PLANET
Networking & Communication

User's Manual

802.11ac 900Mbps

Outdoor Wireless CPE

WBS-512AC

www.PLANET.com.tw

Copyright

Federal Communication Commission Interference Statement

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

To assure continued compliance, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 26cm between the radiator & your body.

CE Compliance Statement

This device meets the RED 2014/53/EU requirements on the limitation of exposure of the general public to electromagnetic fields by way of health protection. The device complies with RF specifications when it is used at a safe distance of 20 cm from your body.

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.

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reasons/remarks
Bulgaria	None	General authorization required for outdoor use and public service
France	Outdoor use; limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Note: Please don't use the product outdoors in France.

WEEE regulation

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User Manual of PLANET 802.11ac 900Mbps Outdoor Wireless CPE

Model: WBS-512AC

Rev: 1.0 (May, 2020)

Part No. EM-WBS-512AC_v1.0

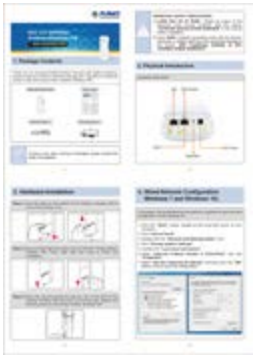
CONTENTS

FIGURE

Chapter 1. Product Introduction

1.1 Package Contents

Thank you for choosing PLANET WBS-512AC Wireless AP. Please verify the contents inside the package box.

Package Contents of WBS-512AC/WBS-512AC			
WBS-512AC	Quick Guide	Ethernet Cable	Mounting Strap
			

Note

If there is any item missing or damaged, please contact the seller immediately.

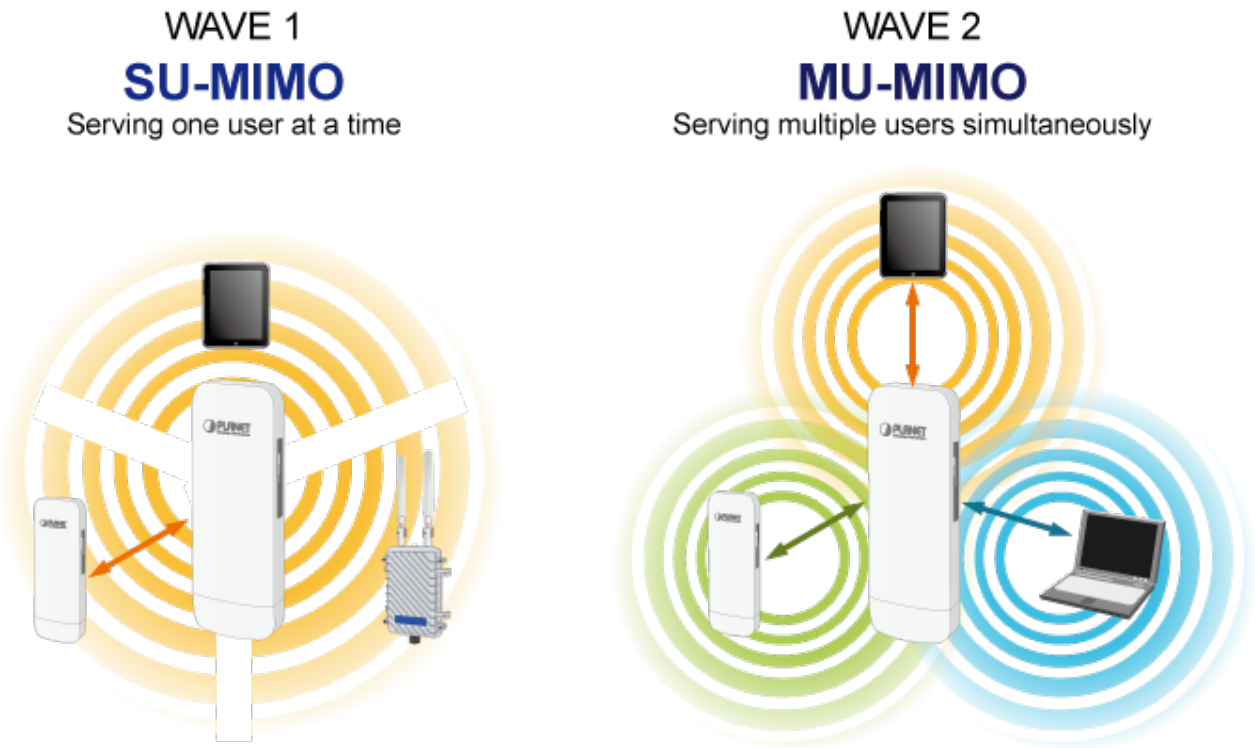
1.2 Product Description

Flexible and Reliable Outdoor Wireless Solution with Superior Performance

PLANET WBS-512AC 802.11ac WAVE 2 900Mbps Outdoor Wireless CPE offers a better range and excellent throughput than those of the traditional wireless device. With the standard IEEE 802.3at Power over Ethernet (PoE) design, the WBS-512AC can be easily installed in the areas where power outlets are not available. The WBS-512AC is definitely suitable for wireless IP surveillance, and bridge link of building to building and backbone of public service. Additionally, the self-healing capability keeps connection alive all the time. With the IP55-rated outdoor enclosure, the WBS-512AC can perform normally under rigorous weather conditions, meaning it can be installed in any harsh, outdoor environments.

Benefits of MU-MIMO under 802.11ac Wave 2

With the MU-MIMO Wave 2 technology, the WBS-512AC, installed in public areas such as hotspots, airports and conferences, reduces the frustration that Wi-Fi users often experience in downloading web pages, e-mail file attachments and media contents. For cellular operators, the WBS-512AC provides a better Wi-Fi user experience, reducing the likelihood of users turning off Wi-Fi and putting more load on the cellular network. For enterprises, this technology also can solve Wi-Fi congestion issues in open work spaces and conference rooms. Outdoor wireless CPE is specially designed for long-distance outdoor surveillance and wireless backhaul solutions that are capable of establishing stable bridge connection through the embedded antenna. To provide maximum performance, the outdoor wireless CPE can implement up to 8 operation modes where a multitude of applications in communities, warehouses, campuses, harbors, etc. can be made.



Multiple SSIDs with VLAN Tagging

The WBS-512AC supports WPA/WPA2, and the 802.1X RADIUS authentication to secure the wireless connection. Besides, the supported IEEE 802.1Q VLAN allows multiple VLAN tags to be mapped to multiple SSIDs to distinguish the wireless access. This makes it possible for the WBS-512ACN to work with managed Ethernet switches to have VLANs assigned to a different access level and authority.

Multi-SSIDs + VLANs

3 Simple Steps to Set Up PtP Connection

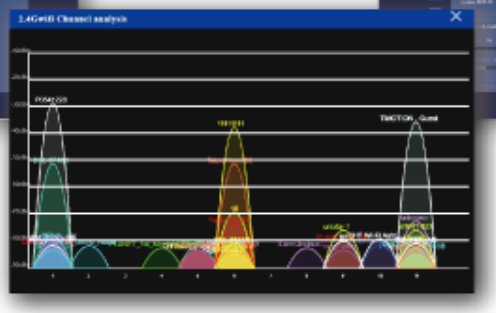
Without needing to enter the Web interface for configuration, the WBS-512AC has the DIP switch for setting to master (AP mode) and to slave (repeater mode). User only needs three simple steps to establish the PtP connection without any difficulty. By just switching the button to “Master” on the master AP, and pressing the reset button, the PtP connection can be established in 2 minutes as the connection steps are shown below.

Optimized Efficiency in AP Management

The brand-new GUI configuration wizard helps the system administrator easily set up the WBS-512AC step by step. Besides, the built-in Wi-Fi analyzer provides real-time channel utilization to prevent channel overlapping to assure greater performance. With the automatic transmission power mechanism, distance control and scheduling reboot setting, the WBS-512AC is easy for the administrator to deploy and manage without on-site maintenance. Moreover, you can use PLANET NMS-500 or NMS-1000V AP control function to deliver wireless profiles to multiple APs simultaneously, thus making the central management simple.

Setup Wizard Multiple Modes

Home Dashboard for Wi-Fi Status View



Wi-Fi Channel Analyzer

1.3 Product Features

- **Industrial Compliant Wireless LAN and LAN**
  - Compliant with the IEEE 802.11a/n/ac WAVE2 MU-MIMO wireless technology
  - 2T2R architecture with data rate of up to 900Mbps
  - Equipped with two 10/100/1000Mbps RJ45 ports with auto MDI/MDI-X supported
- **Fixed Network Broadband Router**
  - Supported WAN connection types: DHCP, Static IP, PPPoE
  - Supports Port Forwarding and DMZ for various networking applications
  - Supports DHCP server in Gateway/WISP mode
- **RF Interface Characteristics**
  - Built-in 14dBi dual-polarization antenna
  - High output power with multiply-adjustable transmit power control
- **Outdoor Environmental Characteristics**
  - IP55 rating
  - IEEE 802.3 at Power over Ethernet design
  - Operating temperature: -20~70 degrees C
- **Multiple Operation Modes and Wireless Features**
  - Multiple operation modes: AP, Gateway, Repeater, Super WDS, WISP
  - WMM (Wi-Fi multimedia) provides higher priority to multimedia transmitting over wireless
  - Coverage threshold to limit the weak signal of clients occupying session
  - Real-time Wi-Fi channel analysis chart and client limit control for better performance
  - Support Terminal Fast Roaming with 802.11k, 802.11v, and 802.11r
- **Secure Network Connection**
  - Full encryption supported: WPA/WPA2, WPA-PSK/WPA2-PSK and 802.1X RADIUS authentication
  - Supports 802.1Q VLAN and SSID-to-VLAN mapping
  - Supports IP/Port/MAC address/URL filtering, DoS, SPI Firewall
  - Supports DMZ and Port Forwarding
  - Bandwidth control per IP address to increase network stability
- **Easy Installation and Management**
  - 3 simple steps to establish PtP (AP + Repeater) connection easily
  - Supports PLANET NMS Controllers in AP mode
  - Easy discovery by PLANET Smart Discovery
  - Self-healing mechanism through system auto reboot setting
  - System status monitoring through remote Syslog Server
  - Supports PLANET DDNS/Easy DDNS

1.4 Product Specifications

Product	**WBS-512AC**		
	900Mbps Outdoor Wireless CPE Wave 2.0, MU-MIMO		
Hardware			
Standard Support	IEEE 802.11a/n/ac IEEE 802.11i IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3x flow control IEEE 802.11k, 802.11v, and 802.11r		
Dimensions (W x D x H)	87 x 38 x 260mm		
Weight	405g		
Power Requirements	48V DC IN, 0.5A, IEEE 802.3 at PoE+ or 12V DC IN, 1.0A from DC Jack		
Power Consumption (max.)	< 10W		
Interface	Wireless IEEE 802.11a/n/ac, 2T2R PoE: 1 x 10/100/1000BASE-TX, auto-MDI/MDIX, 802.3 at PoE In LAN: 1x 10/100/1000BASE-TX, auto-MDI/MDIX		
Button	Reset/Pair button, PtP Switch		
Antenna	Built-in 14dBi directional antenna with dual polarization		
	Half-power beam width	Vertical H: 70 V: 15	
		Horizontal H: 50 V: 15	
Data Rate	IEEE 802.11a: up to 54Mbps IEEE 802.11n (20MHz): up to 150Mbps IEEE 802.11n (40MHz): up to 300Mbps IEEE 802.11ac (80MHz): up to 867Mbps		
Media Access Control	CSMA/CA		
Modulation	802.11 a/n/ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)		
Frequency Band	FCC: 5.180~5.240GHz, 5.745~5.825GHz ETSI: 5.180~5.700GHz		
Operating Channels	FCC: 36, 40, 44, 48, 149, 153, 157, 161, 165 (9 channels) ETSI: 36, 40, 44, 48, 100, 104, 108, 112, 116, 132, 136, 140 (12 channels) 5GHz channel list will vary in different countries according to their regulations.		
Max. Transmit Power (dBm)	FCC: up to 25 ± 1dBm ETSI: < 20dBm (EIRP)		
Receiver Sensitivity (dBm)	**Network Mode**	**Data Rate**	**Receive Sensitivity (dBm)**
	802.11a	6Mbps	-92
		54Mbps	-75
	802.11n HT20	MCS0/MCS8	-91
		MCS7/MCS15	-72

	802.11n HT40	MCS0/MCS8	-88
		MCS7/MCS15	-70
	802.11ac VHT20	MCS0	-92
		MCS8	-70
	802.11ac VHT40	MCS0	-89
		MCS9	-65
	802.11ac VHT80	MCS0	-87
		MCS9	-61
Environment & Certification			
Operating Temperature	-20 ~ 70 degrees C		
Operating Humidity	5 ~ 90% (non-condensing)		
IP Level	IP55		
ESD Protection	± 8kV air-gap discharge ± 4kV contact discharge		
Surge Protection	± 4kV		
Regulatory	CE, RoHS		
Software			
LAN	Static IP/DHCP		
	Supports IP-MAC binding		
WAN Type (GW/WISP mode)	■ Static IP ■ Dynamic IP ■ PPPoE		
Wireless Modes	■ Access Point ■ Gateway ■ Repeater ■ Super WDS ■ WISP		
Channel Width	20MHz, 40MHz, 80MHz		
Encryption Type	64-/128-bit WEP, WPA, WPA-PSK, WPA2, WPA2-PSK, 802.1X		
Wireless Security	Enable/Disable SSID Broadcast		
	Wireless Max. 32 MAC address filtering		
	User Isolation		
Max. SSIDs	4		
Max. Wireless Clients	64 per radio (50 is suggested, depending on usage)		
Max. WDS Peers	4 (Up to 3 peers by using “One-click WDS”)		
Wireless QoS	Supports Wi-Fi Multimedia (WMM)		
Wireless Advanced	Auto Channel Selection		
	5-level Transmit Power Control (Max. (100%), Efficient (75%), Enhanced (50%), Standard (25%), Min. (12.5%))		
	Client Limit Control, Coverage Threshold		

	Wi-Fi channel analysis chart
	Fast Roaming(IEEE 802.11k, 802.11r, 802.11v)
Status Monitoring	Device status, wireless client List
	PLANET Smart Discovery
	DHCP client table
	System Log supports remote syslog server
VLAN	IEEE 802.1Q VLAN (VID: 3~4094)
	SSID-to-VLAN mapping up to 4 SSIDs
Self-healing	Supports auto reboot settings per day/hour
Management	Remote management through PLANET DDNS/Easy DDNS
	Configuration backup and restore
	Supports UPnP
	Supports IGMP Proxy
	Supports PPTP/L2TP/IPSec VPN Pass-through
	SNMP v1/v2c/v3 support, MIB I/II, Private MIB
Central Management	Applicable controllers: WAPC-500, WAPC-1000, NMS-500, NMS-1000V

Chapter 2. Hardware Installation

2.1 Product Outlook

WBS-512AC

- **Dimensions**: 87 x 38 x 260mm
- **Front Side:**

Figure 2-1 WBS-512AC Front Side

Rear Side

Figure 2-2 WBS-512AC Rear Side

Right Side

Figure 2-3 WBS-512AC Right Side

LED Definitions

LED	State	Meaning
Power	On	The device is powered on
	Off	The device is powered off
WAN Port	On	Port linked
	Blinking	Data is transmitting or receiving data
	Off	No link
LAN Port	On	Port linked
	Blinking	Data is transmitting or receiving data
	Off	No link
WLAN	On	The wireless radio is on
	Blinking	Data is transmitting or receiving over wireless
	Off	The wireless radio is off

2.1.1 Port and Button

It provides a simple interface monitoring the AP. Figure 2-4 shows the hardware-based interface of the WBS-512AC.

