

# User Manual



**ENH1350EXT**



**ENH1750EXT**  
version 1.1

Dual Band Long Range Wireless AC1300/AC1750 Outdoor  
Access Point

# IMPORTANT

To install this Access Point please refer to the **Quick Installation Guide** included in the product packaging.

# Table of Contents

Chapter 1 Product Overview.....	4	Chapter 7	
ENH1750EXT		2.4 GHz/5 GHz Wireless.....	47
Key Features/Introduction.....	5	Wireless Settings.....	48
System Requirements.....	6	2.4 GHz/5 GHz Wireless Network.....	49
Package Contents.....	7	Wireless Security.....	50
ENH1350EXT		Wireless Traffic Shaping.....	53
Key Features/Introduction.....	8	Fast Roaming.....	54
System Requirements.....	9	Mesh Settings-ENH1750EXT.....	55
Package Contents.....	9	Guest Network Settings.....	56
Technical Specifications.....	10	Wireless MAC Filtering.....	58
Physical Interface.....	14	Wireless Advanced.....	59
Chapter 2 Before You Begin.....	16	Chapter 8 Management .....	60
Computer Settings.....	17	Management VLAN Settings.....	61
ENH1750EXT		Advanced Settings.....	62
Hardware Installation.....	21	CLI Settings/Email Alert.....	63
Mounting the AP.....	22	Time Zone.....	65
ENH1350EXT		Auto Reboot Settings.....	66
Hardware Installation.....	25	Wi-Fi Scheduler.....	67
Mounting the AP.....	26	Tools.....	68
Chapter 3 Configuring Your Access Point.....	28	Account/Firmware.....	70
Default Settings./Web Configuration.....	29	Backup/Restore .....	71
Chapter 4 Building a Wireless Network.....	30	Log.....	73
Access Point .....	31	Logout/Reset.....	74
Client Bridge Mode.....	32	Appendix.....	75
WDS AP Mode.....	33	FCC Interference Statement.....	76
WDS Bridge Mode.....	34	IC Interference Statement.....	77
WDS Station Mode.....	35	CE Interference Statement.....	79
AP Mesh Mode.....	36	Professional installation instruction.....	80
Mesh Only Mode.....	37		
Chapter 5 Status.....	38		
Overview.....	39		
Connection.....	42		
Chapter 6 Network .....	44		
Basic IP Settings.....	45		
Spanning Tree Protocol Setting.....	46		

# Chapter 1

# **Product Overview**



# Introduction

## Key Features-ENH1750EXT

- 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 2.4GHz band and 1300Mbps on 5GHz band
- Three detachable 5 dBi 2.4 GHz Omni-directional antennas
- Three detachable 7 dBi 5 GHz Omni-directional antennas
- Can be monitored after deployment with EnGenius EZ Controller™ software for Windows (Free online download)
- Mesh Supported
- Can be used with included power adapter or via PoE with PoE 802.3at - capable switches or injectors
- Dual Band/Three Stream
- Band Steering shifts dual band clients to 5 GHz for better throughput performance
- Secured Guest Network option available



## Introduction

The ENH1750EXT is a high-powered, long-range 3x3 Dual-Band Wireless 802.11 ac/a/b/g/n Outdoor Access Point with speeds up to 450 Mbps on 2.4GHz and 1300Mbps on 5GHz band. It can be configured as an: Access Point, Client Bridge, or WDS (AP, Station & Bridge). The ENH1750EXT 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 ENH1750EXT supports the 2.4GHz frequency band under 802.11 b/g/n mode while at the same time providing 5GHz band under 802.11 ac/a/n mode for communicating

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 subject to change without 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.

to and from 5GHz capable computers, tablets or smart phones or transferring files. Several ENH1750EXTs can be deployed in a campus setting using the 5GHz band as a backhaul to provide multiple 2.4GHz wireless cells for computers or mobile devices in common outdoor areas.

The ENH1750EXT is easy to install in virtually any location with its included PoE (Power over Ethernet) injector for quick outdoor installation. The ENH1750EXT enables network administrators to control its transmit power and feature settings for selecting narrow bandwidth and traffic shaping. The ENH1750EXT also supports wireless encryption including Wi-Fi Protected Access (WPA-PSK/WPA2-PSK) Encryption, and IEEE 802.1x with RADIUS.

## **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), Mac OS, or Linux-based operating systems
- Web-Browsing Application (i.e.: Internet Explorer, Firefox, Safari, or another similar browser application)

## Package Contents

The ENH1750EXT package contains the following items:\*

- ENH1750EXT Access Point
- 3 detachable 5 dBi 2.4 GHz Omni-directional Antenna
- 3 detachable 7 dBi 5 GHz Omni-directional Antenna
- Power Adapter (48V/0.8A)
- PoE Injector (EPE-48GR)
- Grounding Cable
- Pole Mount Bracket
- Wall Mount Base
- Mounting Screw Set
- Quick Installation Guide
- Technical Support Card

\*(all items must be in package to issue a refund):

# Introduction

## Key Features-ENH1350EXT

- Up to 28 dBm transmit power enabling long range connectivity
- Supports IEEE802.11ac/a/b/g/n wireless standards with up to 450 Mbps data rate on 2.4GHz band and 1300Mbps on 5GHz band
- Two detachable 5.17 dBi 2.4 GHz Omni-directional antennas
- Two detachable 5.17 dBi 5 GHz Omni-directional antennas
- Can be monitored after deployment with EnGenius EZ Controller™ software for Windows (Free online download)
- Can be used with included power adapter or via PoE with Proprietary 48V.
- Fast Transition and Handover between Access Points
- Band Steering shifts client devices to a proper frequency band for getting more bandwidth and speed under an Access Point.
- Secured Guest Network option available

## Introduction

ENH1350EXT equips with two powerful RF interfaces that support up to 867 Mbps in 5GHz frequency band and 400 Mbps in 2.4GHz frequency band (with 2ss/VHT40 clients). It can be configured as an: Access Point, Client Bridge, or WDS (AP, Station & Bridge). The ENH1350EXT is designed to withstand harsh environment conditions including serve and prolonged exposure to sunlight, extreme cold, frost, snow, rainfall, hail and humidity. The ENH1350EXT supports the 2.4GHz frequency band under 802.11 b/g/n

mode while at the same time providing 5GHz band under 802.11 ac/a/n mode for communicating to and from 5GHz capable computers, tablets or smart phones or transferring files. Several ENH1350EXTs can be deployed in a campus setting using the 5GHz band as a backhaul to provide multiple 2.4GHz wireless cells for computers or mobile



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 subject to change without 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.

devices in common outdoor areas.

The ENH1350EXT is easy to install in virtually any location with its included PoE (Power over Ethernet) adapter for quick outdoor installation. The ENH1350EXT enables network administrators to control its transmit power and feature settings for selecting narrow bandwidth and traffic shaping. The ENH1350EXT also supports wireless encryption including Wi-Fi Protected Access (WPA2-PSK) Encryption, and IEEE 802.1x with RADIUS.

## 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, 10), Mac OS, or Linux-based operating systems
- Web-Browsing Application (i.e.: Internet Explorer, Firefox, Safari, or another similar browser application)

## Package Contents

The ENH1350EXT package contains the following items:\*

- ENH1350EXT Access Point
- 2 detachable 5 dBi 2.4 GHz Omni-directional Antenna
- 2 detachable 5 dBi 5 GHz Omni-directional Antenna
- PoE Adapter (48V/0.6A)
- Power Cord
- Pole Mount Strap
- Wall Mount Screw set
- Quick Installation Guide

\*(all items must be in package to issue a refund)

# Technical Specifications

## ENH1750EXT

### Standard:

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

### Antenna

6 External N-type Antenna  
    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 Indicator

Power  
LAN 1  
LAN 2  
2.4 GHz  
5 GHz

### Power Requirements

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

### Operation Modes

Access Point  
WDS  
Mesh

### WDS Detail

WDS AP  
WDS Bridge  
WDS Station

### Mesh Detail

Mesh AP  
Mesh Only

### 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)  
802.1X Supplicant (CB Mode)  
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)**

Compliant with IEEE 802.11e standard

## **Physical/Environment Conditions**

Operating:

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

Humidity (non-condensing): 90% or less

Storage:

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

Humidity (non-condensing): 90% or less

# ENH1350EXT

## Standard:

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

## Antenna

4 External N-type Antenna  
    2 x detachable 5.17 dBi 2.4 GHz Omni-directional Antennas  
    2 x detachable 5.17 dBi 5 GHz Omni-directional Antennas

## Physical Interface

1 x 10/100/1000 Gigabit Ethernet Port with PoE support  
    LAN Port: IEEE802.3af and Proprietary 48V POE input.  
    Ethernet Ports support Surge Protection to 1KV

## LED Indicator

Power  
LAN  
2.4 GHz  
5 GHz

## Power Requirements

External Power Adapter, DC IN, 48V/0.6A

## Operation Modes

Access Point  
Client Bridge  
WDS

## WDS Detail

WDS AP  
WDS Bridge  
WDS Station

## Management

Auto Channel Selection  
Multiple SSID: 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)  
802.1X Supplicant (CB Mode)  
Multicast Supported  
Auto Reboot  
Obey Regulatory Power

## Security

WPA2 Personal  
WPA2 Enterprise  
Hides SSID in beacons  
MAC address filtering, up to 32 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 to 140 °F (-20 °C to 60 °C)

Humidity (non-condensing): 0%~90% typical

Storage:

Temperature: -40 °F to 176 °F (-40 °C to 80 °C)

Humidity (non-condensing): 0%~90% typical

## Power Setting

ENH1350EXT follow below power table to do power setting.

### 2.4G BAND1

Frequency	CH	Setting
	11b	
2412	CH01	16
2437	CH06	20.5
2462	CH11	19
	11g	
2412	CH01	13.5
2437	CH06	20.5
2462	CH11	14
	11n 20MHz	
2412	CH01	12
2437	CH06	20.5
2462	CH11	13.5
	11n 40MHz	
2422	CH03	10
2437	CH06	14

### 5G BAND1

Frequency	CH	Setting
	11a	
5180	CH36	13
5200	CH40	13
5240	CH48	13
	5G 11n 20MHz	
5180	CH36	13
5200	CH40	13
5240	CH48	13
	5G 11n 40MHz	
5190	CH38	13
5230	CH46	13
	5G 11n 80MHz	
5210	CH42	12.5

### 5G BAND 4

Frequency	CH	Setting
	11a	
5745	CH149	20.5
5785	CH157	20.5
5825	CH165	20.5
	5G 11n 20MHz	
5745	CH149	20.5
5785	CH157	20.5
5825	CH165	20.5
	5G 11n 40MHz	
5755	CH151	20.5
5795	CH159	20.5
	5G 11n 80MHz	
5775	CH155	18.5

# Physical Interface(ENH1750EXT)

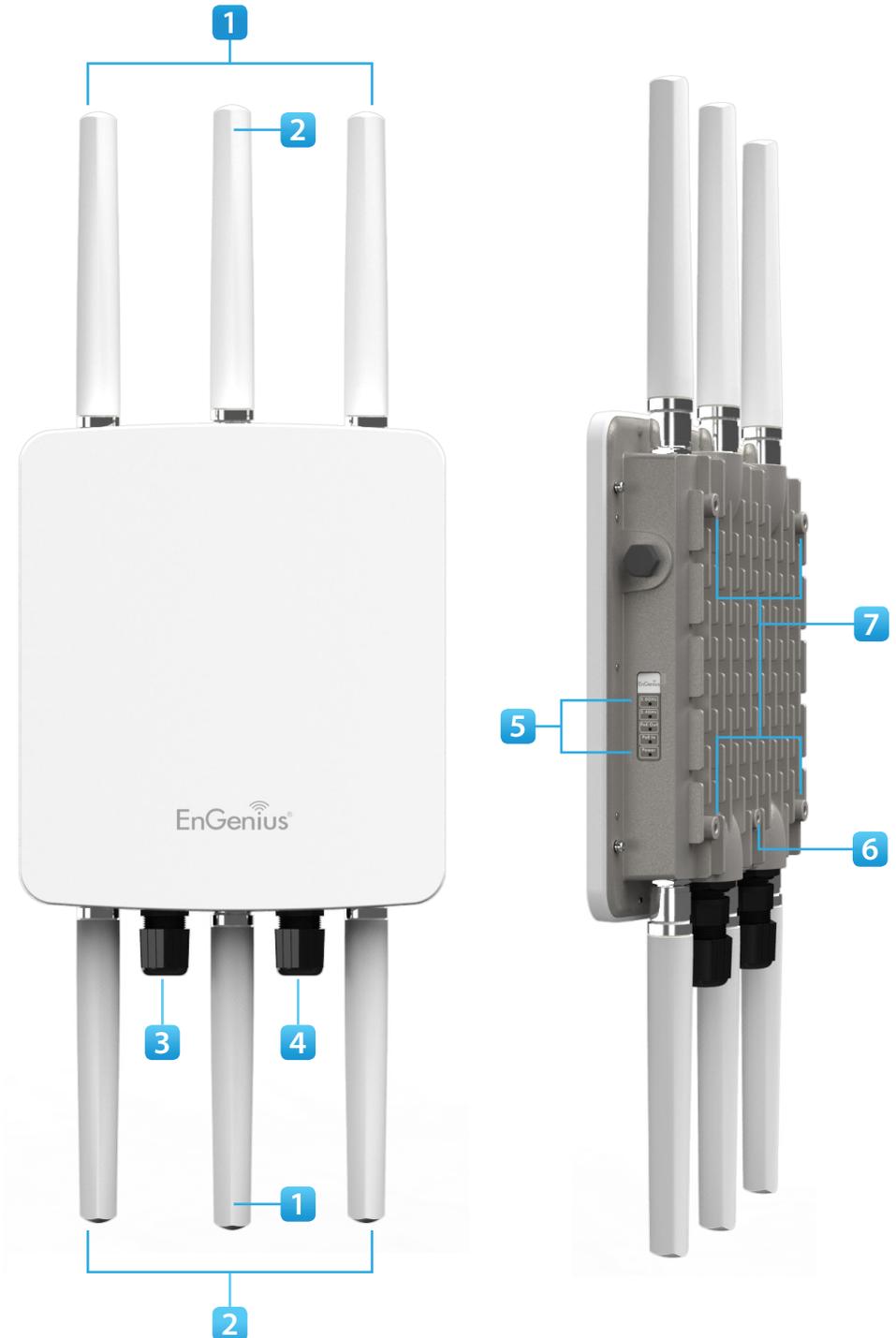
## Dimensions and Weights

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 PSE 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 ENH1750EXT can be attached to a wall or pole.

