



The Neutron Series

User Manual



EWS860AP
version 1.0

Dual Band

Wireless AC1750 Managed Outdoor Access Point

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Chapter 1

Product Overview

Introduction

The EWS860AP is a high-powered, long-range 3x3 Dual-Band Wireless 802.11ac/a/b/g/n Outdoor Access Point with speeds up to 450 Mbps on 2.4 GHz and 1300 Mbps on 5 GHz band. This Access Point is designed to operate in a variety of outdoor environments. Its high-powered, long-range characteristics make it a cost-effective alternative to ordinary Access Points that don't have the range and reach to connect to a growing number of wireless users who wish to connect to a business network. The EWS860AP supports 2.4 GHz frequency band under 802.11 b/g/n mode while at the same time provides 5 GHz band under 802.11ac/a/n mode for communicating to and from 5 GHz capable computers, tablets or smart phones or for transferring files. Several EWS860APs can be deployed in a campus setting using the 5 GHz band as a backhaul to provide multiple 2.4 GHz wireless cells for computers or mobile devices in common outdoor areas.

The EWS860AP is easy to install in virtually any location with its included PoE (Power over Ethernet) injector for quick outdoor installation. The EWS860AP enables network administrators to control its transmit power and feature settings for selecting narrow bandwidth and traffic shaping. The EWS860AP also supports wireless encryption including Wi-Fi Protected Access (WPA-PSK/WPA2-PSK) Encryption, and IEEE 802.1x with RADIUS.

Maximum data rates are based on IEEE 802.11 standards. Actual throughput and range may vary depending on many factors including environmental conditions, distance between devices, radio interference in the operating environment, and mix of devices in the network. Features and specifications are subjected to change without prior notice. Trademarks and registered trademarks are the property of their respective owners. For United States of America: Copyright © 2014 EnGenius Technologies, Inc. All rights reserved.

Key Features

- Deploy and manage with ease using EWS Series Wireless Management Switches
- IP68-rated ruggedized enclosure for harsh outdoor environments

can be used with
802.3at
capable switches or injectors

- Up to 29 dBm transmit power enabling long range connectivity
- Supports IEEE802.11ac/a/b/g/n wireless standards with up to 450 Mbps data rate on 2.4 GHz band and 1300 Mbps on 5 GHz band
- Three detachable 5 dBi 2.4 GHz Omni-directional antennas
- Three detachable 7 dBi 5 GHz Omni-directional antennas
- Backwards compatible with IEEE802.11a/b/g/n wireless devices
- Integrated Power over Ethernet (IEEE802.3at) for lowering deployment costs. Can be powered using either the included power adapter or via PoE with PoE 802.3af/at capable Switches or Injectors
- Dual Band/Three Stream
- Band Steering to load balance clients between 2.4 GHz and 5 GHz for better throughput performance¹
- Secured Guest Network option available

System Requirements

The following are the Minimum System Requirements in order to configure the device:

- Computer with an Ethernet interface or wireless network capability
- Windows OS (XP, Vista, 7, 8), Mac OS, or Linux-based operating systems
- Web-Browsing Application (i.e.: Internet Explorer, Firefox, Chrome, Safari, or another similar browser application)

Package Contents

The package contains the following items (all items must be in package to issue a refund):

- EWS860AP Access Point
- 3 detachable 5 dBi 2.4 GHz Omni-directional Antennas
- 3 detachable 7 dBi 5 GHz Omni-directional Antennas
- Power Adapter (48V/0.8A)
- PoE Injector (EPE-48GR)
- Grounding Cable
- Pole Mount Bracket
- Wall Mount Base
- Mounting Screw Set
- Quick Installation Guide

Applications

Wireless LAN (WLAN) products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of WLANs:

- **Difficult-to-Wire Environments:** There are many situations where wires cannot be installed, deployed easily, or cannot be hidden from view. Older buildings, sites with multiple buildings, and/or areas that make the installation of a Ethernet-based LAN impossible, impractical or expensive are sites where WLAN can be a network solution.
- **Temporary Workgroups:** Create temporary workgroups/networks in more open areas within a building; auditoriums, amphitheaters classrooms, ballrooms, arenas, exhibition centers, or temporary offices where one wants either a permanent or temporary Wireless LAN established.
- **The Ability to Access Real-Time Information:** Doctors/Nurses, Point-of-Sale Employees, and/or Warehouse Workers can access real-time information while dealing with patients, serving customers, and/or processing information.
- **Frequently Changing Environments:** Set up networks in environments that change frequently (i.e.: Show Rooms, Exhibits, etc.).
- **Small Office and Home Office (SOHO) Networks:** SOHO users require a cost-effective, easy, and quick installation of a small network.
- **Training/Educational Facilities:** Training sites at corporations or students at universities use wireless connectivity to exchange information between peers and easily access information for learning purposes.

Technical Specifications

Standard:

IEEE802.11ac/a/n on 5 GHz
IEEE802.11b/g/n on 2.4 GHz
IEEE802.3at

Antenna:

6 External N-type Antennas
3 x Detachable 5 dBi 2.4 GHz Omni-directional Antennas
3 x Detachable 7 dBi 5 GHz Omni-directional Antennas

Physical Interface:

2 x 10/100/1000 Gigabit Ethernet Port with PoE support
LAN1 Port: IEEE802.3at PoE Input
LAN2 Port: IEEE802.3af PoE Output
Both Ethernet Ports support Surge Protection to 6KV

LED Indicators:

Power
LAN 1
LAN 2
2.4 GHz
5 GHz

Power Requirements:

External Power Adapter, DC IN, 48V/0.8A
IEEE802.3at support

Management:

Auto Channel Selection
Multiple SSID: 16 SSIDs (8 SSIDs per Radio)
BSSID
SNMP V1/V2c/V3
MIB I/II, Private MIB
VLAN Tag/VLAN Pass-through
Clients Statistics
Save Configuration as User Default
Fast Roaming
E-Mail Alert
RADIUS Accounting
Guest Network
Control
CLI Supported
Distance Control (ACK Timeout)
Multicast Supported
Auto Reboot
Obey Regulatory Power

Security:

WEP Encryption - 64/128/152 bit
WPA/WPA2 Personal (WPA-PSK using TKIP or AES)
WPA/WPA2 Enterprise (WPA-PSK using TKIP or AES)
Hides SSID in beacons
MAC address filtering, up to 50 MACs
Wireless STA (Client) connection list

Https Support

SSH Support

QoS (Quality of Service):

Complaint with IEEE 802.11e standard

Physical/Environment Conditions:

Operating:

Temperature: -4 °F ~ 158 °F (-20 °C ~ 70 °C)

Humidity (non-condensing): 90% or less

Storage:

Temperature: -22 °F ~ 176 °F (-30 °C ~ 80 °C)

Humidity (non-condensing): 90% or less

Physical Interface

Dimensions and Weights

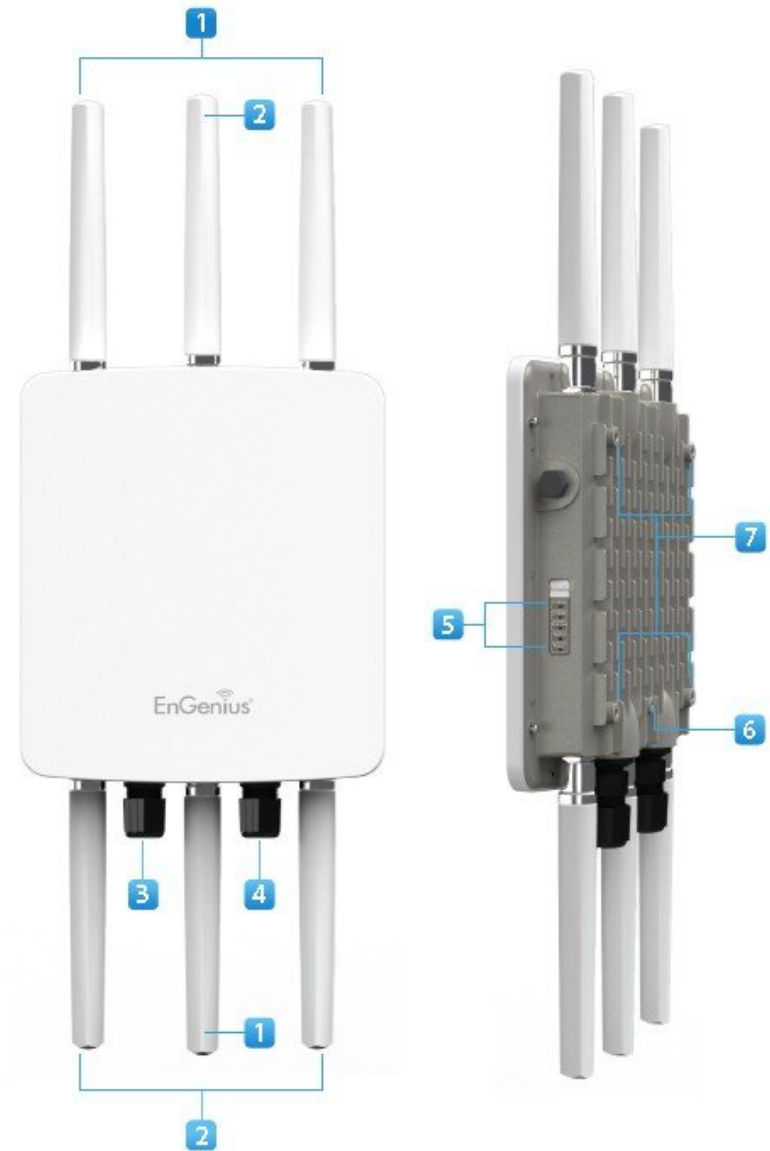
Length: 11.22"

Width: 8.58"

Depth: 2.1"

Weight: 4.17 lbs

1. 2.4 GHz Antennas: Detachable 5 dBi 2.4 GHz Omni-directional
2. 5 GHz Antennas Detachable 7 dBi 5 GHz Omni-directional
3. LAN Port 1 (802.3at PoE Input): Ethernet port for RJ-45 cable.
4. LAN Port 2 (802.3af PoE Output): Ethernet port for RJ-45 cable.
5. LED Indicators: LED lights for Power, LAN Port 1, LAN Port 2, 2.4 GHz Connection and 5 GHz Connection.
6. Ground
7. Mounting Holes: Using the provided hardware, the EWS860AP can be attached to a wall or pole.



Chapter 2

Connections

Before You Begin

This section will guide you through the installation process. Placement of the EnGenius Access Point is essential to maximize the Access Point's performance.

Considerations for Wireless Installation

The operating distance of all wireless devices can often not be pre-determined due to a number of unknown obstacles in the environment in which the device is deployed. The following list describes the solutions that the ENH700EXT offers as a flexible, robust and powerful Outdoor Access Point or Bridge:

- **Difficult-to-Wire Environments** - In outdoor environments sometimes extending a network by laying Ethernet or fiber cabling is either cost prohibitive or physically not possible. The EWS860AP, enables the extension of an existing company network via the propagation of a wireless signal rather than cable as a much more cost-effective alternative.
- **Temporary Workgroups** – Creating a wired network infrastructure for a temporary outdoor worksite/workgroup or special event venue may not be a cost- or time-efficient solution and may present deployment issues if trenches for cabling cannot be dug in existing landscaping. The EWS860AP enables companies, in a matter of minutes, to create an outdoor wireless network that can provide Internet access (based on an existing broadband connection) or access to the company's networked resources like printers, hard drives and databases.
- **Wireless Extensions of Ethernet Networks** – The range of a wired network is typically limited within the confines of a single building. In situations where there are multiple buildings on a campus or another company building very remote from the main building then a Wireless Access Point or Bridge deployment using the EWS860AP provides a very cost-effective way to cover large outdoor areas around a company office or even connect to other company buildings.
- **Expanding User Capacity and Connectivity To Additional Devices** – The EWS860AP is designed specifically to extend and expand existing company networks. Its high transmit power capability and enhanced receive sensitivity results in the ability for a company to connect to more employees, company guests or other wireless clients. The EWS860AP's additional 5GHz frequency radio can be act as a separate AP or bridge to either provide 5GHz wireless access to 5GHz clients; Or connect to other 5GHz devices

to provide backhaul service.

- **Redundancy** – In situations where a portion of an existing wired network may fail, the EWS860AP offers a measure of stability and redundancy to other employees can continue to communicate with one another or access mission critical databases.

Compatibility

Your EWS860AP supports the following Neutron Series EWS Switch models*:

EWS5912FP

8-Port Layer 2 PoE+ Wireless Management Switch with 2 SFP

Supports up to 20 Neutron Series Access Points

EWS7928P

24-Port Layer 2 PoE+ Wireless Management Switch with 4 SFP

Supports up to 50 Neutron Series Access Points

EWS7928FP

24-Port Layer 2 PoE+ Wireless Management Switch with 4 SFP

Supports up to 50 Neutron Series Access Points

EWS7952FP

48-Port Layer 2 PoE+ Wireless Management Switch with 4 SFP

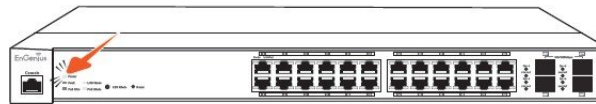
Supports up to 50 Neutron Series Access Points

*Future firmware releases will support additional models.

Connecting to the Neutron Series Switch

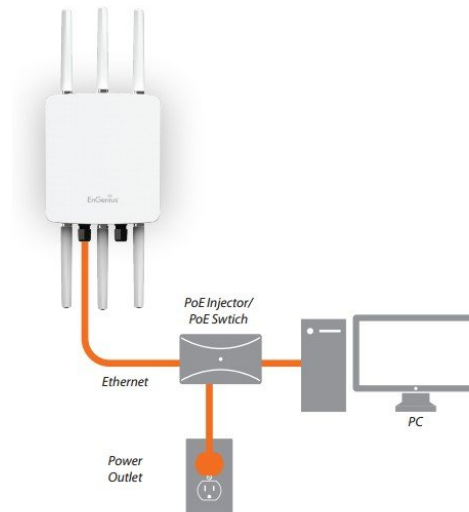
The EWS860AP can operate as a stand-alone AP connecting to third-party PoE capable switches, but more control and versatile management of the AP can be achieved when it is connected to an EnGenius Neutron Series WMS Switch. The following section will guide you in connecting your EWS Switch as well as a brief overview of the management options available for your network:

A) Connect the supplied **Power Cord** to the EWS Switch and plug the other end into an electrical outlet. Verify the Power LED indicator is lit on the EWS Switch. Wait for the EWS Switch to complete boot up. It might take few minutes to complete the process.