WBS-512AC Hardware-based Interface:

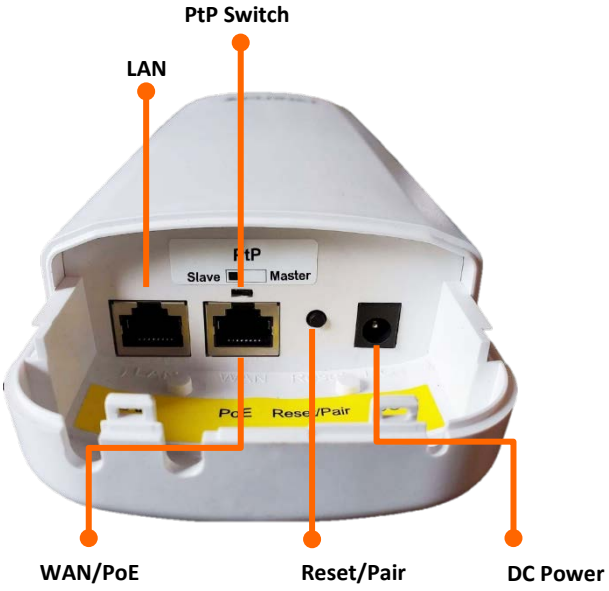


Figure 2-4 WBS-512AC Interface

2.1.2 Hardware Description

Hardware Interface Definition

Object	Description
PoE LAN Port	10/100/1000Mbps RJ45 port, auto MDI/MDI-X
LAN Port	10/100/1000Mbps RJ45 port, auto MDI/MDI-X
PtP Switch	Position "**Master**" to "**Slave**" on the AP.
Reset/Pair Button	Press and hold the **Reset** button on the device for over 15 seconds to return to the factory default setting. Press the "**Reset/Pair**" button on both APs to be connected in 2 minutes. The connection has been successfully established.

Chapter 3. Connecting to the CPE

3.1 System Requirements

- Broadband Internet Access Service (Cable/xDSL/Ethernet connection)
- One IEEE 802.3at PoE switch (supply power to the WBS-512AC)
- PCs with a working Ethernet adapter and an Ethernet cable with RJ45 connectors
- PCs running Windows 98/ME, NT4.0, 2000/XP, Windows Vista / Win 7, MAC OS 9 or later, Linux, UNIX or other platforms compatible with **TCP/IP** protocols

Note

1. The CPE in the following instructions refers to PLANET WBS-512AC.
2. It is recommended to use Internet Explorer 11, Firefox or Chrome to access the CPE.

3.2 Installing the CPE

Before installing the CPE, make sure your PoE switch is connected to the Internet through the broadband service successfully at this moment. If there is any problem, please contact your local ISP. After that, please install the AP according to the following steps. Don't forget to pull out the power plug and keep your hands dry.

Please install the AP according to the following steps. Don't forget to pull out the power plug and keep your hands dry.

Step 1. Push the latch on the bottom of the Outdoor Wireless CPE to remove the sliding cover.

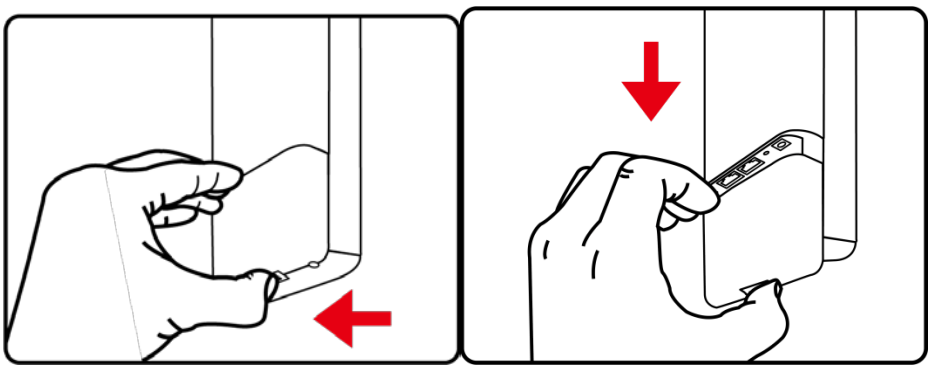


Figure 3-1 Connect the Antenna

Step 2. Plug the RJ45 Ethernet cable into the PoE Port of the Outdoor Wireless CPE. Then, slide back the cover to finish the installation.

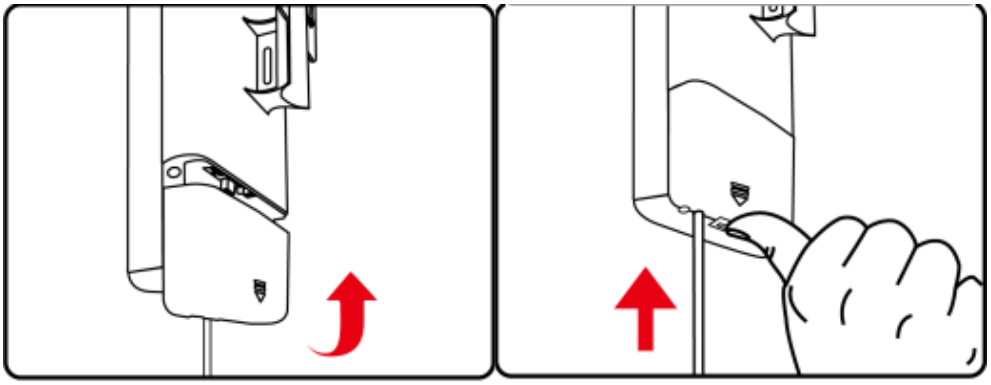


Figure 3-2 Connect the Ethernet cable

Step 3. Place the mounting strap through the slot on the back of the Outdoor Wireless CPE and then around the pole. Tighten the mounting strap to secure the Outdoor Wireless CPE.

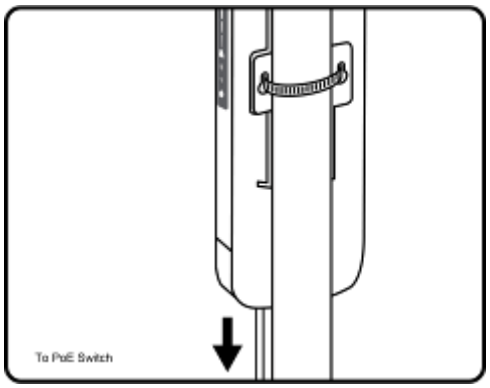


Figure 3-3 Connect the PoE injector

Chapter 4. Quick Installation Guide

This chapter will show you how to configure the basic functions of your CPE within minutes.

A computer with wired Ethernet connection to the Wireless CPE is required for the first-time configuration.

4.1 Manual Network Setup -- TCP/IP Configuration

The default IP address of the WBS-512AC is **192.168.1.253**. And the default Subnet Mask is 255.255.255.0. These values can be changed as you want. In this guide, we use all the default values for description.

Connect the WBS-512AC with your PC by an Ethernet cable plugging in LAN port on one side and in LAN port of PC on the other side. Please power on the WBS-512AC by PoE switch through the PoE port.

In the following sections, we'll introduce how to install and configure the TCP/IP correctly in **Windows 10**. And the procedures in other operating systems are similar. First, make sure your Ethernet Adapter is working, and refer to the Ethernet adapter manual if needed.

4.1.1 Configuring the IP Address Manually

Summary:

- Set up the TCP/IP Protocol for your PC.
- Configure the network parameters. The IP address is 192.168.1.xxx (If the default IP address of the WBS-512AC is 192.168.1.253, and the DSL router is 192.168.1.254, the "xxx" can be configured to any number from 1 to 252.) and subnet mask is 255.255.255.0.

1 Select **Use the following IP address**, and then configure the IP address of the PC.

2 For example, as the default IP address of the WBS-512AC is 192.168.1.253 and the DSL router is 192.168.1.254, you may choose from 192.168.1.1 to 192.168.1.252.

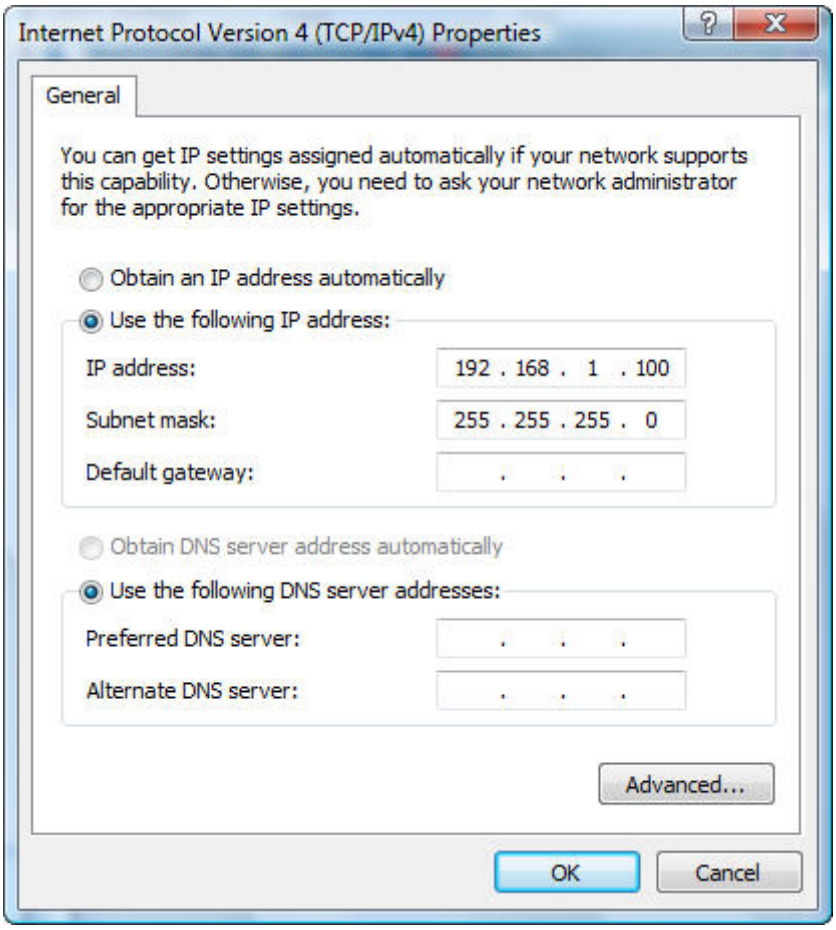


Figure 4-1 TCP/IP Setting

Now click **OK** to save your settings.

Now, you can run the ping command in the **command prompt** to verify the network connection between your PC and the AP. The following example is in **Windows 10** OS. Please follow the steps below:

1. Click on **Start > Run**.
2. Type "**cmd**" in the Search box.

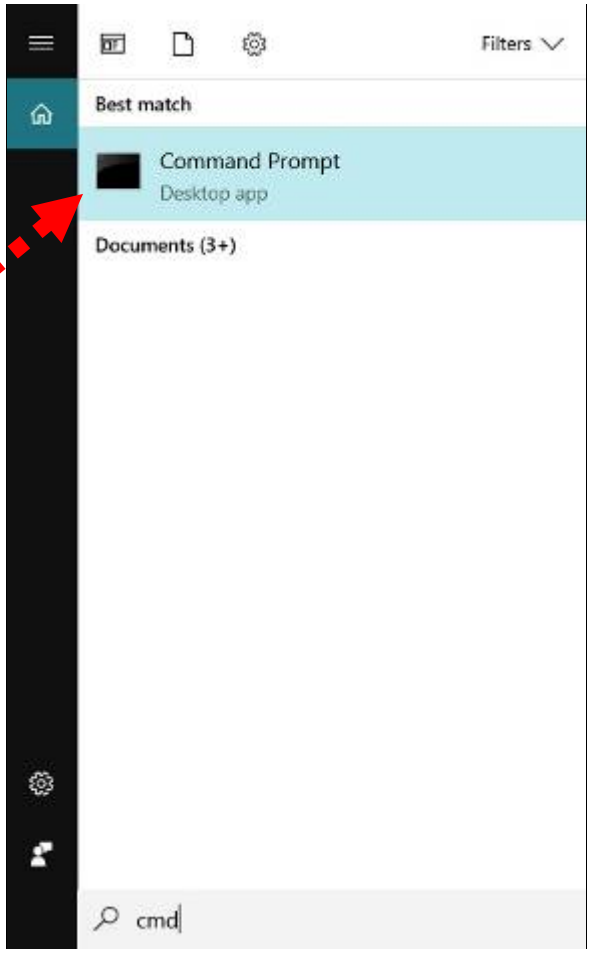


Figure 4-2 Windows Start Menu

3. Open a command prompt, type ping **192.168.1.253** and then press **Enter**.

- If the result displayed is similar to **Figure 4-3**, it means the connection between your PC and the AP has been established well.

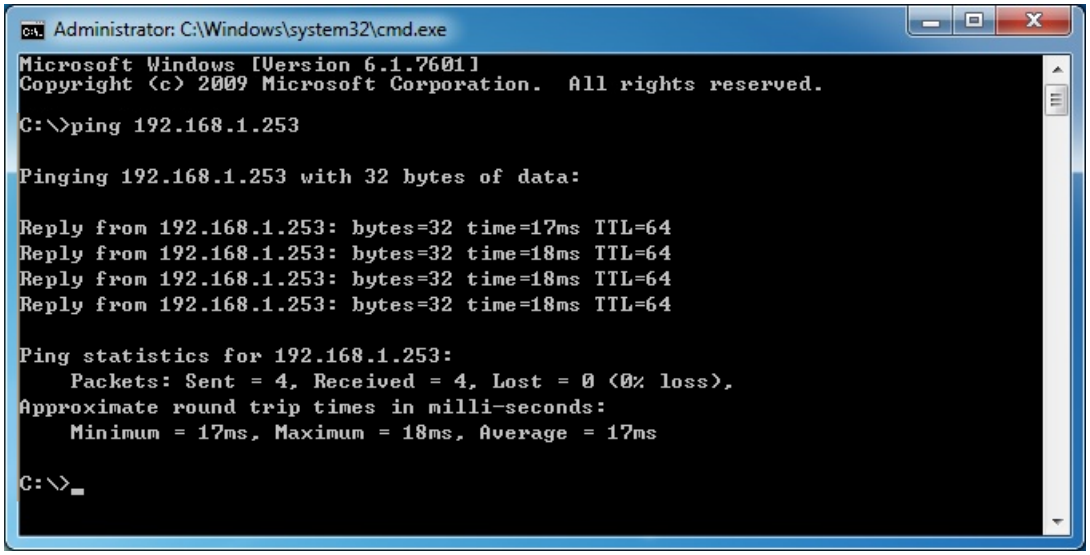


Figure 4-3 Successful Result of Ping Command

- If the result displayed is similar to **Figure 4-4**, it means the connection between your PC and the AP has failed.

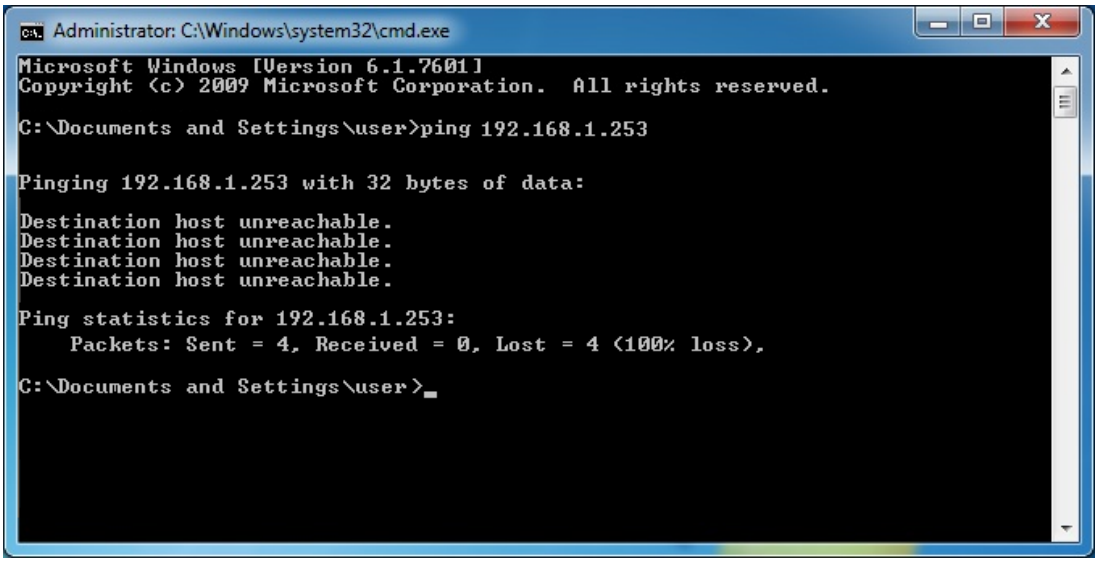


Figure 4-4 Failed Result of Ping Command

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your AP. Some firewall software programs may block a DHCP request on newly installed adapters.