# Physical Interface(ENH1350EXT)

## Dimensions and Weights

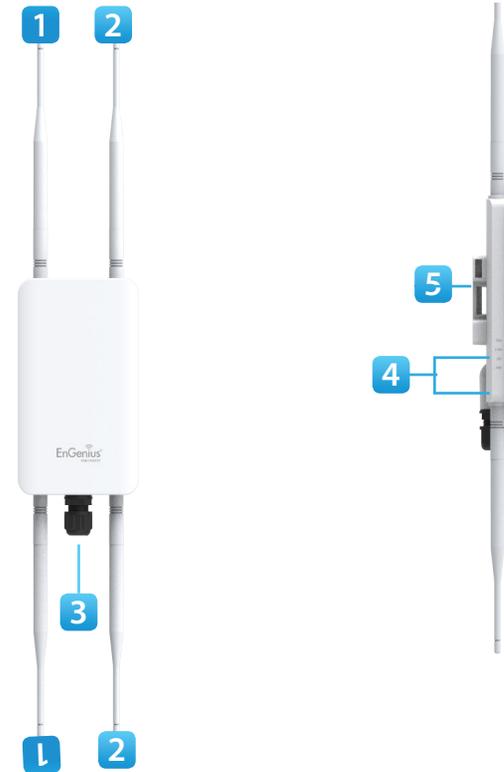
Length: 6.83"

Width: 4.38"

Depth: 1.19"

Weight: TBD

- 1 **2.4 GHz Antennas:** Detachable 5.17 dBi 2.4 GHz Omni-directional
- 2 **5 GHz Antennas** Detachable 5.17 dBi 5 GHz Omni-directional
- 3 **LAN Port (802.3af and Proprietary 48V PoE Input):** Ethernet port for RJ-45 cable.
- 4 **LED Indicators:** LED lights for Power, LAN Port, 2.4 GHz Connection and 5 GHz Connection.
- 5 **Mounting Holes:** Using the provided hardware, the ENH1350EXT can be attached to a wall or pole.



# Chapter 2

## **Before You Begin**



# Computer Settings

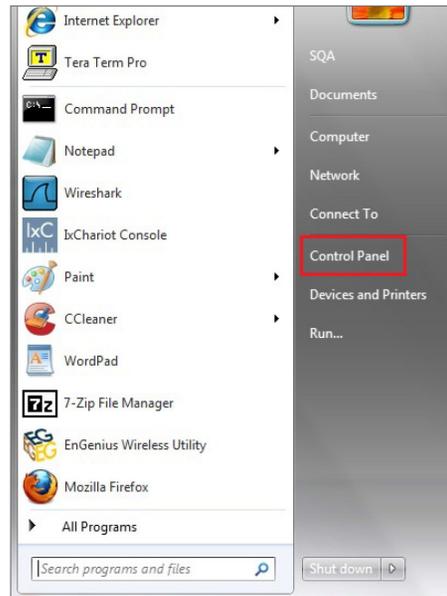
## Windows XP/Windows 7/Windows 8/Windows 10

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

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

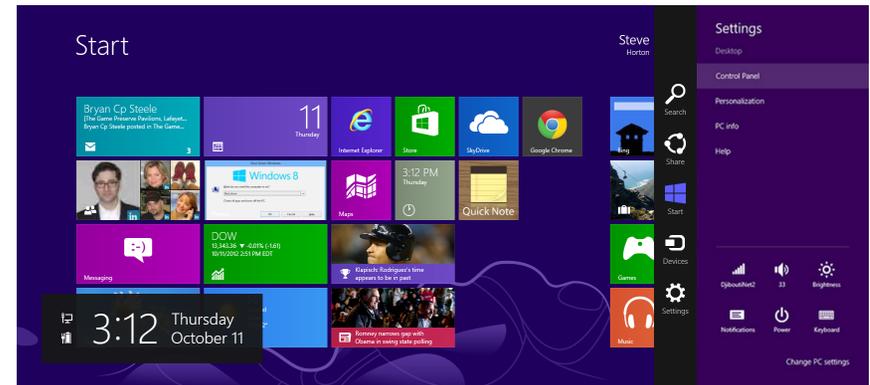


Windows XP



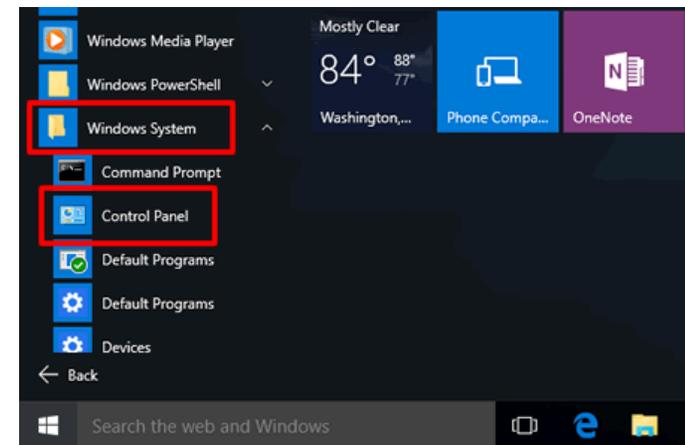
Windows 7

1b. Move your mouse to the lower right hot corner to display the Charms Bar and select the **Control Panel** in Windows 8 OS.



Windows 8

1c. In Windows 10, click **Start** to select **All APPs** to enter the folder of **Windows system** for selecting **Control Panel**.

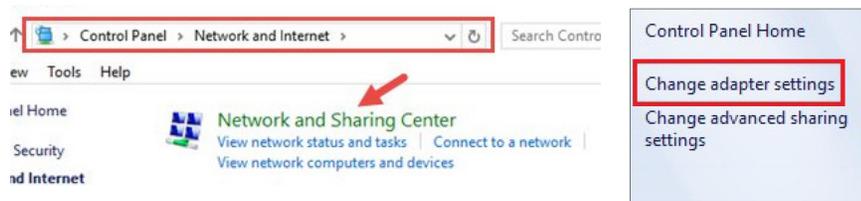


Windows 10

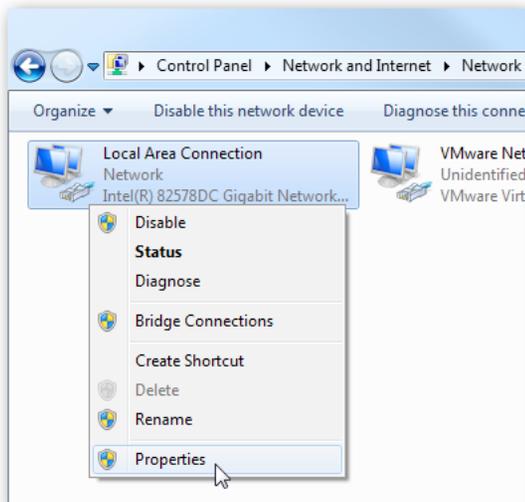
2a. In Windows XP, click **Network Connections**.



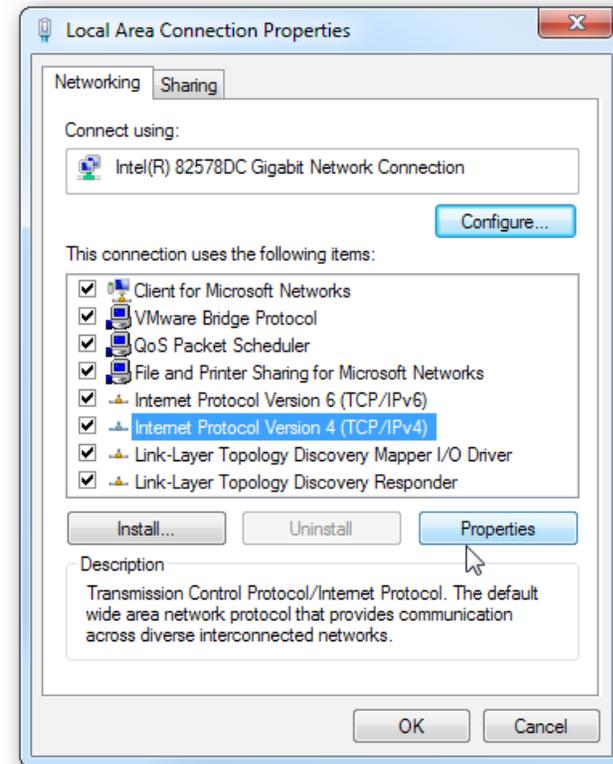
2b. In Windows 7/Windows 8/Windows 10, click **View Network Status and Tasks** in the **Network and Internet** section, then select **Change adapter settings**.



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



4. Select **Internet Protocol Version 4 (TCP/IPv4)** and then select **Properties**.



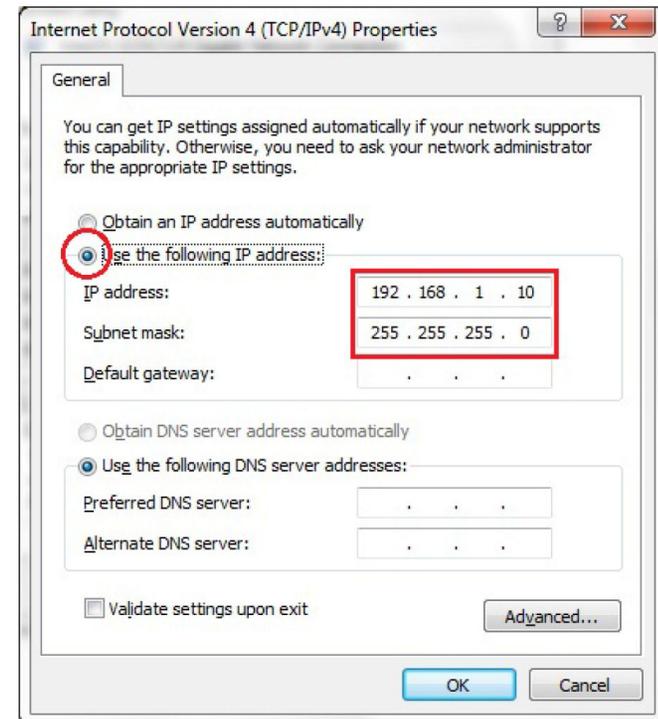
5. Select **Use the following IP address** and enter an IP address that is different from the Access Point and Subnet mask, then click **OK**.

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

For example: ENH220EXT IP address: 192.168.1.1

PCIP 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** (Which can be opened in the Applications folder or 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 press **OK**.

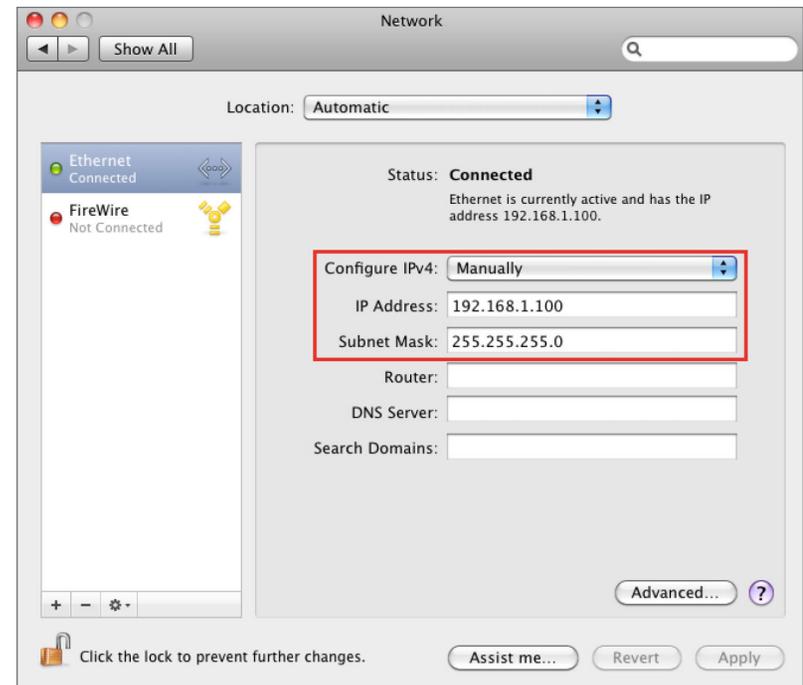
**Note:** Ensure that the IP address and Subnet mask are on the same subnet as the device.

For example: ENH900EXT 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 done.