B) Connect one end of a Category 5/6 Ethernet cable into the Gigabit (10/100/1000) Ethernet port on the Switch's front panel and the other end to the Ethernet Port on the computer. Verify that the LED on the Ethernet port of the Switch is green.

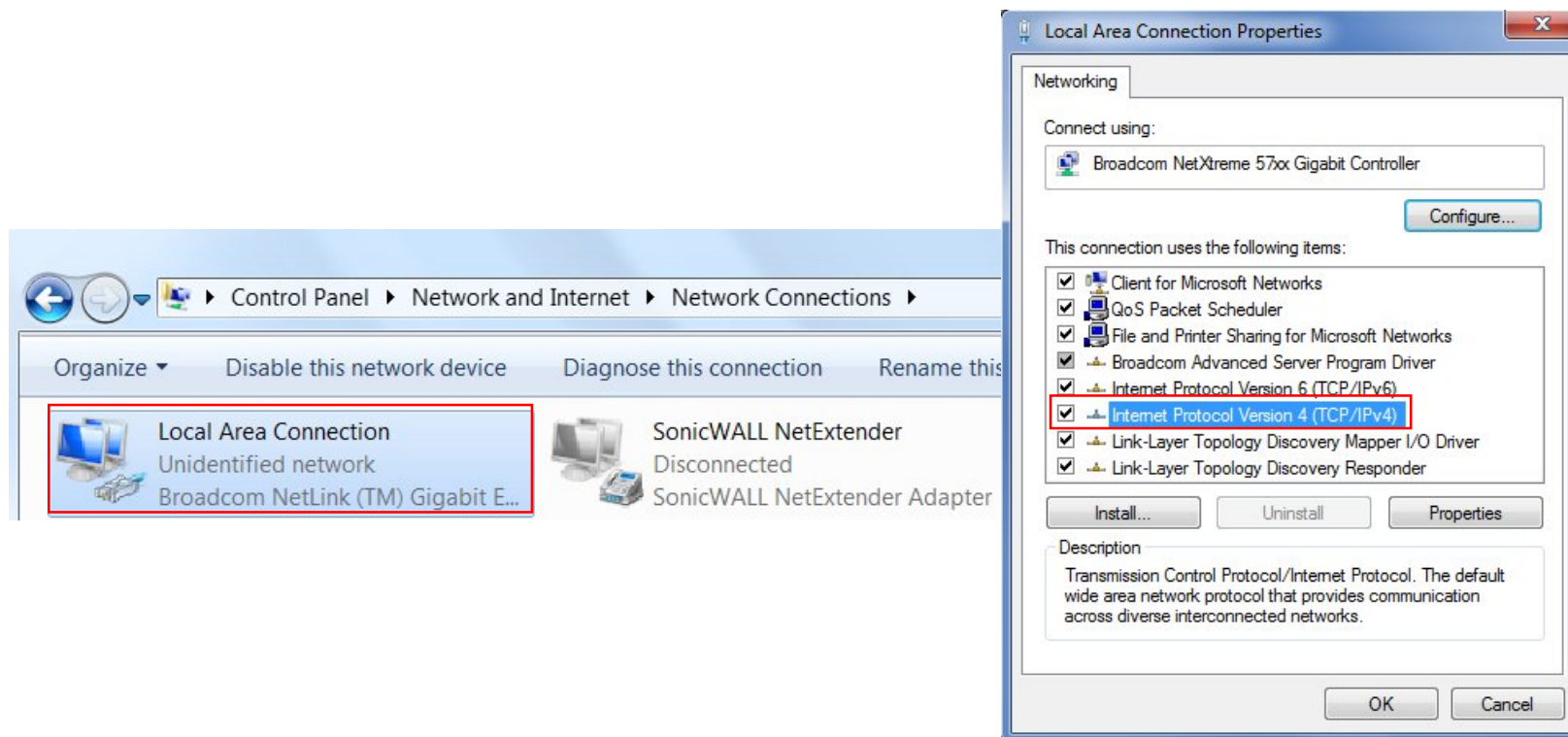
C) Connect the EWS860AP to the EWS Switch. Verify that the LED on the Ethernet port(s) of the EWS Switch is **green**.



IP Address Configuration

Windows XP, 7, 8

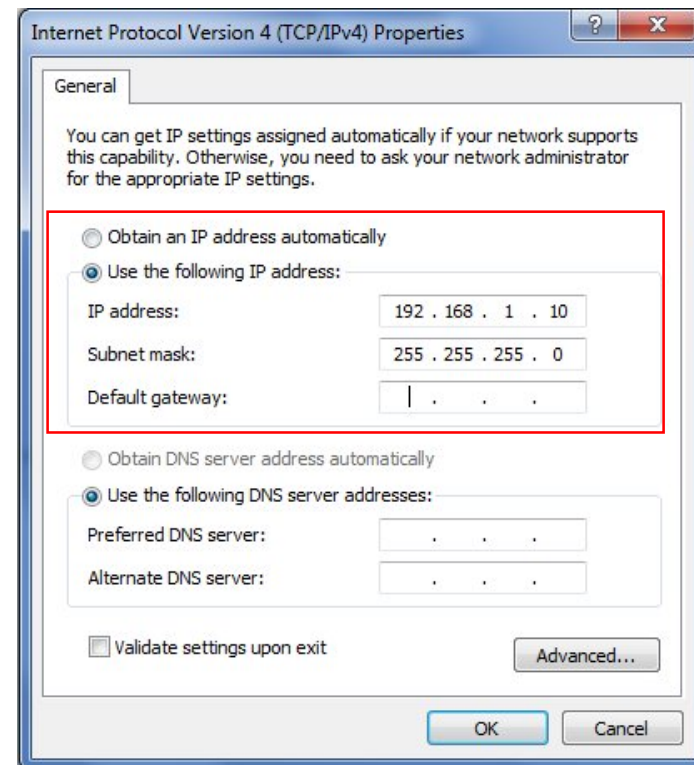
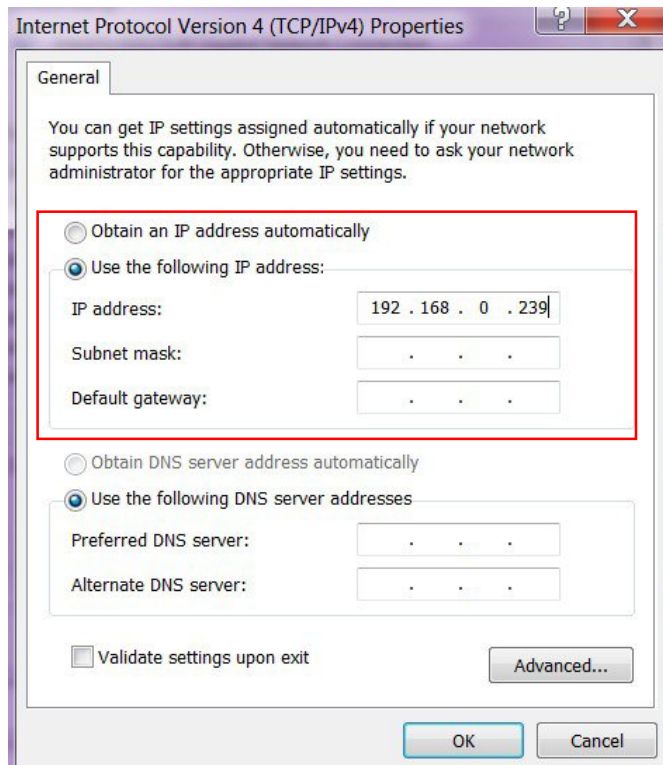
A) Once your computer is on, ensure that your TCP/IP is set to **On** or **Enabled**. Open **Network Connections** and then click **Local Area Connection**. Select **Internet Protocol Version 4 (TCP/IPv4)**.



B) If your computer is already on a network, ensure that you have set it to a Static IP Address on the interface. Please fill in the IP address, Subnet Mask, and Default Gateway you would like to use based on how you utilizing the Access Point. The Access Point can be setup to be managed in groups via an EWS Switch or in Standalone mode:

Managed: 192.168.0.239

Standalone: 192.168.1.XX



Apple Mac OS X

A) Go to System Preferences (it can be opened in the Applications folder or by electing it in the Apple Menu).

B) Select Network in the Internet & Network section.



C) Highlight **Ethernet**.

D) In Configure IPv4, select **Manually**.

E) Enter an IP address that is different from the AP and Subnet mask, then click OK.

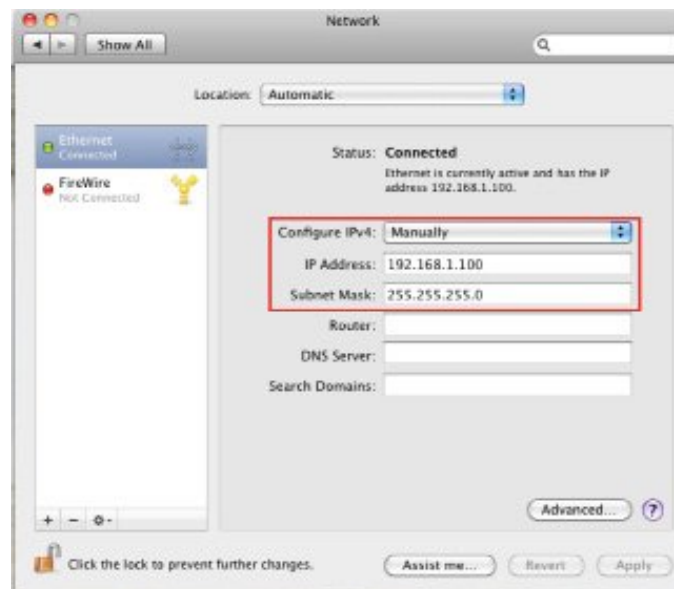
Note: Ensure that the IP address and Subnet mask are on the same subnet as the device. For example:

EWS860AP IP address: 192.168.1.1

PC IP address: 192.168.1.2 – 192.168.1.255

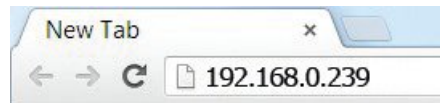
PC Subnet mask: 255.255.255.0

F) Click **Apply** when finished.

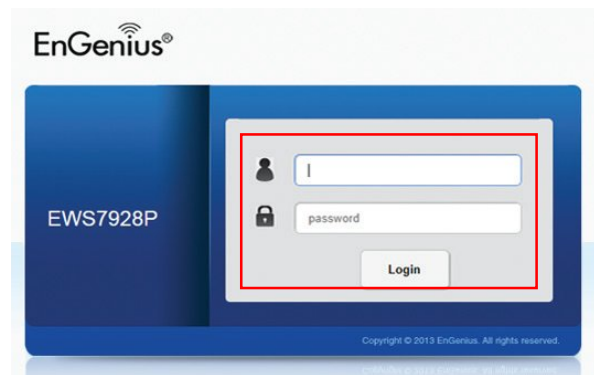


Wireless Management Switch Setup

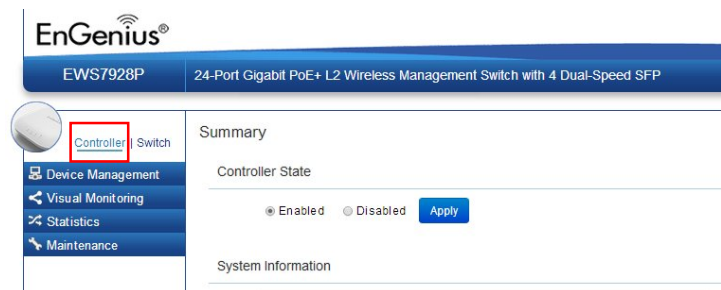
A) Open a web browser on your computer. In the address bar of the web browser, enter **192.168.0.239** and press Enter.



B) A login screen will appear. By default, username is **admin** and the password is **password**. Enter the current username and password of the Wireless Management Switch and then click **Login**.



C) The EnGenius Wireless Management Switch User Interface will appear. Make sure the Controller State is set to **Enabled**. You will now be able to add EWS APs to the Switch to configure and manage from one central location.



AP Setup

Computer Settings

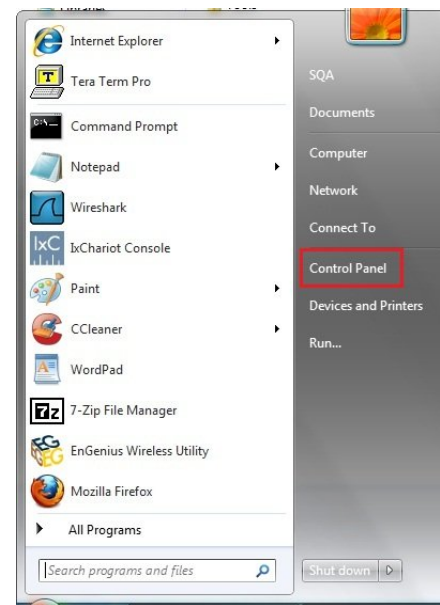
Windows XP/Windows 7

In order to use the Access Point, you must first configure the TCP/IPv4 connection of your Windows OS computer system.

1. Click the **Start** button and open the **Control Panel**.



Windows XP



Windows 7

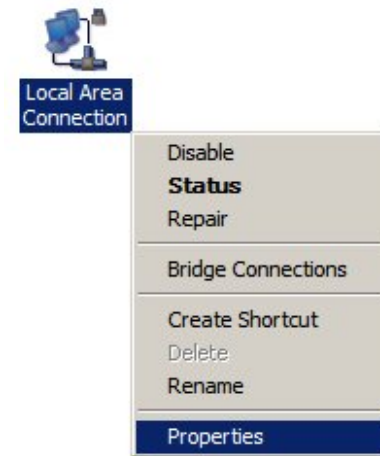
- 2a. In **Windows XP**, click on Network Connections.



