

User Manual

(WAP-8221)



HW: V1
UM: V1.0

Default Settings

IP Address	192.168.188.253
Password	admin
WiFi SSID	LevelOne 2.4G / LevelOne 5.8G
Password	66666666

Attention:

Check box contents:

1. Screw Kit
2. Quick Installation Guide
3. Resource CD (User Manual, QIG)

Warning:



Attention

- Do not use the product in high humidity or high temperatures.
- Do not use the same power source for the Product as other equipment. Only use the power adapter that comes with the package. Using a different voltage rating power adapter may damage the device.
- Do not open or repair the case yourself. If the Product is too hot, turn off the power immediately and have it repaired at a qualified service center.
- Place the Product on a stable surface and avoid using this product and all accessories outdoors.

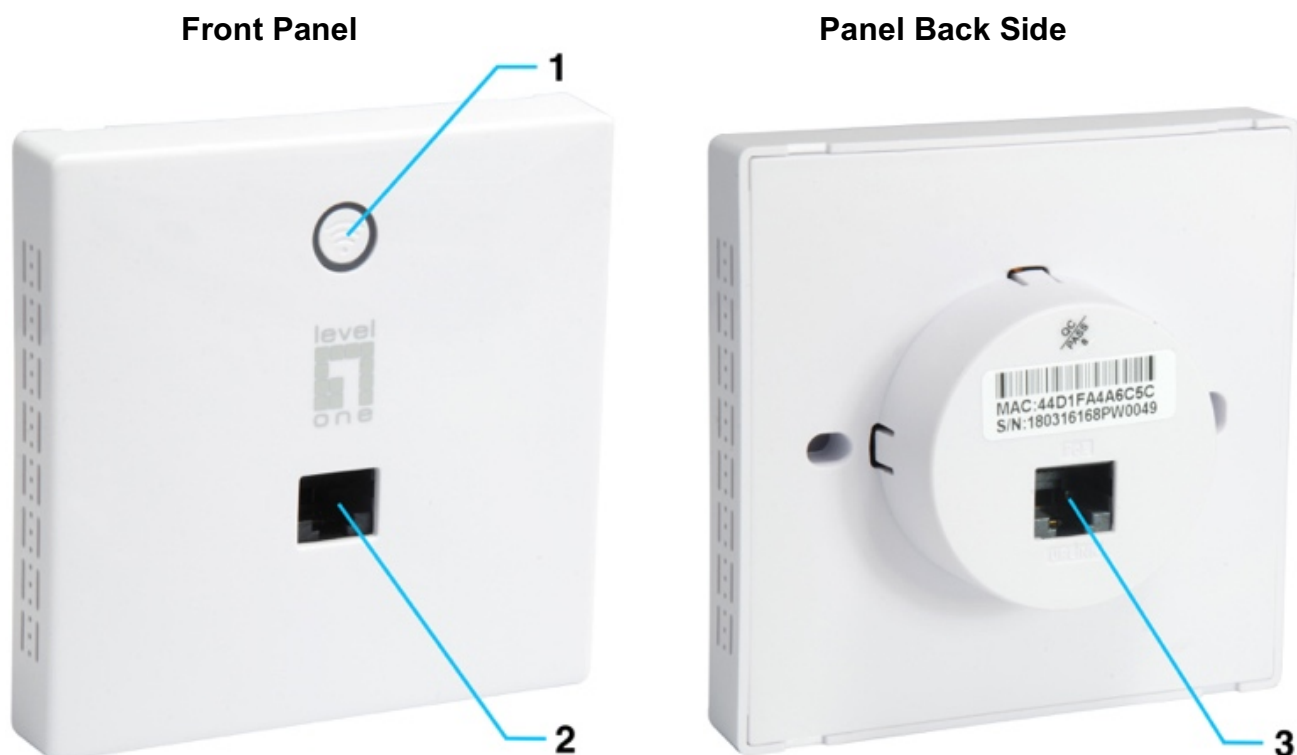
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Chapter 1 Hardware and Operation mode Instruction

1.1 Hardware Description:



- 1.WIFI SSID Broadcast ON/OFF , Reset to Defaults
- 2.LAN Port
- 3.WAN / POE Port

Button Light State:

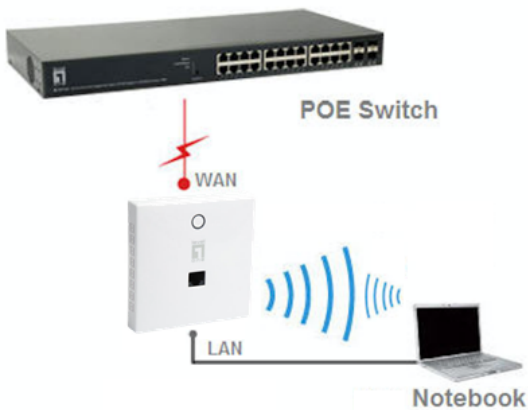
Task to be Performed	Time Period of Pressing Button	SYS LED Behavior
WIFI SSID Broadcast ON	0 ~ 1 seconds	ON Green
WIFI SSID Broadcast OFF	0 ~ 1 seconds	Light off
Reset to Defaults	10 ~ 12 seconds	Blinking Green

1.2 Installation Description:

LED/Button/Interface	Description
WIFI SSID Broadcast ON/OFF	To turn on or off the WIFI SSID Broadcast
Reset to Defaults	With the AP powered on, press the Reset button for 10 ~ 12 seconds until the Signal Strength LED blink faster than ever. The AP will restart itself and reset the device to factory default settings.
LAN port	The LAN port is used to connect to network devices, such as a switch or PC / NB
WAN/POE Port	The WAN/POE port is used to connect to network devices, such as a POE switch OR POE adapter to power the device (IEEE802.3af) 48 VDC. (POE adapter unit is to be ordered separately)

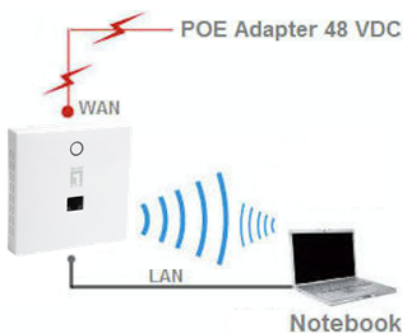
1.3 Way to supply power for this device :

1. PoE Power supply : pls make sure the PoE switch comply with IEEE 802.3af standard.



2. The WAN port connects to the POE adapter (48V DC).

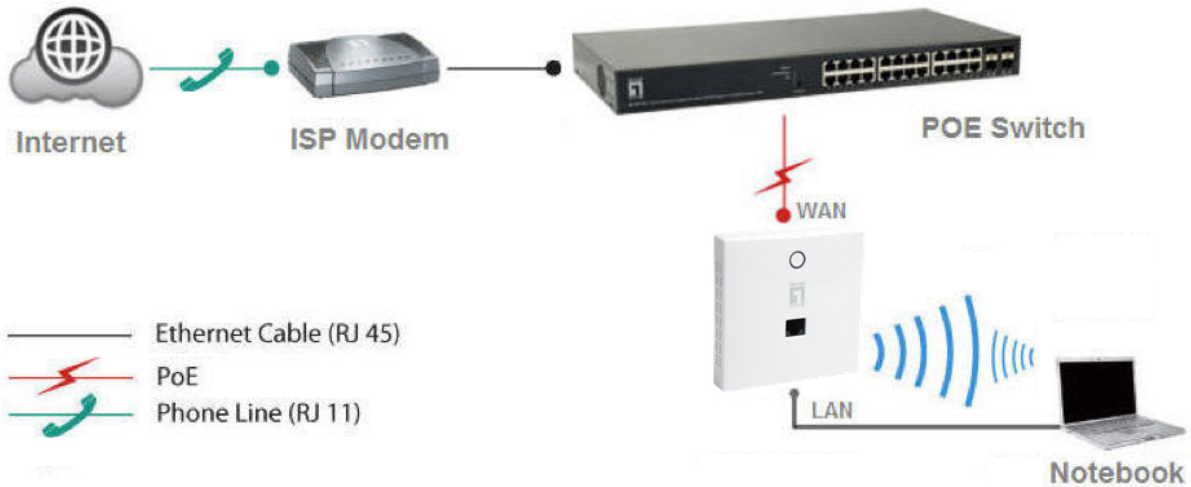
Note: POE adapter unit is to be ordered separately



1.3 Operation Mode description and usage:

There are four operation mode : Gateway mode , Repeater mode , WISP Mode, AP Mode .

- **Gateway mode:** Connect to the ISP Modem through the cable network to connect to the Internet and use with 3 types of Internet access (PPPoE , DHCP, Static IP)



- **WISP mode:** Receive ISP Modem Wireless network and select one of them Internet access method (PPPoE, DHCP, static IP) .
(**Note:** POE adapter unit is to be ordered separately)



- **Repeater mode:** The WAP-8221 can bridge and extend the existing WiFi signal in this operation mode . (**Note:** POE adapter unit is to be ordered separately)



- **AP Mode:** Please Make sure that the upper device has a router, Only after confirming can use AP Mode

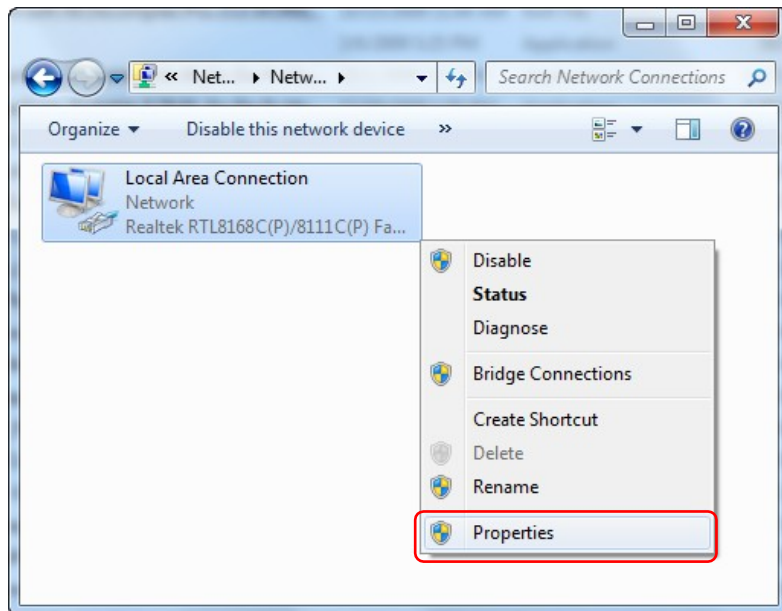


Chapter 2 Login

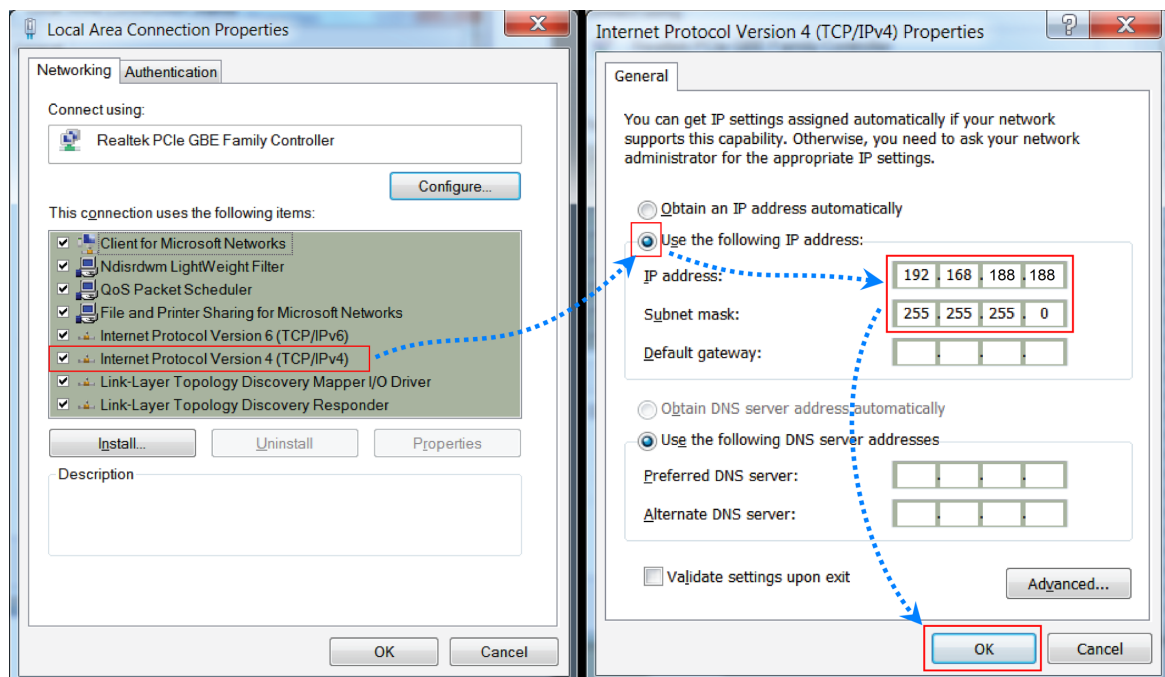
The necessary information about log in is displayed on the sticker of the product, including the URL, User Name and Pass Word

1.Connect the Ceiling AP with computer

2.Configure the PC's local connection IP address as 192.168.188.X (X is number from 2 to 252), subnet mask is 255.255.255.0, follow P1 and P2 to finish.

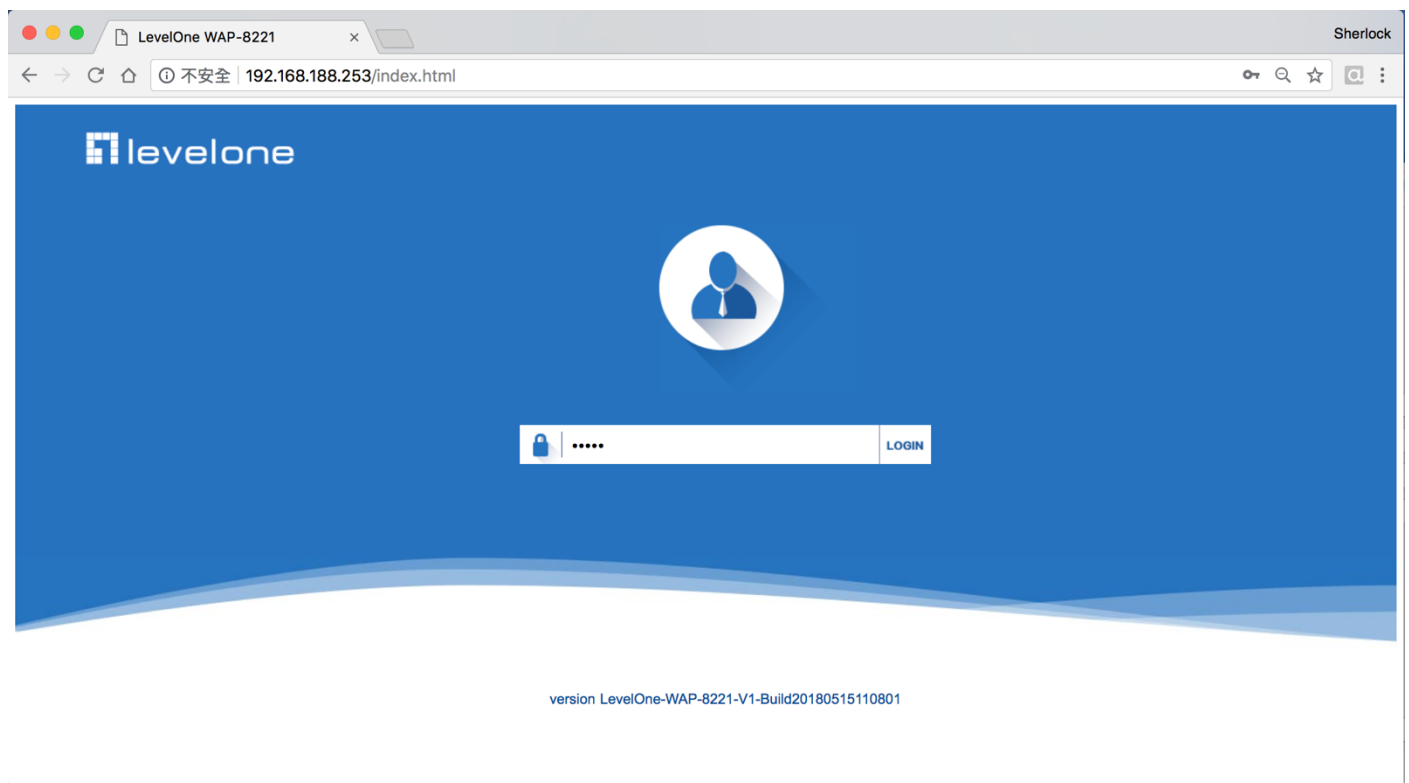


▲ P1 Setting of computer's IP address

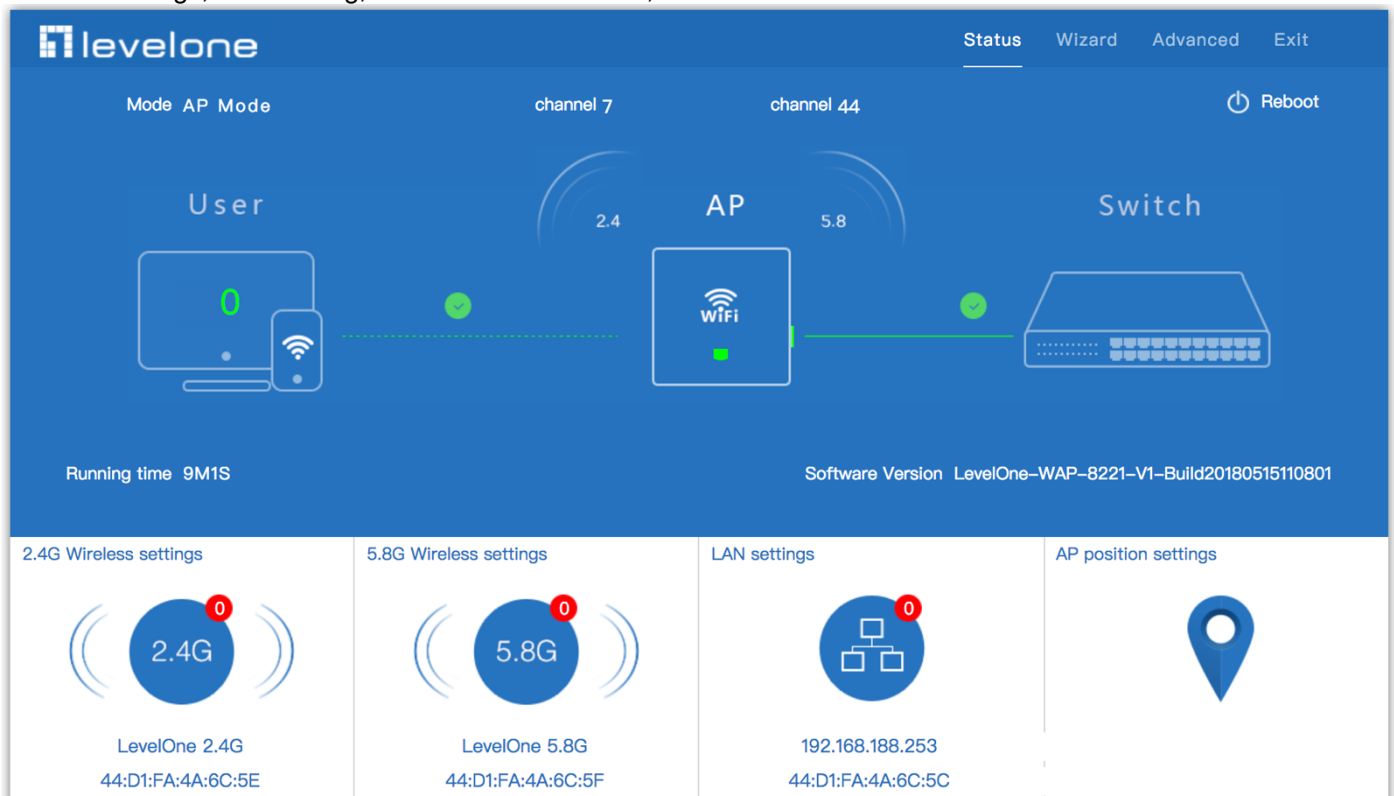


▲ P2 Setting of computer's IP address

3. Input 192.168.188.253 into browser, then pop up the login page, the default login password: **admin**, then login,

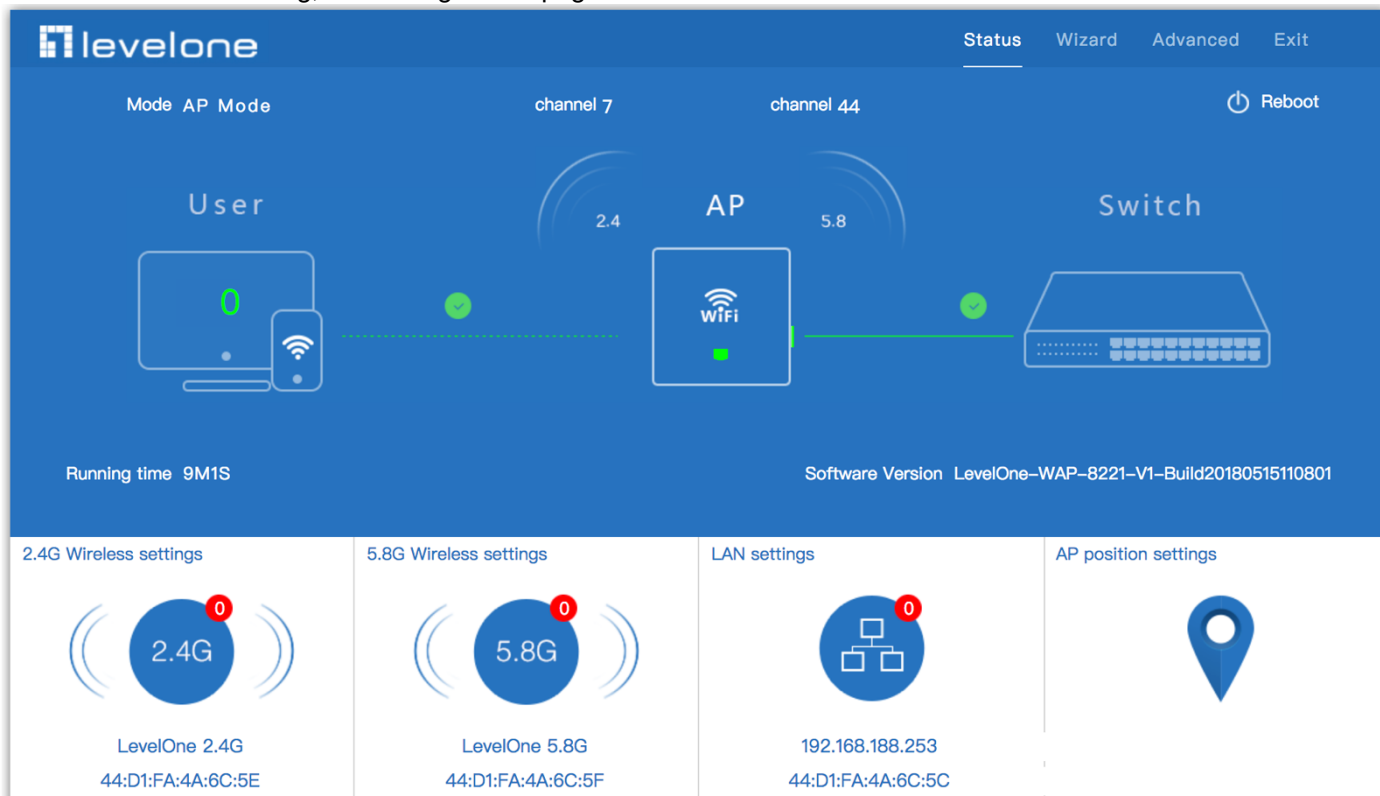


4. After login, This page will show the Wireless AP's default operation mode, channel, connection status, CPU usage, Wireless settings, LAN Setting, Wireless AP's Location, hardware/firmware version.



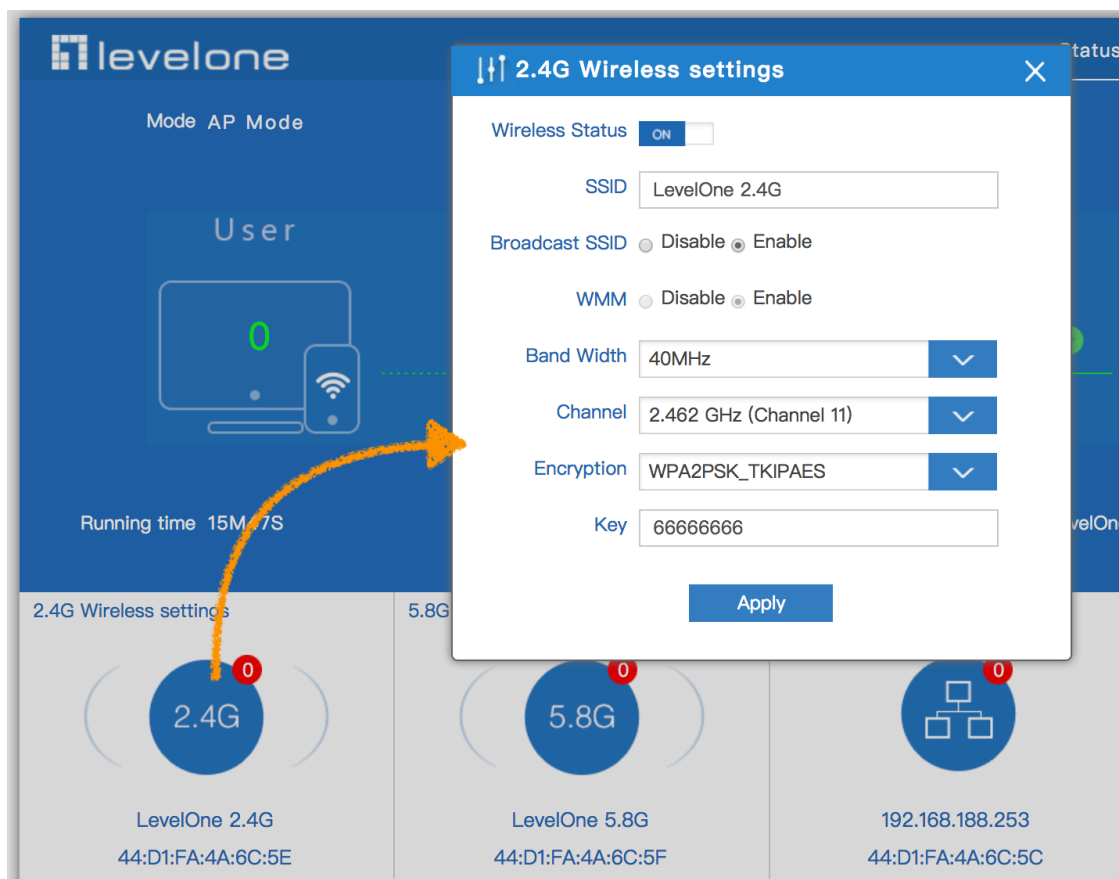
Chapter 3 WEB GUI interface Setting

1. Then in Wireless Setting, GUI configuration page showed as below:

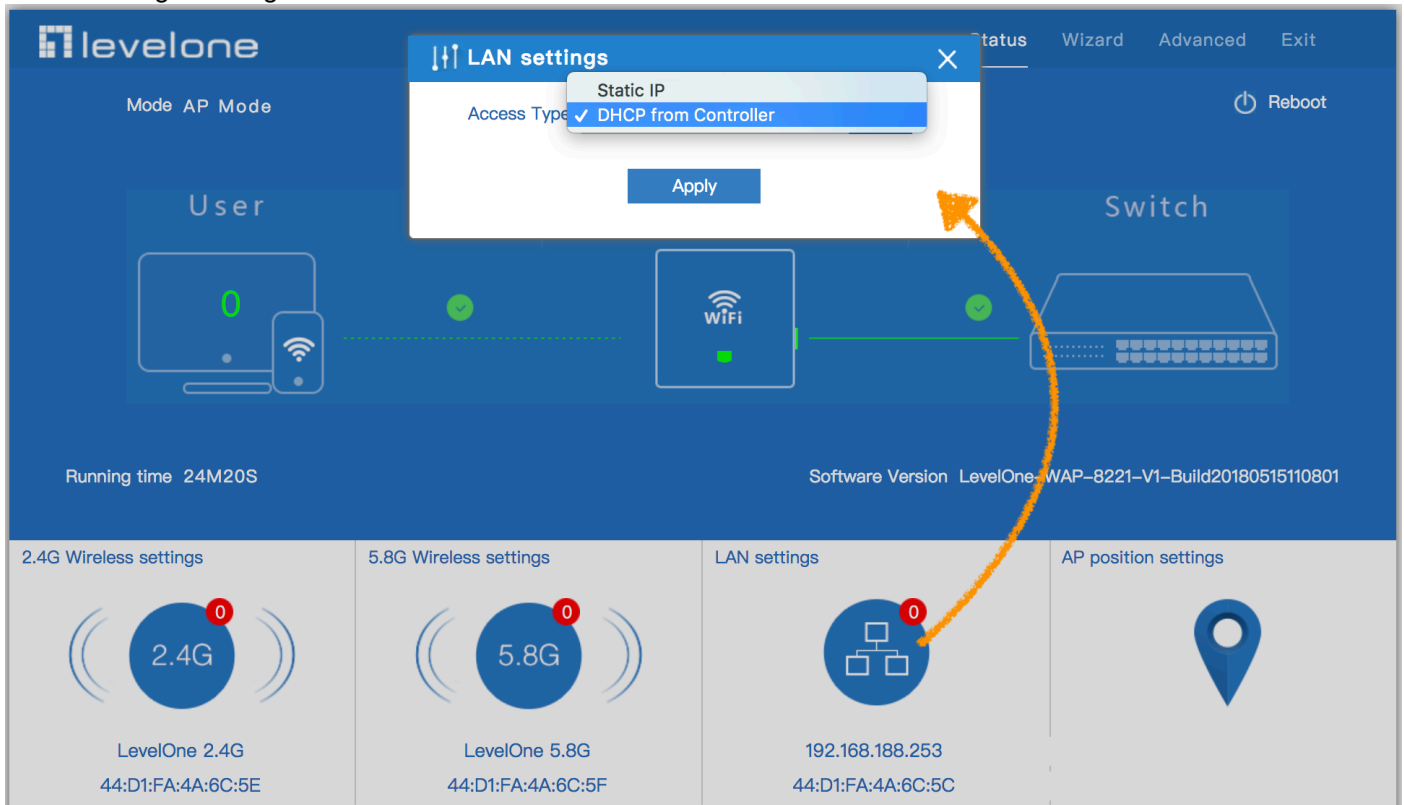


2. Then in Wireless Setting, GUI configuration page showed as below:

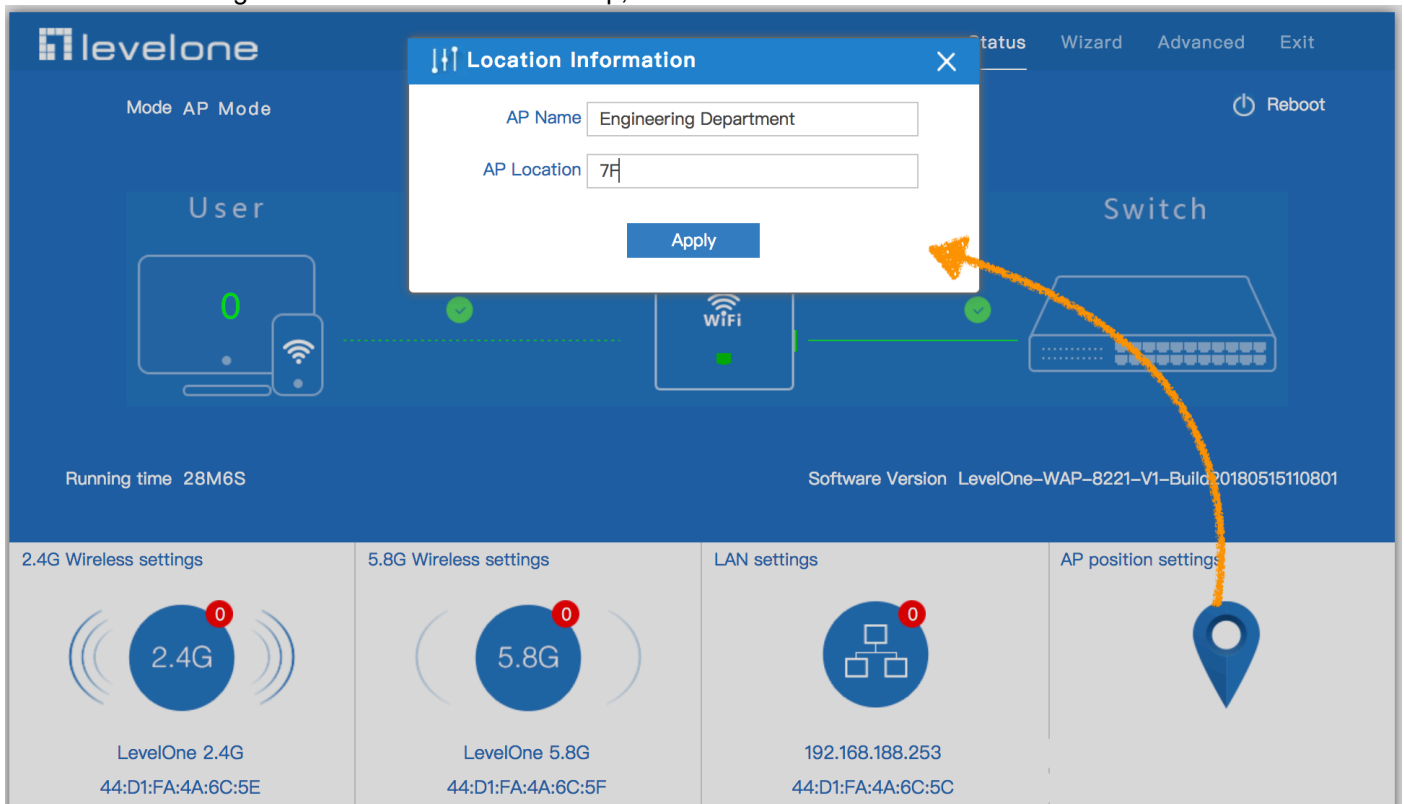
User can configure the SSID, password, band width, channel here, then Apply to finish.