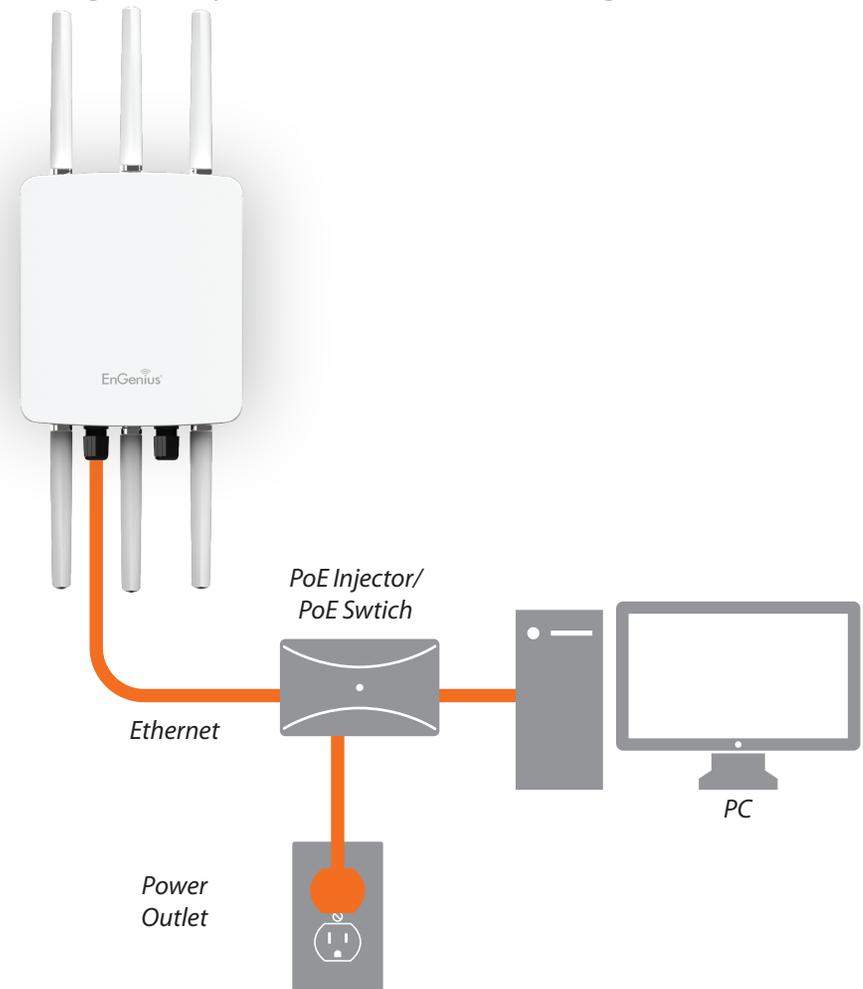


# Hardware Installation

## ENH1750EXT

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/ENH1750EXT 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.

This diagram depicts the hardware configuration.

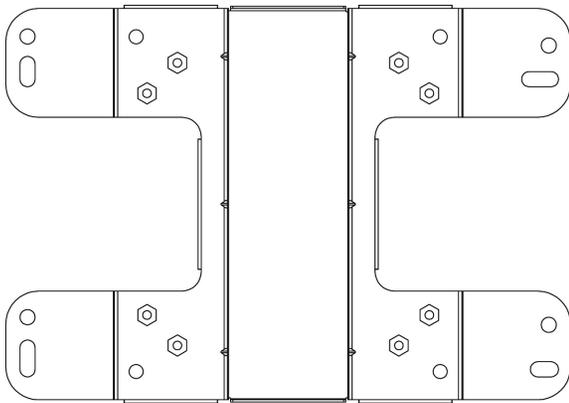


**Note:** The Access Point supports both IEEE 802.3at PoE (Power over Ethernet) or the included power injector. You may use either one as the power source. **Do NOT use both at the same time.**

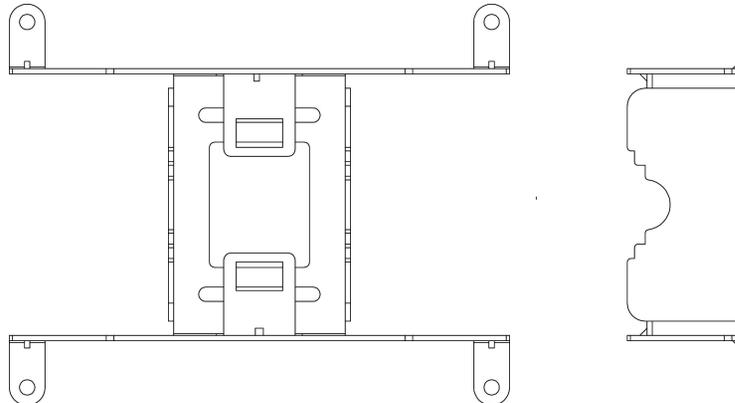
# Mounting the ENH1750EXT

Using the provided hardware, the ENH1750EXT can be attached to a wall or a pole.

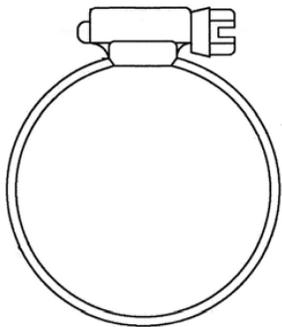
1. Wall Mount Kit 260x180x7 (mm)



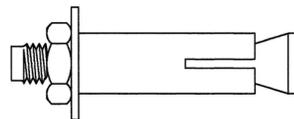
2. Pole Mount Kit 140x112x33 (mm)



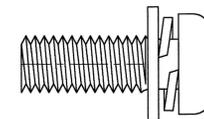
3. Pipe 63.5 (D) x 12.7 (mm)



4. Tool 20(D) x 6 (mm)

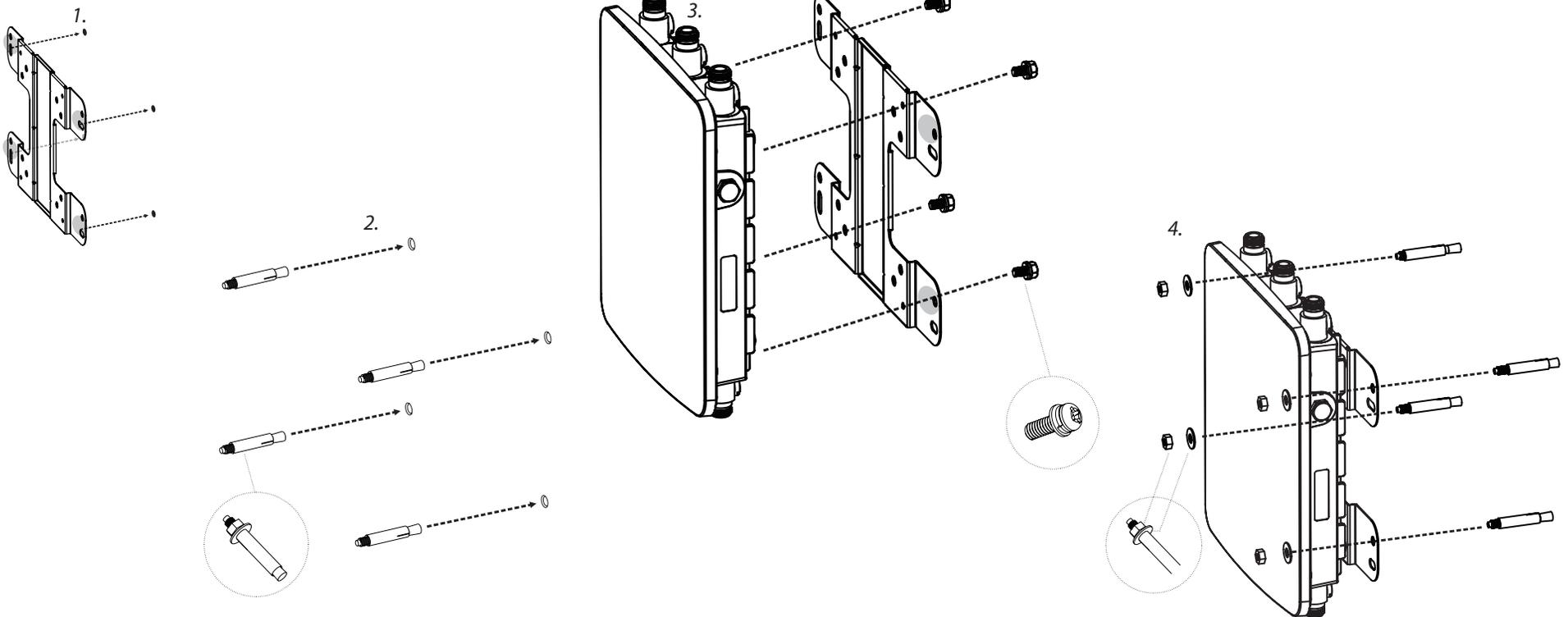


5. Screws: 6.5(D) x 9.95 (mm)



## To attach the ENH1750EXT to a wall using wall mounting kit.

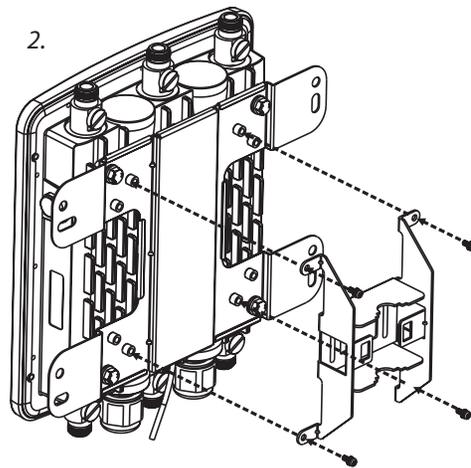
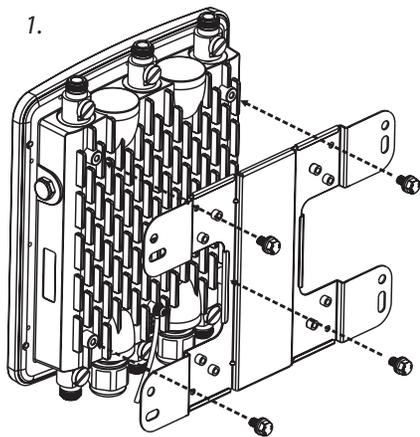
1. Mark the four locations of the mounting holes on the flat mounting surface.
2. Drill a 37 mm deep 8 mm hole in the markings and hammer the bolts into the openings.
3. Place the lock and flat washers on the four hex cap screws and drive the screws to attach the bracket to the back of the Access Point.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



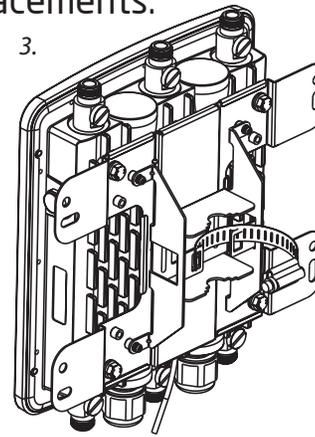
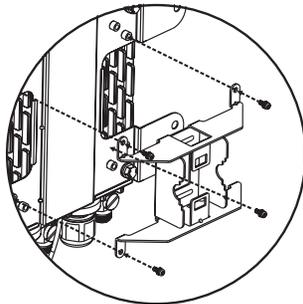
## To attach the ENH1750EXT to a pole using the provided pole mounting kit:

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.

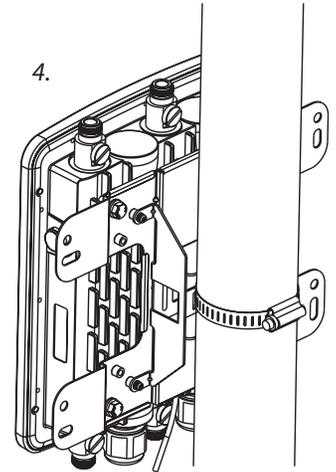
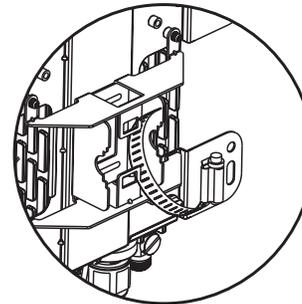
**Note:** See diagram below for vertical and horizontal placements.



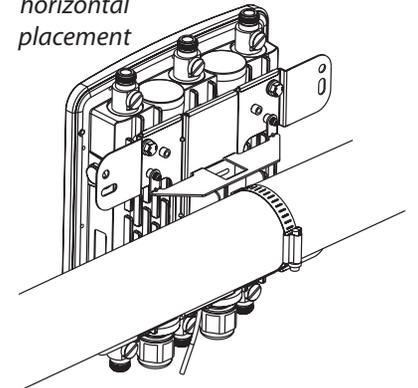
*horizontal placement*



*horizontal placement*



*horizontal placement*



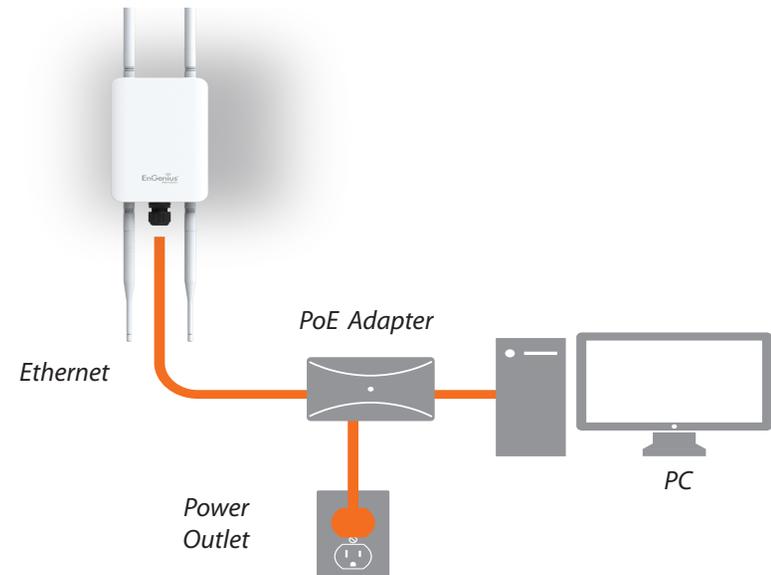
# Hardware Installation

## ENH1350EXT

1. Connect one end of the Ethernet cable into the LAN port (PoE) of the AP/ Bridge and the other end to the PoE port on the PoE adapter.
2. Connect the Power cord with the PoE Adapter and plug the other end into an electrical outlet.
3. Connect the second Ethernet cable into the LAN port of the PoE adapter and the other end to the Ethernet port on the computer.
4. Screw on the provided antennas to the top of this device.