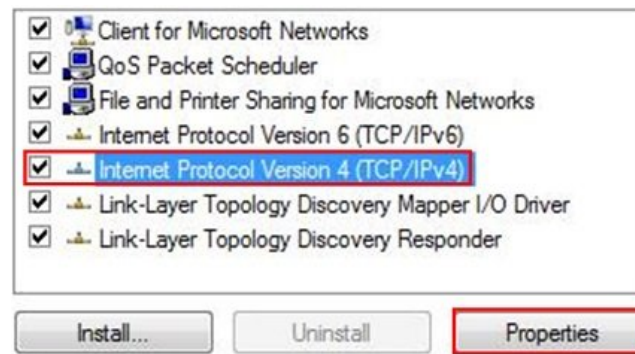
2b. In **Windows 7**, click **View network status and tasks** in the **Network and Internet** section, then select **Change adapter settings**.



3. Right click on **Local Area Connection** and select **Properties**.



4. Select **Internet Protocol Version 4 (TCP/IPv4)**



and then select **Properties**.

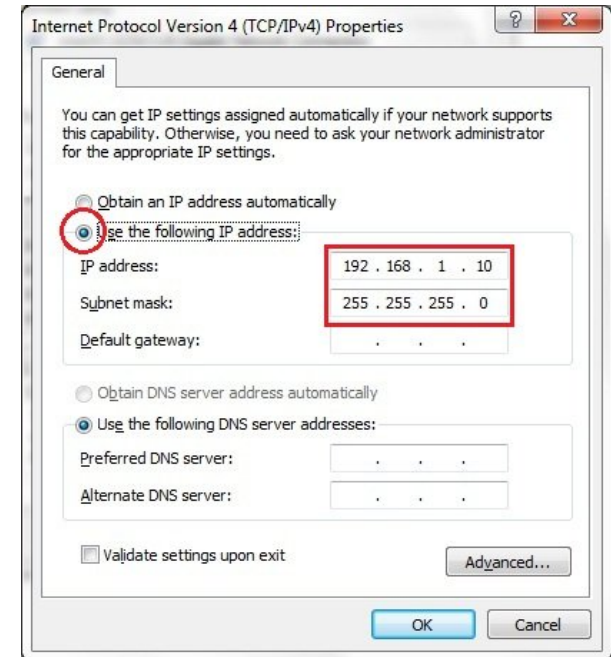
5. Select **Use the following IP address** and enter an IP address that is different from the Access Point and Subnet mask, then click **OK**.

Note: Ensure that the IP address and Subnet mask are on the same subnet as the device.

For example: Access Point IP address: 192.168.1.1

PC IP address: 192.168.1.2 – 192.168.1.255

PC Subnet mask: 255.255.255.0



Apple Mac OS X

1. Go to **System Preferences** (it can be opened in the **Applications** folder or by selecting it in the Apple Menu).
2. Select **Network** in the **Internet & Network** section.

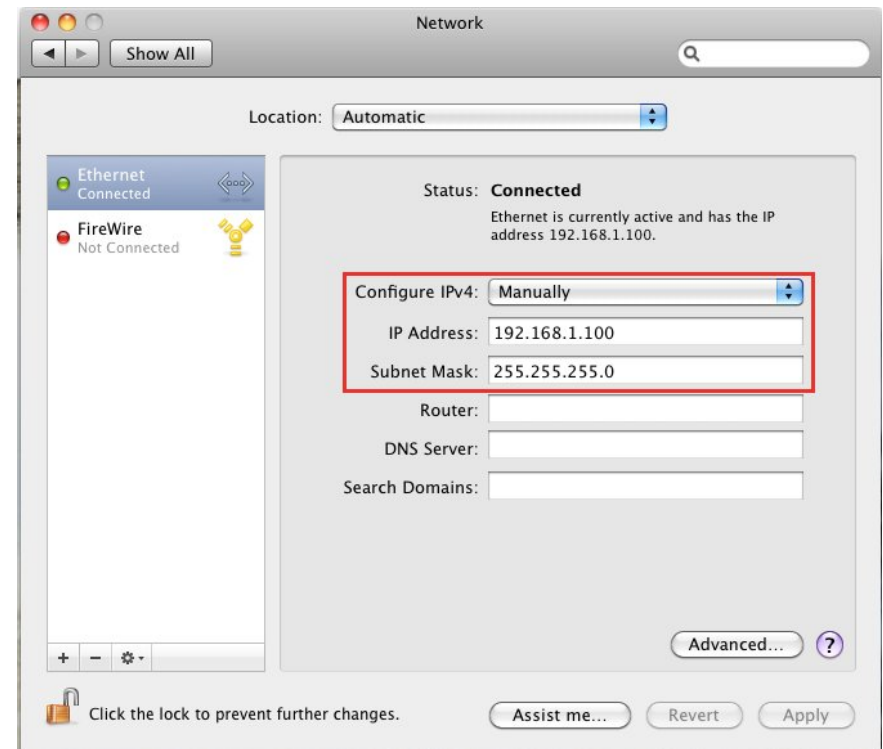


3. Highlight **Ethernet**.
4. In **Configure IPv4**, select **Manually**.
5. Enter an IP address that is different from the Access Point and Subnet mask, then click **OK**.

Note: Ensure that the IP address and Subnet mask are on the same subnet as the device.

For example: Access Point IP address: 192.168.1.1
 PC IP address: 192.168.1.2 – 192.168.1.255
 PC Subnet mask: 255.255.255.0

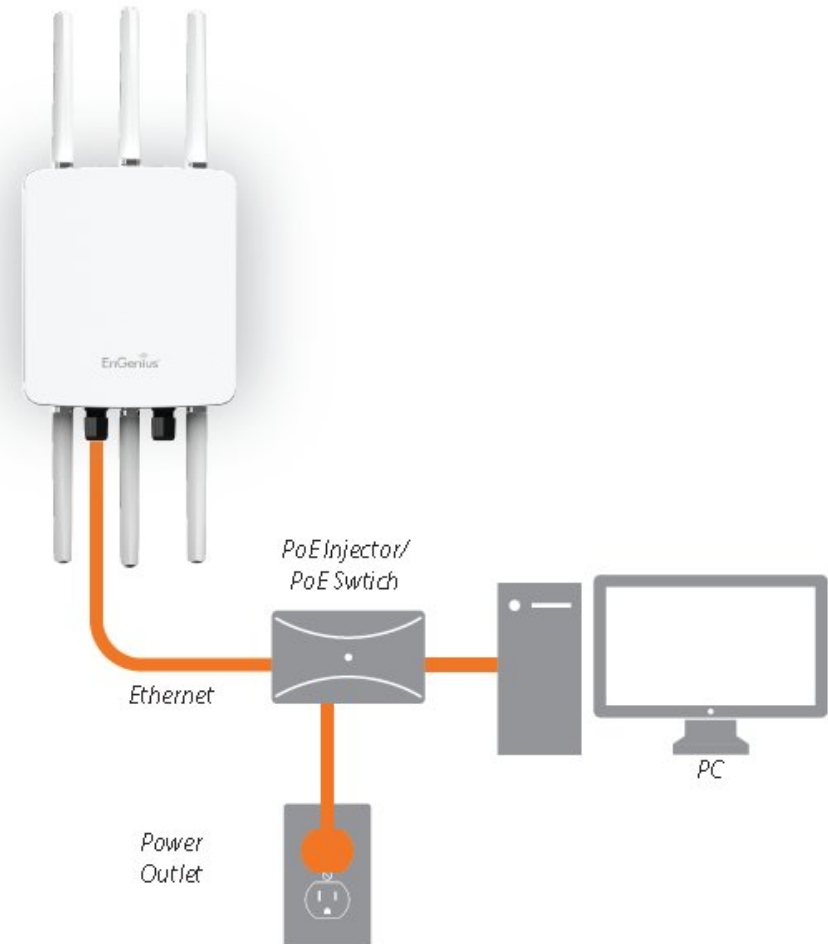
6. Click **Apply** when finished.



Hardware Installation

1. Connect one end of the Ethernet cable into the main LAN port (PoE) of the Access Point and the other end to the AP Ethernet port on the PoE injector.
2. Connect the **Power Adapter** to the **DC-IN** port of the PoE injector and plug the other end in to an electrical outlet.
3. Connect the second Ethernet cable into the **LAN port** of the PoE injector and the other end to the Ethernet port on the computer.
4. Screw on the provided antennas to the device. Once both connections are secure, verify the following:
 - a) Ensure that the **POWER** light is on (it will be green).
 - b) Ensure that the 2.4 GHz/5 GHz WLAN light is on (it will be green for both 5 GHz and 2.4 GHz).
 - c) Ensure that the LAN (Computer/AP Connection) light is on (it will be green).
 - d) Once all three lights are on, proceed to set up the Access Point using the computer.

Note: The Access Point supports both IEEE 802.3at PoE (Power over Ethernet) or the included power injector. You may use either one as the power source. **Do NOT use both at the same time.**

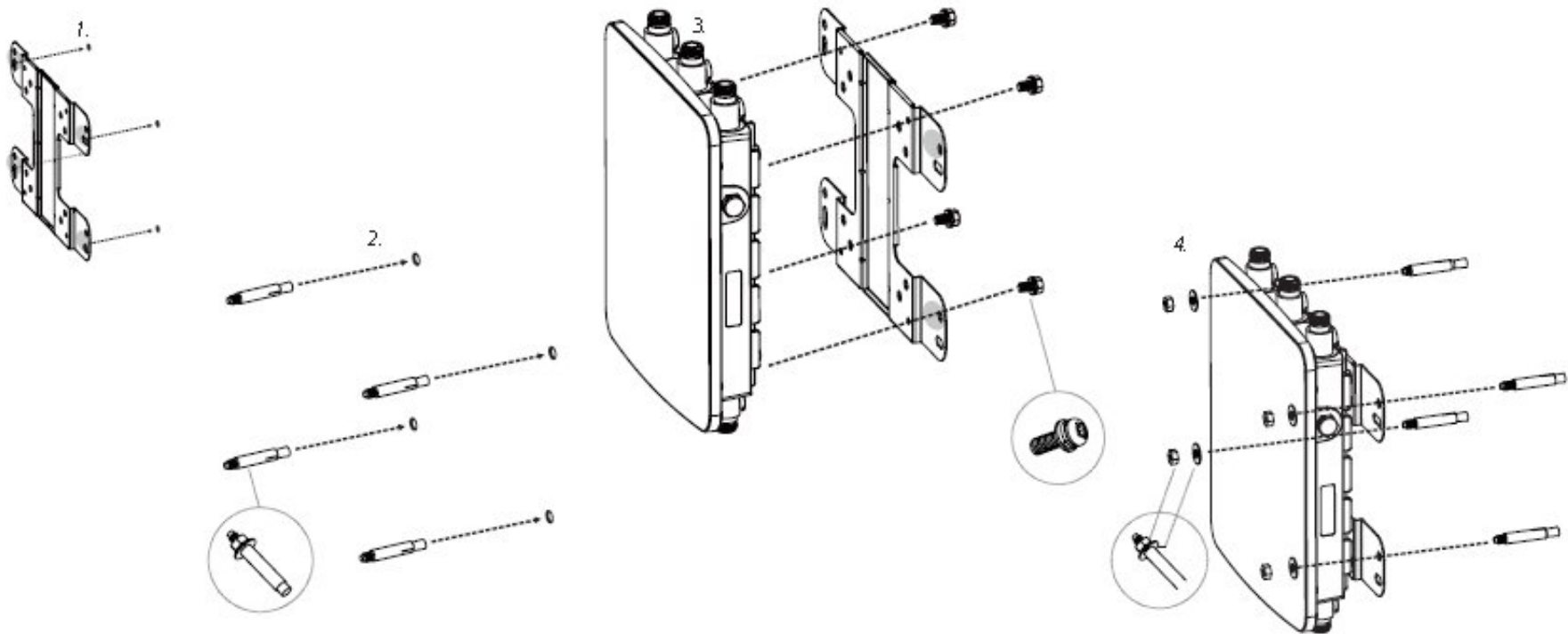


Mounting the Access Point

Using the provided hardware, the Access Point can be attached to a ceiling or wall.

