

# High Performance IPTV Routers & Gateways

Actiontec, now a one-stop source for IPTV-capable consumer premises equipment for service providers of all sizes and infrastructures, offers a full line of fiber, bonded ADSL2+ and VDSL gateways and routers to support your IPTV/triple play programs. Based off of a modular design, all of the broadband routers and gateways can be customized to your needs and offer support for all of the major video networking standards for the WAN and LAN including VDSL2, ADSL2+ bonding, Fiber, Ethernet, MoCA, HomePlug AV or HPNA 3.x. So whether you're delivering standard or HDTV, sticking with your current pipe or switching to fiber to the curb/home, Actiontec has the product for you.

## Ready for Triple Play Environments

High-end CPUs (capable of processing as much as 80 times the throughput as earlier-generation broadband routers) makes it possible for the device to handle multiple high-throughput media streams simultaneously, including standard and HDTV-based video programming. Networks can be set up to feed personal video recording functionality from a single set-top box or other digital storage device to any TV in the house. The device can also support Ethernet, Wi-Fi, and HomePlug AV as well as coax networking using HPNA 3.x or MoCA, 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 play environments.

## A Product For Nearly Every Scenario

Whether you're using Fiber to the Home, Fiber to the Curb, ADSL2+ Pair Bonded and any of the major video LAN standards, Actiontec has a product for you.

- **Wireless Broadband Router (MI424WR)**

Designed for Fiber-to-the-Home (FTTH) scenarios, this router offers both Ethernet and MoCA WAN support, delivering speeds up to 135 Mbps using MoCA or 100 Mbps with Ethernet. The unit has a built-in 4 Port Ethernet Router, Wireless G and other manufacturing LAN options for MoCA and HPNA 3.x. It also supports HomePlug AV with Actiontec adapters.



Model #s MI424-WR,  
R1424, BA214WG, KI414WG, VI414WG

- **Wireless DSL2 Gateway (BA214WR)**

An ADSL2+ pair bonded broadband home gateway that delivers up to 48 Mbps of throughput downstream and up to 4 Mbps upstream without requiring new DSLAM equipment or copper cabling in the home. It also has the same MoCA/HomePlug AV/HPNA 3.x options as the other units.

- **Wireless VDSL Gateway (KI414WR or W1424WR)**

An up to 100 Mbps symmetrical downstream/upstream powerhouse designed for multiple dwelling units or fiber-to-the-curb/VDSL-to-the-house scenarios. It's available with either an Ikanos or Infineon chipset to accommodate different telco preferences, and it has the same MoCA/HomePlug AV/HPNA 3.x options as the other units.

- **Broadband Router (RI408)**

Integrated with an 8 Port 10/100 Mbps Ethernet switch, this router has all of the power and security for small businesses. It can easily support the massive bandwidth required to allow your employees to effortlessly surf the Web at speeds up to 90 Mbps while supporting multiple VoIP services, multiple HD streams, and other digital programming.

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### Even Easier to Use

In an effort to make the device as uncomplicated as possible to deploy and use, the graphical user interface was redesigned from the ground up. Now, it's a snap to check the status of the network or the broadband connection's IP address. Nearly all other configuration options are one or two clicks away, and the home page can be customized with specific Internet links or other online services.

### Protection and Security

With all that data coming in, the security features had better be first rate, and the devices don't disappoint. Each wireless device ships with wireless encryption using WEP turned on by default and 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. They also offer Parental control capabilities, including user-defined site blocking by URL, the ability to customize filtering policies for each computer, and user notification of attempted access to restricted sites.

### Features

- Supports multiple WAN/LAN standards
  - WAN options: VDSL2, ADSL2+ Bonded, MoCA, Ethernet.
  - LAN options: 802.11g, 802.11b, Ethernet, MoCA, HPNA 3.x, Home Plug AV.
- Integrated Wired Networking with 4 Port 10/100 Mbps Ethernet Switch, MoCA and/or HPNA 3.x.
- Integrated Wireless Networking with 802.11g Access Point.
  - 802.11g enabled to support speeds up to 54 Mbps wirelessly
  - 802.11b backward compatible, communicating with 802.11b wireless products at speeds up to 11 Mbps.
- 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

Event Logging  
Intrusion Detection  
MAC Address Filtering  
NAT  
DMZ Hosting  
Access Control  
Advanced Wireless Protection: WPA, WEP 64/128 bit Encryption, 802.1x authentication, MAC Address Filtering

- Other Features
  - DHCP Server Option
  - DHCP Server/PPPoE Server Auto Detection
  - DNS Server
  - IGMP
  - LAN IP & WAN IP Address Selection
  - MAC Address Cloning
  - Port Forwarding
  - PPPoE Support
  - 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 & Queing to LAN-side devices
  - Remote Management and Secured Remote Management using HTTPS
  - Reverse NAT
  - Static NAT
  - Static Routing
  - Time Zone Support
  - TR-069 Support
  - VPN IPSec (VPN passthrough only)