Note: The AP/Bridge should ONLY be powered via Ethernet cable connected to the included PoE Adapter.

This diagram depicts the hardware configuration.



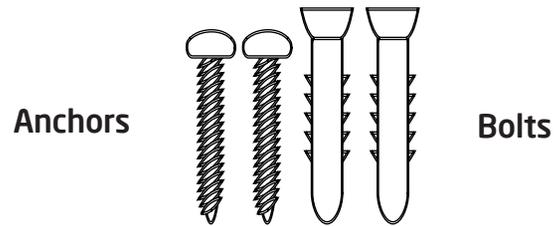
**Note:** The AP/Bridge should ONLY be powered via Ethernet cable connected to the included PoE Adapter.

# Mounting the ENH1350EXT

Using the provided hardware, the ENH1350EXT can be attached to a wall or a pole.

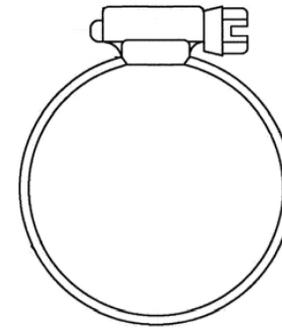
## 1. Wall Mounting Kit

(Anchors:  $\Phi 5.5 \times 18 \text{ mm}$  & Bolts:  $\Phi 8 \times 25 \text{ mm}$ )



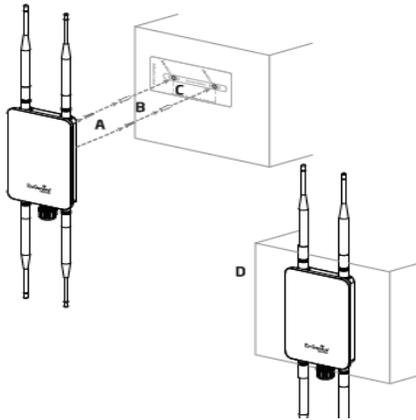
## 2. Pole Mounting Strap

( $\Phi 66 \times 12.6 \text{ mm}$ )



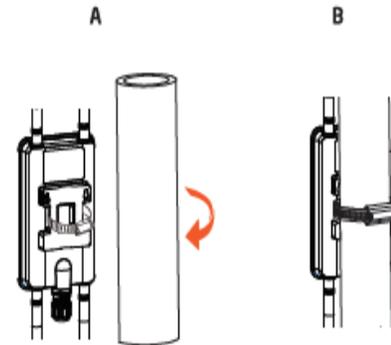
## To attach the ENH1350EXT to a wall using wall mounting kit.

- A. Determine where the Access Point to be placed and stick the Adhesive label on the surface.
- B. Use the appropriate drill bit to drill two 8.1 mm diameter and 26mm depth holes on the markings of the label.
- C. Remove the label and screw the anchors into the holes until they are flush with the wall.
- D. Screw the included screws into the anchors. Place the Access Point against wall with the mounting screw heads.



## To attach the ENH1350EXT to a pole using the provided pole mounting kit:

- A. Thread the open end of the Pole Strap through the two tabs on the Pole Mount Bracket.
- B. Lock and tighten Pole Strap to secure Pole Mount Bracket to the pole.



# 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.

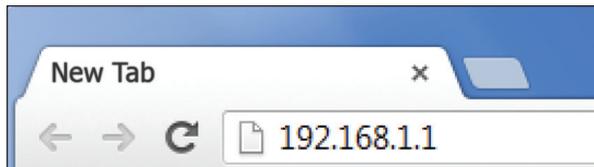
## Default Settings

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/Chrome) and enter the IP Address **http://192.168.1.1**



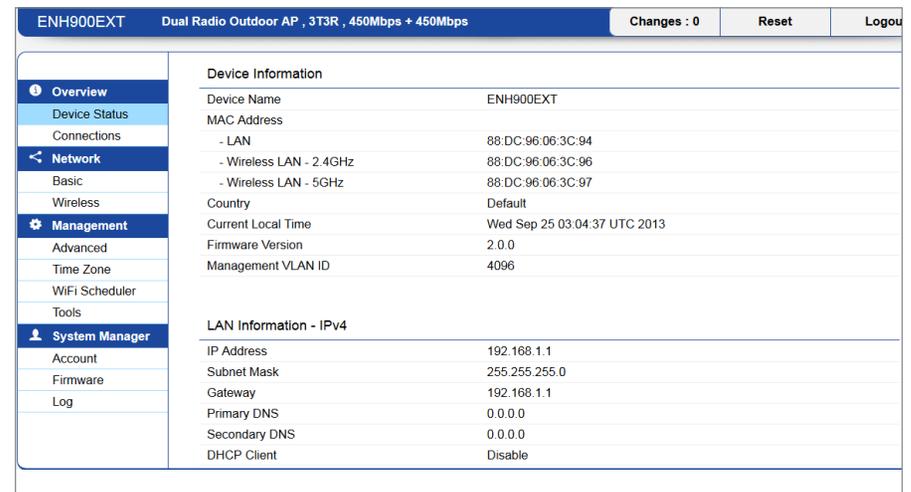
**Note:** If you have changed the default LAN IP Address of the Access Point, ensure you enter the correct IP Address.

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-base configuration page.



\*The model name will be varied by different models.

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



ENH900EXT Dual Radio Outdoor AP, 3T3R, 450Mbps + 450Mbps		Changes : 0	Reset	Logout
<b>Overview</b>	<b>Device Information</b>			
Device Status	Device Name	ENH900EXT		
Connections	MAC Address			
< Network	- LAN	88:DC:96:06:3C:94		
Basic	- Wireless LAN - 2.4GHz	88:DC:96:06:3C:96		
Wireless	- Wireless LAN - 5GHz	88:DC:96:06:3C:97		
Country	Country	Default		
Current Local Time	Current Local Time	Wed Sep 25 03:04:37 UTC 2013		
Firmware Version	Firmware Version	2.0.0		
Management VLAN ID	Management VLAN ID	4096		
<b>Management</b>	<b>LAN Information - IPv4</b>			
Advanced	IP Address	192.168.1.1		
Time Zone	Subnet Mask	255.255.255.0		
WiFi Scheduler	Gateway	192.168.1.1		
Tools	Primary DNS	0.0.0.0		
<b>System Manager</b>	Secondary DNS	0.0.0.0		
Account	DHCP Client	Disable		
Firmware				
Log				

# Chapter 4

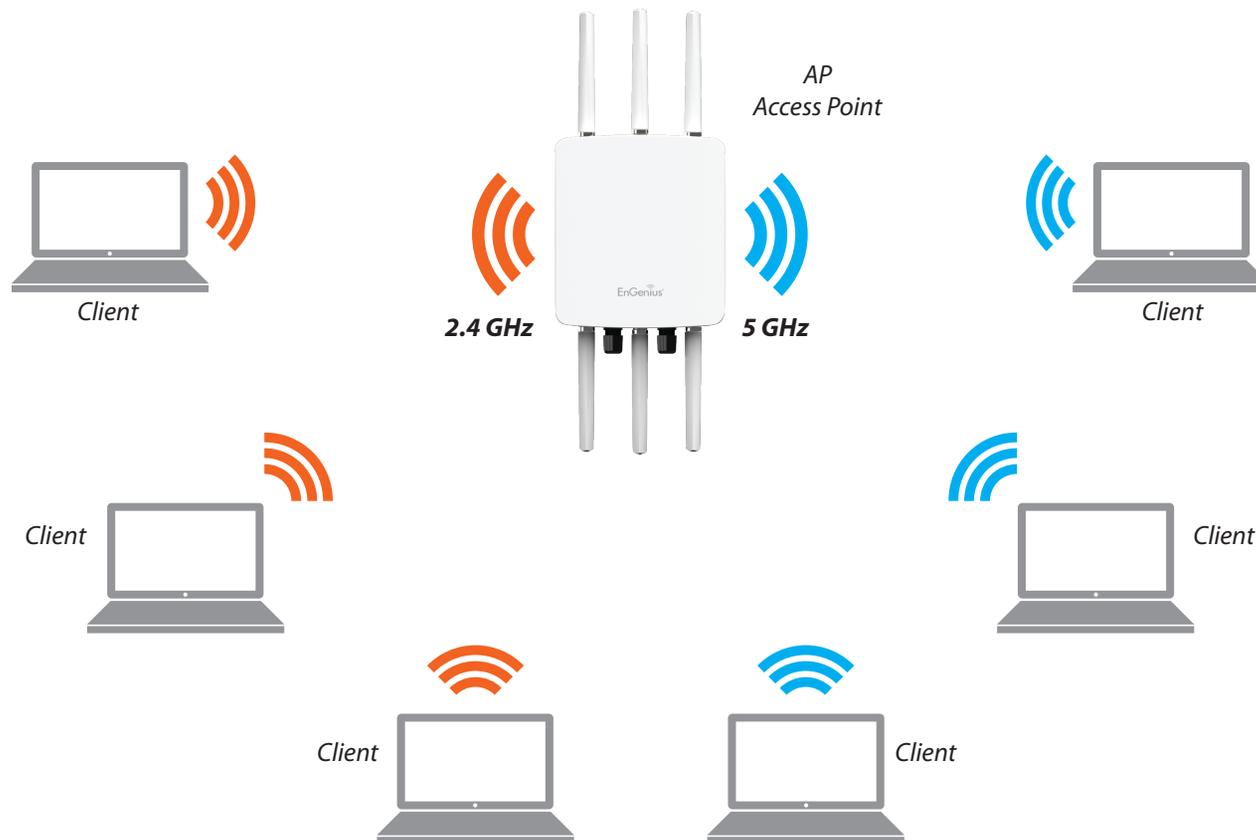
# **Building a Wireless Network**



Before starting to configure this Access Point, you may realize the used scenario under varied operating modes. The AP has the ability to operate in various modes. This chapter describes purpose of different operating modes and lists down the operating modes for outdoor Access Points.

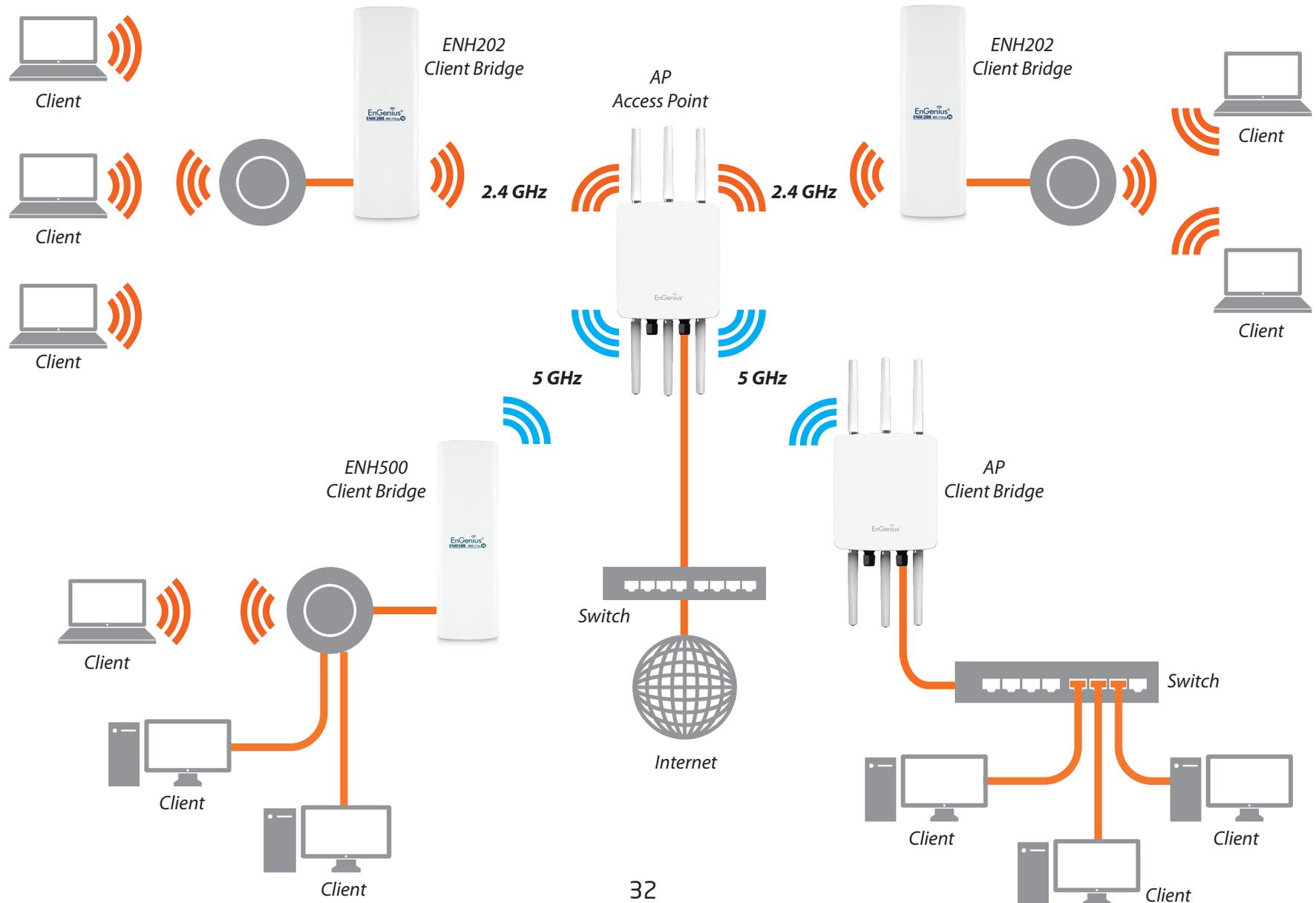
## Access Point Mode

In Access Point Mode, AP behaves like a central connection for stations or clients that support IEEE 802.11 ac/a/b/g/n networks. The stations and clients must be configured to use the same SSID (Service Set Identifier) and security password to associate with the AP. The AP supports up to eight SSIDs at the same time for secure access.