To attach the Access Point to a wall using the wall mounting kit:

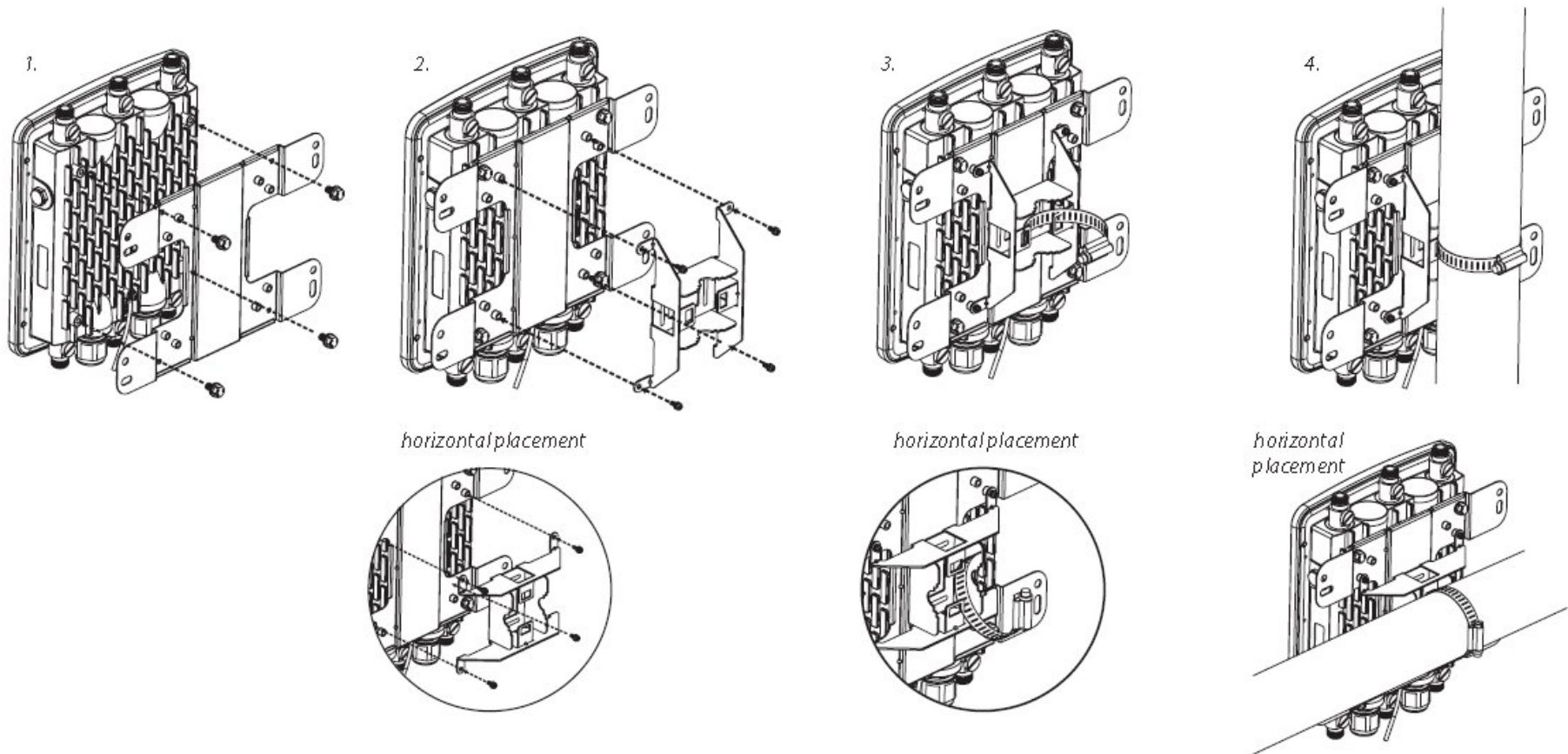
1. Mark the four locations of the mounting holes on the flat mounting surface.
2. Drill a 1.46" (37mm) deep .31" (8 mm) hole in the markings and hammer the bolts into the openings.
3. Place the lock and flat washers on the four hex cap screws and drive the screws to attach the bracket to the back of the Access Point.
4. Tighten the flat washers to secure the bracket to the mounting surface.



To attach the Access Point to a pole using the provided pole mounting kit:

1. Place the lock and flat washers on the four hex cap screws and drive the screws to attach the bracket to the back of the Access Point.
2. Drive the four round head screws to attach the Pole Mount Bracket to the bracket.
3. Thread the open end of the Pole Strap through the two tabs on the Pole Mount Bracket.
4. Lock and tighten the Pole Strap to secure the Pole Mount Bracket to the pole.

Note: See diagram below for vertical and horizontal placements.



Chapter 3

Configuring Your Access Point

Configuring Your Access Point

This section will show you how to configure the device using the web-based configuration interface.

Default Settings

Please use your Ethernet port or wireless network adapter to connect the Access Point.

IP Address	192.168.1.1
Username/Password	admin/admin

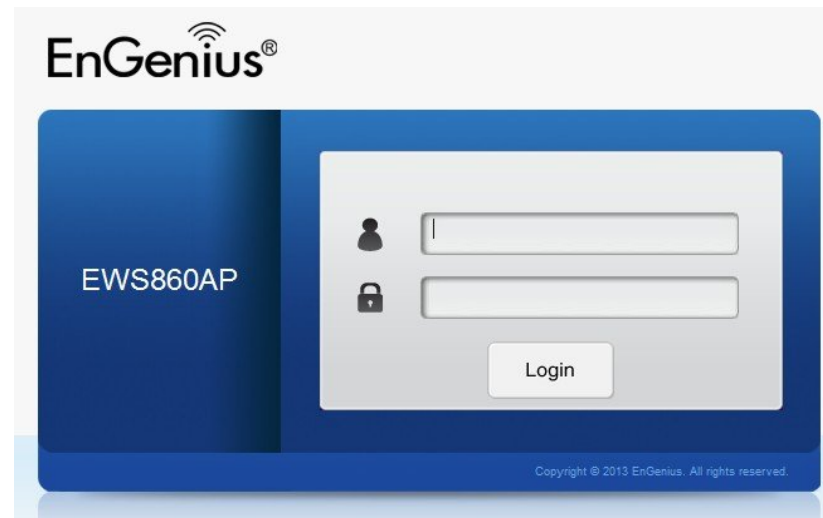
Web Configuration

1. Open a web browser (Internet Explorer/Firefox/Safari) and enter the IP Address <http://192.168.1.1>.



Note: If you have changed the default LAN IP Address of the Access Point, ensure you enter the correct IP Address.

2. The default username and password are: **admin**. Once you have entered the correct username and password, click the **Login** button to open the web-based configuration page.



3. If successful, you will be logged in and see the Access Point User Interface.

Overview

Device Status

Connections

Network

Basic

Wireless

Management

Advanced

Time Zone

WiFi Scheduler

Tools

System Manager

Account

Firmware

Log

Device Information

Device Name EWS860AP

MAC Address

- LAN 00:02:6F:04:04:01

- Wireless LAN - 2.4GHz 00:02:6F:04:04:03

- Wireless LAN - 5GHz 00:02:6F:04:04:04

Country Default

Current Local Time Thu Jun 26 04:45:26 UTC 2014

Firmware Version 2.0.0 + 1.0.6

Management VLAN ID Untagged

LAN Information - IPv4

IP Address 192.168.1.1

Subnet Mask 255.255.255.0

Gateway 192.168.1.1

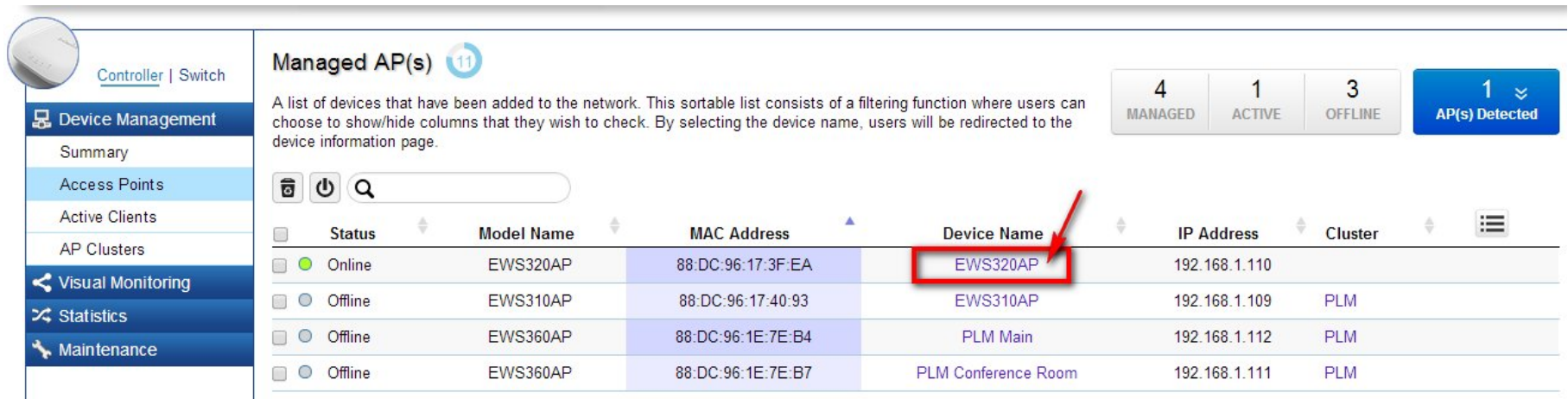
Primary DNS 0.0.0.0

Secondary DNS 0.0.0.0

Device Management

Locating Wireless Managed AP(s)

- Go to **Device Management** on your Switch UI and select Access Points. All Managed AP(s) connected to the same network as the Wireless Management Switch will appear on the right side of the screen, under the Access Point AP(s) Detected list.
- To manage the Access Points, select the desired Managed AP(s) by checking the boxes and click **Add**.
- You will be prompted to enter an IP Address range for the Managed AP(s).



Managed AP(s) 11

A list of devices that have been added to the network. This sortable list consists of a filtering function where users can choose to show/hide columns that they wish to check. By selecting the device name, users will be redirected to the device information page.

4 MANAGED 1 ACTIVE 3 OFFLINE 1 AP(s) Detected

	Status	Model Name	MAC Address	Device Name	IP Address	Cluster
<input checked="" type="checkbox"/>	Online	EWS320AP	88:DC:96:17:3F:EA	EWS320AP	192.168.1.110	
<input type="checkbox"/>	Offline	EWS310AP	88:DC:96:17:40:93	EWS310AP	192.168.1.109	PLM
<input type="checkbox"/>	Offline	EWS360AP	88:DC:96:1E:7E:B4	PLM Main	192.168.1.112	PLM
<input type="checkbox"/>	Offline	EWS360AP	88:DC:96:1E:7E:B7	PLM Conference Room	192.168.1.111	PLM

General Settings

A) Enter the Device Name for the Access Point so that you can differentiate between devices if you plan to use more than one AP.

B) Enter the Administrator account username and password to create an account that can access all features of the AP. next, enter the password again for verification.

C) Select DHCP or Static to determine how IP addresses will be assigned for the AP:

- Select DHCP for an IP Address to be assigned automatically if there is a DHCP server in the network.
- Select Static to enter the IP Address, Subnet Mask, Gateway, and DNS Server manually.

Please refer to the General Settings section on your Switch's User Manual for more information. Click **Apply** to continue.

The screenshot shows a web interface for configuring an access point. The 'General Settings' section is active, showing fields for Device Name, Administrator Username, New Password, and Verify Password. Below these are radio buttons for 'Auto Configuration' (DHCP selected) and 'Static'. If Static is selected, there would be fields for IP Address, Subnet Mask, Default Gateway, Primary DNS Server, and Secondary DNS Server. The bottom of the page has expandable sections for 'Wireless Radio Settings', 'WLAN Settings - 2.4GHz', 'WLAN Settings - 5GHz', and 'Advanced Settings'.

General Settings	
Device Name:	EWS320AP (1~32 characters)
Administrator Username:	admin (1~12 characters)
New Password:	Leave blank if unchanged (1~12 characters)
Verify Password:	Leave blank if unchanged
Auto Configuration	<input checked="" type="radio"/> DHCP <input type="radio"/> Static
IP Address:	192.168.1.110
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.1.254
Primary DNS Server:	192.168.1.254
Secondary DNS Server:	0.0.0.0
Wireless Radio Settings	
WLAN Settings - 2.4GHz	
WLAN Settings - 5GHz	
Advanced Settings	

Wireless Radio Settings

After configuring the General Settings page, you will need to configure the **Wireless Radio Settings**. Enter information pertaining to each frequency band that applies to your AP. Once finished, click **Apply** to continue.

General Settings

Wireless Radio Settings

Country: USA

2.4GHz

5GHz

Wireless Mode: 802.11 b/g/n Mixed

802.11 n only

Channel HT Mode: 20MHz

40MHz

Extension Channel: Upper Channel

Upper Channel

Channel: Auto

Ch44 - 5.220GHz

Transmit Power: 16dBm

20dBm

Client Limits: 127 (1~127, 0 means no limit)

127 (1~127, 0 means no limit)

Data Rate: Auto

Auto

RTS/CTS Threshold: 2346 (1~2346)

2346 (1~2346)

Aggregation: ☒ Enable ☐ Disable

☒ Enable ☐ Disable

32 Frames (1~32)

32 Frames (1~32)

50000 Bytes(Max) (2304~65535)

50000 Bytes(Max) (2304~65535)

WLAN Settings - 2.4GHz

WLAN Settings - 5GHz

Advanced Settings

WLAN Settings 2.4/5 GHz

Next, you will need to configure the WLAN settings for each band. Click on an SSID to access Basic, Traffic, Fast Roaming, and Security settings. Once finished, click **Save** to apply the settings to the SSID. Once you have applied your configurations for each SSID, click **Apply** to continue.

▷ General Settings								
▷ Wireless Radio Settings								
◀ WLAN Settings - 2.4GHz								
ID	Status	SSID	Security	Encryption	Hidden SSID	Client Isolation	VLAN Isolation	VLAN ID
1	Enable	EnGenius	WPA2-PSK	AES	No	No	No	1
2	Disabled	SSID_2-2.4GHz	None	None	No	No	No	2
3	Disabled	SSID_3-2.4GHz	None	None	No	No	No	3
4	Disabled	SSID_4-2.4GHz	None	None	No	No	No	4
5	Disabled	SSID_5-2.4GHz	None	None	No	No	No	5
6	Disabled	SSID_6-2.4GHz	None	None	No	No	No	6
7	Disabled	SSID_7-2.4GHz	None	None	No	No	No	7
8	Disabled	SSID_8-2.4GHz	None	None	No	No	No	8
▷ WLAN Settings - 5GHz								
▷ Advanced Settings								

Advanced Settings

Next, you will need to configure the **Advanced Settings** for the Access Point. Once finished, click **Apply** to continue.

Advanced Settings

Band Steering

Band Steering: ☐ Enable ☒ Disable

(NOTE: In order for Band Steering function to work properly, both 2.4GHz and 5GHz SSID and Security Settings must be the same.)

Fast Handover

Status: ☐ Enable ☒ Disable

RSSI: dBm (Range: -90dBm ~ -60dBm)

(NOTE: Setting the RSSI value too low may cause wireless clients to reconnect frequently)

Guest Network

Band	Status	SSID	Security	Encryption	Hidden SSID	Client Isolation
2.4GHz	Disabled	EnGenius-2.4GHz_GuestNetwork	None	None	No	No
5GHz	Disabled	EnGenius-5GHz_GuestNetwork	None	None	No	No

Manual IP Settings

IP Address:

Subnet Mask:

Automatic DHCP Server Settings

Starting IP Address:

Ending IP Address:

WINS Server IP:

Apply Cancel

Band Steering: The Band Steering feature detects Dual Band clients and shifts them to the 5 GHz band to relieve network congestion on the 2.4 GHz band to maintain optimal data traffic flow, helping clients on both bands.