3. LAN Setting to configure the Static IP or DHCP from Controller

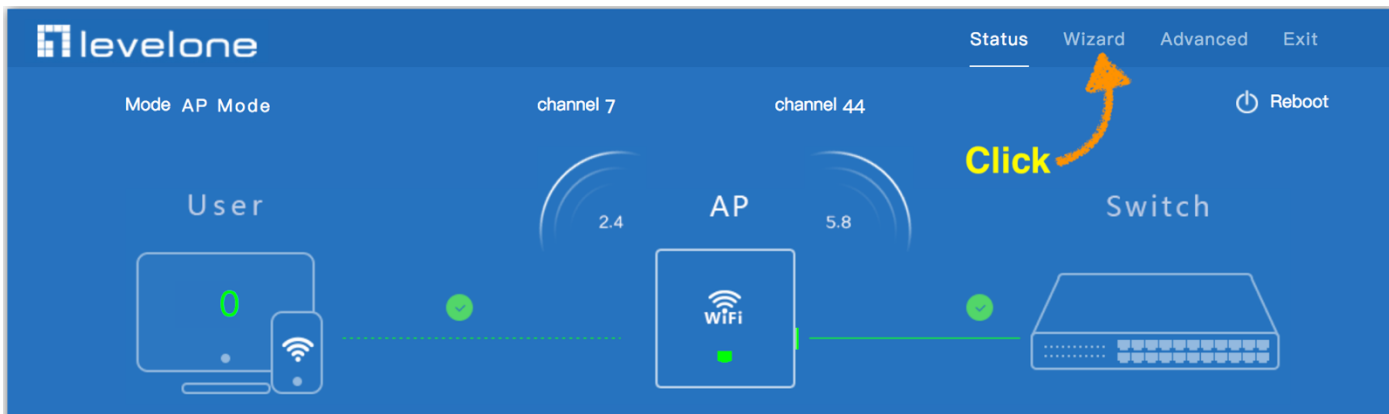


4. AP location setting: can mark where the AP set up, and AP name



3.1 Wizard :

1.Click Wizard in Status page, will pop up following page to configure the operation mode and there are explanation for each operation mode for better application.



2.Wizard: It instruct users to configure wireless AP's operation mode based on needs: there are four operation mode including gateway, repeater, WISP, Wireless AP. Please confirm the operation mode first before configuration starting.



3.2 Gateway Mode:

Before Click Gateway mode, confirm your internet will be static IP, PPPoE, or DHCP: Then will pop up following picture after click it, Please choose the right WAN setting mode, then click next to continue.



3.2.1 Static IP setting in Gateway Mode :

1. Sample Static IP mode setting method, then click next to continue.
(Please contact with ISP for correct IP address and DNS address)

The screenshot shows the 'Gateway Mode' configuration interface. At the top, there are three progress steps: 'First: WAN Settings', 'Second: Wireless', and 'Third: Complete'. Below these, three radio buttons are visible: 'Static IP' (selected), 'PPPOE(ADSL)', and 'DHCP'. The 'Static IP' section contains four input fields: 'IP Address' (192.168.188.253), 'Subnet Mask' (255.255.255.0), 'Default Gateway' (192.168.188.254), and 'Primary DNS' (8.8.8.8). An orange dashed box highlights these fields. At the bottom, there are 'Back' and 'Next' buttons. An orange arrow points from the 'Next' button to the 'Static IP' radio button.

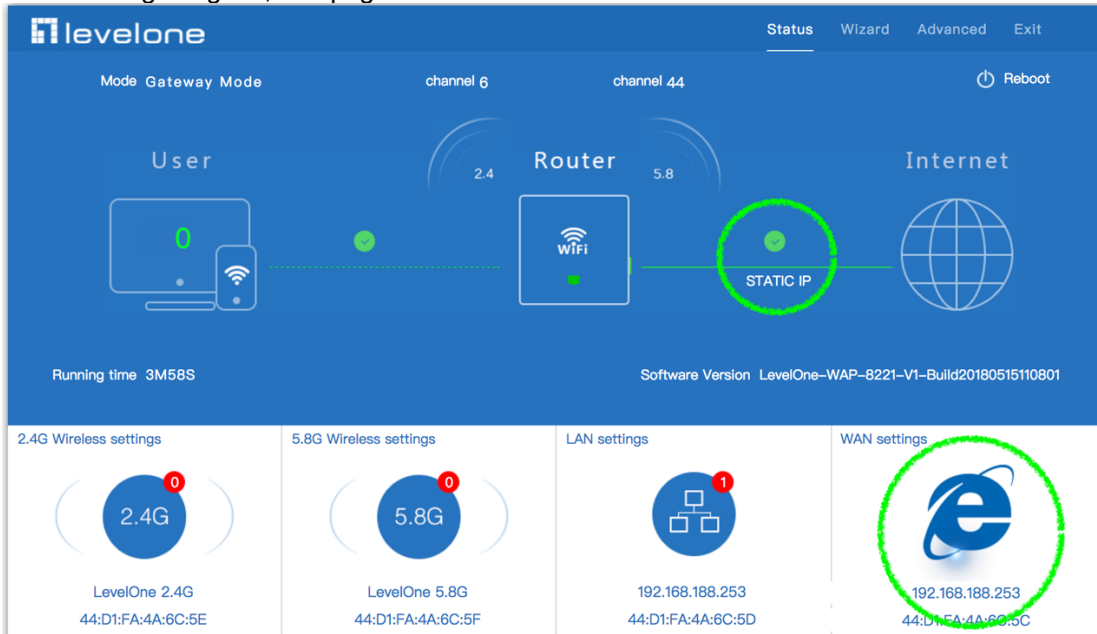
2. Wireless Setting in Gateway Mode (static IP) , Click Next

The screenshot shows the 'Gateway Mode' configuration interface, specifically the 'Wireless Settings' page. The progress steps are 'First: WAN Settings', 'Second: Wireless', and 'Third: Complete'. The 'Wireless Settings' section is divided into two columns: '2.4G Wireless Settings' and '5.8G Wireless Settings'. Each column has a 'WLAN Status' toggle set to 'ON' and a 'wireless analyzer' button. Below these are fields for 'SSID', 'Channel', 'Encryption', and 'Key'. For 2.4G, the SSID is 'LevelOne 2.4G', Channel is '2.462 GHz (Channel 11)', Encryption is 'WPA/WPA2PSK_TKIPAES', and Key is '66666666'. For 5.8G, the SSID is 'LevelOne 5.8G', Channel is '5.700 GHz (Channel 140)', Encryption is 'WPA/WPA2PSK_TKIPAES', and Key is '66666666'. An orange dashed box highlights the entire wireless settings area. At the bottom, there are 'Back' and 'Next' buttons. An orange arrow points from the 'Next' button to the 'Wireless Settings' section.

3. Please wait for the configuration to finish

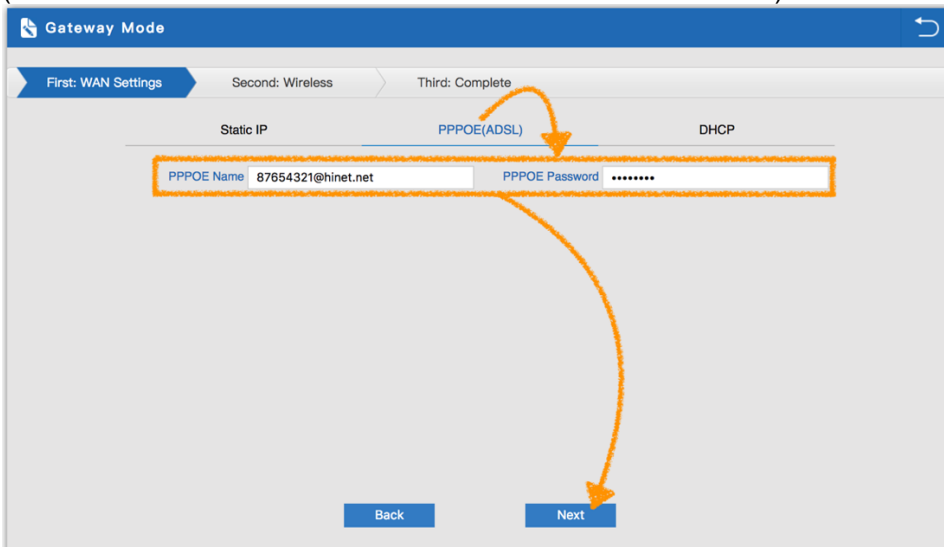
The screenshot shows the 'Complete Settings' page. The progress steps are 'First: WAN Settings', 'Second: Wireless', and 'Third: Complete'. The page features a central graphic with a circular arrow and a loading icon, with the text 'Equipment is restarting, please wait.....' below it. At the bottom, the text 'Settings completed successfully.' is displayed.

4. Please log in again ,This page will show the connection Static IP status

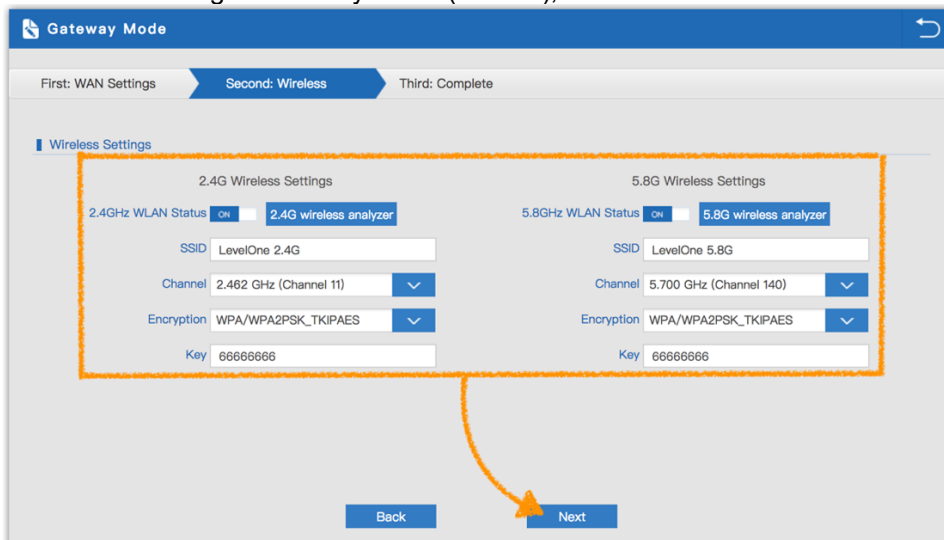


3.2.2 PPPoE(ADSL) setting in Gateway Mode :

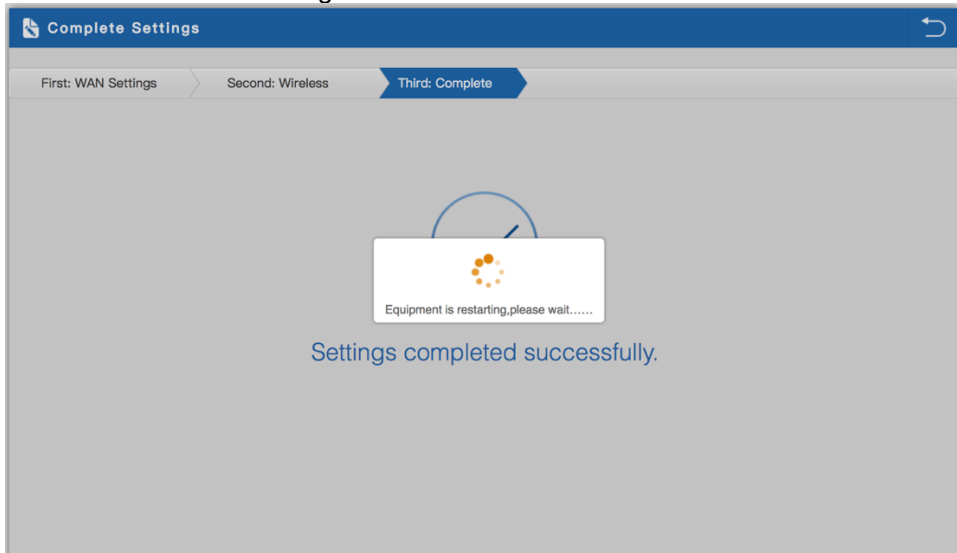
1. Sample PPPoE mode setting method, then click next to continue.
(Please contact with ISP for correct PPPoE Name and Password)



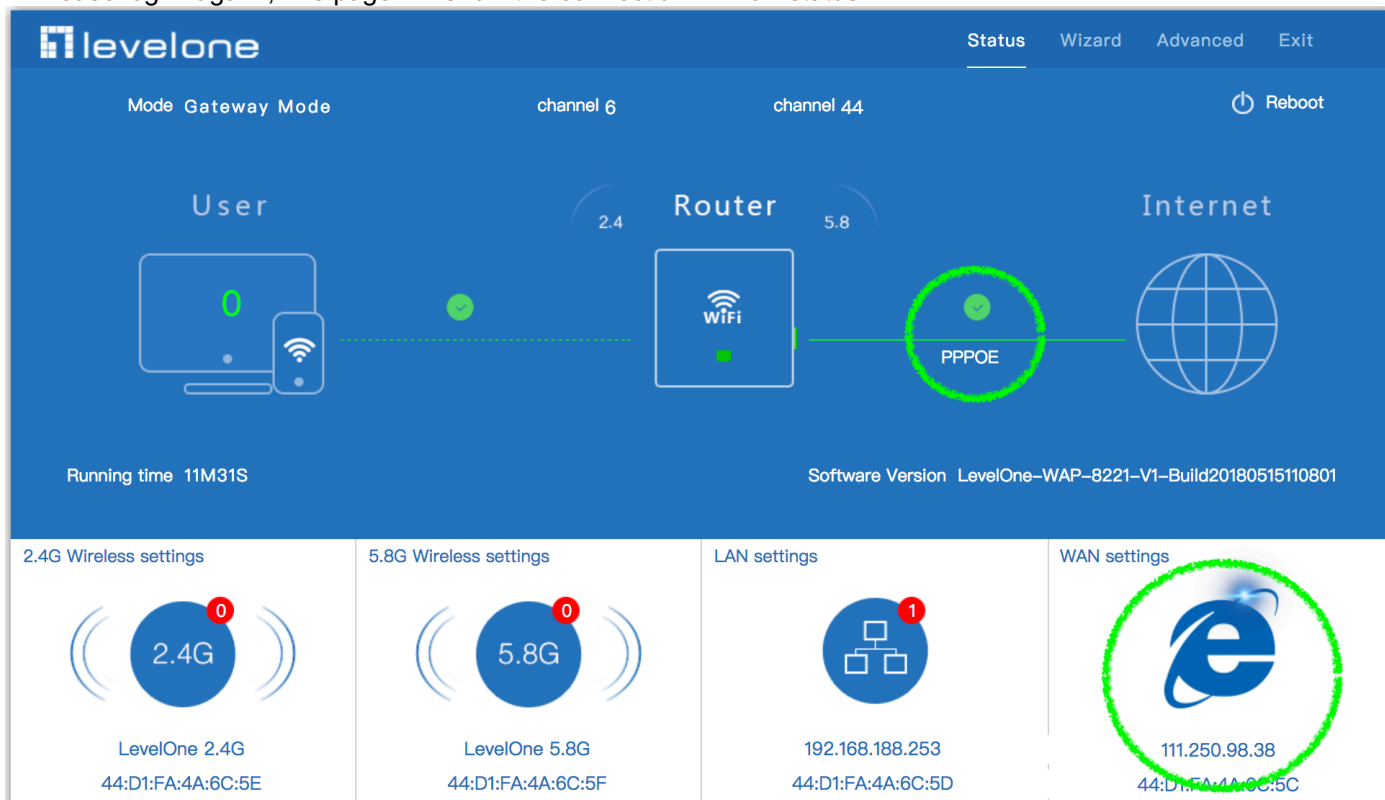
2. Wireless Setting in Gateway Mode (PPPoE), Click Next



3. Please wait for the configuration to finish

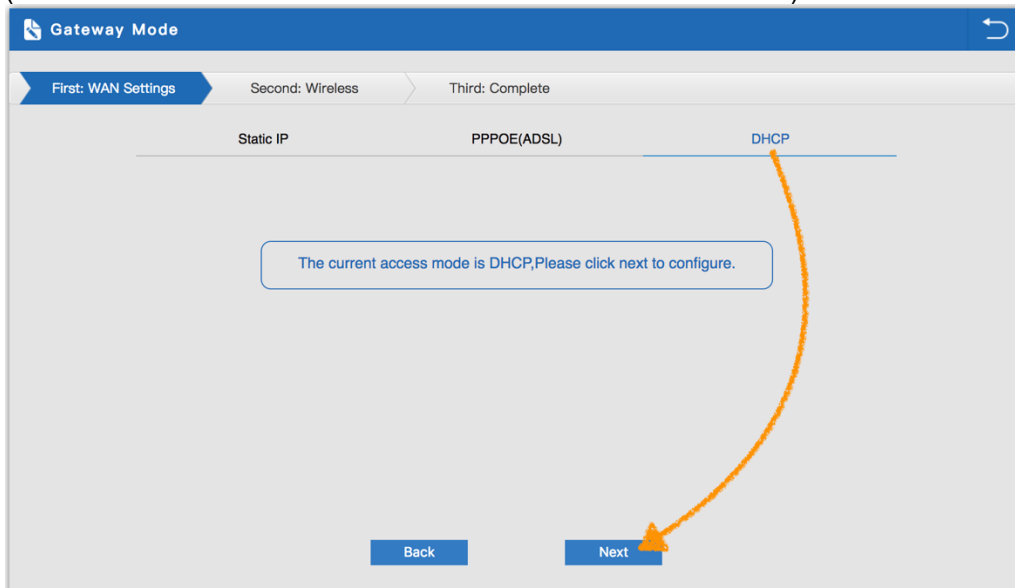


4. Please log in again ,This page will show the connection PPPoE status

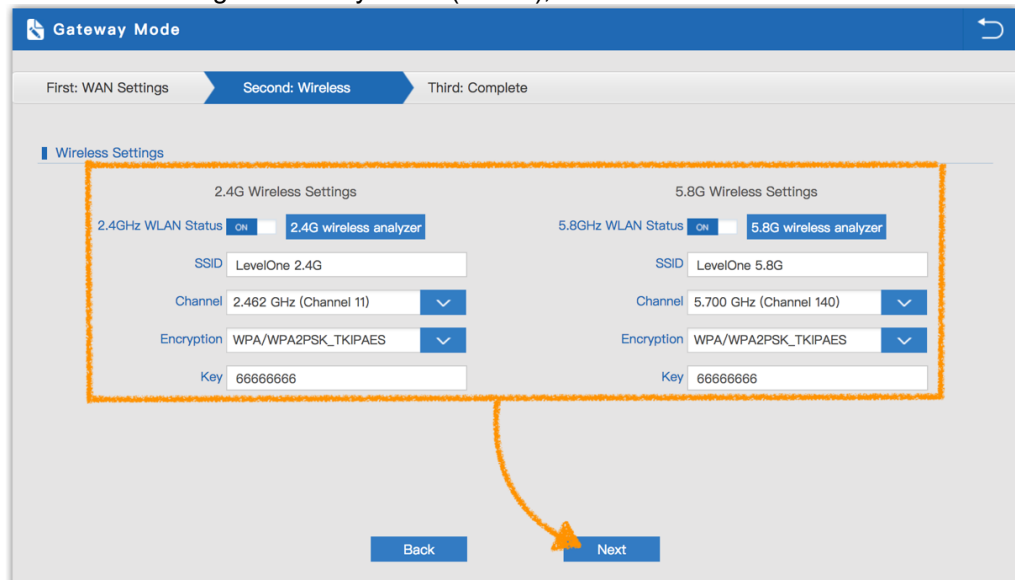


3.2.3 DHCP setting in Gateway Mode :

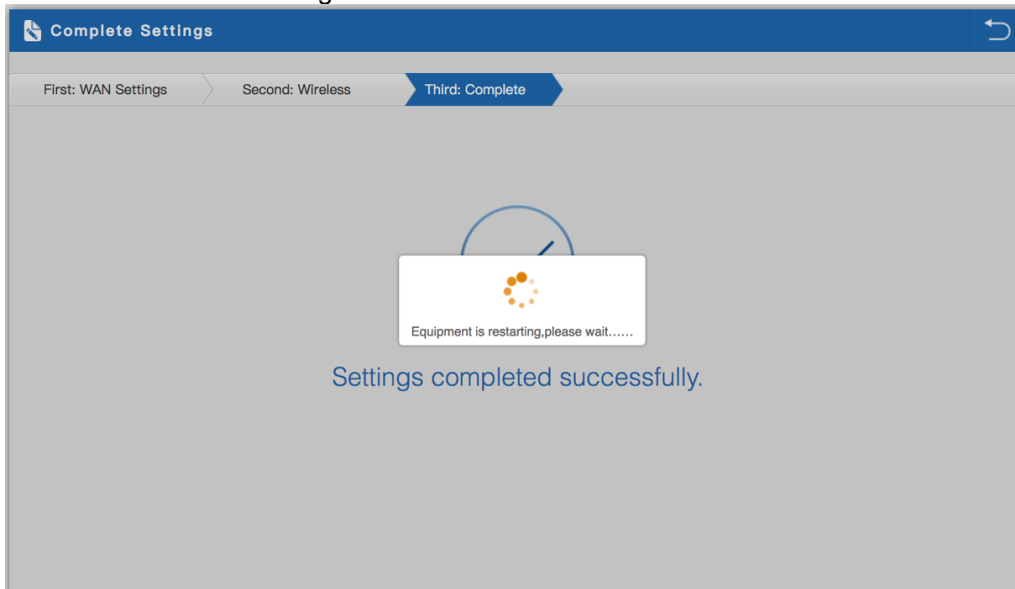
1. Sample DHCP mode setting method, then click next to continue.
(Please contact with ISP for correct IP address and DNS address.)



2. Wireless Setting in Gateway Mode (DHCP), Click Next







3. Please wait for the configuration to finish

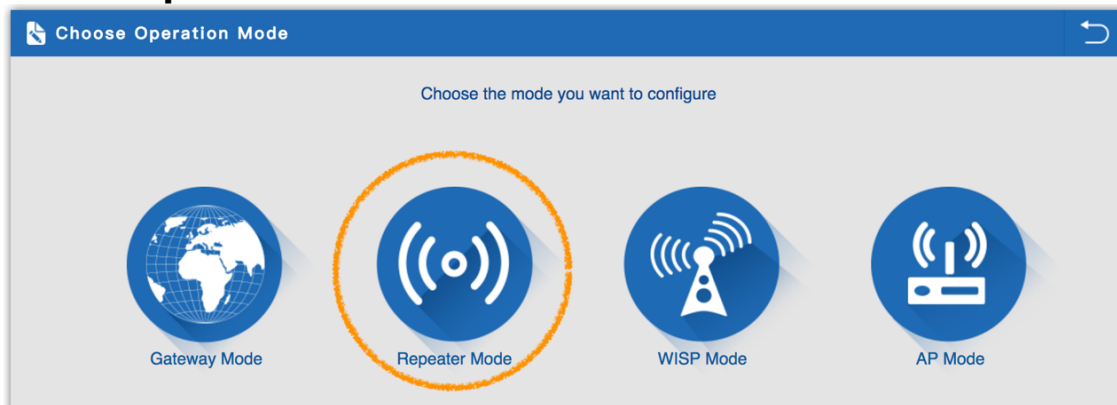


4. Please log in again ,This page will show the connection DHCP status

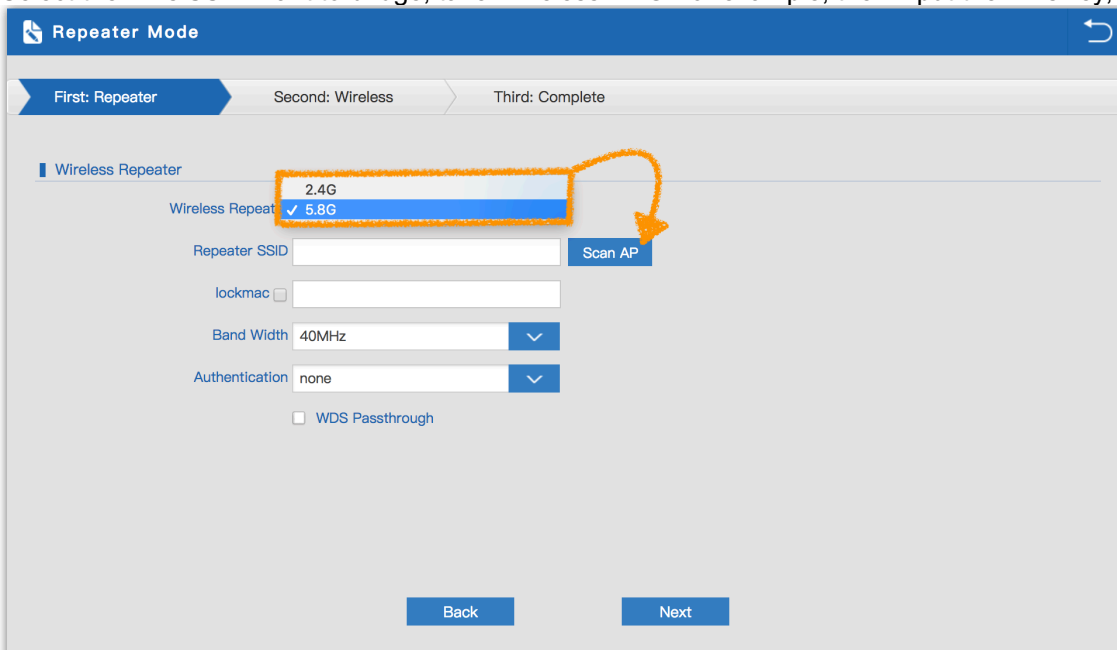
The screenshot displays the LevelOne router's status page. At the top, the LevelOne logo is on the left, and navigation tabs for 'Status', 'Wizard', 'Advanced', and 'Exit' are on the right. Below the navigation, the page shows 'Mode Gateway Mode', 'channel 6', 'channel 44', and a 'Reboot' button. A central diagram illustrates the network flow: 'User' (with a laptop and phone icon) connects to the 'Router' (with a 'WiFi' icon) via 2.4 GHz and 5.8 GHz channels. The Router then connects to 'Internet' (with a globe icon) via a 'DHCP' connection, which is highlighted with a green circle and a checkmark. At the bottom of the diagram, 'Running time 16M15S' and 'Software Version LevelOne-WAP-8221-V1-Build20180515110801' are displayed.

2.4G Wireless settings	5.8G Wireless settings	LAN settings	WAN settings
 LevelOne 2.4G 44:D1:FA:4A:6C:5E	 LevelOne 5.8G 44:D1:FA:4A:6C:5F	 192.168.188.253 44:D1:FA:4A:6C:5D	 192.168.188.108 44:D1:FA:4A:6C:5C

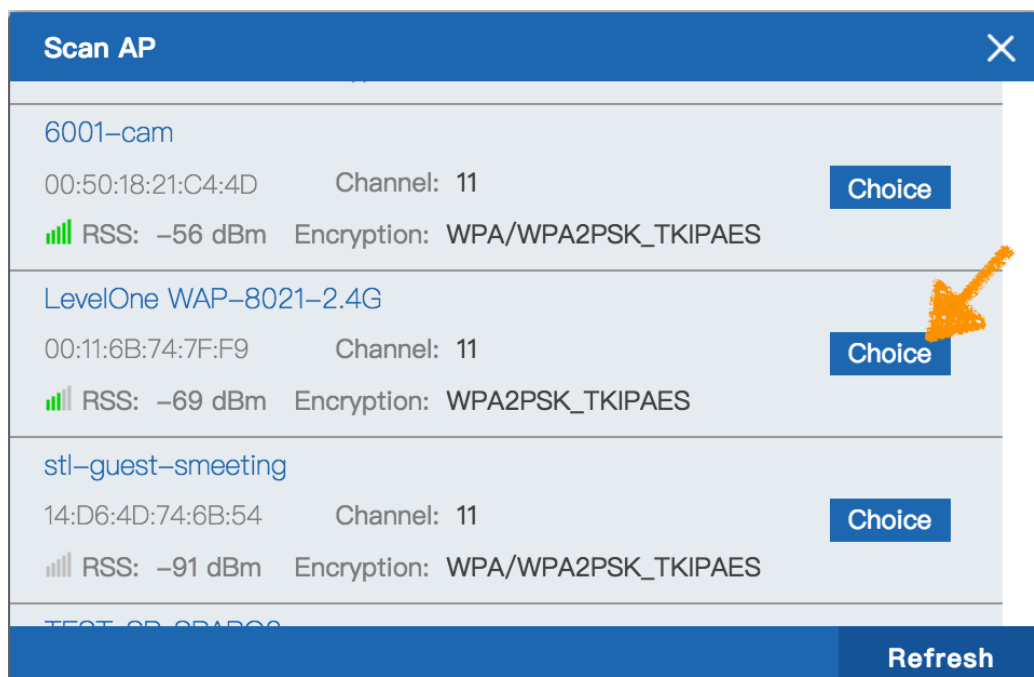
3.3 Repeater mode :



1. Can choose to relay the front-end 2.4G or 5.8G wireless signal to extend the wireless signal range. Select the AP's SSID want to bridge, take "wireless 2.4G" for example, then input the AP's key, click Scan AP

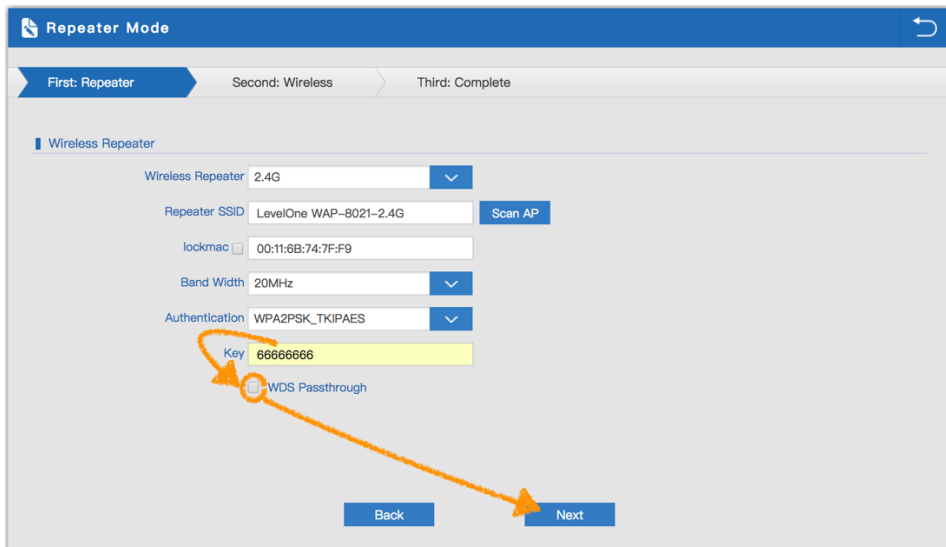


2. Please select WIFI SSID to connect

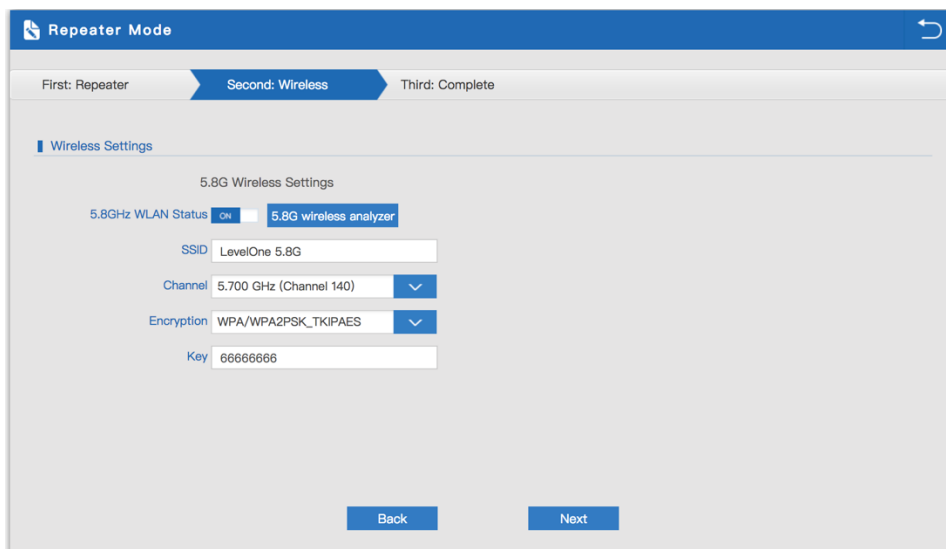


3. Enter the WIFI SSID password to be linked, When click Next

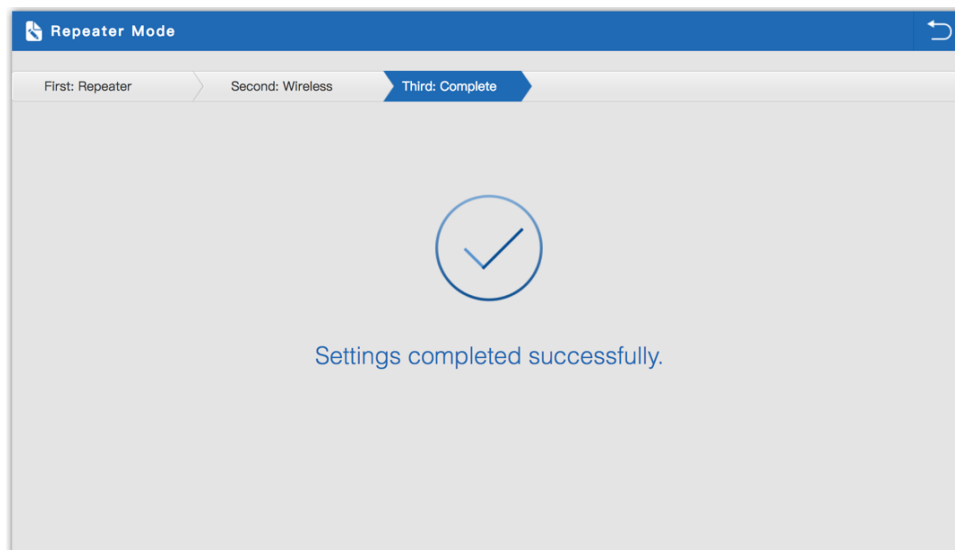
Suggestion: If the upper wireless device is not the same model (WAP-8221), Don't click to WDS Passthrough.



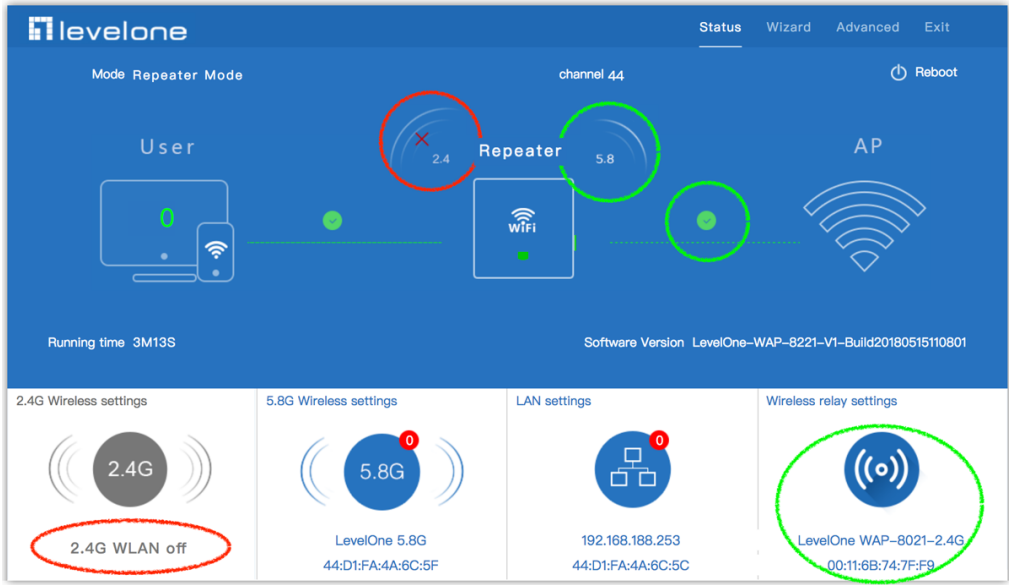
4. If choose to relay the front-end 2.4G wireless signal to extend the wireless signal range. Can choose to enable or disable the 5.8G wireless broadcast of the WAP-8221 itself.