4.2 Starting Setup in the Web UI

It is easy to configure and manage the CPE with the web browser.

Step 1. To access the configuration utility, open a web-browser and enter the default IP address http://192.168.1.253 in the web address field of the browser.

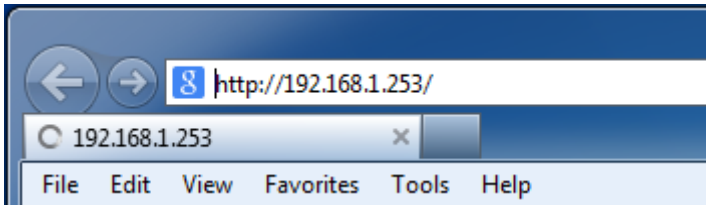


Figure 4-5 Login by Default IP Address

After a moment, a login window will appear. Enter **admin** for the password in lower case letters. Then click **LOGIN** or press the **Enter** key.

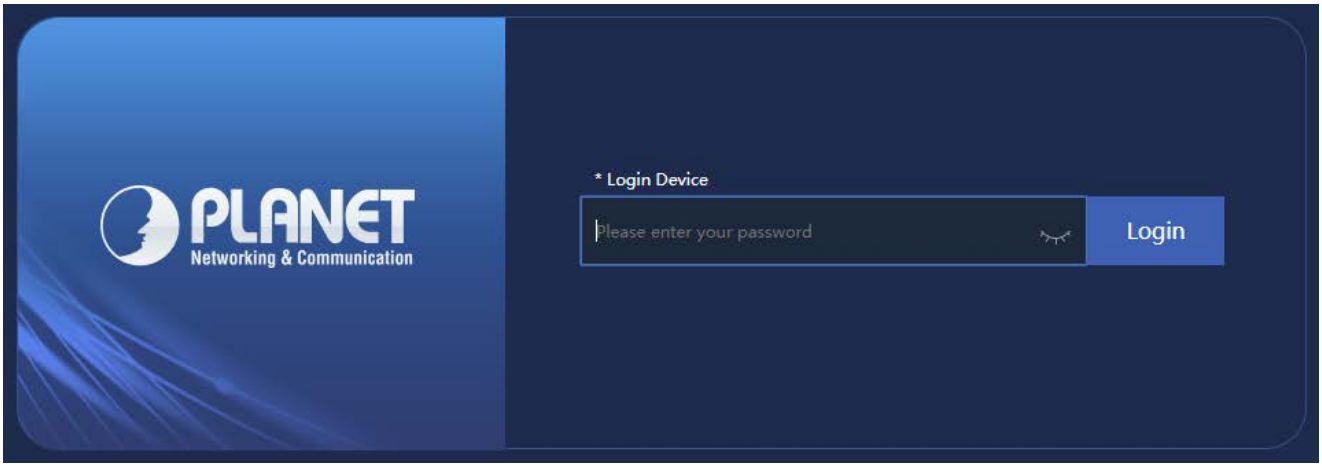


Figure 4-6 Login Window

Default IP Address: **192.168.1.253**

Default Password: **admin**

Note

If the above screen does not pop up, it may mean that your web-browser has been set to a proxy. Go to Tools menu> Internet Options> Connections> LAN Settings on the screen that appears, uncheck **Using Proxy** and click **OK** to finish it.

Chapter 5. Configuring the CPE

This chapter delivers a detailed presentation of CPE's functionalities and features 3 main items below, allowing you to manage the CPE with ease.

Figure 5-1 Main Menu

The page includes the following fields:

Object	Description
Operation Mode	It shows the current mode status.
Device Information	It shows the CPU/memory usage.
Device Description	You can enter the device description.
Flow (5G Wi-Fi) bps	It shows the Upstream/Downstream graph.
LAN Information	It shows the device IP mode, LAN IP, subnet, gateway and MAC address.
Wi-Fi Information	It shows the Wi-Fi status, SSID, channel, Encryption, MAC address and client list.
Version	It shows the firmware version (Double-click to show more detailed info.).

5.1 Wizard

The Wizard guides you to configuring the WBS-512AC in a different mode, including Gateway, Super WDS, WISP, and AP (repeater) mode.

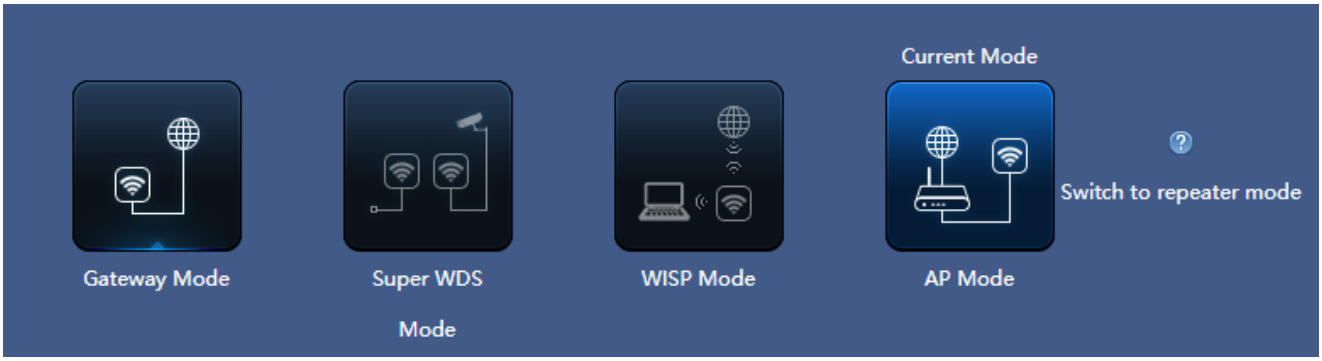


Figure 5-2 Operation Mode

Note

The default operation mode is AP mode.

Change the PtP switch to optional AP/repeater mode.

5.2 Gateway Mode

Click "**Wizard**" → "**Gateway Mode**" and the following page will be displayed. This section allows you to configure the Gateway mode.

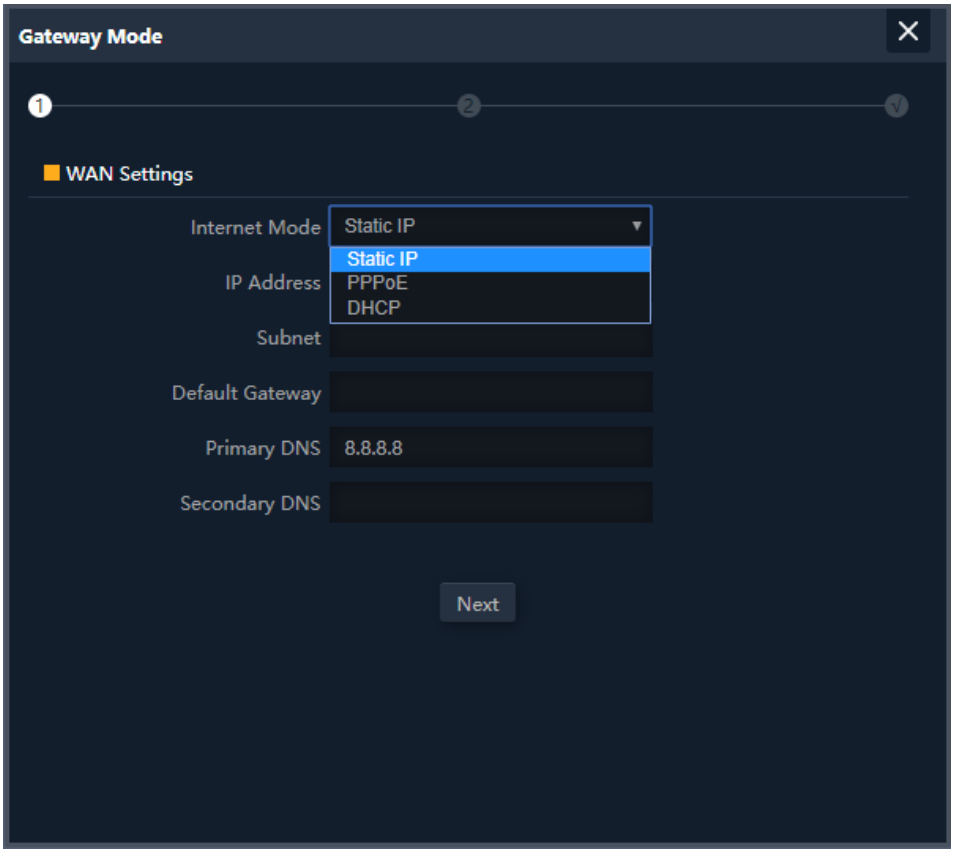


Figure 5-3 Gateway Mode

5.2.1 WAN Settings

Static IP

If your ISP offers you static IP Internet connection type, select "**Static IP**" and then enter IP address, subnet mask, default gateway and primary DNS information provided by your ISP in the corresponding fields.

Figure 5-4 Gateway -- Static IP

The page includes the following fields:

Object	Description
IP Address	Enter the WAN IP address provided by your ISP. Enquire your ISP if you are not clear
Subnet Mask	Enter WAN Subnet Mask provided by your ISP
Default Gateway	Enter the WAN Gateway address provided by your ISP
Primary DNS	Enter the necessary DNS address provided by your ISP
Second DNS	Enter the second DNS address provided by your ISP

PPPoE (ADSL)

Select **PPPOE** if your ISP is using a PPPoE connection and provide you with PPPoE user name and password info.

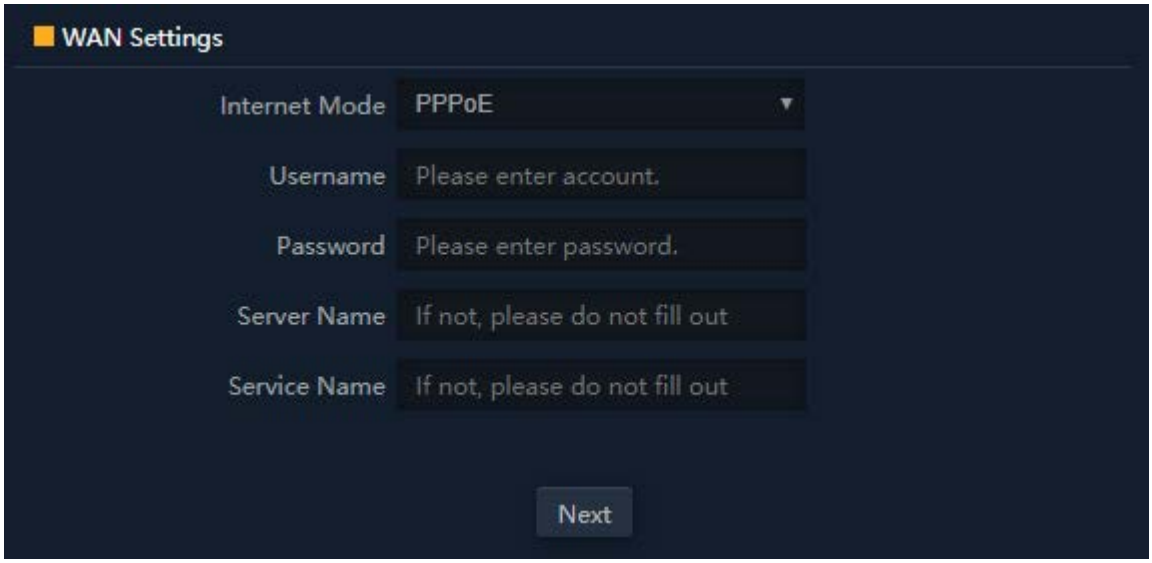


Figure 5-5 Gateway – PPPoE (ADSL)

The page includes the following fields:

Object	Description
Username	Enter the PPPoE User Name provided by your ISP
Password	Enter the PPPoE password provided by your ISP
Server Name	Enter the server name by your ISP, or not
Service Name	Enter the service name by your ISP, or not

DHCP

Choose “**DHCP**” and the router will automatically obtain IP addresses, subnet masks and gateway addresses from your ISP.

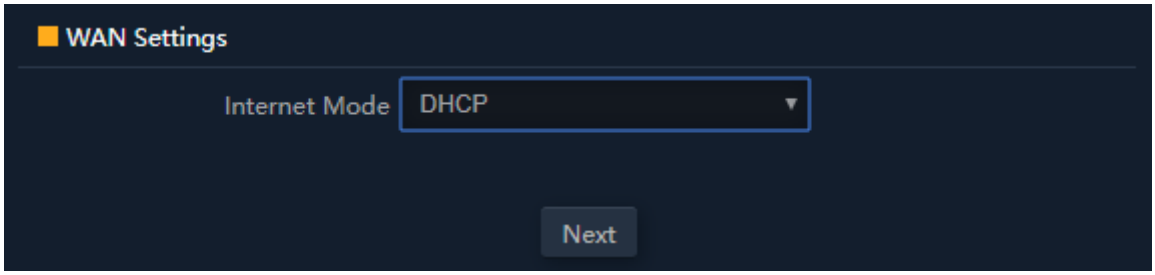


Figure 5-6 Gateway – DHCP

5.2.2 Wireless

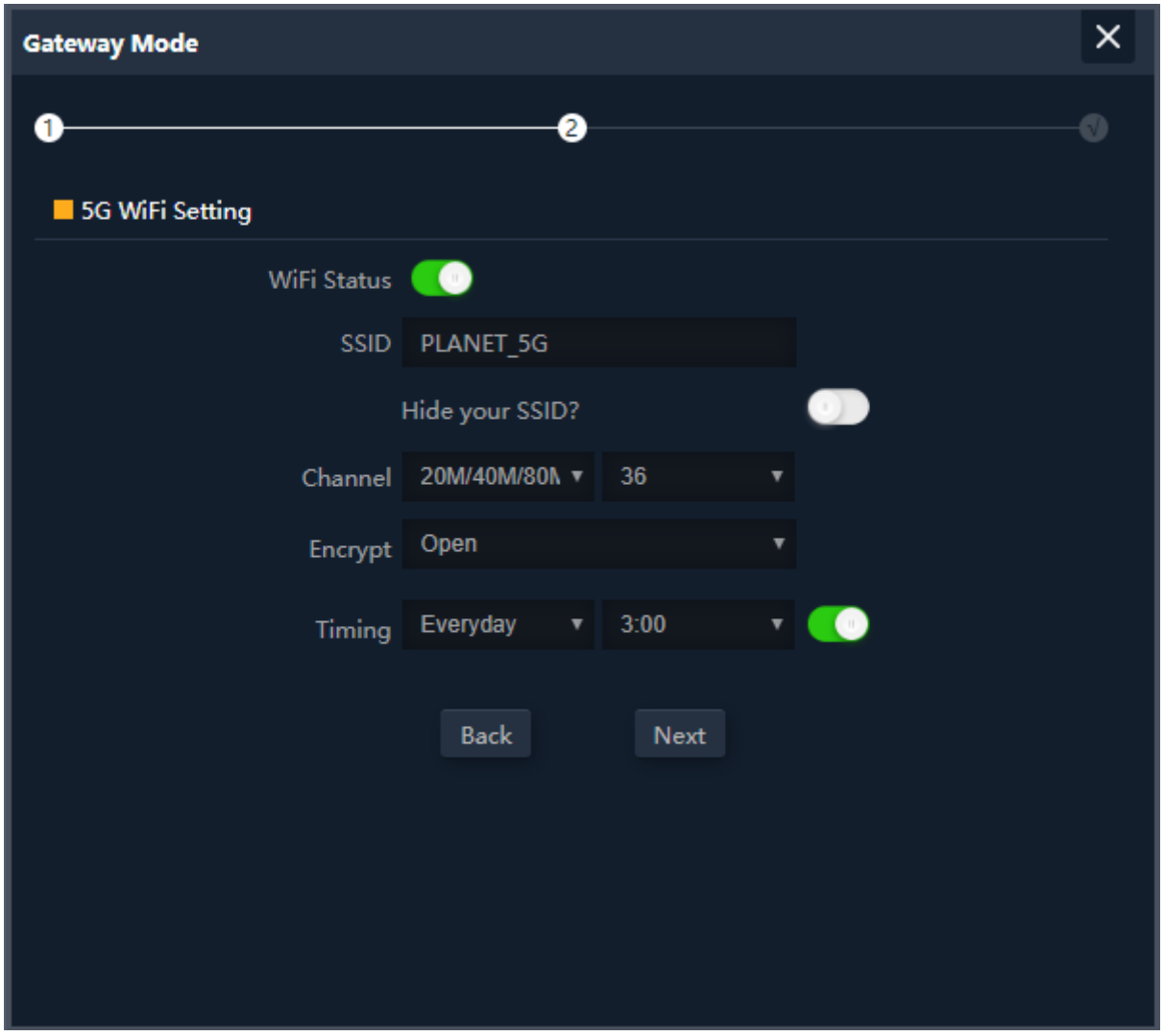


Figure 5-7 Gateway – Wireless

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable wireless LAN
SSID	It is the wireless network name. The default SSID is **PLANET_5G**
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Channel	Select the operating channel you would like to use. The channel range will be changed by selecting a different domain.
Encryption	Select the wireless encryption. The default is **None**
Timing	Set time to restart for clock

