting
  - Full Bridge Device Control
  - LAN IP & WAN IP Address Selection
  - MAC Address Cloning
  - Port Forwarding
  - PPPoE Support
  - IGMP v1, v2, v3
  - IGMP proxy and snooping
  - IGMP fast leave
  - remote IGMP configuration (via TR-069)
  - QoS Support (End to end Layer 2 / 3)
    - Diffserv
    - 802.1p/q Prioritization
    - Configurable Upstream/Downstream Traffic Shaping
    - Random Early Detection
    - Pass-through of WAN-side DSCPs, PHBs & Queuing to LAN-side devices
    - Prioritization via DHCP options
    - Dynamic QoS (Coming Soon)
    - QoS acceleration through hardware queues (Coming Soon)
    - QoS Policy Management (Coming Soon)
  - Self diagnostics/self healing (Coming Soon)
  - Remote Management and Secured Remote Management using TR-069 and HTTPS
  - Reverse NAT
  - Static NAT
  - Static Routing
  - Time/Zone Support
  - VPN: IPSec, PP2P, L2TP (Passthrough only)
  - Deep Packet Inspection (Coming Soon)
  - Fast Path Packet Acceleration (hardware and software)
  - Vista Certification (pending)

### Ports at Rear of Unit



## Wireless Broadband Router

### Technical Specifications

<b>Wireless</b>	IEEE 802.11b IEEE 802.11g IEEE 802.11n (future) IEEE 802.1x SSID Broadcast Enable/Disable WPA/WPA2 WEP 64/128 bit Encryption MAC Filtering Automatic Channel Selection during Boot-up Antenna Diversity Omni-Directional Transmit/Receive Pattern	<b>UDP</b>	RFC 0768 "User Datagram Protocol"
<b>Ethernet</b>	ISO/IEC 8802-3: ANSI/IEEE Standard 802.3 part 3 IEEE 802.3x – Full Duplex Capable IEEE 802.3u – Auto-Negotiation RFC 1213 "Management Information Base for Network Management of TCP/IP-based Internet: MIB-II" D-I-X "The Ethernet – A Local Area Network: Data Link Layer and Physical Layer Specifications" Ports are 10/100BASE T.	<b>TCP</b>	RFC 0793 "Transmission Control Protocol"
<b>Bridge</b>	Transparent MAC Level Bridge for Ethernet-like Devices in Conformance with the IEEE 802.1d Specification. ISO/IEC 10038:1993(E), Std 802.1d STP (Spanning Tree Protocol) 802.1q (VLAN)	<b>IP Routing and Bridging</b>	RFC 1519 "Classless Inter-Domain Routing (CIDR)" RFC 1918 "Address Allocation for Private Internets" RFC 2236 "Internet Group Management Protocol v.2 (IP Multicasting)" Static Routing Routing Table Control Bridge WAN/LAN Transparent Bridging Transparent Bridging Between LAN Devices Automatic Discovery of MAC Addresses Spanning Tree Protocol
<b>IP</b>	IP Version 4 Future Upgradeable to IP Version 6 RFC 0791 "Internet Protocol" RFC 0894 "Standard for the Transmission of IP Datagrams Over Ethernet Networks" RFC 0922 "Broadcasting Internet Datagrams in the Presence of Subnets" RFC 0950 "Internet Standard Subnetting Procedure" RFC 1042 "Standard for the Transmission of IP Datagrams over IEEE 802 Networks" RFC 1112 "Host Extensions for IP Multicasting" RFC 1122 "Requirements for Internet Hosts – Communication Layers" RFC 1123 "Requirements for Internet Hosts – Application and Support" RFC 3300 "Internet Official Protocol Standards"	<b>HTTP</b>	RFC 2246 "The TLS Protocol v.1.0" RFC 2616 "Hypertext Transfer Protocol – HTTP/1.1" RFC 2818 "HTTP over TLS"
<b>ARP</b>	RFC 0826 "Ethernet Address Resolution Protocol or Converting Network Protocol Addresses to 48-bit Ethernet Address for Transmission on Ethernet Hardware"	<b>DHCP Server</b>	RFC 2131 "Dynamic Host Configuration Protocol" RFC 2132 "DHCP Options and BOOTP Vendor Extensions"
<b>ICMP</b>	RFC 0792 "Internet Control Message Protocol" RFC 1256 "ICMP Router Discovery Messages"	<b>DHCP Client</b>	RFC 2131 "Dynamic Host Configuration Protocol" RFC 2132 "DHCP Options and BOOTP Vendor Extensions" The DHCP client supports the following minimal subset of options described in RFC 2132: Requested IP Address (Requested by default is mandatory.) Parameter Request List (Subnet Mask only) IP Address Lease Time (DHCP Lease Time) Client Identifier (DHCP Client Identifier) Default Route (Routers) DNS Servers
		<b>DNS</b>	RFC 2136 "Dynamic DNS" NetBIOS
		<b>NAT, PAT (IP Masquerading)</b>	RFC 2663 "IP Network Address Translator (NAT) Terminology and Considerations" RFC 3022 "Traditional IP Network Address Translator (Traditional NAT)"
		<b>NAT ALGs (Application Level Gateway)</b>	User defined and predefined applications
		<b>NAT Advanced Features</b>	Static NAT Specified IP address local server Local host applications (Games, VoIP) Bi-directional NAT Reverse NAT

