HAWKING® TECHNOLOGY

HOWABN1

# HI-GAIN™ OUTDOOR WIRELESS-300N MULTIFUNCTION ACCESS POINT

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**USER'S MANUAL ▶▶**

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**LIMITED WARRANTY**

Hawking Technology guarantees that every HOWABN1Hi-Gain Wireless-300N Hi-Gain Outdoor Wireless-N Access Point/Bridge is free from physical defects in material and workmanship under normal use for one (1) year from the date of purchase. If the product proves defective during this one-year warranty period, call Hawking Customer Service in order to obtain a Return Authorization number. Warranty is for repair or replacement only. Hawking Technology does not issue any refunds. BE SURE TO HAVE YOUR PROOF OF PURCHASE. RETURN REQUESTS CAN NOT BE PROCESSED WITHOUT PROOF OF PURCHASE. When returning a product, mark the Return Authorization number clearly on the outside of the package and include your original proof of purchase.

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# Federal Communication Commission Interference Statement

### FCC Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 or more of the following measures:

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

### FCC Caution

This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm spacing must be provided between computer mounted antenna and person’s body (excluding extremities of hands, wrist and feet)

during wireless modes of operation.

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.

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

## Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The equipment version marketed in US is restricted to usage of the channels 1-11 only.

# R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

## Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

## EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states: Iceland, Liechtenstein, Norway, and Switzerland.

## EU Countries Not intended for use

None.

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# *Chapter I: Product Information*

## 1-1 Product Introduction

Thank you for purchasing the Hawking Technologies Hi-Gain Outdoor Wireless-N Access Point! This Hi-Gain Outdoor Wireless-N Access Point is designed for outdoor use and designed for building an outdoor wireless network. The Hi-Gain Outdoor Wireless-N Access Point features MIMO technology (multiple in, multiple out), and two Hi-Gain outdoor antennas for maximizing wireless range.

### Product Features

- Complies with the IEEE 802.11b/g/n standards.
- Supports 2.4000~2.4835GHz frequency band.
- High data rate up to 300Mbps network speed.
- Auto rate fallback in case of obstacles or interferences.
- Supports point-to-point and point-to-multi point bridge function.
- Supports WDS (Wireless Distributed System) repeater mode.
- Supports Universal Repeater mode.
- Supports AP Client mode.
- Supports four sets of ESSID to group the different wireless networks.
- Supports WEP, WPA, WPA2 wireless security and RADIUS server authorization function.
- Supports WPS (Wi-Fi Protected Setup) function.
- Provides MAC access control.
- Supports Web-based configuration.
- Fault Tolerance Firmware upgrade via Web browser.
- Complies with IEEE 802.3af Powered Device (PD) standard.
- Complies with IP67 standard for outdoor use.
- Supports wall/pole mounting.

## 1-2 System Requirements

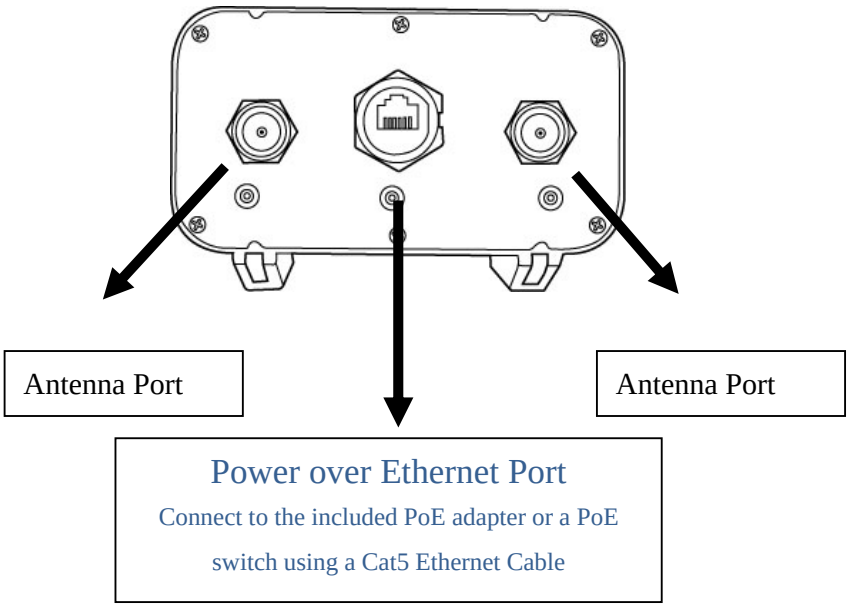
- Computer or network devices with wired or wireless network interface card.
- Web browser (*Microsoft Internet Explorer 4.0 or above, Netscape Navigator 4.7 or above, Opera web browser, or Safari web browser).*
- An available AC power socket (100 – 240 V, 50/60Hz)

## 1-3 Package Contents

Before you start to use this access point, please check if there's anything missing in the package, and contact your dealer of purchase to claim for missing items:

- 1 x Hi-Gain Outdoor Wireless-300N Multi-Function Access Point
- 2 x Hi-Gain Outdoor Antennas
- 1 x POE Adapter
- 1 x L-shape antenna connector
- 1 x Waterproof Gasket kit for RJ-45
- 1 x Power Cable and Power Transformer
- 1 x Ethernet Cable
- 1 x Mounting Kit
- 1 x Setup CD-Rom

## 1-4 Product Overview



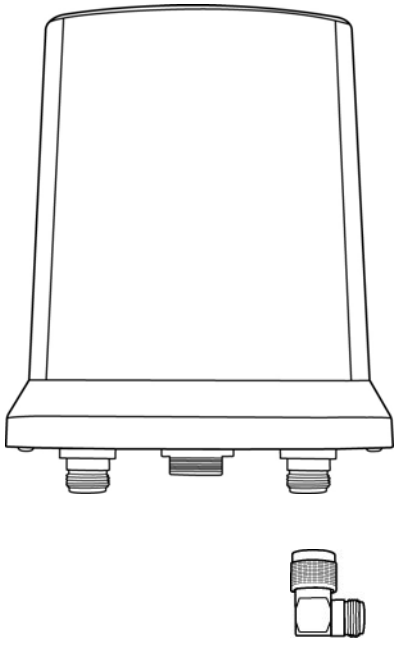

| Item Name | Description |
|---|---|
| Antenna 1 | Main antenna for transmitting and receiving 802.11b/g/n Wi-Fi signals. N-Type antenna connector compatible with N-Type Hi-Gain Antennas for more range. |
| PoE Ethernet Port | 10/100 Mbps Local Area Network port with PoE capabilities |
| Antenna 2 | Secondary antenna. N-Type antenna connector compatible with N-Type Hi-Gain Antennas for more range. |

# *Chapter II: System and Network Setup*

2-1 Installing the Hi-Gain Outdoor Wireless-N Access Point to your Network

**Antenna Installation**

1. Remove the covers from the antenna connectors.
2. Screw the N-Type connector to the antenna connector 2.
3. Screw the antennas to these two connectors.
4. Adjust the two antennas to place at a vertical angle.



## Pole/Mounting Installation

① **HI-GAIN OUTDOOR WIRELESS-N ACCESS POINT * 1PCS**

② **SQUARE NUT * 2PCS**

③ **M5-12 SCREW * 2PCS**

④ **M SHAPE MOUNTING * 1PCS**

⑤ **POLE**

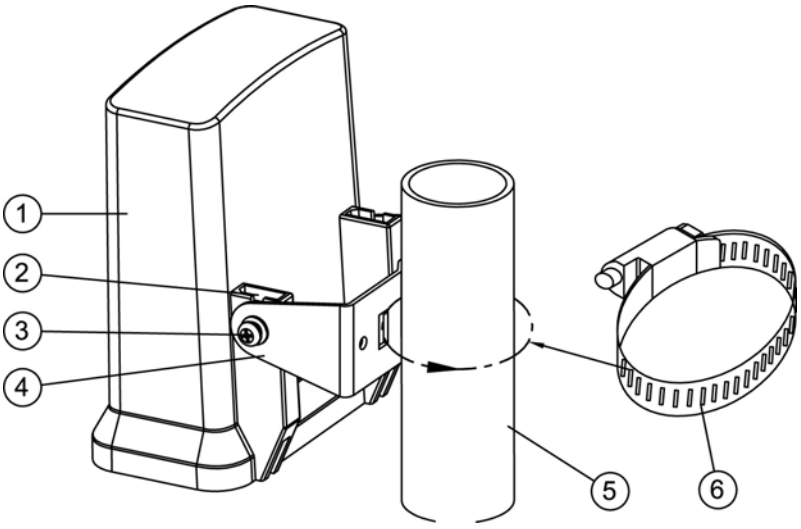
⑥ **HOSE CLAMP 2 * 1PCS**

⑦ **WALL SCREW * 2PCS**

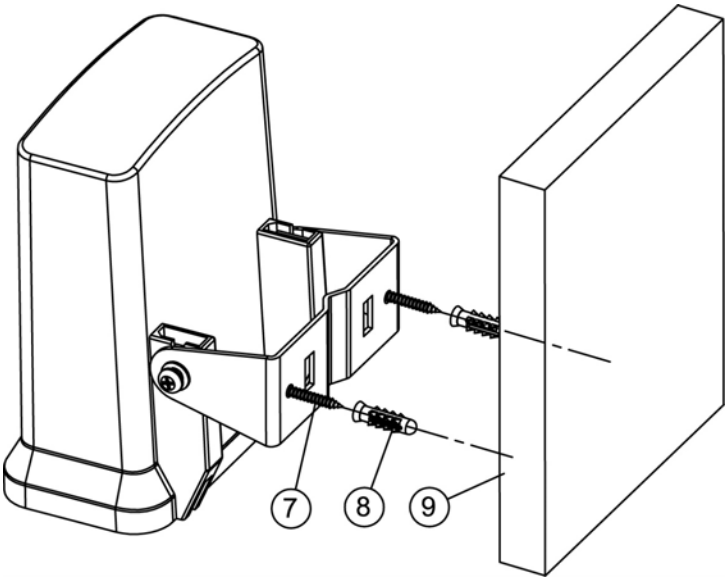
⑧ **WALL ANCHOR * 2PCS**

⑨ **WALL**

## Pole Mounting

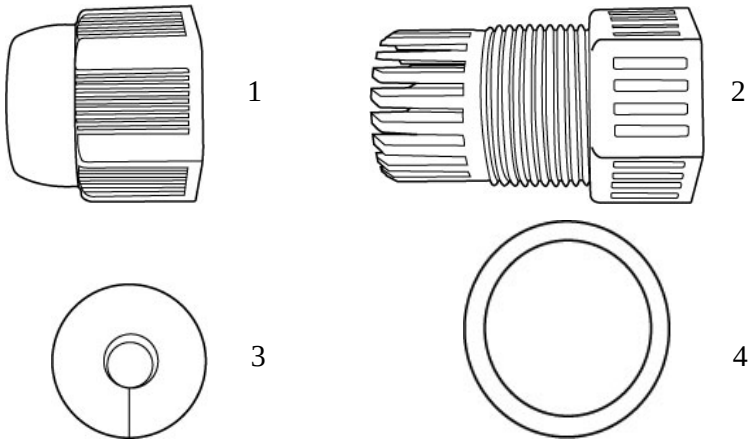


## Wall Mounting

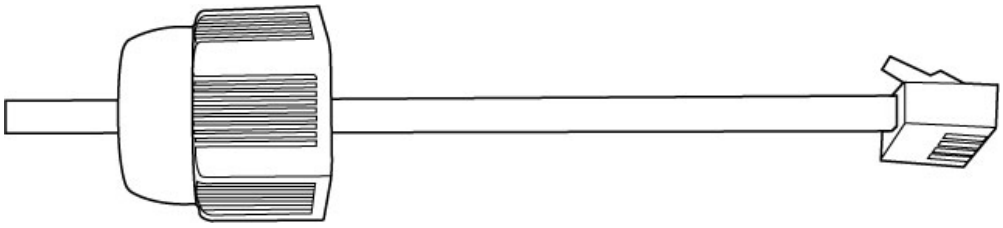



## Ethernet Cable Waterproof Installation

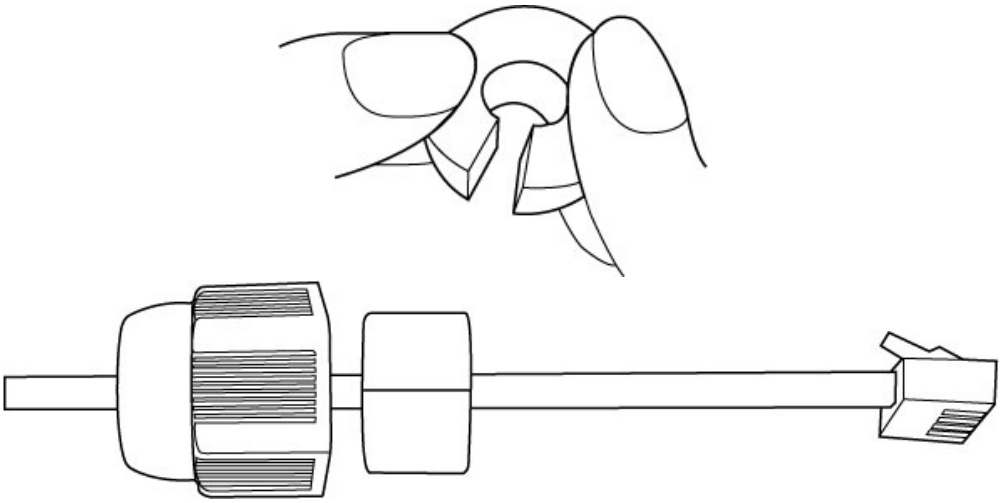
1. SEALING NUT * 1PCS
2. BODY * 1PCS
3. SEAL * 1PCS
4. RUBBER WASHER * 1PCS



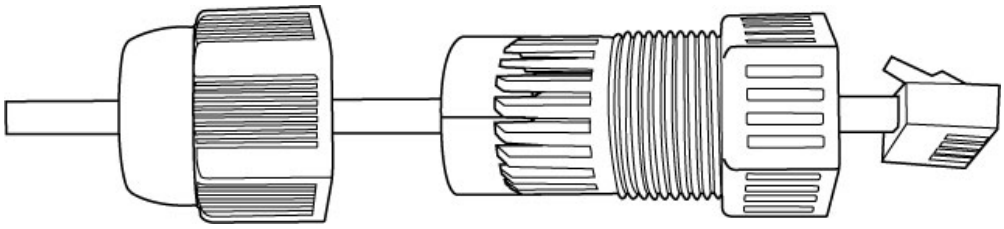
1. Put the Ethernet Cable into the sealing nut (1).



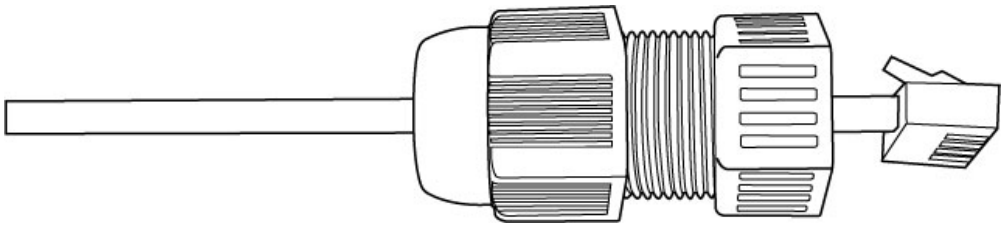
2. Open the seal (3) and clip to the cable.



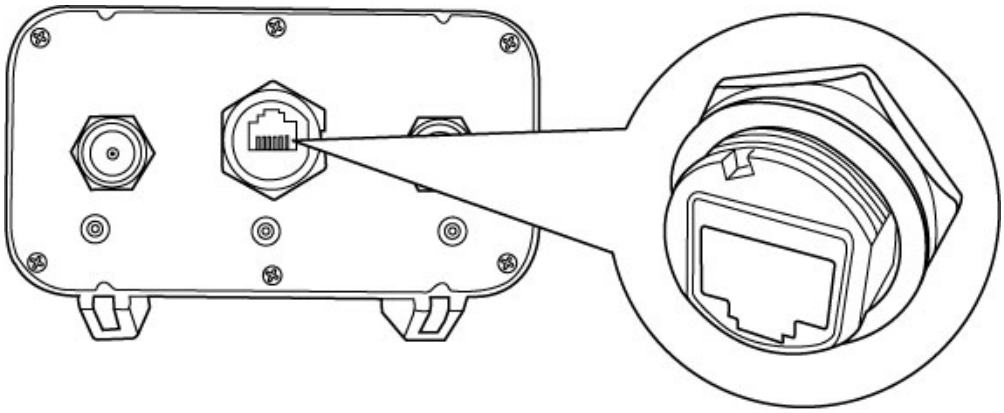
3. Put the body (2) to into the cable and then secure the seal (3) to the body (2).



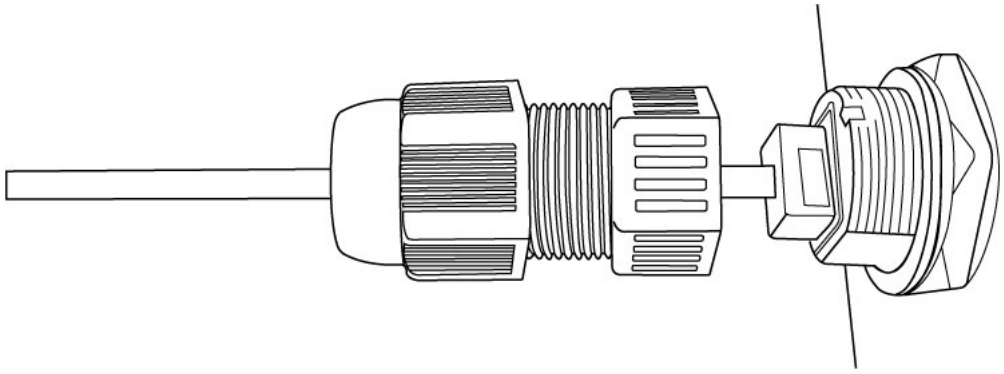
4. Screw the body (2) and the sealing nut (1).



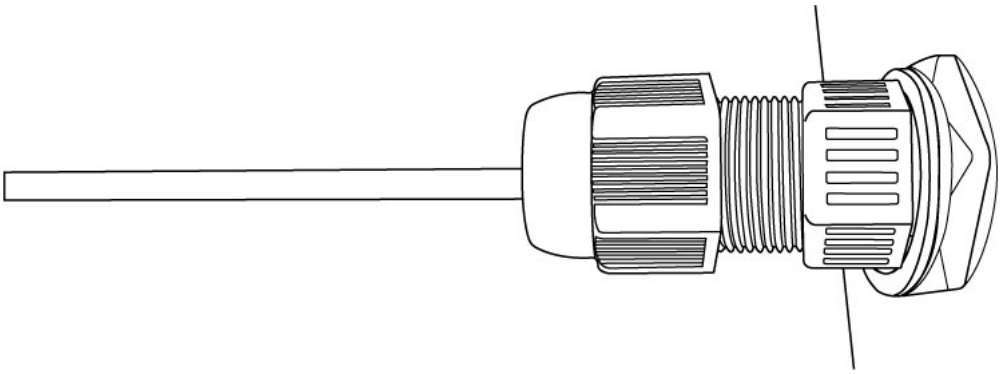
5. Put the rubber washer (4) into the Ethernet connector of the Hi-Gain Outdoor Wireless-N Access Point.



6. Plug the cable into the Ethernet port of the Hi-Gain Outdoor Wireless-N Access Point.



7. Screw the body (2) to the Ethernet connector of the Hi-Gain Outdoor Wireless-N Access Point.



**Power Installation**

1. Connect one end of the Ethernet cable to the LAN port of the Hi-Gain Outdoor Wireless-N Access Point, and the other end of the Ethernet cable to the port labeled ’Power+DATA OUT’ on the Power Over Ethernet Power over Ethernet DC Injector.