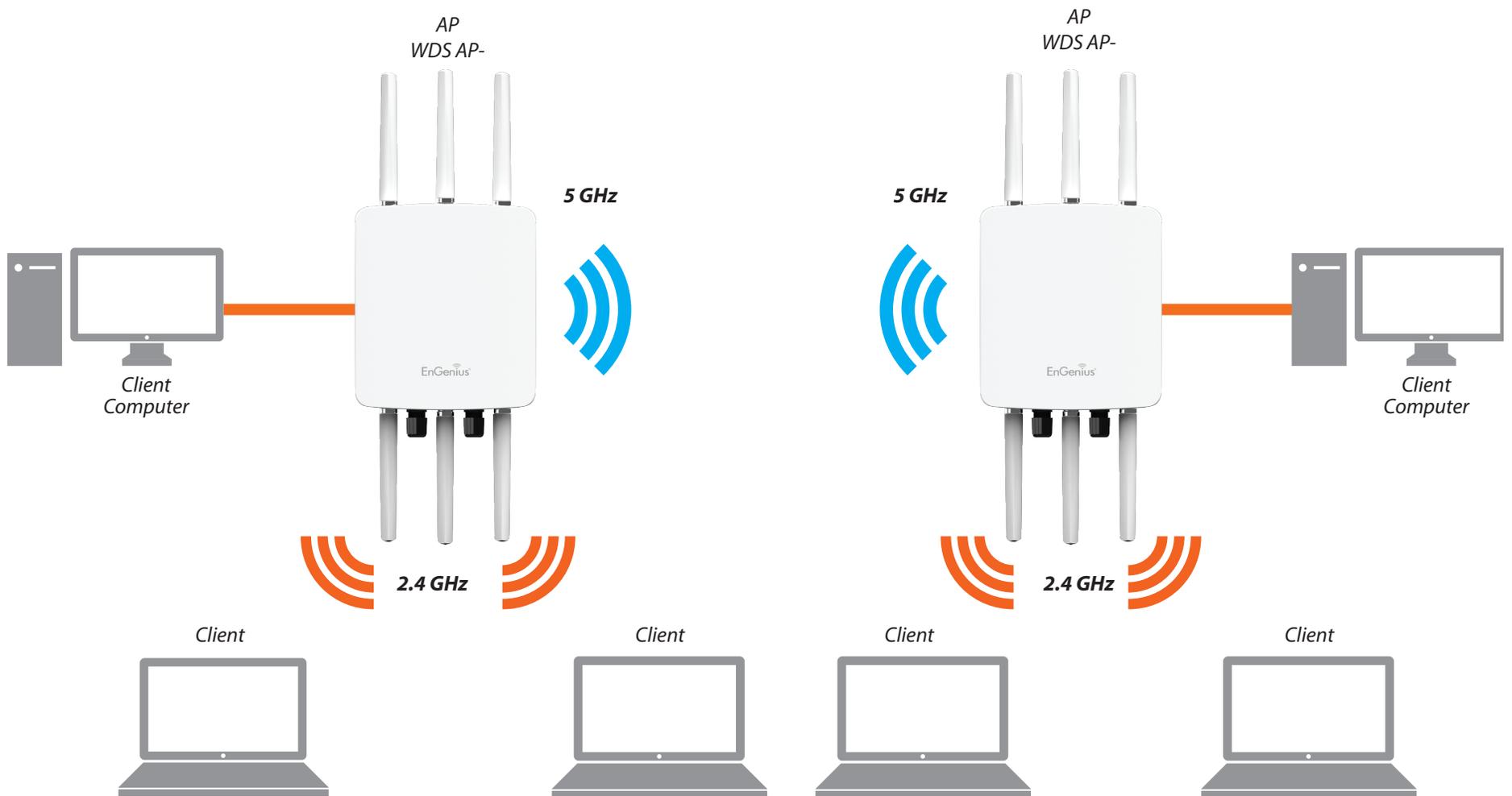
## Client Bridge Mode

The AP can be used as a centralized Outdoor Access Point with which other EnGenius Wireless N 2.4 or 5 GHz Outdoor Client Bridges can associate; leveraging the long-range capability of their internal high-gain directional antennas, resulting in a very cost-effective solution to expand a company network over a multiple building campus.



## WDS AP Mode

The AP also supports WDS AP mode. This operating mode allows wireless stations to connect with Access Point via using WDS technology. In this mode, configure the MAC addresses or SSIDs in both Access Points to enlarge the wireless area by enabling WDS Link settings. WDS supports up to four (4) AP MAC addresses and four (4) SSIDs at the same time.

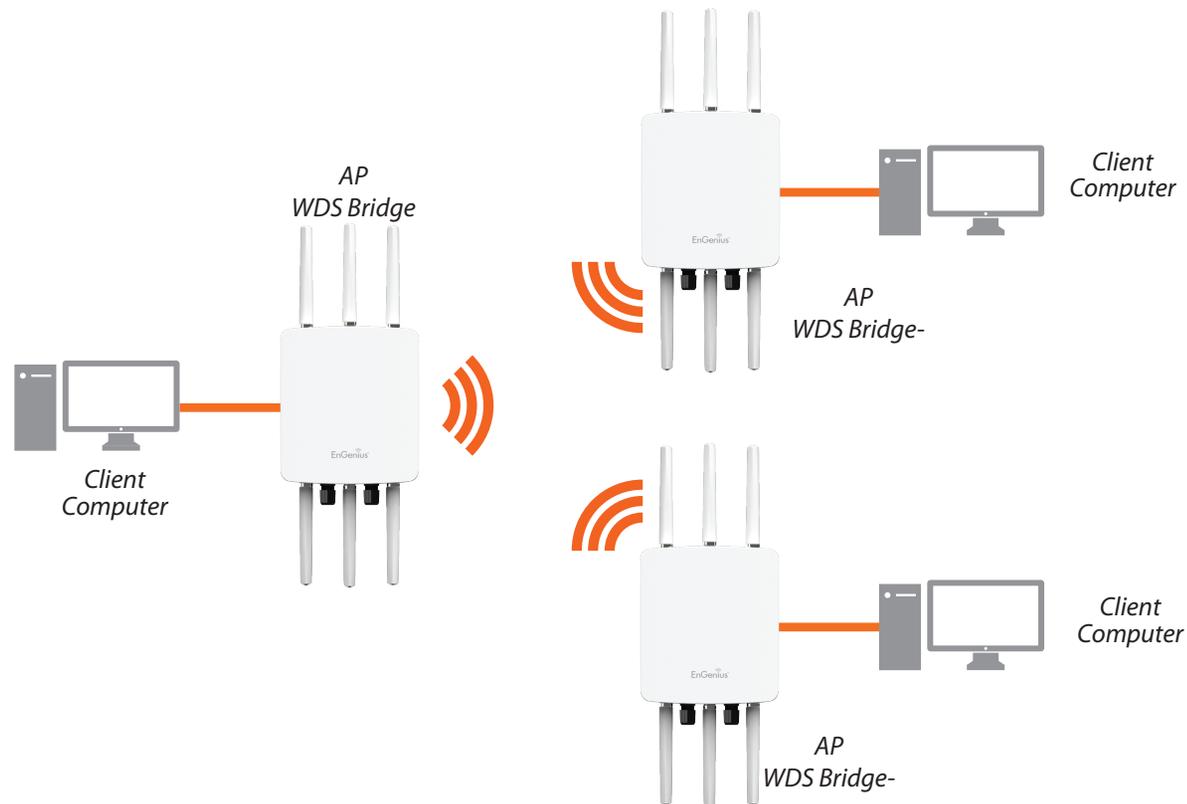


## WDS Bridge Mode

In WDS Bridge Mode, the Access Point can wirelessly connect different LANs by configuring the MAC address and security settings of each Access Points. Use this operating mode when two wired LANs located a small distance apart want to communicate with each other. The best solution is to use the Access Point to wirelessly connect two wired LANs, as shown in the following diagram.

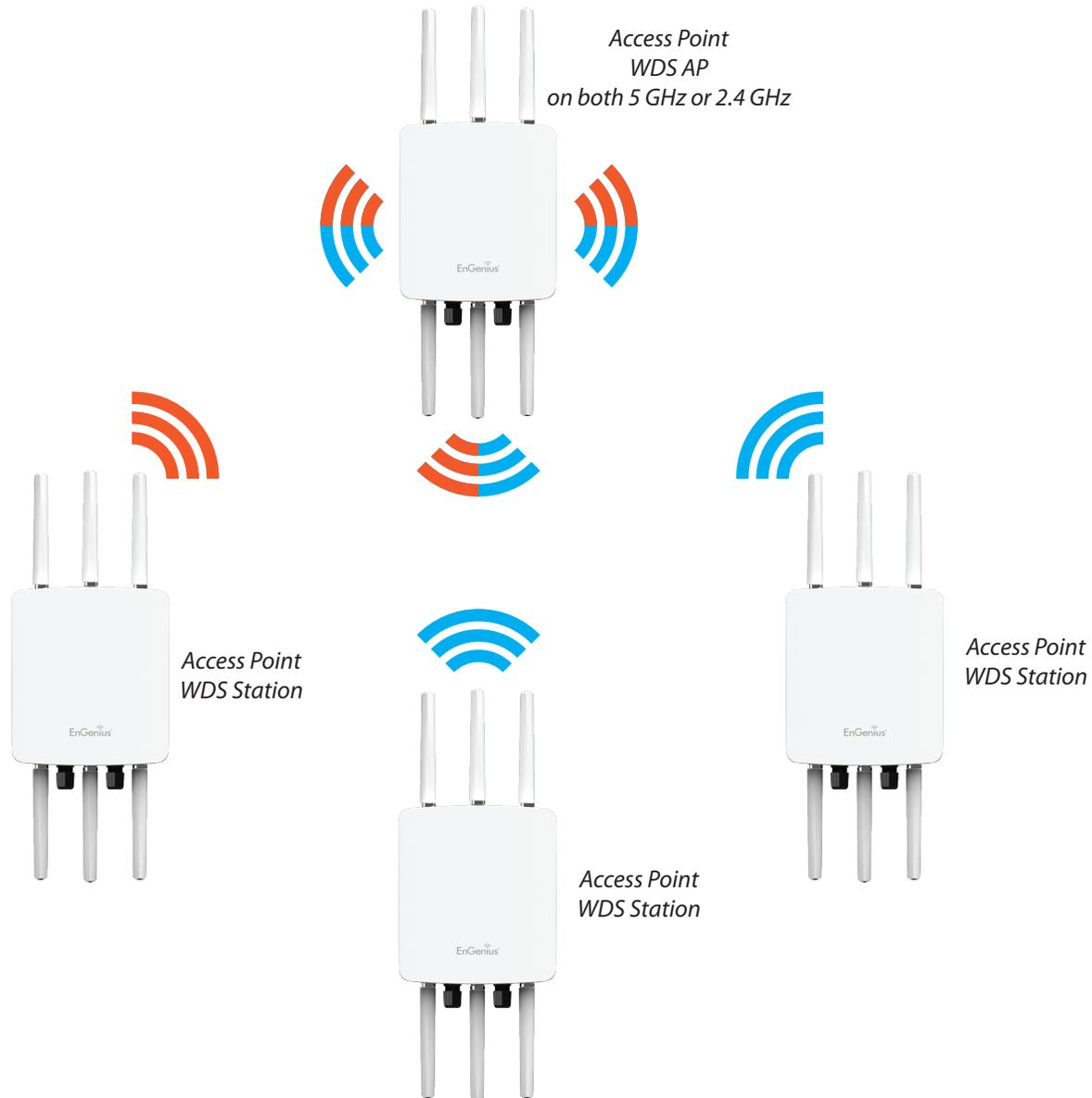
WDS Bridge Mode can establish up to four (4) to eight (8) WDS links, creating a star-like network.

**Note:** WDS Bridge Mode does not act as an Access Point. Access Points linked by WDS are using the same frequency channel. More Access Points connected together may lower throughput. This configuration can be susceptible to generate endless network loops in your network, so it is recommended to enable the Spanning Tree function to prevent this from happening.