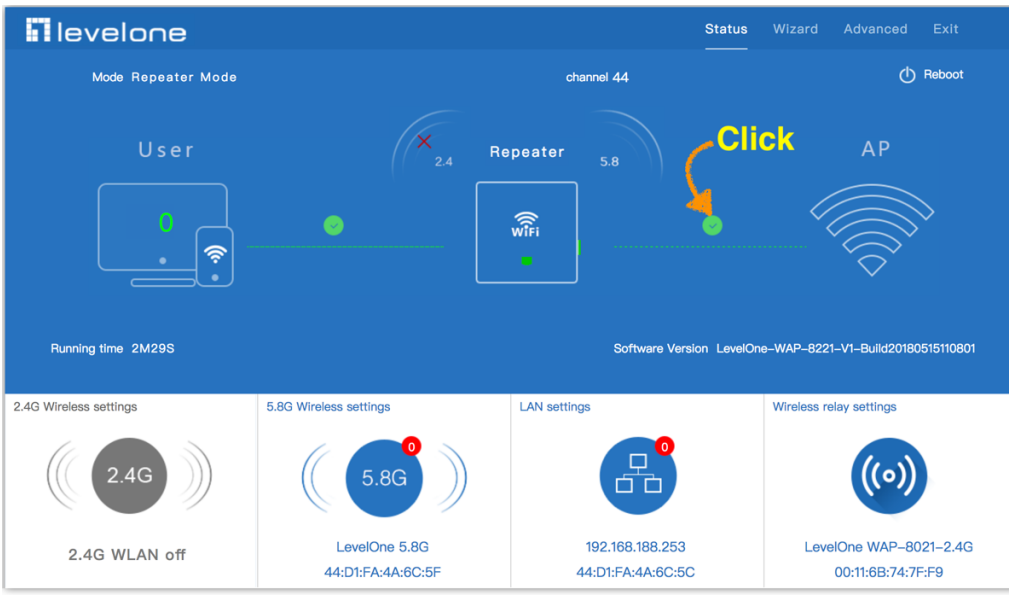
5. Click Return button, will back to Status, show Repeater mode data, show fail or success



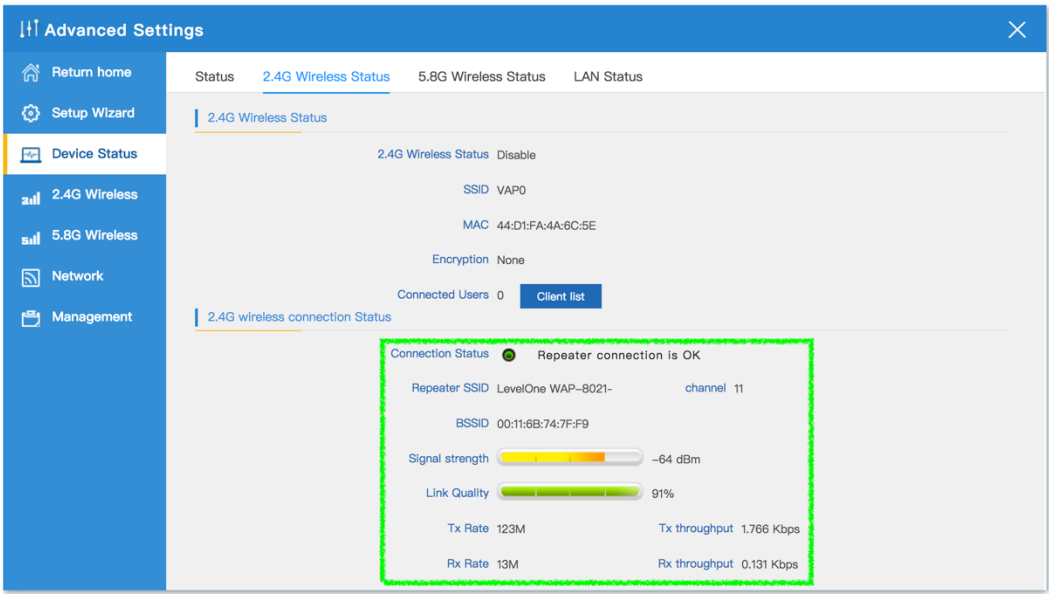
6. Check WIFI Repeater mode data. If choose to relay the front-end 2.4G wireless signal to extend the wireless signal range. In wifi repeater operation mode, WAP-8221 the default is 2.4G SSID disable.



7. Click Status button



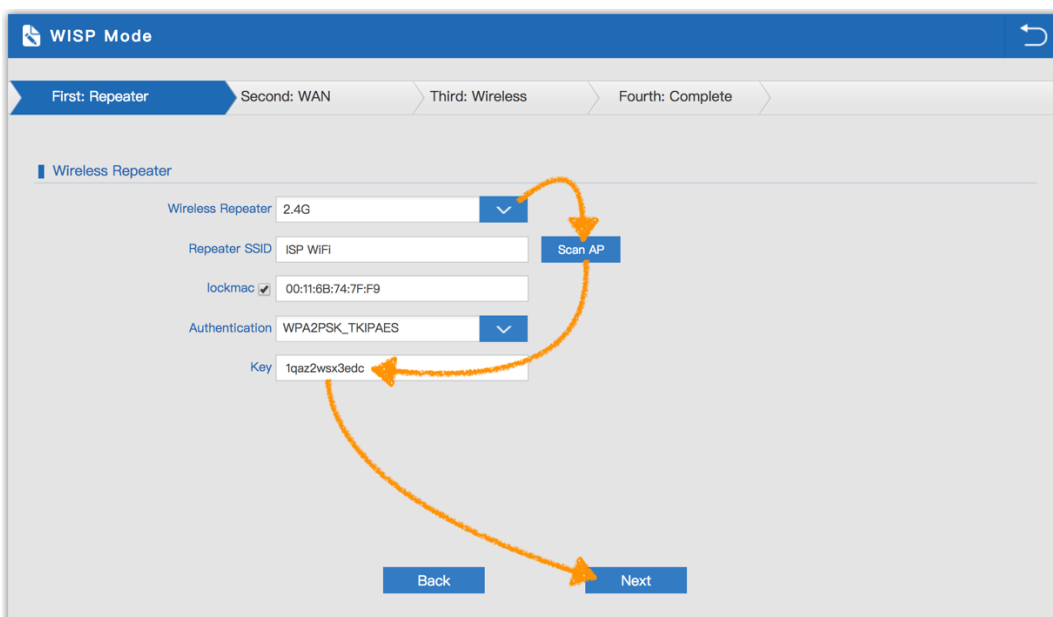
8. Check WIFI Repeater mode data



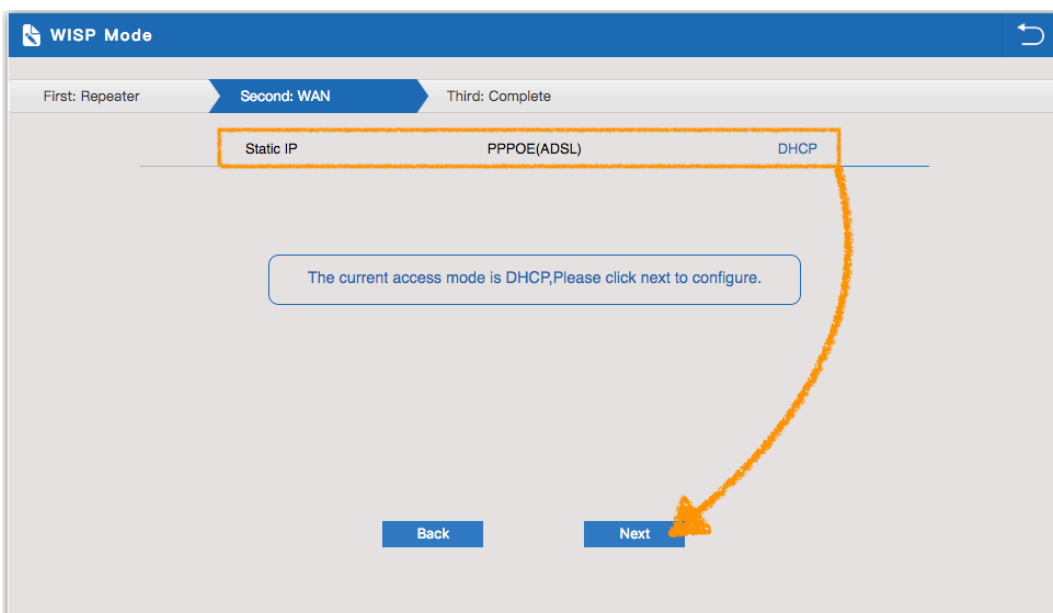
3.4 WISP Mode:



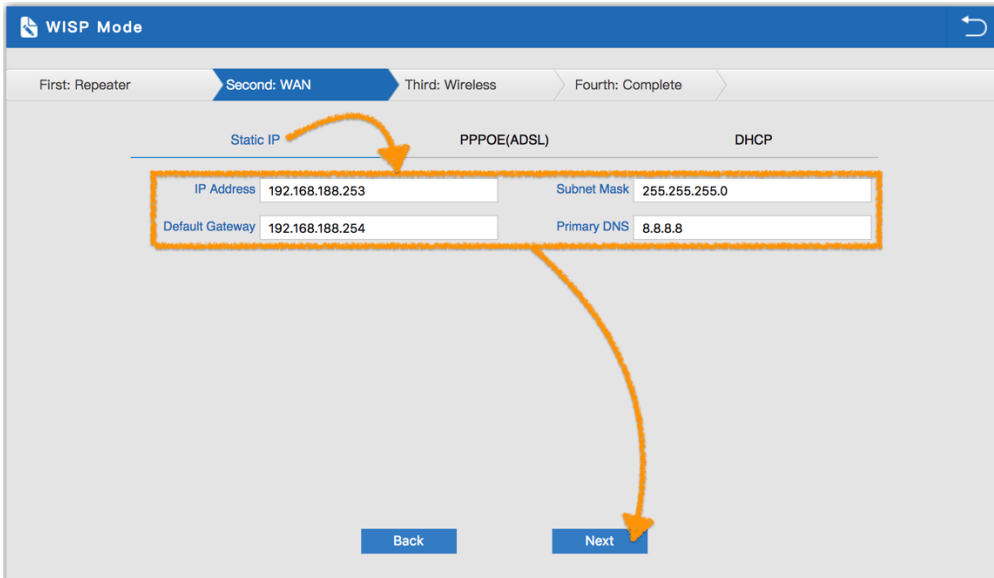
1. Select the AP's SSID want to bridge, take "wireless 2.4G" for example, then input the AP's key, click Scan AP. Enter the WIFI SSID password to be linked, When click Next



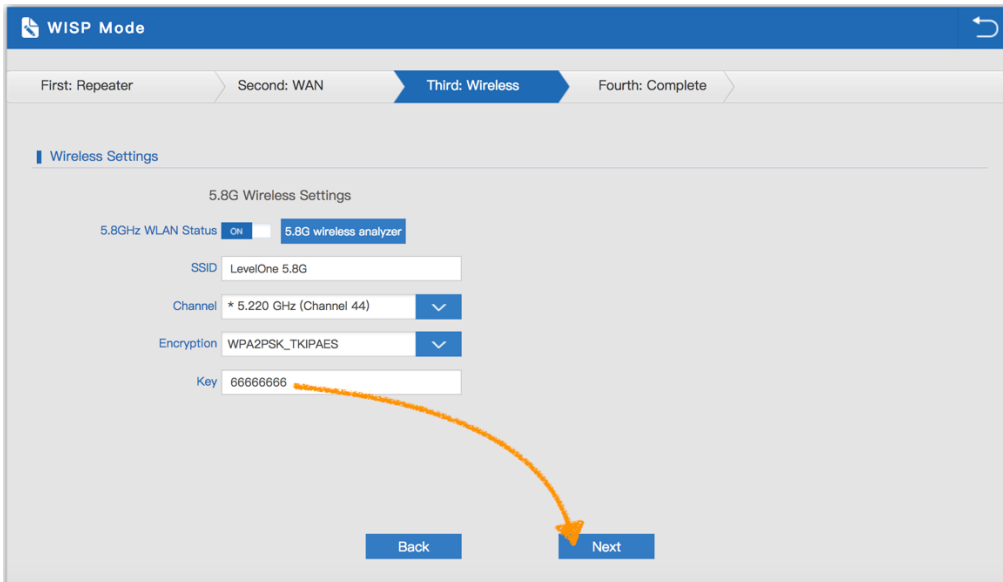
2. Before Click WISP Mode, confirm your ISP WIFI will be static IP, PPPoE, or DHCP: Then will pop up following picture after click it, Please choose the right WAN setting mode, then click next to continue.



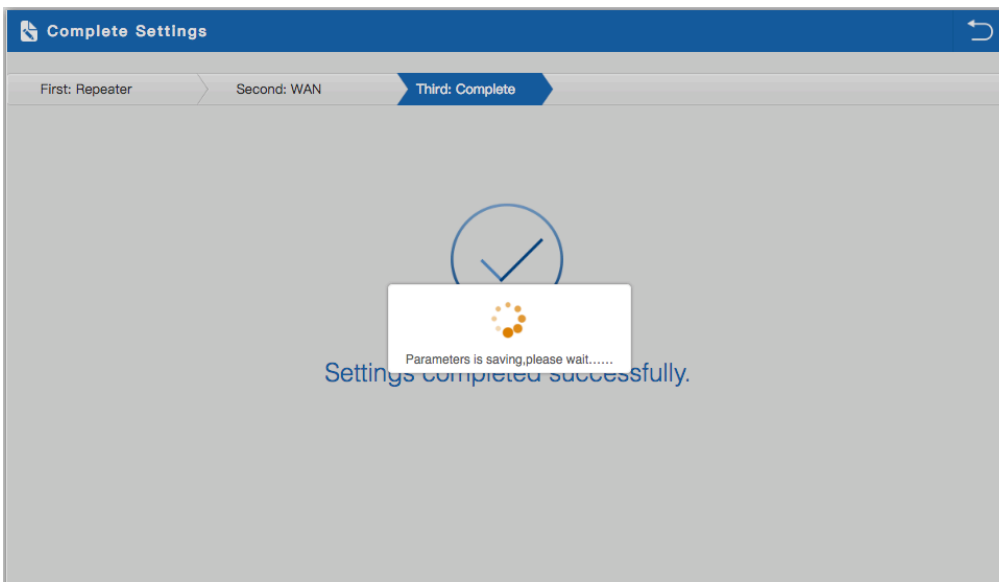
3. Take **Static IP** for example. (Please contact with ISP for correct IP address and DNS address)



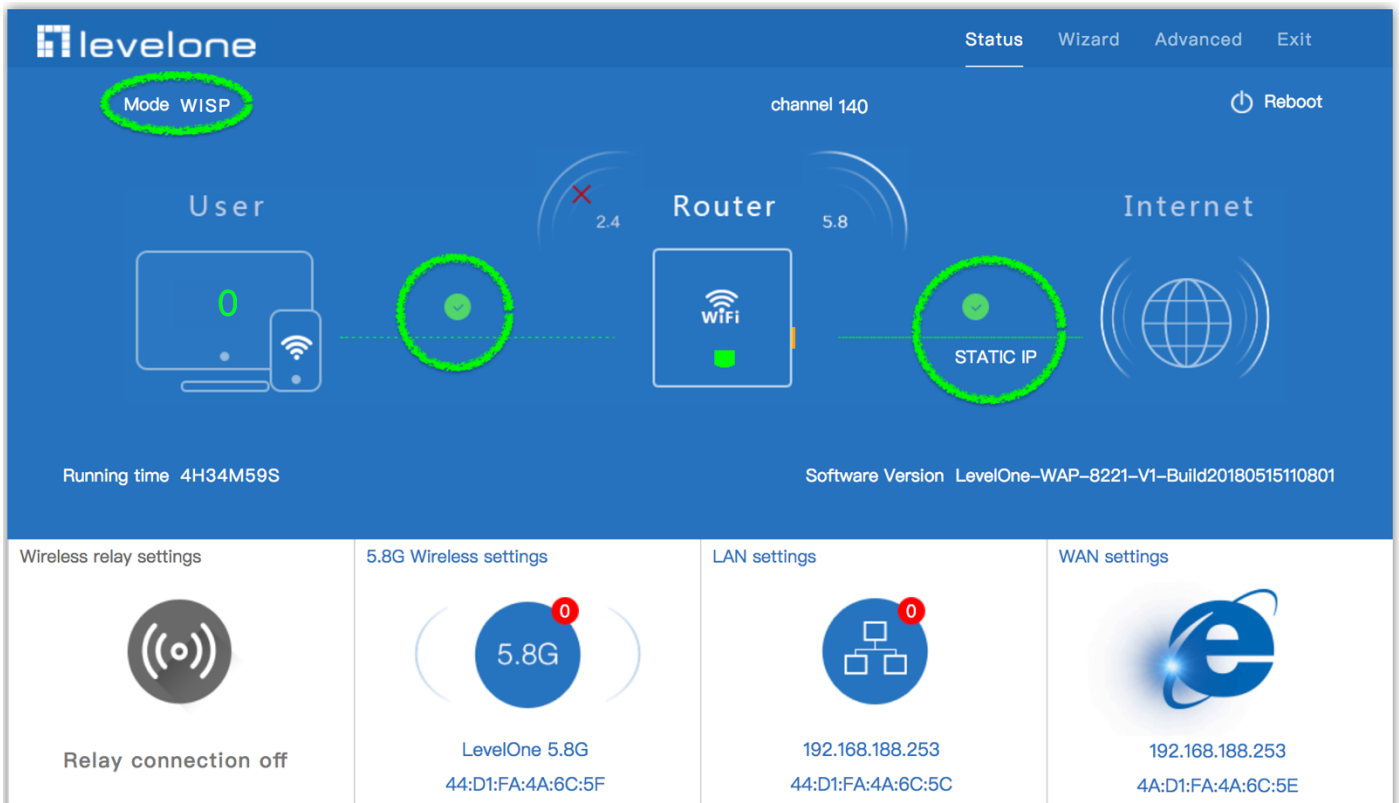
4. Configure the SSID and password the AP going to broadcast. If you have repeated 2.4G WIFI, in default setting, you are only allowed to broadcast 5.8G WIFI.)



5. Click Return button, will back to Status, show WISP mode data, show fail or success

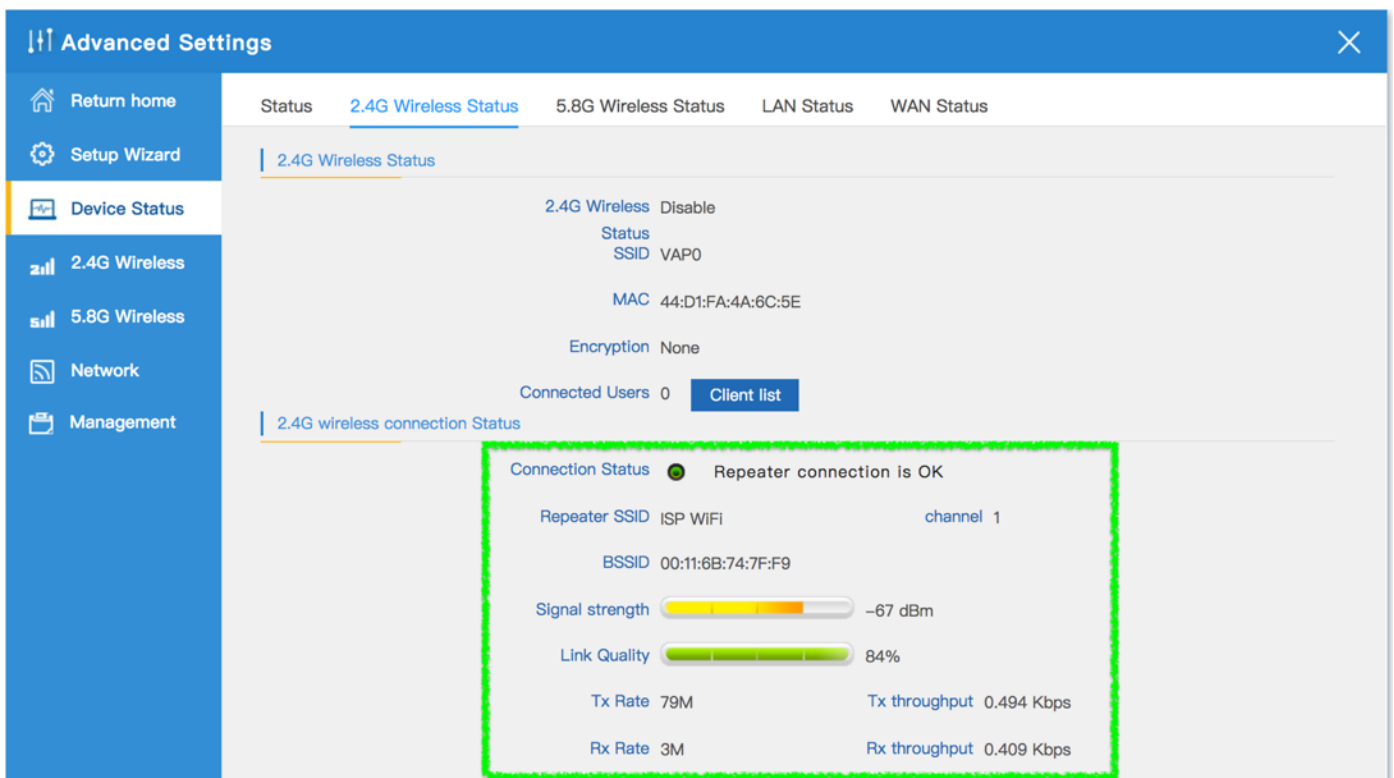


6. Check WISP Mode Status show fail or success



The screenshot shows the LevelOne WISP Mode Status page. At the top left, the 'Mode WISP' is highlighted with a green circle. The page displays a network diagram with 'User', 'Router', and 'Internet' components. The 'User' and 'Internet' components have green checkmarks, while the 'Router' component has a red 'X' and the number '2.4'. The 'Internet' component is labeled 'STATIC IP'. The page also shows 'channel 140' and a 'Reboot' button. At the bottom, there are four settings panels: 'Wireless relay settings' (Relay connection off), '5.8G Wireless settings' (LevelOne 5.8G, 44:D1:FA:4A:6C:5F), 'LAN settings' (192.168.188.253, 44:D1:FA:4A:6C:5C), and 'WAN settings' (192.168.188.253, 4A:D1:FA:4A:6C:5E). The running time is 4H34M59S and the software version is LevelOne-WAP-8221-V1-Build20180515110801.

7. Check WISP Mode Status data

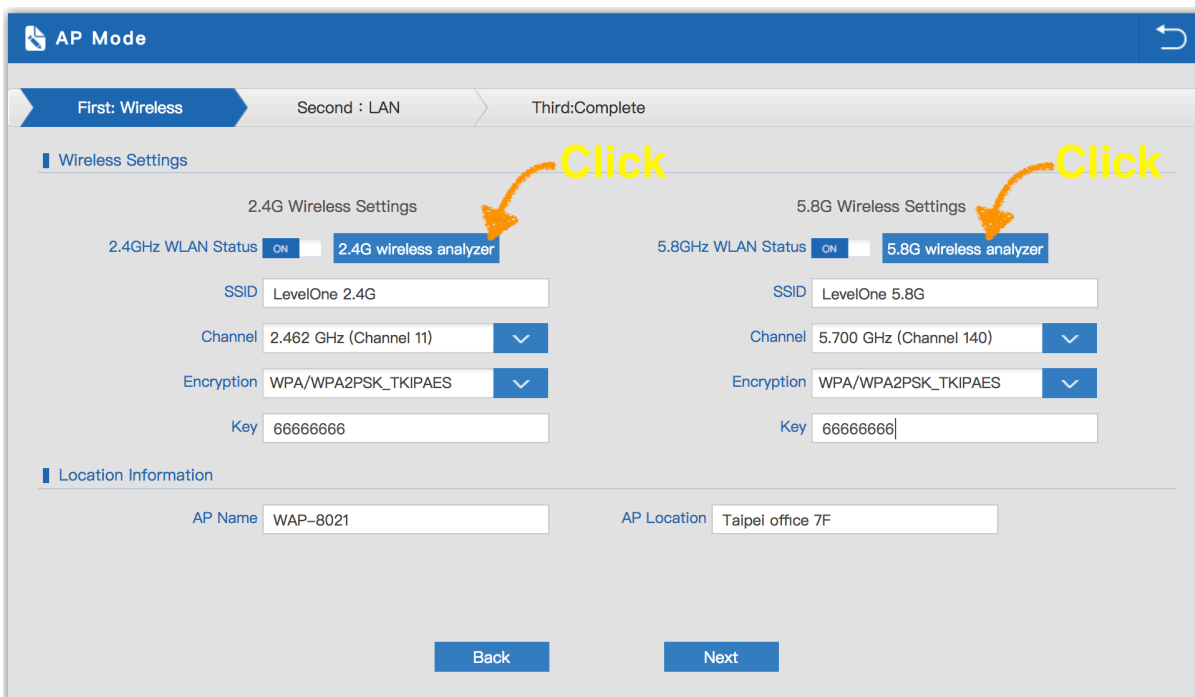


The screenshot shows the 'Advanced Settings' page, specifically the '2.4G Wireless Status' section. The page is titled 'Advanced Settings' and has a sidebar with navigation options: 'Return home', 'Setup Wizard', 'Device Status', '2.4G Wireless', '5.8G Wireless', 'Network', and 'Management'. The main content area shows the '2.4G Wireless Status' with the following information: '2.4G Wireless Disable', 'Status', 'SSID VAP0', 'MAC 44:D1:FA:4A:6C:5E', and 'Encryption None'. There are 'Connected Users 0' and a 'Client list' button. Below this, the '2.4G wireless connection Status' is highlighted with a green box. It shows 'Connection Status' as 'Repeater connection is OK', 'Repeater SSID' as 'ISP WIFI', 'channel 1', 'BSSID' as '00:11:6B:74:7F:F9', 'Signal strength' as '-67 dBm', 'Link Quality' as '84%', 'Tx Rate' as '79M', 'Tx throughput' as '0.494 Kbps', 'Rx Rate' as '3M', and 'Rx throughput' as '0.409 Kbps'.

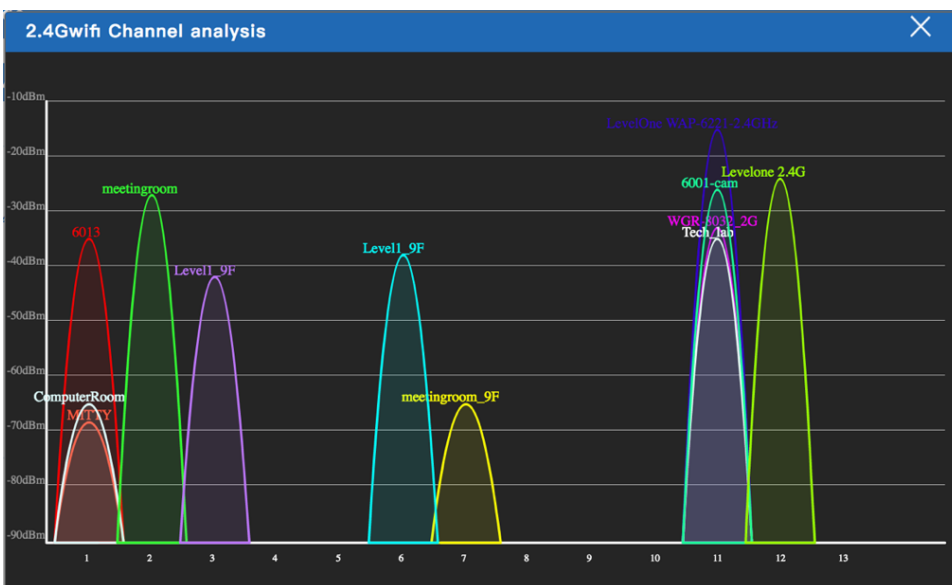
3.5 AP mode & Wireless analyzer :



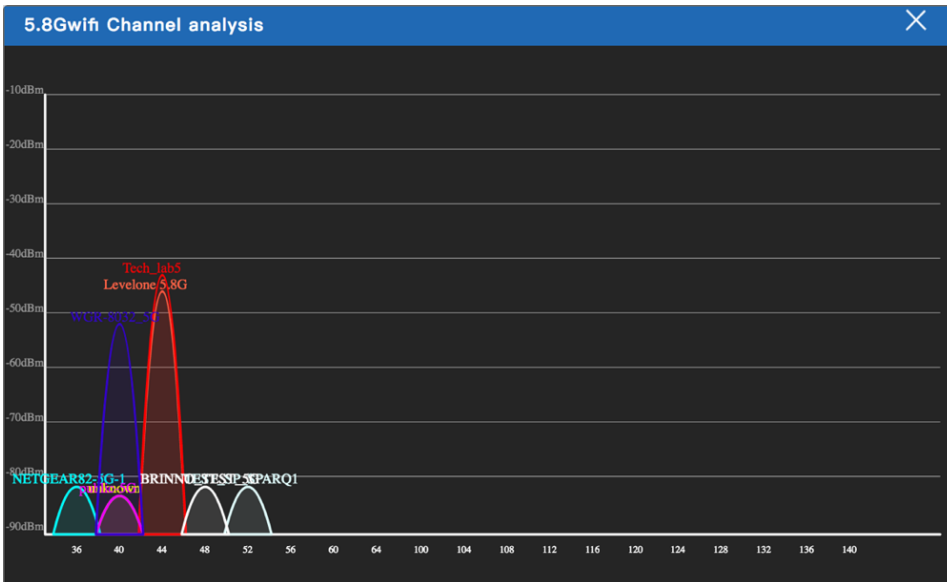
1. To make the WAP-8221 work in some clear channel, user can click wireless analyzer at first. Look for Unoccupied channel, then Wireless performance will be more stable. Picture showed as below.



2. Wireless analyzer Look for Unoccupied channel (2.4GHz)



3. Wireless analyzer Look for Unoccupied channel (5.8GHz)



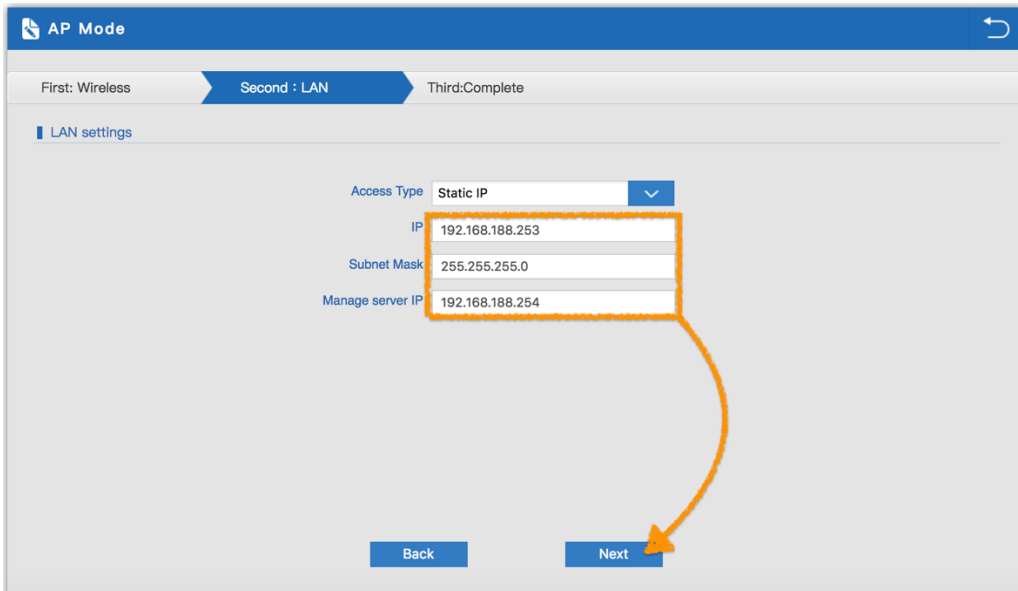
4. Set the wireless data, AP Location info as required, then click next to continue and enter into LAN setting. After LAN setting, complete the AP mode configuration and back to Status.

The screenshot shows the 'AP Mode' configuration interface. The 'Wireless Settings' section is active, showing '2.4G Wireless Settings' and '5.8G Wireless Settings'. The 5.8GHz WLAN Status is set to 'ON' and the channel is '5.700 GHz (Channel 140)'. The SSID is 'LevelOne 5.8G' and the encryption is 'WPA/WPA2PSK_TKIPAES'. The AP Name is 'WAP-8021' and the AP Location is 'Taipei office 7F'. An orange box highlights the 5.8GHz settings and location information, and an orange arrow points to the 'Next' button.

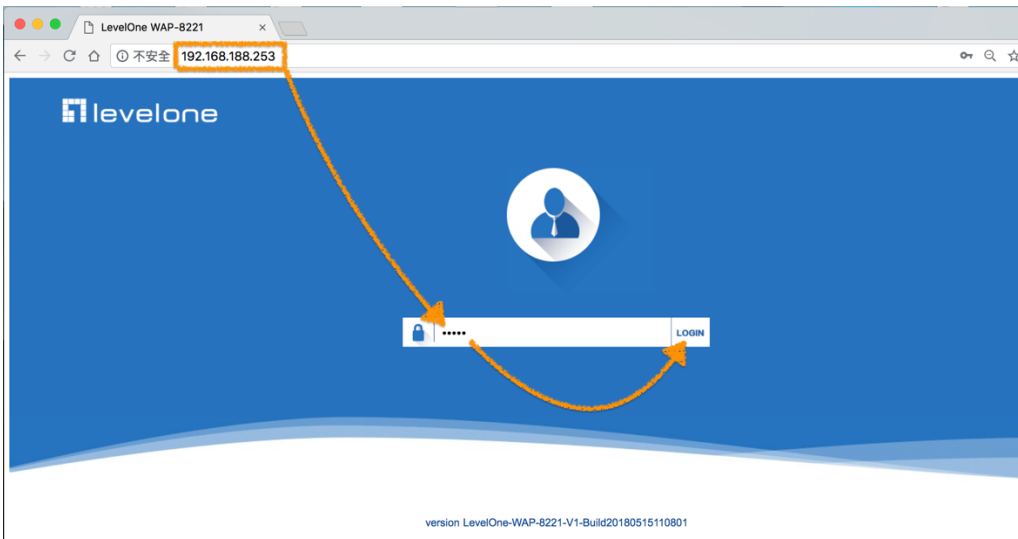
5. Set according to environmental requirements.

The screenshot shows the 'AP Mode' configuration interface with the 'LAN setting' section active. The 'Access Type' is set to 'DHCP from Controller'. An orange box highlights the 'DHCP from Controller' option, and an orange arrow points to the 'Next' button.