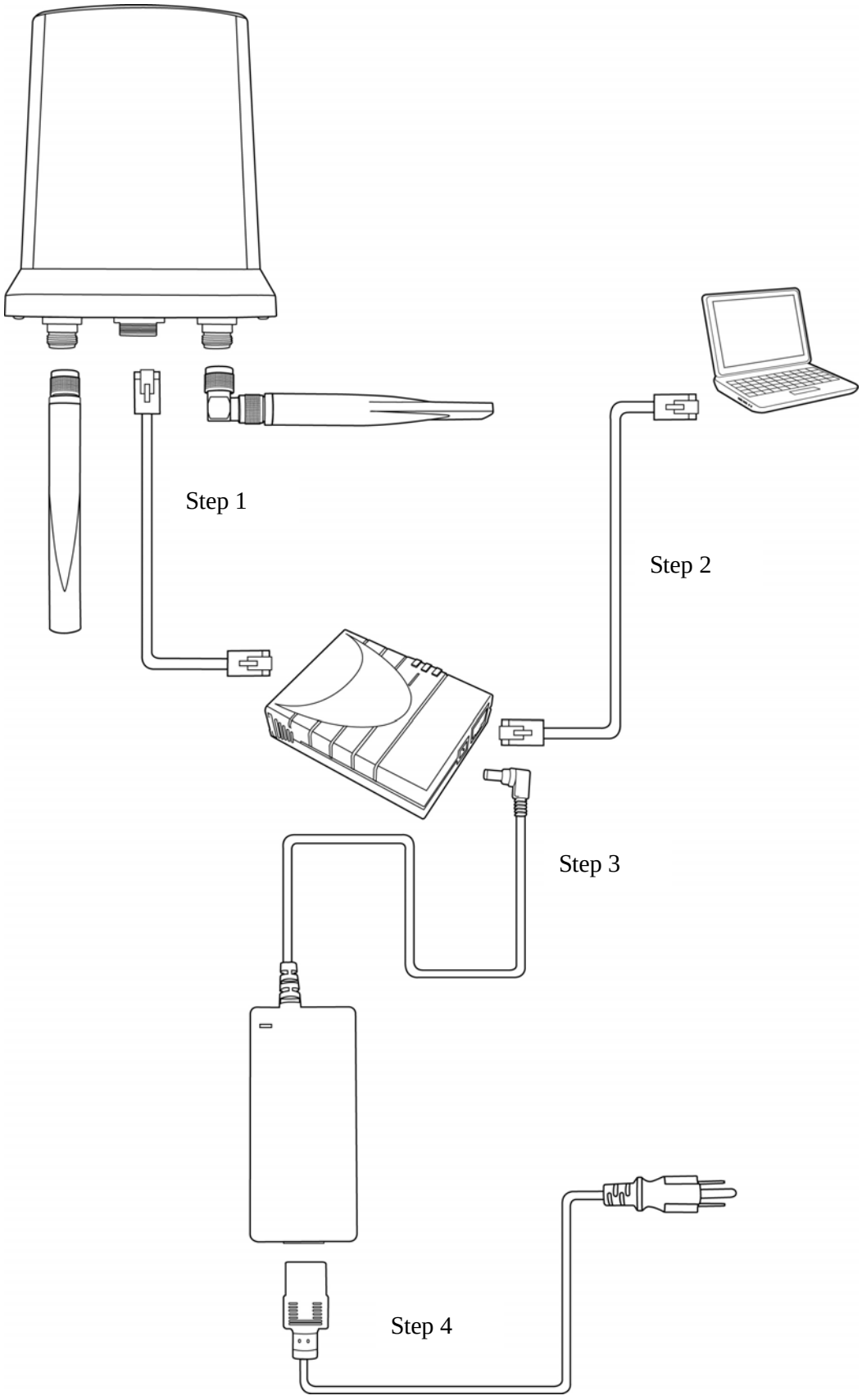
2. Connect another Ethernet cable from the port labeled ‘LAN’ on the Power Over Ethernet Power over Ethernet DC Injector to your router/switch or to a PC.

3. Connect the power adapter to the connector on the Power over Ethernet DC Injector.

4. Connect the power cord to the power adapter and into an electrical outlet.

***Note:*** *You must use the power adapter shipped along with the Hi-Gain*

*Outdoor Wireless-N Access Point, do NOT use any other power adapter from other sources.*


Step 1
Step 2
Step 3
Step 4

## 2-2 Connecting to wireless Hi-Gain Outdoor Wireless-N Access Point by web browser

After the network connection is built, the next step you should do is setup the Hi-Gain Outdoor Wireless-N Access Point with proper network parameters, so it can work properly in your network environment.

Please use the web browser to configure the Hi-Gain Outdoor Wireless-N Access Point. A computer with wired Ethernet connection to the Hi-Gain Outdoor Wireless-N Access Point is required for this first-time configuration.

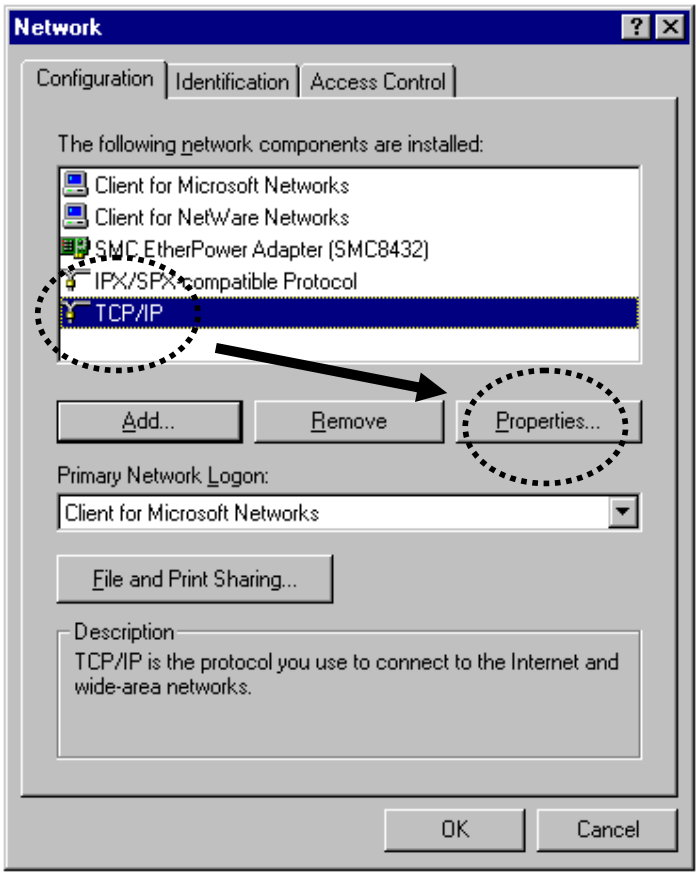
Before you staring to configure the Hi-Gain Outdoor Wireless-N Access Point, please configure the IP address of the computer in the same network segment with the Hi-Gain Outdoor Wireless-N Access Point.

***If the operating system of your computer is….***

| | |
|---|---|
| **Windows 95/98/Me** | **- please go to section 2-2-1** |
| **Windows 2000** | **- please go to section 2-2-2** |
| **Windows XP** | **- please go to section 2-2-3** |
| **Windows Vista** | **please go to section 2-2-4** |

### 2-2-1 Windows 95/98/Me IP address setup

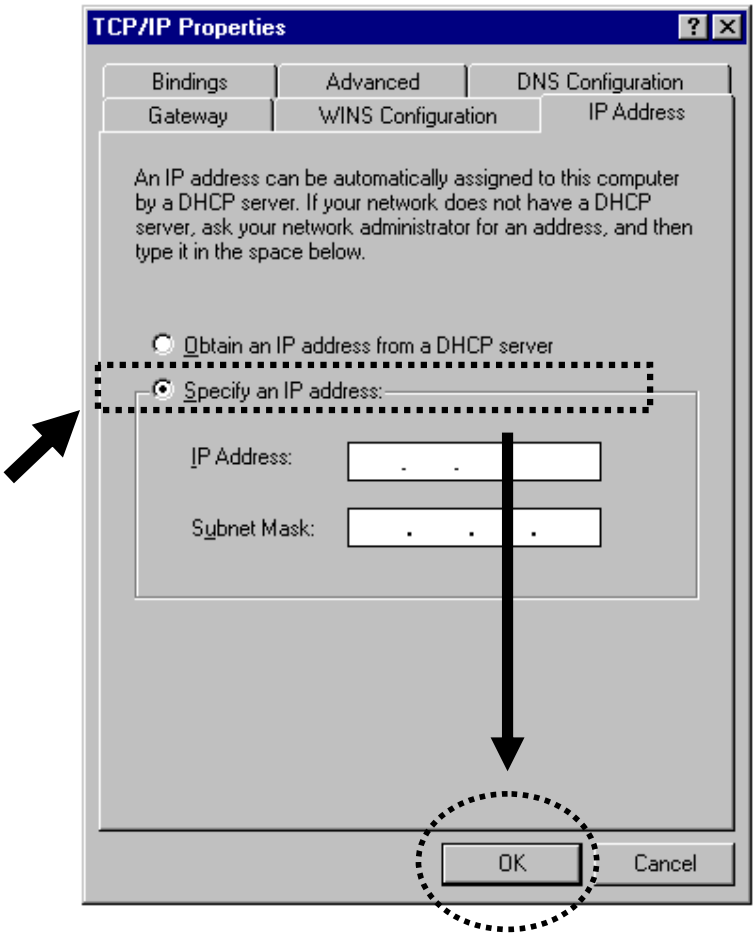
1. Click ‘Start’ button (it should be located at lower-left corner of your computer), then click control panel. Double-click ***Network*** icon, and ***Network*** window will appear. Select ‘TCP/IP’, then click ‘Properties’.




2. Select ‘Specify an IP address’, then input the following settings in respective field:

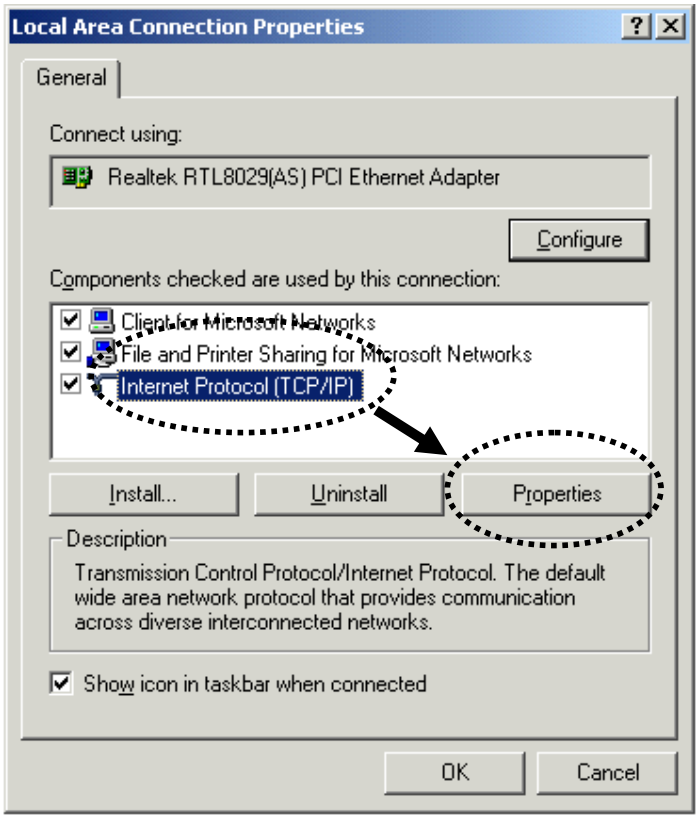
IP address: 192.168.1.2
Subnet Mask: 255.255.255.0

click ‘OK’ when finish.




2-2-2 Windows 2000 IP address setup

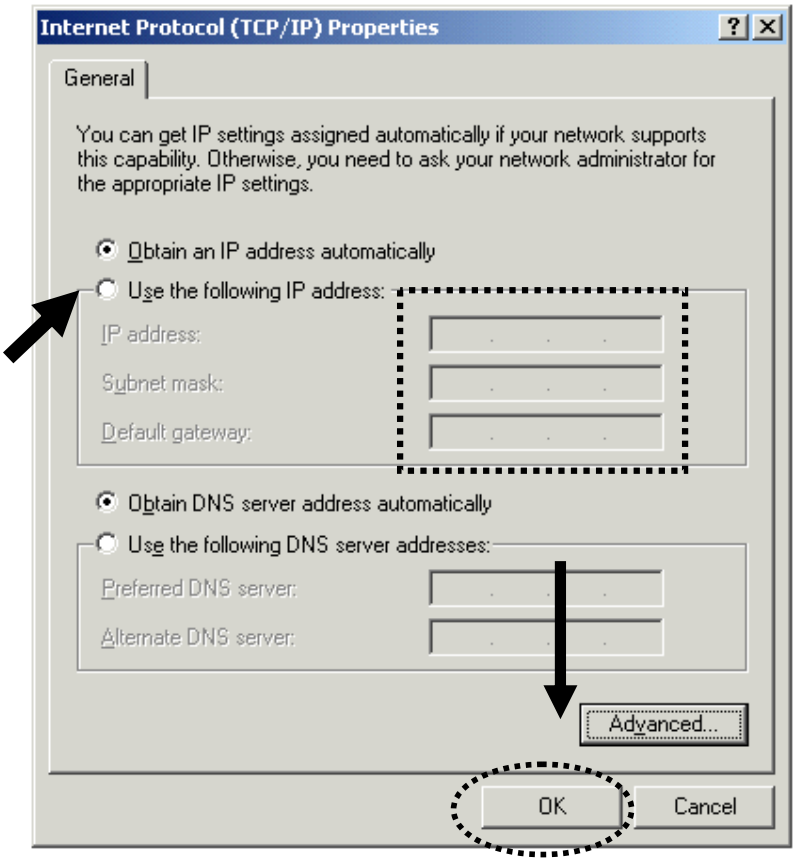
1. Click ‘Start’ button (it should be located at lower-left corner of your computer), then click control panel. Double-click ***Network and Dial-up Connections*** icon, double click ***Local Area Connection,*** and ***Local Area Connection Properties*** window will appear. Select ‘Internet Protocol (TCP/IP)’, then click ‘Properties’




2. Select ‘Use the following IP address’, then input the following settings in respective field:

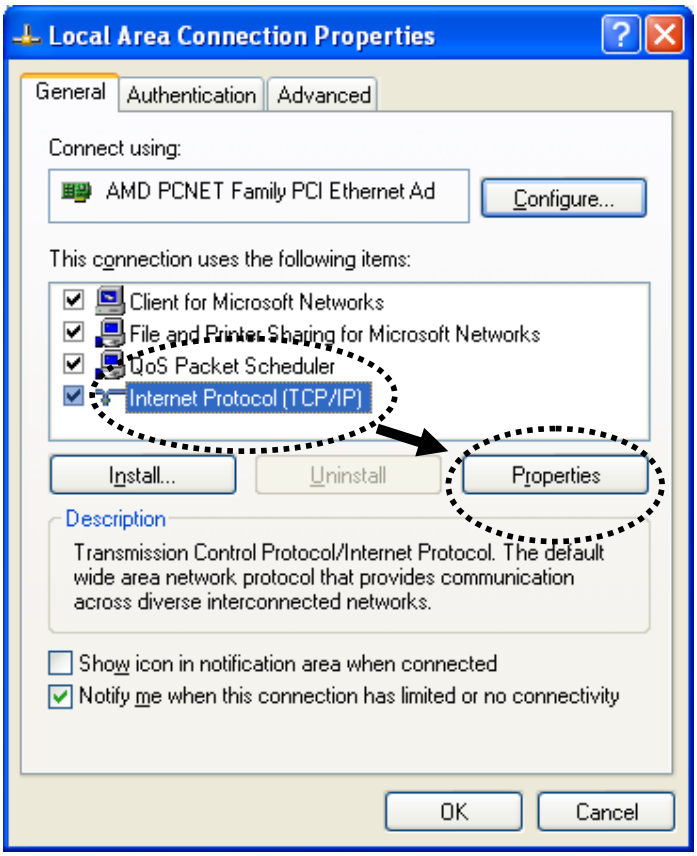
IP address: 192.168.1.2
Subnet Mask: 255.255.255.0

click ‘OK’ when finish.



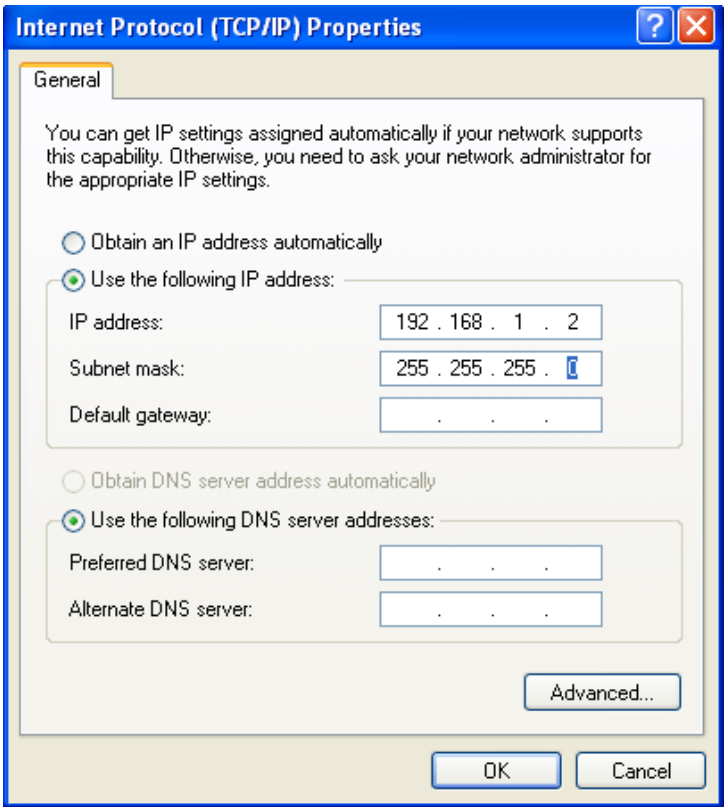

2-2-3 Windows XP IP address setup

1. Click ‘Start’ button (it should be located at lower-left corner of your computer), then click control panel. Double-click ***Network and Internet Connections*** icon, click ***Network Connections,*** and then double-click ***Local Area Connection, Local Area Connection Status*** window will appear, and then click ‘Properties’

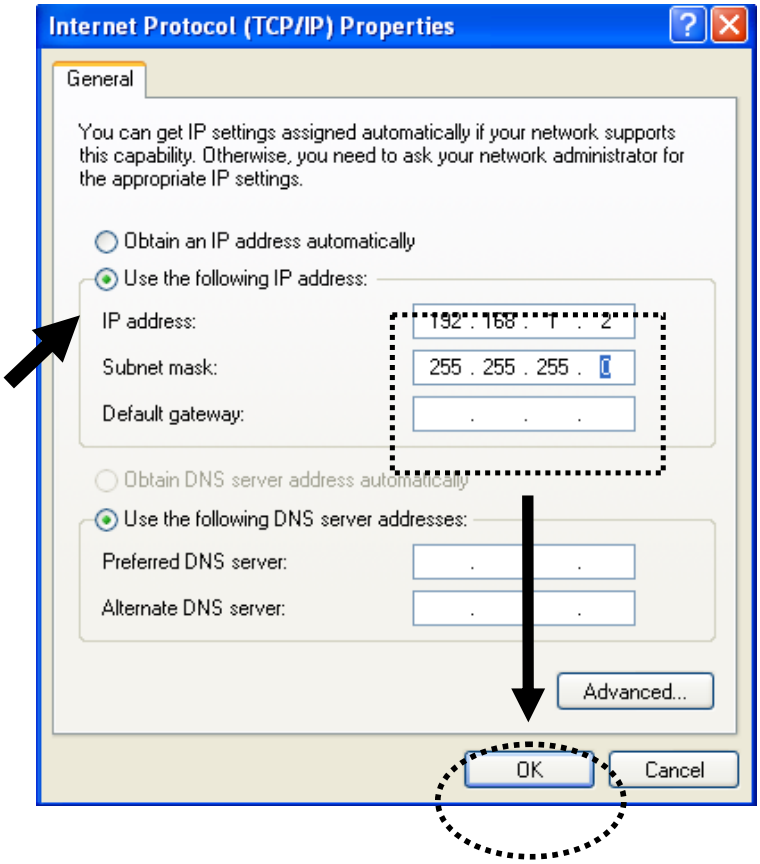



2. Select ‘Use the following IP address’, then input the following settings in respective field:

IP address: 192.168.1.2
Subnet Mask: 255.255.255.0

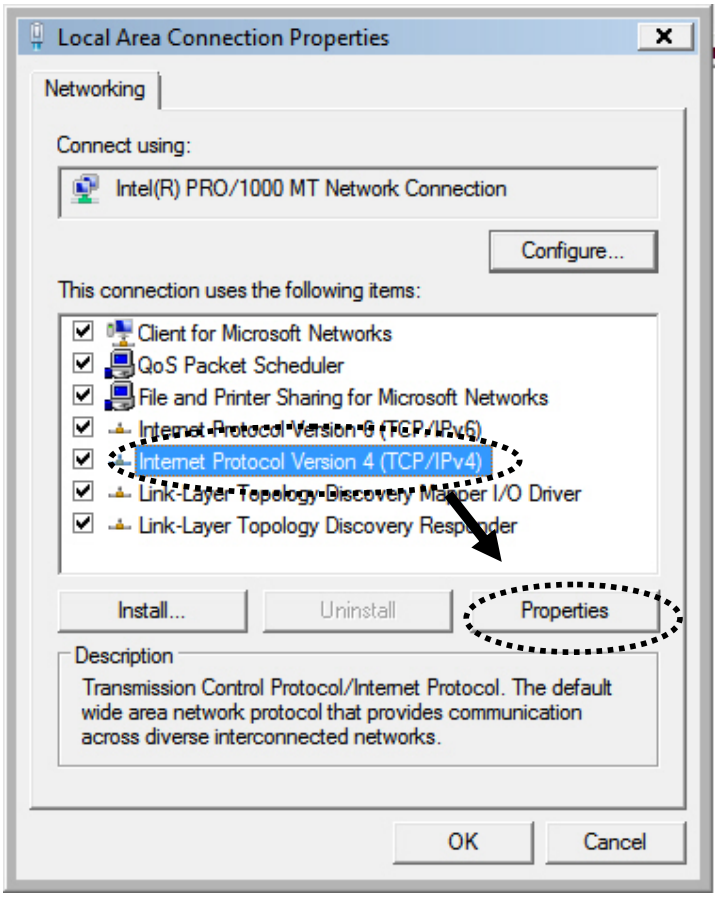



click ‘OK’ when finish.