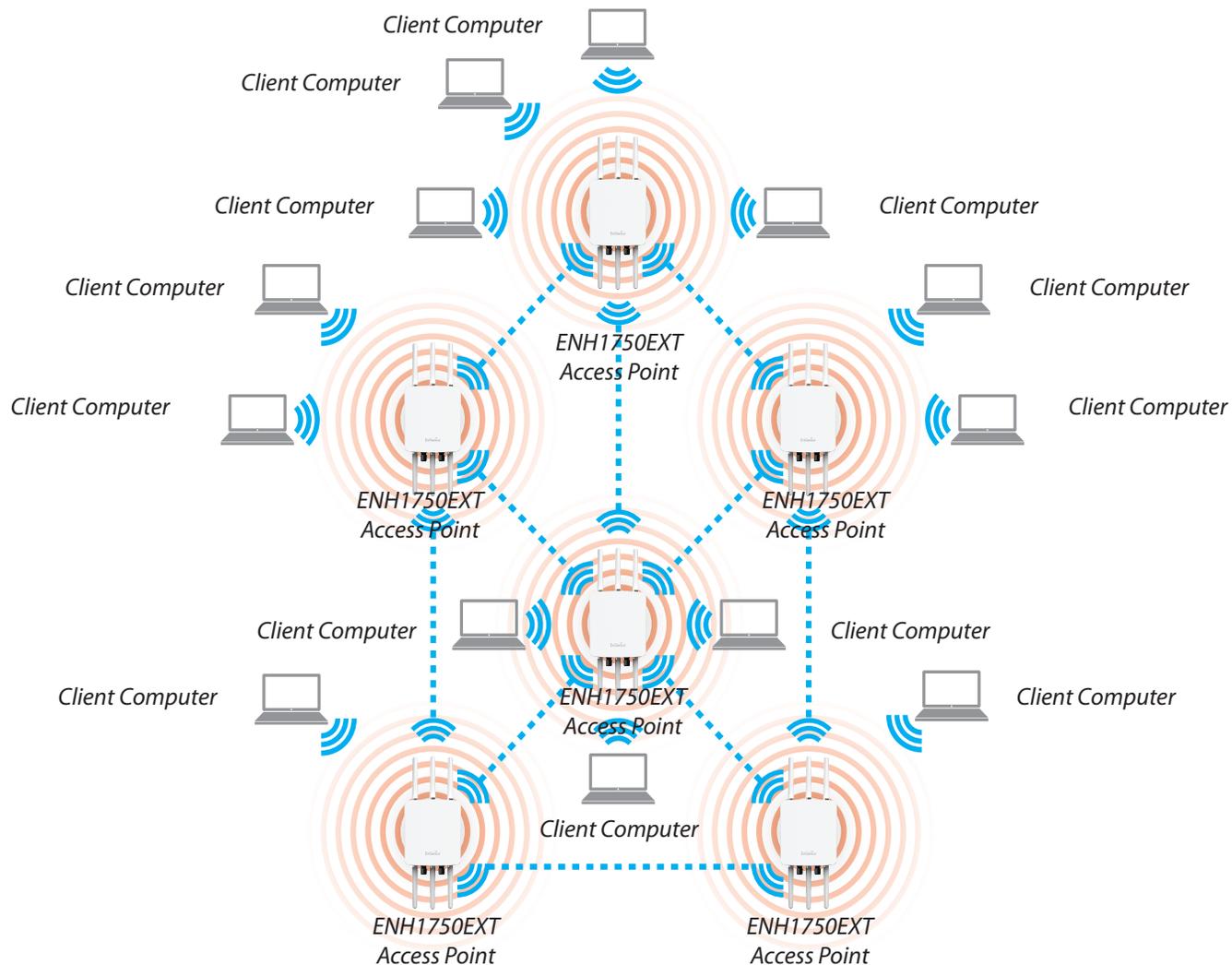
## WDS Station Mode

WDS station (WDS STA) mode expands the WDS by receiving a wireless signal/service and sharing it through the Ethernet port. With WDS STA mode.



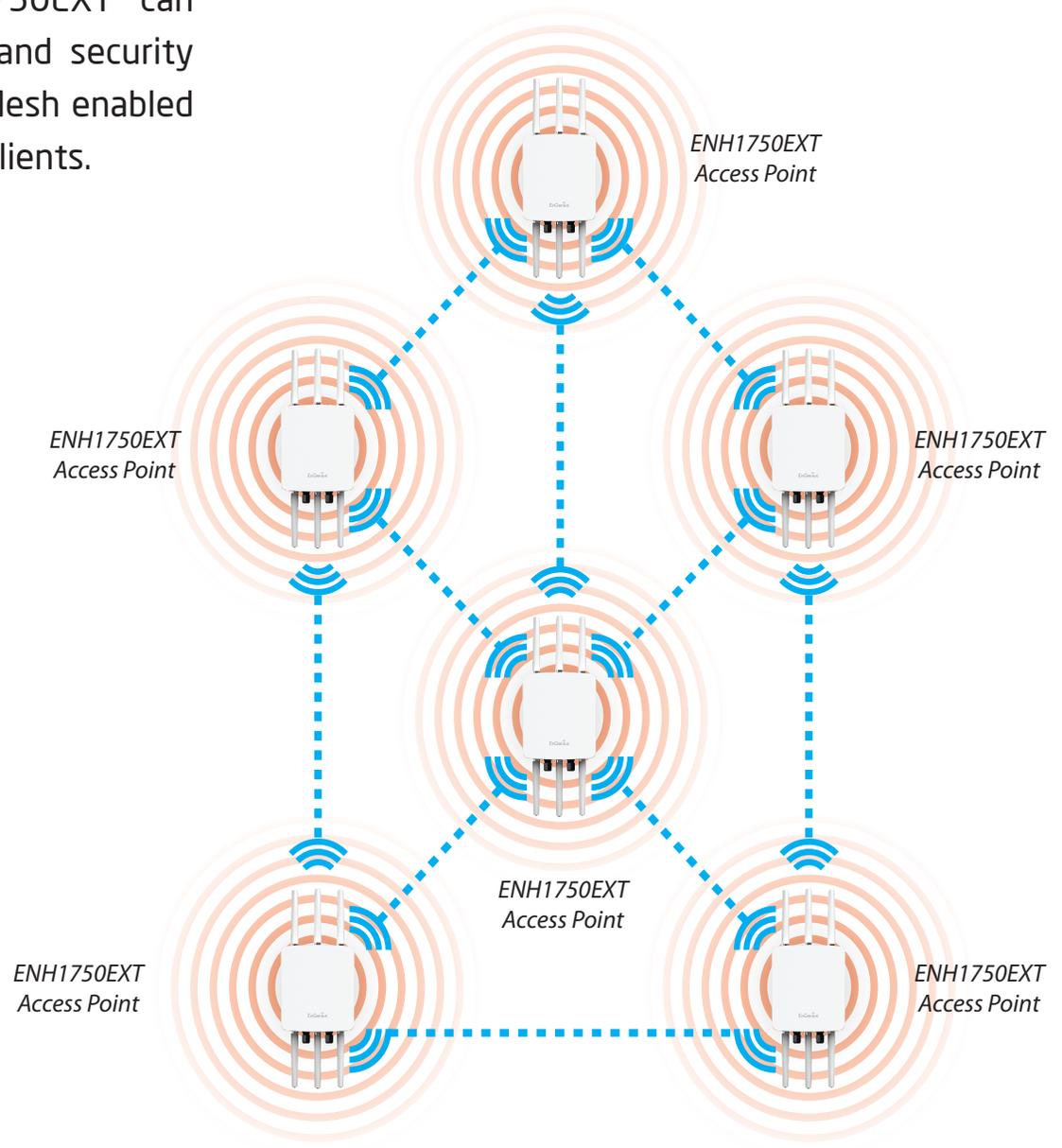
## AP Mesh Mode-ENH1750EXT

Under the AP Mesh mode, the ENH1750EXT can be used as the central connection hub for station or clients that support IEEE 802.11 b/g/n network. Under this mode, the ENH1750EXT can be configured with the same Mesh SSID and security password in order to associate with other ENH1750EXTs, as well as connect with clients under the same SSID and encryption signatures. For example, you would use one band to connect Access Points in range with Mesh



## Mesh Only Mode-ENH1750EXT

Under the Mesh-only mode, the ENH1750EXT can be configured with the same Mesh SSID and security password in order to associate with other Mesh enabled ENH1750EXTs, instead of connecting with clients.



# Chapter 5

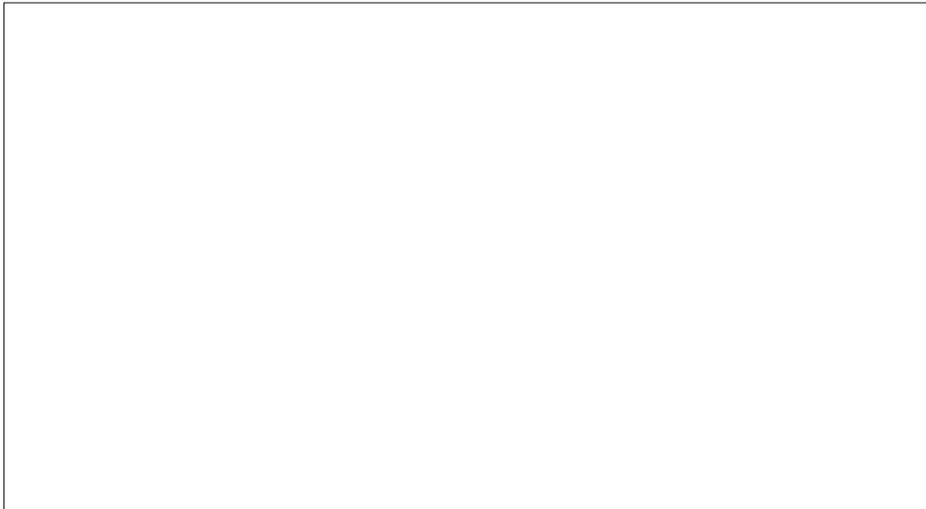
# Status



# Overview

## Save Changes

This page lets you save and apply the settings shown under **Unsaved changes list**, or Revert the unsaved changes and revert to the previous settings that were in effect.



## Device Status

Clicking the **Device Status** link 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

**Note:** VLAN ID is only applicable in Access Point, WDS AP or WDS BR mode.

Device Information	
Device Name	ENH900EXT
MAC Address	
- LAN	88:DC:96:06:3C:94
- Wireless LAN - 2.4GHz	88:DC:96:06:3C:96
- Wireless LAN - 5GHz	88:DC:96:06:3C:97
Country	Default
Current Local Time	Wed Sep 25 03:04:37 UTC 2013
Firmware Version	2.0.0
Management VLAN ID	4096

- The **Memory Information** section shows usage of

memory such as Total Available, Free, Cached, Buffered

and WDS AP modes.

- The **LAN Information** section shows the Local Area Network settings such as the LAN IP Address, Subnet mask, Primary DNS Address, Secondary DNS Address, status of DHCP client, and status of Spanning Tree protocol (STP).

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

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

**Note:** Profile Settings are only applicable in Access Point

Wireless LAN Information - 2.4GHz					
Operation Mode	AP				
Wireless Mode	802.11 B/G/N				
Channel Bandwidth	20-40 MHz				
Channel	2.437 GHz (Channel 6)				
Distance	1000 M				
Profile	SSID	Security	VID	802.1Q	
#1	EnGenius063C96_1-2.4GHz	None	1	Disable	
#2	EnGenius063C96_2-2.4GHz	None	2	Disable	
#3	EnGenius063C96_3-2.4GHz	None	3	Disable	
#4	EnGenius063C96_4-2.4GHz	None	4	Disable	
#5	EnGenius063C96_5-2.4GHz	None	5	Disable	
#6	EnGenius063C96_6-2.4GHz	None	6	Disable	

Wireless LAN Information - 5GHz					
Operation Mode	AP				
Wireless Mode	802.11 A/N				
Channel Bandwidth	40 MHz				
Channel	5.66 GHz (Channel 132)				
Distance	1000 M				
Profile	SSID	Security	VID	802.1Q	
#1	EnGenius063C97_1-5GHz	None	51	Disable	
#2	EnGenius063C97_2-5GHz	None	52	Disable	
#3	EnGenius063C97_3-5GHz	None	53	Disable	
#4	EnGenius063C97_4-5GHz	None	54	Disable	
#5	EnGenius063C97_5-5GHz	None	55	Disable	
#6	EnGenius063C97_6-5GHz	None	56	Disable	
#7	EnGenius063C97_7-5GHz	None	57	Disable	
#8	EnGenius063C97_8-5GHz	None	58	Disable	

- The **Statistics** section shows Mac information such as SSID, MAC address, RX and TX.

- The **Wireless Mesh Information - 2.4 GHz** section shows wireless information such as Operation Mode, Wireless Mode, Channel Bandwidth, Frequency/Channel, Mesh SSID and Mesh Security.

Wireless Mesh Information - 2.4GHz	
Operation Mode	mesh-ap
Wireless Mode	802.11 B/G/N
Channel Bandwidth	20
Frequency/Channel	N/A
Mesh SSID	EnGeniusMesh
Mesh Security	None

# Connection

## 2.4 GHz/5 GHz Connection List

Click the connection link under the Overview menu displays the connection list of clients associated to the ENH1750EXT's 2.4 GHz/5 GHz, along with the MAC addresses and signal strength for each client. Clicking **Refresh** updates the client list.

**Note:** Only applicable in Access Point and WDS AP modes.

## 2.4 GHz/5 GHz WDS Link List

Click the connection link under the Overview menu. This page displays the current status of the WDS link, including WDS Link ID, MAC Address, Link Status and RSSI.

**Note:** Only applicable in WDS AP and WDS Bridge modes.

# Realtime

## Realtime

The Realtime section contains the following options:

**CPU Loading:** 3 minutes CPU loading percentage information, it displays current loading, average loading and peak loading status. Left bar is loading percentage; button is time tracing. Interval is every 3 seconds

**Traffic Loading:** 2.4GHz and 5GHz and Ethernet port inbound and outbound traffic by current, average and peak time.

**Realtime Connection (Pkts):** Overview on current active network connections. It displays UDP and TCP packets information and other connection status. UDP connections curve is in blue; TCP connection curve is in green; others curve is in red. Below of chart shows connections source and destination.

### **The Mesh Link List**

Monitor the 2.4GHz Mesh Link List under the status menu. The page will display the current status of the Mesh Links under the Mesh AP mode and Mesh nodes under the Mesh Only mode.

**Note:** Only Applicable in the Mesh AP and Mesh Only mode.

# Chapter 6

# **Network**



# Basic IP Settings

## IPv4/IPv6 Settings

This page allows you to modify the device's IP settings.

IPv4 Settings	
IP Network Setting	Static IP ▾
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
IPv6 Settings	<input checked="" type="checkbox"/> Link-local Address
IP Address	
Subnet Prefix Length	
Gateway	
Primary DNS	
Secondary DNS	

**IP Network Settings:** Select whether the device IP address will use a 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.

