

# M8000

802.11a/b/g Outdoor Layer-2 MESH AP

- 2.4GHz / 5GHz
- 802.11 a/b/g
- MESH



## PRODUCT DESCRIPTION

EnGenius Mesh AP is designed with IEEE802.11a/b/g standards and addressed on providing high performance mesh network. The product encased in the IP-65 protection enclosure and delivers the maximum scalability, high reliability at outdoor environment. Compared with expensive T1/E1 leased lines, the Mesh network offers a cost-effective last-mile connection.

EnGenius Mesh AP provides wireless connection over self-adaptation mesh backhaul (5GHz). The mesh AP can operate at 2.4GHz for long range interference. The detachable antenna design allows users to use various antennas for different deployment.

The M8000, including advanced AODV (Ad-hoc On-demand Distance Vector) protocol, is the industry and scalable mesh routing algorithm. It allows data to be transferred with the optimal path. WAN interface for Internet connection with Gateway mode, power over Ethernet for both Gateway mode and Relay mode.

EnGenius Mesh AP provides the highest security mechanism to protect data information over wireless. The security feature include AES backhaul link, WPA2 client access, SSL for web management. To simplify the administration task throughout the large area, this product also provides centralized management software. This software is built based on SNMP protocol and can be installed in computer.

## Package Content

- 1 x 802.11a/b/g Layer-2 MESH AP (M8000)
- 1 x PoE injector with Power Adapter
- 1 x Mounting kit
- 1 x 1.8m Grounding Cable
- 2 x Dual Band Antennas
- 1 x CD-ROM with User's Manual, NMS and Reset Tool

Features	Benefits
Dual Radio for independent Backhaul and local access	Allow operators to set up at both 2.4GHz for long range and 5GHz for backhaul to reduce the frequency interference
Self Configuration and Healing	Automatically search and link with gateway AP and other nearest node Mesh AP for Ease of Deployment & Management
EnGenius Business Class High Power Technology	Get more coverage and distance to save the installation fee
Wide temperature range and robust mechanical design (IP65)	Delivers reliable, top performance in the most demanding environments to Avoid water invaded and weather corroded
Power over Ethernet (PoE)	Easy installation and cost-effective
Support Multiple SSID for client access mode	Distinguish separate networks within the same wireless space to provide secure connection
Support VLAN pass-through (Wired, Wireless)	Reduce the size of each broadcast domain, which in turn reduces network traffic and increases network security
Support 802.1x (EAP-TLS/TTLS/SIM/PEAP), 802.11i (WPA/WPA2, AES), VPN pass-thru mechanisms	Provide mutual authentication (Client and dynamic encryption keys to enhance security
Hide SSID	Avoids unallowable users sharing bandwidth, increases efficiency of the network
Support MAC Address access control list	Ensures secure network connection
Support WMM Extension	Improve the user experience for audio, video, and voice applications by prioritizing data traffic
Bandwidth control	Enables operators to specify the maximum line bandwidth that a particular transfer operation can use
Support SNMP v2c/v3	Allow users to operate with existing network management tools
Centralized management software	Easy to manage volume Mesh AP via central control system to save the management cost

TECHNICAL SPECIFICATION												
> Hardware Specification												
MCU	Intel IXP425, 533MHz											
RF	Atheros AR5413											
Memory	64MB SDRAM											
Flash	16MB											
Physical Interface	One 10/100 Fast Ethernet RJ-45											
Power Requirements	Active Ethernet (Power over Ethernet, IEEE802.3af)- 48 VDC/0.375A											
Regulation Certifications	FCC Part 15/UL, ETSI 300/328/CE											
> RF Specification												
Frequency Band	802.11a: 5.15~5.35GHz, 5.47~5.725GHz, 5.725~5.825GHz  802.11b/g: U.S., Europe and Japan product covering 2.4 to 2.484 GHz, programmable for different country regulations											
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)											
Modulation Technology	OFDM: BPSK, QPSK, 16-QAM, 64-QAM DBPSK, DQPSK, CCK											
Operating Channels	<b>802.11b/g</b> 11 for North America, 14 for Japan, 13 for Europe  <b>802.11a</b> US/Canada:12 non-overlapping channel (5.15~5.35GHz, 5.725~5.825GHz) Europe:19 non-overlapping channel (5.15~5.35GHz, 5.47~5.825GHz) Japan:4 non-overlapping channel (5.15~5.25GHz) China:5 non-overlapping channel (5.725~5.85GHz)											
Receive Sensitivity (Typical)	<table border="1"> <thead> <tr> <th>802.11a</th> <th>802.11g</th> <th>802.11b</th> </tr> </thead> <tbody> <tr> <td>-88dBm @ 6Mbps</td> <td>-90 dBm @ 6Mbps</td> <td>-95 dBm @ 1Mbps</td> </tr> <tr> <td>-70dBm @ 54Mbps</td> <td>-74 dBm @ 54Mbps</td> <td>-90 dBm @ 11Mbps</td> </tr> </tbody> </table>			802.11a	802.11g	802.11b	-88dBm @ 6Mbps	-90 dBm @ 6Mbps	-95 dBm @ 1Mbps	-70dBm @ 54Mbps	-74 dBm @ 54Mbps	-90 dBm @ 11Mbps
802.11a	802.11g	802.11b										
-88dBm @ 6Mbps	-90 dBm @ 6Mbps	-95 dBm @ 1Mbps										
-70dBm @ 54Mbps	-74 dBm @ 54Mbps	-90 dBm @ 11Mbps										
Antenna *2	N type dual band omni external antenna											