5.3 Super WDS Mode

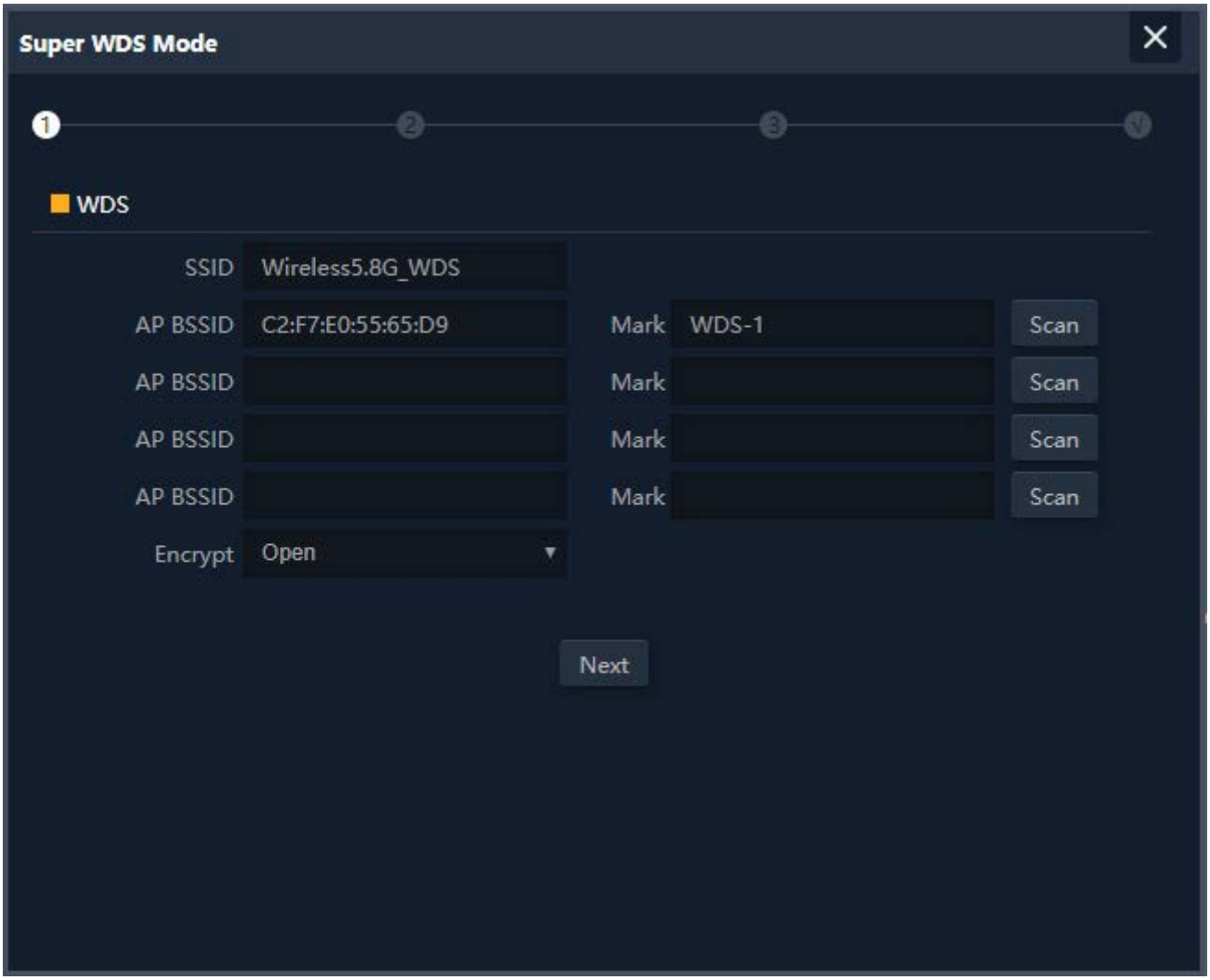


Figure 5-8 Super WDS Mode

The page includes the following fields:

Object	Description
WDS SSID	It is the WDS wireless network name. The default SSID is

	"**Wireless5.8G_WDS**"
AP BSSID/Mark	Press the "**Scan**" button to find the WDS BSSID to connect
Encryption	Select open or WEP for the wireless encryption. The default is **None** Key in the correct password for BSSID of WEP

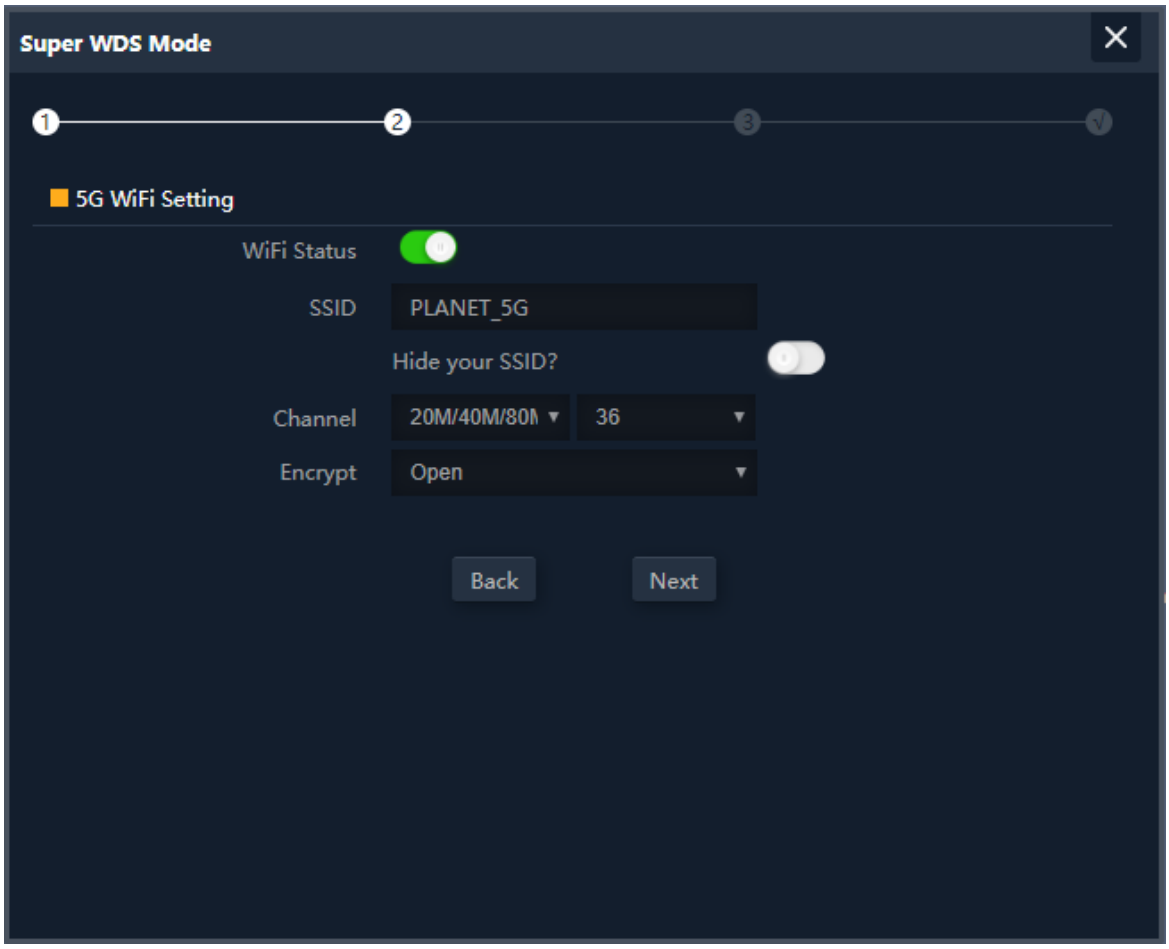


Figure 5-9 Super WDS Mode

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable wireless LAN
SSID	It is the wireless network name. The default SSID is "**PLANET_5G**"
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Bandwidth	Select the operating channel width, "**20MHz**" or "**40MHz**" or "**80MHz**"
Channel	Select the operating channel you would like to use. The channel range will be changed by selecting a different domain.
Encryption	Select the wireless encryption. The default is "**None**"

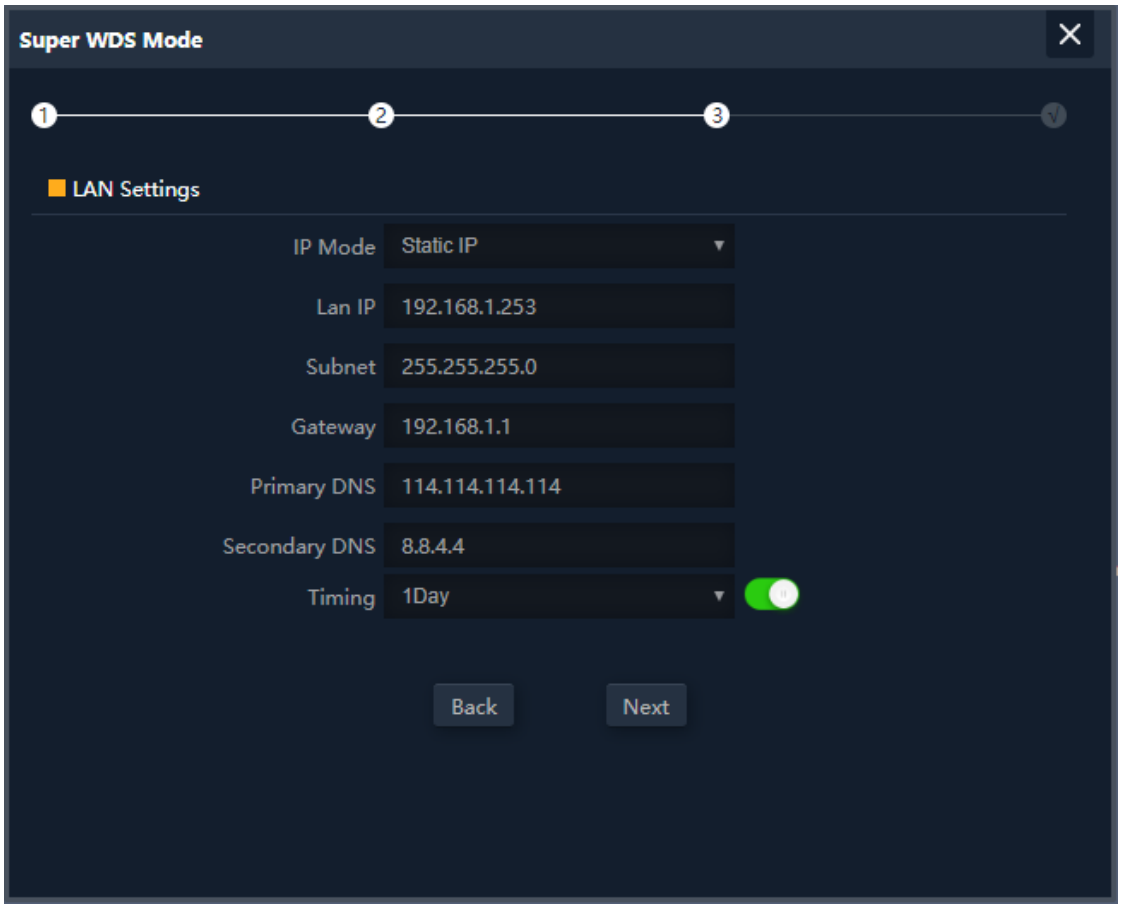


Figure 5-10 Super WDS Mode

The page includes the following fields:

Object	Description
IP Mode	Select "**Static IP**" or "**DHCP Client**" for setting up device IP
Timing	Set time to restart

AP1 – Enter the WDS SSID and encrypt password.

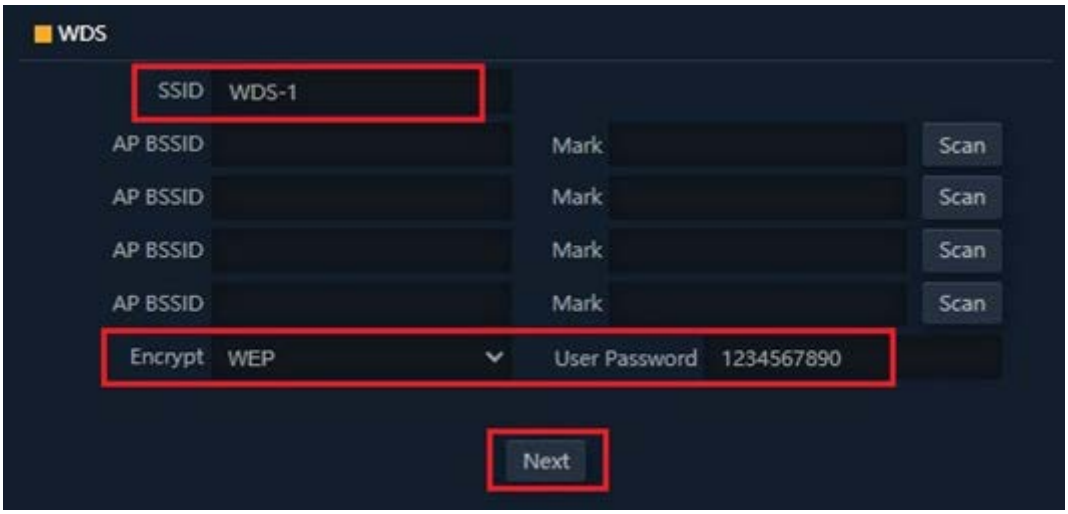


Figure 5-11 Super WDS Mode – AP1

AP2 -- Press the "**Scan**" button to find AP1 BSSID and choose it to connect. Enter the encrypt password.