**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.

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

## Spanning Tree Protocol (STP) Settings

This page allows you to modify the Spanning Tree settings. Enabling the Spanning Tree protocol will prevent network loops in your LAN network.

Spanning Tree Protocol (STP) Settings		
Status	Disable	
Hello Time	2	seconds (1-10)
Max Age	20	seconds (6-40)
Forward Delay	4	seconds (4-30)
Priority	32768	(0-65535)

**Spanning Tree Status:** Enables or disables the Spanning Tree function. Default is Disable.

**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 a long 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 in the network.

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

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

# Chapter 7

## 2.4 GHz & 5 GHz Wireless



# Wireless

## Wireless Settings

Wireless Settings	
Device Name	<input type="text" value="ENH1750EXT"/>
Country / Region	<input type="text" value="United States"/>
Band Steering	<input type="text" value="Disable"/> <span style="color: red;">NOTE:</span> In order for Band Steering function to work, the 2.4GHz and 5GHz SSID 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 broadcast to other devices.

**Band Steering:** Enable Band Steering to send 802.11n clients to the 5 GHz band, where 802.11b/g clients cannot go, and leave 802.11b/g clients in 2.4GHz to operate at their slower rates. Before implementing this feature, we suggest you to assure the both 2.4GHz and 5GHz SSID, as well as security settings must be the same. EnGenius Band Steering supports following advanced settings,

**Force 5GHz:** When band steering is configured to Force 5GHz mode, the AP will not dual band capable client devices to network to the 2.4GHz band only if the client devices are not currently associated on 2.4GHz radio in this AP.

**Prefer 5GHz:** When band steering is configured to Prefer 5GHz mode, the AP will steer dual band capable client devices to 5GHz radio when the RSSI value of these client devices on 5GHz radio is more than set one. The allowed RSSI value for default setting is -75dBm.

**\*Band Balance:** When band steering is configured to Band Balance mode, the AP will steer dual band capable client devices to 5GHz when the RSSI value of these client devices on 5GHz radio is more than set one. To evenly allocate RF resource on the both 2.4GHz and 5GHz radios, users also can set the portion of client devices on 5GHz radio to assure smoothly connection. The default value of the 5GHz radio is 75%.

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

This page displays the current status of the Wireless settings of the AP.

## 2.4 GHz/5 GHz Wireless Network

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

**Operation Mode:** Scrow down this list to select operation modes for implementing on this radio. The default operation mode is **Access Point** on base stations and Access Points and is **Client Bridge** on Client Premise Equipements (CPE). Meanwhile, EnGenius outdoor devices also support WDS modes for peer to peer or peer to multi-peer connections.

**Wireless Mode:** Scrow down this list to select wireless broadcasting standard on 2.4GHz and 5GHz frequency

bands.

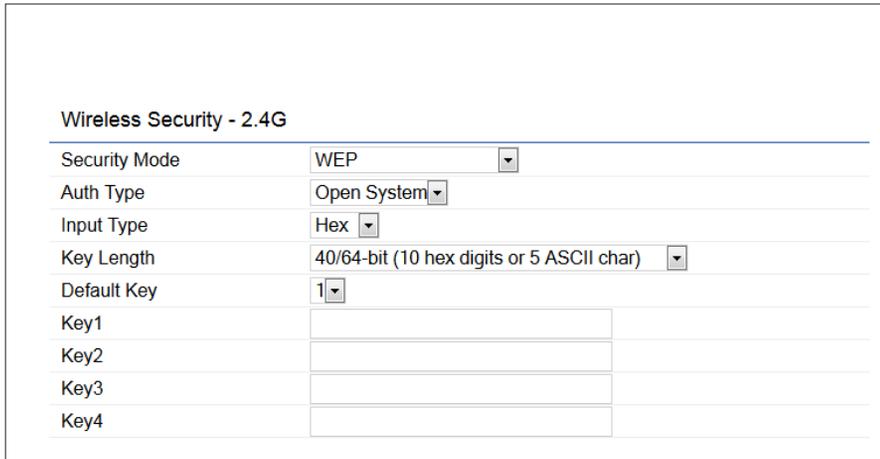
**Channel HT Mode:** Scrow down this list to select bandwidth for operating under a frequency band. The default channel bandwidth is 20 MHz on 2.4GHz frequency radio and 40 MHz on 5GHz frequency radio. Considering the different applications, users can decide to implement a channel bandwidth to fulfill real applications. The larger the channel, the greater the transmission quality and speed.

**Transmit Power (Tx Power):** Default Tx power is Auto to obey regularatory power of each country.

**Channel:** Click Configuration button to open a new windows to configure channels for performing wireless service.

## Wireless Security

The Wireless Security section lets you configure the AP's security modes



Wireless Security - 2.4G	
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	

**Security Mode:** Including WEP, WPA2-PSK, WPA2. We strongly recommend you to use WPA2-PSK mode.

\* **Setting of WEP mode:**

**Auth Type:** Select **Open System** or **Shared Key**.

**Input Type:**

ASCII: Regular Text (recommended)

Hexadecimal Numbers (For advanced users)

**Key Length:** Select the desired option and ensure that 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 the 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 Number:** Enter the Key Value or values you wish to use. Only the Key selected as Default is required. The others are optional.

Wireless Security - 5GHz	
Security Mode	WPA-PSK ▼
Encryption	AES ▼
Passphrase	<input type="text"/>
Group Key Update Interval	3600

**\* Setting of WPA2-PSK:**

**Encryption:** You may select AES, TKIP or Both (TKIP+AES) to be the encryption type you would like. 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 to 63 characters in length. If using HEX format, the Key must be 64 HEX characters in length.

**Group Key Update Interval:** Specifies how often, in seconds, the Group Key changes. The default value is 3600.

Wireless Security - 5GHz	
Security Mode	WPA-Enterprise ▼
Encryption	AES ▼
Group Key Update Interval	3600
Radius Server	<input type="text"/>
Radius Port	1812 Default 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

\*

**\* Setting of WPA2-Enterprise (Pre-Shared Key):**

**Encryption:** Select the WPA2 Enterprise. Please ensure that your wireless clients use the same settings.

**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:** Enable or disable 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:** Specifies how often, in seconds, the accounting data sends.

**Note:** 802.11n does not allow WPA2-PSK TKIP security mode. The connection mode will automatically change from 802.11n to 802.11g.

## Wireless Traffic Shaping

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

Wireless Traffic Shaping		
Enable Traffic Shaping	Disable ▾	
Download Limit	100	Mbps (1-999)
Upload Limit	100	Mbps (1-999)

Wireless Traffic Shaping.

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

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

**Per User:** Check this option to enable wireless traffic shaping per user function. This function allow users to limit the maximum download / upload bandwidth for each client devices on this SSID.

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

## Fast Roaming

Enable the function to serve mobile client devices that roam from Access Point to Access Point. Some applications running on Client devices require fast re-association when they roam to a different Access Point

Please enter the settings of the SSID and initialize the Security mode to WPA enterprise, as well as to set the Radius Server firstly. Users can enable the Fast Roaming and implement the advanced search.

Please also set the same enterprise Encryption under the same SSID on other Access Points and enable the Fast Roaming. When the configuration is realized on different Access Point, the mobile client devices can run the voice service and require seamless roaming to prevent delay in conversation from Access Point to Access Point.

Fast Roaming	
Enable Fast Roaming	Enable ▾
Advanced Search	Enable ▾

**Enable Fast Roaming:** Enable or disable fast roaming feature.

**Enable Advanced Search:** Enable or disable advanced search feature.

## Mesh Settings- ENH1750EXT

EnGenius®  
ENH900EXT Dual Radio Outdoor AP , 3T3R , 450Mbps + 450Mbps Changes : 13 Reset Logout

Overview  
Device Status  
Connections  
Network  
Basic  
Wireless  
Management  
Advanced  
Time Zone  
WiFi Scheduler  
Tools  
System Manager  
Account  
Firmware  
Log

Wireless Settings

Device Name: ENH900EXT  
Country / Region: Please Select a Country Code  
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.

	2.4GHz	5GHz
Operation Mode	Mesh-AP <input checked="" type="checkbox"/> Green	Access Point <input checked="" type="checkbox"/> Green
Wireless Mode	Access Point	802.11 A/N
Channel HT Mode	WDS Access Point	40 MHz
Extension Channel	WDS Bridge	Lower Channel
Channel	WDS Station	Auto
Transmit Power	Mesh-Only	Auto
Data Rate	AUTO	Auto
RTS / CTS Threshold (1 - 2346)	2346	2346
Client Limits	127 <input type="radio"/> Enable <input checked="" type="radio"/> Disable	127 <input type="radio"/> Enable <input checked="" type="radio"/> Disable

**AES Passphrase:** Enter the key values you wish to use. Other Access Points must use the same key to establish a mesh link

**Mesh SSID:** To create a mesh network, please enter the Mesh SSID of the Access Point that you wish to include in the Mesh.

**Security:** Select None or WPA2-PSK AES from drop-down list.

## Guest Network Settings

Adding a guest network allows visitors to use the Internet without giving out your office or company wireless security key. You can add a guest network to each wireless network in the 2.4 GHzb/g/n and 5 GHza/n frequencies.

Guest Network Settings					
Enable	SSID	Edit	Security	Suppressed SSID	Station Separation
<input type="checkbox"/>	EnGenius-2.4GHz_GuestNet	Edit	None	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	EnGenius-5GHz_GuestNet	Edit	None	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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				

**SSID:** Specified the SSID for the current profile.. Choices given are: Disabled, Deny MAC in the list, or Allow MAC in the list.

**Hidden SSID:** Check this option to hide SSID from clients, If checked, this SSID will not appear in the AP detect.

**Client Isolation:** Click the appropriate radio button to allow or prevent communication between client devices.

**IP address:** The IP Address of this device.

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

**Starting IP Address:** The first IP Address in the range of the addresses by the DHCP server.

**Ending IP Address:** The last IP Address in the range of addresses assigned by the DHCP server.

# RSSI Threshold

Fast Handover 

---

Status  Enable  Disable

RSSI  dBm (Range: -60dBm ~ -100dBm)

---

**Enable :** Enable the Fast Handover feature by ensuring that each client is served by at least one Access Point at any time. Access Points continuously monitor the connectivity quality of any client in their range and efficiently share this information with other Access Points in the vicinity of that client to coordinate which of them should serve the client best.

**RSSI:** Enter the RSSI (Received Signal Strength Index) in order to determine the handover procedure which the current wireless link will terminate. RSSI is an indication of the power level being received by the antenna. Therefore, the higher the RSSI number, the stronger the signal.

# Wireless MAC Filtering

Wireless MAC Filtering is used to allow or deny network access to wireless clients (computers, tablet PCs, NAS, smartphones, etc.) according to their MAC addresses. You can manually add a MAC address to restrict permission to access EAP1750H. The default setting is: **Disable Wireless MAC Filter**.

**Note:** Only applicable in Access Point and WDS AP mode.

Wireless MAC Filter

ACL Mode: Disabled

No.	MAC Address
	<input type="text"/> : <input type="text"/> <input type="button" value="Add"/>

**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 you wish to configure for.

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

**Delete:** Deletes the selected entries.

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

# Wireless Advanced

This page allows you to configure advanced wireless settings for the EWS550AP/EWS510AP/EWS511AP. It is recommended that the default settings are used unless the user has experience with more advanced networking features.

## 2.4 GHz/5 GHz Wireless Advanced

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

**Data Rate:** Select a data rate from the drop-down list. The data rate affects throughput of data in the EAP1750H. The lower the data rate, the lower the throughput, though transmission distance will be lowered as well.

**Transmit Power:** Sets the power output of the wireless signal.

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

**Distance:** Specifies the distance between Access Points and clients. Longer distances may drop high-speed connections.

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

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

# Chapter 8

# Management



## Management VLAN Settings

This page allows you to assign a VLAN tag to packets sent over the network. 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.

**Note:** Only applicable in Access Point and WDS AP modes.

Management VLAN Settings	
<b>CAUTION:</b> If you reconfigure the Management VLAN ID, you may lose connectivity to the access point. Verify that the switch and DHCP server can support the reconfigured VLAN ID, and then re-connect to the new IP address.	
Management VLAN	Enable <input checked="" type="checkbox"/> 4096

**Management VLAN:** If your network includes VLANs, you can enable **Management VLAN ID** for packets passing through the Access Point with a tag.

**Save:** Click **Save** to confirm the changes or **Cancel** to cancel and return to previous settings.

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

# Advanced Settings

## SNMP Settings

This page allows you to assign the Contact Details, Location, Community Name, and Trap Settings for a Simple Network Management Protocol (SNMP). SNMP 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.

### SNMP Settings

Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Contact	<input type="text"/>
Location	<input type="text"/>
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	<input type="text" value="MD5"/>
- Authorized Key	<input type="text" value="12345678"/> (8-32 Characters)
- Private Protocol	<input type="text" value="DES"/>
- Private Key	<input type="text" value="12345678"/> (8-32 Characters)
- Engine ID	<input type="text"/>

**SNMP Enable/Disable:** Enables or disables the SNMP feature.

**Contact:** Specifies the contact details of the device.

**Location:** Specifies the location of the device.

**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 IP address of the computer that will receive the SNMP traps.

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

**SNMPv3:** Enables or disables the SNMPv3 feature.

**User Name:** Specifies the username for SNMPv3.

**Auth Protocol:** Selects the authentication protocol type: MDS or SHA.

**Auth Key:** Specifies the authentication key.

**Priv Protocol:** Selects the privacy protocol type: DES.

**Priv Key:** Specifies the privacy key for privacy.

**Engine ID:** Specifies the engine ID for SNMPv3.

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

## CLI Settings

CLI Setting	
CLI	Enable ▾
SSH Setting	
SSH	Disable ▾
HTTPS Setting	
HTTPS	Enable ▾
HTTPS forward	Disable ▾

**CLI:** The Command Line Interface (CLI) allows you to type commands instead of choosing them from a menu or selecting an icon.