2-2-4 Windows Vista IP address setup

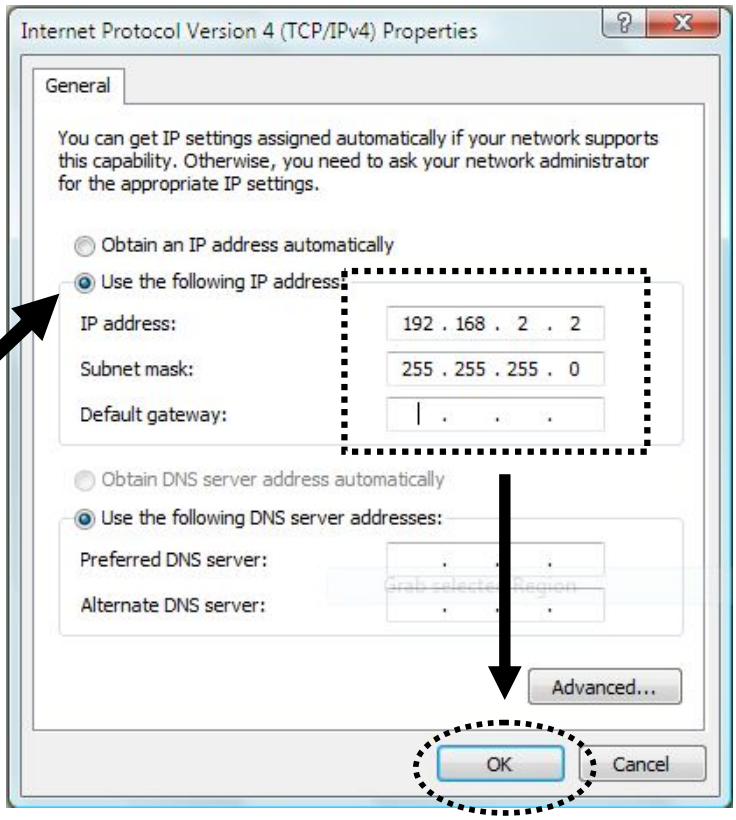
1. Click ‘Start’ button (it should be located at lower-left corner of your computer), then click control panel. Click ***View Network Status and Tasks***, then click ***Manage Network Connections..***Right-click ***Local Area Netwrok, then select ‘Properties’. Local Area Connection Properties*** window will appear, select ‘Internet Protocol Version 4 (TCP / IPv4), and then click ‘Properties’




2. Select ‘Use the following IP address’, then input the following settings in respective field:

IP address: 192.168.1.2
Subnet Mask: 255.255.255.0

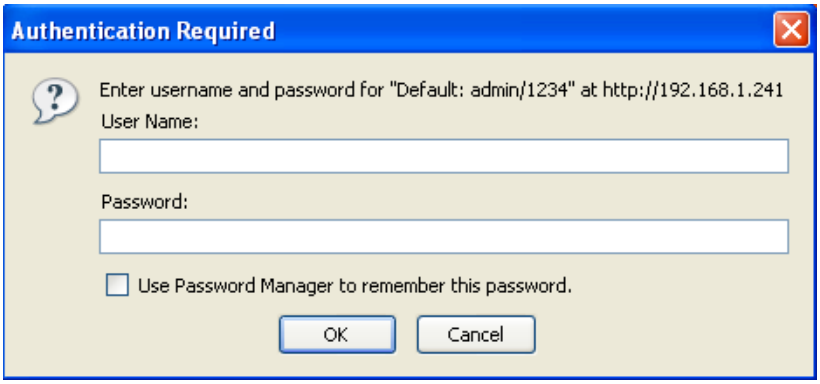
click ‘OK’ when finish.



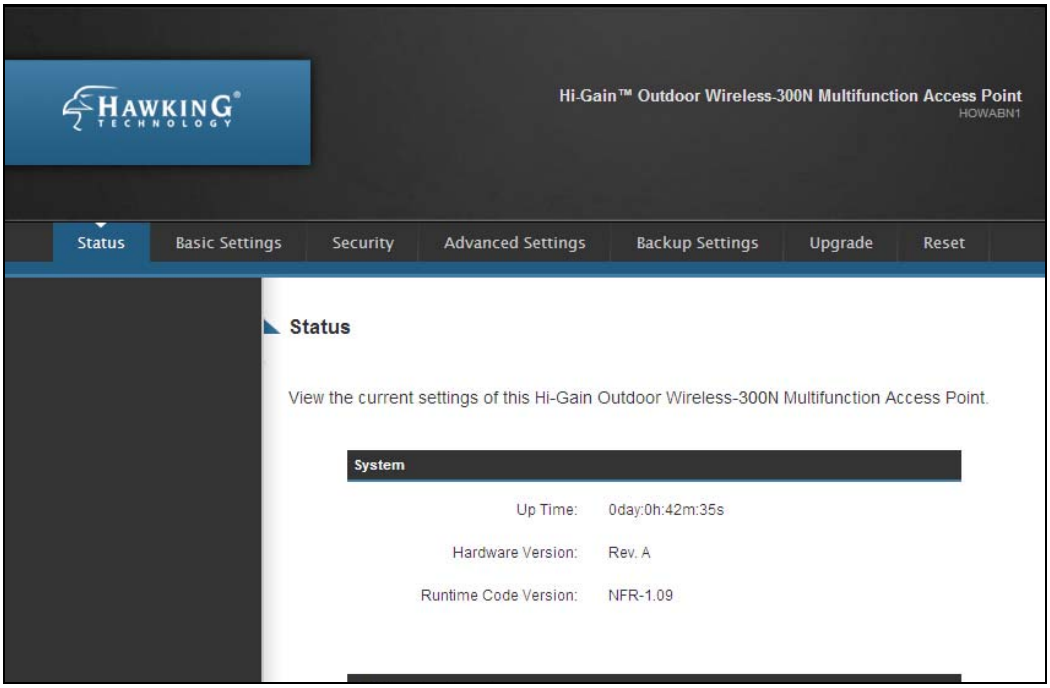

Note: Your IP should be 192.168.1.2, not 192.168.2.2.

2-2-5 Connecting to Web Management Interface

All functions and settings of this Hi-Gain Outdoor Wireless-N Access Point must be configured via web management interface. Please start your web browser, and input '192.168.1.230' in address bar, then press 'Enter' key. The following message should be shown:




Please input user name and password in the field respectively, default user name is 'admin', and default password is '1234', then press 'OK' button, and you can see the web management interface of this Hi-Gain Outdoor Wireless-N Access Point:

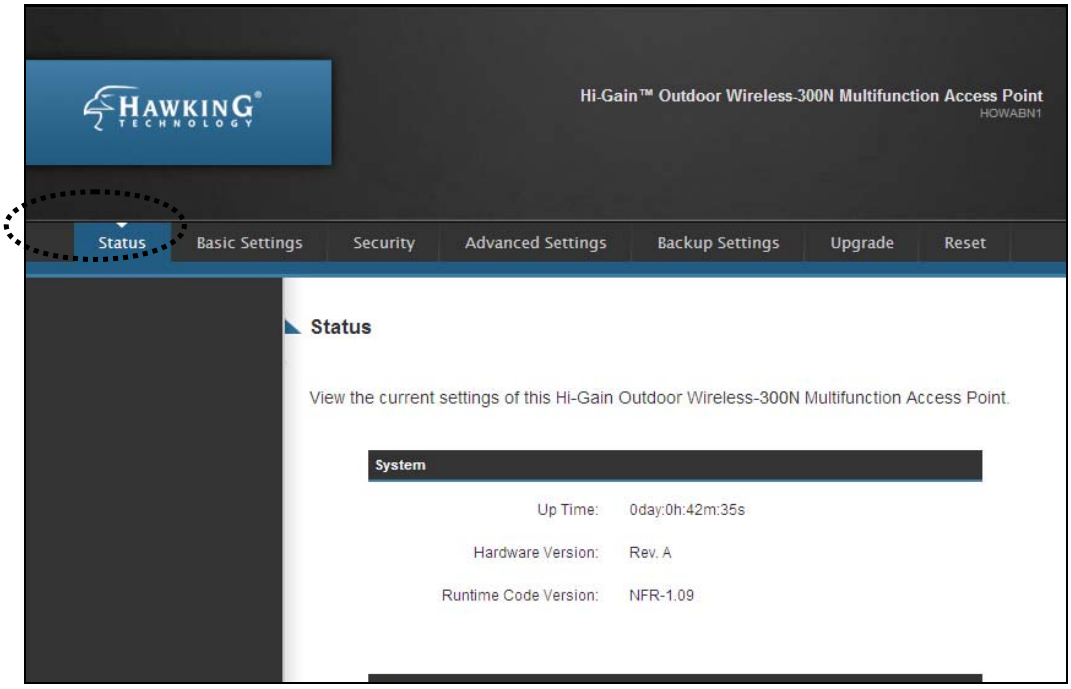


**NOTE: If you can’t see the web management interface, and you’re being prompted to input user name and password again, it means you didn’t input username and password correctly. Please retype user name and password again. If you’re certain about the user name and password you type are correct, please go to ‘4-2 Troubleshooting’ to perform a factory reset, to set the password back to default value.**

2-3 View System Status and Information

After you connected to the Hi-Gain Outdoor Wireless-N Access Point by web browser, the first thing you see is ‘Status and Information’ page. All system and network related information of this Hi-Gain Outdoor Wireless-N Access Point will be displayed here. The information is very helpful when you want to know the detailed information of your Hi-Gain Outdoor Wireless-N Access Point, and when you try to fix the communication problem between this Hi-Gain Outdoor Wireless-N Access Point and other wired / wireless computer / devices.

You can click ‘Home’ on the left, and the system status and information will be displayed, as shown below:



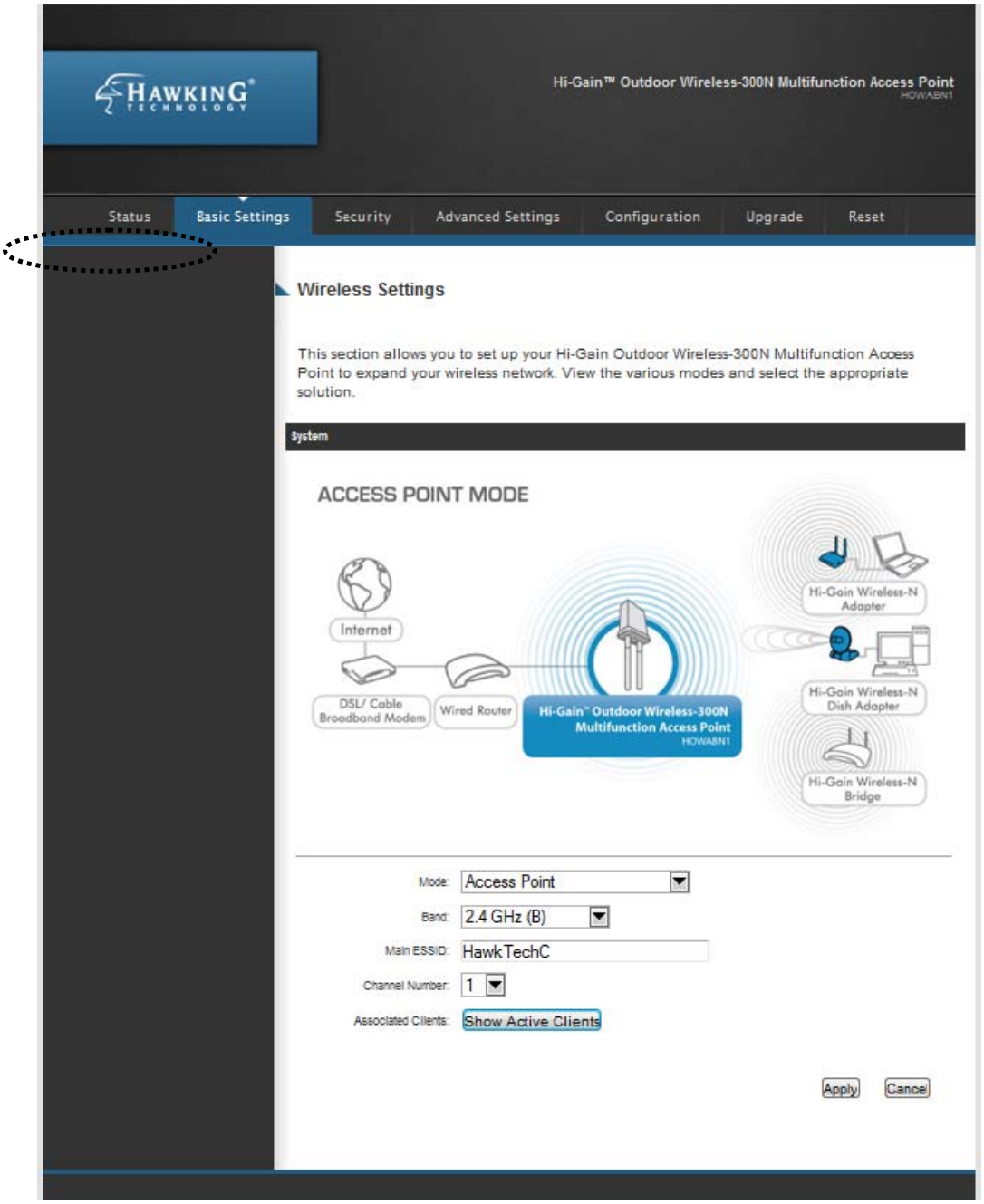

Here are descriptions of every item:

| | |
|---|---|
| *Up time* | *Displays the total passed time since the wireless Hi-Gain Outdoor Wireless-N Access Point is powered.* |
| *Hardware Version* | *Displays hardware version. This information is helpful when you need online help from the dealer* |

| | |
|---|---|
| | *of purchase.* |
| *Runtime Code Version* | *Displays current firmware version. If you want to perform firmware upgrade, this number will help you to determine if you need such upgrade.* |
| *Mode* | *Displays current wireless operating mode (see next Section)* |
| *ESSID* | *Displays current ESSID (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point)* |
| *Channel Number* | *Displays current wireless channel number* |
| *Security* | *Displays current wireless security setting* |
| *BSSID* | *Displays current BSSID (a set of unique identification name of this Hi-Gain Outdoor Wireless-N Access Point, it can not be modified by user)* |
| *Associated Clients* | *Displays the number of connected wireless client* |
| *IP Address* | *Displays the IP address of this wireless Hi-Gain Outdoor Wireless-N Access Point* |
| *Subnet Mask* | *Displays the net mask of IP address* |
| *Default Gateway* | *Displays the IP address of default gateway* |
| *MAC address* | *Displays the MAC address of LAN interface* |

2-4 Select an Operating Mode for Wireless Hi-Gain Outdoor Wireless-N Access Point

This Hi-Gain Outdoor Wireless-N Access Point can be operated in different modes; you can click ‘Basic Setting’ on the left of web management interface to select an operating mode you want to meet for different needs:



You can click ‘Mode’ dropdown menu to select operating mode, and there are 6 operating modes available:

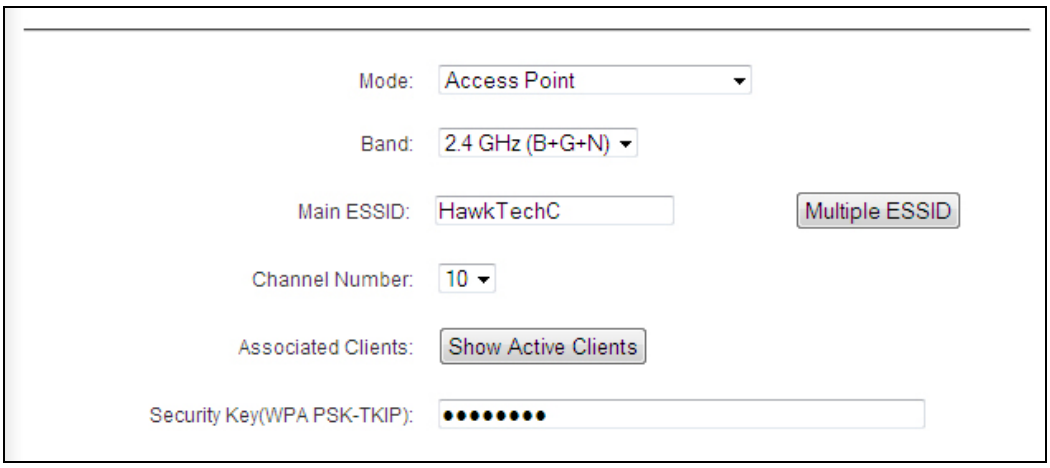
| | |
|---|---|
| *Access Point* | *Hi-Gain Outdoor Wireless-N Access Point mode, allows wireless clients to connect to Hi-Gain Outdoor Wireless-N Access Point and exchange data with the devices connected to the wired network.* |
| *Bridge-Client* | *Enable the Ethernet device such us TV and Game player connected to the Hi-Gain Outdoor Wireless-N Access Point to a wireless client. Ethernet Bridge Mode.* |
| *AP Bridge-Point to Point* | *Establish wireless connection with another wireless Hi-Gain Outdoor Wireless-N Access Point using the same mode, and link the wired network which these two wireless Hi-Gain Outdoor Wireless-N Access Points connected to together. Only one Hi-Gain Outdoor Wireless-N Access Point can be connected in this mode.* |
| *AP Bridge-Point to Multi-Point* | *Establish wireless connection with other wireless Hi-Gain Outdoor Wireless-N Access Points using the same mode, and link the wired network which these wireless Hi-Gain Outdoor Wireless-N Access Points connected to together. Up to 4 Hi-Gain Outdoor Wireless-N Access Points can be connected in this mode.* |
| *AP Bridge-WDS* | *This mode is similar to ‘AP Bridge to Multi-Point’, however the Hi-Gain Outdoor Wireless-N Access Point does not work in bridge-dedicated mode, and will be able to accept wireless clients while the Hi-Gain Outdoor Wireless-N Access Point is working as a wireless bridge.* |
| *Universal Repeater* | *Wirelessly repeats the signal from a 802.11b/g/n wireless network and rebroadcasts it locally. Client users connect to the Access Point individually with wireless enabled computers.* |

Please select one wireless operating mode, for detailed descriptions of every operating mode; please refer to Section 2-4-1 to 2-4-6 listed below.

2-4-1 Access Point Mode

This is the most common mode. When in Access Point mode, the Hi-Gain Outdoor Wireless-N Access Point acts as a bridge between 802.11b/g/N wireless devices and wired Ethernet network, and exchange data between them.

When you select ‘Access Point’, the following options will be displayed:

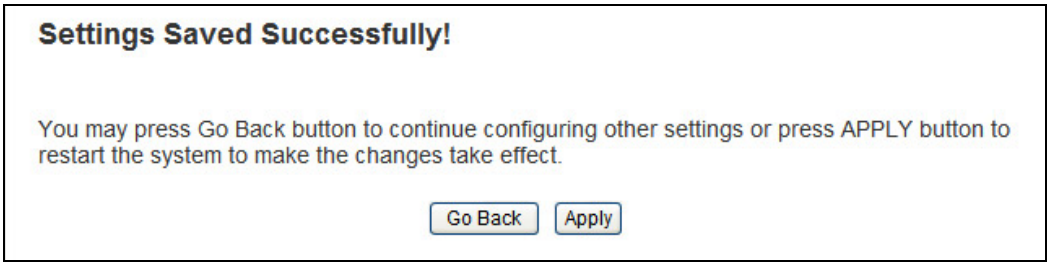



Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you’ll be able to allow or deny a wireless client of a certain band.*<br><br>*If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g) will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.* |

| | |
|---|---|
| | *If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *Main ESSID* | *Please input the ESSID (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point) here. You can input up to 32 alphanumerical characters.* ***PLEASE NOTE THAT ESSID IS CASE SENSITIVE.*** |
| *Multiple ESSID* | *The Hi-Gain Outdoor Wireless-N Access Point supports multiple SSID function; up to four SSIDs can be set. If you want to configure additional SSIDs, please click this button. For detailed descriptions of the function, please refer to Section 2-4-1-1.* |
| *Channel Number* | *Please select a channel number you wish to use. If you know a certain channel number is being used by other wireless Hi-Gain Outdoor Wireless-N Access Points nearby, please refrain from using the same channel number* |
| *Associated Clients* | *Click 'Show Active Clients' button and a new popup window will appear which contains the information about all wireless clients connected to this Hi-Gain Outdoor Wireless-N Access Point. You can click 'Refresh' button in popup window to keep information up-to-date.* |

After you finish your settings, please click 'Apply', and the following message will be displayed:



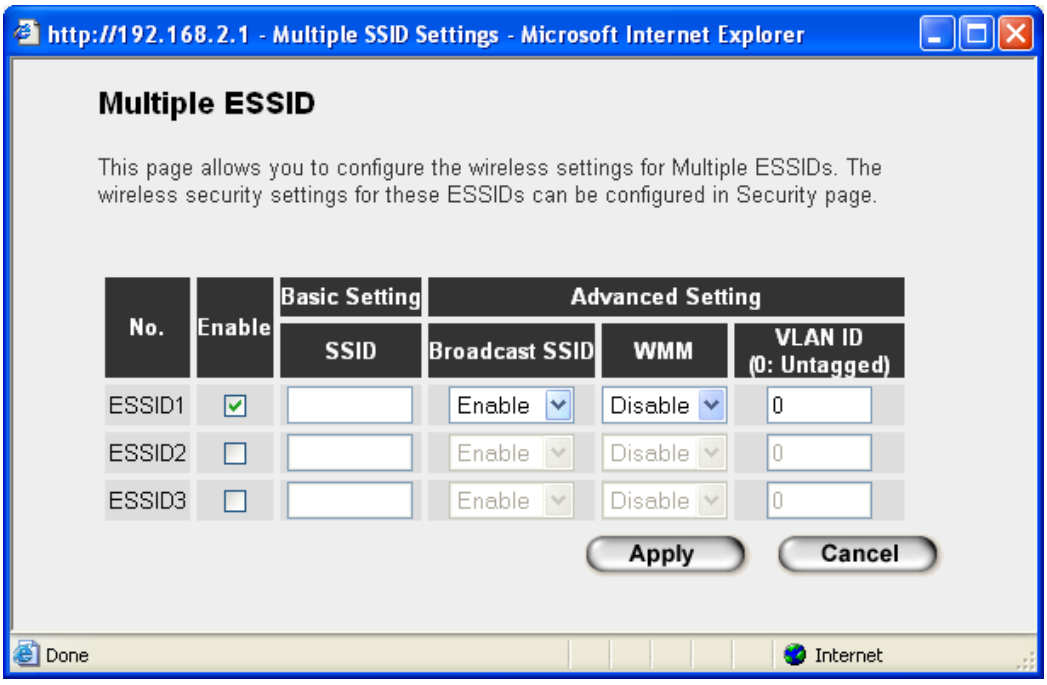

When you see this message, the settings you made are successfully saved. You can click 'Go Back' button to go back to previous page and continue

on other setting items, or click ‘Apply’ button to restart the wireless access point and the changes will take effect after about 30 seconds.