Available transmit power	Frequency	FCC	ETSI
	4.92~5.08 GHz	17 dBm @6~36Mbps 16 dBm @48Mbps 15 dBm @54Mbps	20 dBm @6~24Mbps 18 dBm @36Mbps 16 dBm @48Mbps 15 dBm @54Mbps
	5.18~5.32 GHz		20 dBm @6~24Mbps 18 dBm @36Mbps 16 dBm @48Mbps 15 dBm @54Mbps
	5.26~5.32 GHz	20 dBm @6~24Mbps 18 dBm @36Mbps 16 dBm @48Mbps 15 dBm @54Mbps	
	5.52~5.70 GHz		19 dBm @6~24Mbps 17 dBm @36Mbps 15 dBm @48Mbps 14 dBm @54Mbps
	5.745~5.825GHz	18 dBm @6~24Mbps 16 dBm @36Mbps 14 dBm @48Mbps 13 dBm @54Mbps	18 dBm @6~24Mbps 16 dBm @36Mbps 14 dBm @48Mbps 13 dBm @54Mbps
	2.412~2.462 GHz (IEEE802.11g)	25 dBm @6~24Mbps 23 dBm @36Mbps 22 dBm @48Mbps 21 dBm @54Mbps	25 dBm @6~24Mbps 23 dBm @36Mbps 22 dBm @48Mbps 21 dBm @54Mbps
	2.412~2.462 GHz (IEEE802.11b)	25 dBm @1~11Mbps	25 dBm @1~11Mbps

### SOFTWARE FEATURES

> General	
Topology	Infrastructure
Protocol / Standard	IEEE 802.3 (Ethernet) IEEE 802.3u (Fast Ethernet) IEEE 802.11a (5GHz WLAN) IEEE 802.11b/g (2.4GHz WLAN) RFC 768 UDP RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 1034, 1035 DNS RFC 1058 RIP RFC 1119 SNTPv2 RFC 1541 / 2131 / 3046 DHCP client / Server RFC 2068 / 2616 HTTP RFC 2516 PPPoE RFC 2865,2866 RADIUS

Operation Mode	MESH Gateway, Client Relay
LAN	- DHCP Client - DHCP Relay
IPV4	- Multicast - Routing
Wireless	- Auto Channel Selection (Setting varies by Country) - Transmission Rate 11a/g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps 11b : 11, 5.5, 2, 1 Mbps - Distance Control (Ack timeout)
Security	- Authentication : 802.11i (WPA, WPA2) 802.1x (including EAP-TLS/TTLS) - Encryption : Open, WEP-64/128, TKIP, AES - MAC address access control list - MSSID Support in client access mode - Hidden SSID - VLAN pass-through
QoS	WMM
<b>&gt; Management</b>	
Configuration	Web-based configuration (HTTP)/HTTPS/SSH
Network Windows Management Utility	- MESH AP discovery - MESH AP status - MESH AP setup, upgrade, reboot - User status, activity
Firmware Upgrade	Upgrade firmware via utility (HTTP)/TFTP
Administrator Setting	Administrator password change
Reset Setting	Reboot and Reset to Factory Default
System monitoring	Status, Statistics and Event Log
SNMP	V2c, V3 (MIB)
Alarms	Configuration Alarms

#### ENVIRONMENTAL AND PHYSICAL

Temperature Range	Operating: -20°C~70°C Storage: -30°C to 80°C
Humidity (non-condensing)	0% ~ 90% typical
Dimensions	260mm (L) x 175mm (W) x 65mm (H)
Weight	450g

> Application