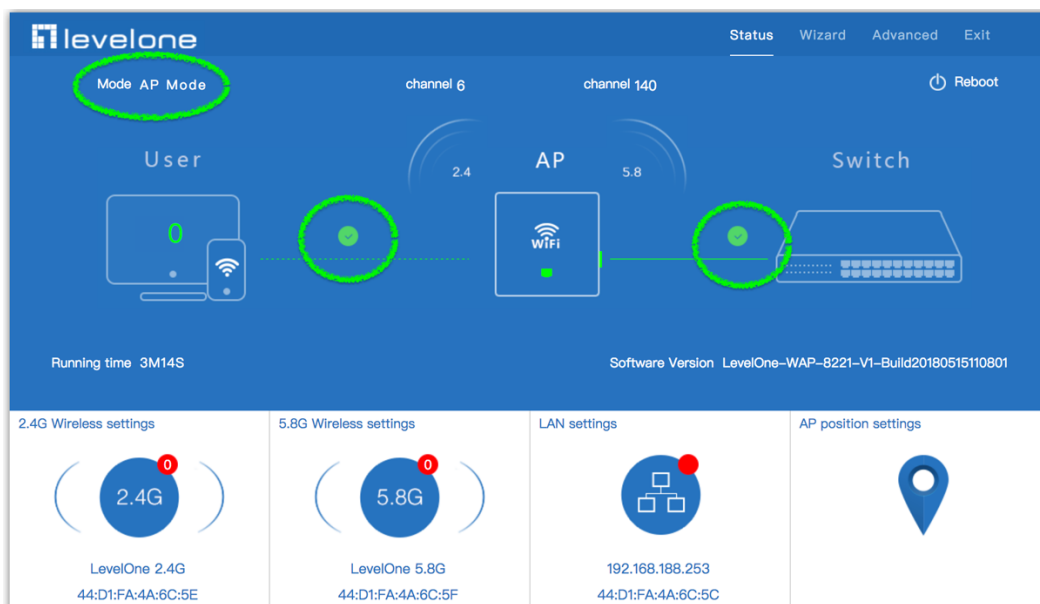
6. Demo Static IP setting



7. Re-login to WEB UI, Use the Static IP you just set.



8. Check AP Mode Status show fail or success.

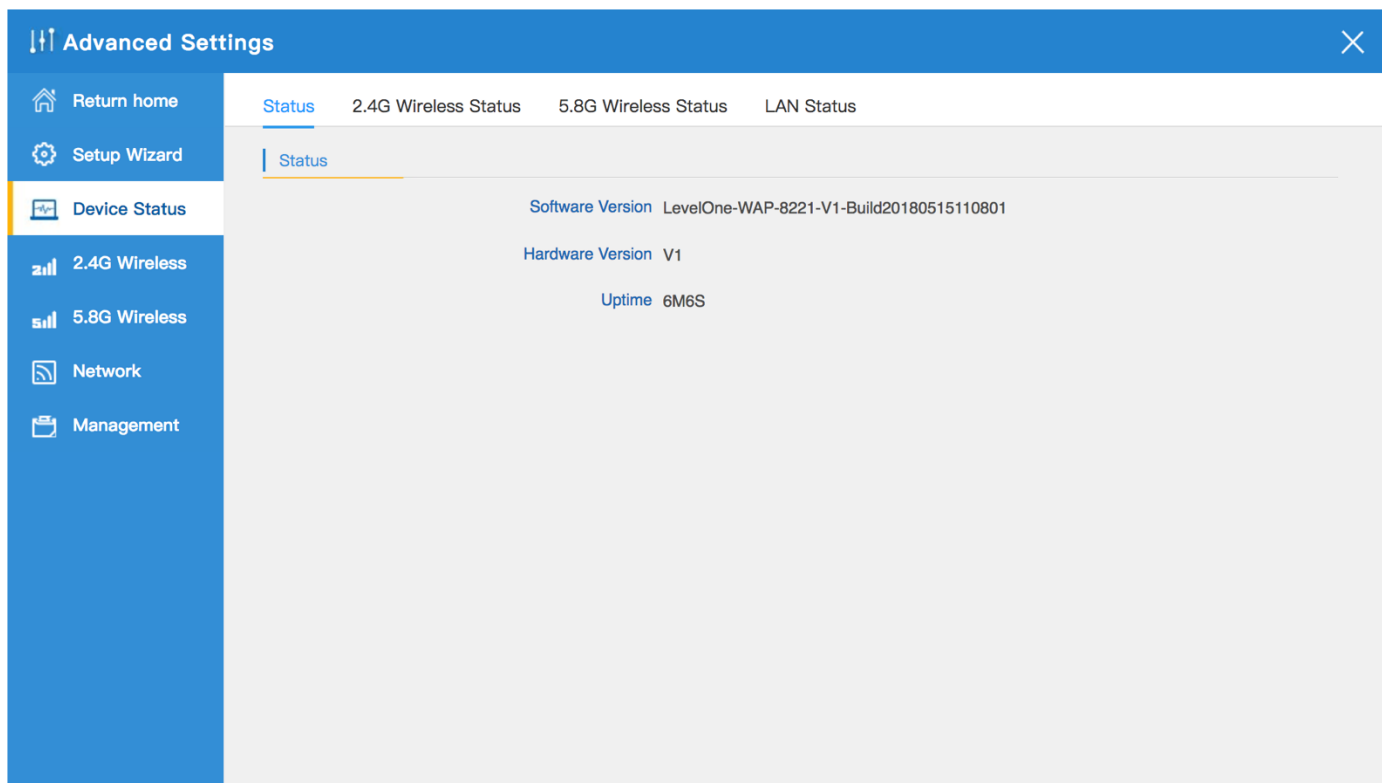


Chapter 4 Advanced Setting

4.1 Device Status

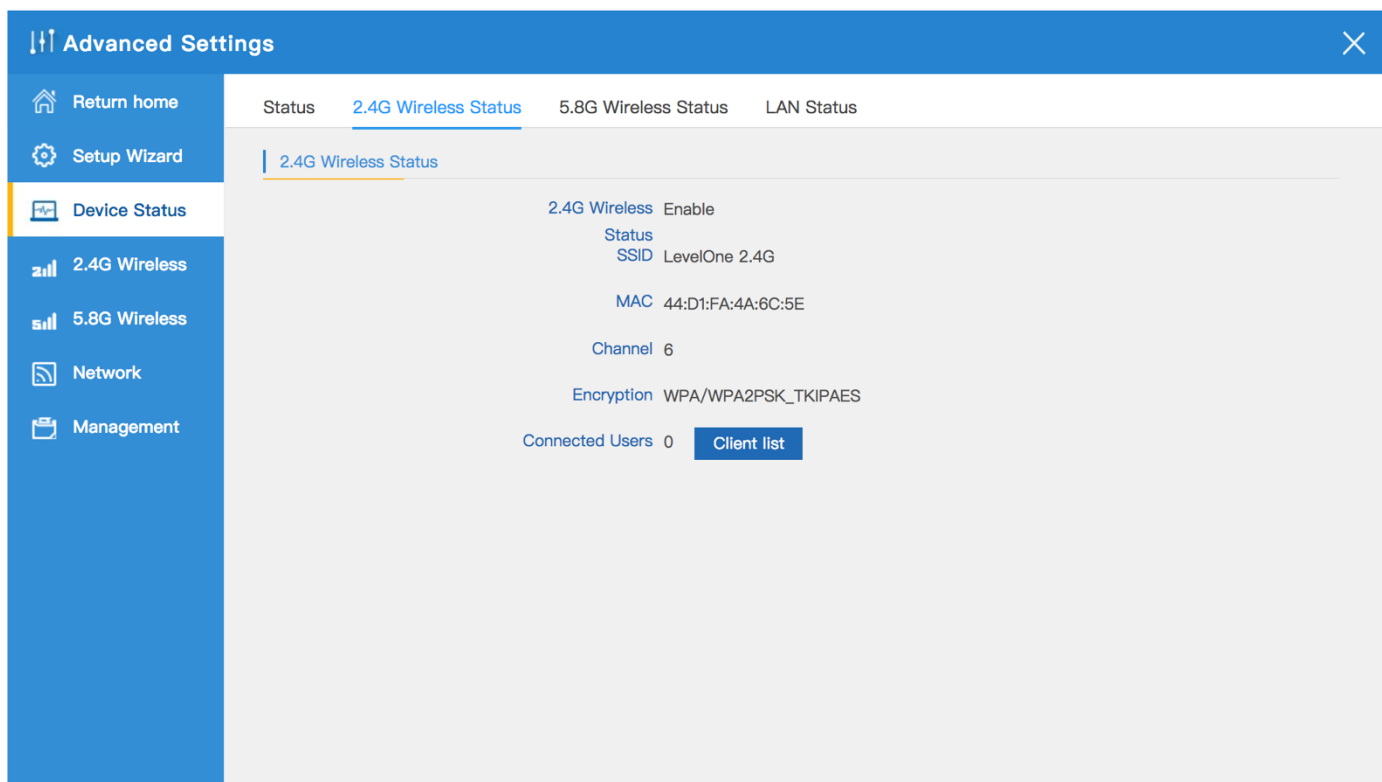
4.1.1 Status:

- Mainly to check the wireless AP's firmware version, hardware version, uptime info.



4.1.2 2.4G Wireless Status:

- Show wireless AP's SSID, MAC address for WiFi, Channel, Encryption, Client List info.



4.1.3 5.8G Wireless Status:

- Show wireless AP's SSID, MAC address for WiFi, Channel, Encryption, Client List info.

The screenshot shows the 'Advanced Settings' window with the '5.8G Wireless Status' tab selected. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless, 5.8G Wireless, Network, and Management. The main content area displays the following information:

- Status: 2.4G Wireless Status, **5.8G Wireless Status**, LAN Status
- 5.8G Wireless Status: Enable
- SSID: LevelOne 5.8G
- MAC: 44:D1:FA:4A:6C:5F
- Channel: 140
- Encryption: WPA2PSK_TKIPAES
- Connected Users: 0
- Client list button

4.1.4 LAN Status:

- Check wireless AP's IP address, Subnet Mask, LAN MAC address and other info showed in following picture

The screenshot shows the 'Advanced Settings' window with the 'LAN Status' tab selected. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless, 5.8G Wireless, Network, and Management. The main content area displays the following information:

- Status: 2.4G Wireless Status, 5.8G Wireless Status, **LAN Status**
- LAN IP: 192.168.188.253
- Subnet Mask: 255.255.255.0
- MAC: 44:D1:FA:4A:6C:5C
- Manage server IP: 192.168.188.254
- DHCP Status: Disable
- DHCP address range: 192.168.188.2 — 192.168.188.252
- Assigned IP: 0
- Client list button

4.2 2.4G Wireless

4.2.1 2.4G Basic Settings :

- Mainly to configure the wireless SSID, password, band width ,encryption, channel, Multi SSID.

Advanced Settings

Return home | Setup Wizard | Device Status | **2.4G Wireless** | 5.8G Wireless | Network | Management

2.4G Basic Settings | 2.4G Virtual AP | 2.4G Access Control | 2.4G Advanced Settings

Wireless Basic Settings

Wireless Status ON OFF **2.4G wireless analyzer**

SSID

Broadcast SSID Disable Enable

WMM Disable Enable

Channel

Band Width ▼

Channel ▼

Authentication

Encryption ▼

Key

Apply

4.2.2 2.4G Virtual AP :

- There are 3 virtual AP in 2.4G wireless, if need enable multi SSIDs, then users can configure it showed in following picture:

Advanced Settings

Return home | Setup Wizard | Device Status | **2.4G Wireless** | 5.8G Wireless | Network | Management

2.4G Basic Settings | **2.4G Virtual AP** | 2.4G Access Control | 2.4G Advanced Settings

2.4G Virtual AP

Virtual AP1 | Virtual AP2 | Virtual AP3

Wireless Status ON OFF

SSID

Broadcast SSID Disable Enable

WMM Disable Enable

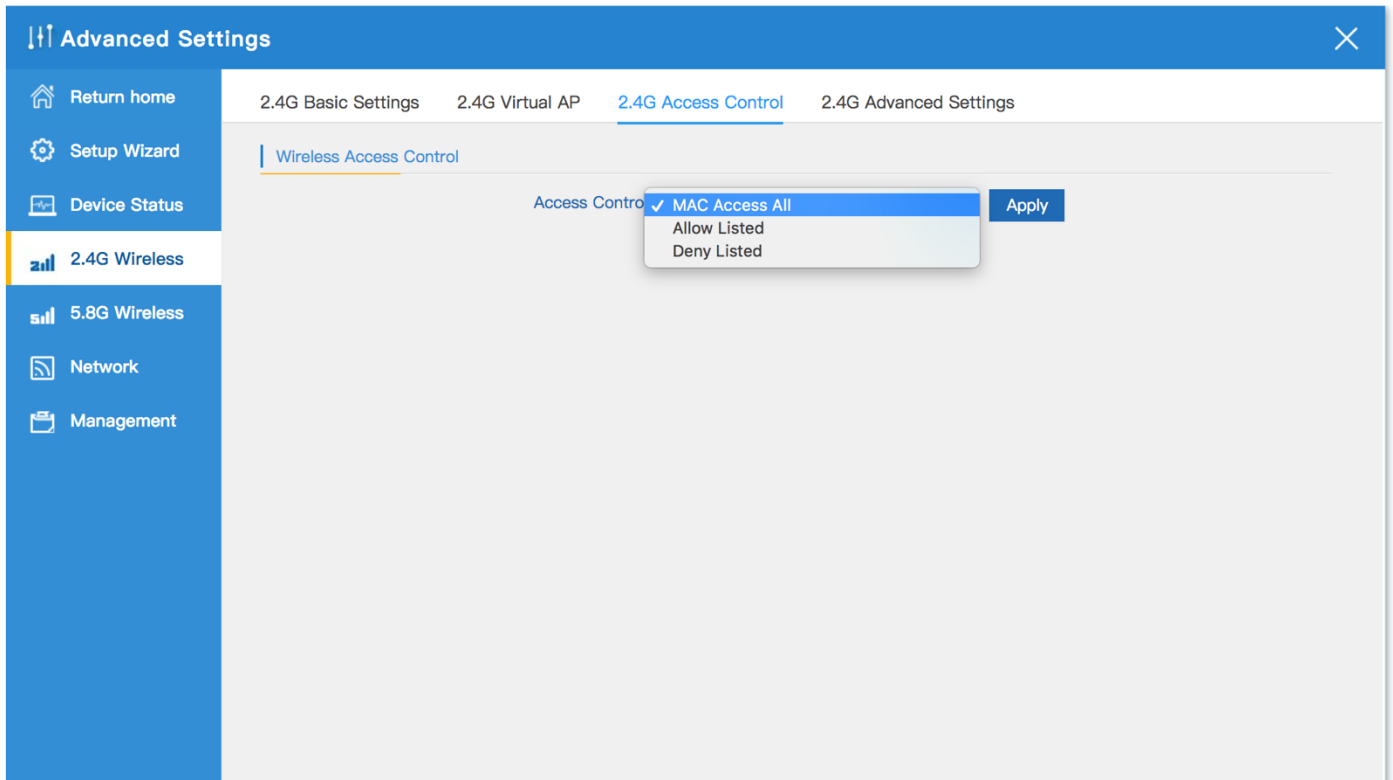
Encryption ▼

Key

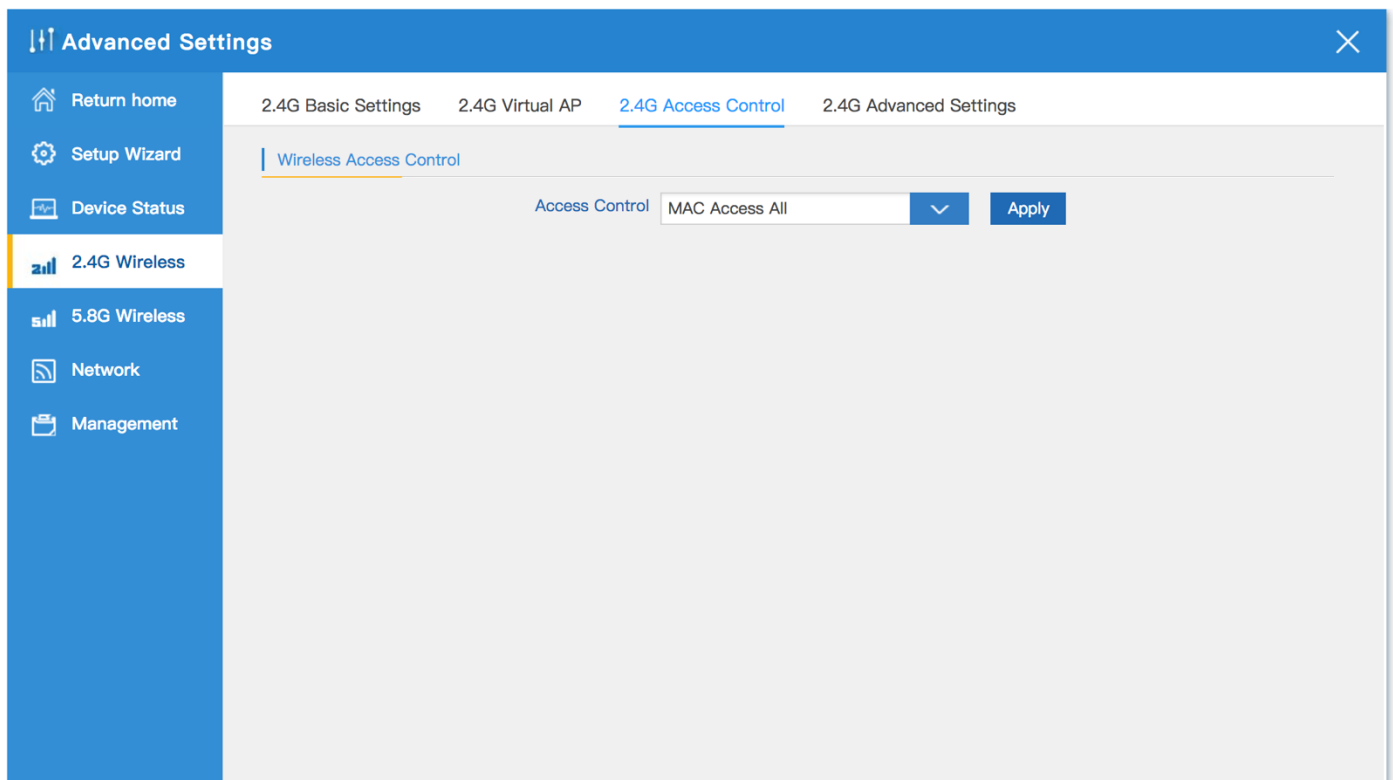
Apply

4.2.3 2.4G Access Control :

1. Allow or deny the users access into this wireless AP based on MAC address.

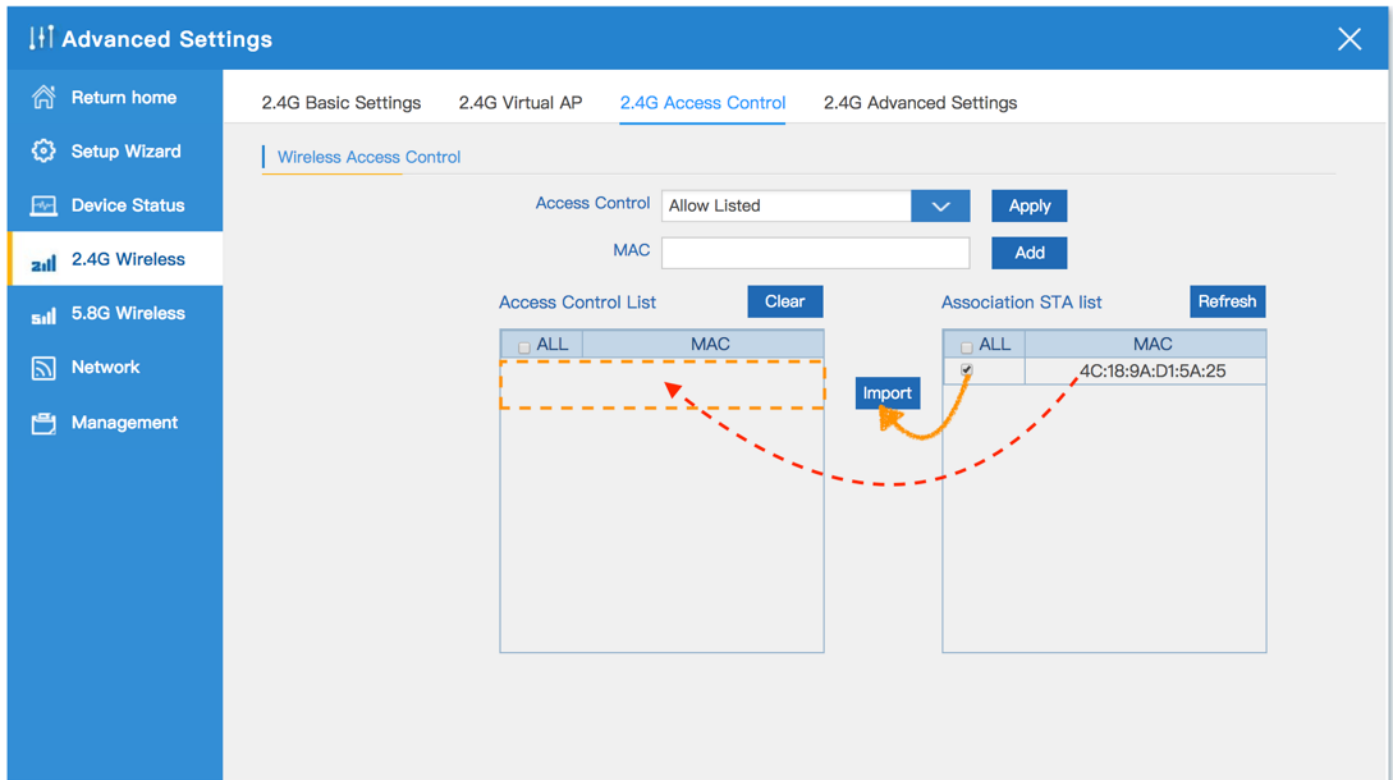


2. Allow all the users access into this wireless AP



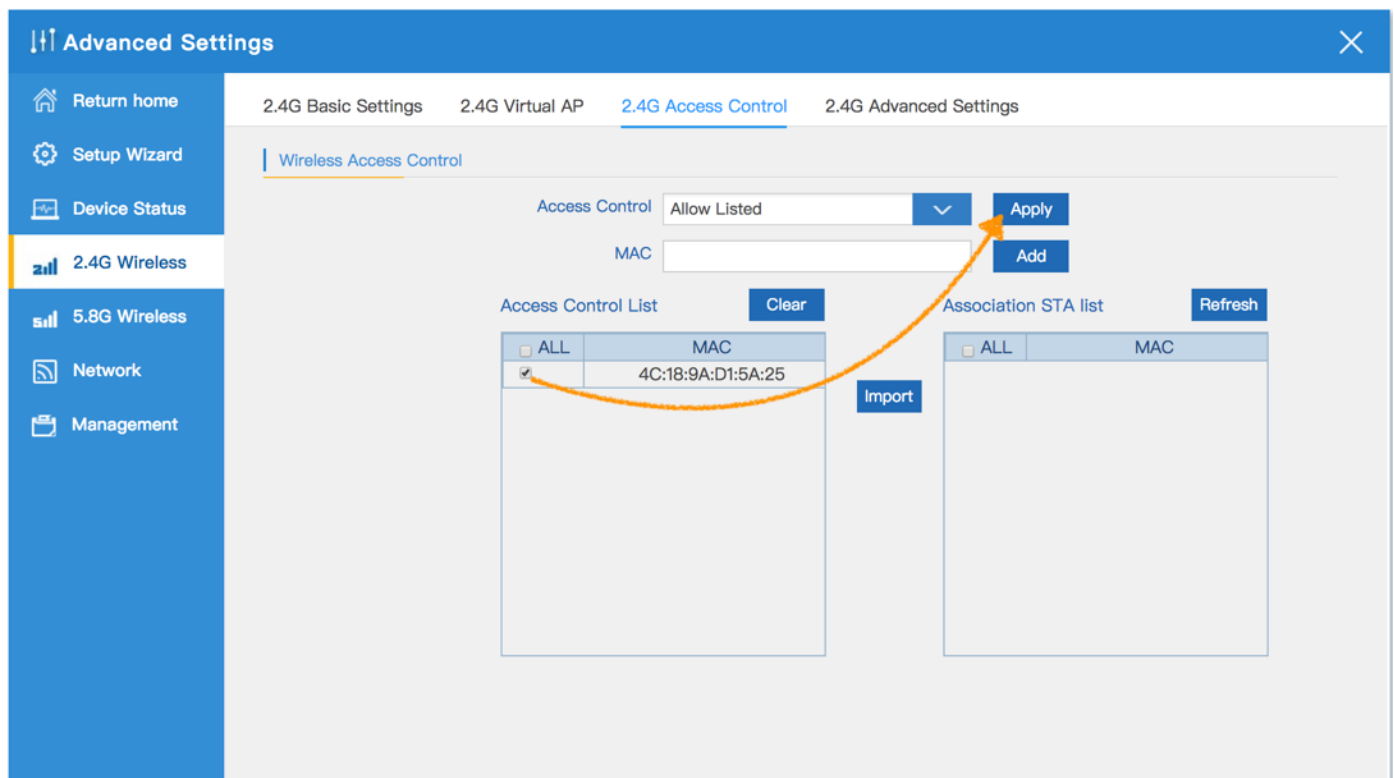
3. Only users who have joined the MAC address list can access the wireless AP.

The following is a demonstration of teaching . Add the user MAC address in the list to the access control list



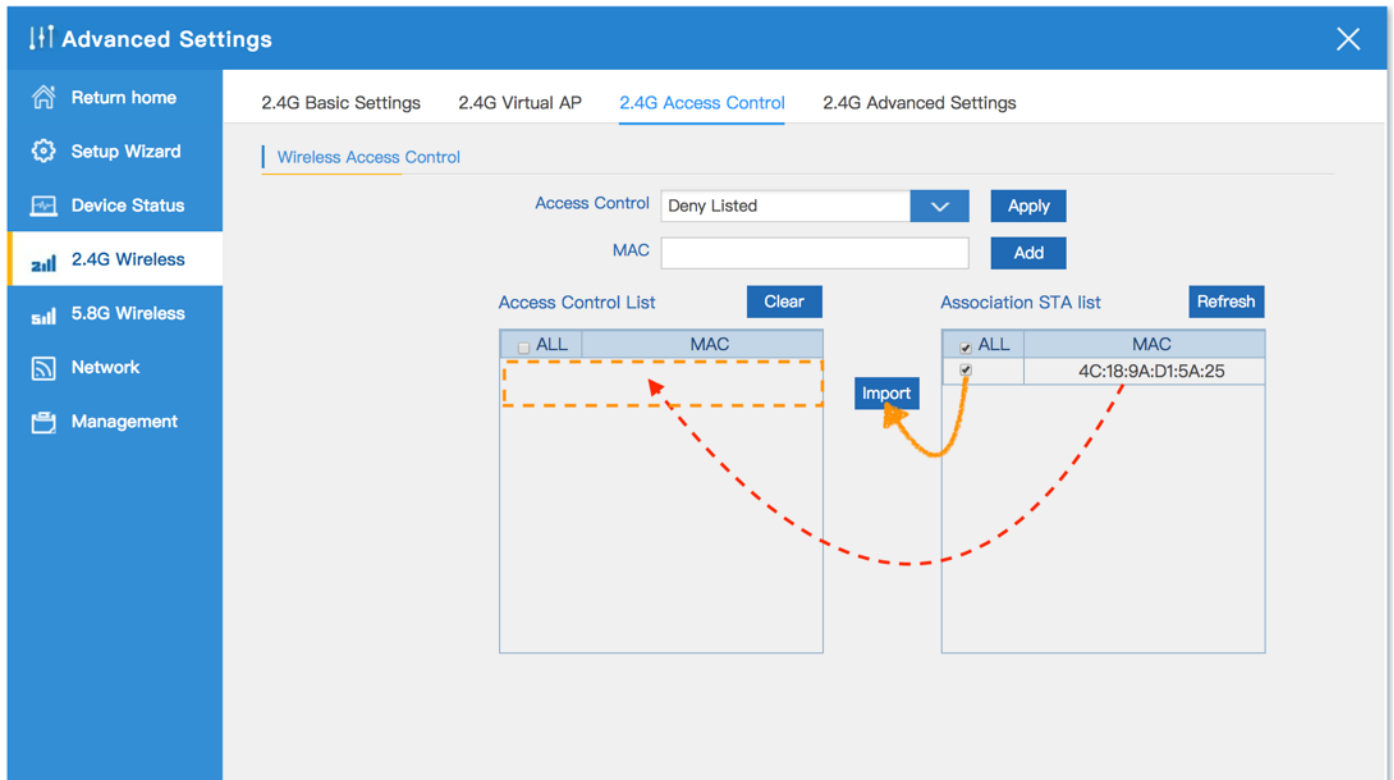
4. After the user's MAC address is added to the access control list, Click Apply.

After setting is completed, it will start to allow users access to this wireless AP function



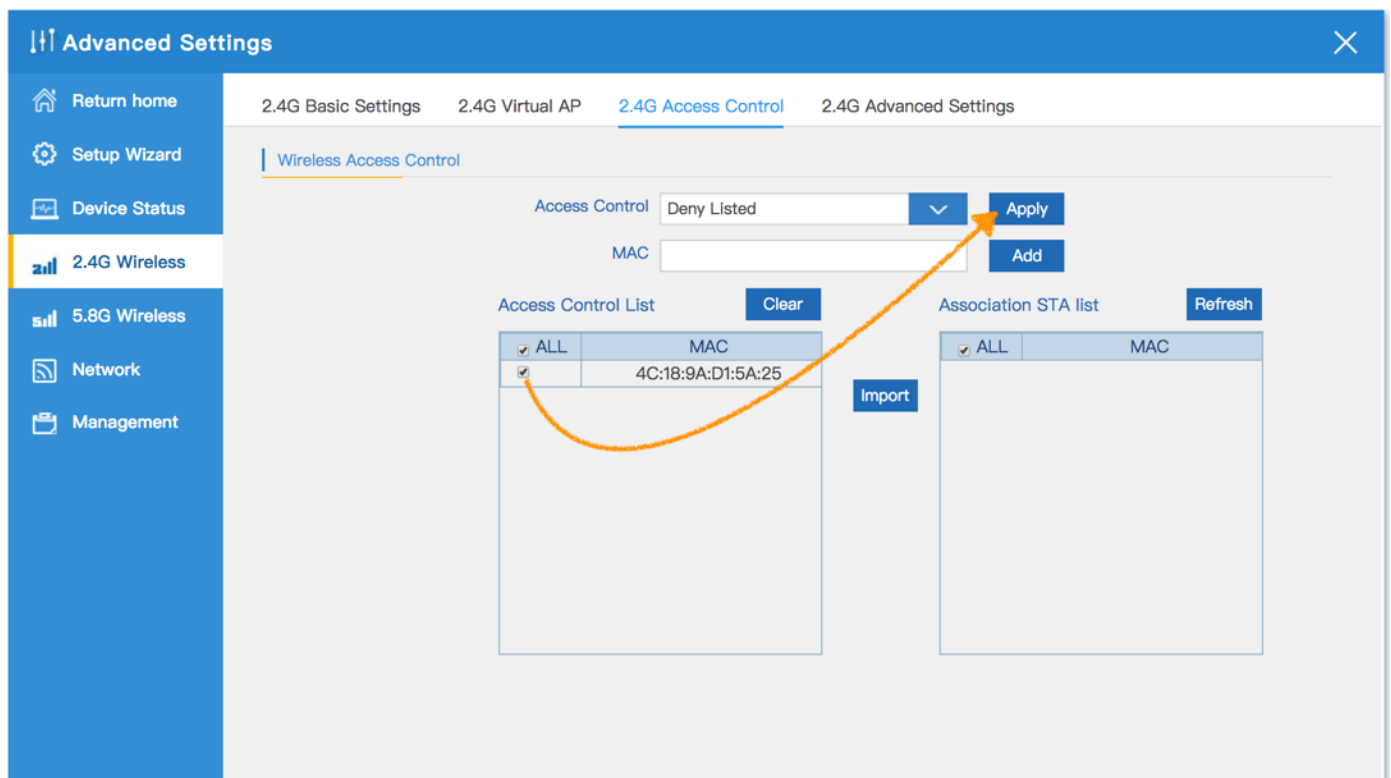
5. Users who have joined the MAC address list are denied access to the wireless AP.

The following is a demonstration of teaching . Add the user MAC address in the list to the access control list



6. After the user's MAC address is added to the access control list, Click Apply.

After setting is completed, it will start to deny users access to this wireless AP function



7. In this page, will show the regional, mode, RF Power, Max user access...

The screenshot shows the 'Advanced Settings' window for 2.4G wireless configurations. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless (selected), 5.8G Wireless, Network, and Management. The main content area is titled '2.4G Advanced Settings' and includes the following fields and controls:

- Regional: U.S.A (dropdown)
- Channel: Channel(1-11)
- MODE: 802.11N/G (dropdown)
- RF Output Power: 100% (dropdown)
- Packet Threshold: 2346 (range: 256-2346)
- RTS Threshold: 2346 (range: 0-2347)
- Ack Timeout control: 64 (range: 0-255)us
- Beacon interval: 100 (range: 100-1024)ms
- MAX User: 64 (range: 0-64 0 not limited)
- Coverage Threshold: -90 (range: -95dBm~-65dBm)
- Aggregation: ON
- Short GI: ON
- User isolation: OFF

An 'Apply' button is located at the bottom center of the settings area.

4.3 5.8G Wireless

4.3.1 5.8G Basic Settings :

- Mainly to configure the wireless SSID, password, band width ,encryption, channel, Multi SSID.