## Wireless Broadband Router

### Technical Specifications (cont'd)

<p><b>Firewall</b> ICSA Certified on Core Software Stateful Packet Inspection (SPI) Firewall Pre-defined Security Policies Event Logging Denial of Service (DoS) protection: General: Ping Flood, ICMP Echo Storm, UDP Snork Attack, ICMP Smurf, UDP Fraggle, TCP Window Checks, Invalid TCP Options, TCP Flags, TCP 3WHS, TCP LAND, TCP 3SYN/UDP/ICMP Flood, PROTOS Attacks, Short IP Packets IP Spoofing Attacks: FTP Bounce, Broadcast/Multicast Source IP Attack Intrusion and Scanning Attacks: IP Source Route, ICMP Echo Reply without Request, ICMP Ping Sweep, TCP Stealth Scan (FIN, XMAS, NULL), UDP Port, FTP Passive Attack, Loopback/Echo Chargen IP Fragment Overlap: Teardrop, Teardrop2, Newtear, Opetear, Bonk, Boink Syndrop, Nестea Ping of Death: SSPing, Jolt, Jolt2, Flushot Attack, Oshare Attack Fragmentation Attacks: Overlap, Changed Data, Changed Length, Microfragments, Empty Fragments, TCP Header Fragments DMZ (Demilitarized Zone) Hosting Access Control Remote Access Control (HTTP, Telnet, Diagnostics) Block Internet Services from LAN hosts. Intrusion Detection Firewall Breach E-mail Notification MAC Address Filtering Control IP-TOS Manipulation with Firewall Rules TCP MTU Clamping</p>	<p><b>QoS</b> 802.1P/Q Prioritization DiffServ RFC 2474 “Differentiated Services Field” RFC 2475 “Architecture for Differentiated Services” RFC 2598 “An Expedited Forwarding PHB” Configurable Upstream/Downstream Traffic Shaping Between 802.1P User Priorities, DSCPs, and PHBs. Pass-through of WAN-side DSCPs, PHBs and Queuing to LAN-side Devices Supported Random Early Detection (RED): According to queue size According to CPU load</p>
<p><b>Content Filtering</b> Web Filtering Service 40 Content Filtering Categories Customizable Filtering Policies per LAN Host Scheduled Filtering Policy Enforcement Web-based Filtering Statistics Reports Parental Control Service Office Productivity Control Service URL Keyword-Based Filtering Customizable Filtering per LAN Host Parental Control User Defined Blocked Sites User Notification upon Restricted Site Access Attempt Subscription to Online services available</p>	<p><b>MoCA</b> Dual MoCA support: WAN, LAN WAN MoCA Frequency: 975MHz-1025MHz (single channel) LAN MoCA Frequency: 1125MHz-1425MHz (6 channels)</p> <p><b>Universal Plug-N-Play (UPnP)</b> Internet Gateway Device (IGD) Standardized Device Control Protocol v. 1.0</p> <p><b>TELNET</b> RFC 0854 “Telnet Protocol Specification” RFC 0855 “Telnet Option Specifications” RFC 0857 “Telnet Echo Option” RFC 0858 “Telnet Suppress Go Ahead Option”</p> <p><b>FTP Client</b> RFC 0959 “File Transfer Protocol” RFC 1350 “The TFTP Protocol (Revision 2)”</p> <p><b>Web Server &amp; Web-Based Configuration</b> RFC 1945 “Hypertext Transfer Protocol – HTTP/1.0” RFC 2068 “Hypertext Transfer Protocol – HTTP/1.1” RFC 2617 “HTTP Authentication: Basic and Digest Access Authentication”</p> <p><b>Setup &amp; Management</b> Web-based</p> <p><b>Wireless Operating Range</b> Outdoors: Up to 55m (180 ft) @ 54 Mbps Up to 122m (400 ft) @ 18 Mbps Up to 171m (560 ft) @ 11 Mbps Up to 305m (1,000 ft) @ 1 Mbps</p> <p><b>Environmental Operating Range</b> Operating Ambient Temperature: 0°C to 40°C (32°F to 104°F) Altitude: -197 to 7000 feet Relative Humidity: 8% to 95% non-condensing Operating (Circuit Board Ambient) Temperature: 0°C to 70°C Relative Humidity: 8% to 95% non-condensing Shipping and Storage Temperature: -20°C to 85°C Relative Humidity: 5% to 100% non-condensing</p>

## Wireless Broadband Router

### Technical Specifications (cont'd)

<b>Power Requirements</b>	10V, 1.6A
<b>Regulatory Compliance</b>	FCC Part 15 UL 60950-1
<b>DSL Forum Compliance</b>	TR-064, TR-069, TR-094, TR-098, TR-106, and TR-111 Compliant
<b>Physical Placement Options</b>	Stand on its side (Vertical stand included.) Sit horizontally Mount on a wall (Mounting template included.)
<b>LEDs</b>	Power Ethernet WAN Coax WAN Internet Ethernet LAN Coax LAN Wireless WPS USB

### Minimum System Requirements

- PC or Macintosh with Ethernet or 802.11b/802.11g wireless or MoCA connection.
- Microsoft Windows 98SE, Me, 2000, XP, Vista; Mac OS 9 or higher; Linux/BSD, Unix
- TCP/IP Network Protocol Installed
- Internet Explorer 5.0+ or Netscape 7.0+, Safari, Firefox

### Package Contents

- Wireless Broadband Router
- Vertical Stand
- Black Power Cord
- Yellow 6ft. Ethernet Cable
- White 10ft. Ethernet Cable
- Quick Start Guide
- Installation Guide
- Wireless Networking Guide
- User Manual CD-ROM
- Wall Mount Template

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Features/specifications are dependent on the firmware version.  
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