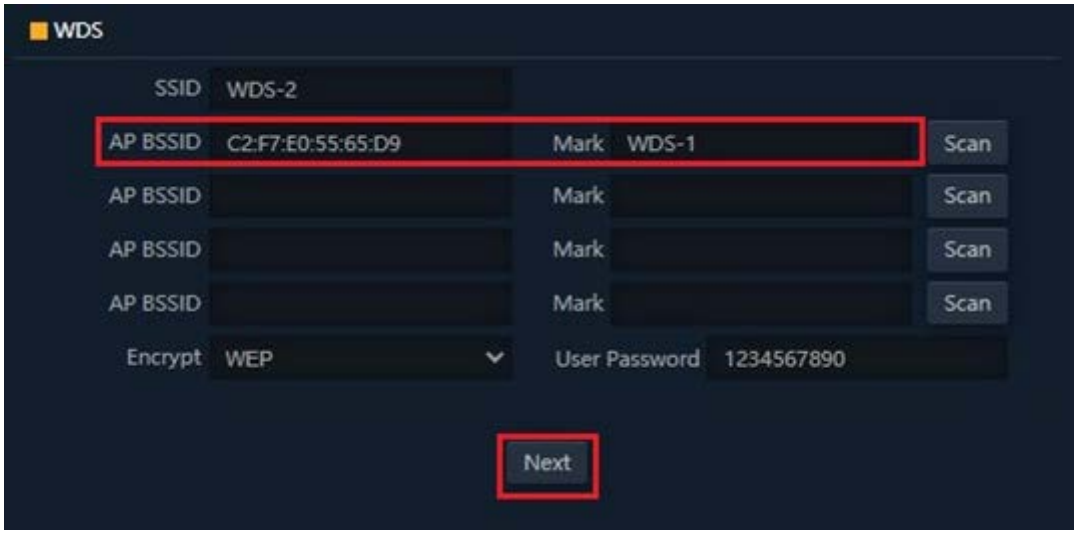


Figure 5-12 Super WDS Mode – AP2

5.4 WISP Mode

Click "**Wizard**" → "**WISP Mode**" and the following page will be displayed. This section allows you to configure the WISP mode.

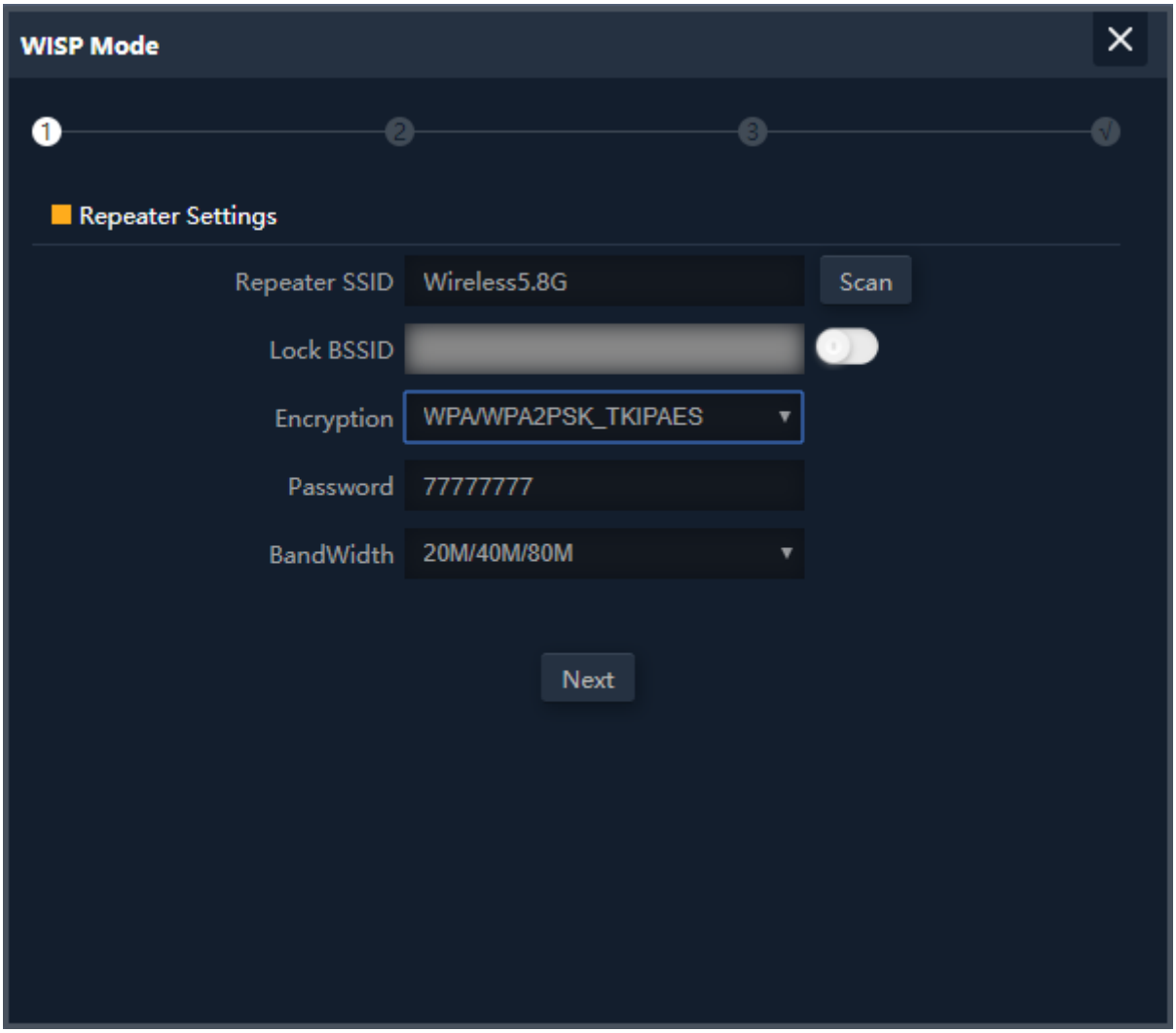


Figure 5-13 WISP Mode

The page includes the following fields:

Object	Description
Repeater SSID	Enter the root AP's SSID or press "**Scan**" to select
Lock BSSID	Check to lock the root AP' MAC address
Encryption	Select the wireless encryption of root AP. The default is "**WPA/WPA2PSK_TKIPAES**"
Password	Enter the password of root AP
Bandwidth	Select the operating channel width, "**20MHz**" or "**40MHz**" or "**80MHz**"

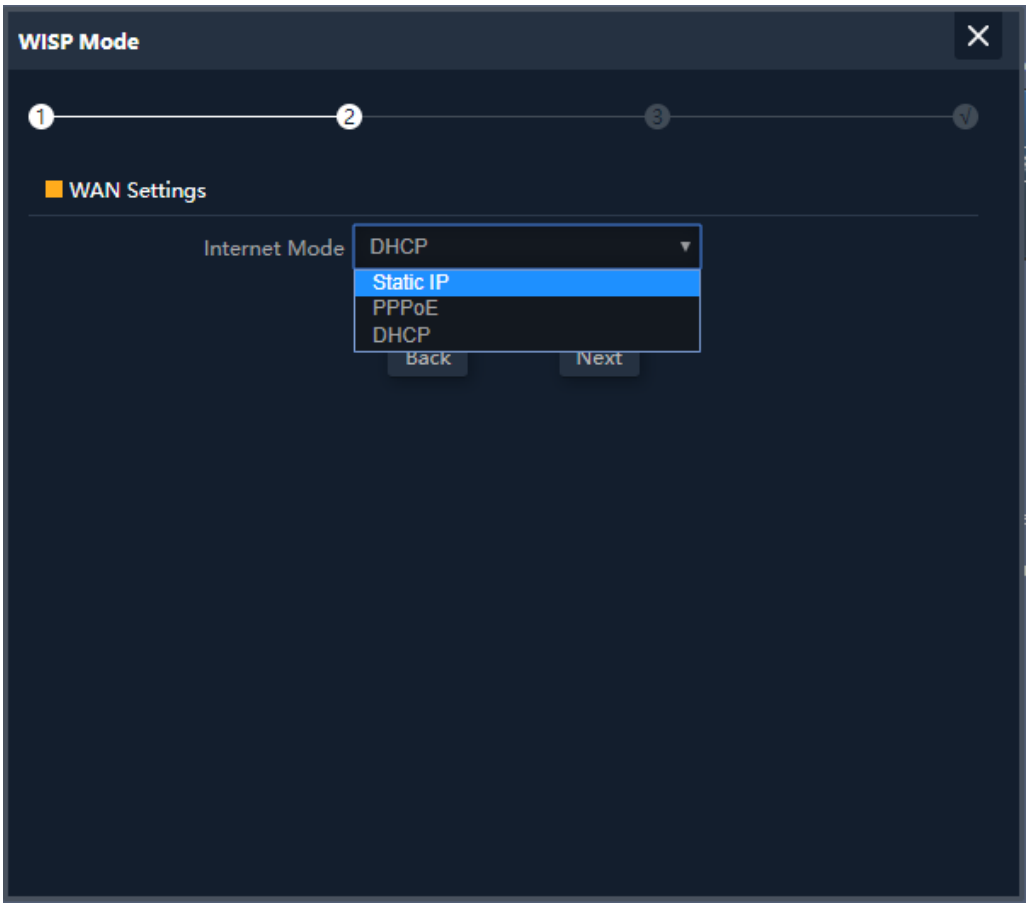


Figure 5-14 WISP Mode – Select Internet Mode (Set up WAN type)

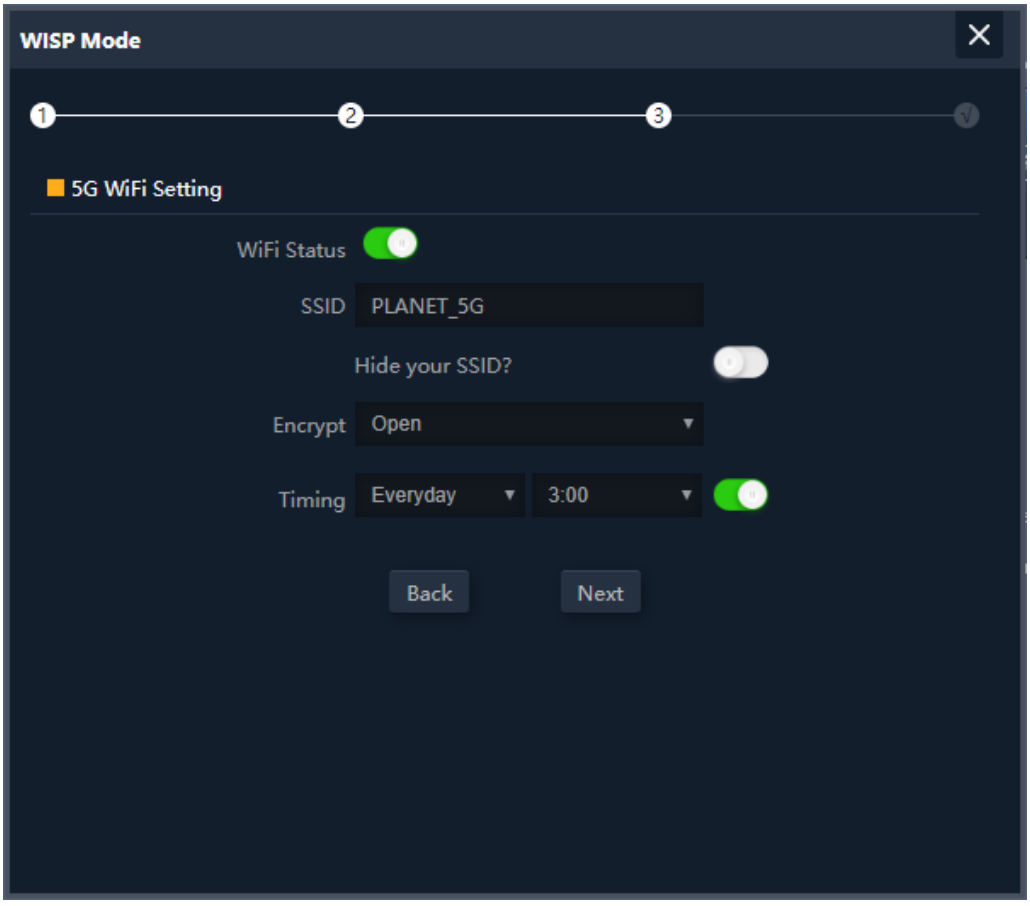


Figure 5-14 WISP Mode – Setting up Wi-Fi

5.5 AP Mode

Click “**Wizard**” → “**AP Mode**” and the following page will be displayed. This section allows you to configure the AP mode.

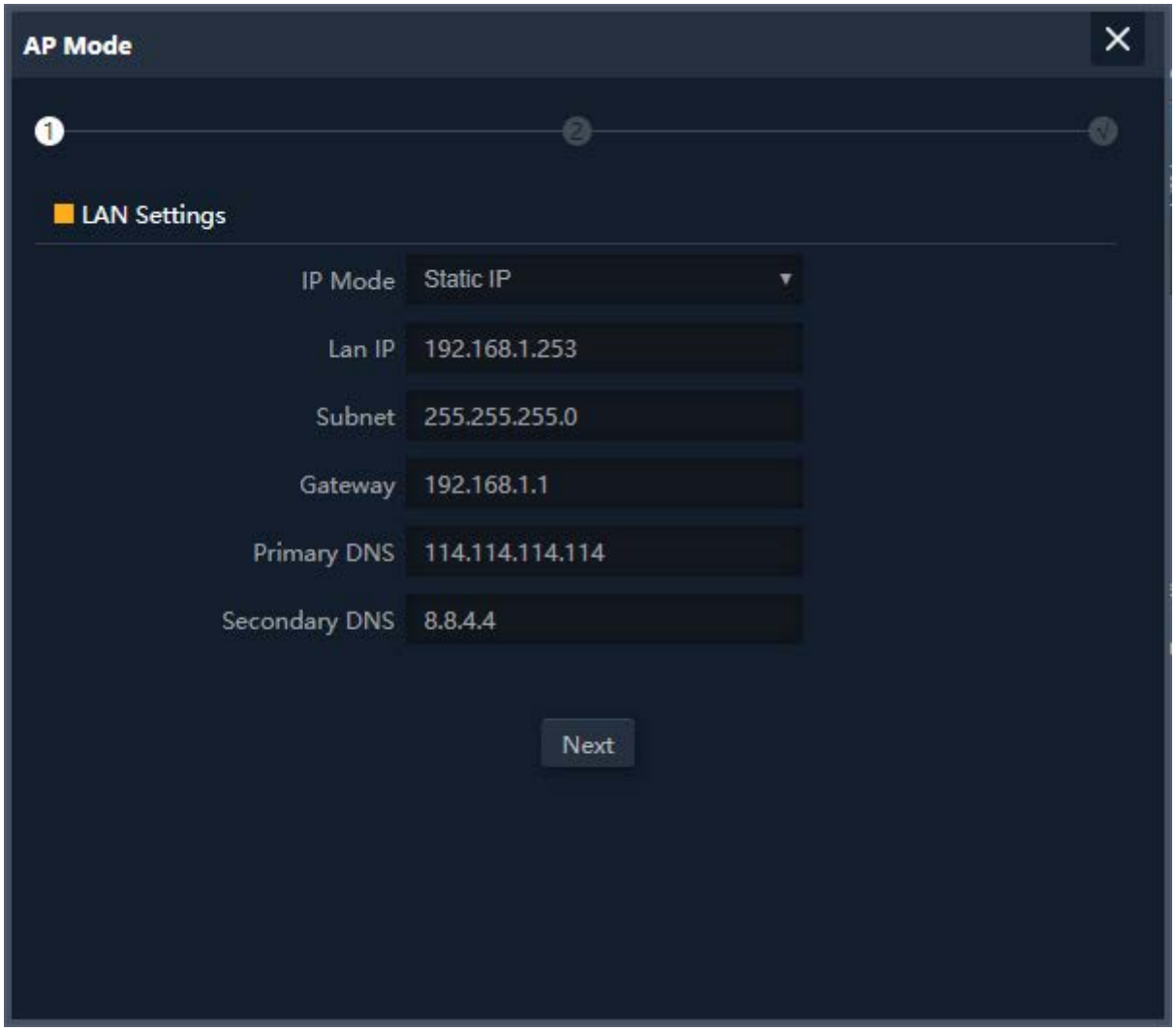


Figure 5-8 AP Mode

The page includes the following fields:

Object	Description
IP Mode	Select “**Static IP**” or “**DHCP Client**” for setting up device IP
LAN IP	Enter the AP static IP address
Subnet	Enter the network mask
Gateway	Enter the default gateway IP address
Primary DNS	Enter the primary DNS IP address, or not
Secondary DNS	Enter the secondary DNS IP address, or not

Enter the LAN IP address.