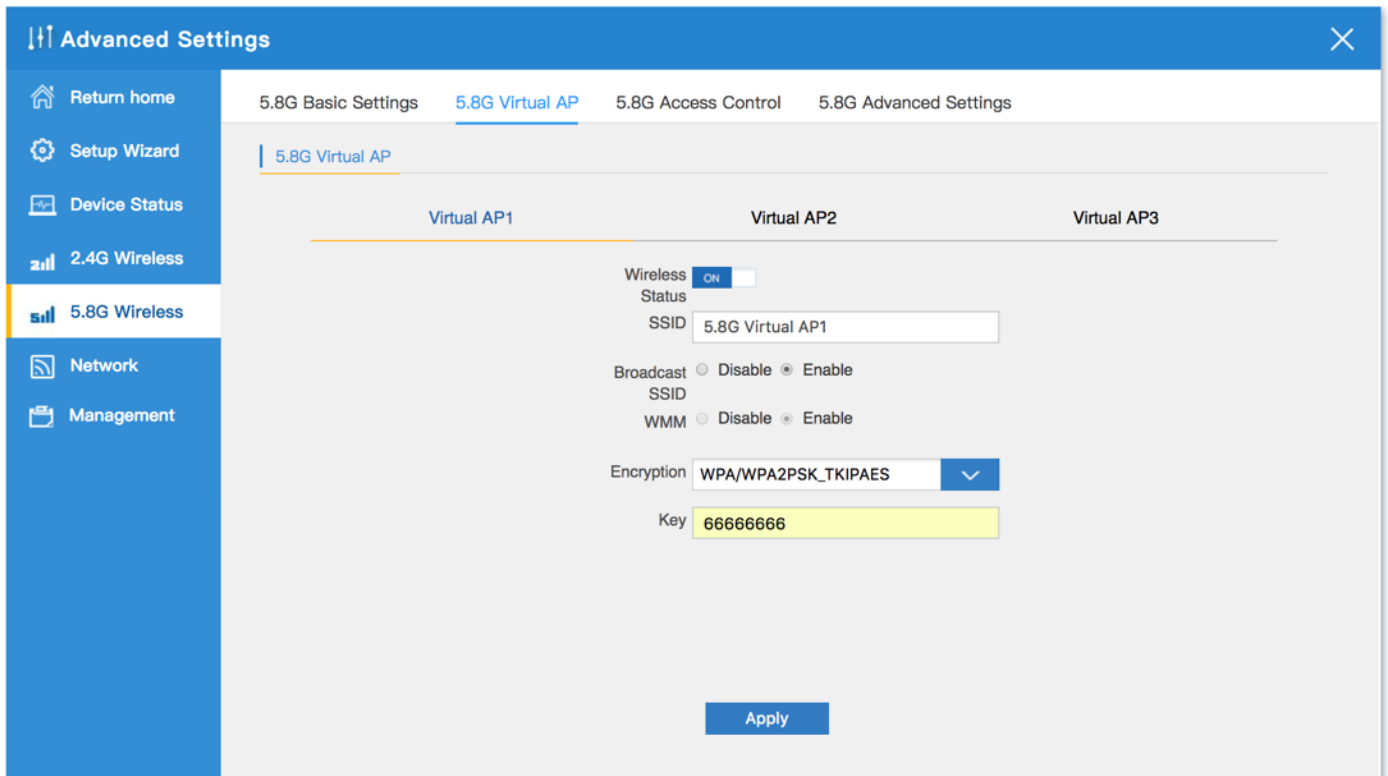
The screenshot shows the 'Advanced Settings' window for 5.8G wireless configurations. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless, 5.8G Wireless (selected), Network, and Management. The main content area is titled '5.8G Basic Settings' and includes the following fields and controls:

- Wireless Status: ON
- 5.8G wireless analyzer:
- SSID: LevelOne 5.8G
- Broadcast SSID: Disable Enable
- WMM: Disable Enable
- Channel section:
 - Band Width: 80MHz (dropdown)
 - Channel: * 5.220 GHz (Channel 44) (dropdown)
- Encryption section:
 - Encryption: WPA/WPA2PSK_TKIPAES (dropdown)
 - Key: 66666666

An 'Apply' button is located at the bottom center of the settings area.

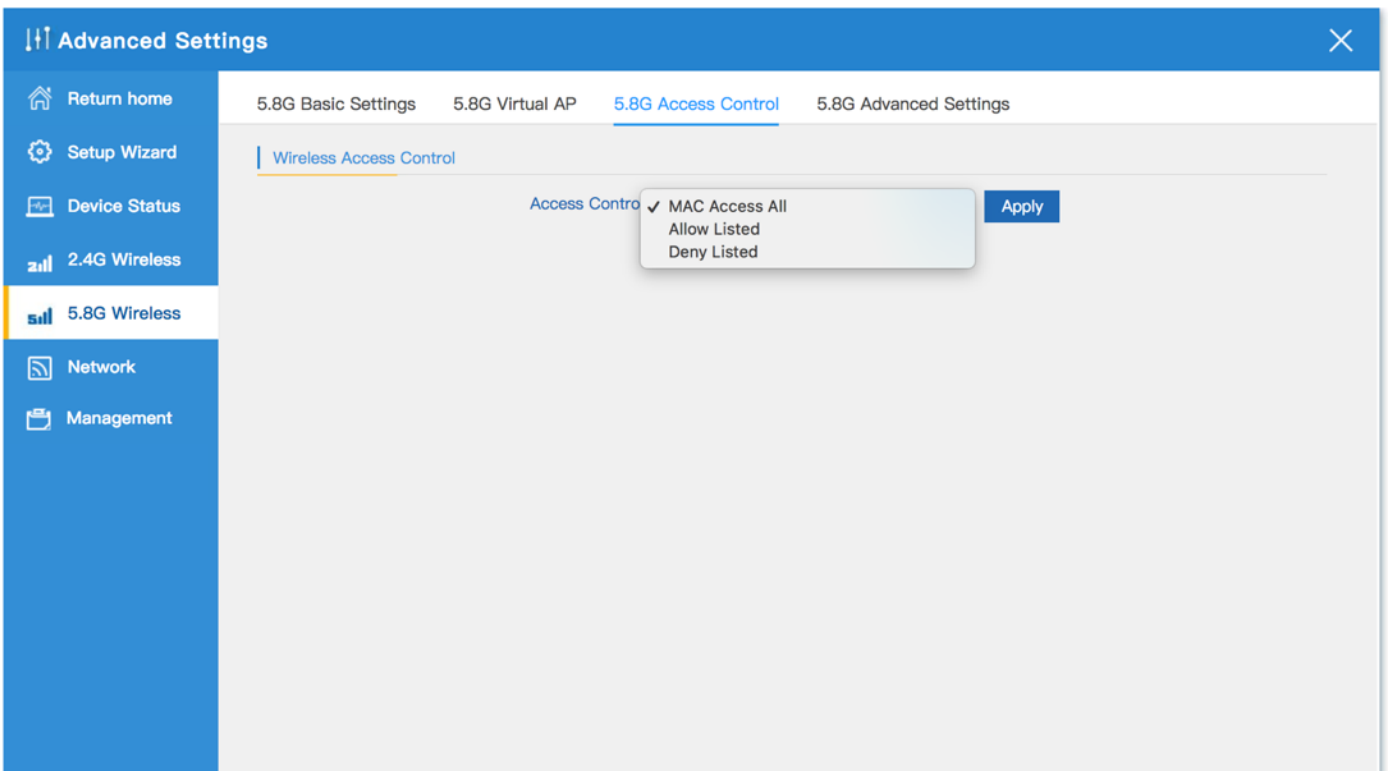
4.3.2 5.8G Virtual AP :

- There are 3 virtual AP in 5.8G wireless, if need enable multi SSIDs, then users can configure it showed in following picture:

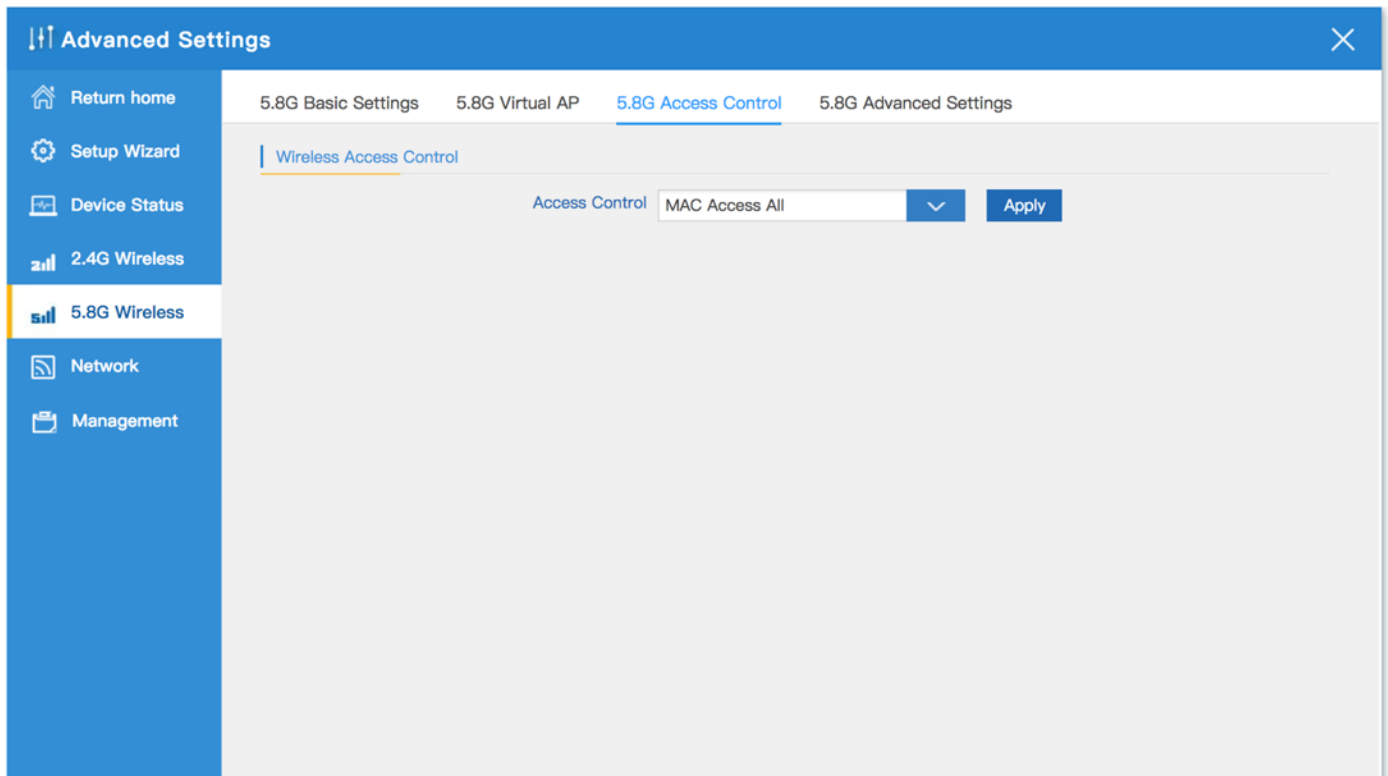


4.3.3 5.8G Access Control :

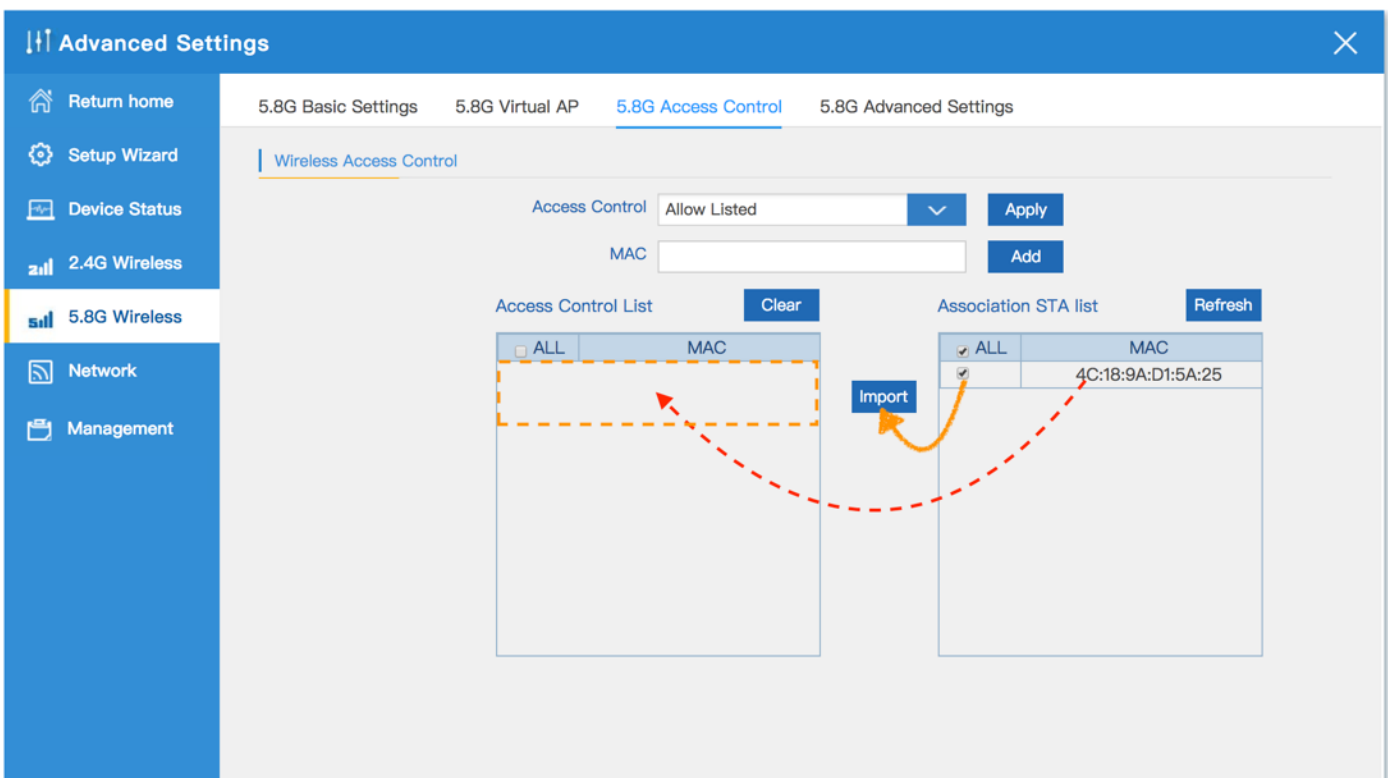
1. Allow or deny the users access into this wireless AP based on MAC address.



2. Allow all the users access into this wireless AP



3. Only users who have joined the MAC address list can access the wireless AP. The following is a demonstration of teaching . Add the user MAC address in the list to the access control list



4. After the user's MAC address is added to the access control list, Click Apply. After setting is completed, it will start to allow users access to this wireless AP function

The screenshot shows the 'Advanced Settings' interface for '5.8G Access Control'. The 'Access Control' dropdown is set to 'Allow Listed'. The 'MAC' input field is empty. The 'Access Control List' table contains one entry with MAC address 4C:18:9A:D1:5A:25. The 'Apply' button is highlighted with an orange arrow.

ALL	MAC
<input checked="" type="checkbox"/>	4C:18:9A:D1:5A:25

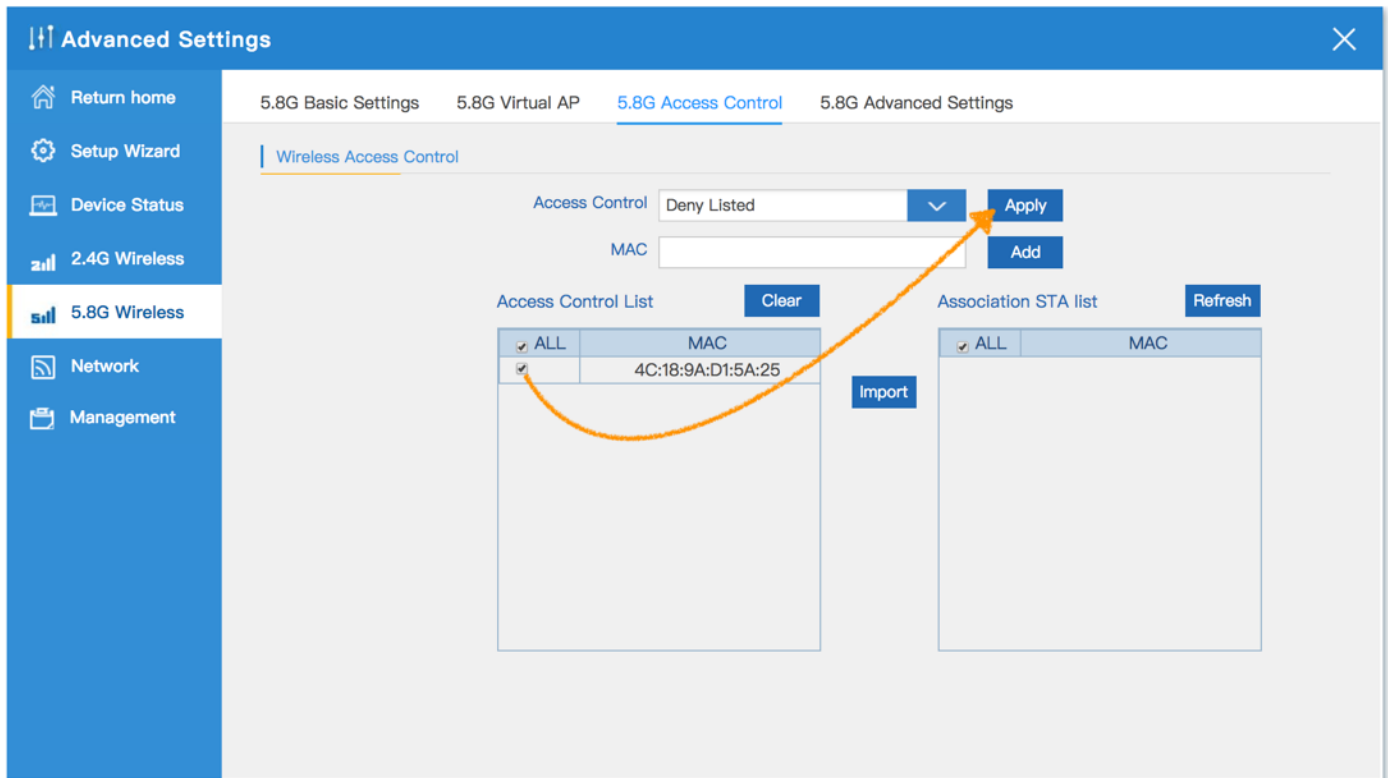
5. Users who have joined the MAC address list are denied access to the wireless AP. The following is a demonstration of teaching . Add the user MAC address in the list to the access control list

The screenshot shows the 'Advanced Settings' interface for '5.8G Access Control'. The 'Access Control' dropdown is set to 'Deny Listed'. The 'MAC' input field is empty. The 'Access Control List' table is empty. The 'Association STA list' table contains one entry with MAC address 4C:18:9A:D1:5A:25. The 'Import' button is highlighted with an orange arrow.

ALL	MAC
-----	-----

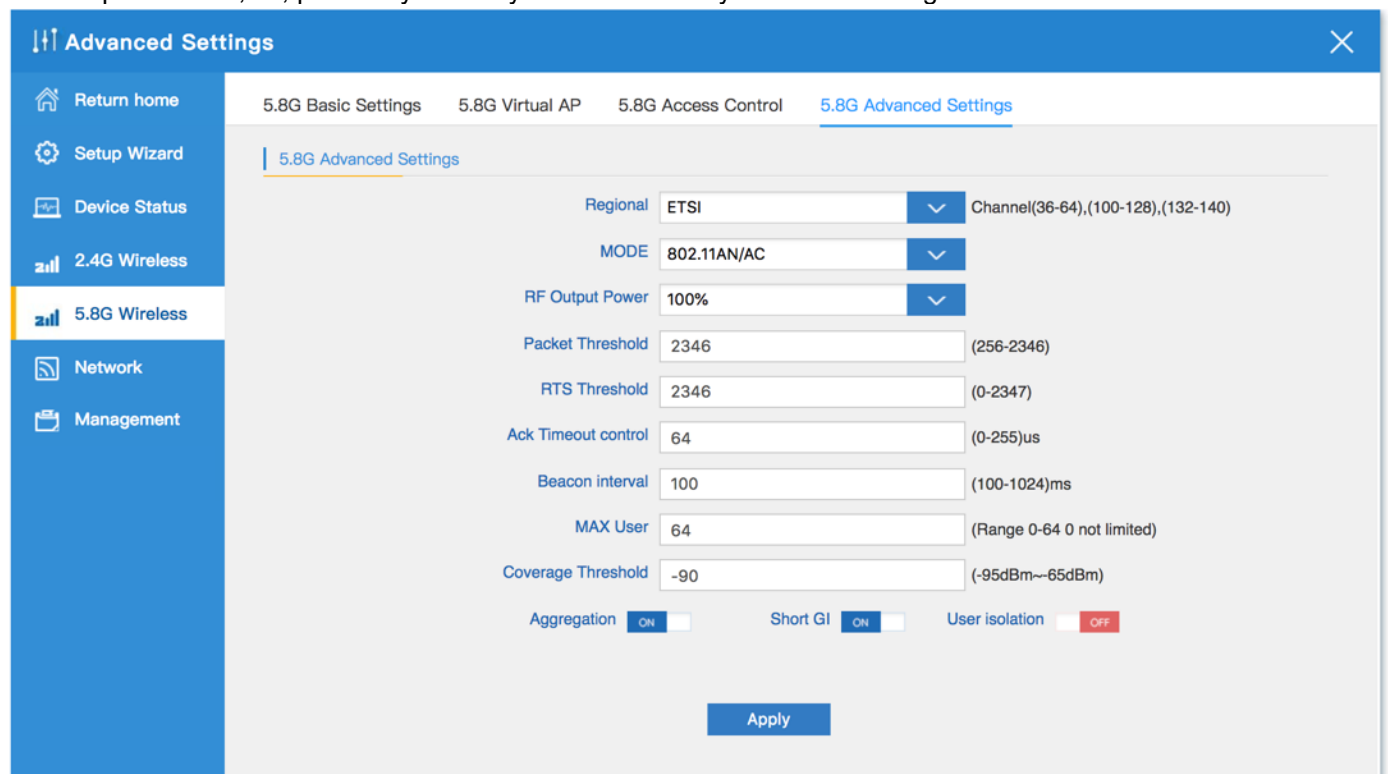
ALL	MAC
<input checked="" type="checkbox"/>	4C:18:9A:D1:5A:25

- After the user's MAC address is added to the access control list, Click Apply. After setting is completed, it will start to deny users access to this wireless AP function

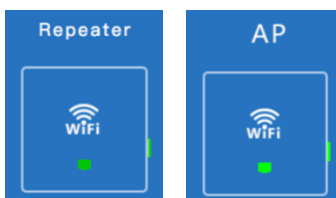


- In this page, will show the regional, mode, RF Power, Max user access...

Remark : In Regional, the default is Debug, which including the frequency of 5.180GHz to 5.825GHz, but some local laws will prohibit this, so, pls strictly abide by local laws and by cautious in using them.



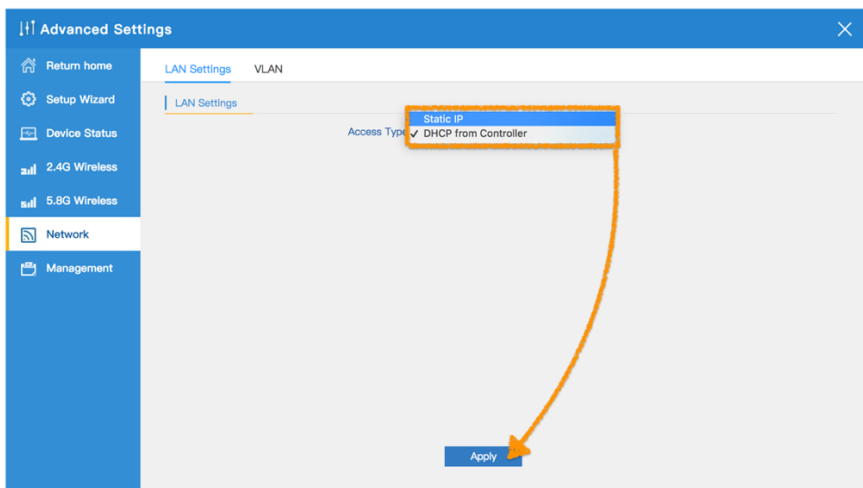
CHAPTER 5 Enable the status of Repeater Mode or AP Mode



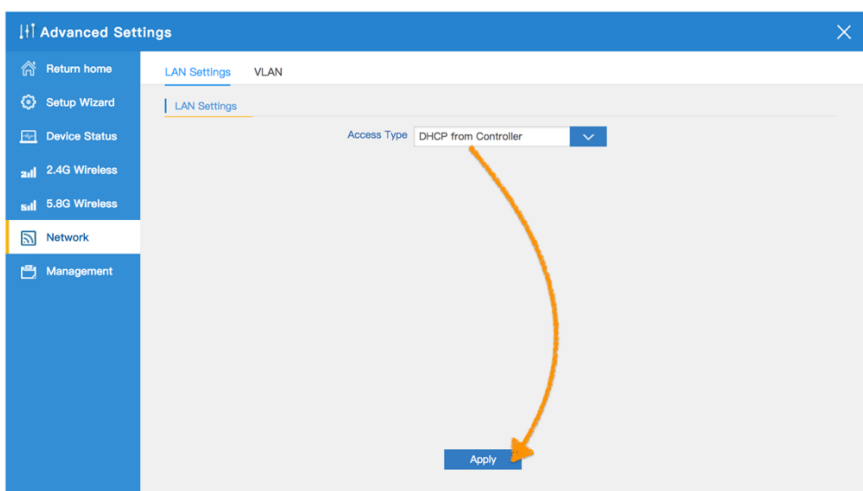
5.1 Network

5.1.1 LAN Settings:

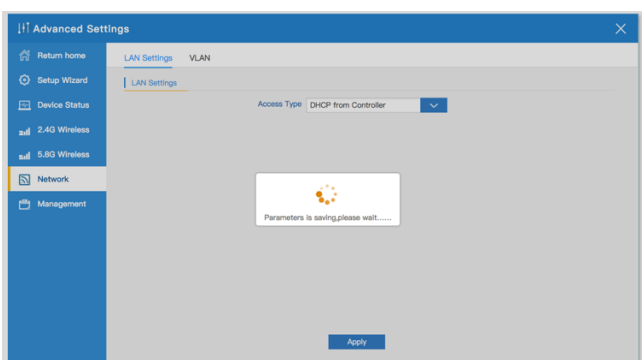
1. Can choose two kinds of usage modes (Static IP, DHCP for Controller) which can be selected according to the current network architecture environment.



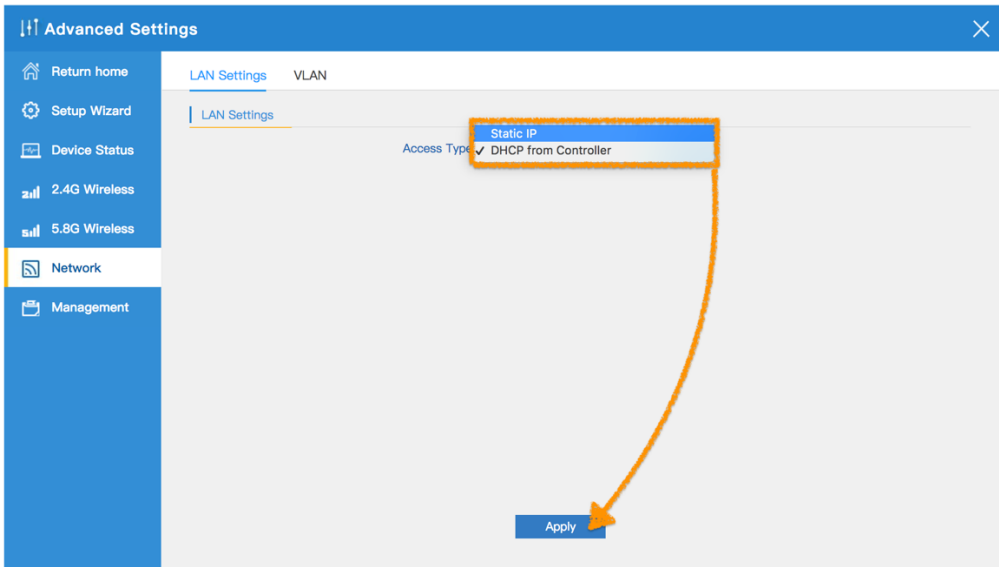
2. Use DHCP for Controller mode, please confirm that the current network architecture has IP address allocation.



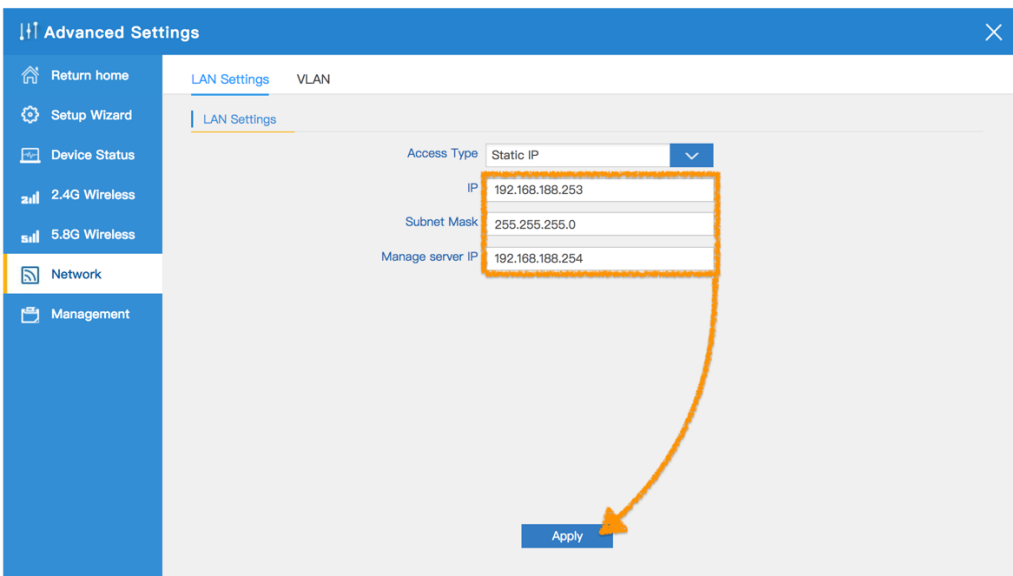
3. Click Apply, Wait for DHCP Controller Mode is Enable, please wait about 20~30 seconds.



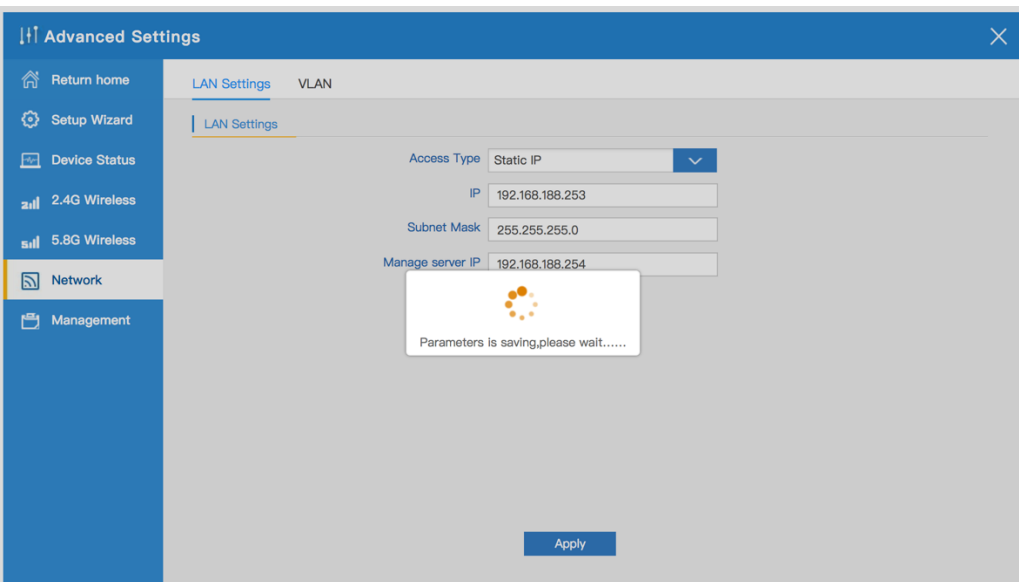
4. The following example for Static IP Mode



5. Sample Static IP mode setting method, then click Apply to continue.
(Please contact with ISP for correct IP address, Subnet MasDNS address)



6. Click Apply, Wait for Static IP Mode is Enable, please wait about 40~50 seconds.



5.1.2 VLAN :

- Please confirm before you can use ,Need support IEEE 802.1Q and VLAN Tagging Managed Switch, Specify WiFi SSID for WAP-8221 , corresponding to the VLAN-ID (3-4094).

Advanced Settings

LAN Settings VLAN

VLAN

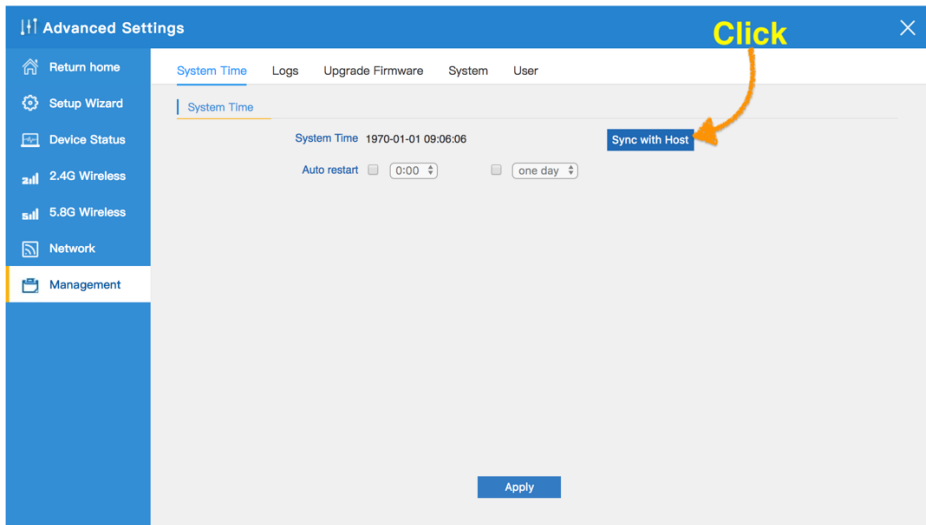
VLAN-ID(3-4094)	AP	2.4G			5.8G			
	AP	VAP1	VAP2	VAP3	AP	VAP1	VAP2	VAP3
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Apply

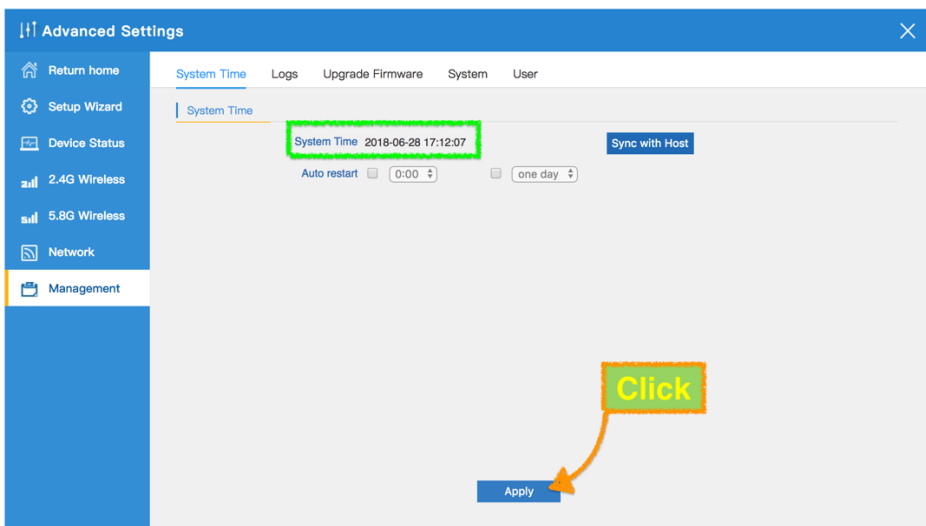
5.2 Management

5.2.1 System Time :

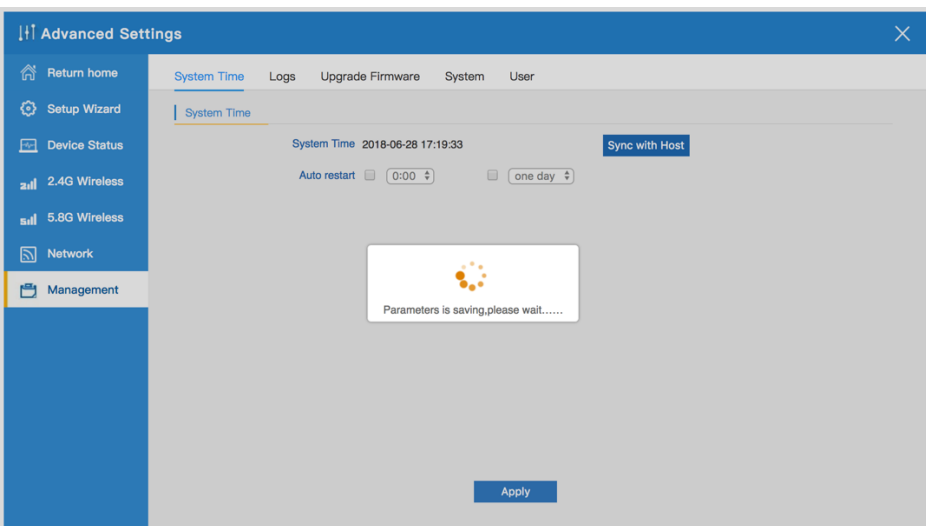
1. Click on Sync with Host to automatically update to the current Time.