Fast Handover: With Fast Handover enabled, the EWS860AP will send a disassociation request to the wireless client and let it find another AP to handover and associate upon detecting the wireless client's RSSI value as lower than specified. The range is from -90dBm ~ -60dBm.

Guest Network: A Guest Network is a section of a computer network designed for use by temporary visitors. This subnetwork often provides full Internet connectivity, but also strictly limits access to any internal web sites or files.

Wireless Security: The Wireless Security section lets you configure the EWS860AP's security modes: WEP, WPA-PSK, WPA2-PSK, WPA-PSK Mixed, WPA-Enterprise, WPA2-Enterprise and WPA Mixed Enterprise. It is **strongly** recommended that you use **WPA2-PSK** for the most secure connection.

Managing A Wireless Management Switch

For further Switch configurations, click on **Switch** at the top left of the dash board. Refer to your Switch's User Manual for more information on these configuration settings.



Summary

Controller State

☒ Enabled ☐ Disabled [Apply](#)

System Information

Controller Version:	1.0.6
Max. Managed APs:	50
IP Address:	192.168.1.246
Base MAC Address:	88:DC:96:16:A8:26
Serial Number:	141307774
System Uptime:	10 days, 23 hours, 40 mins

Chapter 4

Overview

Overview

The **Overview** section contains the following options:

- Device Status
- Connections

The following sections describe these options:

Device Status

Clicking the **Device Status** section under the **Overview** menu shows the status information about the current operating mode.

- The **Device Information** section shows general system information such as Device Name, MAC address, Current Time, Firmware Version, and Management VLAN ID

Device Information	
Device Name	EWS860AP
MAC Address	
- LAN	00:02:6F:04:04:01
- Wireless LAN - 2.4GHz	00:02:6F:04:04:03
- Wireless LAN - 5GHz	00:02:6F:04:04:04
Country	Default
Current Local Time	Thu Jun 26 04:45:26 UTC 2014
Firmware Version	2.0.0 + 1.0.6
Management VLAN ID	Untagged

- The **LAN Information** section shows the Local Area Network settings such as the LAN IP Address, Subnet mask, Gateway, DNS Address, DHCP Client, and STP status.

LAN Information - IPv4

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Gateway	192.168.1.1
Primary DNS	0.0.0.0
Secondary DNS	0.0.0.0
DHCP Client	Disable
Spanning Tree Protocol (STP)	Disable

LAN Information - IPv6

IP Address	N/A
Link-Local Address	fe80::202:6fff:fe04:401
Gateway	N/A
Primary DNS	N/A
Secondary DNS	N/A

- The **Wireless LAN Information 2.4 GHz/5 GHz** section shows wireless information such as Operating Mode, Frequency, and Channel. Since the Access Point supports multiple-SSIDs, information about each SSID and security settings are displayed.

Wireless LAN Information - 2.4GHz

Operation Mode		Access Point			
Wireless Mode		802.11 B/G/N			
Channel Bandwidth		20-40 MHz			
Channel		2.412 GHz (Channel 1)			
Distance		1000 M			
Profile	SSID	Security	VID	802.1Q	
#1	EnGenius040403_1-2.4GHz	None	1	Disable	
#2	EnGenius040403_2-2.4GHz	None	2	Disable	
#3	EnGenius040403_3-2.4GHz	None	3	Disable	
#4	EnGenius040403_4-2.4GHz	None	4	Disable	
#5	EnGenius040403_5-2.4GHz	None	5	Disable	
#6	EnGenius040403_6-2.4GHz	None	6	Disable	
#7	EnGenius040403_7-2.4GHz	None	7	Disable	
#8	EnGenius040403_8-2.4GHz	None	8	Disable	

Wireless LAN Information - 5GHz

Operation Mode		Access Point			
Wireless Mode		802.11 AC/N			
Channel Bandwidth		80 MHz			
Channel		5.54 GHz (Channel 108)			
Distance		1000 M			
Profile	SSID	Security	VID	802.1Q	
#1	EnGenius040404_1-5GHz	None	51	Disable	
#2	EnGenius040404_2-5GHz	None	52	Disable	
#3	EnGenius040404_3-5GHz	None	53	Disable	
#4	EnGenius040404_4-5GHz	None	54	Disable	
#5	EnGenius040404_5-5GHz	None	55	Disable	
#6	EnGenius040404_6-5GHz	None	56	Disable	
#7	EnGenius040404_7-5GHz	None	57	Disable	
#8	EnGenius040404_8-5GHz	None	58	Disable	

Connections

Clicking the **Connections** section under the **Device Status** menu displays the list of clients associated to the Access Point's 2.4 GHz/5 GHz bands, along with the MAC address, TX, RX and signal strength for each client. Clicking **Kick** in the Block column removes this client.

Connection List - 2.4GHz					
SSID	MAC Address	TX	RX	RSSI	Block
Connection List - 5GHz					
SSID	MAC Address	TX	RX	RSSI	Block
EnGenius05B06A_1-5GHz	00:02:6F:93:47:5C	162Kb	30Kb	-42dBm	Kick

Refresh

Click **Refresh** to refresh the Connection List page.

Chapter 5

Network

Basic

This page allows you to modify the device's IP settings and the Spanning Tree settings. Enabling Spanning Tree Protocol (STP) will prevent network loops in your LAN network.

IPv4 Settings

IPv4 Settings	
IP Network Setting	<input type="radio"/> DHCP <input checked="" type="radio"/> Static IP
IP Address	<input type="text" value="192.168.1.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.1"/>
Primary DNS	<input type="text" value="0.0.0.0"/>
Secondary DNS	<input type="text" value="0.0.0.0"/>

IP Network Settings: Select whether the device IP address will use the static IP address specified in the IP Address field or be obtained automatically when the device connects to a DHCP server.

IP Address: The IP Address of this device.

IP Subnet Mask: The IP Subnet mask of this device.

Gateway: The Default Gateway of this device. Leave it blank if you are unsure of this setting.

Primary/Secondary DNS: The primary/secondary DNS address for this device.

IPv6 Settings

IPv6 Settings	<input checked="" type="checkbox"/> Link-local Address
IP Address	
Subnet Prefix Length	
Gateway	
Primary DNS	
Secondary DNS	

Link-Local Address: Check this if you want to use a Link-Local Address.

IP Address: The IPv6 IP Address of this device.

Subnet Prefix Length: The IPv6 Subnet Prefix Length of this device.

Gateway: The IPv6 Default Gateway of this device. Leave it blank if you are unsure of this setting.

Primary / Secondary DNS: The primary / secondary DNS address for this device.

Spanning Tree Settings

Spanning Tree Protocol (STP) Settings		
Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	
Hello Time	<input type="text" value="2"/>	seconds (1-10)
Max Age	<input type="text" value="20"/>	seconds (6-40)
Forward Delay	<input type="text" value="4"/>	seconds (4-30)
Priority	<input type="text" value="32768"/>	(0-65535)

Save current setting(s)

Status: Enables or disables the Spanning Tree feature.

Hello Time: Specifies Bridge Hello Time, in seconds. This value determines how often the device sends handshake packets to communicate information about the topology throughout the entire Bridged Local Area Network.

Max Age: Specifies Bridge Max Age, in seconds. If another bridge in the spanning tree does not send a hello packet for an extended period of time, it is assumed to be inactive.

Forward Delay: Specifies Bridge Forward Delay, in seconds. Forwarding Delay Time is the time spent in each of the Listening and Learning states before the Forwarding state is entered. This delay is provided so that when a new bridge comes onto a busy network, it analyzes data traffic before participating.

Priority: Specifies the Priority Number. A smaller number has a greater priority.

Save: Click **Save** to confirm the changes.


Chapter 6

2.4 GHz & 5 GHz Wireless

Wireless Network

This page displays the current status of the Wireless settings of the Access Point.

Wireless Settings

Wireless Settings	
Device Name	<input type="text" value="EWS860AP"/>
Country / Region	<input type="text" value="Please Select a Country Code"/> 
Band Steering	<input type="radio"/> Enable <input checked="" type="radio"/> Disable NOTE: In order for Band Steering function to work properly, both 2.4GHz and 5GHz SSID and Security Settings must be the same.

Device Name: Enter a name for the device. The name you type appears in SNMP management. This name is not the SSID and is not broadcasted to other devices.

Country/Region: Select a Country/Region to conform to local regulations.

Band Steering: Enable Band Steering to shift Dual Band-capable clients to 5 GHz from the 2.4 GHz band, helping to relieve network congestion and maintain optimal data traffic speeds. This means that sensitive applications such as IP camera streams, VoIP (Voice over IP), HD video streaming and large file transfers perform with improved quality and reliability.

*In order for the Band Steering feature to work properly, both the 2.4 GHz and the 5 GHz SSID and security settings must be under the same selection settings.

	2.4GHz	5GHz
Operation Mode	Access Point <input type="checkbox"/> Green	Access Point <input type="checkbox"/> Green
Wireless Mode	802.11 B/G/N <input type="checkbox"/>	802.11 AC/N <input type="checkbox"/>
Channel HT Mode	20/40 MHz <input type="checkbox"/>	80 MHz(AC Only) <input type="checkbox"/>
Extension Channel	Upper Channel <input type="checkbox"/>	Lower Channel <input type="checkbox"/>
Channel	Auto <input type="checkbox"/>	Auto <input type="checkbox"/>
Transmit Power	Auto <input type="checkbox"/>	Auto <input type="checkbox"/>
Data Rate	Auto <input type="checkbox"/>	Auto <input type="checkbox"/>
RTS / CTS Threshold (1 - 2346)	2346	2346
Client Limits	127 <input checked="" type="radio"/> Enable <input type="radio"/> Disable	127 <input checked="" type="radio"/> Enable <input type="radio"/> Disable
Aggregation	32 Frames 50000 Bytes(Max)	
AP Detection	Scan	Scan
Distance (1-30km)	1	1

Wireless Mode: Supports 802.11b/g/n mixed mode in 2.4 GHz and 802.11a/n mixed mode in 5 GHz.

Channel HT Mode: The default channel bandwidth is 20/40MHz. Note that the larger the channel bandwidth, the better the transmission quality and speed.

Extension Channel: Use the drop-down list to set the Extension Channel as an **Upper** or **Lower** channel. An extension channel is a secondary channel used to bond with the primary channel to increase this range to 40MHz, allowing for much greater bandwidth. This option is only available when Wireless Mode is 802.11n and Channel HT Mode is 20/40 MHz or 40MHz.

Channel: Select the channel appropriate for your country's regulation.

Transmit Power: Select the transmit power for the radio. Increasing the power improves performance, but if two or more Access Points are operating in the same area on the same channel, it may cause interference.

Data Rate: Use the drop-down list to set the available transmit data rates permitted for wireless clients. The data rate affects the throughput of the Access Point. The lower the data rate, the lower the throughput, but the longer transmission distance. Please select the balance that works best for your deployment.

RTS/CTS Threshold: Specifies the threshold package size for RTC/CTS. A smaller number causes RTS/CTS packets to be sent more often and consumes more bandwidth.

Client Limits: Limits the total number of clients.

Aggregation: Merges data packets into one packet. This option reduces the number of packets, but also increases packet sizes.

AP Detection: AP Detection can select the best channel to use by scanning nearby areas for Access Points.

Distance: Specifies the distance between the Access Point and its clients. Note that longer distances may drop higher speed connections.

2.4 GHz/5 GHz SSID Profile

Under **Wireless Settings**, you can edit the SSID profile to fit your deployment needs. Click **Edit** under the SSID you would like to make changes to.

Wireless Settings - 2.4GHz

No.	Enable	SSID	Edit	Security	Hidden SSID	Client Isolation	VLAN Isolation	VLAN ID
1	<input checked="" type="checkbox"/>	EnGenius05B069_1-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
2	<input type="checkbox"/>	EnGenius05B069_2-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
3	<input type="checkbox"/>	EnGenius05B069_3-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3
4	<input type="checkbox"/>	EnGenius05B069_4-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
5	<input type="checkbox"/>	EnGenius05B069_5-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
6	<input type="checkbox"/>	EnGenius05B069_6-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
7	<input type="checkbox"/>	EnGenius05B069_7-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7
8	<input type="checkbox"/>	EnGenius05B069_8-2.4GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8

Wireless Settings - 5GHz

No.	Enable	SSID	Edit	Security	Hidden SSID	Client Isolation	VLAN Isolation	VLAN ID
1	<input checked="" type="checkbox"/>	EnGenius05B06A_1-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	51
2	<input type="checkbox"/>	EnGenius05B06A_2-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	52
3	<input type="checkbox"/>	EnGenius05B06A_3-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	53
4	<input type="checkbox"/>	EnGenius05B06A_4-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	54
5	<input type="checkbox"/>	EnGenius05B06A_5-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	55
6	<input type="checkbox"/>	EnGenius05B06A_6-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	56
7	<input type="checkbox"/>	EnGenius05B06A_7-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	57
8	<input type="checkbox"/>	EnGenius05B06A_8-5GHz	Edit	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	58

Enable: Check this option to enable this profile for client use.

SSID: Specifies the SSID for the current profile.

Security: Displays the Security Mode the SSID uses. You can click **Edit** to change the security mode. For more details, see the next section.

Hidden SSID: Check this option to hide the SSID from clients. If checked, the SSID will not appear in the site survey.

Client Isolation: Check this option to prevent communication between client devices.

VLAN Isolation: Check this option to enable the VLAN Isolation feature.

VLAN ID: Specifies the VLAN ID for the SSID profile.

Wireless Security

The Wireless Security section lets you configure the Access Point's security modes: WEP, WPA-PSK, WPA2-PSK, WPA-PSK Mixed, WPA-Enterprise, WPA2-Enterprise and WPA Mixed Enterprise.

It is strongly recommended that you use **WPA2-PSK**. Click on the **Edit** button under **Wireless Settings** next to the SSID to change the security settings.

WEP

Security Mode	WEP
Auth Type	Open System
Input Type	Hex
Key Length	40/64-bit (10 hex digits or 5 ASCII char)
Default Key	1
Key1	
Key2	
Key3	
Key4	

Auth Type: Select Open System or Shared Key.

Input Type: ASCII: Regular Text (Recommended) or HEX: Hexadecimal Numbers (For advanced users).