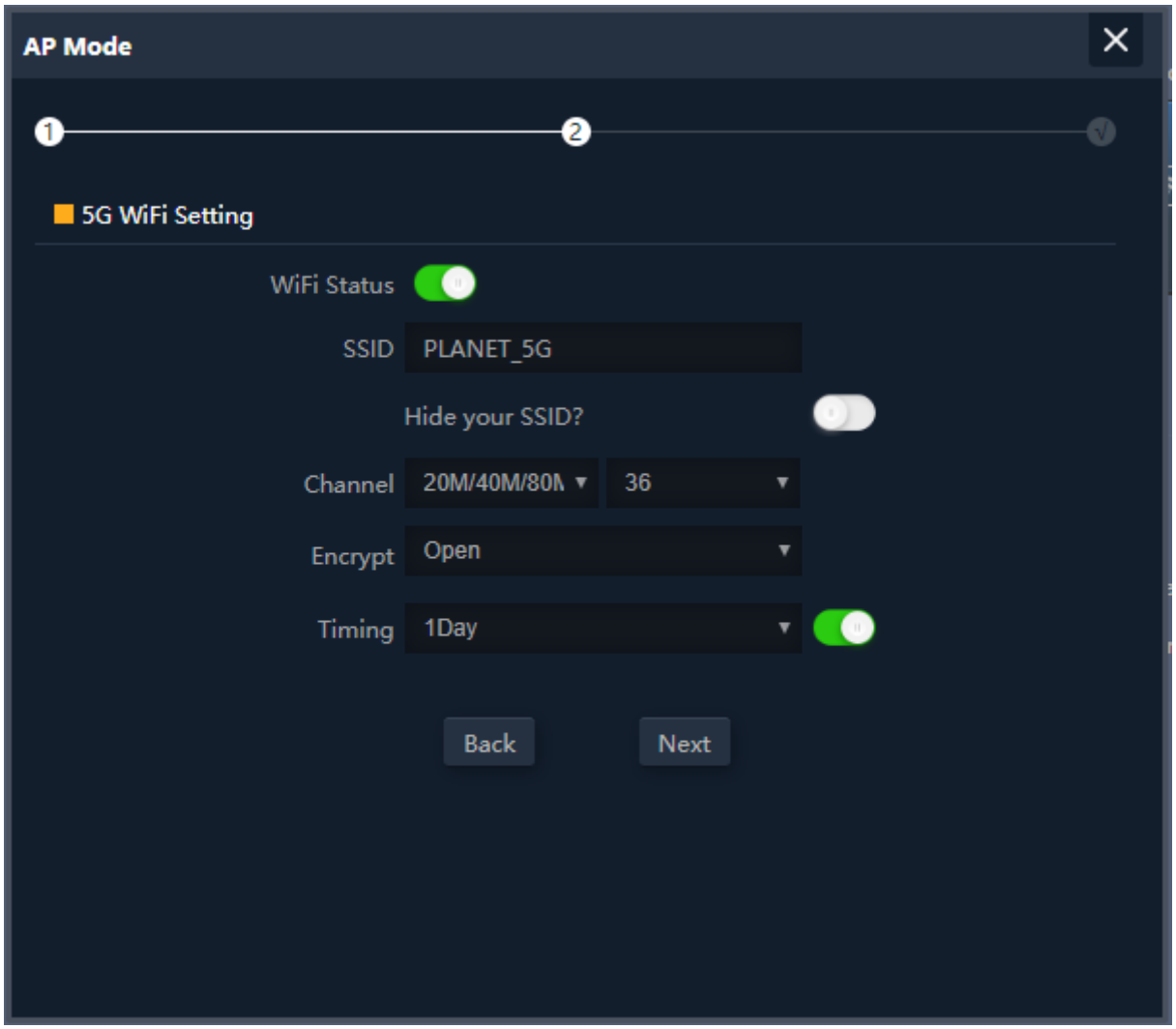


Figure 5-15 AP Mode – Set up Wi-Fi

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable wireless LAN
SSID	It is the wireless network name. The default SSID is "**PLANET_5G**"
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Bandwidth	Select the operating channel width, "**20MHz**" or "**40MHz**" or "**80MHz**"
Channel	Select the operating channel you would like to use. The channel range will be changed by selecting a different domain.
Encryption	Select the wireless encryption. The default is "**None**"
Timing	Set time to restart

5.6 Repeater Mode

Click “**Wizard**” → “**Repeater Mode**” and the following page will be displayed. This section allows you to configure the Repeater mode.

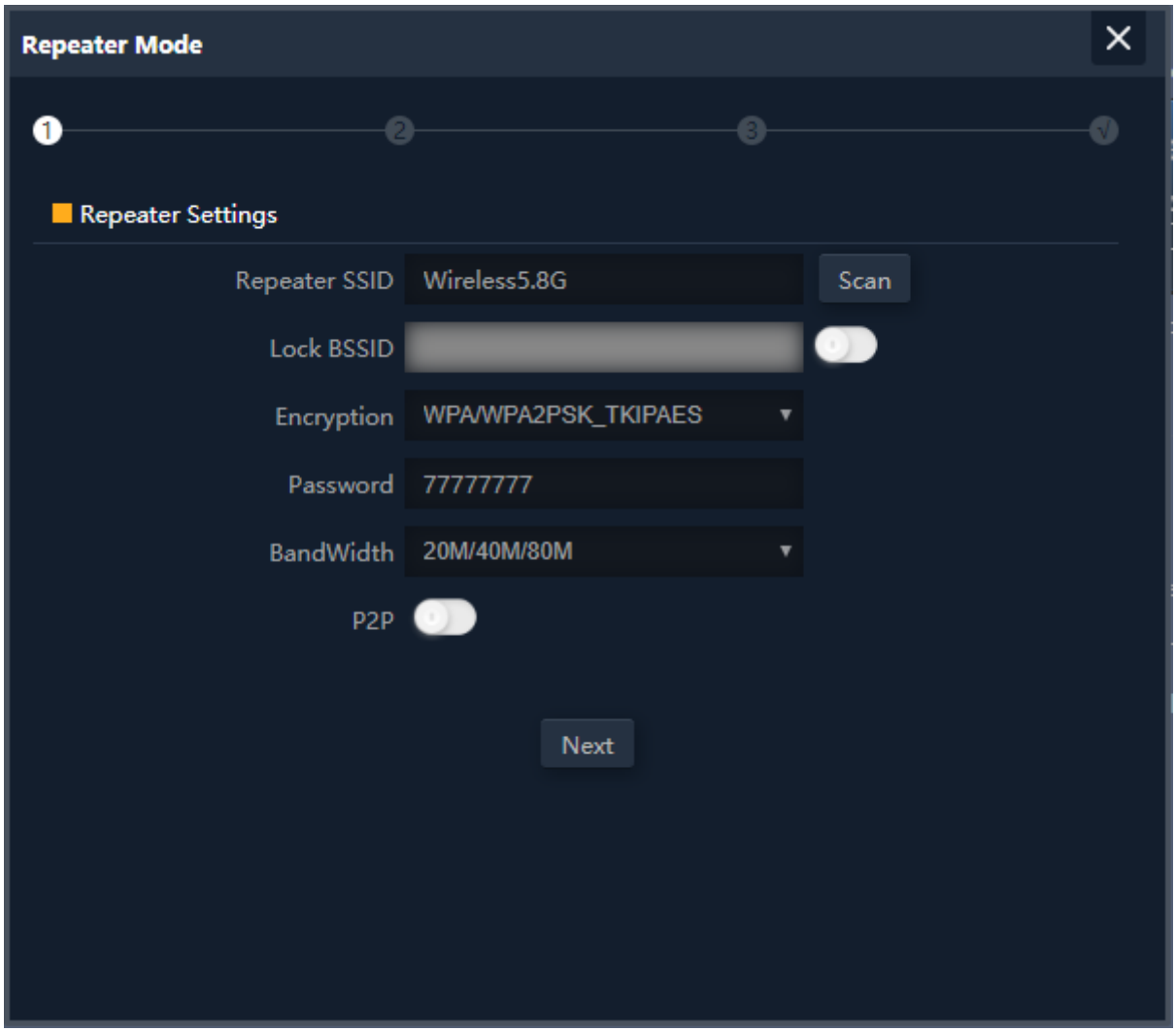


Figure 5-16 Repeater Mode

The page includes the following fields:

Object	Description
Repeater SSID	Enter the root AP’s SSID or press “**Scan**” to select
Lock BSSID	Check to lock the root AP’ MAC address
Encryption	Select the wireless encryption of root AP. The default is “**WPA/WPA2PSK_TKIPAES**”
Password	Enter the password of root AP
Bandwidth	Select the operating channel width, “**20MHz**” or “**40MHz**” or “**80MHz**”
P2P	Enable switch for Point to Point function

Press the “**Scan”** button to find the root AP that you need to repeat and press **Choice** to select the AP.

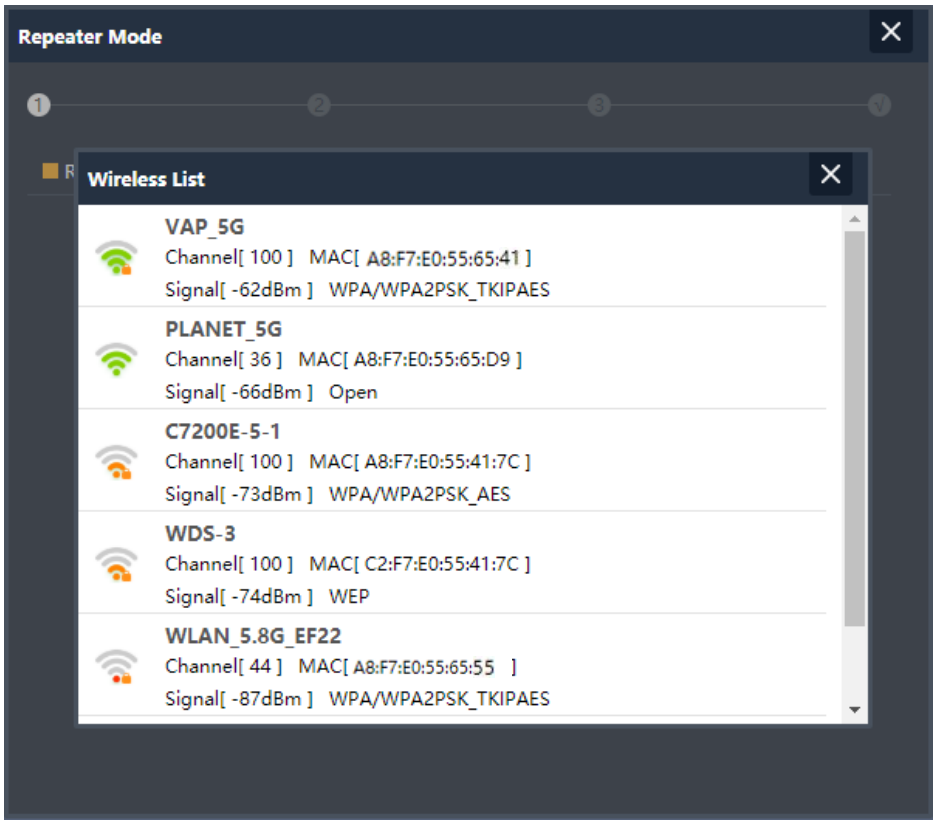


Figure 5-17 Repeater Mode -- Scan AP

Set up the repeater wireless network

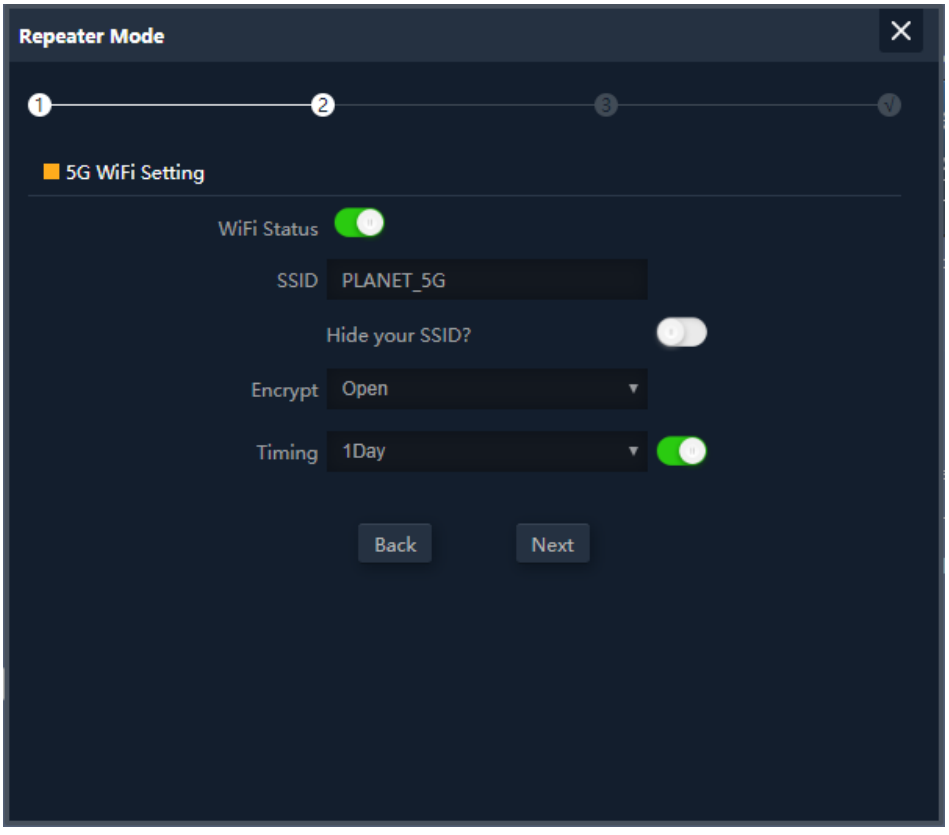


Figure 5-18 Repeater Mode – Setting up Wi-Fi

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable wireless LAN
SSID	It is the wireless network name. The default SSID is "**PLANET_5G**"
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Encryption	Select the wireless encryption. The default is "**None**"
Timing	Set time to restart

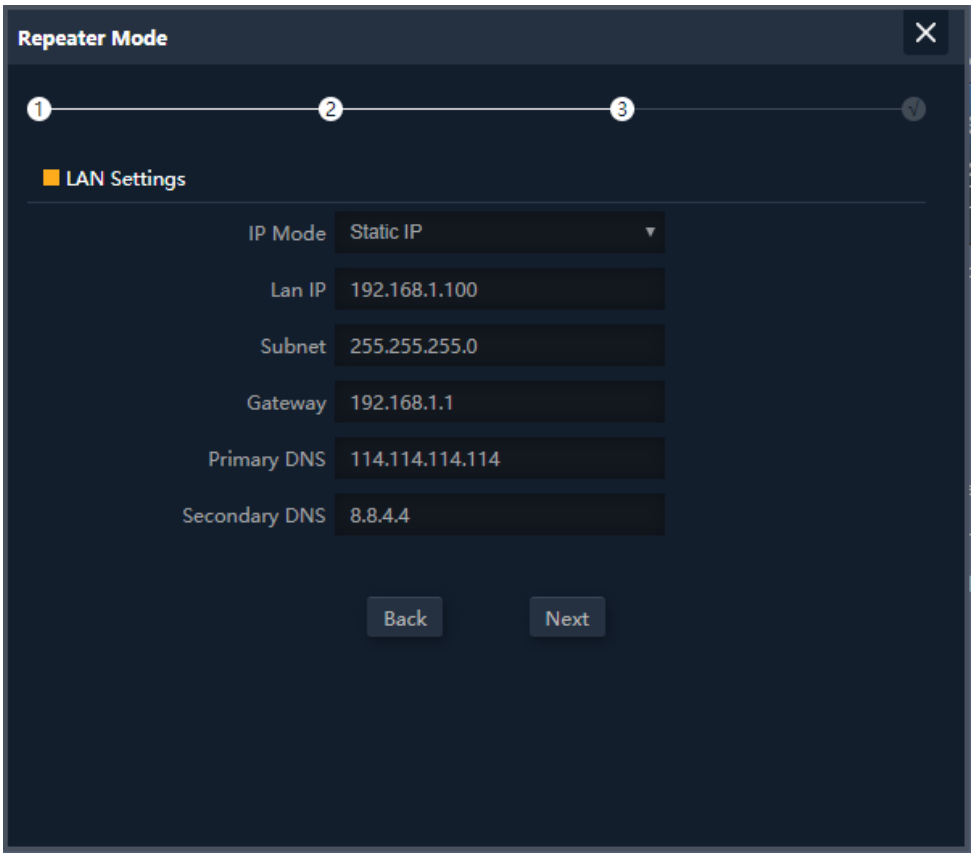


Figure 5-19 Repeater Mode – Setting up Wi-Fi

The page includes the following fields:

Object	Description
IP Mode	Select "**Static IP**" or "**DHCP Client**" for setting up device IP
LAN IP	Enter the AP static IP address
Subnet	Enter the network mask
Gateway	Enter the default gateway IP address
Primary DNS	Enter the primary DNS IP address, or not
Secondary DNS	Enter the secondary DNS IP address, or not

Enter the LAN IP address.