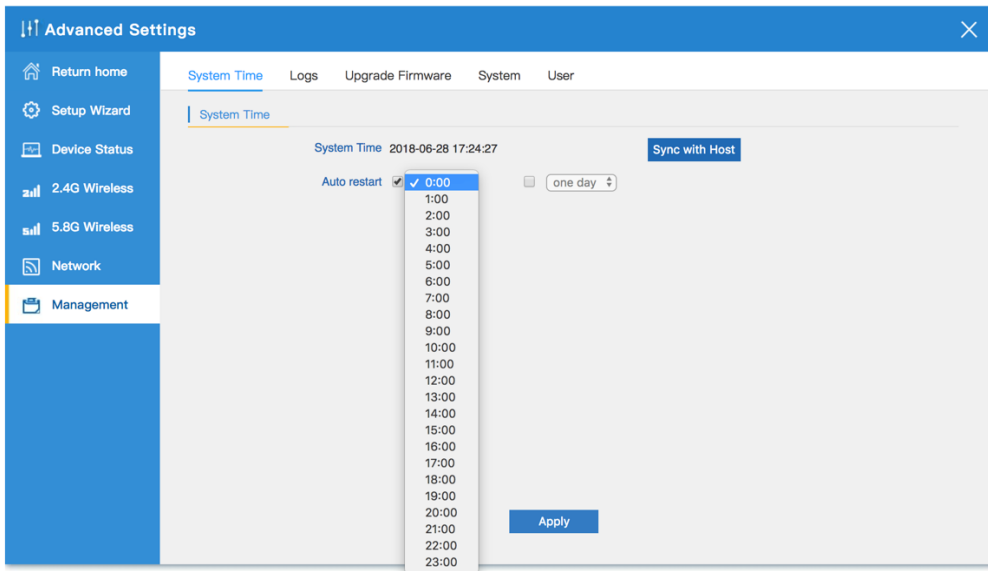
2. Confirm that System Time is correctly refreshed to the current time, Click Apply



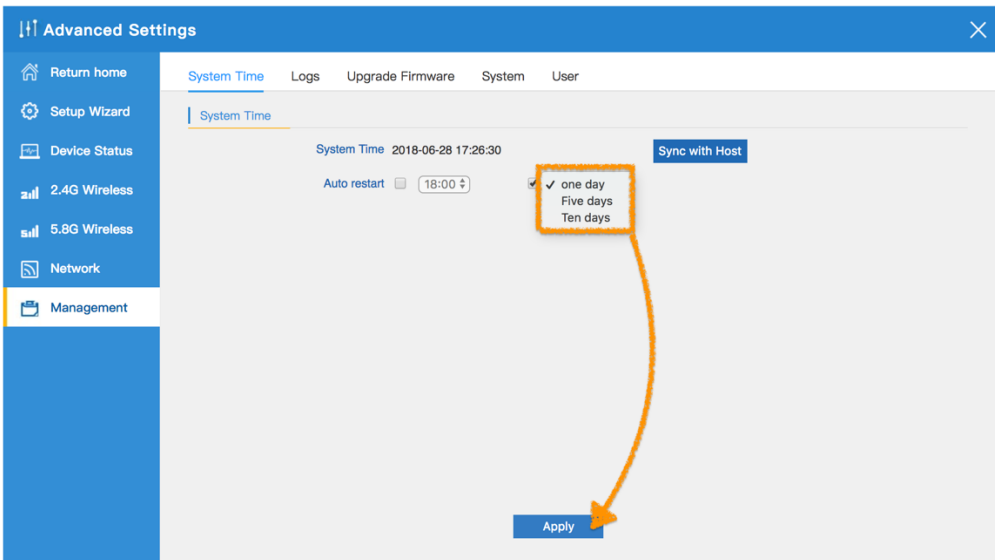
3. Enable System for update to the current Time, please wait about 20~30 seconds.



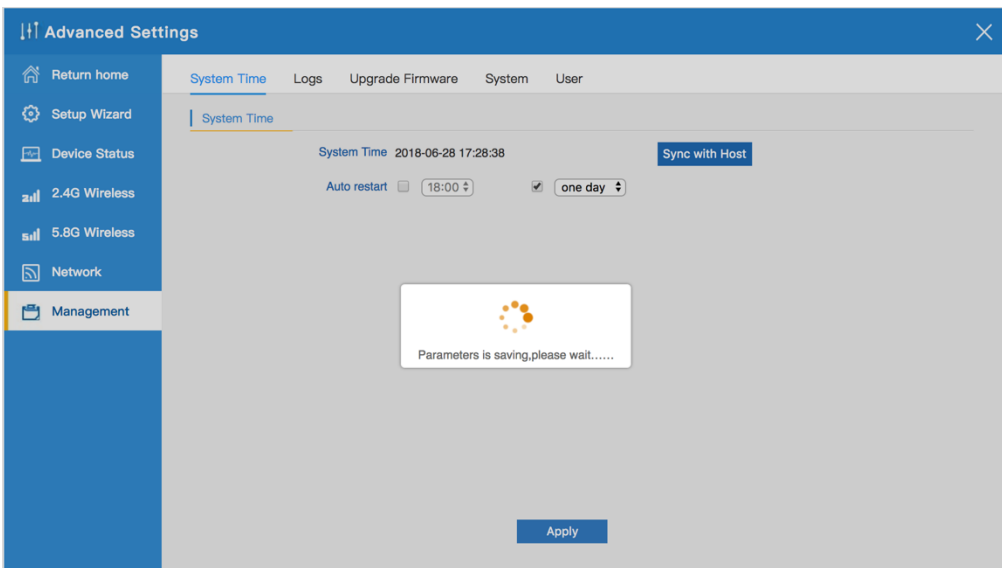
4. Define the system reboot time(0:00~23:00)



5. Can choose every day or every five days or every 10 days , System Reboot Automatically.

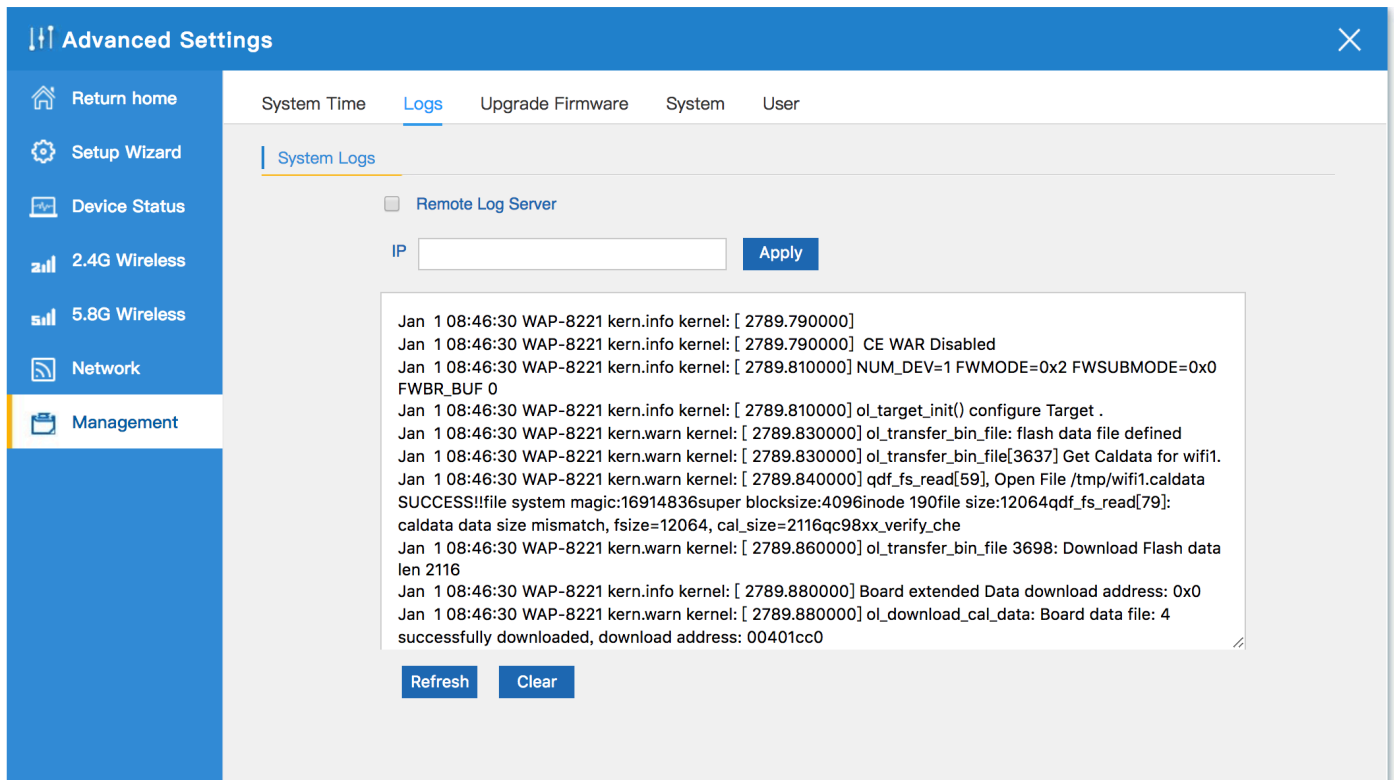


6. Enable Define the system reboot time, please wait about 20~30 seconds.



5.2.2 Logs :

- In Logs part, you can copy the running history of the device to consult the engineers when you have any trouble



Advanced Settings

System Time **Logs** Upgrade Firmware System User

System Logs

Remote Log Server

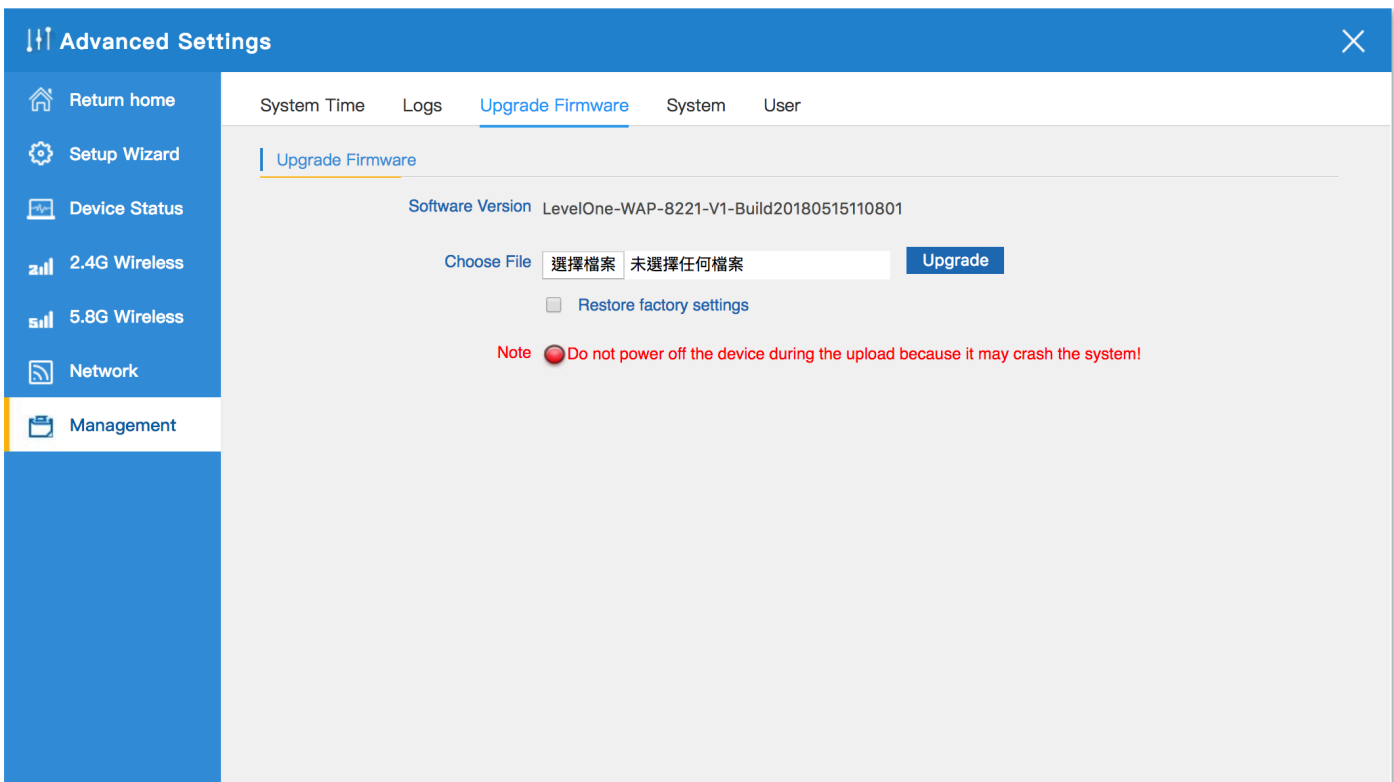
IP **Apply**

```
Jan 1 08:46:30 WAP-8221 kern.info kernel: [ 2789.790000]
Jan 1 08:46:30 WAP-8221 kern.info kernel: [ 2789.790000] CE WAR Disabled
Jan 1 08:46:30 WAP-8221 kern.info kernel: [ 2789.810000] NUM_DEV=1 FWMODE=0x2 FWSUBMODE=0x0 FWBR_BUF 0
Jan 1 08:46:30 WAP-8221 kern.info kernel: [ 2789.810000] ol_target_init() configure Target .
Jan 1 08:46:30 WAP-8221 kern.warn kernel: [ 2789.830000] ol_transfer_bin_file: flash data file defined
Jan 1 08:46:30 WAP-8221 kern.warn kernel: [ 2789.830000] ol_transfer_bin_file[3637] Get Caldata for wifi1.
Jan 1 08:46:30 WAP-8221 kern.warn kernel: [ 2789.840000] qdf_fs_read[59], Open File /tmp/wifi1.caldata
SUCCESS!!file system magic:16914836super blocksize:4096inode 190file size:12064qdf_fs_read[79]:
caldata data size mismatch, fsize=12064, cal_size=2116qc98xx_verify_che
Jan 1 08:46:30 WAP-8221 kern.warn kernel: [ 2789.860000] ol_transfer_bin_file 3698: Download Flash data
len 2116
Jan 1 08:46:30 WAP-8221 kern.info kernel: [ 2789.880000] Board extended Data download address: 0x0
Jan 1 08:46:30 WAP-8221 kern.warn kernel: [ 2789.880000] ol_download_cal_data: Board data file: 4
successfully downloaded, download address: 00401cc0
```

Refresh **Clear**

5.2.3 Upgrade Firmware :

- Allows you to browse the new firmware in your computer and upgrade. Please do not power off the device during upgrade. (**Note** : The update firmware is recommended to use the connection RJ45 Network Cable update . Not recommended to use the wireless connection method to update the firmware.)



Advanced Settings


System Time Logs **Upgrade Firmware** System User

Upgrade Firmware

Software Version LevelOne-WAP-8221-V1-Build20180515110801

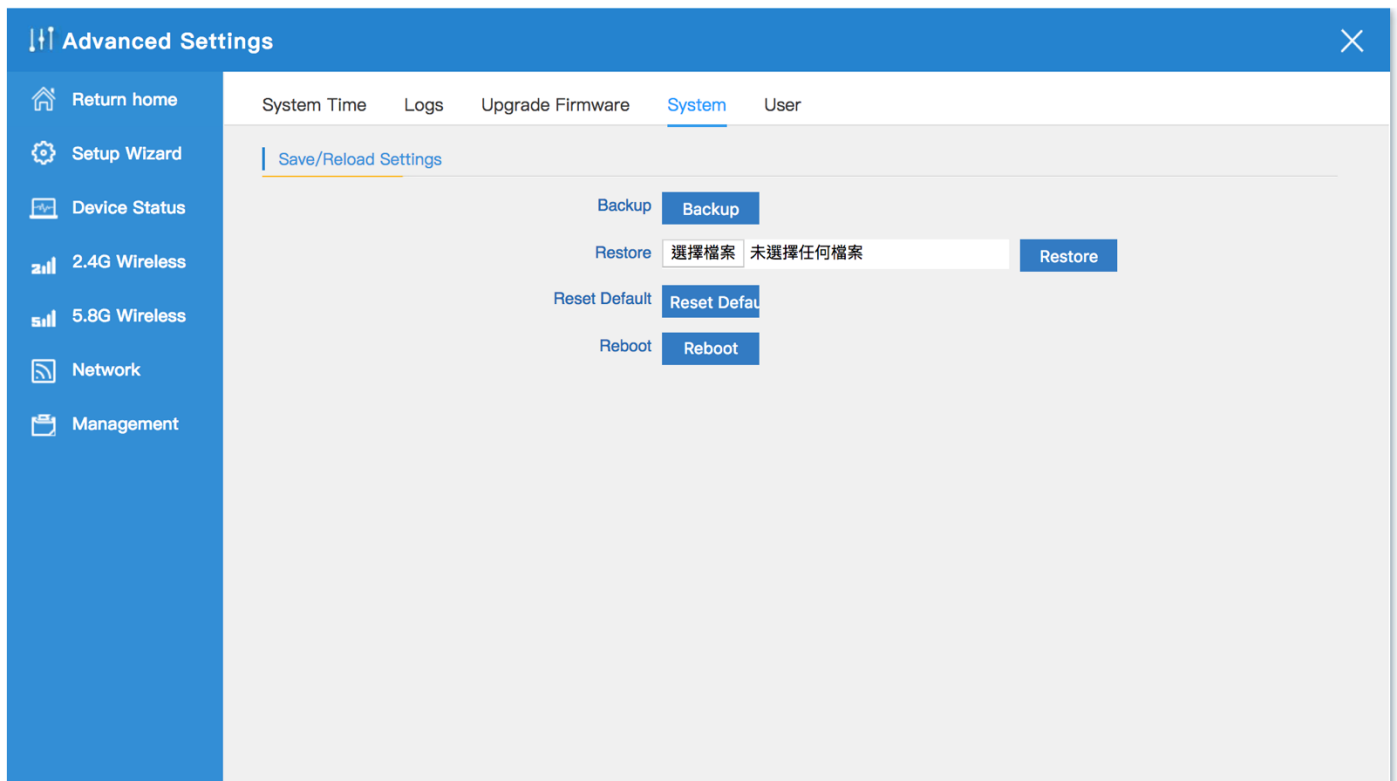
Choose File **Upgrade**

Restore factory settings

Note  Do not power off the device during the upload because it may crash the system!

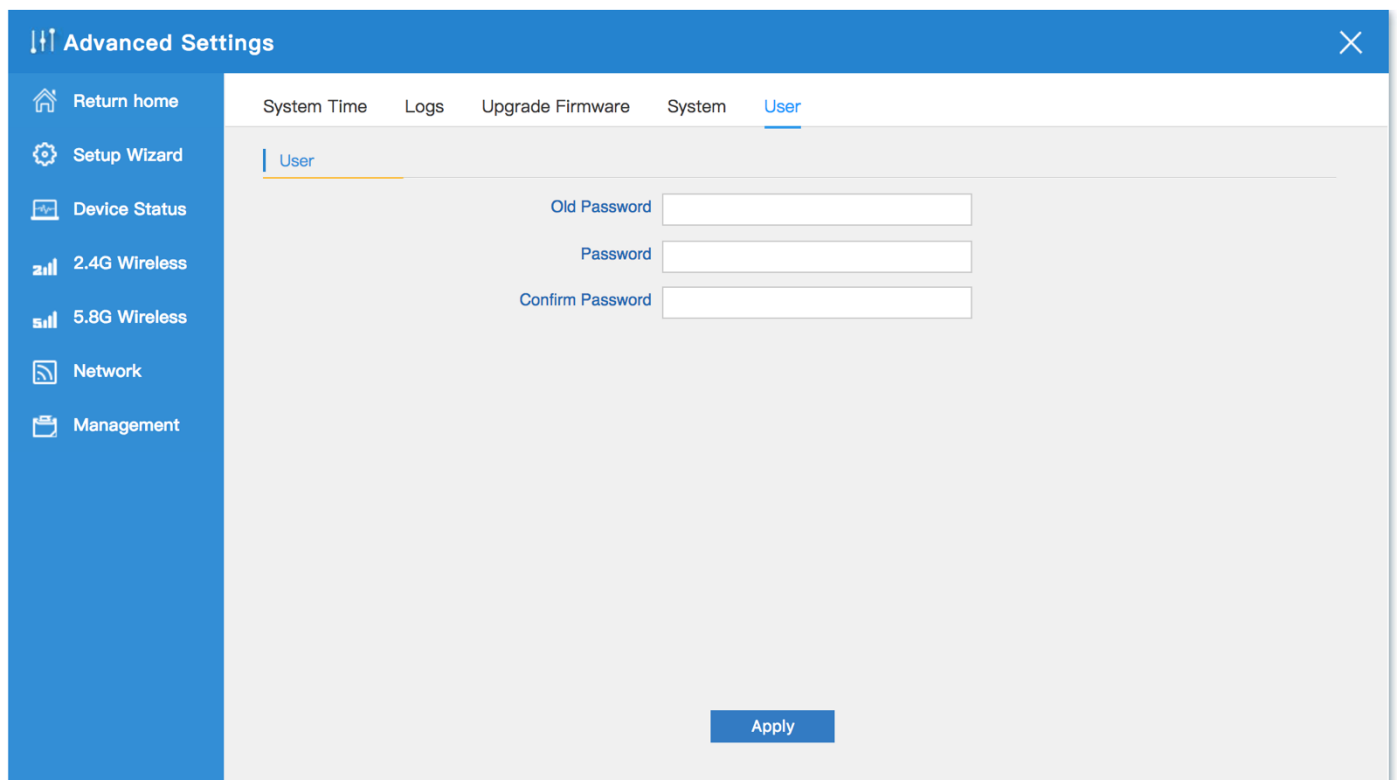
5.2.4 System :

- You are able to backup the current configuration to your PC and restore by applying the configuration file from your PC. And you can Reset and Reboot the device with just one click



5.2.5 User :

- Management and change the password for Log in



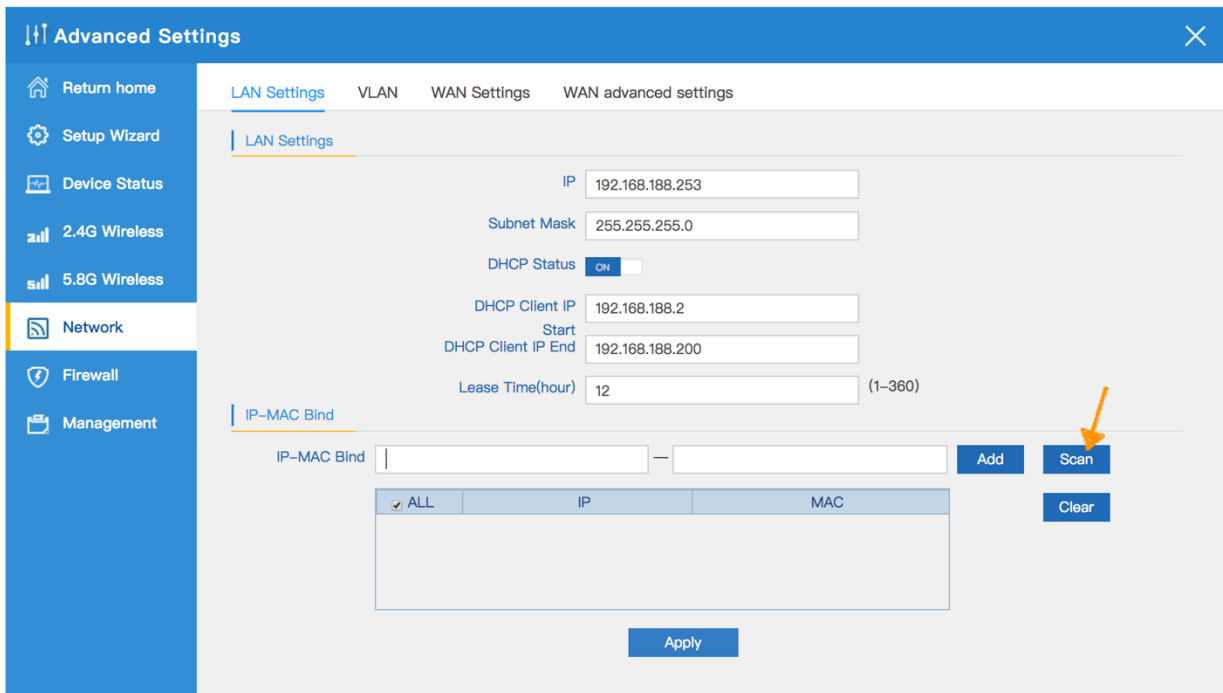
CHAPTER 6 Enable the status of Gateway Mode or WISP Mode



6.1 Network

6.1.1 LAN Settings :

1. Set the specified device retention IP for easy management. The following is a demonstration of teaching .



Advanced Settings

LAN Settings | VLAN | WAN Settings | WAN advanced settings

IP: 192.168.188.253
Subnet Mask: 255.255.255.0
DHCP Status: ON
DHCP Client IP: 192.168.188.2
DHCP Client IP Start: 192.168.188.200
DHCP Client IP End: 192.168.188.200
Lease Time(hour): 12 (1-360)

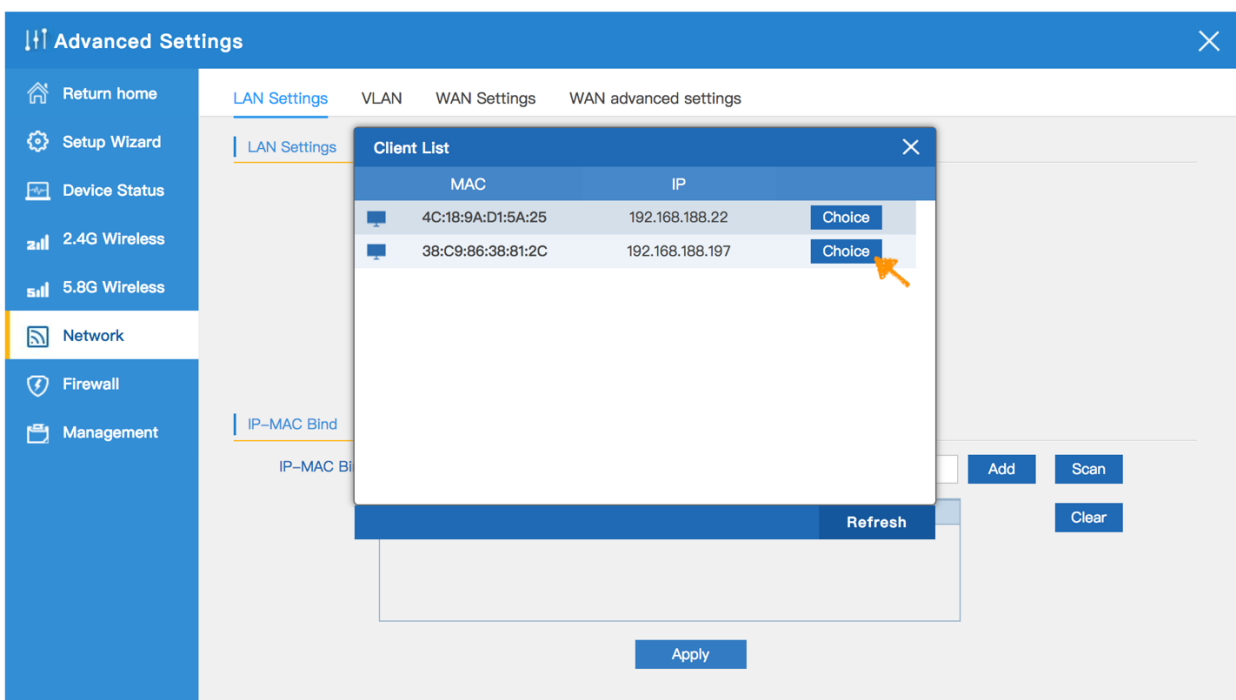
IP-MAC Bind

IP-MAC Bind: [] - [] [Add] [Scan] [Clear]

ALL	IP	MAC
-----	----	-----

[Apply]

2. Click Choice



Advanced Settings

LAN Settings | VLAN | WAN Settings | WAN advanced settings

Client List

MAC	IP	Choice
4C:18:9A:D1:5A:25	192.168.188.22	Choice
38:C9:86:38:81:2C	192.168.188.197	Choice

[Refresh]

[Add] [Scan] [Clear]

[Apply]

3. Add the user MAC address in the list to the access control list . Completed the reserved IP settings

The screenshot shows the 'Advanced Settings' page with the 'LAN Settings' tab selected. Under 'LAN Settings', the IP is set to 192.168.188.253, Subnet Mask to 255.255.255.0, and DHCP Status is ON. The DHCP Client IP is 192.168.188.2, starting at 192.168.188.200 and ending at 192.168.188.200, with a lease time of 12 hours. Below this, the 'IP-MAC Bind' section shows an IP of 192.168.188.197 and a MAC of 38:C9:86:38:81:2C. An 'Add' button is highlighted with an orange arrow pointing to the 'Apply' button at the bottom.

6.1.2 VLAN :

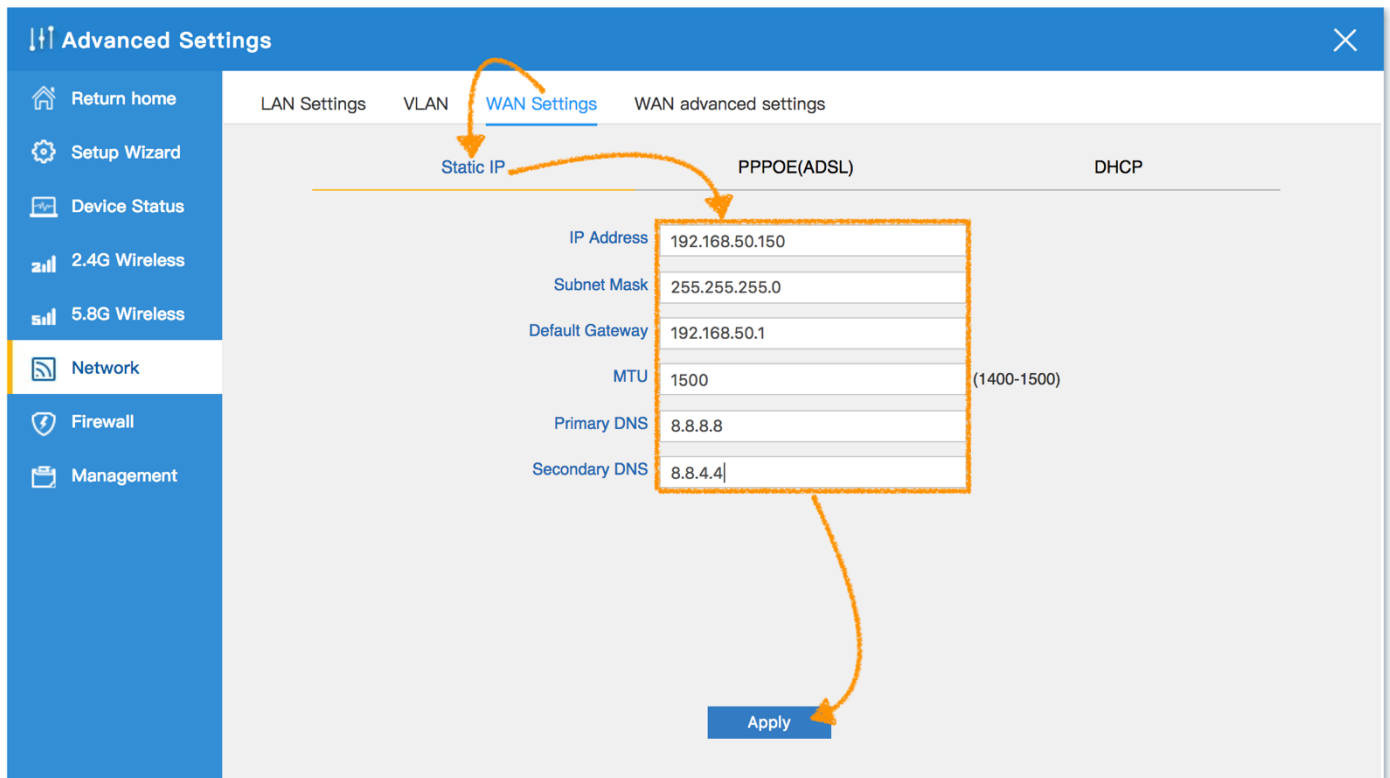
- Please confirm before you can use ,Need support IEEE 802.1Q and VLAN Tagging Managed Switch, Specify WiFi SSID or WAN/LAN Port for WAP-8123 , corresponding to the VLAN-ID (3-4094).

The screenshot shows the 'Advanced Settings' page with the 'VLAN' tab selected. It displays a table for configuring VLANs. The table has columns for 'VLAN-ID(3-4094)', 'AP', and two groups of wireless ports: '2.4G' (VAP1, VAP2, VAP3) and '5.8G' (VAP1, VAP2, VAP3). Each cell in the table contains a checkbox for enabling the VLAN on that specific port.