### 2-4-1-1 Multiple ESSID

This Hi-Gain Outdoor Wireless-N Access Point supports four SSIDs. Except the main SSID (It can be configure from the Basic Setting page), you can configure another three additional SSIDs here. With different SSIDs, you can separate the wireless networks with different SSID name, wireless security, WMM, and VLAN settings.

**NOTE: If you want to configure the wireless security for different SSID, please go to ‘2-7 Wireless Security’ for more information.**



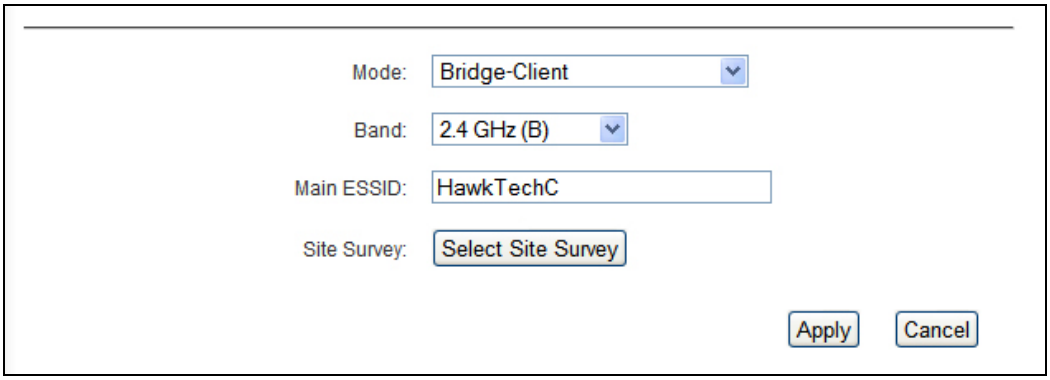

Here are descriptions of every setup item:

| | |
|---|---|
| *No.* | *Except Main SSID, you can configure additional three ESSID here.* |

| | |
|---|---|
| *Enable* | *Select the box to enable the different additional ESSID.* |
| *SSID* | *Please input the SSID name (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point) here. You can input up to 32 alphanumerical characters.* ***PLEASE NOTE THAT ESSID IS CASE SENSITIVE.*** |
| *Broadcast SSID* | *Decide if the wireless Hi-Gain Outdoor Wireless-N Access Point will broadcast its own ESSID or not. You can hide the ESSID of your wireless Hi-Gain Outdoor Wireless-N Access Point (set the option to 'Disable'), so only people those who know the ESSID of your wireless Hi-Gain Outdoor Wireless-N Access Point can get connected.* |
| *WMM* | *WMM (Wi-Fi Multimedia) technology, which can improve the performance of certain network applications, like audio/video streaming, network telephony (VoIP), and others. When you enable WMM function, the Hi-Gain Outdoor Wireless-N Access Point will define the priority of different kinds of data, to give higher priority to applications which require instant responding. Therefore you can improve the performance of such network applications.* |
| *VLAN ID (0:Untagged)* | *If your network uses VLANs, you can assign the SSID to a VLAN on your network. Client devices that associate using the SSID are grouped into this VLAN. The VLAN ID range is from 1 to 4094. The VLAN ID is 0 by default, it means that disable the VLAN function for the ESSID.* |

2-4-2 Bridge-Client

In this mode, you can connect the Hi-Gain Outdoor Wireless-N Access Point to an Ethernet device such us a TV or Game Console to enable the Ethernet device have wireless access and join to a wireless network through an Hi-Gain Outdoor Wireless-N Access Point or AP router.

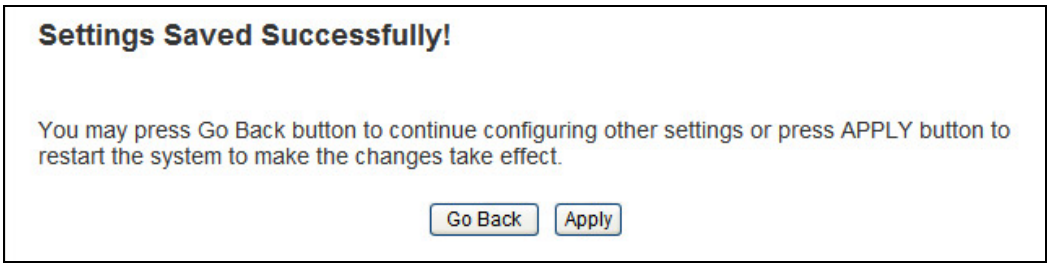



Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band.*<br><br>*If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g) will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you want to allow 802.11b, 802.11g, and 802.11N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *Main ESSID* | *Please input the ESSID (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point) here. You can input up to 32 alphanumerical characters.* ***PLEASE NOTE THAT ESSID IS CASE SENSITIVE.*** |
| *Site Survey* | *When you use this Hi-Gain Outdoor Wireless-N Access Point as a wireless station for Ethernet network device to have wireless capability, you have to associate it with a working Hi-Gain* |

| | |
|---|---|
| | *Outdoor Wireless-N Access Point. Click 'Select Site Survey' button, then a "Wireless Site Survey Table" will pop up. It will list all available Hi-Gain Outdoor Wireless-N Access Points near by. You can select one Hi-Gain Outdoor Wireless-N Access Point in the table and it will join wireless LAN through this Hi-Gain Outdoor Wireless-N Access Point. Please go to Section 2-4-2-1 for more information about the 'Wireless Site Survey Table'.* |

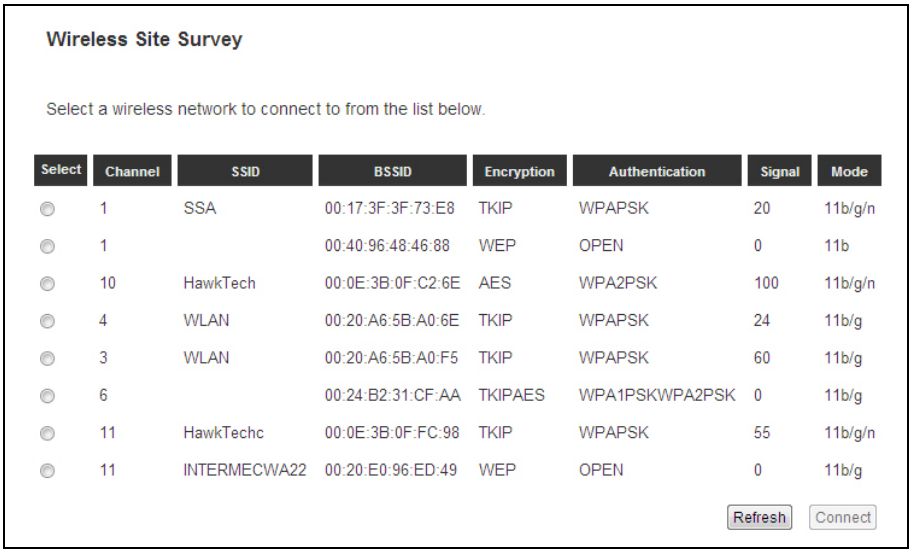
After you finish with setting, please click 'Apply', and the following message will be displayed:




When you see this message, the settings you made are successfully saved. You can click 'Go Back' button to back to previous page and continue on other setting items, or click 'Apply' button to restart the wireless access point and the changes will take effect after about 30 seconds.

2-4-2-1 Wireless Site Survey

The table will list the Hi-Gain Outdoor Wireless-N Access Points nearby as the Hi-Gain Outdoor Wireless-N Access Point is set to Bridge-Client mode; you can select one of the Hi-Gain Outdoor Wireless-N Access Points to associate.




Here are descriptions of every setup item:

| | |
|---|---|
| *Select* | *Click the radio button to select the Hi-Gain Outdoor Wireless-N Access Point.* |
| *Channel* | *Display to channel number of the Hi-Gain Outdoor Wireless-N Access Point.* |
| *SSID* | *Display the SSID name of the Hi-Gain Outdoor Wireless-N Access Point.* |
| *BSSID* | *Display the BSSID (MAC Address) of the Hi-Gain Outdoor Wireless-N Access Point.* |
| *Encryption* | *Display the encryption setting of the Hi-Gain Outdoor Wireless-N Access Points. If you have selected the Hi-Gain Outdoor Wireless-N Access Point with security setting, you have to go to '2-7 Wireless Security' to set the same security with the Hi-Gain Outdoor Wireless-N Access Point you want to associate.* |
| *Authentication* | *Display the authentication type of the Hi-Gain Outdoor Wireless-N Access Point.* |
| *Signal* | *The signal strength of each Hi-Gain Outdoor Wireless-N Access Point will be displayed here. The signal strength is stronger, the connection quality is better.* |

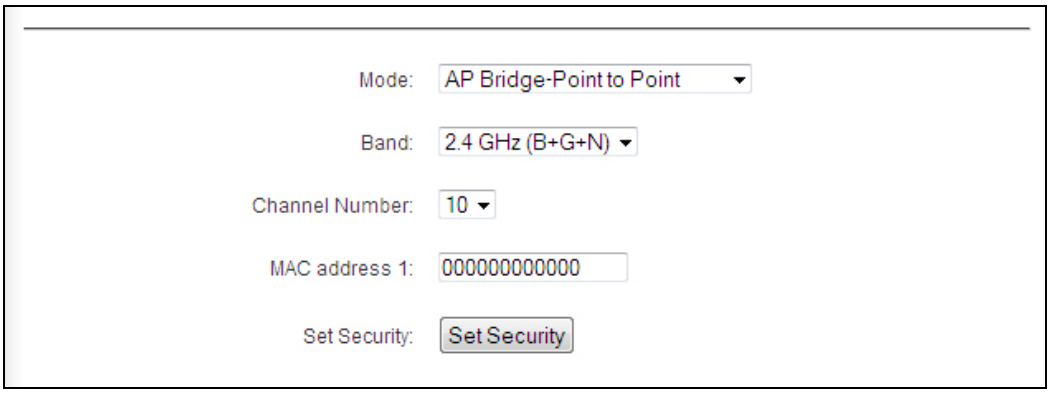
| | |
|---|---|
| *Mode* | *Display the wireless modes include 11b, 11b/g or 11b/g/n or 11n only of the Hi-Gain Outdoor Wireless-N Access Points.* |
| *Refresh* | *Click this button to refresh the table.* |
| *Connection* | *Select an Hi-Gain Outdoor Wireless-N Access Point and click this button to choose the network. The SSID name of the Hi-Gain Outdoor Wireless-N Access Point you have selected will be displayed in the Main SSID in the Basic Setting page.* |

2-4-3 AP Bridge-Point to Point Mode

In this mode, this wireless Hi-Gain Outdoor Wireless-N Access Point will connect to another wireless Hi-Gain Outdoor Wireless-N Access Point which uses the same mode, and all wired Ethernet clients of both wireless Hi-Gain Outdoor Wireless-N Access Points will be connected together. You can use this mode to connect a network to another network which is physically isolated.

Please note that when you set your Hi-Gain Outdoor Wireless-N Access Point to this mode, it will not accept regular wireless clients anymore.

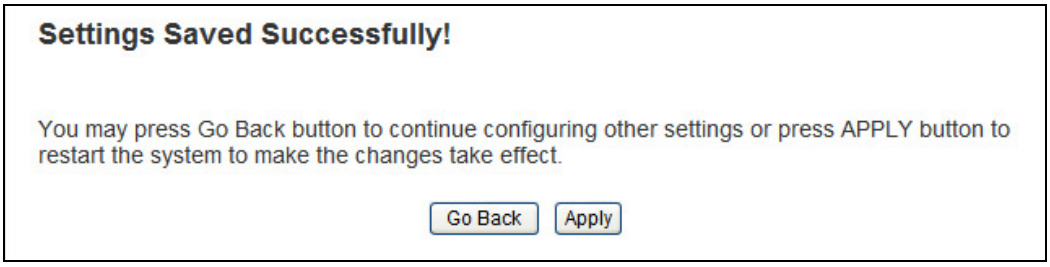
When you select ‘AP Bridge-Point to Point’, the following options will be displayed:




Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band.*<br><br>*If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g) will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *Channel Number* | *Please select a channel number you wish to use. The channel number must be same with another wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *MAC address 1* | *Please input the MAC address of the wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *Set Security* | *Click this button to select an encryption mode for this wireless link, a new popup window will appear. Please refer to Section 2-7 for detailed descriptions.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:



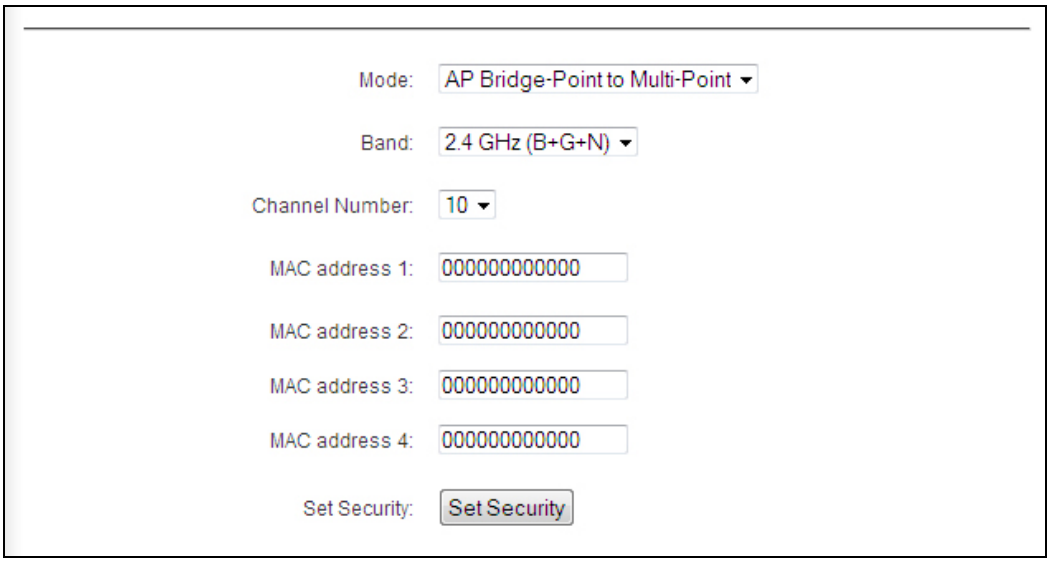

When you see this message, the settings you made are successfully saved, you can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless access point and the changes will take effect after about 30 seconds.

2-4-4 AP Bridge-Point to Multi-Point Mode

In this mode, this wireless Hi-Gain Outdoor Wireless-N Access Point will connect to up to four wireless Hi-Gain Outdoor Wireless-N Access Points which use the same mode, and all wired Ethernet clients of every wireless Hi-Gain Outdoor Wireless-N Access Points will be connected together. You can use this mode to connect a network to other networks which is physically isolated.

Please note that when you set your Hi-Gain Outdoor Wireless-N Access Point to this mode, it will not accept regular wireless clients anymore.

When you select 'AP Bridge-Point to Multi-Point', the following options will be displayed:

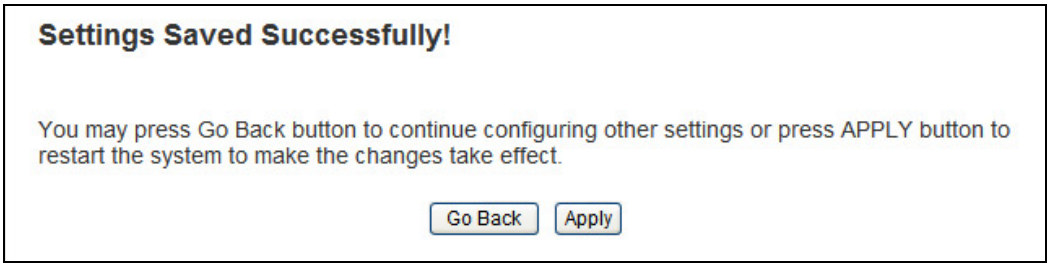



Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band.*<br><br>*If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g)* |

| | |
|---|---|
| | *will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *Channel Number* | *Please select a channel number you wish to use. The channel number must be same with another wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *MAC address 1-4* | *Please input the MAC address of the wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *Set Security* | *Click this button to select an encryption mode for this wireless link, a new popup window will appear. Please refer to Section 2-7 for detailed descriptions.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:



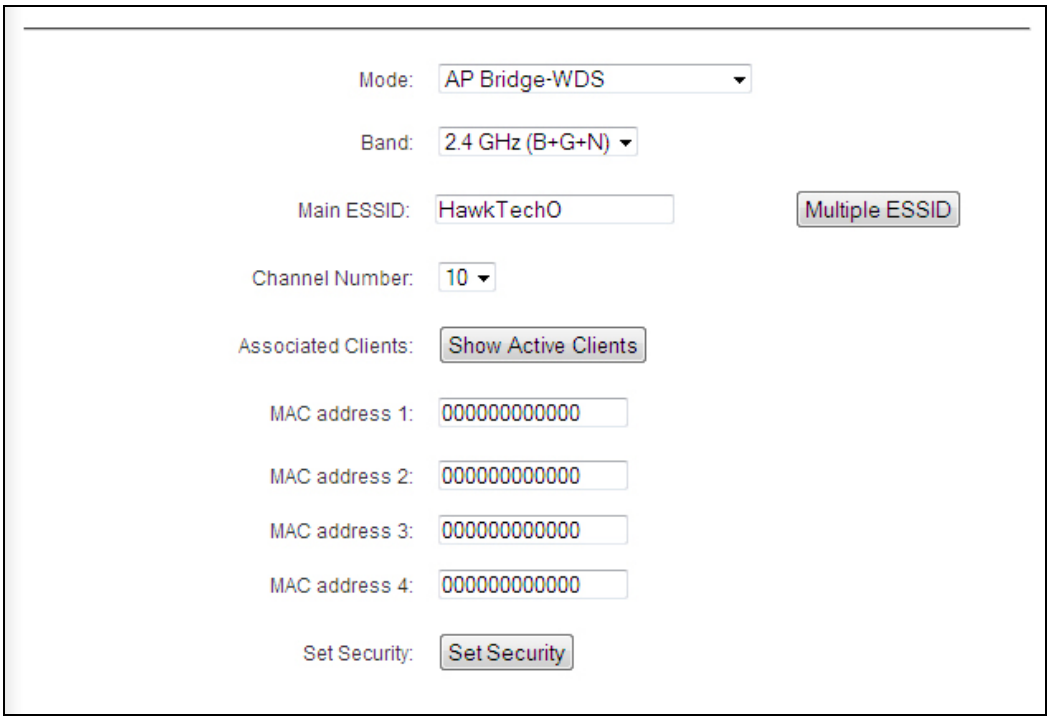

When you see this message, the settings you made are successfully saved. You can click 'Go Back' button to back to previous page and continue on other setting items, or click 'Apply' button to restart the wireless access point and the changes will take effect after about 30 seconds.

2-4-5 AP Bridge-WDS Mode

In this mode, this wireless Hi-Gain Outdoor Wireless-N Access Point will connect to up to four wireless Hi-Gain Outdoor Wireless-N Access Points which uses the same mode, and all wired Ethernet clients of every wireless Hi-Gain Outdoor Wireless-N Access Points will be connected together. You can use this mode to connect a network to other networks which is physically isolated.

When you use this mode, this Hi-Gain Outdoor Wireless-N Access Point is still able to accept wireless clients.