# High Performance IPTV Routers & Gateways

## Technical Specifications

Features	Descriptions
<b>Physical Specifications</b>	Stand on its side Set horizontally on the desk. Wall Mountable
<b>Environmental</b>	Support the following environmental conditions. References to ETSI EN 300 019-2-2 V2.1.2 (1999-09) and ETSI EN 300 019-1-3 V2.1.1 (2002-11). Operating Ambient Temperature: 10°C to 40°C, 32°F to 104°F. Operating (Circuit Board Ambient) Temperature: 0°C to 70°C, with Relative Humidity: 8% to 95% non-condensing. Altitude: -197 to 7000 feet. Relative Humidity: 8% to 95% non-condensing. Shipping and Storage Temperature: -20°C to 85°C, with Relative Humidity: 5% to 100%.
<b>Regulatory</b>	UL listed FCC Part 15 Subpart B, Class B FCC Part 68 MoCA Certification "Cert Wave" Access point component of the CPE shall be certified, by the Wi-Fi Alliance, with Wi-Fi Protected Access (WPA)
<b>WAN Protocols</b>	IP Version 4 IP Version 6 upgradeable RFC 0768 "User Datagram Protocol" RFC 0791 "Internet Protocol" RFC 0792 "Internet Control Message Protocol" RFC 0793 "Transmission Control Protocol" RFC 0826 "Ethernet Address Resolution Protocol (ARP)" RFC 0894 "Standards 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 1256 "ICMP Router Discovery Messages" RFC 1519 "Classless Inter-Domain Routing (CIDR)" RFC 1812 "Requirements for IP Version 4 Routers" RFC 1918 "Address Allocation for Private Internets"
<b>WAN Protocols (cont'd)</b>	RFC 2246 "The LS Protocol v1.0" (HTTP) RFC 2616 "Hypertext Transfer Protocol—1.1" (HTTP) RFC 2818 "HTTP over TLS" RFC 3300 "Internet Official Protocol Standards" Allow IPSec pass through for a minimum of 4 concurrent LAN IPsec sessions per LAN Port. Ability to bridge IP over Ethernet Support PPPoE over the encapsulated Ethernet as defined in RFCs 2516, including support of 8-byte overhead MSS adjustment Support auto-detect of either PPPoE or DHCP as described in the document entitled "CPE_DCHP-PPPoE_AutoDetect_Definition_V3" PPPoE over the encapsulated Ethernet as defined in RFCs 2516, including support of 8-byte overhead MSS adjustment. RFC 1812 "Requirements for IP Version 4 Routers"
<b>IP Addressing</b>	Default IP address of 192.168.1.1 for local VDSL Gateway addressing. Default subnet mask of 255.255.255.0 for assignment to DHCP leases for local Gateway addressing. Configurable to specify alternate private subnets (without restriction) for local Gateway addressing. Manually configurable to specify the start address within a subnet used for local addressing. Manually configurable to specify the stop address within a subnet used for local addressing. Automatically negotiate its Internet IP address (WAN IP Assignment) whenever it is powered-on or reset. Configurable to use a Static IP address. Support Static Address Maps for up to 5 IP pre-selected hosts. Support RFC 2663 "IP Network Address Translator (NAT) Terminology and Considerations". Support RFC 3022 "Traditional IP Network Address Translator (Traditional NAT)"
<b>LAN</b>	4 LAN facing Ethernet ports and one LAN facing MoCA or HPNA 3.x interface. Support, at a minimum, a 256 MAC address table for LAN Devices. Comply with IEEE 802.1D, Bridging between all LAN interfaces; including Spanning Tree Protocol (STP). DHCP Support a minimum of 253 LAN devices. DNS Support manual configuration of DNS entries. Support Dynamic DNS, RFC 2136

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### Technical Specifications (cont'd)

<p><b>LAN (cont'd)</b></p>	<p>ARP/RARP Display the ARP table upon request.</p>	<p><b>QoS (cont'd)</b></p>	<p>The mapping between layer 3 and layer 2 QoS marking is configurable. Support traffic shaping or rate shaping on each egress and ingress interface. Support priority queuing, weighted fair queuing, custom queuing, and FIFO. Support DHCP vendor class identifier extension. Support Traffic classification based on DHCP Option 60</p>
<p><b>Standards Compliance</b></p>	<p>TR-069 Compliant Ability to release and renew its WAN DHCP address based on a remote (network based) management request. CMS Certification. TR-111 Support interoperability with TR-111: Applying TR-069 to Remote Management of Home Devices. TR-106 Support interoperability with TR-106 Home Networking Model. WT-135 Support interoperability with the Set-top Box CPE, as described by WT-135 TR-064 (future upgradeable) TR-098 TR-104 for External Data</p>	<p><b>Firewall</b></p>	<p>Stateful Packet Inspection (SPI) Firewall Pre-defined Security Policies Even Logging Denial of Service (DoS) protection: General: Ping Flood, ICMP Echo Storm, UDS Snork Attack, ICMP Smurf, UDS 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 Router, 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, Opeear, Bonk, Boink Syndrom, Nester 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, SNMP, 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 Support for ACL &amp; ALG</p>
<p><b>QoS</b></p>	<p>Support Ethernet 802.1P/Q Prioritization DiffServ Support RFC 2474 "Differentiated Services Field" Support RFC 2475 "Architecture for Differentiated Services" Support RFC 2598 "An Expedited Forwarding PHB" Support three strict priority queues for Upstream and Downstream traffic Support up to eight upstream traffic classes on WAN interface. Support traffic prioritization, and policing on all network interfaces Support common firewall functions, such as access control, port forwarding, DMZ, port triggering, remote administration, website blocking, and filtering. Configurable to allow specifying or selecting the following: Source and/or destination IP address, source and/or destination IP range, host names, protocol, source and/or destination ports, MAC addresses, egress and ingress interfaces, for each firewall function if applicable. Support static NAT in addition to common NAT functions. Honor layer 3 QoS markings including TOS, DSCP, IP precedence bits.</p>	<p><b>VDSL2 WAN Module</b></p>	<p>WAN, one RJ-11 port Comply with all G.993.2 requirements Comply with all G.993.1 requirements Support Packet (Ethernet) over VDSL2</p>