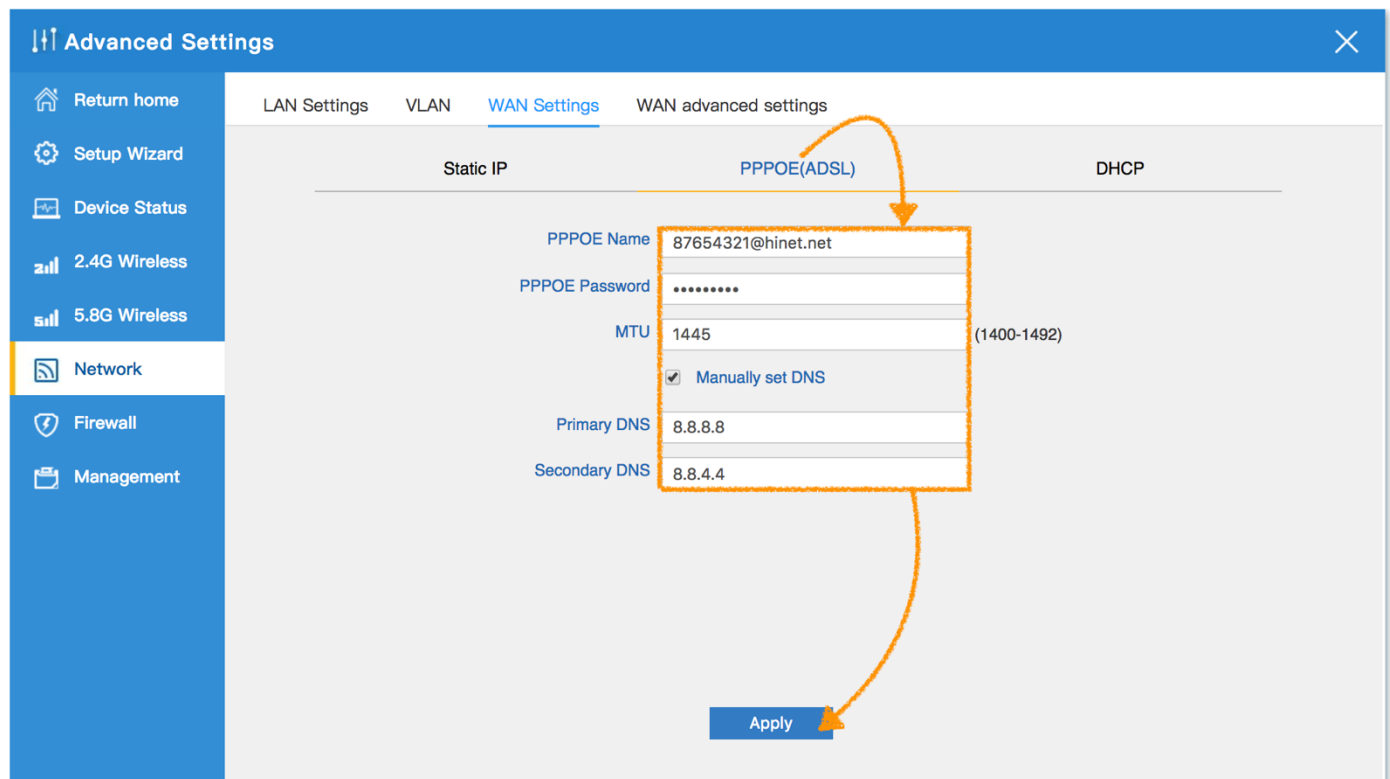
VLAN-ID(3-4094)	2.4G			5.8G				
	AP	VAP1	VAP2	VAP3	AP	VAP1	VAP2	VAP3
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.3 WAN Settings :

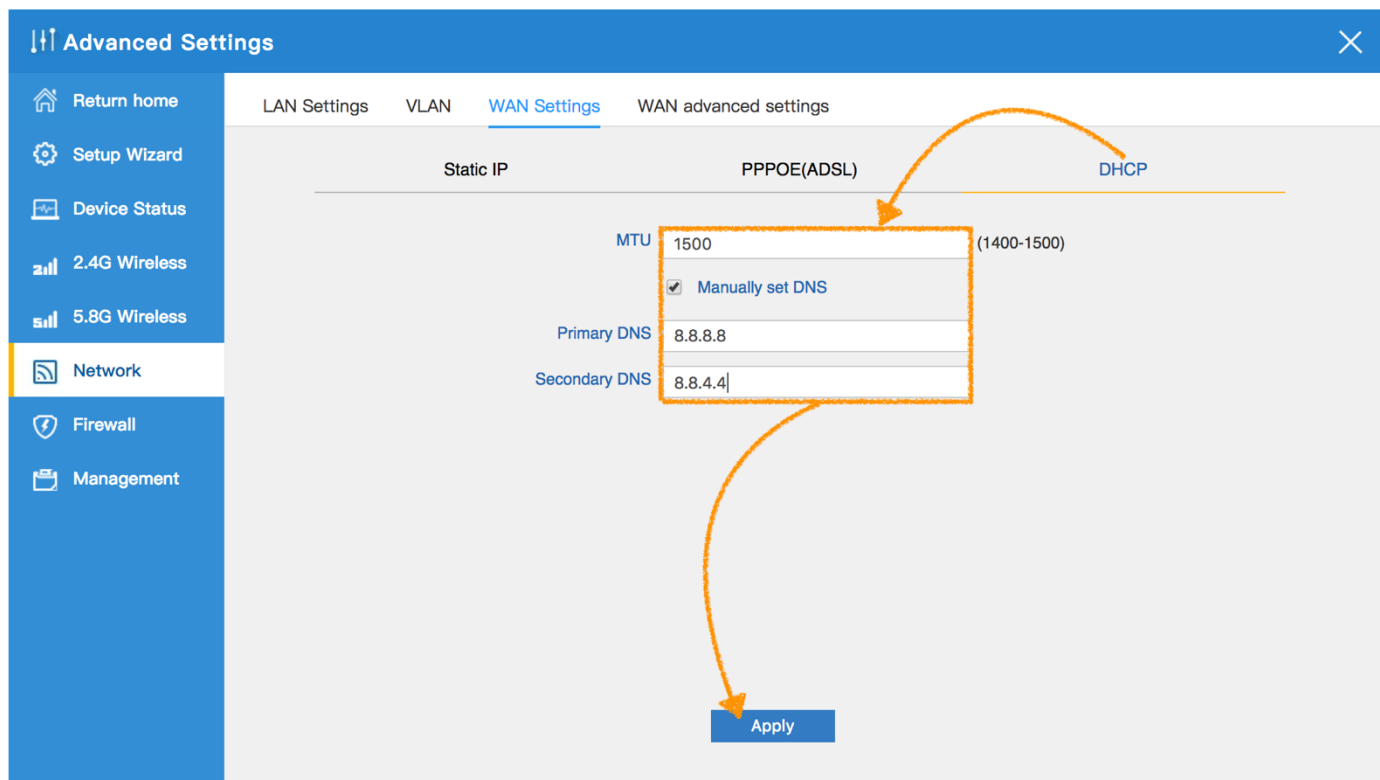
1. Please check with the ISP first how to access the Internet , The following is a demonstration of Static IP teaching .



2. The following is a demonstration of PPPoE teaching .

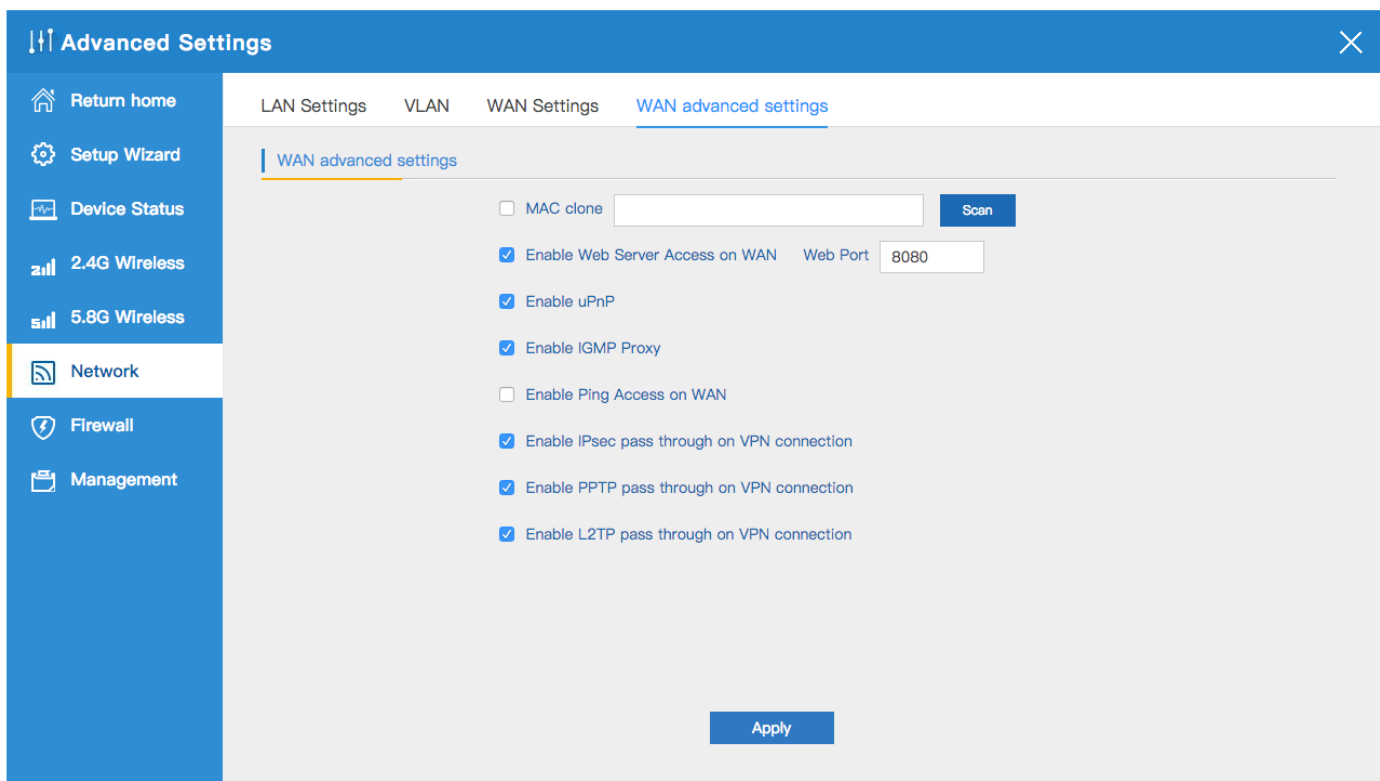


3.The following is a demonstration of DHCP teaching .



6.1.4 WAN advanced settings:

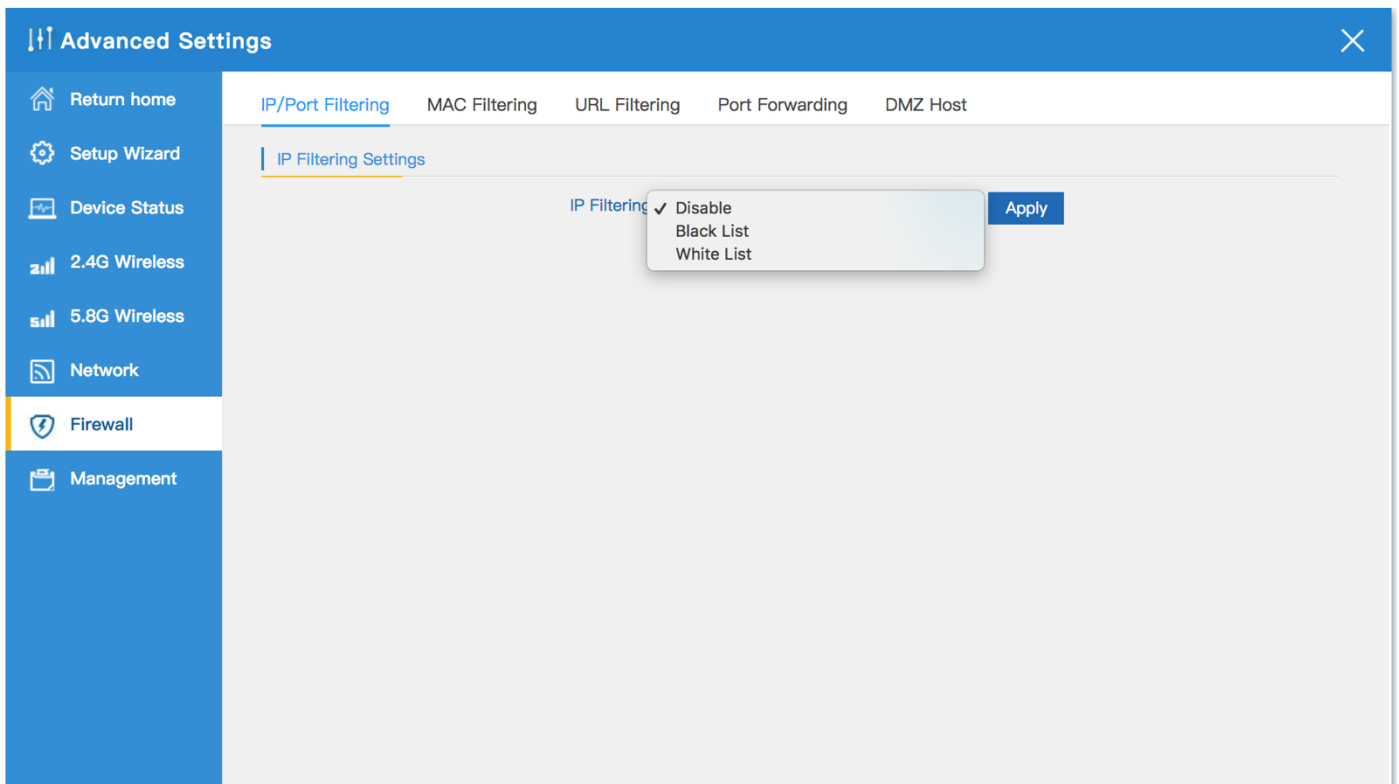
- Internet security does not recommend enable Ping Access on WAN to prevent interested people from knowing the real IP address



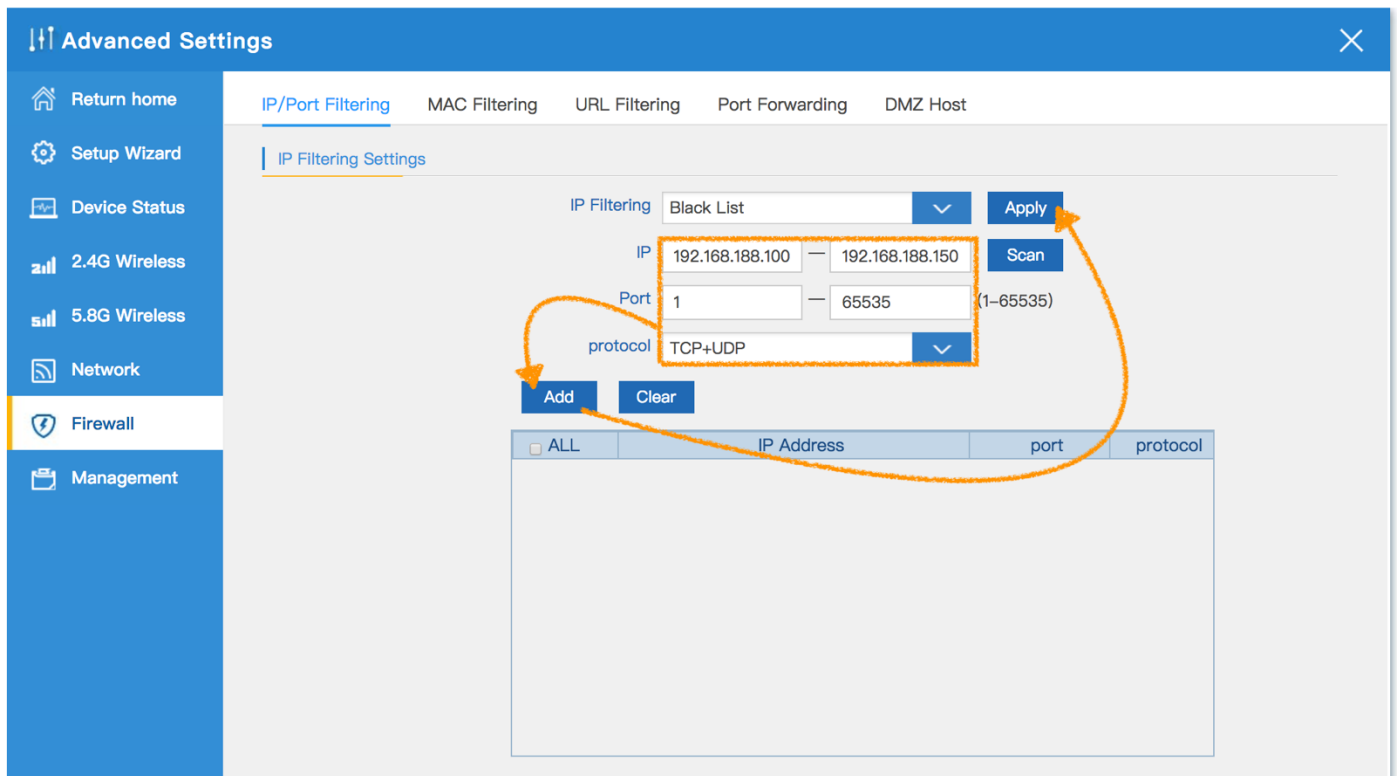
6.2 Firewall

6.2.1 IP/Port Filtering :

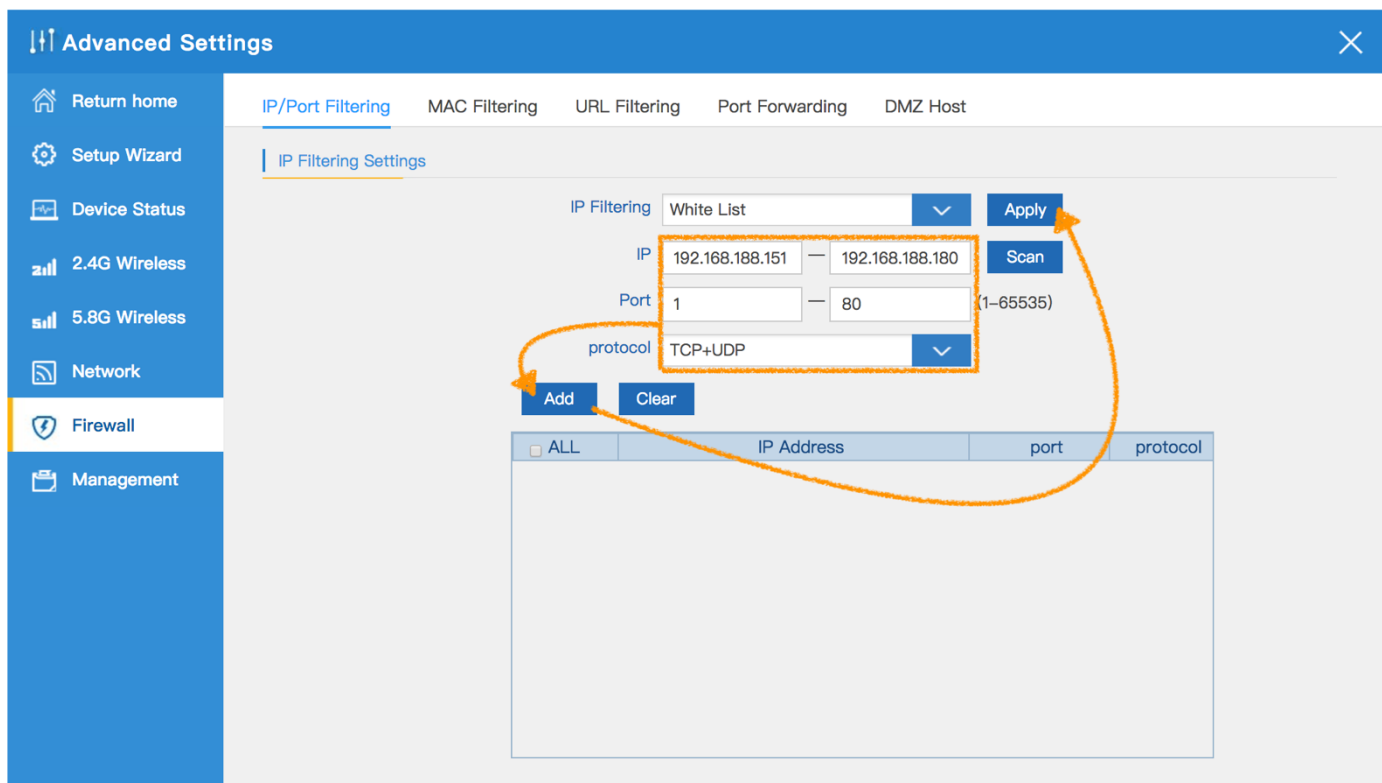
1.Factory default value is Disable, Can be set to whitelist or blacklist. The following will begin to introduce how to set the enable function



2.Black List : IP Address that can be specified as a separate or range , and then specifies the port range (1~65535) and protocol(TCP/UDP) .

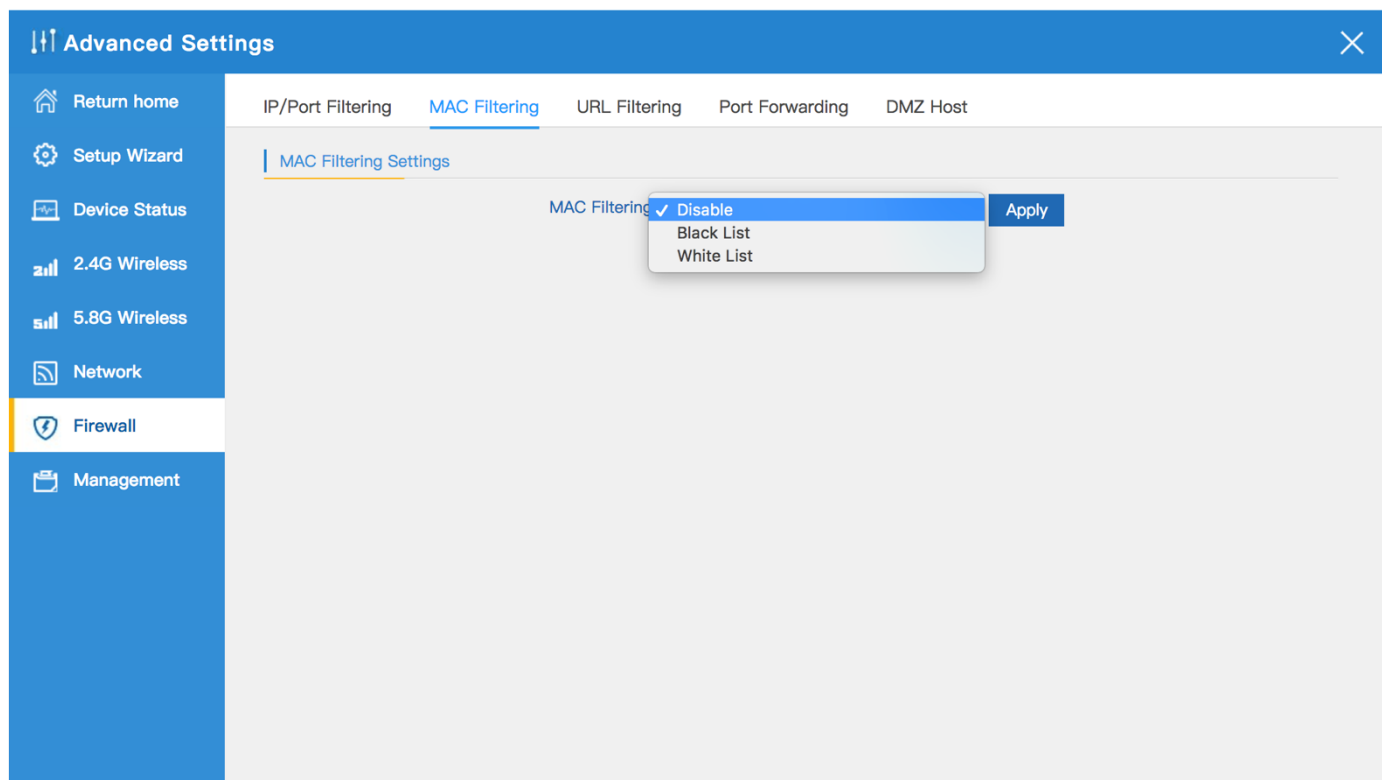


3.White List : IP Address that can be specified as a separate or range , and then specifies the port range (1~65535) and protocol(TCP/UDP) , which is set as the status of the allow.

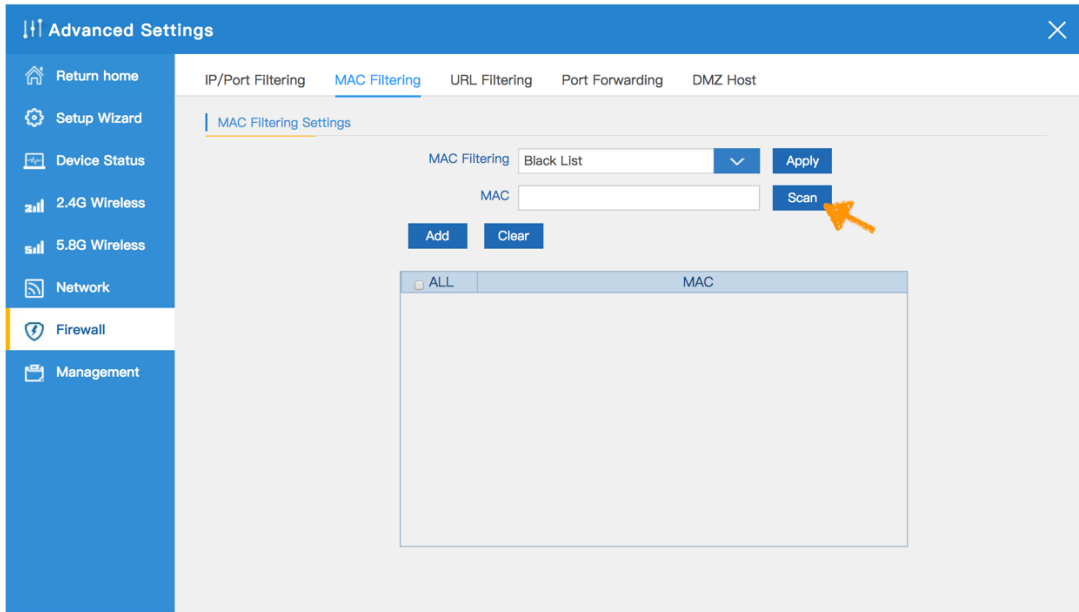


6.2.2 MAC Filtering :

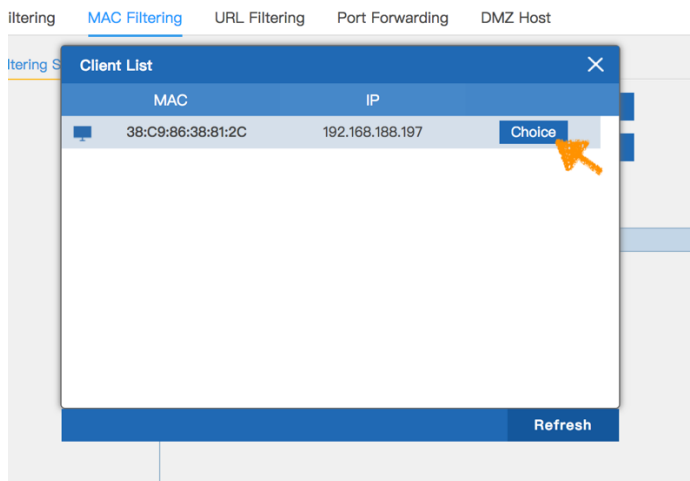
1.Factory default value is disable, Can be set to whitelist or blacklist. The following will begin to introduce how to set the enable function



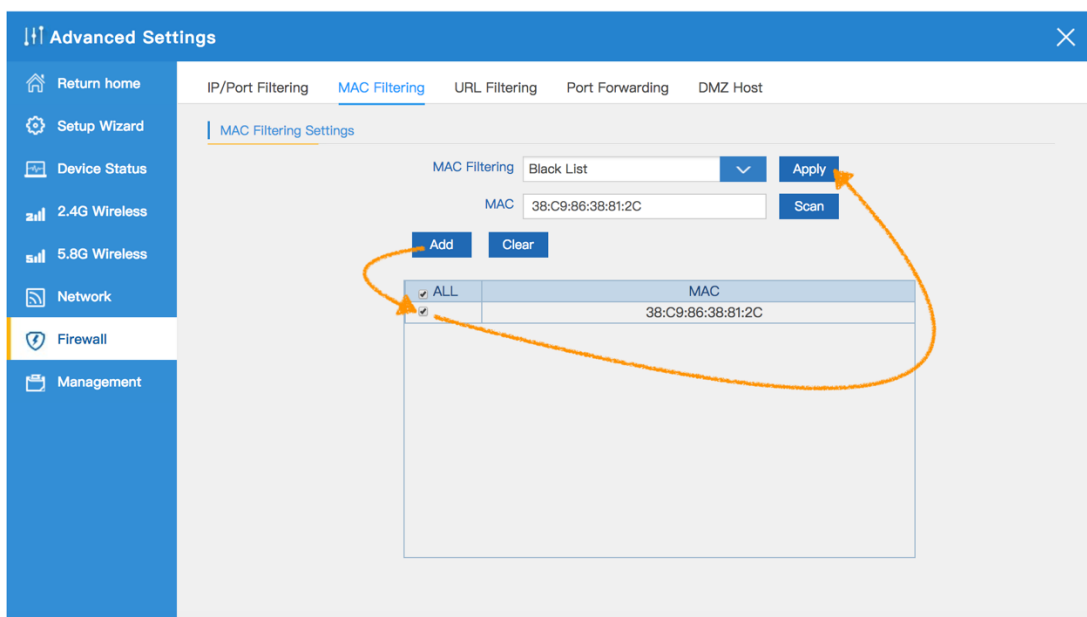
2.Black List : Scan specified mode or manual input mode to set, you can block the specified MAC address to connect to the Internet, leaving only link Regional network function.



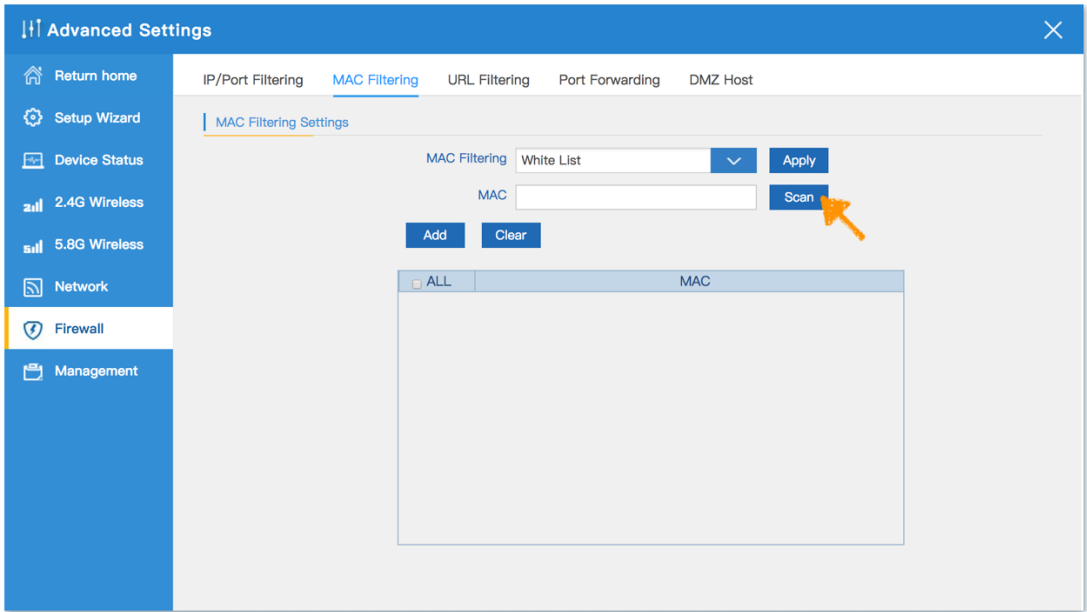
3. Click Choice



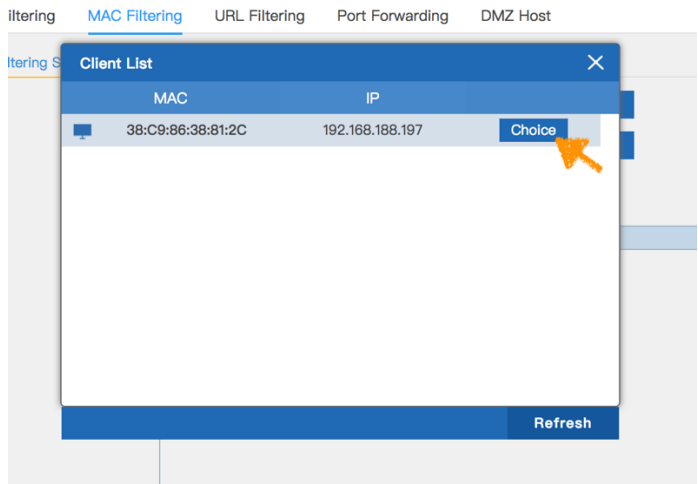
4. Added specified MAC address , Click Apply



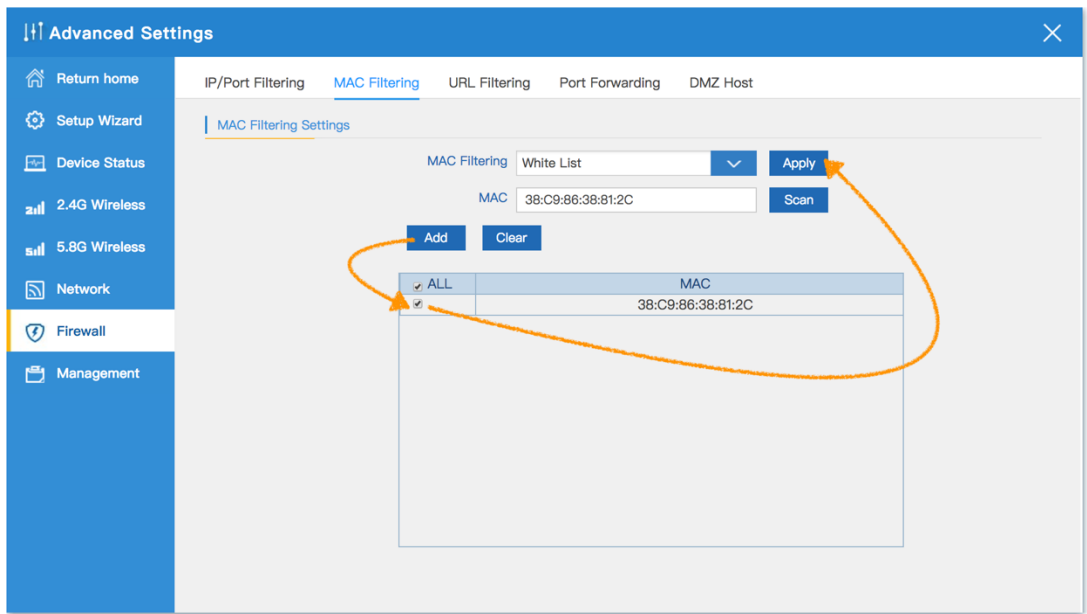
5.White List : Scan specified mode or manual input mode is set to allow the specified MAC address to connect to the Internet



