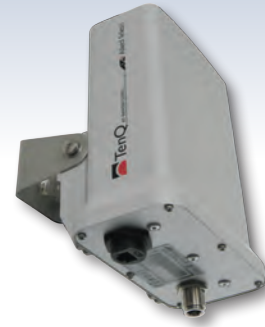


## AT-WR4541a/g

### OUTDOOR WIRELESS CPE

The AT-WR4541a is an IEEE 802.11a/b/g outdoor wireless CPE with 15dBi 5GHz embedded panel antenna.

The AT-WR4541g is an IEEE 802.11a/b/g outdoor wireless CPE with 11dBi 2.4GHz embedded panel antenna.



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

Flexibility is the primary advantage of AT-WR4541 wireless routing CPEs. Both models share the same firmware, radio module and enclosure. The only difference is in the embedded panel antenna: AT-WR4541a features a 15dBi 5GHz antenna while AT-WR4541g is equipped with an 11dBi 2.4GHz antenna.

Both models feature an additional type N coax connector for using either 2.4GHz or 5GHz external antennas.

#### Product Positioning

WR4500 series is a complete solution for wireless ISPs, local utilities, municipalities, hospitality and enterprises.

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.

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

#### Features

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 parts.

IP routing allows network designers to design and deploy fully redundant networks with predictable behavior 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.

### Key Features

- » IEEE 802.11a/b/g compliant
- » WLAN regulatory domain compliance (IEEE 802.11h included)
- » Hot spot captive-portal
- » Routing capability (RIP, OSPF, IP static routes)
- » Bridging and VLAN support
- » QoS management for multimedia application
- » RoHS compliant
- » Multicast routing via PIM and IGMP
- » Security (firewall, NAT, DoS, IP/port/MAC filtering)
- » DHCP client/server/relay
- » DNS
- » NTP client/server
- » Syslog support
- » File transfer support (FTP, SFTP, TFTP)
- » TELNET and SSH login
- » Web GUI
- » SNMP support
- » Power over Ethernet remote powering
- » IP67 rated outdoor robust construction
- » Professional look suitable for indoor installation too
- » Wide choice of omni-directional, directional and sector antennas

## Management

CLI (via SSH and TELNET)  
Web GUI  
SNMPv2, v3 (read only)

## Network services

### Bridging

Multiple bridge interfaces  
VLAN bridging  
IEEE 802.1D Spanning-Tree Protocol  
IEEE 802.1w Rapid Spanning-Tree Protocol

### VLAN Support

IEEE 802.1Q VLAN tagging

### Routing

IPv4 static routes  
Routing Information Protocol (RIPv1, v2)  
Open Shortest Path First (OSPFv1, v2, v3)  
Virtual Router Redundancy (VRRP)

### Multicasting

PIM  
IGMP

### QoS

Data rate limitation  
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

### Firewalling and NAT

Access Control Lists  
Stateful packet filtering  
Peer-to-Peer protocol filtering  
Source and destination NAT  
Bridge firewalling  
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 (sequence/frequency matching)  
- Packet size  
- Time

## Tunneling

PPTP, PPPoE and L2TP  
PPPoE dial-on-demand  
IPIP tunnels, EoIP (Ethernet over IP)

## Security

Access Control Lists  
RADIUS-based authentication and accounting  
MPPE encryption; compression for PPPoE  
PAP, CHAP, MSCHAPv1 and MSCHAPv2 authentication protocols  
SSL  
TLS  
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  
Support for caching on a separate drive  
Caching lists  
Parent proxy support

## Applications

DHCP client/server/relay  
DNS client/server  
FTP server  
SFTP server  
NTP client/server  
SSH server  
TFTP server  
TELNET client/server  
UPnP  
Syslog  
Monitoring:  
- IP traffic accounting  
- Firewall actions logging  
- Statistics graphs accessible via HTTP GUI  
Tools:  
- Ping  
- Traceroute  
- Bandwidth test  
- Ping flood  
- Packet sniffer

## Wireless Services

### Supported Typologies

Point-to-Point  
Point-to-Multipoint  
Infrastructure (AP/STA)  
Wireless Distribution System (WDS)

### Authentication

Wireless supplicant (RADIUS-based)  
EAP over IEEE 802 (IEEE 802.1x)

### Security

64/128 bit WEP encryption  
WPA-PSK and WPA-EAP  
WPA2-PSK and WPA2-EAP  
AES-CCM and TKIP encryption  
Std FIPS 197 AES