5.7 Wi-Fi

5.7.1 5G Wi-Fi

5.7.1.1. Basic

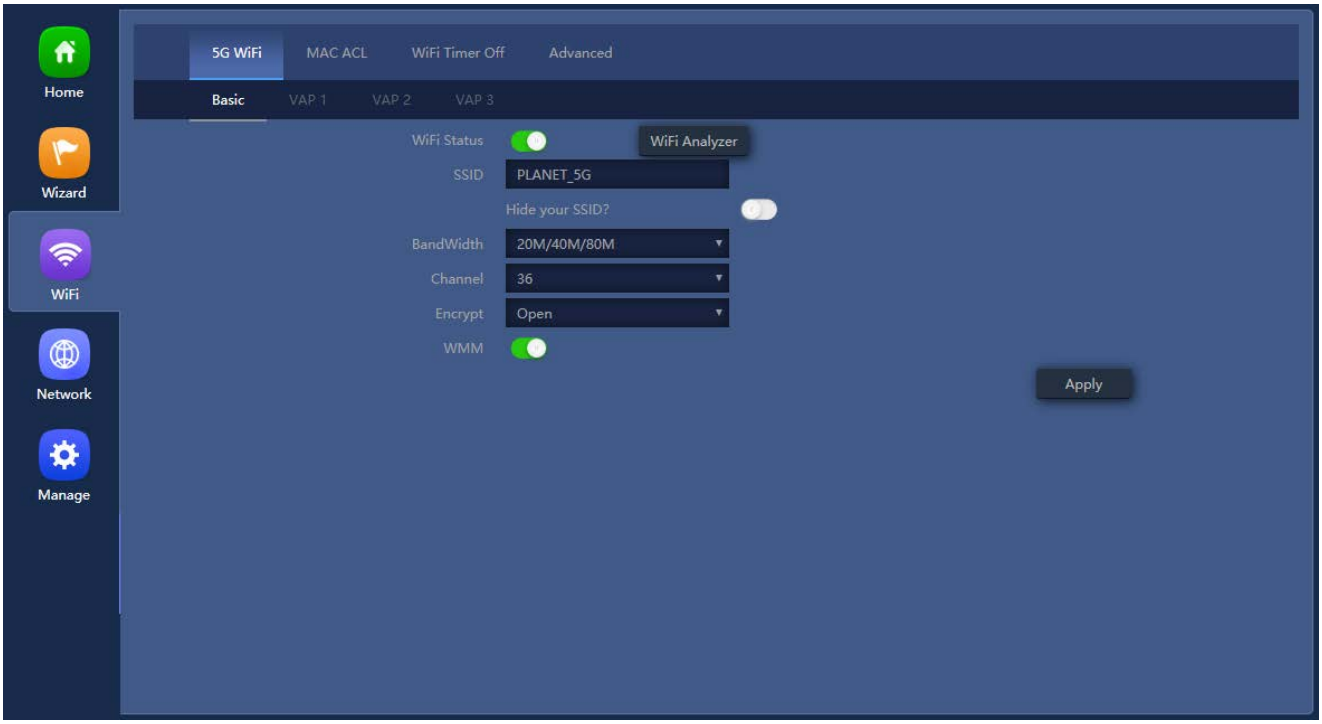


Figure 5-20 Basic

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable wireless LAN
SSID	It is the wireless network name. The default SSID is "**PLANET_5G**"
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Channel	It shows the channel of the CPE. Default 5GHz is channel 36.
Encryption	Select the wireless encryption. The default is "**None**"
WMM	Enable/Disable WMM (Wi-Fi Multimedia) function
Wi-Fi Analyzer	Press this button to analyze local area wireless signal

5.7.1.2. VAP

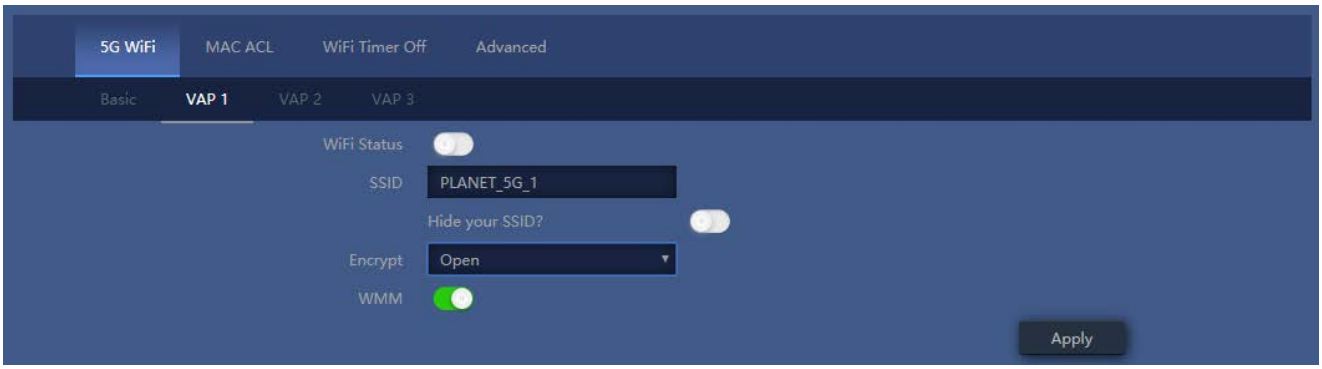


Figure 5-21 VAP

Select VAP1~VAP3 to enable virtual AP

The page includes the following fields:

Object	Description
Wi-Fi Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable virtual wireless LAN
SSID	It is the wireless network name. The default SSID is "**PLANET_5G_1**" to "**PLANET_5G_3**"
Hide your SSID ?	Select **ON** (**Green**) or **OFF** (**Gray**) to hide wireless LAN or not
Channel	It shows the channel of the CPE. Default 5GHz is channel 36.
Encryption	Select the wireless encryption. The default is "**None**"
WMM	Enable/Disable WMM (Wi-Fi Multimedia) function

5.7.2 MAC ACL

5.7.2.1. MAC ACL

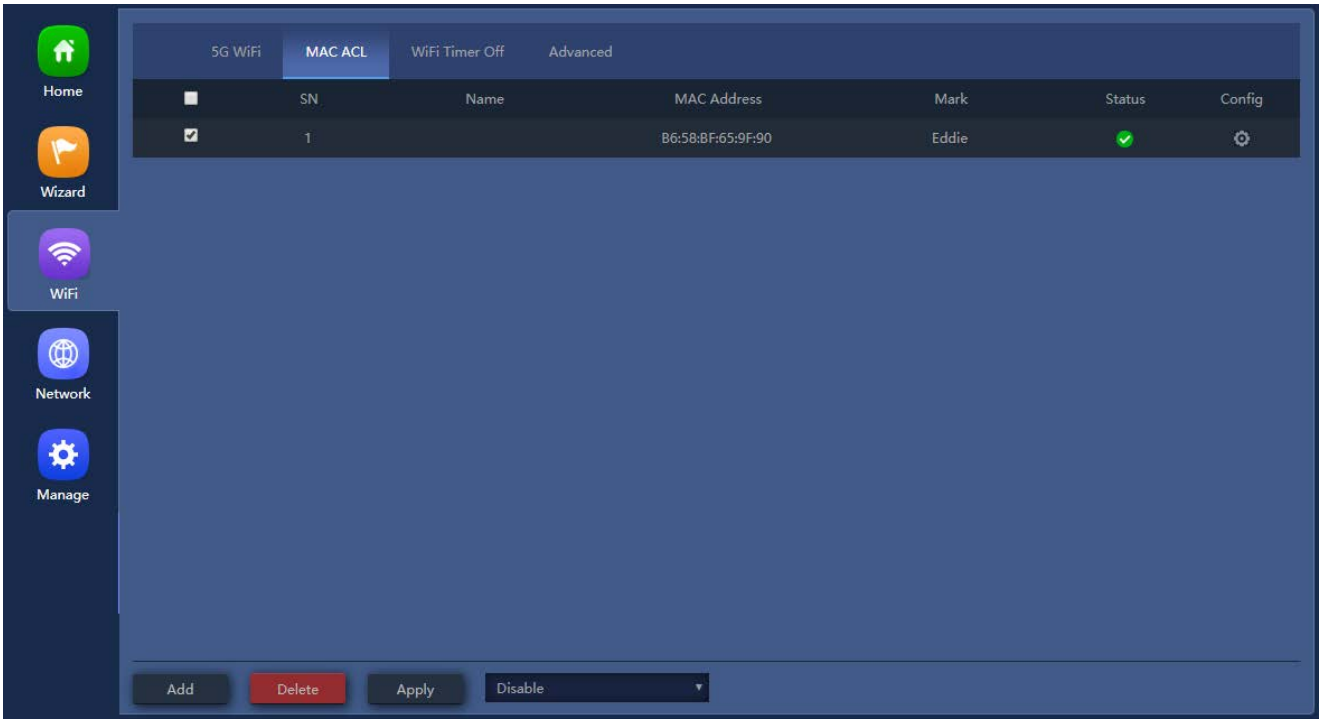


Figure 5-9 MAC ACL

The page includes the following fields:

Object	Description
Add	Press the "**Add**" button to add end-device that is scanned from wireless network and mark them
Delete	Press the "**Delete**" button to delete device from list
Apply	Press the "**Apply**" button to enable/disable the rule
ACL Status	Select the rule of ACL, default is **Disable**. Whitelist: **Allows the devices to pass in the rule** Blacklist: **Prohibited rules within the device through**

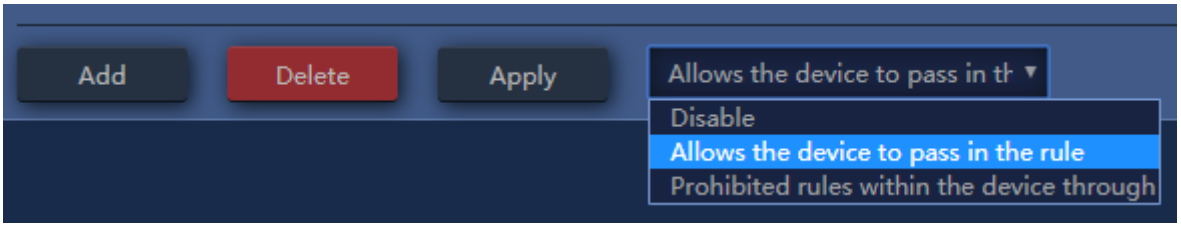


Figure 5-22 ACL status

5.7.3 Wi-Fi Timer Off

5.7.3.1. Wi-Fi Timer Off

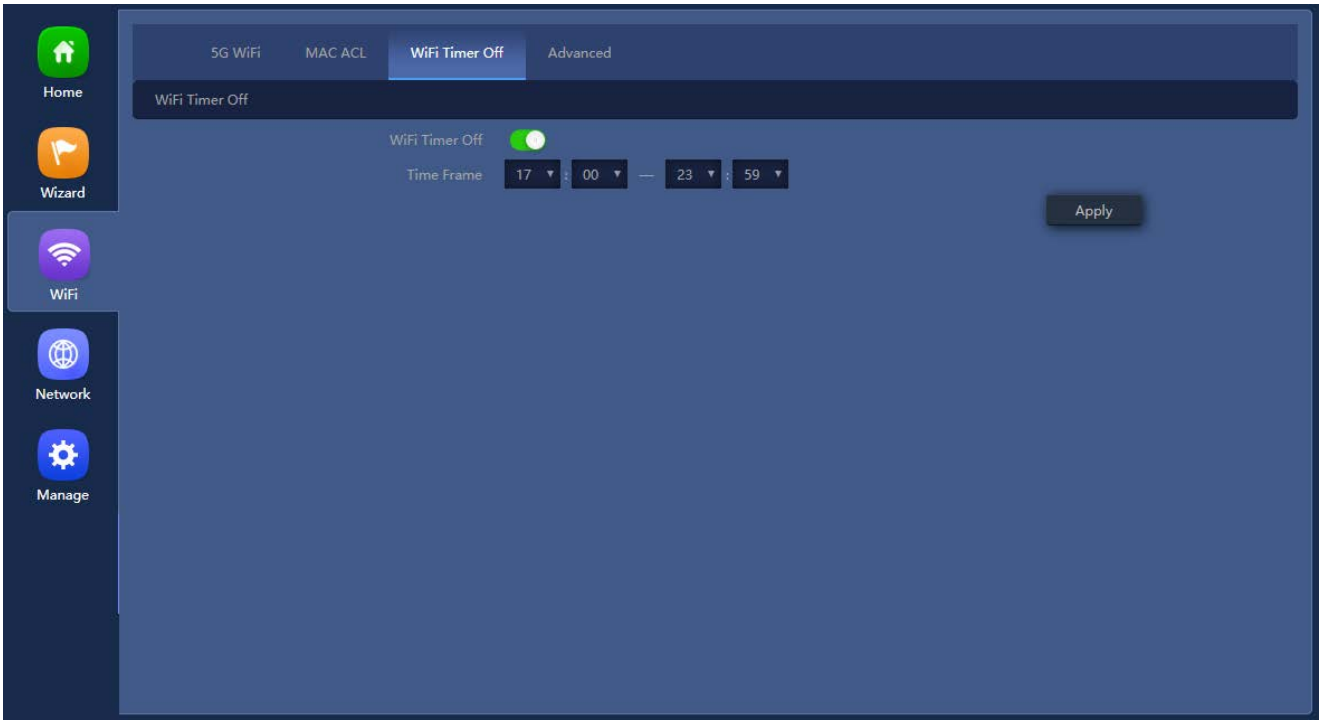


Figure 5-23 Wi-Fi Timer Off

The page includes the following fields:

Object	Description
Wi-Fi Timer Off	Select ON (**Green**) or OFF (**Gray**) to enable or disable timer
Time Frame	Choose the time frame of Wi-Fi

