Allied Telesis™

AT-WR4542
IEEE 802.11 5GHz Outdoor Wireless Routing CPE

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IEEE 802.11a/h outdoor wireless routing CPE with 22dBi 5GHz embedded panel antenna

A Complete Solution for Wireless ISPs, Local Utilities, Municipalities, Hospitality and Enterprises

The WR4500 family of dual band outdoor wireless base routers and routing CPEs allow the building of wireless only or hybrid IP networks that are scalable, reliable and fully controllable.

Wireless ISPs can easily and quickly provide homes in rural areas with broadband Internet access and VoIP telephony and, at the same time, can set-up WiFi hot spots for nomadic users.

Enterprises can connect remote buildings without the need for expensive leased lines and can extend WiFi coverage to outdoor yards providing users with mobile intranet and Internet access everywhere.

Municipalities can build wireless IP networks for connecting remote offices and for increasing public safety with real time monitored surveillance cameras and continuous communication with local police patrols. Local utilities can easily control their remote equipments and read, in real time, gas, water and electricity meters without any need for expensive fiber cabling.

Hot spot services can be provided to hotel guests and hospital patients 'illuminating' rooms from outside the building with a reduced impact on medical equipments because no transmit radio will be installed inside the hospital.

AT-WR4542 can be used either as CPEs in Point to Multipoint links or as both ends of a Point to Point link.

Real Wireless IP Routers

WR4500 dual band wireless routers have all the features of IP routers and much more. A full set of routing protocols together with enhanced filtering capabilities make the WR4500 series the best choice for building simple and complex wireless and hybrid (wired-wireless) networks with a tight integration between the wired and wireless parts.

IP routing allows network designers to design and deploy fully redundant networks with predictable behaviour in any working condition, while network operations managers retain full control over packet forwarding.

Point to Point, Point to Multipoint as well as partially or fully meshed networks can be easily designed and deployed with limited need for deciding in advance the network architecture. Common network management tools can be used for configuring and monitoring the network and its users the usual way. Any network engineer will be able, with little wireless training, to design and troubleshoot an Allied Telesis powered wireless network.

Wireless Networking Made Easy

Wireless specific functionalities are integrated in the WR4500 firmware in such a way that setting up a Point to Point link is as easy as configuring an interface.

Key Features

- Feature rich firmware

- Real IP routing functionalities

- 5 GHz operations

- IEEE 802.11a/h compliant

- Certified for HiperLAN bands operation in Europe with DFS and TPC

- Power over Ethernet remote powering

- IP65 rated outdoor robust construction

- Embedded IP firewalling functionalities

- Highly configurable QoS management for multimedia applications

- High sensitivity radio interface for longer reach and higher throughput on wireless links

- RoHS compliant

- TDMA operation mode for full QoS control on wireless

- Multicast routing via PIM and IGMP

Specifications
Physical Specifications

Dimensions   34cm x 34cm x 5cm
(W x D x H)   13.4" x 13.4" x 2"

Weight   1.9 Kg (4.2 lbs)

Mounting kit and
equipment back: Metal

Radome: Plastic

Environmental Specifications

Operating conditions
temperature: -30°C to +65°C
    (-22°F to +140°F)
Relative humidity: 5% to 95% (non-condensing)

Storage conditions
temperature: -40°C to +70°C
    (-40°F to +158°F)
Relative humidity: 5% to 95% (non-condensing)

Robustness
IEC 60529
protection Level: IP65

MTBF: 39,000 hrs

Power Characteristics

Power: PoE 16 to 28vDC, 0.5A Max
Power consumption: 8W

Interfaces

Fast Ethernet interfaces
Standard: IEEE 802.3u (MDI/MDI-X)
Ports: 1
Connector: RJ-45 female

Radio interfaces
Radio: 1
Standard: IEEE 802.11a/h
    (Radio is dual band but antenna
    allows 5GHz operations only)
Connectors: None

Layer 2 Features
Bridging
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1w Rapid Spanning-Tree Protocol
- Multiple bridge interfaces
- Bridge firewalling
- MAC NAT

VLAN
- IEEE 802.1Q VLAN tagging on Ethernet and wireless links
- VLAN bridging

Layer 3 Features
Routing
- Static routing
- Equal cost multi-path routing
- Policy-based routing
- RIPv1 / v2
- OSPFv2
- PIM
- IGMP

Firewall and NAT
- Stateful packet filtering
- Peer-to-Peer protocol filtering
- Source and destination NAT
- Packet classification by:
  - Source MAC
  - Interfaces
  - IP addresses and subnets
  - Ports and port range
  - Protocols
  - Protocol options (ICMP type, TCP flags and MSS)
  - ToS (DSCP)
  - Packet content (matching sequence/frequency)
  - Packet size
  - Time