When you select 'AP Bridge-WDS', the following options will be displayed:



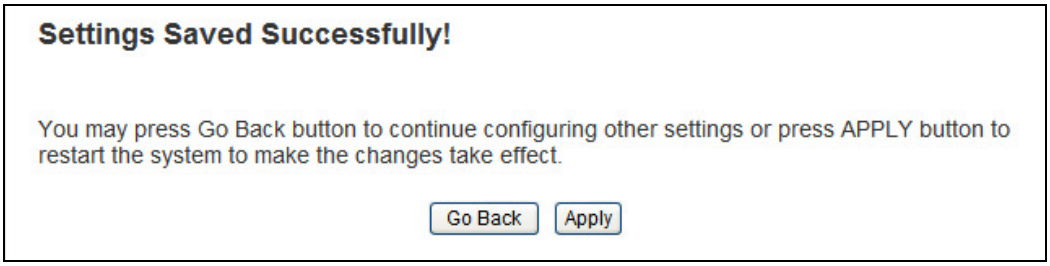

Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band.* |

| | |
|---|---|
| | *If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g) will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *MAIN ESSID* | *Please input the ESSID (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point) here. You can input up to 32 alphanumerical characters.* ***PLEASE NOTE THAT ESSID IS CASE SENSITIVE.*** |
| *Multiple ESSID* | *The Hi-Gain Outdoor Wireless-N Access Point supports multiple SSID function; up to four SSIDs can be set. If you want to configure additional SSIDs, please click this button. For detailed descriptions of the function, please refer to Section 2-4-1-1.* |
| *Channel Number* | *Please select a channel number you wish to use. The channel number must be same with another wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *Associated Clients* | *Click 'Show Active Clients' button and a new popup window will appear which contains the information about all wireless clients connected to this Hi-Gain Outdoor Wireless-N Access Point. You can click 'Refresh' button in popup window to keep information up-to-date.* |
| *MAC address 1-4* | *Please input the MAC address of the wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |

| | |
|---|---|
| *Set Security* | *Click this button to select an encryption mode for this wireless link, a new popup window will appear. Please refer to Section 2-7 for detailed descriptions.* |

After you finish with setting, please click ‘Apply’, and the following message will be displayed:

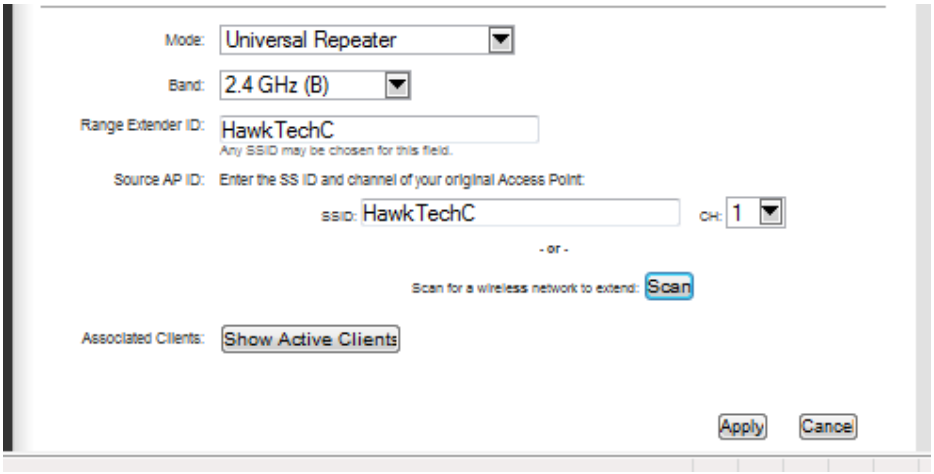



When you see this message, the settings you made are successfully saved. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

### 2-4-6 Universal Repeater

In this mode, the Hi-Gain Outdoor Wireless-N Access Point can act as a wireless repeater. It will use the Bridging function to connect to the source access point and use the Access Point function to rebroadcast the signal.

**NOTE: For Repeater Mode, this Hi-Gain Outdoor Wireless-N Access Point will demodulate the received signal, checking if this signal is noise for the operating network then have the signal modulated and amplified again. The output power of this mode is the same as that of WDS and normal AP mode.**

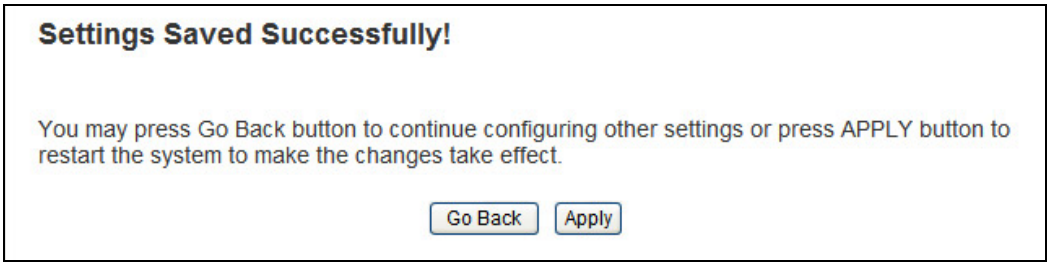



Here are descriptions of every setup item:

| | |
|---|---|
| *Band* | *Please select the wireless band you wish to use. By selecting different band setting, you'll be able to allow or deny the wireless client of a certain band.*<br><br>*If you select 2.4GHz (B), 2.4GHz (N), or 2.4GHz (G), only wireless clients using the wireless band you select (802.11b, 802.11 Draft-N, or 802.11g) will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you select 2.4GHz (B+G), then only wireless clients using 802.11b and 802.11g band will be able to connect to this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*If you want to allow 802.11b, 802.11g, and 802.11 Draft-N clients to connect to this Hi-Gain Outdoor Wireless-N Access Point, select 2.4GHz (B+G+N).* |
| *MAIN SSID* | *Please input the ESSID (the name used to identify this wireless Hi-Gain Outdoor Wireless-N Access Point) here. You can input up to 32 alphanumerical characters.* ***PLEASE NOTE THAT ESSID IS CASE SENSITIVE.*** |
| *Multiple ESSID* | *The Hi-Gain Outdoor Wireless-N Access Point* |

| | |
|---|---|
| | *supports multiple SSID function; up to four SSIDs can be set. If you want to configure additional SSIDs, please click this button. For detailed descriptions of the function, please refer to Section 2-4-1-1.* |
| *Channel Number* | *Please select a channel number you wish to use. The channel number must be same with another wireless Hi-Gain Outdoor Wireless-N Access Point you wish to connect* |
| *Associated Clients* | *Click 'Show Active Clients' button and a new popup window will appear which contains the information about all wireless clients connected to this Hi-Gain Outdoor Wireless-N Access Point. You can click 'Refresh' button in popup window to keep information up-to-date* |
| *Root AP SSID* | *In 'Universal Repeater' mode, this device can act as a station to connect to a Root AP. You should assign the SSID of the Root AP here or click 'Select Site Survey' button to choose a Root AP.* |
| *Select Site Survey* | *Click 'Select Site Survey' button, then a "Wireless Site Survey Table" will pop up. It will list all available Hi-Gain Outdoor Wireless-N Access Points near by. You can select one Hi-Gain Outdoor Wireless-N Access Point in the table and the Hi-Gain Outdoor Wireless-N Access Point will join wireless LAN through this Hi-Gain Outdoor Wireless-N Access Point. Please go to Section 2-4-2-1 for more information about the 'Wireless Site Survey Table'.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:



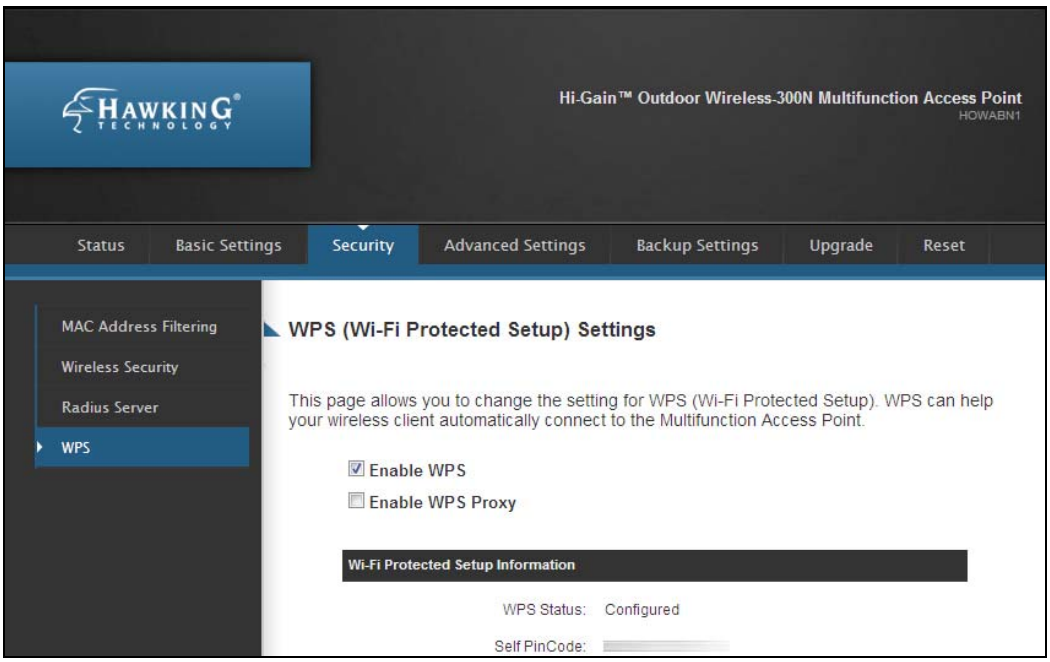

When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

## 2-5 WPS Setting

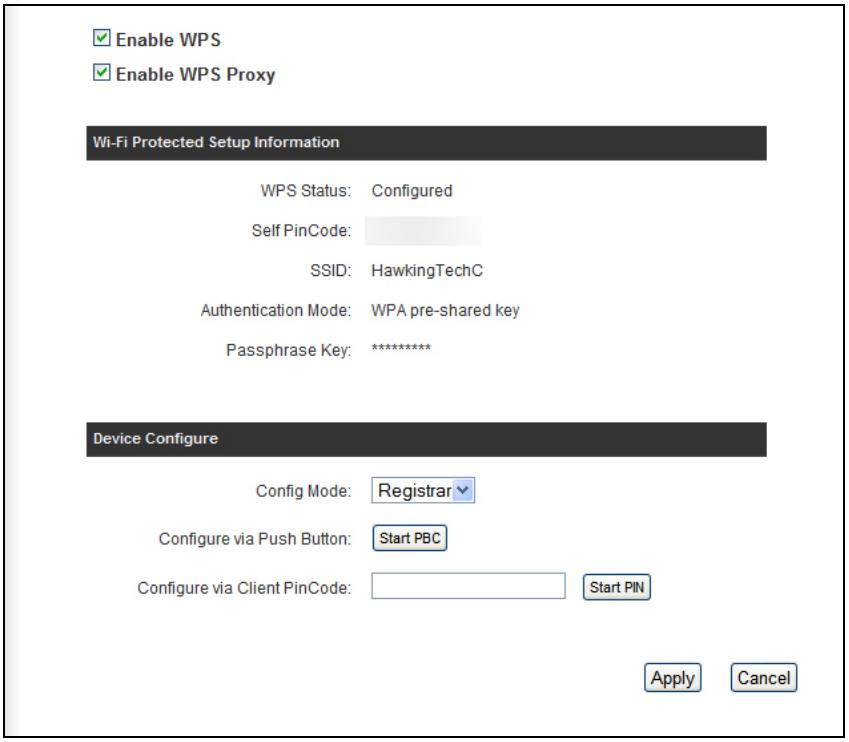
Wi-Fi Protected Setup (WPS) is the simplest way to build connection between wireless network clients and this Hi-Gain Outdoor Wireless-N Access Point. You don't have to select encryption mode and input a long encryption passphrase every time when you need to setup a wireless client, you only have to press a button on wireless client and this Hi-Gain Outdoor Wireless-N Access Point, and the WPS will do the setup for you.

This Hi-Gain Outdoor Wireless-N Access Point supports two types of WPS: Push-Button Configuration (PBC), and PIN code. If you want to use PBC, you have to switch this Hi-Gain Outdoor Wireless-N Access Point to WPS mode and push a specific button on the wireless client to start WPS mode. You can push Reset/WPS button of this Hi-Gain Outdoor Wireless-N Access Point, or click 'Start PBC' button in the web configuration interface to do this; if you want to use PIN code, you have to provide the PIN code of the wireless client you wish to connect to this Hi-Gain Outdoor Wireless-N Access Point and then switch the wireless client to WPS mode. The detailed instructions are listed follow:

**Note: WPS function of this Hi-Gain Outdoor Wireless-N Access Point will not work for those wireless clients do not support WPS.**




To use WPS function to set encrypted connection between this Hi-Gain Outdoor Wireless-N Access Point and WPS-enabled wireless client by WPS, click ‘WPS Setting’ on the left of web management menu, and the following information will be displayed:



Here are descriptions of every setup item:

| | |
|---|---|
| *Enable WPS* | *Check this box to enable or disable WPS function* |
| *Wi-Fi Protected Setup Information* | *All information related to WPS will be displayed here, they're helpful when you're setting up connections by WPS.*<br><br>*WPS Status: Displays WPS status. If data encryption settings of this Hi-Gain Outdoor Wireless-N Access Point has never been set, 'unConfigured' message will be displayed her. (see Section 2-7 for detailed information); if data encryption settings has been set before, 'Configured' message will be displayed here.*<br><br>*Self PinCode: This is the WPS PIN code of this Hi-Gain Outdoor Wireless-N Access Point. This code is useful when you need to build wireless connection by WPS with other WPS-enabled wireless devices.*<br><br>*SSID: Displays the SSID (ESSID) of this Hi-Gain Outdoor Wireless-N Access Point.*<br><br>*Authentication Mode: The wireless security authentication mode of this Hi-Gain Outdoor Wireless-N Access Point will be displayed here. If you don't enable security function of the Hi-Gain Outdoor Wireless-N Access Point before WPS is activated, the Hi-Gain Outdoor Wireless-N Access Point will auto set the security to WPA (AES) and generate a set of passphrase key for WPS connection.*<br><br>*Passphrase Key: Displays the WPA passphrase here, all characters will be replaced by asterisk for security reason. If encryption is not set on this Hi-Gain Outdoor Wireless-N Access Point, nothing* |

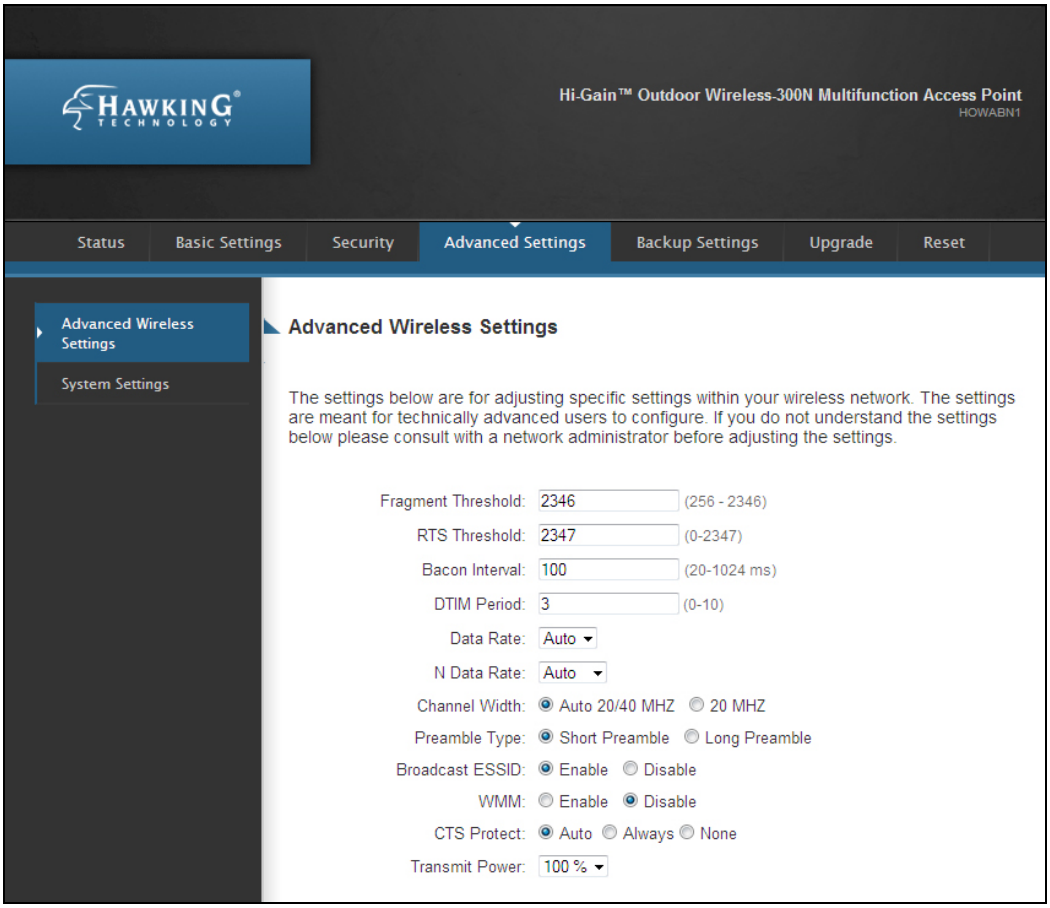
| | |
|---|---|
| | *will be displayed here.* |
| *Config Mode* | *There are 'Registrar' and 'Enrollee' modes for the WPS connection. When 'Registrar' is enabled, the wireless clients will follow the Hi-Gain Outdoor Wireless-N Access Point's wireless settings for WPS connection. When 'Enrolle' mode is enabled, the Hi-Gain Outdoor Wireless-N Access Point will follow the wireless settings of wireless client for WPS connection.* |
| *Start PBC* | *Click 'Start PBC' to start Push-Button style WPS setup procedure. This Hi-Gain Outdoor Wireless-N Access Point will wait for WPS requests from wireless clients for 2 minutes. The 'WLAN' LED on the Hi-Gain Outdoor Wireless-N Access Point will be steady on for 2 minutes when this Hi-Gain Outdoor Wireless-N Access Point is waiting for incoming WPS request.* |
| *Start PIN* | *Please input the PIN code of the wireless client you via client wish to connect, and click 'Start PIN' button. The 'WLAN' LED on the Hi-Gain Outdoor Wireless-N Access Point will be steady on when this Hi-Gain Outdoor Wireless-N Access Point is waiting for incoming WPS request.* |

**NOTE: When you're using PBC type WPS setup, you must press 'PBC' button (hardware or software) of wireless client within 120 seconds; if you didn't press PBC button of wireless client within this time period, please press 'PBC' button (hardware or software) of this Hi-Gain Outdoor Wireless-N Access Point again.**

## 2-6 Advanced Wireless Settings

This wireless Hi-Gain Outdoor Wireless-N Access Point has many advanced wireless features. Please note that all settings listed here are for experienced users only, if you're not sure about the meaning and function of these settings, please don't modify them, or the wireless performance will be reduced.