Key Length: Select the desired option and ensure the wireless clients use the same setting. Your choices are: 64, 128, and 152-bit password lengths.

Default Key: Select the key you wish to be default. Transmitted data is **ALWAYS** encrypted using the Default Key; the other Keys are for decryption only. You must enter a Key Value for the Default Key.

Encryption Key: Enter the Key Value or values you wish to use. The default is option is None.

WPA-PSK/WPA2-PSK (Pre-Shared Key)

Security Mode	WPA-PSK Mixed ▼
Encryption	Both(TKIP+AES) ▼
Passphrase	<input type="text"/>
Group Key Update Interval	3600

Encryption: Select the WPA/WPA2 encryption type you would like to use. Available options are: Both, TKIP (Temporal Key Integrity Protocol) and AES (Advanced Encryption Standard). Please ensure that your wireless clients use the same settings.

Passphrase: Wireless clients must use the same Key to associate the device. If using ASCII format, the Key must be from 8~63 characters in length. If using HEX format, the Key must be 64 HEX characters in length.

Group Key Update Interval: Specify how often, in seconds, the Group Key changes.

WPA/WPA2-Enterprise

Security Mode	WPA Mixed-Enterprise ▼
Encryption	Both(TKIP+AES) ▼
Group Key Update Interval	3600
Radius Server	<input type="text"/>
Radius Port	1812
Radius Secret	<input type="text"/>
Radius Accounting	Disable ▼
Radius Accounting Server	<input type="text"/>
Radius Accounting Port	1813
Radius Accounting Secret	<input type="text"/>
Interim Accounting Interval	600

Encryption: Select the WPA/WPA2 encryption type you would like to use. Available options are Both, TKIP (Temporal Key Integrity Protocol) and AES(Advanced Encryption Standard). Please ensure that your wireless clients use the same settings.

Group Key Update Interval: Specify how often, in seconds, the group key changes.

Radius Server: Enter the IP address of the Radius server.

Radius Port: Enter the port number used for connections to the Radius server.

Radius Secret: Enter the secret required to connect to the Radius server.

Radius Accounting: Enables or disables the accounting feature.

Radius Accounting Server: Enter the IP address of the Radius accounting server.

Radius Accounting Port: Enter the port number used for connections to the Radius accounting server.

Radius Accounting Secret: Enter the secret required to connect to the Radius accounting server.

Interim Accounting Interval: Specify how often, in seconds, the accounting data sends.

Note: 802.11n does not allow WEP/WPA-PSK TKIP/WPA2-PSK TKIP security modes. The connection mode will automatically change from 802.11n to 802.11g. Please be aware of this when making your selections.

Wireless MAC Filter

The Wireless MAC Filter feature is used to allow or deny network access to wireless clients (computers, tablet PCs, NAS, smart phones, etc.) according to their MAC addresses. You can manually add a MAC address to restrict permission to the Access Point. The default setting is: Disable Wireless MAC Filter.

Wireless MAC Filter

ACL Mode ▼

: : : : :

No.	MAC Address
-----	-------------

ACL (Access Control List) Mode: Determines whether network access is granted or denied to clients whose MAC addresses appear in the MAC address table on this page. Choices given are: Disabled, Deny MAC in the list, or Allow MAC in the list.

MAC Address: Enter the MAC address of the wireless client.

Add: Click **Add** to add the MAC address to the MAC Address table.

Delete: Deletes the selected entries.

Traffic Shaping

Traffic Shaping regulates the flow of packets leaving an interface to deliver improved Quality of Service.

Wireless Traffic Shaping

Enable Traffic Shaping	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Download Limit	<input type="text" value="100"/> Mbps (1-999)
Upload Limit	<input type="text" value="100"/> Mbps (1-999)

Save current setting(s)

Enable Traffic Shaping: Select to enable or disable Wireless Traffic Shaping.

Download Limit: Specifies the wireless transmission speed used for downloading.

Upload Limit: Specifies the wireless transmission speed used for uploading.

Save: Click **Save** to apply the changes.

Guest Network

The Guest Network feature allows administrators to grant Internet connectivity to visitors or guests while keeping other networked devices (computers and hard drives) and sensitive personal or proprietary information private and secure.

Guest Network Settings

Enable	SSID	Edit	Security	Hidden SSID	Client Isolation
<input type="checkbox"/>	EnGenius-2.4GHz_GuestNetw	Edit	None	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	EnGenius-5GHz_GuestNetwo	Edit	None	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Enable SSID: Select to enable or disable SSID broadcasting.

SSID: Specifies the SSID for the current profile. This is the name visible on the network to wireless clients.

Security: You can use None or WPA-PSK / WPA2-PSK security for this guest network.

Hidden SSID: Check this option to hide the SSID from broadcasting to discourage wireless users from connecting to a particular SSID.

Client Isolation: Check this option to prevent wireless clients associated with your Access Point to communicate with other wireless devices connected to the AP.

After enabling the Guest Network in the SSID Config page, assign an IP Address, Subnet Mask and DHCP server IP address range for this Guest Network.

Manual IP Settings	
- IP Address	192.168.200.1
- Subnet Mask	255.255.255.0
Automatic DHCP Server Settings	
- Starting IP Address	192.168.200.100
- Ending IP Address	192.168.200.200
- WINS Server IP	0.0.0.0

Manual IP Settings

IP Address: Specify an IP Address for the Guest Network.

Subnet Mask: Specify the Subnet Mask IP Address for the Guest Network.

Automatic DHCP Server Settings

Starting IP Address: Specify the starting IP Address range for the Guest Network.

Ending IP Address: Specify the ending IP Address range for the Guest Network.

WINS Server IP: Specify the WINS Server IP Address for the Guest Network. WINS stands for **Windows Internet Name Service**. It is Microsoft's implementation of their **NetBIOS Name Service** (NBNS), a name server and service for NetBIOS computer names.

Fast Handover

With Fast Handover enabled, the AP will send a disassociation request to the wireless client and let it find another AP to handover and associate upon detecting the wireless client's RSSI value as lower than specified. The RSSI value can be adjusted to allow more clients to stay associated to this AP. Note that setting the RSSI value too low may cause wireless clients to reconnect frequently.

Fast Handover

Status	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
RSSI	<input type="text" value="-70"/> dBm (Range: -60dBm ~ -90dBm)

Management VLAN Settings

This section allows you to assign a VLAN tag to packets. A VLAN is a group of computers on a network whose software has been configured so that they behave as if they were on a separate Local Area Network (LAN). Computers on VLAN do not have to be physically located next to one another on the LAN.

Management VLAN Settings

Status ☐ Enable ☒ Disable

Caution: If you encounter disconnection issue during the configuration process, verify that the switch and the DHCP server can support the new VLAN ID and then connect to the new IP address.

Save

Save current setting(s)

Status: If your network includes VLANs and if tagged packets need to pass through the Access Point, select **Enable** and enter the VLAN ID. Otherwise, click **Disable**.

Save: Click **Save** to apply the changes.

Note: If you reconfigure the Management VLAN ID, you may lose your connection to the Access Point. Verify that the DHCP server supports the reconfigured VLAN ID and then reconnect to the Access Point using the new IP address.

Chapter 7

Management

SNMP Settings

This page allows you to assign the Contact Details, Location, Community Name, and Trap Settings for Simple Network Management Protocol (SNMP). This is a networking management protocol used to monitor network attached devices. SNMP allows messages (called protocol data units) to be sent to various parts of the network. Upon receiving these messages, SNMP compatible devices (called agents) returns the data stored in their Management Information Bases. To configure SNMP Settings, click under the **Advanced** tab on the side bar under **Management**.

SNMP Settings	
Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Contact	<input type="text"/>
Location	<input type="text"/>
Port	<input type="text" value="161"/>
Community Name (Read Only)	<input type="text" value="public"/>
Community Name (Read Write)	<input type="text" value="private"/>
Trap Destination	
- Port	<input type="text" value="162"/>
- IP Address	<input type="text"/>
- Community Name	<input type="text" value="public"/>
SNMPv3 Settings	
- Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
- Username	<input type="text" value="admin"/> (1-31 Characters)
- Authorized Protocol	MD5 <input type="button" value="v"/>
- Authorized Key	<input type="text" value="12345678"/> (8-32 Characters)
- Private Protocol	DES <input type="button" value="v"/>
- Private Key	<input type="text" value="12345678"/> (8-32 Characters)
- Engine ID	<input type="text"/>

Status: Enables or Disables the SNMP feature.

Contact: Specifies the contact details of the device.

Location: Specifies the location of the device.

Port: Displays the port number.

Community Name (Read Only): Specifies the password for the SNMP community for read only access.

Community Name (Read/Write): Specifies the password for the SNMP community with read/write access.

Trap Destination Address: Specifies the port and IP address of the computer that will receive the SNMP traps.

Trap Destination Community Name: Specifies the password for the SNMP trap community.

SNMPv3 Status: Enables or disables the SNMPv3 feature.

User Name: Specifies the username for the SNMPv3 feature.

Auth Protocol: Select the Authentication Protocol type: MD5 or SHA.

Auth Key: Specify the Authentication Key for authentication.

Priv Protocol: Select the Privacy Protocol type: DES.

Priv Key: Specifies the privacy key for privacy.

Engine ID: Specifies the Engine ID for SNMPv3.

CLI/SSH Settings

Most users will configure the device through the graphical user interface (GUI). However, for those who prefer an alternative method there is the Command Line Interface (CLI). The CLI can be accessed through a command console, modem, or Telnet connection. For more security, you can enable SSH (Secure Shell) to establish a secure data communication.

CLI Setting

Status

☒ Enable ☐ Disable

SSH Setting

Status

☐ Enable ☒ Disable

CLI Status: Select **Enable** or **Disable** to enable or disable the ability to modify the Access Point via a command line interface (CLI).

SSH Status: Select **Enable** or **Disable** to enable or disable the ability to modify the Access Point via a command line interface (CLI) with a secure channel.

HTTPS Settings

Hypertext Transfer Protocol Secure (HTTPS) is a communications protocol for secure communication over a computer network with especially wide deployment on the Internet. Technically, it is not a protocol in and of itself; rather, it is the result of simply layering the Hypertext Transfer Protocol (HTTP) on top of the SSL/TLS protocol, thus adding the security capabilities of SSL/TLS to standard HTTP communications.

HTTPS Settings

Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
HTTPS forward	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Status: Select **Enable** or **Disable** to enable or disable the ability to modify the Access Point via a HTTPS.

HTTPS forward: When this option is enabled, it will be forwarded to HTTPS if the user uses HTTP to access the Access Point.

Email Alerts

The Access Point will send email alerts when configurations have been changed.

Email Alert	
Status	<input type="checkbox"/> Enable
- From	<input type="text"/>
- To	<input type="text"/>
- Subject	[Email-Alert][EWS320AP][88:DC:96:05:B0:68] Configur
Email Account	
- Username	<input type="text"/>
- Password	<input type="password"/>
- SMTP Server	<input type="text"/> Port: 25
- Security Mode	None <input type="button" value="v"/>
<input type="button" value="Send Test Mail"/>	
<input type="button" value="Apply"/> Apply saved settings to take effect	

Status: Check **Enable** to enable Email Alert feature.

From: Enter the address to show as the sender of the email.

To: Enter the address to show as the receiver of the email.

Subject: Enter the subject to show as the subject of the email.

Email Account

Username/Password: Enter the username and password required to connect to the SMTP server.

SMTP Server/Port: Enter the IP address/domain name and port of the SMTP server. The default port of SMTP Server is port 25.

Security Mode: Select the mode of security for the Email alert. The options are None, SSL/TLS and STARTTLS.

Send Test Mail: Click **Send Test Mail** button to test the Email Alert setup.

Apply: Click **Apply** to save the changes.

Date and Time Settings

This page allows you to set the internal clock of the Access Point. To access the Date and Time settings, click **Time Zone** under the **Management** tab on the side bar.

Date and Time Settings

☐ Manually Set Date and Time

Date: 2014 / 01 / 07

Time: 11 : 16 (24-Hour)

Synchronize with PC

☒ Automatically Get Date and Time

NTP Server: 209.81.9.7

Time Zone

Time Zone: UTC+00:00 Gambia, Liberia, Morocco

☐ Enable Daylight Saving

Start: January 1st Sun 12 am

End: January 1st Mon 12 am

Apply Apply saved settings to take effect

Manually Set Date and Time: Manually specify the date and time.

Synchronize with PC: Click to synchronize the Access Point's internal clock with the computer's time.

Automatically Get Date and Time: Enter the IP address of an NTP server or use the default NTP server to have the internal clock set automatically.

Time Zone: Choose the time zone you would like to use from the drop-down list.

Enable Daylight Savings: Check the box to enable or disable daylight savings time for the Access Point. Next, enter the dates that correspond to the present year's daylight savings start and end times.

Click **Apply** to save the changes.

Wi-Fi Scheduler

Use the Wi-Fi Scheduler feature to reboot the Access Point or control the wireless availability on a routine basis. The Wi-Fi Scheduler feature relies on the GMT time setting acquired from a network time protocol (NTP) server. For details on how to connect the Access Point to an NTP server, see **Date and Time Settings**.

Auto Reboot Settings

You can specify how often you would like to reboot the Access Point.

Auto Reboot Settings	
Status	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Timer	<input type="checkbox"/> Sunday <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday
	<input type="text" value="0"/> : <input type="text" value="0"/>

Status: Enables or disables the Auto Reboot feature.

Timer: Specifies the time and frequency in rebooting the Access Point by Min, Hour and Day.

Wi-Fi Scheduler

Wi-Fi Scheduler

☐ Enable
 ☒ Disable

NOTE: Please assure that the Time Zone Settings is synced with your local time when enabling the Wi-Fi Scheduler.

Wireless Radio

2.4GHz

SSID Selection

EnGenius05B069_1-2.4GHz

Schedule Templates

Choose a template

Schedule Table

Day	Availability	Duration
Sunday	available	00 : 00 ~ 24 : 00
Monday	available	00 : 00 ~ 24 : 00
Tuesday	available	00 : 00 ~ 24 : 00
Wednesday	available	00 : 00 ~ 24 : 00
Thursday	available	00 : 00 ~ 24 : 00
Friday	available	00 : 00 ~ 24 : 00
Saturday	available	00 : 00 ~ 24 : 00

Save

Save current setting(s)

Status: Enables or disables the Wi-Fi Scheduler feature.