6.Click Choice

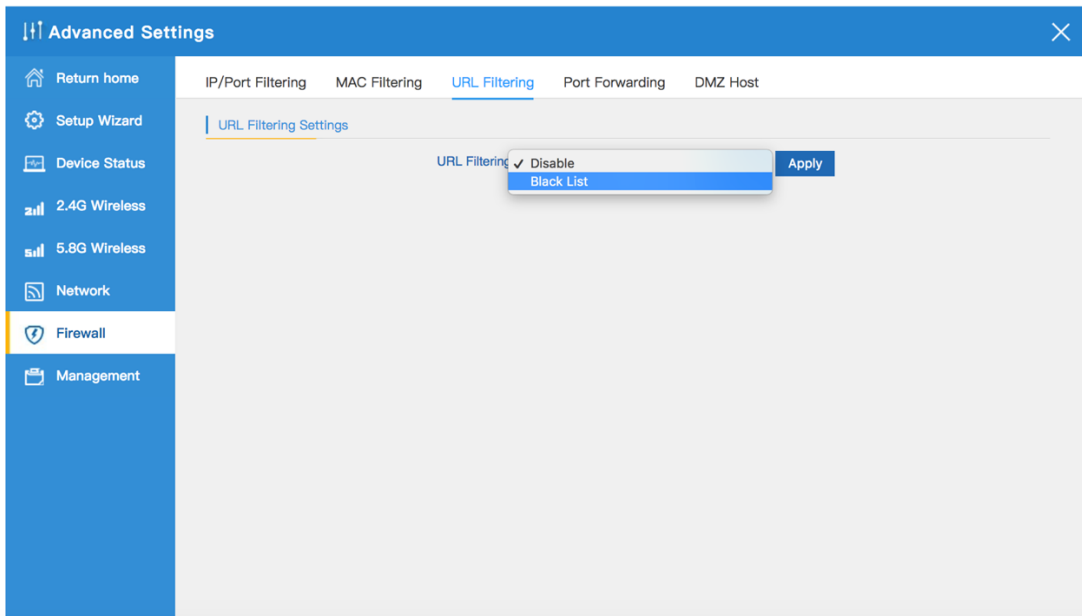


7.Added specified MAC address , Click Apply

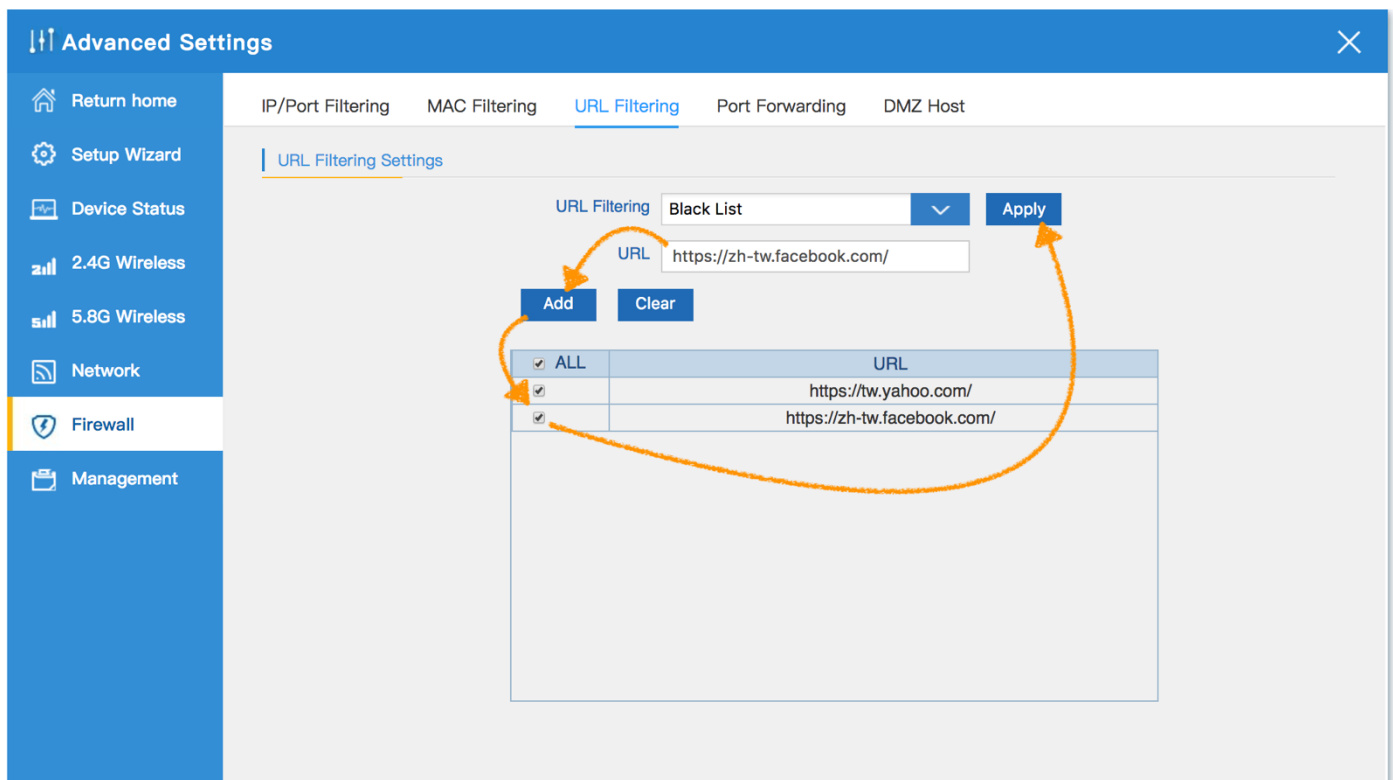


6.2.3 URL Filtering :

1.Factory default value is disable, Can be set to Black List. The following will begin to introduce how to set the enable Black List function



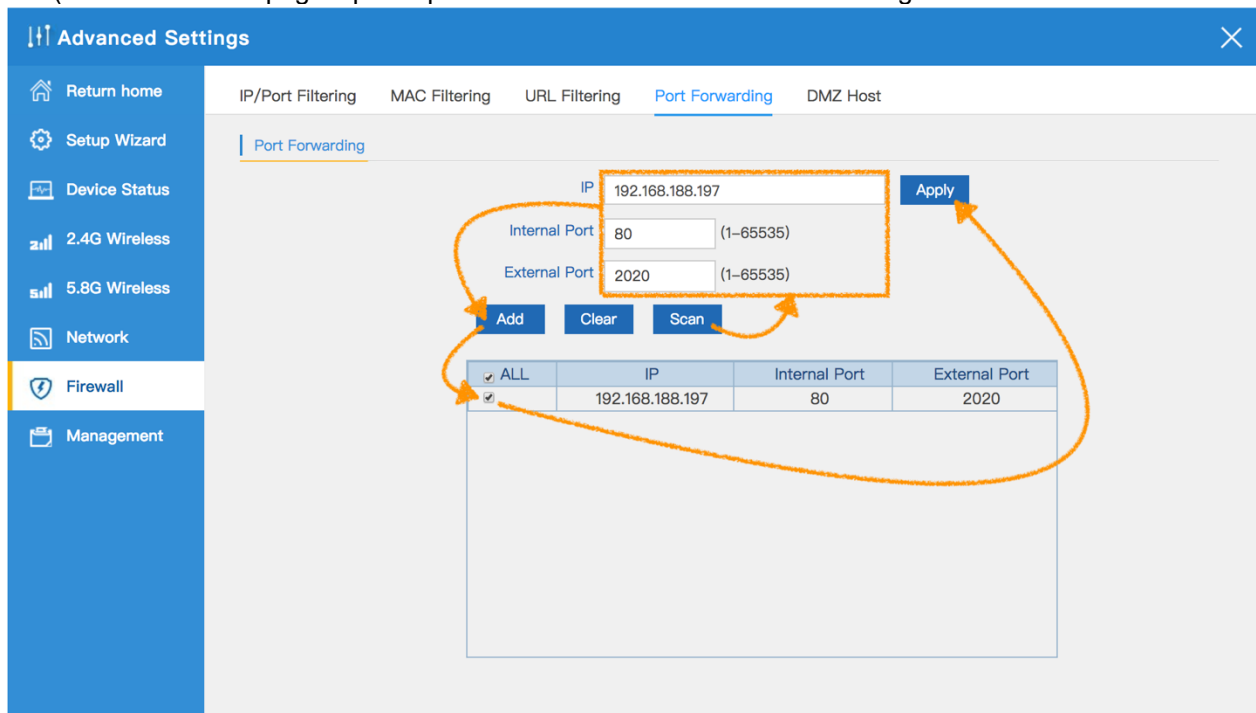
2.**Black List** : Can set the URL refuse to access the list , making all devices unable to connect to the list of websites



6.2.4 Port Forwarding

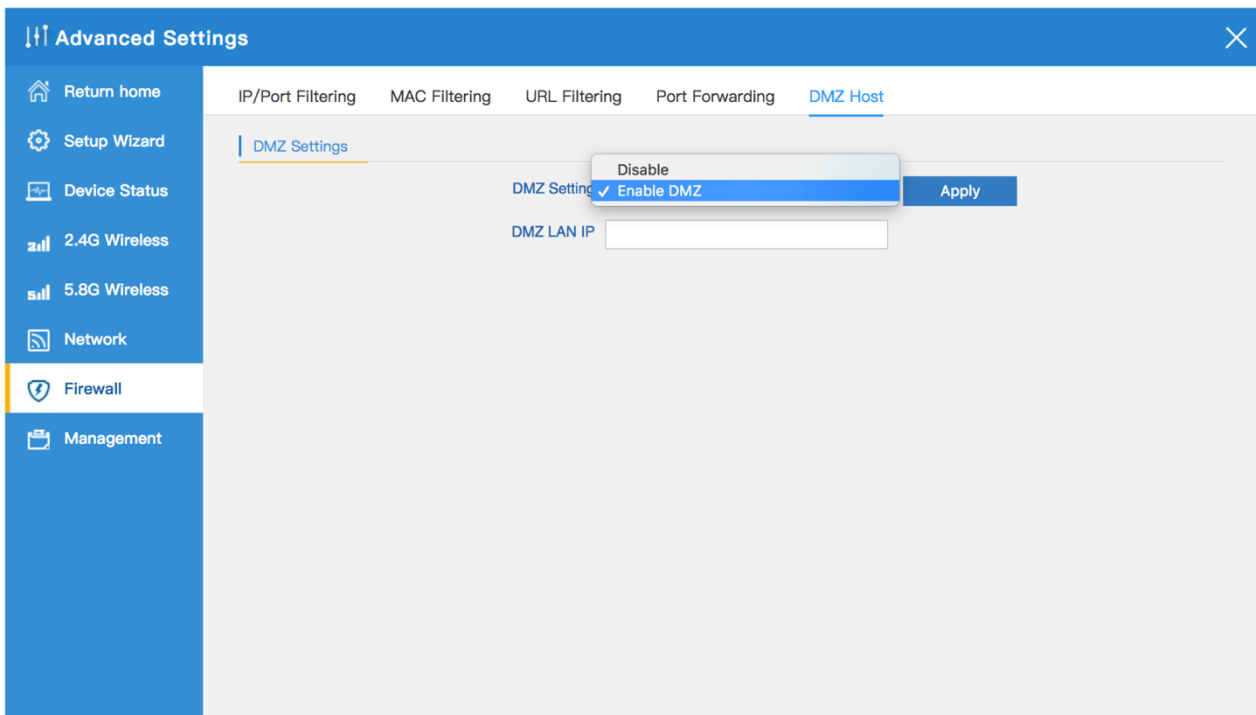
- The scan specified mode or manual input mode is set to allow the specified internal IP address of the External / External port so that other users can connect from the remote network to the WAP-8123 internal network equipment (ex: NAS , IP camera)
- After the setting is completed, the real fixed IP address or DDNS mode can be used to remotely connect to the NAS inside the WAP-8123

(ex: Remote user page input http://111.250.96.135:2020 Port Forwarding to NAS IP address:192.168.188.197:80)



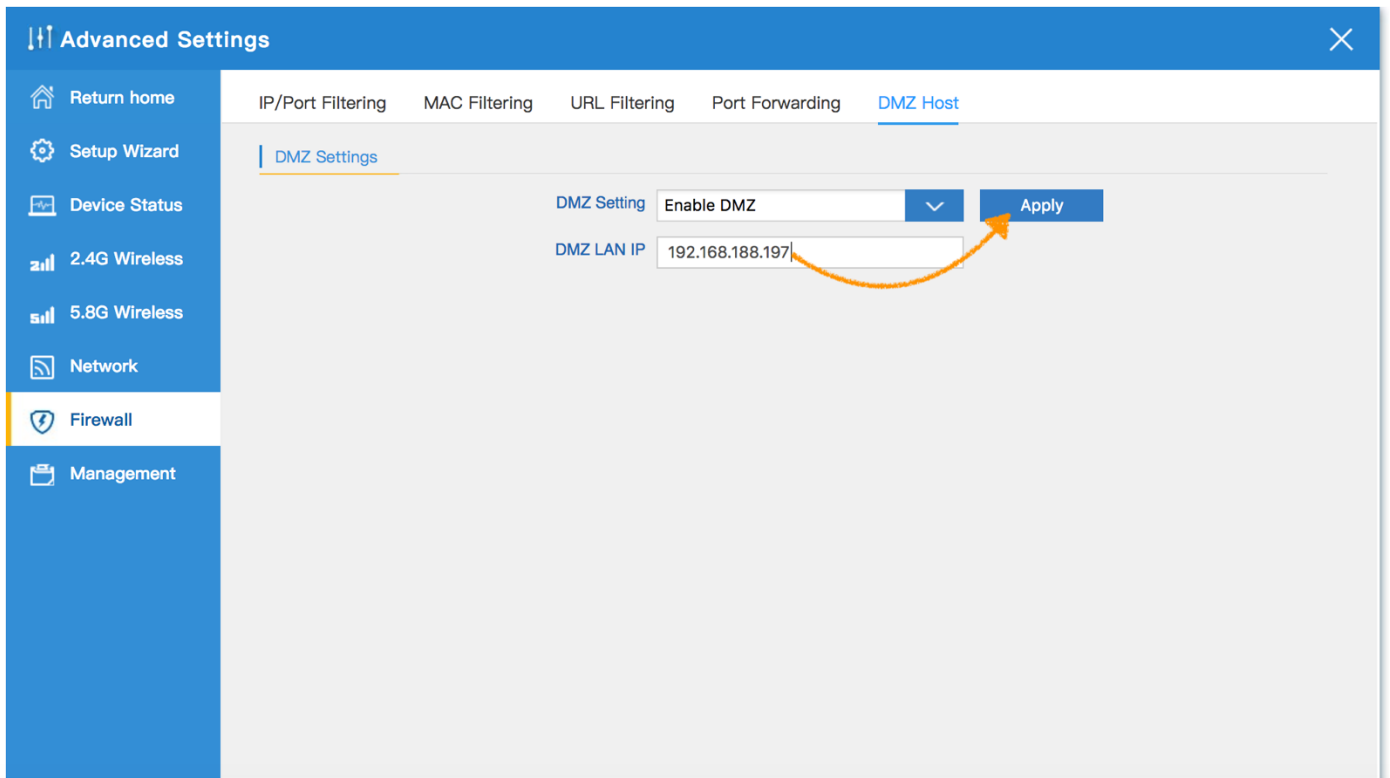
6.2.5 DMZ Host

1.Factory default value is disable . The following will begin to introduce how to set the enable DMZ Host function



2. When enabled, will independent a non-military block for this ip address device.

Note : This device will be directly exposed on the Internet, there will be some risk



6.3 Management

6.3.1 System Time :

1. Get time from NTP server can only be available under Gateway and WISP Mode. Before sync with host, please select your Time zone. **Auto restart** : Define the system reboot time(0:00~23:00) , Can choose every day or every five days or every 10 days , System Reboot Automatically.

The screenshot shows the 'System Time' configuration page. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless, 5.8G Wireless, Network, Firewall, and Management. The main content area has tabs for System Time, DDNS settings, QoS, Logs, Upgrade Firmware, System, and User. Under 'System Time', there are two radio buttons for 'Synchronous mode': 'Sync with Host' (unselected) and 'Sync with Server' (selected). Below this, the 'System Time' is displayed as '1970-01-01 08:03:50' with a 'Sync with Server' button. The 'Choose Time Zone' dropdown is set to 'Beijing,Chongqing,Urumqi,Re-Hong Kong,Taiwan;'. The 'NTP Server' dropdown is set to 'time.windows.com'. The 'Auto restart' section has a checkbox (unchecked), a time selector set to '0:00', and a frequency dropdown set to 'one day'. An 'Apply' button is at the bottom.

2.Can set up the required NAT Server

This screenshot is similar to the previous one, but the 'NTP Server' dropdown menu is open, showing a list of options. An orange arrow points to the '---CUSTOM---' option with the word 'Click' written next to it. The list of NTP servers includes: time.windows.com (checked), 210.98.16.100-Time.Kriss.re.kr, 211.115.194.21-Ntp1.epidc.co.kr, 64.250.177.145-Time.nist.gov, 192.5.41.41-North America, 192.5.41.209-North America, 208.184.49.9-North America, 131.188.3.220-Europe, 130.149.17.8-Europ, 203.60.1.2-Australia, 203.117.180.36-Asia Pacific, and ---CUSTOM---. The 'Apply' button is visible at the bottom.

3. Can add NTP Server yourself (ex: Hinet NTP Server)

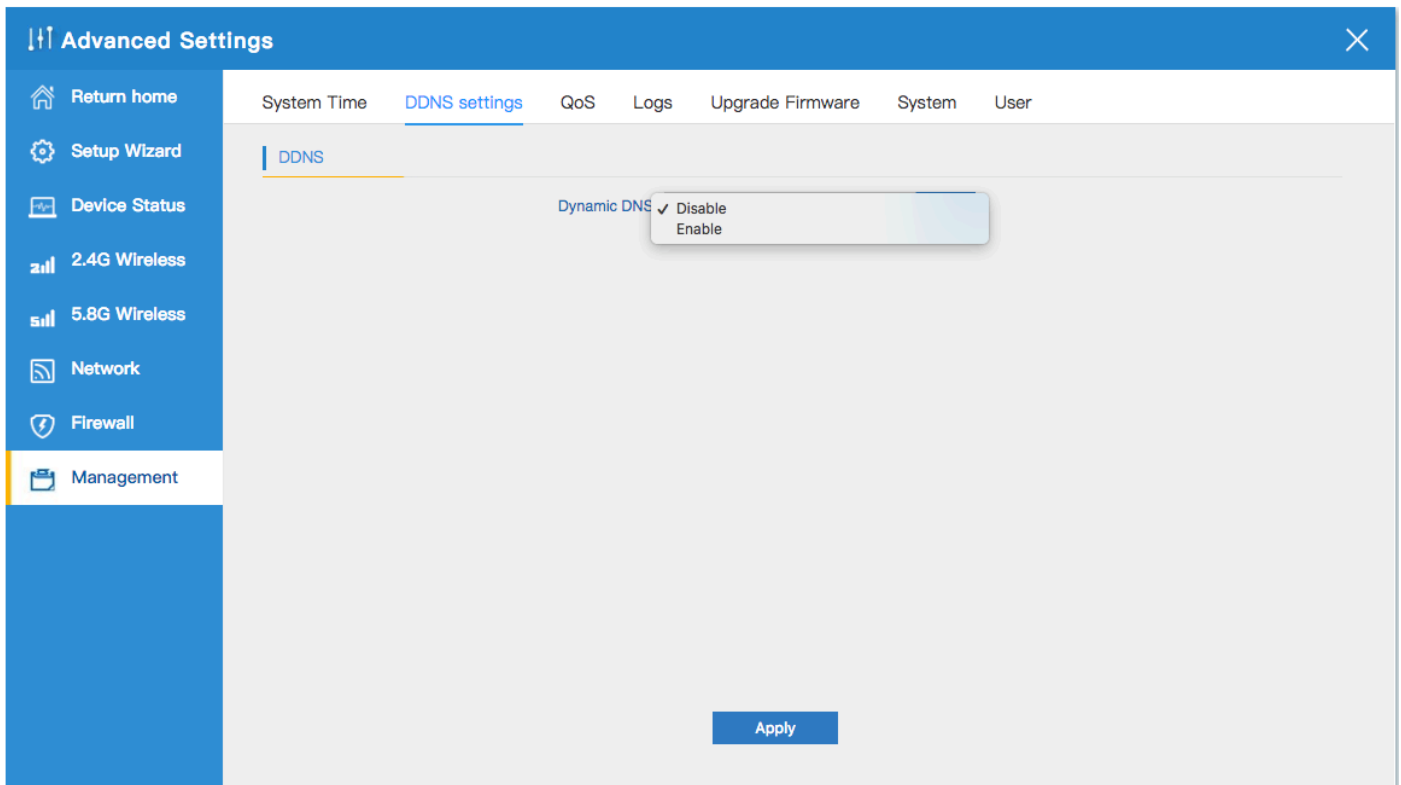
The screenshot displays the 'Advanced Settings' interface, specifically the 'System Time' configuration page. The left sidebar contains navigation options: Return home, Setup Wizard, Device Status, 2.4G Wireless, 5.8G Wireless, Network, Firewall, and Management. The main content area shows the following settings:

- Synchronous mode:** Sync with Host, Sync with Server
- System Time:** 1970-01-01 08:06:44, with a **Sync with Server** button.
- Choose Time Zone:** Beijing,Chongqing,Urumqi,Re-Hong Kong,Taiwan;
- NTP Server:** ---CUSTOM---
- Manual Setup:** tock.stdtime.gov.tw (highlighted with a yellow box)
- Auto restart:** 0:00, one day

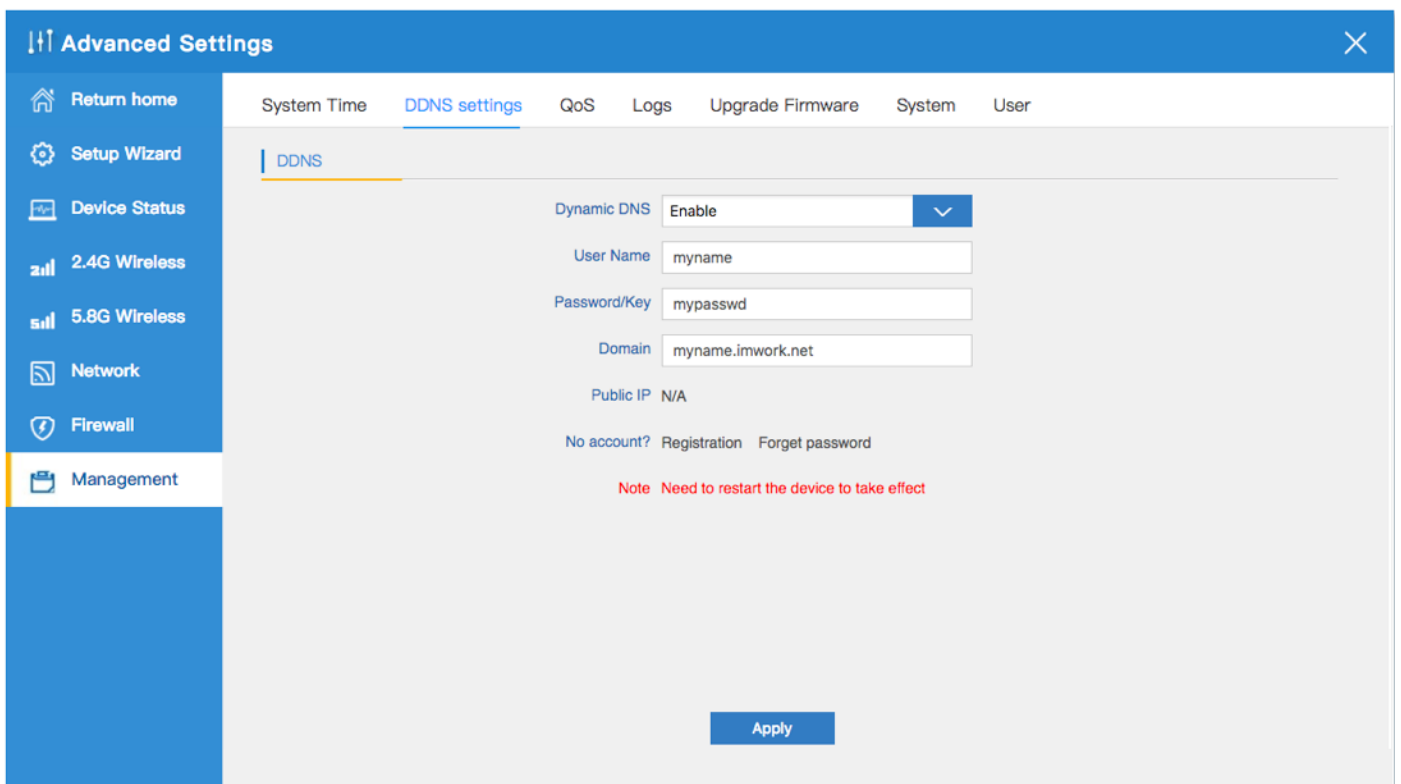
An orange arrow points from the 'Manual Setup' field to the **Apply** button at the bottom of the page.

6.3.2 DDNS settings :

1.Factory default value is disable



2. For users no apply for an ISP fixed IP address, only Floating real IP address , you can also connect to the network device in WAP-8123 through the DDNS service.



6.3.3 QoS :

- Can manually specify the IP address range of the device to limit the upload and download

The screenshot shows the 'Advanced Settings' interface with the 'QoS' tab selected. The 'QoS' section has an 'ON' toggle and an 'Apply' button. Below it, 'Upload' and 'Download' bandwidths are set to 1024000 Kbps, with a range of (100-1024000)Kbps. The 'QoS Rule settings' section has an 'IP range' of 192.168.188.100 to 192.168.188.200, 'Mode' set to 'Share total bandwidth with all IP address.', and 'Bandwidth' set to 20000 Kbps for Upload and 50000 Kbps for Download. A 'Comment' field contains 'engineer'. Below the form is a table with one rule:

<input type="checkbox"/>	Start IP	End IP	Mode	Upload(Kbps)	Download(Kbps)	Comment
<input checked="" type="checkbox"/>	192.168.188.100	192.168.188.200	Share	20000	50000	engineer

6.3.4 Logs :

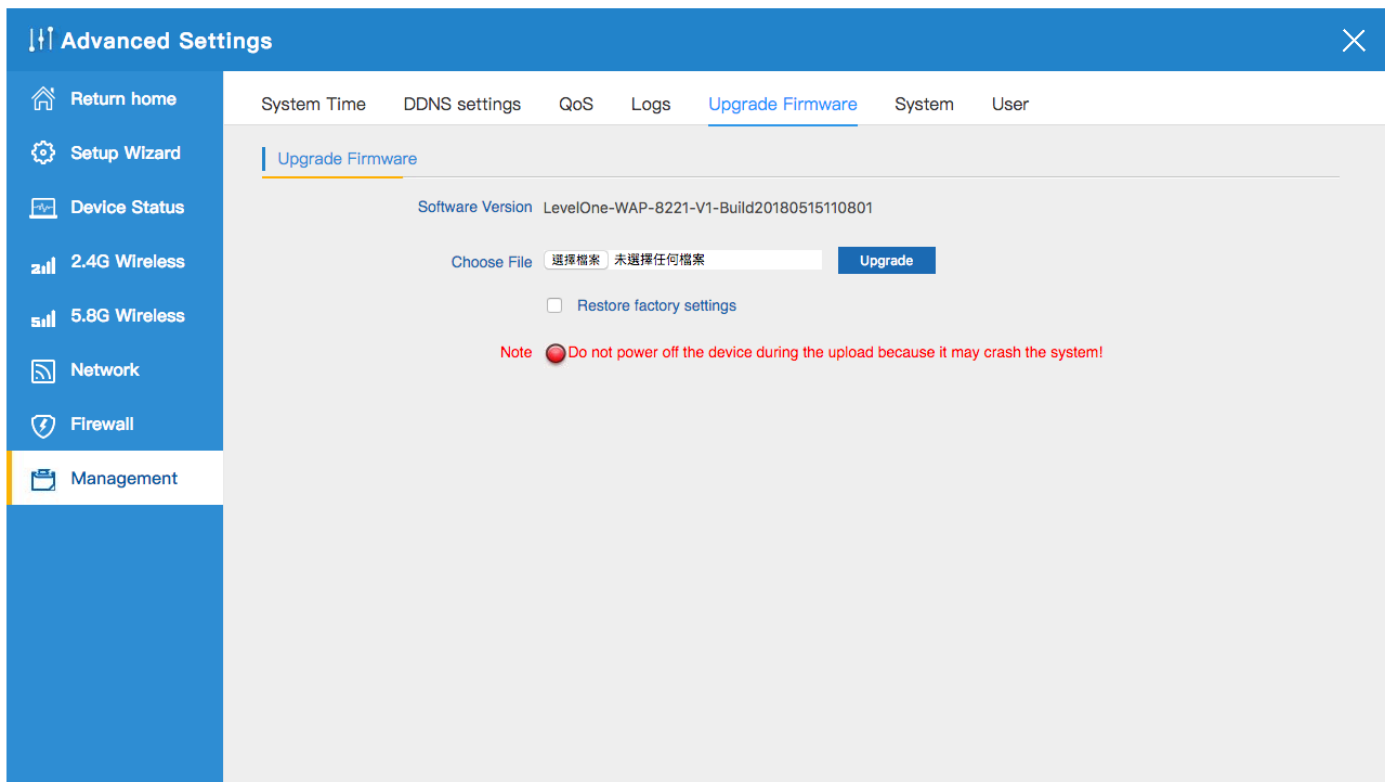
- In Logs part, you can copy the running history of the device to consult the engineers when you have any trouble

The screenshot shows the 'Advanced Settings' interface with the 'Logs' tab selected. The 'System Logs' section has a 'Remote Log Server' toggle and an 'IP' field with an 'Apply' button. Below is a log viewer showing system boot logs for WAP-8221:

```
Jan 1 08:00:09 WAP-8221 syslog.info syslogd started: BusyBox v1.19.4
Jan 1 08:00:09 WAP-8221 kern.notice kernel: klogd started: BusyBox v1.19.4 (2018-05-15 11:12:10 CST)
Jan 1 08:00:09 WAP-8221 kern.notice kernel: [ 0.000000] Linux version 3.3.8 (ycore@ycore-70TUA000CN) (gcc version 4.6.3
20120201 (prerelease) (Linaro GCC 4.6-2012.02) ) #1 Tue May 15 12:00:39 CST 2018
Jan 1 08:00:09 WAP-8221 kern.debug kernel: [ 0.000000] MyLoader: syp=786bbffd, boardp=7c7bf547, parts=6c12feb9
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] bootconsole [early0] enabled
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] CPU revision is: 00019374 (MIPS 24Kc)
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] SoC: Qualcomm Atheros QCA9531 rev 2
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] Clocks: CPU:650.000MHz, DDR:597.045MHz, AHB:216.666MHz,
Ref:25.000MHz
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] Determined physical RAM map:
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] memory: 08000000 @ 00000000 (usable)
Jan 1 08:00:09 WAP-8221 kern.info kernel: [ 0.000000] Initrd not found or empty - disabling initrd
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] Zone PFN ranges:
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] Normal 0x00000000 -&gt; 0x00008000
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] Movable zone start PFN for each node
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] Early memory PFN ranges
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] 0: 0x00000000 -&gt; 0x00008000
Jan 1 08:00:09 WAP-8221 kern.warn kernel: [ 0.000000] On node 0 totalpages: 32768
```

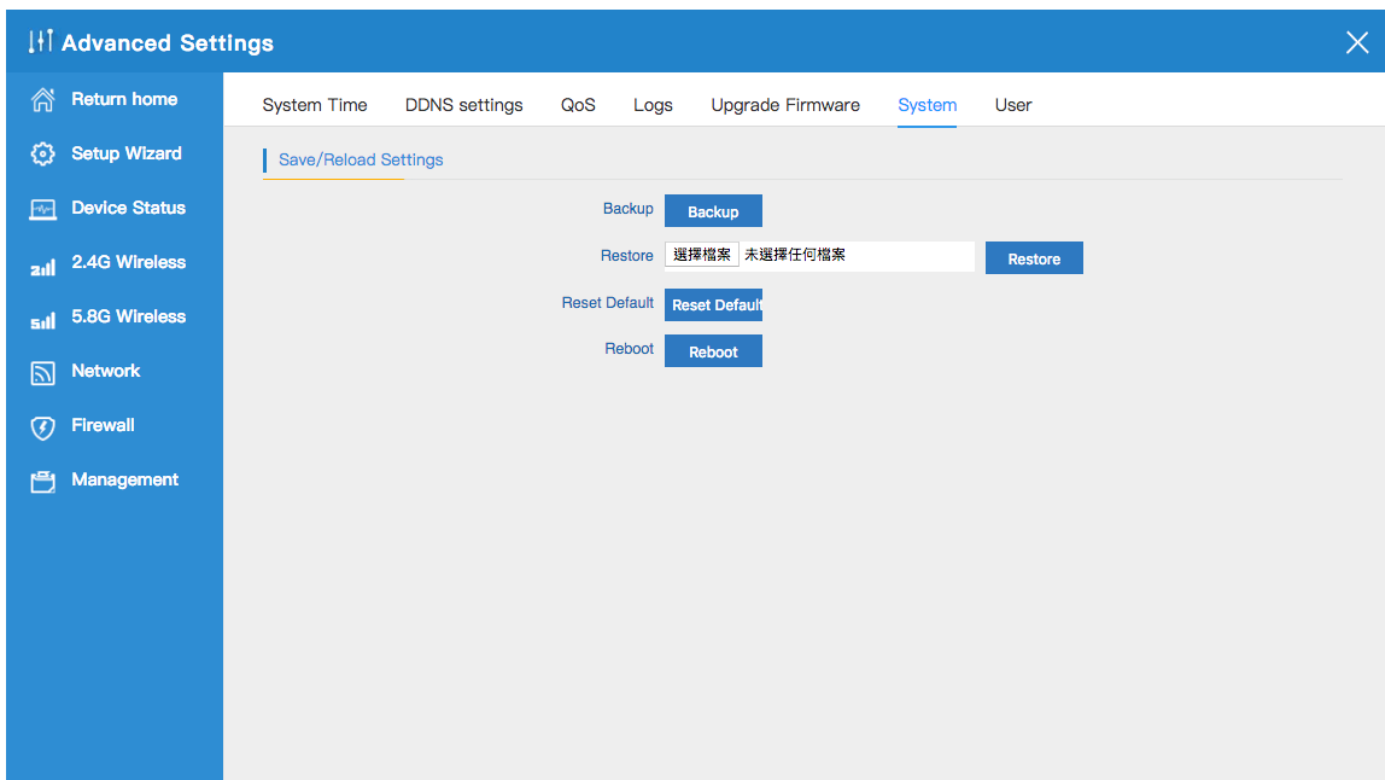
6.3.5 Upgrade Firmware :

- Allows you to browse the new firmware in your computer and upgrade. Please do not power off the device during upgrade.



6.3.6 System :

You are able to backup the current configuration to your PC and restore by applying the configuration file from your PC. And you can Reset and Reboot the device with just one click



6.3.7 User :

- Management and change the password for Log in

The screenshot displays the 'Advanced Settings' web interface. On the left is a blue sidebar with navigation links: 'Return home', 'Setup Wizard', 'Device Status', '2.4G Wireless', '5.8G Wireless', 'Network', 'Firewall', and 'Management'. The top navigation bar includes 'System Time', 'DDNS settings', 'QoS', 'Logs', 'Upgrade Firmware', 'System', and 'User'. The 'User' tab is selected, showing a form with three input fields: 'Old Password', 'Password', and 'Confirm Password'. An 'Apply' button is positioned at the bottom center of the form area.

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