### Features

IEEE 802.11a/b/g  
IEEE 802.11d  
IEEE 802.11e  
IEEE 802.11h  
IEEE 802.11i  
Regulatory domain compliance  
WMM  
SSID hiding/ignoring  
Virtual AP  
Multiple SSID (up to 128)  
VLAN to SSID mapping  
Antenna alignment support  
Scan list of users

**Technical Specifications**

**Standard Compliance**

RoHS Compliant  
 ElectroMagnetic Compatibility (EMC)  
 EC: ETSI EN 301 489-1 V1.8.1:2008  
 EC: ETSI EN 301 489-17 V1.3.2:2008

**Radio Equipment**

EC: EN 300 328 V1.7.1:2006  
 EC: EN 301 893 V1.5.1:2008

**Safety**

EC: EN 60950-1:2006

**Environmental Specifications**

Operating temperature: -30°C to 65°C (-22°F to 140°F)  
 Storage temperature: -40°C to 70°C (-40°F to 158°F)  
 Relative humidity: 95% relative, non-condensing  
 International protection rating: IP67  
 (with optional AT-TQ0051/3, UTP cable)  
 MTBF: 39,000 hours

**Physical Specifications**

Dimensions (W x D x H): 13.3 x 8.6 x 16 cm  
 (5.2" x 3.4" x 6.3")  
 Weight: 0.45 Kg (1.0 lbs) main unit  
 0.59 Kg (1.3 lbs) with mount kit  
 Case: Low flammability UL94-V0 plastic and aluminum enclosure

**Power Characteristics**

Input voltage: Passive PoE  
 Voltage range: 12 ~ 24vDC  
 Max absorption: 7W  
 Connector: RJ-45 female

**Interfaces**

**Wired Interfaces**

Type: Fast Ethernet  
 Standard: IEEE 802.3u  
 Ports: 1  
 Connector: RJ-45 female

**Wireless Interfaces**

Type: WLAN  
 Standard: IEEE 802.11a/b/g  
 Ports: 1  
 Connector: 1 x N-type female

**Embedded Panel Antenna**

**AT-WR4541a-50**

Frequency range: 5,150~5,875 MHz  
 Gain: 15 dBi  
 Horizontal HPBW: 24°~30°  
 Vertical HPBW: 19°~21°

**AT-WR4541g-50**

Frequency range: 2,400~2,500 MHz  
 Gain: 10.5~11 dBi  
 Horizontal HPBW: 54°  
 Vertical HPBW: 38°

**Radio Characteristics**

	IEEE 802.11a	IEEE 802.11b	IEEE 802.11g
<b>FREQUENCY RANGE</b>			
	4.9GHz ~ 5.8GHz		2.3GHz ~ 2.5GHz
<b>MODULATION TECHNIQUE</b>			
	OFDM (BPSK, QPSK, 16QAM, 64QAM)		DSSS (DBPSK, DQPSK, CCK) - OFDM (DPSK, QPSK, 16-QAM, 64-QAM)
<b>OUTPUT POWER</b>			
	17dBm @ 6Mbps 13dBm @ 54Mbps	19dBm @ 1Mbps 19dBm @ 11Mbps	18dBm @ 6Mbps 15dBm @ 54Mbps
<b>RECEIVE SENSITIVITY</b>			
	-88dBm @ 6Mbps -71dBm @ 54Mbps	-95dBm @ 1Mbps -90dBm @ 11Mbps	-90dBm @ 6Mbps -73dBm @ 54Mbps
<b>DATA RATES</b>			
	54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback	11, 5.5, 2, 1Mbps, auto-fallback	54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback
<b>SECURITY</b>			
	» 64-bit, 128-bit, WEP encryption » AES-CCM and TKIP encryption » WPA, WPA2 » IEEE 802.1x authentication		
<b>OPERATION MODE</b>			
	» Bridging » Infrastructure » WDS		
<b>MEDIA ACCESS PROTOCOL</b>			
	CSMA/CA with ACK architecture 32-bit MAC		



### Ordering Information

#### AT-WR4541a-50

IEEE 802.11a/b/g outdoor wireless CPE with 15dBi  
5GHz embedded panel antenna

#### AT-WR4541g-50

IEEE 802.11a/b/g outdoor wireless CPE with 11dBi  
2.4GHz embedded panel antenna

### Associated Products

#### AT-TQ00xx

Cables and accessories

#### AT-TQ02xx

2.4GHz antenna and accessories

#### AT-TQ05xx

5GHz antenna and accessories

#### AT-WR4562

IEEE 802.11a/b/g outdoor dual-radio wireless base  
station