QoS management
- Hierarchical HTB QoS system with bursts
- Per IP / protocol / subnet / port / firewall mark
- PCQ, RED, SFQ, FIFO queue
- CIR, MIR, contention ratios, dynamic client rate equalizing (PCQ), bursts, peer-to-peer protocol limitation

Tunneling protocols
- PPTP, PPPoE and L2TP
- PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols
- RADIUS authentication and accounting
- MPPE encryption; compression for PPPoE
- Data rate limitation
- Differentiated firewall
- PPPoE dial on demand
- IPIP tunnels, EoIP (Ethernet over IP)

IPSec
- IP security AH and ESP protocols
- MODP Diffie-Hellman groups 1,2,5
- MD5 and SHA1 hashing algorithms
- DES, 3DES, AES-128, AES-192, AES-256 encryption algorithms
- Perfect Forwarding Secrecy (PFS) MODP groups 1,2,5

Proxy
- FTP and HTTP caching proxy server
- HTTPS proxy
- Transparent DNS and HTTP proxying
- SOCKS protocol support
- DNS static entries
- Support for caching on a separate drive
- Access Control Lists
- Caching lists
- Parent proxy support

DHCP
- DHCP server per interface
- DHCP relay
- DHCP client
- Multiple DHCP networks
- Static and dynamic DHCP leases
- RADIUS support

VRRP
- VRRP protocol for high availability

UPnP
- Universal Plug & Play support

NTP
- Network Time Protocol server and client

Monitoring/accounting
- IP traffic accounting
- Firewall actions logging
- Statistics graphs accessible via HTTP GUI

Management
- SNMP V2 read-only
- SSH and Telnet CLI
- Web GUI
- Windows-based GUI

Tools
- Ping
- Traceroute
- Bandwidth test
- Ping flood
- Packet sniffer
- Dynamic DNS update tool

Wireless Features
Operation modes
- Point to Point
- Point to Multipoint
- WDS: Wireless Distribution System
- Wireless client (station mode)
- Wireless bridging
- Dynamic Frequency Selection (DFS)
- Transmit Power Control (TPC)

Access security
- 40 and 104-bit WEP
- WPA2-PSK and WPA2-EAP
- WPA-PSK and WPA-EAP
- AES-CCM and TKIP encryption
- Access Control List
- Std FIPS 197 AES

Authentication
- RADIUS
- EAP and IEEE 802.1x

Technical Specifications
Standards and Protocols

IEEE

IEEE 802.1D	MAC bridges
IEEE 802.1Q	Virtual LANs
IEEE 802.1x	Port-based network access control
IEEE 802.1w	Rapid reconfiguration of Spanning-Tree
IEEE 802.2	Logical link control
IEEE 802.3-2002	CSMA/CD access method and physical layer specifications
IEEE 802.3u	100TX
IEEE 802.3x	Full-duplex operation
IEEE 802.11a	WLAN MAC and PHY specifications. High-speed physical Layer in the 5 GHz band
IEEE 802.11b	WLAN MAC and PHY specifications. Higher-speed physical layer extension in the 2.4 GHz band
IEEE 802.11g	WLAN MAC and PHY specifications. Amendment 4: further higher data rate extension in the 2.4 GHz band
IEEE 802.11h	WLAN MAC and PHY specifications. Amendment 5: spectrum and transmit power management extensions in the 5 GHz band in Europe
IEEE 802.11i	WLAN MAC and PHY specifications. Amendment 6: MAC security enhancements

IETF

RFC 768	UDP
RFC 791	IP
RFC 792	ICMP
RFC 793	TCP
RFC 826	ARP
RFC 854	Telnet protocol specification
RFC 855	Telnet option specifications
RFC 856	Telnet binary transmission
RFC 857	Telnet echo option
RFC 858	Telnet suppress go ahead option
RFC 932	Subnetwork addressing scheme
RFC 950	Subnetting, ICMP
RFC 951	BootP
RFC 959	FTP
RFC 1027	Proxy ARP
RFC 1035	DNS
RFC 1058	RIPv1
RFC 1091	Telnet terminal-type option
RFC 1122	Internet host requirements