You can click 'Advanced Setting' on the left to enter advanced settings menu, and the following message will be displayed:



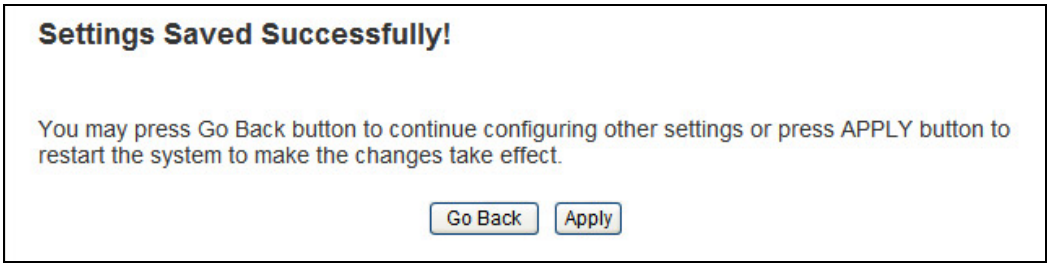

Here are descriptions of every setup item:

| | |
|---|---|
| *Fragment Threshold* | *Set the Fragment threshold of wireless radio.* ***Do not modify default value if you don't know what it is, default value is 2346*** |
| *RTS Threshold* | *Set the RTS threshold of wireless radio.* ***Do not*** |

| | |
|---|---|
| | ***modify default value if you don't know what it is, default value is 2347*** |
| *Beacon Interval* | *Set the beacon interval of wireless radio.* ***Do not modify default value if you don't know what it is, default value is 100*** |
| *DTIM Period* | *Set the DTIM period of wireless radio.* ***Do not modify default value if you don't know what it is, default value is 3*** |
| *Data Rate* | *Set the wireless data transfer rate to a certain value. Since most of wireless devices will negotiate with each other and pick a proper data transfer rate automatically,* ***it's not necessary to change this value unless you know what will happen after modification.*** |
| *N Data Rate* | *Set the data rate of 802.11 Draft-N clients, available options are MCS 0 to MCS 15, it's safe to set this option to 'Auto' and* ***it's not necessary to change this value unless you know what will happen after modification.*** |
| *Channel Width* | *Select wireless channel width (bandwidth taken by wireless signals of this Hi-Gain Outdoor Wireless-N Access Point). It's suggested to select 'Auto 20/40MHz'. Do not change to '20 MHz' unless you know what it is.* |
| *Preamble Type* | *Set the type of preamble of wireless radio,* ***Do not modify default value if you don't know what it is, default setting is 'Short Preamble'.*** |
| *Broadcast ESSID* | *Decide if the wireless Hi-Gain Outdoor Wireless-N Access Point will broadcast its own ESSID or not. You can hide the ESSID of your wireless Hi-Gain Outdoor Wireless-N Access Point (set the option to 'Disable'), so only people those who know the ESSID of your wireless Hi-Gain Outdoor Wireless-N Access Point can get connected.* |
| *WMM* | *WMM (Wi-Fi Multimedia) technology, which can improve the performance of certain network applications, like audio/video streaming, network telephony (VoIP), and others. When you enable* |

| | |
|---|---|
| | *WMM function, the Hi-Gain Outdoor Wireless-N Access Point will define the priority of different kinds of data, to give higher priority to applications which require instant responding. Therefore you can improve the performance of such network applications.* |
| *CTS Protect* | *Enabling this setting will reduce the chance of radio signal collisions between 802.11b and 802.11g wireless Hi-Gain Outdoor Wireless-N Access Points. It's recommended to set this option to 'Auto'.* |
| *TX Power* | *You can set the output power of wireless radio. Unless you're using this wireless Hi-Gain Outdoor Wireless-N Access Point in a really big space, you may not have to set output power to 100%.* ***This will enhance security (malicious / unknown users in distance will not be able to reach your wireless Hi-Gain Outdoor Wireless-N Access Point).*** |

After you finish with setting, please click 'Apply', and the following message will be displayed:



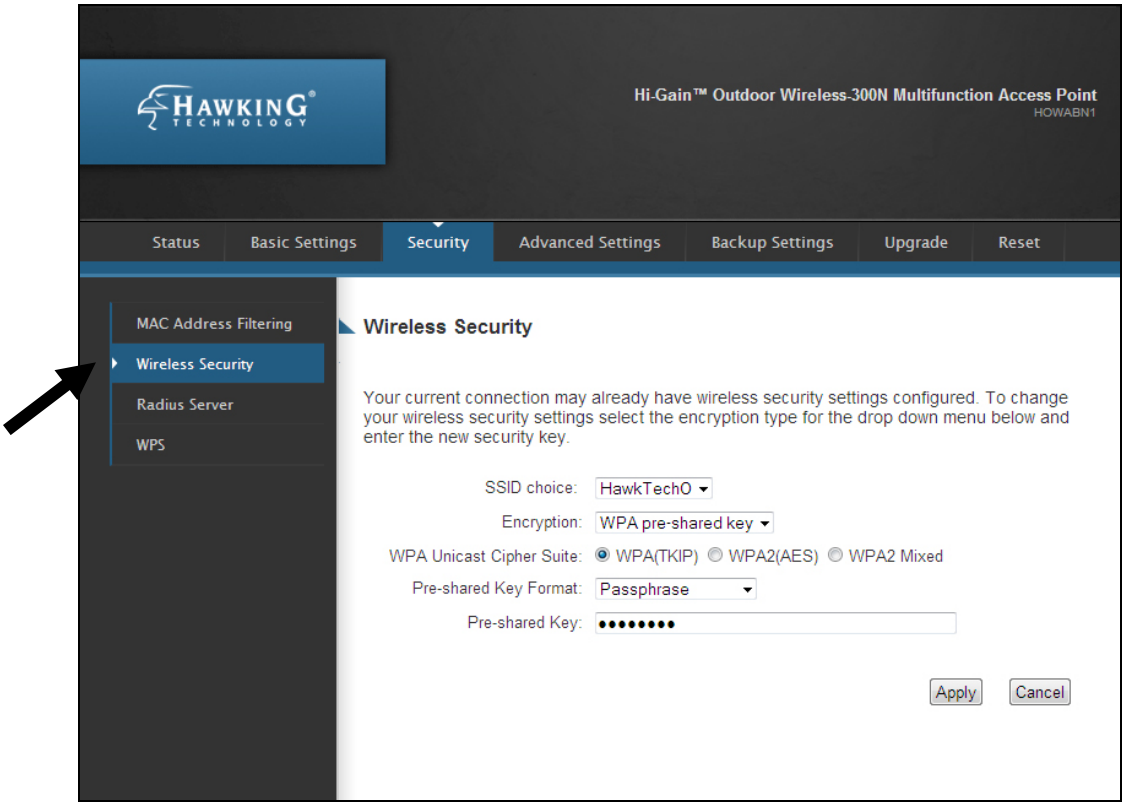

When you see this message, the settings you made is successfully save. You can click 'Go Back' button to back to previous page and continue on other setting items, or click 'Apply' button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

## 2-7 Wireless Security

This wireless Hi-Gain Outdoor Wireless-N Access Point provides many types of wireless security (wireless data encryption). When you use data encryption, data transferred by radio signals in the air will become unreadable for those people who don't know correct encryption key (encryption password).

There are two ways to set wireless security:

1. Click 'Security' on the left of web management interface.




2. Click 'Set Security' button when the wireless operating mode you selected is 'AP Bridge-Point to Point', 'AP Bridge-Point to Multi-Point', or 'AP Bridge-WDS'.

There are four types of security level you can select: Disable (no security - data encryption disabled), WEP, WPA Pre-shared Key, and WPA Radius. Please refer to the following sections for detailed instructions.

**NOTE: If you have enabled Multiple SSID function, please select the SSID network you wish to configure in advance.**

Please remember it’s very important to set wireless security settings properly! Without a proper setting, hackers and intruders may gain access to your local network and do something bad to your computers and servers, which could cause serious problem.

There are several things you can do to improve wireless security:

1. Always enable data encryption. Only disable it when you want to open your wireless Hi-Gain Outdoor Wireless-N Access Point to the public.

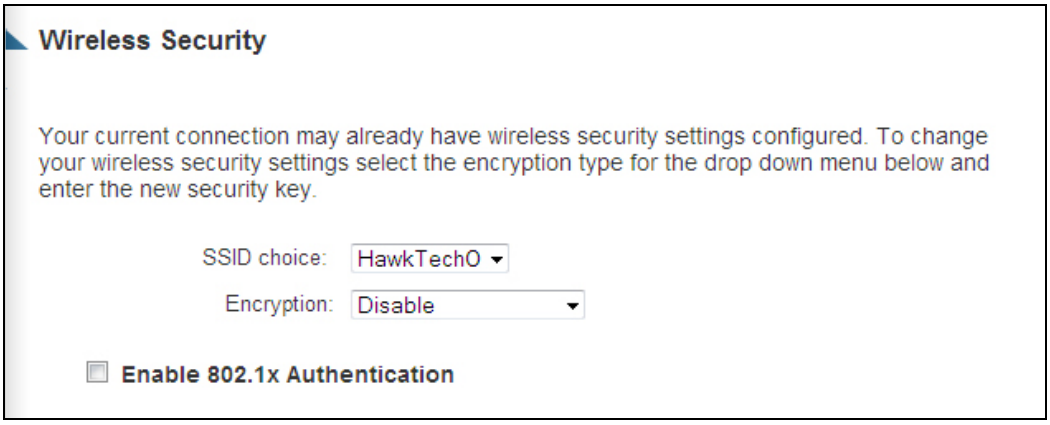
2. Never use simple words as encryption password. Use the random combination of symbols, numbers, and alphabets will greatly improve security.

3. Use WPA when possible - it's much safer than WEP.

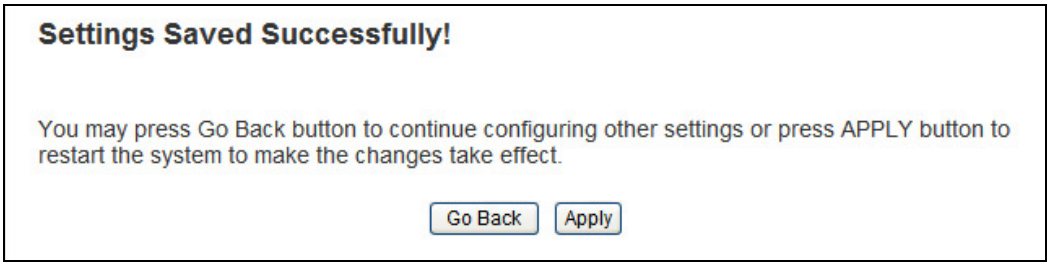
4. Change encryption password when you’ve used it for too long time.

2-7-1 Disable Security

Select the SSID you wish to configure. When you select ‘Disable’, wireless encryption for the network is disabled.




After you finish with setting, please click ‘Apply’, and the following message will be displayed:




When you see this message, the settings you made is successfully save. You can click ‘go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-7-2 WEP

WEP (Wired Equivalent Privacy) is a common encryption mode, it's safe enough for home and personal use. But if you need higher level of security, please consider using WPA encryption (see next Section).

However, some wireless clients don't support WPA, but only support WEP, so WEP is still a good choice for you if you have such kind of client in your network environment.

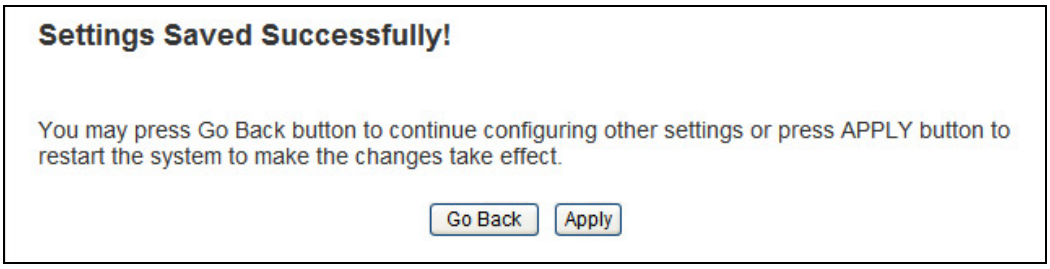
When you select 'WEP' as encryption type, the following messages will be displayed:

Here are descriptions of every setup item:

| | |
|---|---|
| *Key Length* | *There are two types of WEP key length: 64-bit and 128-bit. Using '128-bit' is safer than '64-bit', but will reduce some data transfer performance.* |
| *Key Format* | *There are two types of key format: ASCII and Hex. When you select a key format, the number of* |

| | |
|---|---|
| | *characters of key will be displayed. For example, if you select '64-bit' as key length, and 'Hex' as key format, you'll see the message at the right of 'Key Format' is 'Hex (10 characters), which means the length of WEP key is 10 characters.* |
| *Default Tx Key* | *You can set up to four sets of WEP key, and you can decide which key is being used by default here.* ***If you don't know which one you should use, select 'Key 1'.*** |
| *Encryption Key 1 to 4* | *Input WEP key characters here, the number of characters must be the same as the number displayed at 'Key Format' field. You can use any alphanumerical characters (0-9, a-z, and A-Z) if you select 'ASCII' key format, and if you select 'Hex' as key format, you can use characters 0-9, a-f, and A-F. You must enter at least one encryption key here, and if you entered multiple WEP keys, they should not be same with each other.* |
| *Enable 802.1x Authentication* | *Check this box to enable 802.1x user authentication. Please refer to Section 2-7-5 for detailed instructions.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:

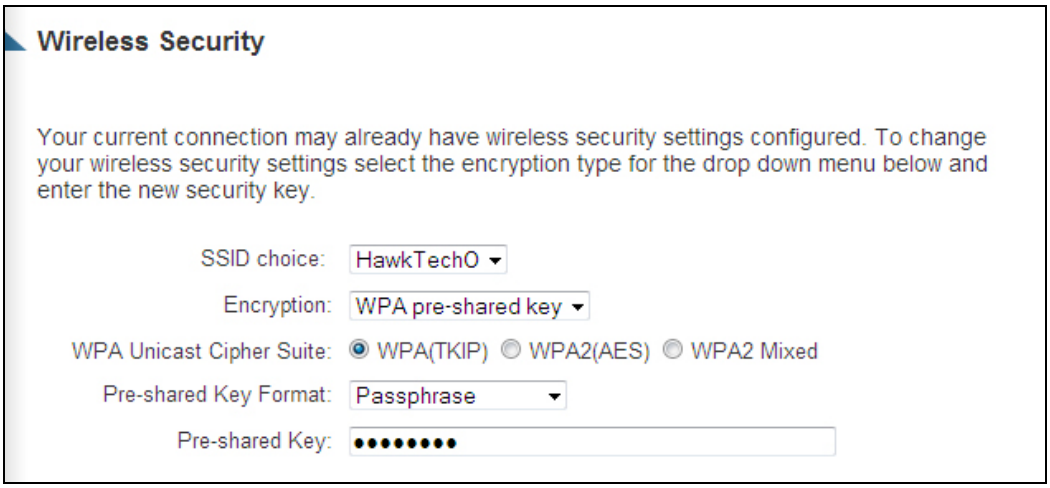



When you see this message, the settings you made is successfully save. You can click 'Go Back' button to back to previous page and continue on other setting items, or click 'Apply' button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-7-3 WPA Pre-shared Key

WPA Pre-shared key is the safest encryption method currently, and it's recommended to use this encryption method to ensure the safety of your data.

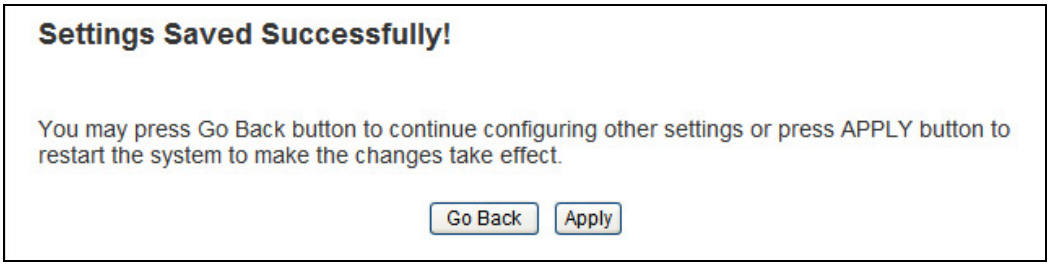
When you select 'WPA pre-shared key' as encryption type, the following messages will be displayed:




Here are descriptions of every setup item:

| | |
|---|---|
| *WPA Unicast Cipher Suite* | *Available options are: WPA (TKIP), WPA2 (AES), and WPA2 Mixed. You can select one of them, but you have to make sure your wireless client support the cipher you selected.* |
| *Pre-shared Key Format* | *Please select the format of pre-shared key here, available options are 'Passphrase' (8 to 63 alphanumerical characters) and 'Hex (64 hexadecimal characters – 0 to 9 and a to f).* |
| *Pre-shared Key* | *Please input pre-shared key according to the key format you selected here. For security reason, don't use simple words).* |

After you finish with setting, please click 'Apply', and the following message will be displayed:

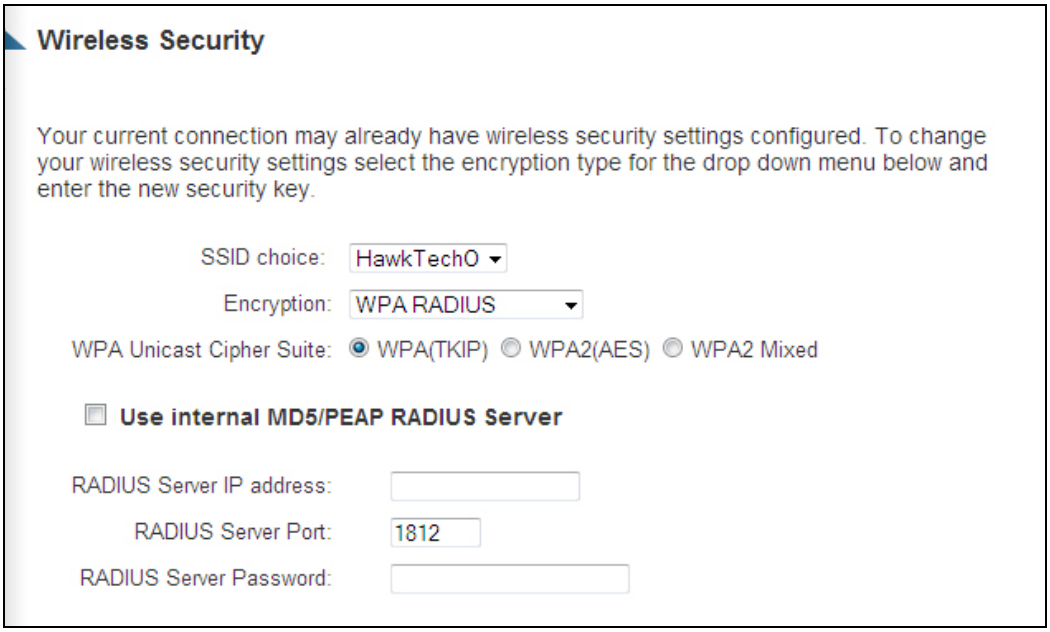



When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-7-4 WPA RADIUS

WPA Radius is the combination of WPA encryption method and RADIUS user authentication. If you have a RADIUS authentication server, you can check the identify of every wireless client by user database.

When you select 'WPA RADIUS' as encryption type, the following messages will be displayed:

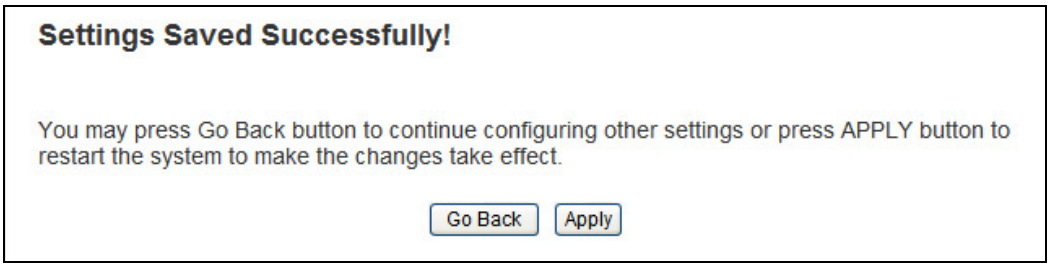



Here are descriptions of every setup item:

| | |
|---|---|
| *WPA Unicast Cipher Suite* | *You can select WPA encryption type here. AES is safer than TKIP, but not every wireless client supports it. Please refer to the specification of your wireless client to decide which encryption type you should use.* |
| *Use internal MD5/PEAP RADIUS Server* | *Uses built-in RADIUS Server (refer to Section 2-8) instead of external RADIUS server. If you check this box, the value in following three fields will be ignored.* |
| *RADIUS Server IP address* | *Please input the IP address of RADIUS authentication server here.* |
| *RADIUS Server* | *Please input the port number of RADIUS* |

| | |
|---|---|
| *Port* | *authentication server here. Default value is 1812.* |
| *RADIUS Server Password* | *Please input the password of RADIUS authentication server here.* |

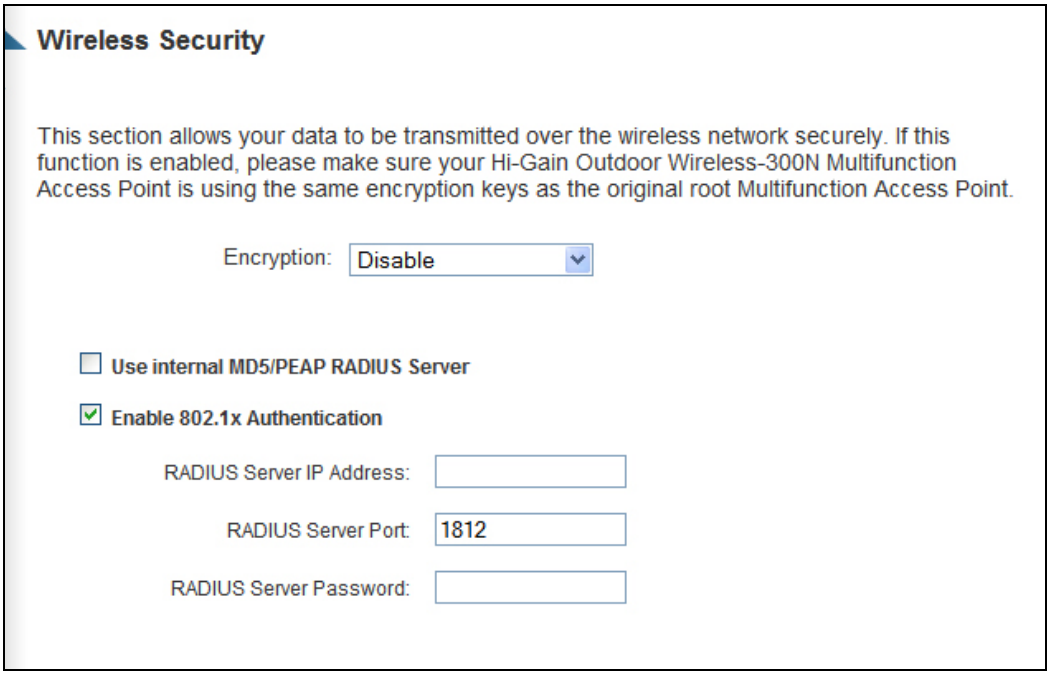
After you finish with setting, please click ‘Apply’, and the following message will be displayed:




When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-7-5 802.1x Authentication