Wireless Radio: Select either the 2.4 GHz or 5 GHz band to use Wi-Fi Schedule on.

SSID Selection: Select a SSID to use the Wi-Fi Scheduler with.

Schedule Templates: There are 3 templates available: Always available, Available 8-5 daily and Available 8-5 daily except Weekends. Select **Custom Schedule** if you wish to set the schedule manually.

Schedule Table: Allows you to set the schedule manually.

Tools

This section allows you to analyze the connection quality of the Access Point and trace the routing table to a target within the network.

Ping Test Parameters

Ping Test Parameters		
Target IP / Domain Name	<input type="text"/>	
Ping Packet Size	<input type="text" value="64"/>	Bytes
Number of Pings	<input type="text" value="4"/>	
<input type="button" value="Start"/>	<div><div></div></div>	

Target IP/Domain Name: Enter the IP address or Domain name you would like to search.

Ping Packet Size: Enter the packet size of each ping.

Number of Pings: Enter the number of times you wish to ping.

Start: Click **Start** to begin pinging target device (via IP).

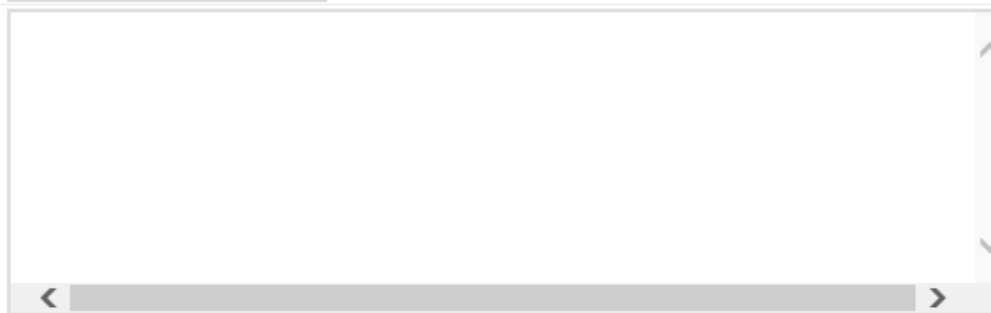
Traceroute Parameters

Traceroute Test Parameters

Target IP / Domain Name

Start

Stop



Target IP/Domain Name: Enter an IP address or domain name you wish to trace.

Start: Click **Start** to begin the traceroute operation.

Stop: Halts the traceroute test.

Speed Test Parameters

Speed Test Parameters

Target IP / Domain Name	<input type="text"/>	
Time Period	<input type="text" value="20"/>	sec
Check Interval	<input type="text" value="5"/>	sec
<input type="button" value="Start"/>	<div><div></div></div>	
IPv4 Port	5001	
IPv6 Port	5002	

Target IP/Domain Name: Enter an IP address or domain name you wish to run a Speed Test for.

Time Period: Enter the time in seconds that you would like the test to run for and in how many intervals.

Start: Starts the Speed Test.

IPv4 / IPv6 Port: The Access Point uses IPv4 port 5001 and IPv6 port 5002 for the speed test.

LED Control

This section allows you to control the LED control functions for the AP: Power Status, LAN, 2.4 GHz WLAN, and 5 GHz WLAN interface.

LED Control	
Power	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
LAN	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
WLAN-2.4GHz	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
WLAN-5GHz	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
<div><div>Apply</div><div>Apply saved settings to take effect</div></div>	

Apply: Click **Apply** to save the changes.

Device Discovery

Under Device Discovery, you can choose for the Access Point to automatically scan for local devices to connect to. Click **Scan** to begin the process.

Device Discovery

Device Name	Operation Mode	IP Address	System MAC Address	Firmware Version
-------------	----------------	------------	--------------------	------------------

Scan

Chapter 8

System Manager

Account Settings

This page allows you to change the username and password of the device. By default, the username is **admin** and the password is **admin**. The password can contain from 0 to 12 alphanumeric characters and is case sensitive.

Account Settings	
Administrator Username	<input type="text" value="admin"/>
Current Password	<input type="password"/>
New Password	<input type="password"/>
Verify Password	<input type="password"/>

Apply saved settings to take effect

Administrator Username: Enter a new username for logging in to the Administrator Username field.

Current Password: Enter the old password for logging in to the Current Password field.

New Password: Enter the new password for logging in to the New Password field.

Verify Password: Re-enter the new password in the Verify Password field for confirmation.

Apply: Click **Apply** to save the changes.

Note: it is highly recommended that you change your password to something more unique for greater security.

Firmware Upgrade

This page allows you to upgrade the Firmware of the Access Point.

Firmware Upgrade

Current Firmware Version: 2.0.0

Select the new firmware from your hard disk.

To Perform a Firmware Upgrade:

1. Click the **Browse...** button and navigate the OS File System to the location of the Firmware upgrade file.
2. Select the upgrade file. The name of the file will appear in the Upgrade File field.
3. Click the **Upload** button to commence the Firmware upgrade.

Note: The EWS860AP will be unavailable during the upgrade process and must restart when the upgrade is completed. Any connections to or through the device will be lost.

Backup/Restore

This page allows you to save your current device configurations. When you save your configuration settings, you can also reload the saved configurations into the device through the **Restore New Settings** from a file folder. If extreme problems occur, or if you have set the Access Point incorrectly, you can use the **Reset** button in the **Reset to Default** section to restore all the configurations of the Access Point to their original default settings. To configure the Backup/Restore Settings, click **Firmware** under the **Systems Manager** tab.

Backup/Restore Settings	
Factory Setting	
- Backup Setting	<input type="button" value="Export"/>
- Restore New Setting	<input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Import"/>
- Reset to Default	<input type="button" value="Reset"/>
User Setting	
- Back Up Setting as Default	<input type="button" value="Backup"/>
- Restore to User Default	<input type="button" value="Restore"/>

Factory Settings

Backup Setting: Click **Export** to save the current device configurations to a file.

Restore New Setting: Choose the file you wish restore and click **Import**.

Reset to Default: Click the **Reset** button to restore the Access Point to its factory default settings.

User Settings

Back Up Setting as Default: Click **Backup** to backup the user settings you would like to use as the default settings.

Restore to User Default: Click **Restore** to restore the Access Point to user's default settings.

System Log

This page allows you to setup the System Log and local log functions of the Access Point. Click **Log** under the **Systems Manager** tab to open up the System Log page.

System Log

Status

☒ Enable ☐ Disable

Log type

All

Refresh

Clear

Jun 26 05:51:01 EWS860AP cron.info crond[2149]: crond: USER root pid 3941 cmd kill

Jun 26 05:50:01 EWS860AP user.notice root: starting ntpd

Jun 26 05:50:01 EWS860AP cron.info crond[2149]: crond: USER root pid 3190 cmd sch

Jun 26 05:50:01 EWS860AP cron.info crond[2149]: crond: USER root pid 3189 cmd . /

Jun 26 05:50:01 EWS860AP cron.info crond[2149]: crond: USER root pid 3183 cmd kill

Jun 26 05:49:01 EWS860AP cron.info crond[2149]: crond: USER root pid 2774 cmd kill

Jun 26 05:48:01 EWS860AP cron.info crond[2149]: crond: USER root pid 2281 cmd sch

Jun 26 05:48:01 EWS860AP cron.info crond[2149]: crond: USER root pid 2275 cmd kill

Jun 26 05:47:01 EWS860AP cron.info crond[2149]: crond: USER root pid 1829 cmd kill

Jun 26 05:46:01 EWS860AP cron.info crond[2149]: crond: USER root pid 1416 cmd sch

Remote Log

☐ Enable ☒ Disable

Log Server IP Address

0.0.0.0

Status: Enables or disables the System Log feature.

Log Type: Select the Log Type mode you would like to use.

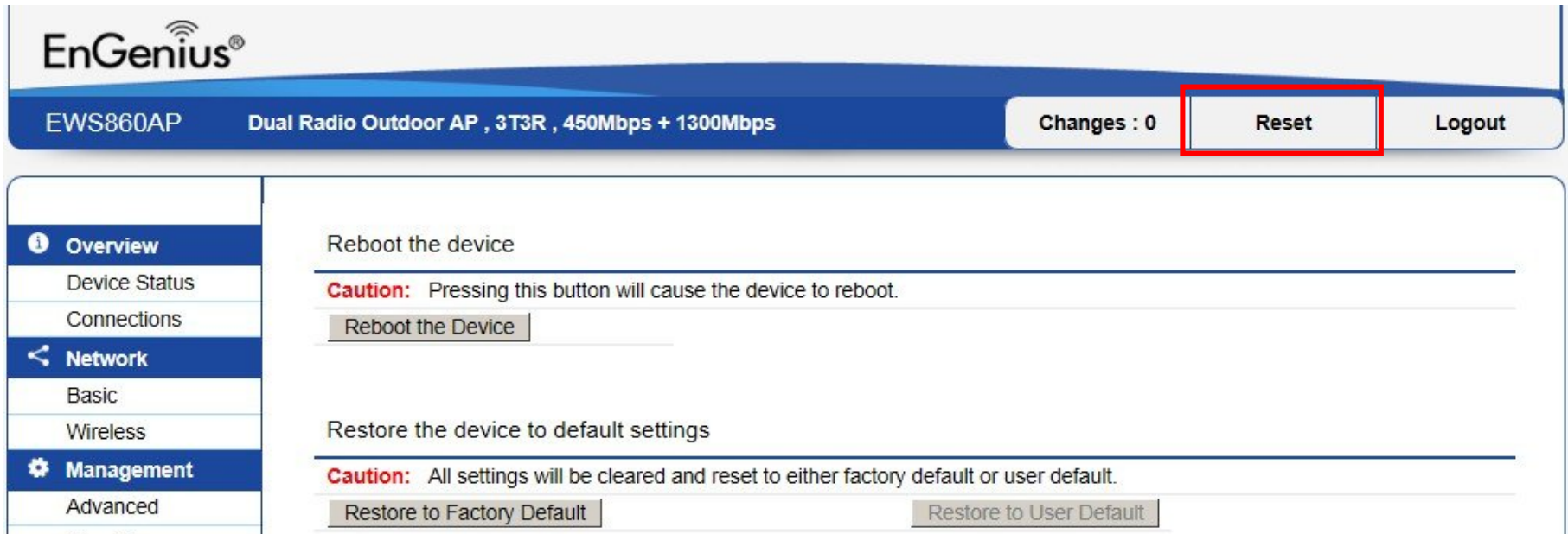
Remote Log: Enables or disables the Remote Log feature. If enabled, enter the IP address of the Log you would like to remote to.

Log Server IP Address: Enter the IP address of the log server.

Apply: Click **Apply** to save the changes.

Reset

In some circumstances, you may be required to force the device to reboot. Click on **Reset** and you will have the choice to reboot the device or reset the device.



The screenshot displays the EnGenius web management interface for an EWS860AP. The top header bar is blue and contains the EnGenius logo, the device model 'EWS860AP', the description 'Dual Radio Outdoor AP , 3T3R , 450Mbps + 1300Mbps', a 'Changes : 0' indicator, a 'Reset' button (highlighted with a red rectangle), and a 'Logout' button. A left-hand navigation menu is visible, with 'Overview' selected. The main content area is divided into two sections. The first section, 'Reboot the device', includes a 'Caution' message: 'Pressing this button will cause the device to reboot.' and a 'Reboot the Device' button. The second section, 'Restore the device to default settings', includes a 'Caution' message: 'All settings will be cleared and reset to either factory default or user default.' and two buttons: 'Restore to Factory Default' and 'Restore to User Default'.

EnGenius®

EWS860AP Dual Radio Outdoor AP , 3T3R , 450Mbps + 1300Mbps Changes : 0 **Reset** Logout

Overview

- Device Status
- Connections

Network

- Basic
- Wireless

Management

- Advanced

Reboot the device

Caution: Pressing this button will cause the device to reboot.

Reboot the Device

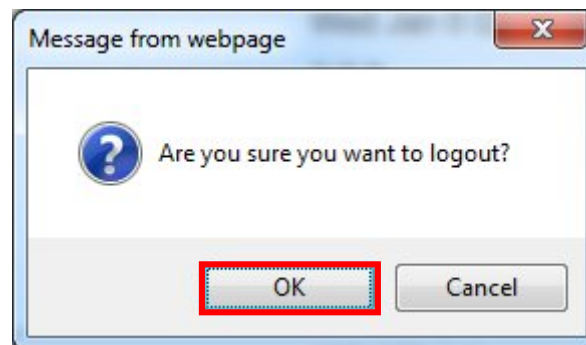
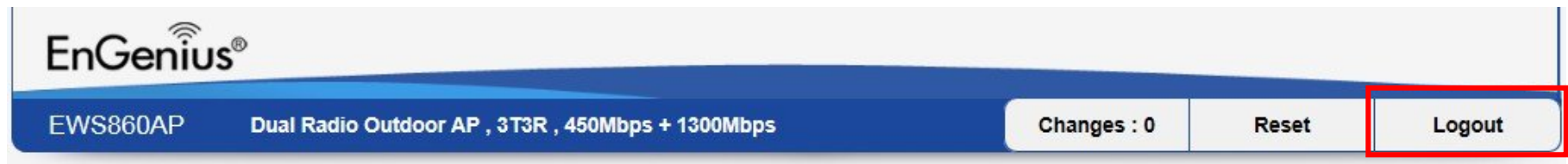
Restore the device to default settings

Caution: All settings will be cleared and reset to either factory default or user default.

Restore to Factory Default Restore to User Default

Logout

Click **Logout** and a warning window will appear. Click **OK** to logout.



Glossary

6to4: 6to4 allows IPv6 packets to be transmitted over an IPv4 network.

ACL The Access Control List specifies which users or processes are granted access to objects, as well as which operations are allowed.

Access Point Mode: In Access Point mode, the EPG600 allows wireless devices to connect to a wired network using Wi-Fi, or other related standards. You can choose to have the router associate only with certain iterations (IEEE standards) and by doing so this will either positively or negatively affect the router's speed and throughput performance.