RFC 1155	MIB
RFC 1157	SNMP
RFC 1212	Concise MIB definitions
RFC 1213	MIB-II
RFC 1245	OSPF protocol analysis
RFC 1246	Experience with the OSPF protocol
RFC 1256	ICMP router discovery messages
RFC 1305	NTP version 3
RFC 1334	PPP authentication protocols
RFC 1350	TFTP
RFC 1493	Definitions of managed objects for bridges
RFC 1518	An architecture for IP address allocation with CIDR
RFC 1519	Classless Inter-Domain Routing (CIDR)
RFC 1542	Clarifications and extensions for the BootStrap protocol
RFC 1592	Simple Network Management Protocol (SNMP) distributed protocol interface V.2.0
RFC 1631	The IP Network Address Translator (NAT)
RFC 1643	Ethernet MIB
RFC 1661	The Point-to-Point Protocol (PPP)
RFC 1701	GRE
RFC 1702	GRE over IPv4
RFC 1793	Extending OSPF to support demand circuits
RFC 1812	Router requirements
RFC 1829	IPSec algorithm
RFC 1858	Fragmentation
RFC 1877	PPP Internet protocol control protocol extensions for name server addresses
RFC 1918	IP addressing
RFC 1945	HTTP/1.0
RFC 1994	PPP Challenge Handshake Authentication Protocol (CHAP)
RFC 2003	IP encapsulation within IP
RFC 2011	SNMPv2 Management Information Base for the Internet protocol using SMIv2
RFC 2049	MIME
RFC 2068	HTTP/1.1
RFC 2082	RIP-2 MD5 authentication
RFC 2096	IP forwarding table MIB
RFC 2113	IP router alert option
RFC 2131	DHCP
RFC 2136	Dynamic updates in the Domain Name System (DNS UPDATE)
RFC 2236	Internet Group Management Protocol, version 2
RFC 2246	The TLS protocol version 1.0
RFC 2284	EAP
RFC 2328	OSPFv2
RFC 2338	Virtual Router Redundancy Protocol
RFC 2401	Security architecture for IP

RFC 2402	IP authentication header
RFC 2403	IPSec authentication - MD5
RFC 2433	Microsoft PPP CHAP extensions
RFC 2453	RIPv2
RFC 2474	DCSP in the IPv4 and IPv6 headers
RFC 2516	A method for transmitting PPP Over Ethernet (PPPoE)
RFC 2616	Hypertext Transfer Protocol - HTTP/1.1
RFC 2637	Point-to-Point Tunneling Protocol (PPTP)
RFC 2661	L2TP
RFC 2663	IP Network Address Translator (NAT) terminology and considerations
RFC 2759	Microsoft PPP CHAP extensions, version 2
RFC 2790	Host MIB
RFC 2863	The interfaces group MIB
RFC 2865	RADIUS
RFC 2866	RADIUS accounting
RFC 3007	Secure Domain Name System (DNS) dynamic update
RFC 3022	Traditional NAT
RFC 3046	DHCP relay agent information option
RFC 3164	Syslog protocol
RFC 3168	The addition of Explicit Congestion Notification (ECN) to IP
RFC 3376	Internet Group Management Protocol, version 3
RFC 3768	VRRP
RFC 4251	The Secure Shell (SSH) protocol architecture
RFC 4601	Protocol Independent Multicast - Sparse Mode (PIM-SM): protocol specification (revised)
RFC 5059	Bootstrap Router (BSR) mechanism for PIM

Radio Characteristics

Frequency band:	5 GHz
Radio type:	IEEE 802.11a/h

Modulation:

6 and 9Mbps	PSK (OFDM)
12 and 18Mbps	QPSK (OFDM)
24 and 36Mbps	16-QAM (OFDM)
48 and 54Mbps	64-QAM (OFDM)

Channels:

US/Canada (FCC)	12 non overlapping (5.150 to 5.350; 5.725 to 5.825)
Europe (ETSI)	19 non overlapping (5.150 to 5.350; 5.470 to 5.725)
France	19 non overlapping (5.150 to 5.350; 5.470 to 5.725)
Japan (Telec)	4 non overlapping (5.150 to 5.250)
China	5 non overlapping (5.725 to 5.850)
Other countries	Per local regulations

	Standard	Data Rate (Mbps)		Receive Sensitivity (dBm)	Max Output Power (*) (dBm)
		Normal Mode	Super AG Mode		
AT-WR4542	IEEE 802.11a/h	6	12	-88	17
		9	18	-87	17
		12	24	-85	16
		18	36	-83	16
		24	48	-80	15
		36	72	-75	15
		48	96	-73	14
		54	108	-71	13

(*) This is the actual Radio Output Power and does not include the Antenna gain.

Regulatory Approvals

EMI/EMC: FCC part 15 Class B
                      CE marking Class A

Safety: IEC60950, UL60950, CSA60950,
                      EN60950

RoHS compliant

Ordering Information

AT-WR4542-xx
IEEE 802.11a/h outdoor wireless routing CPE with 22dBi 5GHz embedded panel antenna

Where xx =   10 for North America
                     30 for UK
                     40 for Australian
                     50 for European

Associated Products

AT-TQ00xx
Cables and accessories

AT-WR4541a
IEEE 802.11a/b/g/h outdoor wireless routing CPE with 15dBi 5GHz embedded panel antenna

AT-WR4541g
IEEE 802.11a/b/g/h outdoor wireless routing CPE with 11dBi 2.4GHz embedded panel antenna

AT-WR4561-00
IEEE 802.11 dual band single radio outdoor wireless base router

AT-WR4562-00
IEEE 802.11 dual band dual radio outdoor wireless base router

Connecting The (IP) World

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