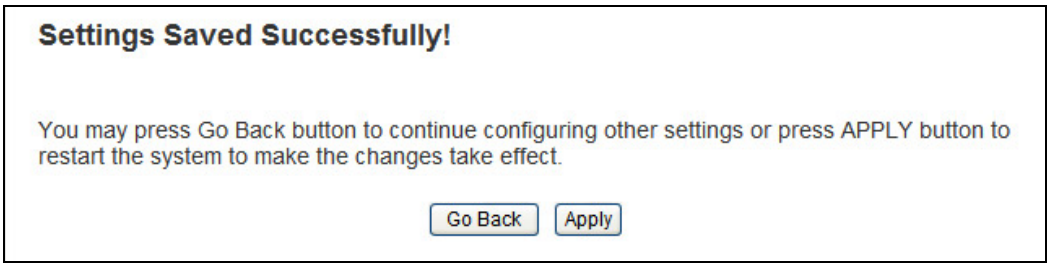
You can enable 802.1x user identification (based on RADIUS user authentication server) by checking ‘Enable 802.1x Authentication’ box when you select ‘Disable’ or ‘WEP’ as encryption type, and the following message will be displayed:




Here are descriptions of every setup item:

| | |
|---|---|
| *Use internal MD5/PEAP RADIUS Server* | *Uses built-in RADIUS Server (refer to next Section) instead of external RADIUS server. If you check this box, the value of internal RADIUS server fields will be ignored.* |
| *Enable 802.1x Authentication* | *Enable or disable the use of 802.1x user authentication.* |
| *RADIUS Server IP address* | *Please input the IP address of RADIUS authentication server here.* |
| *RADIUS Server Port* | *Please input the port number of RADIUS authentication server here. Default value is 1812.* |
| *RADIUS Server Password* | *Please input the password of RADIUS authentication server here.* |

After you finish with setting, please click ‘Apply’, and the following message will be displayed:



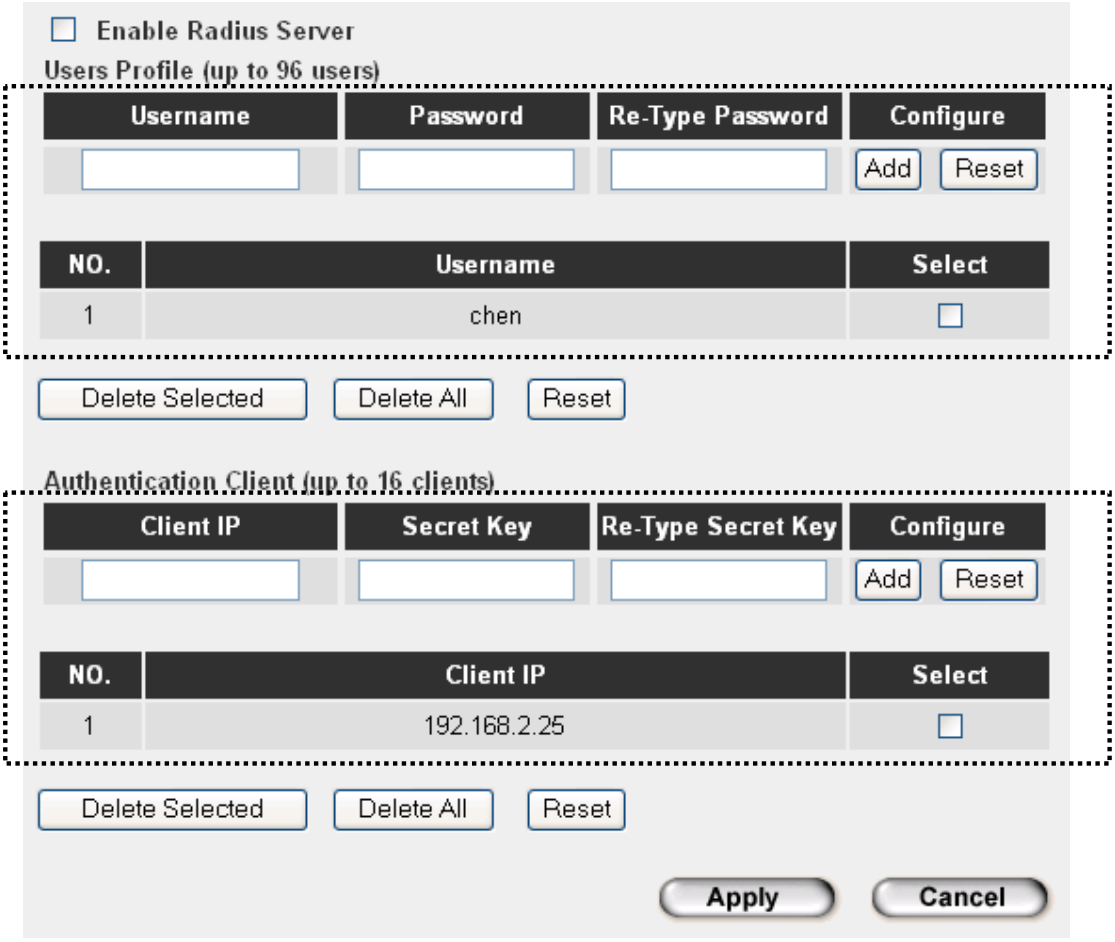

When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-8 Radius Server

Comparing to other wireless security measures, radius server provides user-based authentication. If your wireless client supports 802.1x user authentication, you can use the ‘Radius Server’ function to use the internal mini radius server to improve security and wireless user control.

The internal radius server only supports 96 users and 16 IP addresses. If the number of user and/or IP address you need is more than this, please use external radius server.

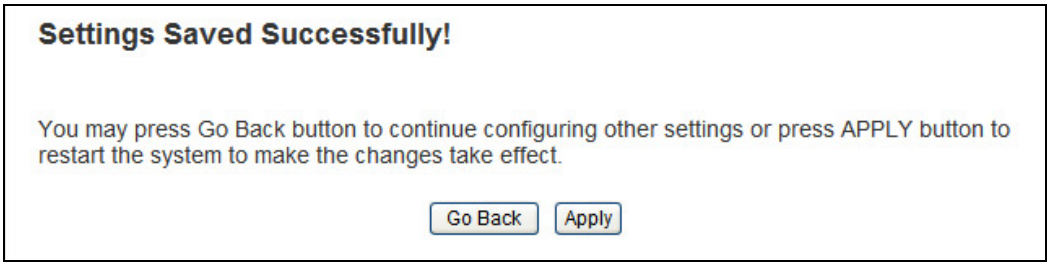
To setup internal radius server, click ‘Raidus Server’ on the left of web management interface, and the following information will be displayed:



Here are descriptions of every setup item:

| | |
|---|---|
| *Enable Radius Server* | *Check this box to enable internal radius server function.* |
| *User Profile* | *You can add or delete radius user here. Please input username, password, re-type password in corresponding field, and click 'Add' button to add the user to radius server database. You can click 'Reset' to clear the text you typed in above three fields.*<br><br>*All current radius users will be listed here. If you want to delete one or more users, check 'Select' box of that user, and click 'Delete Selected' button; you can click 'Delete All' button to delete all users in radius server database. You can also click 'Reset' button to uncheck all 'Select' boxes.* |
| *Authentication Client* | *You can add allowed radius client IP address here. Please input client IP, secret key, re-type secret key in corresponding field, and click 'Add' button to add the IP address to radius server database. You can click 'Reset' to clear the text you typed in above three fields.*<br><br>*All current IP addresses will be listed here. If you want to delete one or more addresses, check 'Select' box of that address, and click 'Delete Selected' button; you can click 'Delete All' button to delete all addresses in radius server database. You can also click 'Reset' button to uncheck all 'Select' boxes.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:

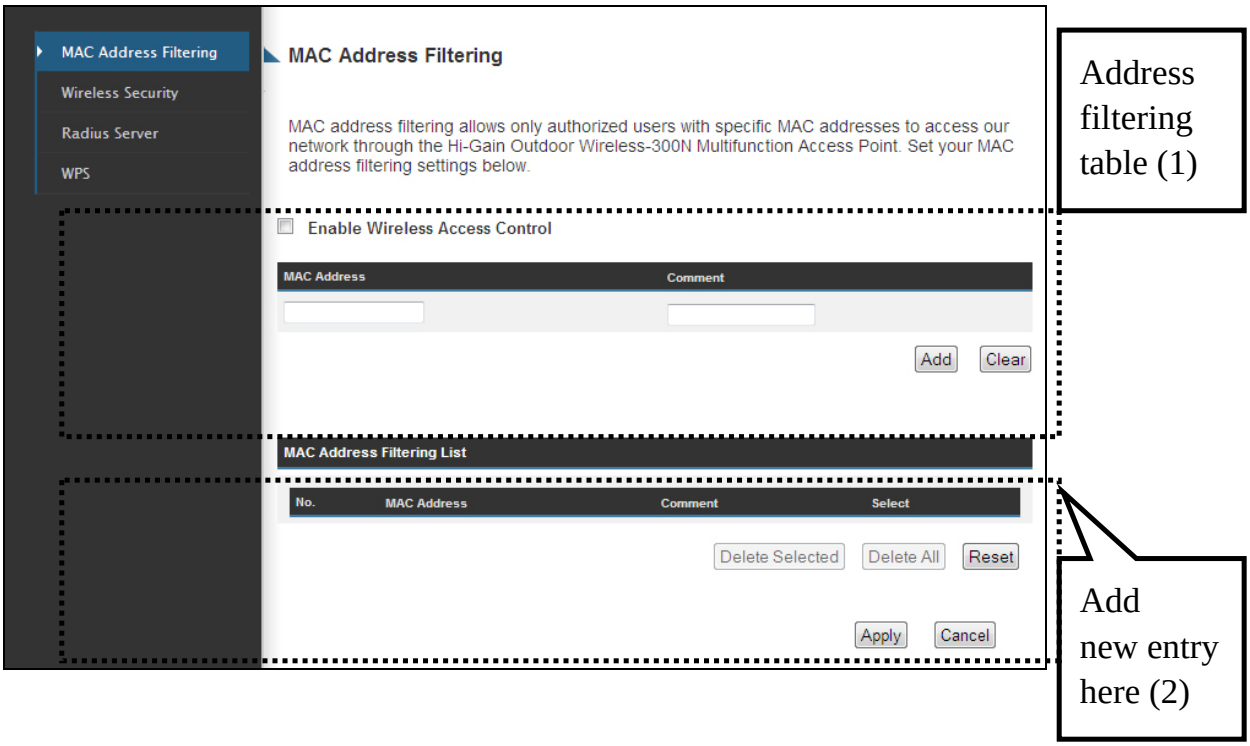



When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-9 MAC Filtering

Another security measure you can use to keep hackers and intruders away is ‘MAC filtering’. You can pre-define a so-called ‘white-list’, which contains MAC addresses of the wireless clients you trust. All other wireless client with the MAC address which is not in your list will be denied by this wireless Hi-Gain Outdoor Wireless-N Access Point.

To setup MAC filtering, please click ‘MAC Filtering’ on the left of web management interface and the following messages will be displayed:



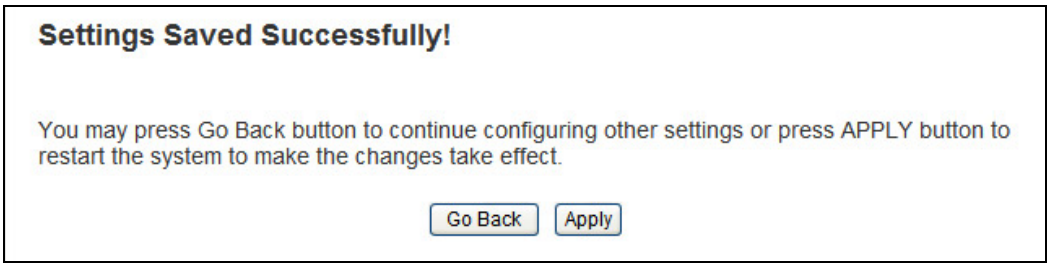

This page contains two parts of MAC filtering information. All allowed MAC addresses will be listed in upper part (1), and you can add new MAC addresses by components in lower part (2).

Here are descriptions of every setup item:

| | |
|---|---|
| *Select* | *Check this box to select one or more MAC address(es) to delete.* |
| *Delete Selected* | *Click this button to delete all selected MAC* |

| | |
|---|---|
| | *address(es).* |
| *Delete All* | *Delete all MAC address entries.* |
| *Reset* | *Uncheck all selected MAC address entries.* |
| *Enable Wireless Access Control* | *Check this box to enable MAC address restriction, if unchecked, no restriction will be enforced (any wireless client with proper encryption setting will be able to connect to this wireless Hi-Gain Outdoor Wireless-N Access Point).* |
| *MAC address* | *Input MAC address allowed using this wireless Hi-Gain Outdoor Wireless-N Access Point here. You don't have to add colon (:) or hyphen (-) by yourself, just input 0 to 9 and a to f here, like 112233445566 or aabbccddeeff.* |
| *Comment* | *You can input any text here as the comment of this MAC address, like 'ROOM 2A Computer' or anything. You can input up to 16 alphanumerical characters here. This is optional and you can leave it blank, however, it's recommended to use this field to write a comment for every MAC addresses as a memory aid. This is optional.* |
| *Add* | *When you finish inputting MAC address and (optional) Comment, click this button to add the MAC address to the list.* |
| *Clear* | *Remove all characters in 'MAC address' and 'Comments' field.* |

After you finish with setting, please click 'Apply', and the following message will be displayed:




When you see this message, the settings you made is successfully save. You can click 'Go Back' button to back to previous page and continue on

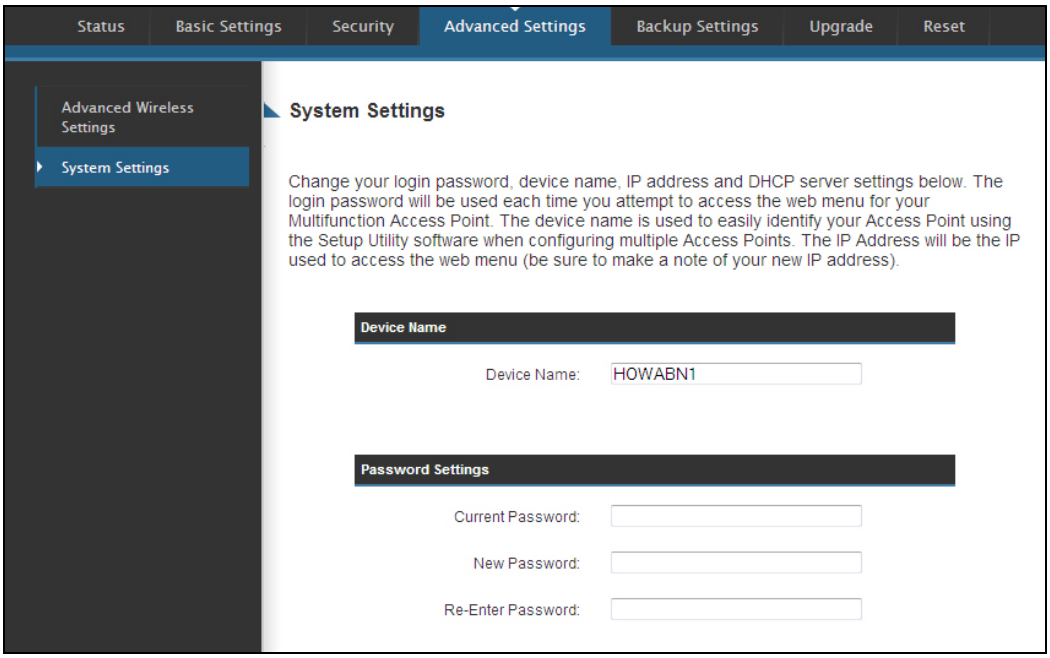
other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

## 2-10 System Utilities

This Hi-Gain Outdoor Wireless-N Access Point provides some control functions include password, IP address management, and DHCP server function. Please click ‘System Utility’ on the left of web management interface to access these functions. Below are detailed descriptions of every control function.

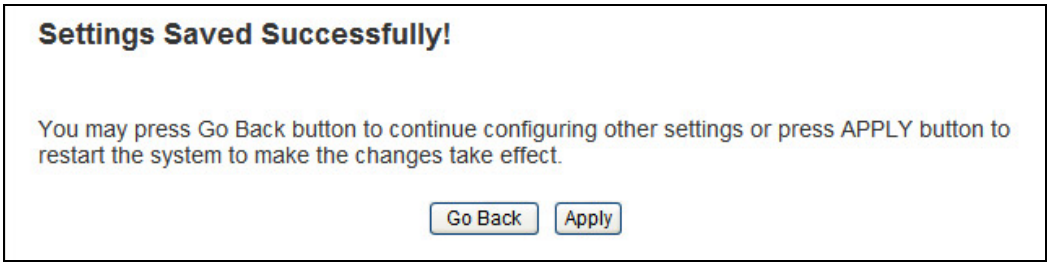
### 2-10-1 Change Password

You can change the password used to enter the web configuration menu of this wireless Hi-Gain Outdoor Wireless-N Access Point.




Please click ‘System Utility’ on the left, and the following message will be displayed:

Please input current password in ‘Current Password’ field, then input new password in both ‘New Password’ and ‘Re-Enter Password’ field. After you finish, please go to the bottom of this page and click ‘Apply’, and the following message will be displayed:



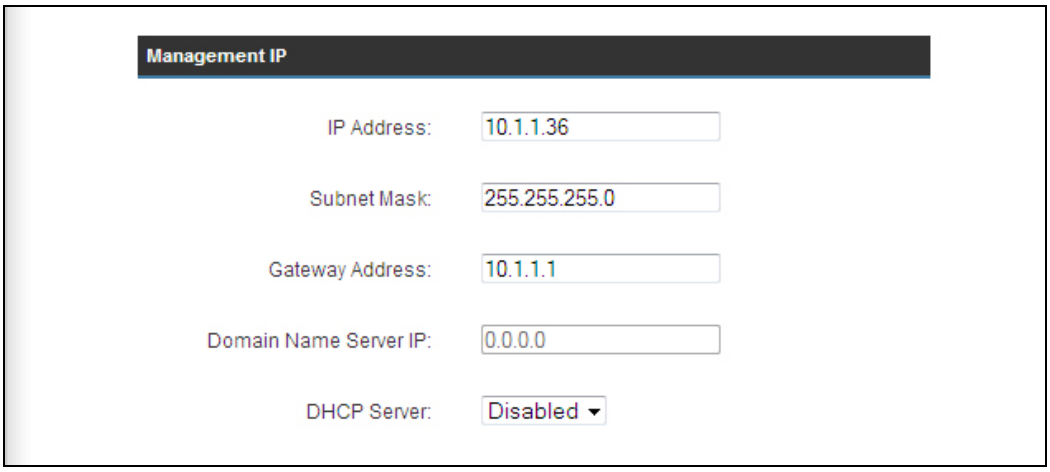

When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-10-2 IP Address of the Wireless Hi-Gain Outdoor Wireless-N Access Point

You can change the IP address of this wireless Hi-Gain Outdoor Wireless-N Access Point, so it can become a part of your local network. Please remember this address or you will not be able to connect the configuration menu of this wireless Hi-Gain Outdoor Wireless-N Access Point.

Default IP address is: 192.168.1.230 / Subnet Mask 255.255.255.0, you can press and hold ‘Reset/WPS’ button over 10 seconds to change the IP address back to default value if you forget the IP address you set.

To change IP address, please click ‘System Utility’ on the left, and the following message will be displayed:

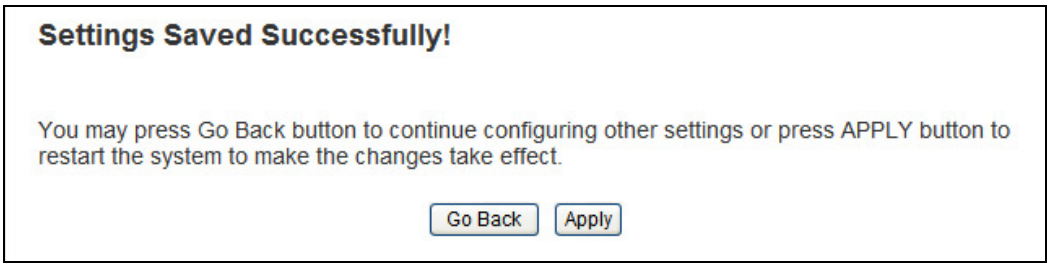



Please input IP address and Subnet Mask in corresponding field, and you can input the IP address of gateway in ‘Gateway Address’ field, if you need to manage this wireless Hi-Gain Outdoor Wireless-N Access Point from other network (like Internet).

If you want to activate the DHCP server function of this wireless Hi-Gain Outdoor Wireless-N Access Point, please select ‘Enabled’ in ‘DHCP Server’ option, and see next Section for detailed instructions; if you don’t want to use DHCP server function of this wireless Hi-Gain Outdoor Wireless-N Access Point, or there’s another DHCP server on the network

this Hi-Gain Outdoor Wireless-N Access Point connects to, please select ‘Disable’.