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### Technical Specifications (cont'd)

Features	Descriptions
<b>ADSL2+ Pair Bonding WAN Module</b>	<p>WAN, two RJ-11 ports</p> <p>Compliant with ADSL 2/2+ and ADSL 2+ Bonding Standards</p> <p>Full-rate ANSI T1.413 Issue 2</p> <p>G.dmt (ITU G.992.1)</p> <p>G.hs (ITU G.994.1)</p> <p>ADSL over ISDN/U-R2</p> <p>G.dmt.bis (ITU G.992.3)</p> <p>G.dmt.bisplus (ITU G.992.5)</p> <p>G.bond-ATM compatible (ITU-T G.998.1)</p>
<b>MoCA WAN/LAN Module</b>	<p>2 MoCA channels: WAN, LAN</p> <p>WAN MoCA Frequency: 975MHz-1025MHz (single channel)</p> <p>LAN MoCA Frequency: 1125MHz-1525MHz (8 channels)</p> <p>Speeds up to 270 Mbps</p> <p>Dual MoCA channel using a single F-Type connection.</p> <p>Transmit power from the MoCA node at the F-type connector capable of +2 dBm (nominal) at all operating frequencies into an impedance of 75 ohms.</p> <p>Assuming that the required receive power at each MoCA node in the in-home network is -57 dBm and assuming a flat attenuation in this network of 59 dB, the MoCA link between any other in-home device able to support a net total throughput of 8235 Ethernet MAC frames per second assuming 1518 bytes per Ethernet frame.</p>
<b>MoCA LAN Only Module</b>	<p>Speeds up to 270 Mbps</p> <p>Single MoCA channel using a single F-Type connection.</p> <p>LAN MoCA frequencies 1125MHz - 1525MHz (8 channels).</p> <p>Transmit power from the MoCA node at the F-type connector capable of +2 dBm (nominal) at all operating frequencies into an impedance of 75 ohms.</p> <p>Assuming that the required receive power at each MoCA node in the in-home network is -57 dBm and assuming a flat attenuation in this network of 59 dB, the MoCA link between any other in-home device able to support a net total throughput of 8235 Ethernet MAC frames per second assuming 1518 bytes per Ethernet frame.</p>
<b>HPNA3.1 LAN Module</b>	<p>Speeds up to 320 Mbps</p> <p>Handle multiple networks over the same wiring, with up to 32 devices spread up to 1,000 feet apart on a single network.</p> <p>G.9954.X protocol stack</p> <p>Support for both priority-based and parameter-based QoS methods</p> <p>ITU G.9954 and HomePNA 3</p>

<b>Wireless LAN Module</b>	<p>IEEE 802.11g</p> <p>IEEE 802.11b backward compatible</p> <p>IEEE 802.11i</p> <p>Capable to monitor wireless connections to various client devices for parameters such as signal strength and throughput.</p> <p>Configurable multiple RF transmission power levels</p> <p>Multiple Encryption Options Supported: 64 &amp; 128 bit WEP encryption, WPA, 802.1x, and RADIUS authentication</p> <p>64 bit WEP is enabled by default.</p> <p>Antenna system has an omni-directional transmit/receive pattern.</p> <p>Maximum Transmit Power (EIRP) equal to or greater than 100 mW when operating in the 802.11g mode.</p> <p>SSID Broadcast Enable/Disable</p> <p>Multiple SSIDs supported</p> <p>Automatic Channel Selection during Boot-up.</p> <p>Channels 1-11 approved for use in the USA.</p>
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### Minimum System Requirements

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

### Corporate Office

**760 N. Mary Avenue, Sunnyvale, CA 94085**

Main: (408) 752-7700

Tech Support: (888) 436-0657

Fax: (408) 541-9003

Tech Support Fax: (719) 522-9421

Internet: [www.actiontec.com](http://www.actiontec.com)

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