AES: An Advanced Encryption Standard is an encryption algorithm. You can chose 128, 192 or 256-bit long key size for encryption and decryption of text.

ALG: Application Layer Gateway serves as a window between correspondent application processes so that they may exchange information on an open environment.

Backup: A copy of a set of files made for replacement purposes in case the original set is damaged or lost.

Bandwidth: Bandwidth refers to the information-carrying capacity of a network or component of a network expressed in bits per second.

Bit Rate: The rate at which bits are transmitted or received during communication, expressed as the number bits in a given amount of time, usually one second.

Boot: A computer's startup operation.

Community String: A text string that acts as a password and is used to authenticate messages sent between a management station and a router containing a SNMP agent. The community string is sent in every packet between the manager and the agent.

Default Gateway: A Default Gateway is the device that passes traffic from the local subnet to devices on other subnets. It is usually the IP address of the router to which your network is connected.

DES: A Data Encryption Standard is an encryption type that enhances the encryption capabilities of SNMP version 3.

DDNS: Dynamic Domain Name Service (DDNS) allows for an Internet domain name to be assigned to a computer with a varying (dynamic) IP address.

DHCP: The Dynamic Host Configuration protocol is used for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services.

DLNA: The Digital Living Network Alliance DLNA is a nonprofit collaborative trade organization that is responsible for defining interoperability guidelines to enable the sharing of digital media between multimedia devices. Some HDTVs, Gaming Consoles, and other media devices adhere to DLNA guidelines.

DNS: A Domain Name System is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network. This allows the recognition of domain names such as www.yahoo.com instead of 98.139.183.24, which is more difficult to remember.

Domain: A portion of the spanning hierarchy tree that refers to general groupings of networks based on organization type or geography.

DoS: Denial of Service is an interruption in an authorized user's access to a computer network and is typically caused with malicious intent. Although the process and targets of a DoS attack vary, it generally consists of efforts to temporarily or indefinitely interrupt or suspend services of a host connected to a network.

Download: The transfer of a file from a remote computer to a local computer.

Dynamic IP: An IP address that is assigned and changed periodically. Dynamic IP addresses can change each time you connect to the Internet, while static IP addresses are reserved for you statically and don't change over time.

Encryption: The application of a specific algorithm to data so as to alter the appearance of the data making it incomprehensible to those who are not authorized to see the information.

Firewall: A router or access server, or several routers or access servers designated as a buffer between any connected public networks and a private network. A firewall router uses access lists and other methods to ensure the security of the private network.

Firmware: A collection of programmed routines and instructions that is implemented in a computer chip or similar hardware form instead of a software form. Please check www.engeniustech.com for firmware updates.

FTP: An application protocol that uses the TCP/IP protocols. It is used to exchange files between computers/devices on networks.

Gateway: A gateway is a point in a network that acts as an entry point to another network. In a corporate network for example, a computer server acting as a gateway often also acts as a proxy server and a firewall server. A gateway is often associated with both a router, which knows where to direct a given packet of data that arrives at the gateway, and a Switch, which furnishes the actual path in and out of the gateway for a given packet.

Guest Network: A guest network is a section of a computer network designed for use by temporary visitors. This subnetwork often provides full Internet connectivity, but also strictly limits access to any internal Web sites or files.

GUI: Graphical User Interface. User environment that uses pictorial as well as textual representations of the input and output of applications and the hierarchical or other data structure in which information is stored.

IGMP: The Internet Group Multicast Protocol is a protocol that provides the means for a host to inform its attached router that an application running wants to join a specific multicast group.

IP: The Internet Protocol is a method transmitting data over a network. Data to be sent is divided into individual and completely independent “packets.” Each computer (or host) on the Internet has at least one address that uniquely identifies it from all others, and each data packet contains both the sender’s address and the receiver’s address. The Internet Protocol ensures that the data packets all arrive at the intended address. As IP is a connectionless protocol, (which means that there is no established connection between the communication end-points) packets can be sent via different routes and do not need to arrive at the destination in the correct order. Once the data packets have arrived at the correct destination, another protocol, Transmission Control Protocol (TCP) puts them in the right order.

IP Address: An IP address is simply an address on an IP network used by a computer/device connected to that network. IP addresses allow all the connected computers/devices to find each other and to pass data back and forth. To avoid conflicts, each IP address on any given network must be unique. An IP address can be assigned as fixed, so that it does not change, or it can be assigned dynamically (and automatically) by DHCP. An IP address consists of four groups (or quads) of decimal digits separated by periods, e.g. 130.5.5.25. Different parts of the address represent different things. One part represent the network number or address, and other part represents the local machine address.

IPv6: IPv6 provides an identification and location system for computers on networks and routes that traffic across the Internet.

L2TP: The Layer 2 Tunneling Protocol is used to support VPNs or as part of the delivery of services by ISPs.

LAN: A communication infrastructure that supports data and resource sharing within a small area that is completely contained on the premises of a single owner.

MAC Address: Standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use these addresses to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are 6 bytes long and are controlled by the IEEE.

MAC Address Filtering: Mac Address Filtering permits and denies network access to specific devices based on a device's MAC address.

MD5: A Message-Digest algorithm is a widely used cryptographic hash function producing a 128-bit (16-byte) hash value, typically expressed in text format as a 32 digit hexadecimal number.

Mesh Mode: Mesh Networks are a network topology in which each node (called a mesh node) relays data for the network. All nodes cooperate in the distribution of data in the network. In the event that a node fails, other nodes can automatically reconfigure or "fill in" for another Wireless AP in the network (called Self-healing) and pickup a signal that otherwise would have been dropped.

MTU: Maximum Transmission Unit is a specification in a data link protocol that defines the maximum number of bytes that can be carried in any one packet on that link.

NAT: Network Address Translation is a methodology of modifying network address information in Internet Protocol (IP) datagram packet headers while they are in transit across a traffic routing device.

NTP Server: The Network Time Protocol is used for clock synchronization between computer systems.

Packet: A discrete chunk of communication in a pre-defined format.

Port Forwarding: Port Forwarding allows remote computers to connect to a specific computer or service within a private LAN.

Port Mapping: Port Mapping allows you to redirect a particular range of service port numbers from the WAN to a particular LAN IP address.

Port Triggering: Port Triggering lets you map a local port or range of ports to a specific public port. Sending packets out over the local port triggers the router to open an incoming local port that is mapped to the same public port and application as the outgoing local port(s). The local application can communicate over the incoming and outgoing ports without the need for creating a fixed address.

PPPoE: Point-to-Point Protocol over Ethernet (PPPoE) is a network protocol for encapsulating PPP frames inside Ethernet frames. PPPoE can be used to have an office or building-full of users share a common DSL, cable modem, or wireless connection to the Internet.

PPTP: A protocol that allows corporations to extend their own corporate network through private “tunnels” over the public Internet. In this way a corporation can effectively use a WAN as a large single LAN.

Priority Queue A Priority queue is a queue where an element with a high priority is served before an element with low priority. If two elements happen to have the same priority, they are served according to their order in the queue.

QoS: Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow. It is especially important for applications like multimedia streaming and VoIP.

RADIUS: Remote Authentication Dial In User Service is a networking protocol that provides centralized authentication, authorization, and accounting management for users that connect and use a network service.

RAM: Random Access Memory. A group of memory locations that are numerically identified to allow high speed access by a CPU. In random access, any memory location can be accessed at any time by referring to its numerical identifier as compared to sequential access, where memory location 6 can only be accessed after accessing memory locations 1-5.

Reboot: A user activity where the user starts a computing device without interrupting its source of electrical power.

Router: A device that determines the next network point to which a packet should be forwarded to on its way to its final destination. A router creates and/or maintains a special routing table that stores information on how best to reach certain destinations. A router is sometimes included as part of a network Switch.

Server: In general, a server is a computer program that provides services to other computer programs within the same or other computers. A computer running a server program is also frequently referred to as a server. In practice, the server may contain any number of server and client programs. A web server is the computer program that supplies the requested HTML pages or files to the client (browser).

SHA: A Secure Hash Algorithm produces a 160-bit (20-byte) hash value typically rendered as a hexadecimal number, 40 digits long.

Static IP: An IP address that is unchanging. It is more reliable when dealing with VoIP, online gaming, and VPNs.

SSID: A Service Set Identifier is a set consisting of all the devices associated with a WLAN.

Subnet Mask: A representation of a user's Internet address where all of the bit positions corresponding to the user's network and subnetwork id are 1's and the bit corresponding to the user's host id are 0's.

Throughput: Rate of information arriving at, and possibly passing through, a particular point in a network system.

Time-Out: Event that occurs when one network device expects to hear from another network device within a specified period of time, but does not. The resulting time-out usually results in a retransmission of information or the dissolving of the session between the two devices.

TKIP: Temporal Key Integrity Protocol is a stopgap security protocol used in IEEE 802.11 wireless networking standards used to replace WEP.

UID: A Unique Identifier is a unique reference number used as an identifier.

Upload: The activity of transferring a file from a user's computer system to a remote system.

UPnP: Universal Plug n Play is a protocol that permits networked devices to seamlessly discover each other's presence on the network.

VLAN: A Virtual Local Area network allows a network manager to logically segment a LAN into different broadcast domains. Since this is a logical segmentation and not a physical one, workstations do not have to be physically located together.

VoIP: Voice over IP is a technology used for the delivery of voice communications and multimedia sessions over IP networks rather than a PSTN line.

VPN A Virtual Private Network creates a secure "tunnel" between the points within the VPN. Only devices with the correct "key" will be able to work within the VPN. The VPN network can be within a company LAN (Local Area Network), but different sites can also be connected over the Internet in a secure way. One common use for VPN is for connecting a remote computer to the corporate network, via e.g. a direct phone line or the Internet.

VPN Tunnel: VPN Tunneling is a link which connects a network directly to another network. The connection between the complementary links is called a VPN tunnel. VPN comprises with a VPN server and a VPN client. A VPN client is usually a software program which can be configured to the VPN server.

WAN: A Wide Area Network is a network that covers a broad area over long distances using private or public network transports between different LANs, MANs and other localized computer networking architectures.

WDS Mode: Wireless Distribution System Mode is a MAC address-based system enabling the wireless interconnection of Access Points in an IEEE 802.11 network.

WEP: Wired Equivalent Privacy is a security protocol for wireless networks that encrypts transmitted data.

WLAN: A Wireless LAN is a LAN that links two or more devices using some wireless distribution method. This gives users the ability to move around within a local coverage area and still be connected to the network.

WOL: Wake on LAN allows a computer to be turned on or awakened by a network message.

WPA /WPA2: Wi-Fi Protected Access and Wi-Fi Protected Access II are security protocols and security certification programs used to secure wireless

computer networks. They are recommended over WEP.

Appendix

Appendix A - FCC Interference Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Operations in the 5.15-5.25 GHz band are restricted to indoor usage only.

IMPORTANT NOTE:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 21 cm between the radiator & your body.

Appendix B - IC Interference Statement

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Caution:



- (i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
- (ii) high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:



- (i) les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 21cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 21cm de distance entre la source de rayonnement et votre corps.

Appendix C - CE Interference Statement

Europe – EU Declaration of Conformity

- EN60950-1
Safety of Information Technology Equipment
- EN50385
Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)
- EN 300 328
Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- EN 301 893
Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
- EN 301 489-1
Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- EN 301 489-17
Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment









This device is a 5GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.



In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up

outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

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 Český [Czech]	<i>[Jméno výrobce]</i> tímto prohlašuje, že tento <i>[typ zařízení]</i> je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
 Dansk [Danish]	Undertegnede <i>[fabrikantens navn]</i> erklærer herved, at følgende udstyr <i>[udstyrets typebetegnelse]</i> overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
 Deutsch [German]	Hiermit erkläre <i>[Name des Herstellers]</i> , dass sich das Gerät <i>[Gerätetyp]</i> in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
 Eesti [Estonian]	Käesolevaga kinnitab <i>[tootja nimi = name of manufacturer]</i> seadme <i>[seadme tüüp = type of equipment]</i> vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
 English	Hereby, <i>[name of manufacturer]</i> , declares that this <i>[type of equipment]</i> is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
 Español [Spanish]	Por medio de la presente <i>[nombre del fabricante]</i> declara que el <i>[clase de equipo]</i> cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
 Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ <i>[name of manufacturer]</i> ΔΗΛΩΝΕΙ ΟΤΙ <i>[type of equipment]</i> ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
 Français [French]	Par la présente <i>[nom du fabricant]</i> déclare que l'appareil <i>[type d'appareil]</i> est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

 Italiano [Italian]	Con la presente <i>[nome del costruttore]</i> dichiara che questo <i>[tipo di apparecchio]</i> è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo <i>[name of manufacturer / izgatavotāja nosaukums]</i> deklarē, ka <i>[type of equipment / iekārtas tips]</i> atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo <i>[manufacturer name]</i> deklaruoja, kad šis <i>[equipment type]</i> atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
 Nederlands [Dutch]	Hierbij verklaart <i>[naam van de fabrikant]</i> dat het toestel <i>[type van toestel]</i> in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
 Malti [Maltese]	Hawnhekk, <i>[isem tal-manifattur]</i> , jiddikjara li dan <i>[il-mudel tal-prodott]</i> jikkonforma mal-ħt iġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
 Magyar [Hungarian]	Alulírott, <i>[gyártó neve]</i> nyilatkozom, hogy a <i>[... típus]</i> megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
 Polski [Polish]	Niniejszym <i>[nazwa producenta]</i> oświadczam, że <i>[nazwa wyrobu]</i> jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
 Português [Portuguese]	<i>[Nome do fabricante]</i> declara que este <i>[tipo de equipamento]</i> está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
 Slovensko [Slovenian]	<i>[Ime proizvajalca]</i> izjavlja, da je ta <i>[tip opreme]</i> v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	<i>[Meno výrobcu]</i> týmto vyhlasuje, že <i>[typ zariadenia]</i> spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
 Suomi [Finnish]	<i>[Valmistaja = manufacturer]</i> vakuuttaa täten että <i>[type of equipment = laitteen tyyppimerkintä]</i> tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
 Svenska [Swedish]	Härmed intygar <i>[företag]</i> att denna <i>[utrustningstyp]</i> står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