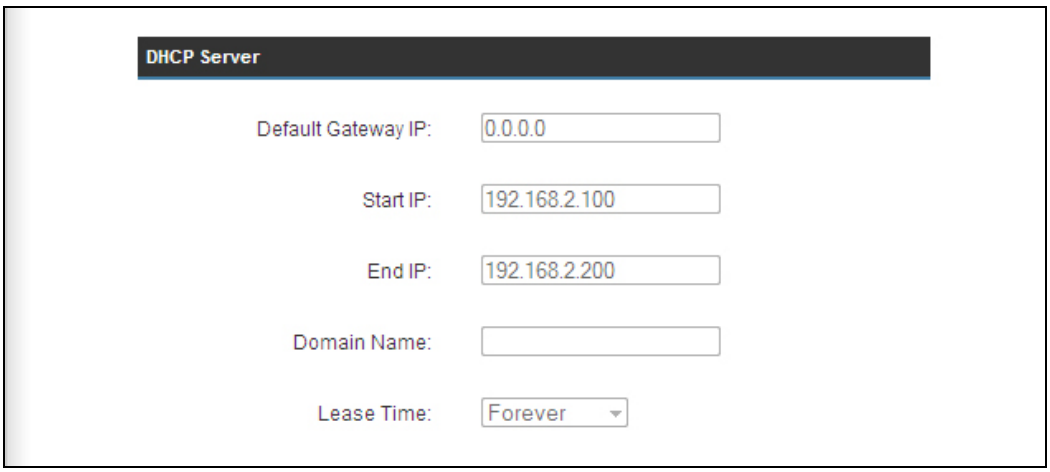
After you finish, please go to the bottom of this page and click ‘Apply’, and the following message will be displayed:




When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

2-10-3 DHCP Server

This wireless Hi-Gain Outdoor Wireless-N Access Point is capable to act as a DHCP server for your network, and it's disabled by default. If you want to activate this function, please click 'System Utility' on the left, and the following message will be displayed:

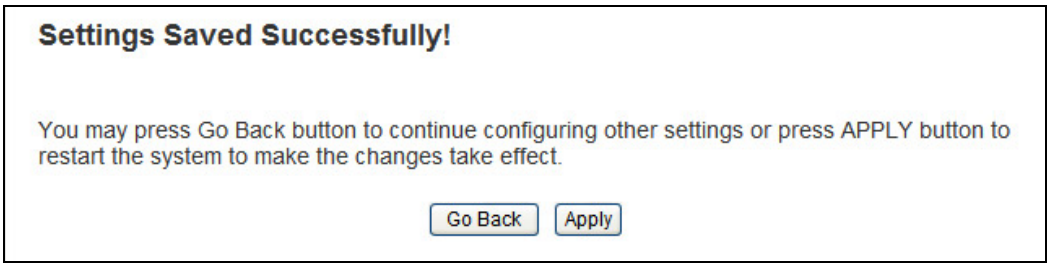



**NOTE: Please remember to select 'Enable' in 'DHCP Server' option as described in last Section or all DHCP-related fields will be grayed out, and you will not be able to input any DHCP parameter.**

Here are descriptions of every setup item:

| | |
|---|---|
| *Default Gateway IP* | *Please input the IP address of default gateway of your network here.* |
| *Domain Name Server IP* | *Please input the IP address of domain name server (DNS) here.* |
| *Start IP* | *Please input the start IP address of the IP range.* |
| *End IP* | *Please input the end IP address of the IP range.* |
| *Domain Name* | *If you wish, you can also optionally input the domain name for your network. This is optional.* |
| *Lease Time* | *Please choose a lease time (the duration that every computer can keep a specific IP address) of every IP address assigned by this Hi-Gain Outdoor Wireless-N Access Point from dropdown menu.* |

After you finish, please click ‘Apply’, and the following message will be displayed:




When you see this message, the settings you made is successfully save. You can click ‘Go Back’ button to back to previous page and continue on other setting items, or click ‘Apply’ button to restart the wireless Hi-Gain Outdoor Wireless-N Access Point and the changes will take effect after about 30 seconds.

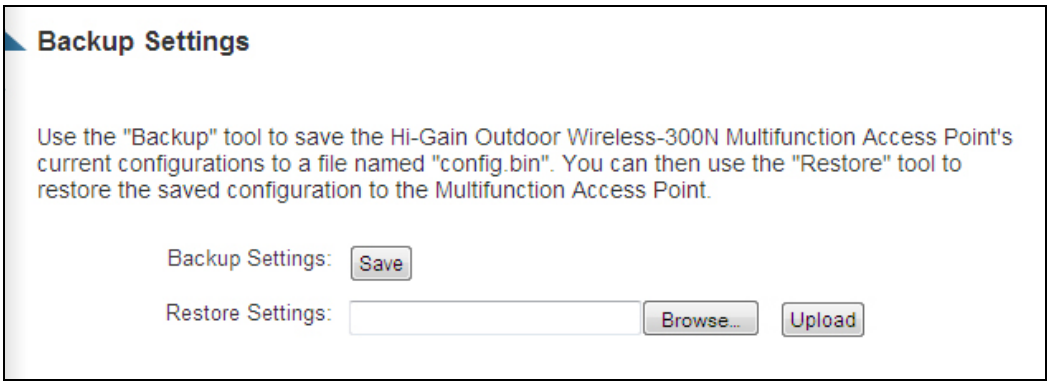
# *Chapter III: Advanced Configuration*

## 3-1 Configuration Backup and Restore

You can backup all configurations of this Hi-Gain Outdoor Wireless-N Access Point to a file, so you can make several copied of Hi-Gain Outdoor Wireless-N Access Point configuration for security reason.

To backup or restore Hi-Gain Outdoor Wireless-N Access Point configuration, please follow the following instructions:

Please click ‘Configuration Tool’ on the left of web management interface, and the following message will be displayed on your web browser:




Here are descriptions of every buttons:

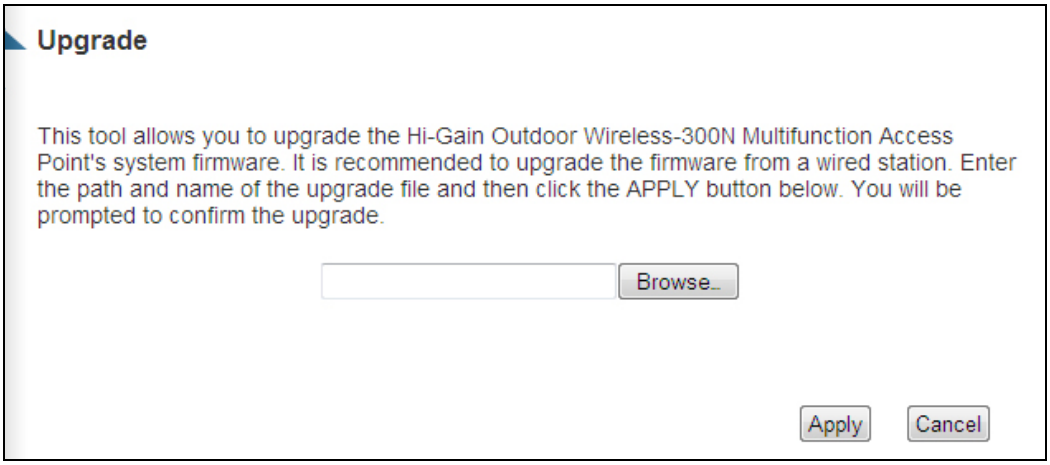
| | |
|---|---|
| *Backup Settings* | *Press ‘Save...’ button, and you’ll be prompted to download the configuration as a file, default filename is ‘config.bin’, you can save it as another filename for different versions, and keep it in a safe place.* |
| *Restore Settings* | *Press ‘Browse…’ to pick a previously-saved configuration file from your computer, and then click ‘Upload’ to transfer the configuration file to Hi-Gain Outdoor Wireless-N Access Point. After the configuration is uploaded, the Hi-Gain Outdoor Wireless-N Access Point’s configuration* |

| | |
|---|---|
| | *will be replaced by the file you just uploaded.* |
| *Restore to Factory Default* | *Click this button to remove all settings you made, and restore the configuration of this Hi-Gain Outdoor Wireless-N Access Point back to factory default settings.* |

3-2 Firmware Upgrade

If there are new firmware of this wireless Hi-Gain Outdoor Wireless-N Access Point available, you can upload the firmware to the Hi-Gain Outdoor Wireless-N Access Point to change the firmware with new one, to get extra functions or problem fix.

To perform firmware upgrade, please click ‘Upgrade’ on the left of web management interface, and the following message will be displayed:




Click ‘Browse’ button first, you’ll be prompted to provide the filename of firmware upgrade file. Please download the latest firmware file from our website, and use it to upgrade your Hi-Gain Outdoor Wireless-N Access Point.

After a firmware upgrade file is selected, click ‘Apply’ button, and the Hi-Gain Outdoor Wireless-N Access Point will start firmware upgrade procedure automatically. The procedure may take several minutes, please be patient.

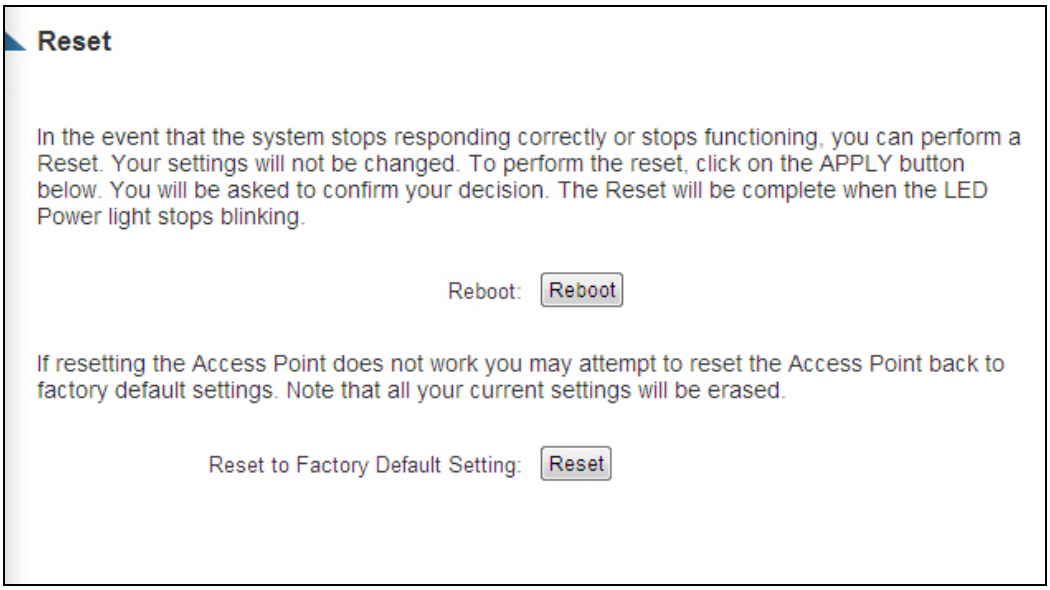
**NOTE: Never interrupt the upgrade procedure by closing the web browser or physically disconnect your computer from Hi-Gain Outdoor Wireless-N Access Point or it will cause firmware upgrade failed. This Hi-Gain Outdoor Wireless-N Access Point supports fault tolerance firmware upgrade. Once the firmware you uploaded is corrupt, get into the web management of the Hi-Gain Outdoor**

3-3 System Reset

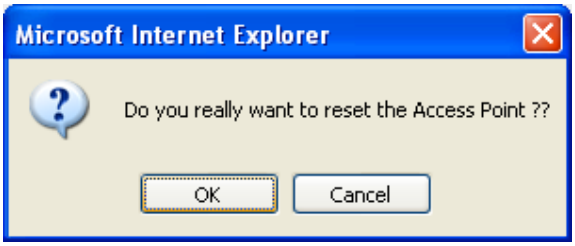
When you think the Hi-Gain Outdoor Wireless-N Access Point is not working properly, you can use this function to restart the Hi-Gain Outdoor Wireless-N Access Point; this may help and solve the problem.

This function is useful when the Hi-Gain Outdoor Wireless-N Access Point is far from you or unreachable. However, if the Hi-Gain Outdoor Wireless-N Access Point is not responding, you may have to switch it off by unplug the power plug and plug it back again after 10 seconds.

To reset your Hi-Gain Outdoor Wireless-N Access Point, please click ‘Reset’ on the left, and the following message will be displayed:




Please click ‘Apply’, and a popup message will ask you again, to make sure you really want to reset the Hi-Gain Outdoor Wireless-N Access Point:



Click ‘OK’ to reset the Hi-Gain Outdoor Wireless-N Access Point, or click ‘Cancel’ to abort. Please remember all connections between wireless client and this Hi-Gain Outdoor Wireless-N Access Point will be disconnected.

# *Chapter IV: Appendix*

## 4-1 Hardware Specification

SoC : Ralink RT3052

Flash: 8MB

SDRAM: 32MB

LAN Port: 10/100M UTP Port x 1

Antenna: 5dBi Detachable Omni Antenna x 2 (2T2R Spatial Multiplexing MIMO configuration. These 2 antennas are for signal transmitting and receiving)

Power: 48VDC, 0.5A Switching Power Adapter (for POE)

Dimension: 88(H) x 134(W) x 176(D) mm

Transmit Power: 11n:14dBm ± 1.5dBm, 11g:15dBm ± 1.5dBm, 11b:17 ± 1.5dBm

Temperature: Operating: -20~70℃, Storage: -40~80℃

Humidity: Operating: 10~90% (Non-Condensing), Storage: 5~95% (Non-Condensing)

Certification: FCC, CE

4-2 Troubleshooting

If you found the Hi-Gain Outdoor Wireless-N Access Point is working improperly or stop responding to you, don't panic! Before you contact your dealer of purchase for help, please read this troubleshooting first. Some problems can be solved by yourself within very short time!

| Scenario | Solution |
|---|---|
| Hi-Gain Outdoor Wireless-N Access Point is not responding to me when I want to access it by web browser | a. Please check the connection of power cord and network cable of this Hi-Gain Outdoor Wireless-N Access Point. All cords and cables should be correctly and firmly inserted to the Hi-Gain Outdoor Wireless-N Access Point.<br>b. You must use the same IP address section which Hi-Gain Outdoor Wireless-N Access Point uses.<br>c. Are you using MAC or IP address filter? Try to connect the Hi-Gain Outdoor Wireless-N Access Point by another computer and see if it works; if not, please perform a hard reset (pressing 'reset' button).<br>d. Set your computer to obtain an IP address automatically (DHCP), and see if your computer can get an IP address.<br>e. If you did a firmware upgrade and this happens, contact your dealer of purchase for help.<br>f. If all above solutions don't work, contact the dealer of purchase for help. |
| Can't get connected to wireless Hi-Gain Outdoor Wireless-N Access Point | a. If encryption is enabled, please re-check WEP or WPA passphrase settings on your wireless client.<br>b. Try to move closer to wireless Hi-Gain Outdoor Wireless-N Access Point.<br>c. Unplug the power plug of Hi-Gain Outdoor Wireless-N Access Point, and plug it back |

| | |
|---|---|
| | again after 10 seconds. |
| I can't locate my Hi-Gain Outdoor Wireless-N Access Point by my wireless client | a. 'Broadcast ESSID' set to off?<br>b. Is Antenna properly installed and secured?<br>c. Are you too far from your Hi-Gain Outdoor Wireless-N Access Point? Try to get closer.<br>d. Please remember that you have to input ESSID on your wireless client manually, if ESSID broadcast is disabled. |
| File download is very slow or breaks frequently | a. Try to reset the Hi-Gain Outdoor Wireless-N Access Point and see if it's better after that.<br>b. Try to know what computers do on your local network. If someone's transferring big files, other people will think Internet is really slow.<br>c. Change channel number and see if this works. |
| Hi-Gain Outdoor Wireless-N Access Point become hot | a. This is not a malfunction, if you can keep your hand on the Hi-Gain Outdoor Wireless-N Access Point's case.<br>b. If you smell something wrong or see the smoke coming out from Hi-Gain Outdoor Wireless-N Access Point or A/C power adapter, please disconnect the Hi-Gain Outdoor Wireless-N Access Point and A/C power adapter from utility power (make sure it's safe before you're doing this!), and call your dealer of purchase for help. |

## 4-3 Glossary

**Default Gateway (Hi-Gain Outdoor Wireless-N Access Point):** Every non-Hi-Gain Outdoor Wireless-N Access Point IP device needs to configure a default gateway's IP address. When the device sends out an IP packet, if the destination is not on the same network, the device has to send the packet to its default gateway, which will then send it out towards the destination.

**DHCP:** Dynamic Host Configuration Protocol. This protocol automatically gives every computer on your home network an IP address.

**DNS Server IP Address:** DNS stands for Domain Name System, which allows Internet servers to have a domain name (such as www.BroadbandHi-Gain Outdoor Wireless-N Access Point.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of Internet servers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "BroadbandHi-Gain Outdoor Wireless-N Access Point.com" into your Internet browser), the user is sent to the proper IP address. The DNS server IP address used by the computers on your home network is the location of the DNS server your ISP has assigned to you.

**DSL Modem:** DSL stands for Digital Subscriber Line. A DSL modem uses your existing phone lines to transmit data at high speeds.

**Ethernet:** A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10/100 million bits per second (Mbps).

**Idle Timeout:** Idle Timeout is designed so that after there is no traffic to the Internet for a pre-configured amount of time, the connection will automatically be disconnected.

**IP Address and Network (Subnet) Mask:** IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, that identifies a single, unique Internet computer host in an IP network. Example: 192.168.2.1. It consists of 2 portions: the IP network address, and the host identifier.

The IP address is a 32-bit binary pattern, which can be represented as four cascaded decimal numbers separated by ".": aaa.aaa.aaa.aaa, where each "aaa" can be anything from 000 to 255, or as four cascaded binary numbers separated by ".":

bbbbbbbb.bbbbbbbb.bbbbbbbb.bbbbbbbb, where each “b” can either be 0 or 1.
A network mask is also a 32-bit binary pattern, and consists of consecutive leading 1’s followed by consecutive trailing 0’s, such as 11111111.11111111.11111111.00000000. Therefore sometimes a network mask can also be described simply as “x” number of leading 1’s.
When both are represented side by side in their binary forms, all bits in the IP address that correspond to 1’s in the network mask become part of the IP network address, and the remaining bits correspond to the host ID.

For example, if the IP address for a device is, in its binary form, 11011001.10110000.10010000.00000111, and if its network mask is, 11111111.11111111.11110000.00000000
It means the device’s network address is 11011001.10110000.10010000.00000000, and its host ID is, 00000000.00000000.00000000.00000111. This is a convenient and efficient method for Hi-Gain Outdoor Wireless-N Access Points to route IP packets to their destination.

**ISP Gateway Address:** (see ISP for definition). The ISP Gateway Address is an IP address for the Internet Hi-Gain Outdoor Wireless-N Access Point located at the ISP's office.

**ISP:** Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

**LAN:** Local Area Network. A LAN is a group of computers and devices connected together in a relatively small area (such as a house or an office). Your home network is considered a LAN.

**MAC Address:** MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network. The MAC address is a unique identifier for a device with an Ethernet interface. It is comprised of two parts: 3 bytes of data that corresponds to the Manufacturer ID (unique for each manufacturer), plus 3 bytes that are often used as the product’s serial number.

**NAT:** Network Address Translation. This process allows all of the computers on your home network to use one IP address. Using the broadband Hi-Gain Outdoor Wireless-N Access Point’s NAT capability, you can access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

**Port:** Network Clients (LAN PC) uses port numbers to distinguish one network application/protocol over another. Below is a list of common applications and protocol/port numbers:

| Application | Protocol | Port Number |
|---|---|---|
| Telnet | TCP | 23 |
| FTP | TCP | 21 |
| SMTP | TCP | 25 |
| POP3 | TCP | 110 |
| H.323 | TCP | 1720 |
| SNMP | UCP | 161 |
| SNMP Trap | UDP | 162 |
| HTTP | TCP | 80 |
| PPTP | TCP | 1723 |
| PC Anywhere | TCP | 5631 |
| PC Anywhere | UDP | 5632 |

**PPPoE:** Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a secure data transmission method originally created for dial-up connections; PPPoE is for Ethernet connections. PPPoE relies on two widely accepted standards, Ethernet and the Point-to-Point Protocol. It is a communications protocol for transmitting information over Ethernet between different manufacturers

**Protocol:** A protocol is a set of rules for interaction agreed upon between multiple parties so that when they interface with each other based on such a protocol, the interpretation of their behavior is well defined and can be made objectively, without confusion or misunderstanding.

**Hi-Gain Outdoor Wireless-N Access Point:** A Hi-Gain Outdoor Wireless-N Access Point is an intelligent network device that forwards packets between different networks based on network layer address information such as IP addresses.

**Subnet Mask:** A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers (e.g. 255.255.255.0) configured like an IP address. It is used to create IP address numbers used only within a particular

network (as opposed to valid IP address numbers recognized by the Internet, which must be assigned by InterNIC).

**TCP/IP, UDP:** Transmission Control Protocol/Internet Protocol (TCP/IP) and Unreliable Datagram Protocol (UDP). TCP/IP is the standard protocol for data transmission over the Internet. Both TCP and UDP are transport layer protocol. TCP performs proper error detection and error recovery, and thus is reliable. UDP on the other hand is not reliable. They both run on top of the IP (Internet Protocol), a network layer protocol.

**WAN:** Wide Area Network. A network that connects computers located in geographically separate areas (e.g. different buildings, cities, countries). The Internet is a wide area network.

**Web-based management Graphical User Interface (GUI):** Many devices support a graphical user interface that is based on the web browser. This means the user can use the familiar Netscape or Microsoft Internet Explorer to Control/configure or monitor the device being managed.