**SSH:** Enable Secure Shell (SSH) to make secure, encrypted connections in the network. Secure Shell is a network protocol that allows data to be exchanged using a secure channel between two network devices.

**HTTPS:** Enable HTTPS to transfer and display web content securely. The Hypertext Transfer Protocol over SSL (Secure Socket Layer) is a TCP/IP protocol used by web servers to transfer and display web content securely.

## Email Alert

You can use the Email Alert feature to send messages to the configured email address when particular system events occur.

Note: Do **NOT** use your personal email address as it can unnecessarily expose your personal email login credentials. Use a separate email account made for this feature instead.

Email Alert	
Status	<input checked="" type="checkbox"/> Enable
- From	<input type="text"/>
- To	<input type="text"/>
- Subject	[Email-Alert][ENH900EXT][00:02:6F:FF:FF:FF] Config
Email Account	
- Username	<input type="text"/>
- Password	<input type="text"/>
- SMTP Server	<input type="text"/> Port: 25
- Security Mode	None ▾ <input type="button" value="Send Test Mail"/>

**Status:** Enable this function for further settings.

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

**To:** Enter the address to receive email alerts.

**Subject:** Enter the text to appear in the email subject line.

**Username:** Enter the username for the email account that will be used to send emails.

**Password:** Enter the password for the email account that will be used to send emails.

**SMTP Server:** Enter the IP address or hostname of the outgoing SMTP server.

**Port:** Enter the SMTP port number to use for outbound emails.

# Time Zone

## Time Setting

This page allows you to set the internal clock of the AP.

**Date and Time Settings**

Manually Set Date and Time

Date: 2013 / 09 / 25

Time: 08 : 10 (24-Hour)

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

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

**Synchorize with PC:** Click this button to synchorize Date and time of this AP with the PC.

**Automatically Get Date and Time:** Select Automatically Get Date and Time and check whether you wish to enter the IP address of an NTP server or use the default NTP server to have the internal clock set automatically.

**Time Zone:** Choose a time zone to implement the service for this AP.

**Enable Daylight Saving:** Check whether daylight savings applies to your area.

**Start:** Select the day, month, and time when daylight savings time starts.

**Enable Daylight Saving:** Select the day, month, and time when daylight savings times ends.

# Auto Reboot Settings

You can specify how often you wish to reboot the AP.

## Auto Reboot Setting

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"/>

**Auto Reboot Setting:** Enables or disables the Auto Reboot function.

**Timer:** Select the day and enter the time you would like to reboot automatically.

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

# Wi-Fi Scheduler

The Wi-Fi Scheduler can be created for use in enforcing rules. For example, if you wish to restrict web access to Mon-Fri from 3pm to 8pm, you could create a schedule selecting Mon, Tue, Wed, Thu and Fri while entering a Start time of 3pm and End Time of 8pm to limit access to these times.

Wi-Fi Scheduler

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

Wireless Radio

SSID Selection

Schedule Templates

Day	Availability	Duration
Sunday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Monday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Tuesday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Wednesday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Thursday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Friday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00
Saturday	<input type="text" value="available"/>	00 : 00 ~ 24 : 00

drop-down list.

**Day(s):** Place a checkmark in the boxes for the desired days or select the **All Week** radio button to select all seven days of the week.

**Duration:** The Start Time is entered in two fields. The first box is for hours and the second box is for minutes. The End Time is entered in the same format as the Start time.

**Status:** Enables or disables the Wi-Fi scheduler function.

**Wireless Radio:** Select 2.4 GHz or 5 GHz from the drop-down list for the preferred band type.

**SSID Selection:** Select a SSID from the drop-down list.

**Schedule Templates:** Select a schedule template from the

# Tools

## Ping Test Parameters

This page allows you to analyze the connection quality of the AP and trace the routing table to a target in the network.

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 style="border: 1px solid #ccc; height: 100px; width: 100%;"></div>

Traceroute Test Parameters	
Target IP / Domain Name	<input type="text"/>
<input type="button" value="Start"/> <input type="button" value="Stop"/>	<div style="border: 1px solid #ccc; height: 100px; width: 100%;"></div>

**Target IP:** Enter the IP address 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 Ping:** Click **Start Ping** to begin pinging the target device (via IP).

**Traceroute Target:** Enter the IP address or domain name you wish to trace.

**Start Traceroute:** Click **Start Traceroute** to begin the trace route operation.

## Speed Test Parameters / LED Control

This page allows you to analyze the connection quality of the AP and trace the routing table to a target in the network.

### 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
IPv4Port	<input type="text" value="5001"/>
IPv6Port	<input type="text" value="5002"/>
<input type="button" value="Start"/>	

**Target IP / Domain Name:** Enter an IP address or domain name you wish to implement a speed test for realizing the variance on wireless speed.

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

**IPv4/IPv6 Port:** This Access Points uses IPv4 5001 and IPv6 5002 port for the speed test.

**Start:** Click start to implement speed test.

## LED Control

Control LED on/off for Power, LAN interface, or 2.4 GHz/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

**Power:** Enables or disables the Power LED indicator.

**LAN:** Enables or disables the LAN LED indicator.

**WLAN-2.4 GHz:** Enables or disables the WLAN-2.4 GHz LED indicator.

**WLAN-5 GHz:** Enables or disables the WLAN-5 GHz LED indicator.

## Device Discovery

This page allows you to discover devices from network for Operation Mode, IP Address, System MAC Address and Firmware version.

Device Discovery				
Device Name	Operation Mode	IP Address	System MAC Address	Firmware Version
<input type="button" value="Scan"/>				

# Account

This page allows you to change the AP username and password. 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

Account Settings	
Administrator Username	admin
Current Password	•••••
New Password	
Verify Password	

**Administrator Username:** Enter a new username for logging in to the New Name entry box.

**Current Password:** Enter the old password for logging in to the Old Password entry box.

**New Password:** Enter the new password for logging in to the New Password entry box.

**Verify Password:** Re-enter the new password in the Confirm Password entry box for confirmation.

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

# Firmware

## Firmware Upgrade

This page allows you to upgrade the firmware of the AP.

### Firmware Upgrade

Current Firmware Version: 1.0.0	
Select the new firmware from your hard disk.	
<input type="text"/>	<input type="button" value="瀏覽"/>
<input type="button" value="Upload"/>	

### To Perform the Firmware Upgrade:

1. Click the **Choose File** button and navigate the OS file system to the location of the 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 device is unavailable during the Firmware 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 the current device configurations. When you save your configurations, you also can reload the saved configurations into the device through the Restore Saved Settings from a file section. If extreme problems occur, or if you have set the AP incorrectly, you can use the **Reset** button in the Revert to Factory Default Settings section to restore all the configurations of the AP to the original default settings.

**Backup Setting:** Click **Export** to save the current configured settings.

**Restore New Setting:** To restore settings that have been previously backed up, click **Browse**, select the file, and click **Restore**.

**Restore to Default:** Click **Reset** button to restore the ENH1750EXT to its factory default settings.

## Backup/Restore Settings

Factory Setting	
- Backup Setting 	<input type="button" value="Export"/>
- Restore New Setting	<input type="button" value="選擇檔案"/> <input type="button" value="未選擇任何檔案"/> <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"/>

- **Caution:** Please write down your account number and password before saving. The user settings will now become the new default settings at the next successful login.

## User Setting

The function allows you to backup the current device configurations into the AP as the default value. If extreme problems occur, or if you have set the AP incorrectly, you can push the Reset button to revert all the configurations of the AP to the user default.

**Back Up Setting as Default:** Click **Backup** to backup the user settings you would like to the device's memory for the default settings.

**Restore to User Default:** Click **Restore** to restore user settings to the factory standard settings.

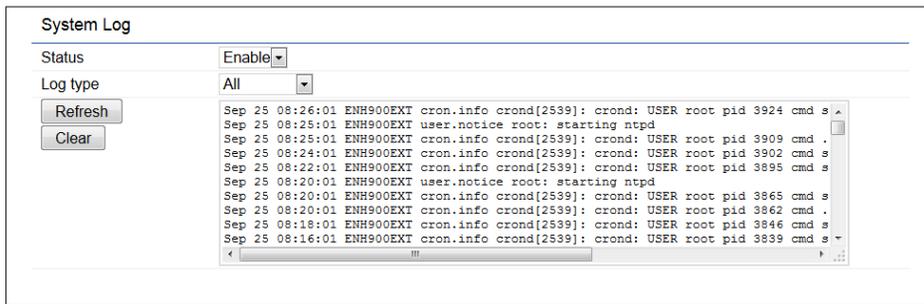
**Note1:** After setting the current settings as the default, you should click the **Restore to Default** on the web interface for reverting the settings into the factory default instead of pushing the reset button.

**Note2:** Please **write down** your account and password before saving. The user settings will now become the new default settings at the next successful login.

# Log

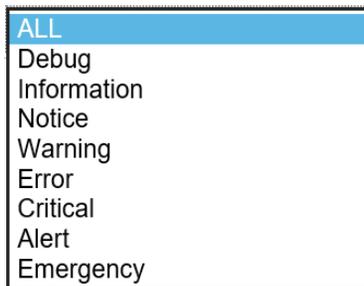
## System Log

The AP automatically logs (records) events of possible interest are in its internal memory. To view the logged information, click the **Log** link under the System Manager menu. If there is not enough internal memory to log all events, older events are deleted from the log. When powered down or rebooted, the log will be cleared.



**Status:** Enable/Disable this function.

**Log type:** You may choose one of log types to display logs in the following window. The default log types is All.



## Remote Log

This page allows you to setup the Remote Log functions for the AP.

**Remote Log:** Enable/disable this function.

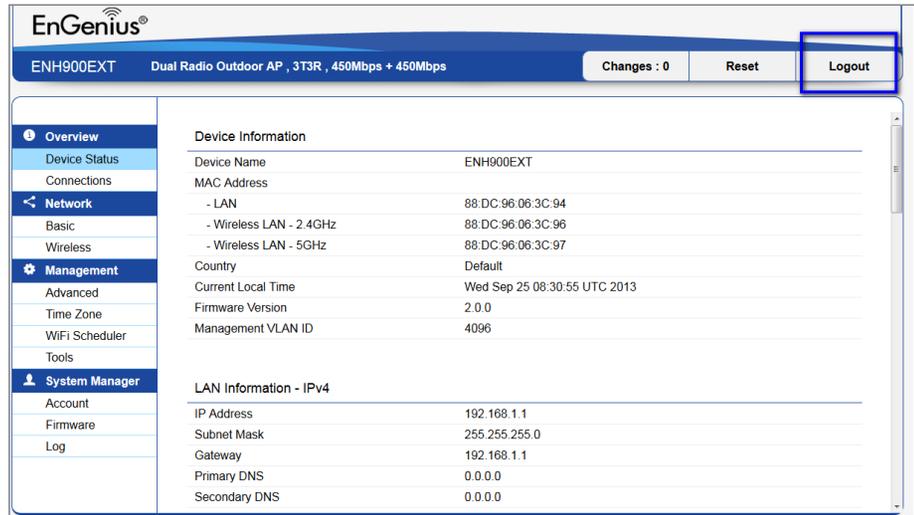
**Log Server IP Address:** Enter the IP address of the log server.

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

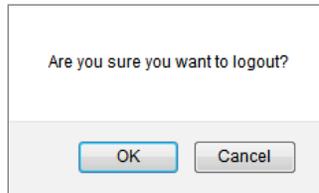


# Logout

**Logout:** Click Logout in Management menu to logout.



Please confirm again to logout the system or not.



# Reset

In some circumstances, it may be required to force the device to reboot. Click on **Reset** to reboot the AP



Once you click reset button, you will see the options for reboot or restore this AP.

Reboot the device: Click it to reboot this device.

Restore to Factory Default: Click it to reset this device to factory default setting.

Restore to User Default: Click it to reset this device to user default settings. For realizing the setting method, you may refer page 74 and page 75.

## 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

# Appendix



# Appendix A

## 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.

## **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 20 cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Operation of this device is restricted to indoor use only.

# Appendix B - IC Interference Statement

## Industry Canada statement

This device complies with RSS-247 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-247 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.
- (iii) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 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.
- (iii) 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 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

## **FOR MOBILE DEVICE USAGE 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 a minimum distance of 20cm between the radiator & your body.

### **Pour l'utilisation de dispositifs mobiles) 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 20cm de distance entre la source de rayonnement et votre corps.

# Appendix C - CE Interference Statement

## Europe - EU Declaration of Conformity

This device complies with Directive 2014/53/EU issued by the Commission of the European Community.

- Declaration of Conformity

Please add certification standard in your user manual which depended on the test standards your device performed. or

- If the DoC should be a simplified version, please take below as reference –

Hereby, EnGenius Networks declares that the EWS550AP/EWS510AP/EWS511AP are in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

Importer: EnGenius Networks Europe B.V.

Importer Address: ESP 240, 5633 AC Eindhoven, The Netherlands

Manufacturer : EnGenius Networks. Inc.

Manufacturer Address: No.500, Fusing 3rd Rd., Hwa-Ya Technology Park Kuei-Shan Dist., Taoyuan City, Taiwan (R.O.C.)

CE DoC Link: <https://www.engeniusnetworks.eu/ens500ext-ac-ens500-ac-enstation5-accedoc>

# Appendix D -Professional installation instruction

## 1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

## 2. Installation location

The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

## 3. External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC/IC limit and is prohibited.

## 4. Installation procedure

Please refer to user's manual for the detail.

## 5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.