5.7.4 Advanced

5.7.4.1. Advanced

Figure 5-24 Advanced

The page includes the following fields:

Object	Description
5G Mode	Select **802.11A** or **802.11AN** or **802.11AC** in CPE
Maximum 5G per AP	The maximum users are **64**
5G WLAN Partition	Enable it to isolate each connected wireless client so that they cannot access mutually.
5G Coverage Threshold	The coverage threshold is to limit the weak signal of clients occupying session. The default is -90dBm
5G TX Power	The range of transmit power is **Max (100%)**, **Efficient (75%)**, **Enhanced (50%), Standard (25%)** or **Min (12.5%)**. In case of shortening the distance and the coverage of the wireless network, input a smaller value to reduce the radio transmission power
Multicast Fast	A part of the 802.11n standard that allows sending multiple frames per single access to the medium by combining frames together into one larger frame. It creates the larger frame by combining smaller frames with the same physical source, destination end points, and traffic class (QoS) into one large frame with a common MAC header
Short GI	Guard intervals are used to ensure that distinct transmissions do not interfere with one another.
Packet Threshold	When the length of a data packet exceeds this value, the router will

	send an RTS frame to the destination wireless node, and the latter will reply with a CTS frame, and thus they are ready to communicate. The default value is **2346**
RTS Threshold	Enable or Disable RTS/CTS protocol. It can be used in the following scenarios and used by Stations or Wireless AP. 1) When medium is too noisy or lots of interferences are present. If the AP/Station cannot get a chance to send a packet, the RTS/CTS mechanism can be initiated to get the packet sent. 2) In mixed mode, the hidden node problem can be avoided. The default value is **2347**
Dial Switch	Enable or Disable PtP switch
Terminal Fast Roam	Enable or Disable 802.11k, 802.11v and 802.11r

5.7.5 Network

5.7.5.1. LAN Settings

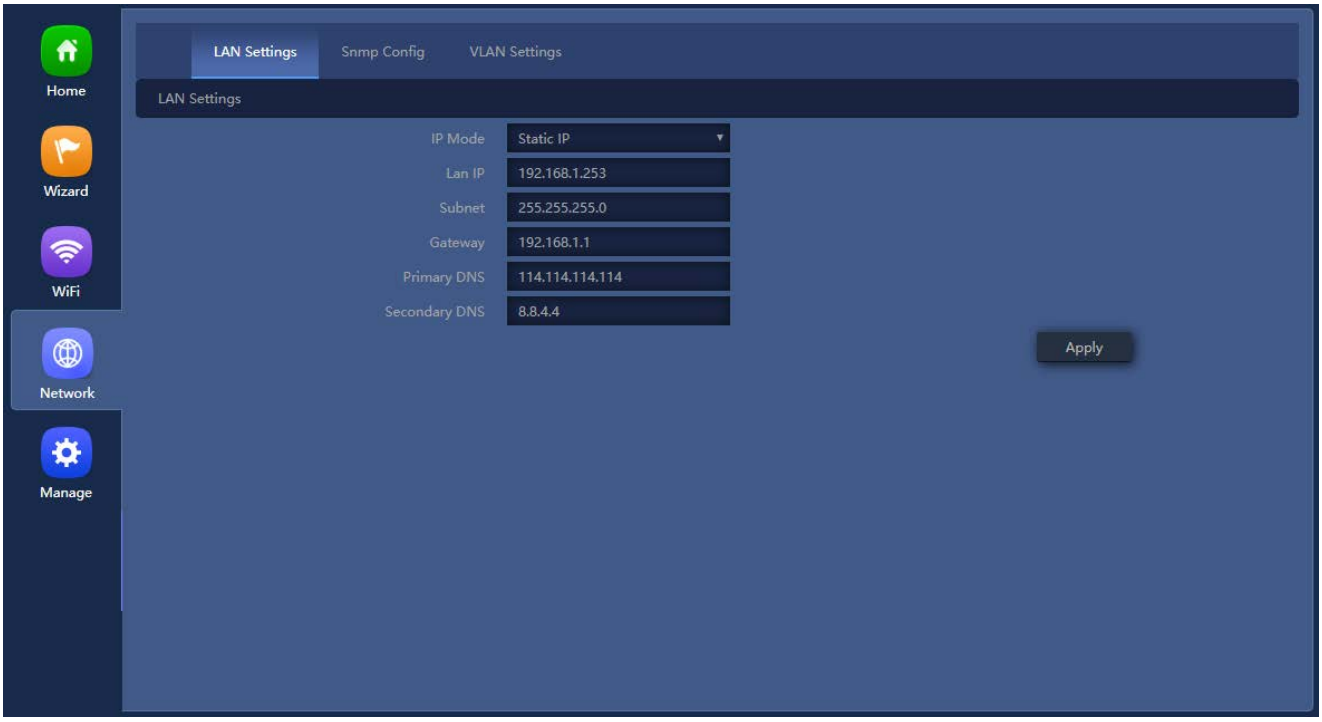


Figure 5-25 LAN Settings

The page includes the following fields:

Object	Description
IP Mode	Select "**Static IP**" or "**DHCP Client**" for setting up device IP
LAN IP	Enter the AP static IP address
Subnet	Enter the network mask
Gateway	Enter the default gateway IP address
Primary DNS	Enter the primary DNS IP address, or not
Secondary DNS	Enter the secondary DNS IP address, or not

5.7.5.2. SNMP Config

Figure 5-10 SNMP Config

The page includes the following fields:

Object	Description
Read Community	Enter the read community, default is **public**
Write Community	Enter the write community, default is **private**
Trap Destination Address	Enter the SNMP trap IP address, default is **192.168.1.100**

5.7.5.3. VLAN Settings

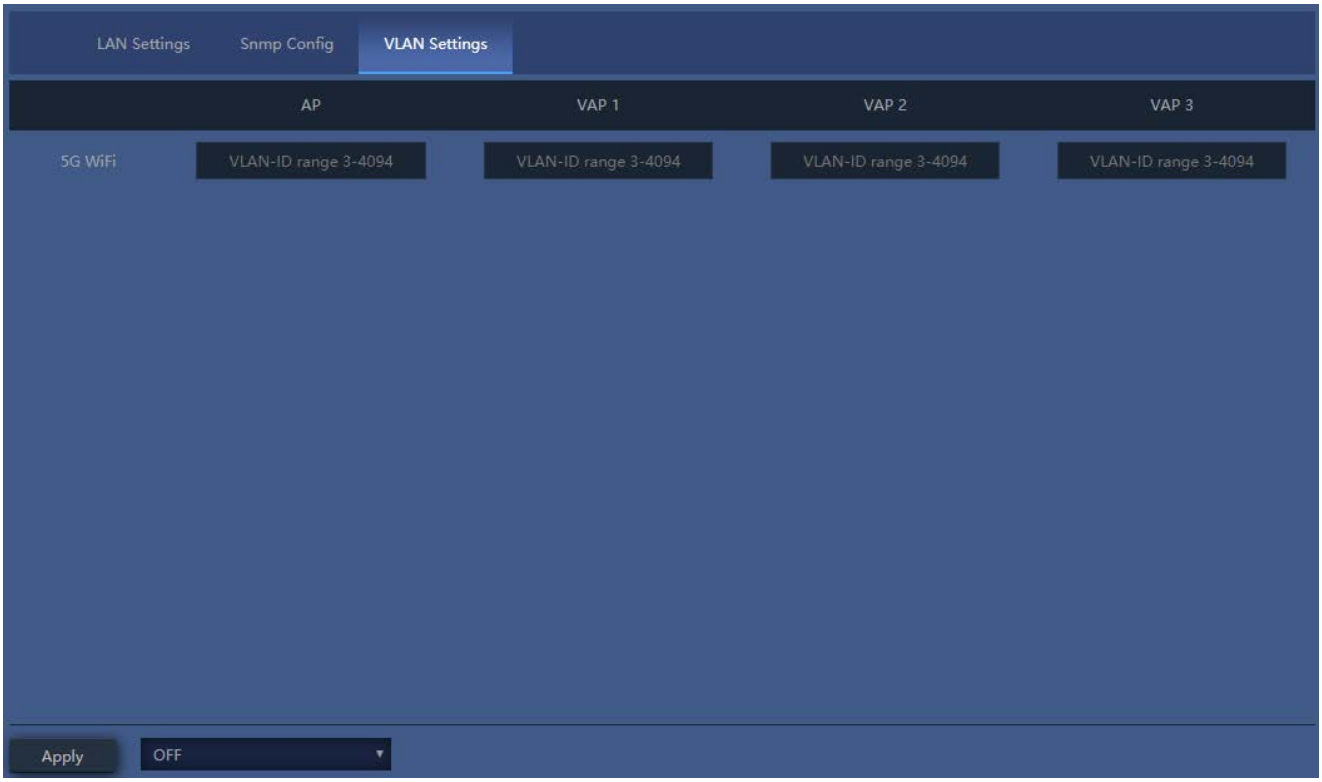


Figure 5-11 VLAN Settings

The page includes the following fields:

Object	Description
AP	Select AP or VAP included in the VLAN
VLAN ID	Enter the VLAN ID from 3 to 4094

5.7.5.4. WAN Settings

Static IP

If your ISP offers you static IP Internet connection type, select "**Static IP**" and then enter IP address, subnet mask, default gateway and primary DNS information provided by your ISP in the corresponding fields.

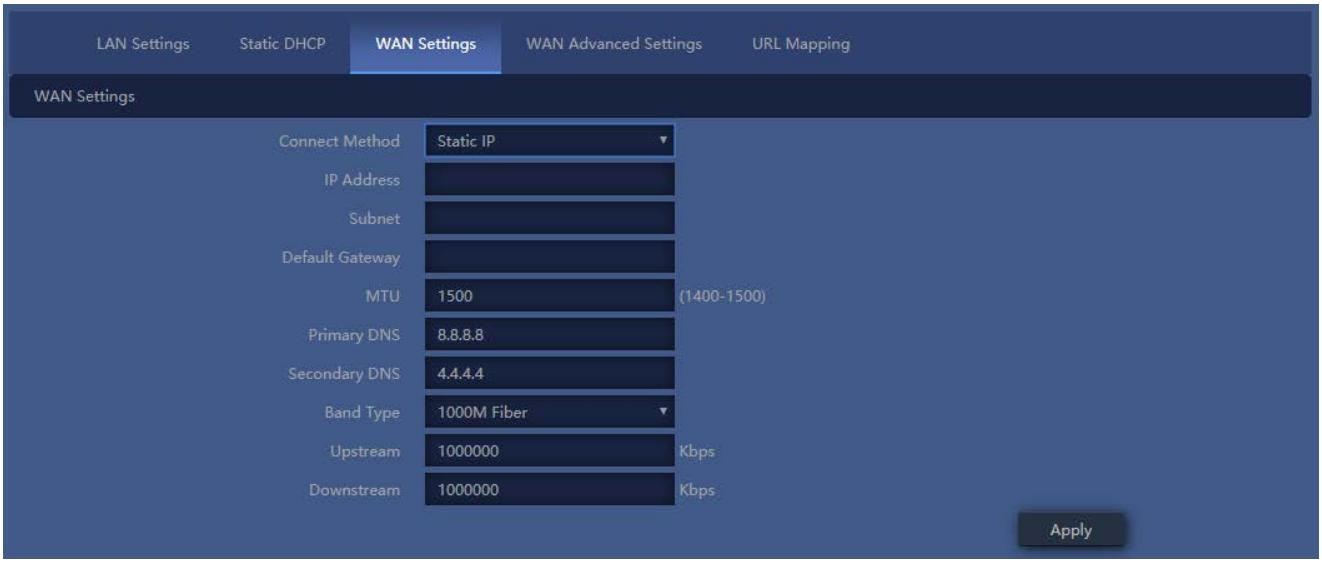


Figure 5-12 Static IP

The page includes the following fields:

Object	Description
IP Address	Enter the WAN IP address provided by your ISP. Enquire your ISP if you are not clear
Subnet	Enter WAN Subnet Mask provided by your ISP
Default Gateway	Enter the WAN Gateway address provided by your ISP
MTU	Maximum Transmission Unit. Default is 1500
Primary DNS	Enter the necessary DNS address provided by your ISP
Secondary DNS	Enter the secondary DNS address provided by your ISP
Upstream	Enter limited upstream throughput, default is **1000000** Kbps
Downstream	Enter limited downstream throughput, default is **1000000** Kbps

PPPoE (ADSL)

Select **PPPOE** if your ISP is using a PPPoE connection and provide you with PPPoE user name and password info.

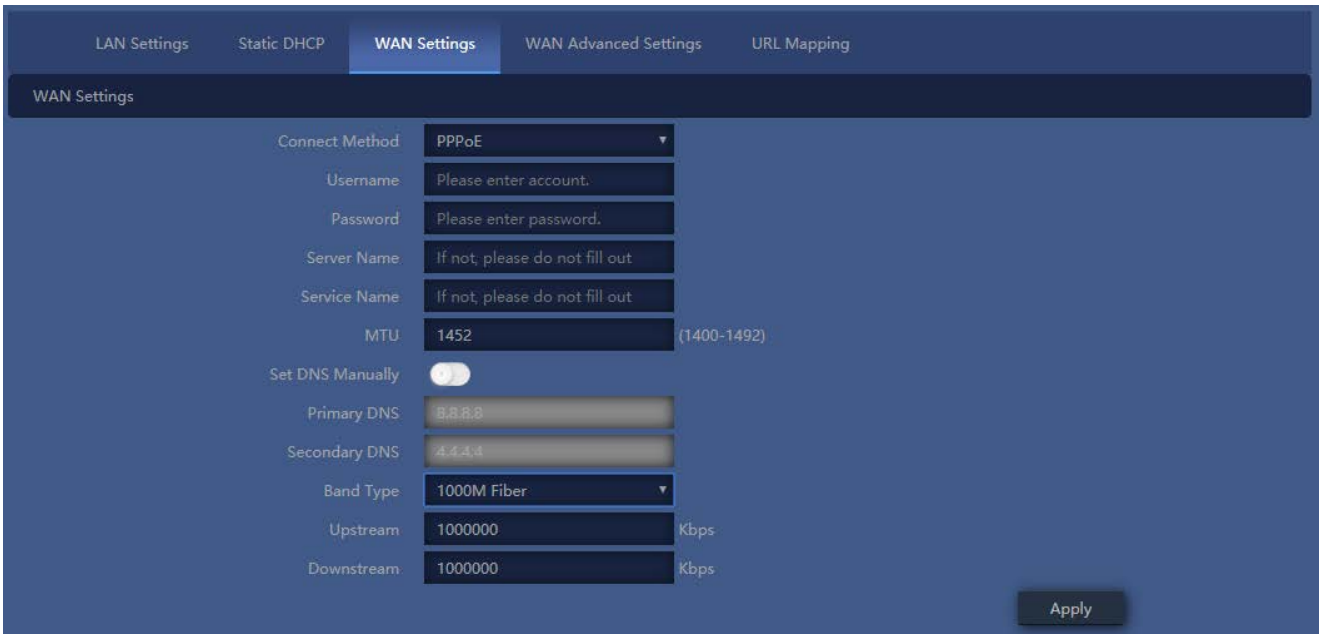


Figure 5-13 PPPoE (ADSL)

The page includes the following fields:

Object	Description
Username	Enter the PPPoE User Name provided by your ISP
Password	Enter the PPPoE password provided by your ISP
Set DNS Manually	Enable/Disable DNS Manually
Primary DNS	Enter the necessary DNS address provided by your ISP
Secondary DNS	Enter the secondary DNS address provided by your ISP
MTU	Maximum Transmission Unit. Default is 1452
Band Type	Select the band type provided by your ISP
Upstream	Enter limited upstream throughput, default is **1000000** Kbps
Downstream	Enter limited downstream throughput, default is **1000000** Kbps

DHCP

Choose "**DHCP**" and the router will automatically obtain IP addresses, subnet masks and gateway addresses from your ISP.

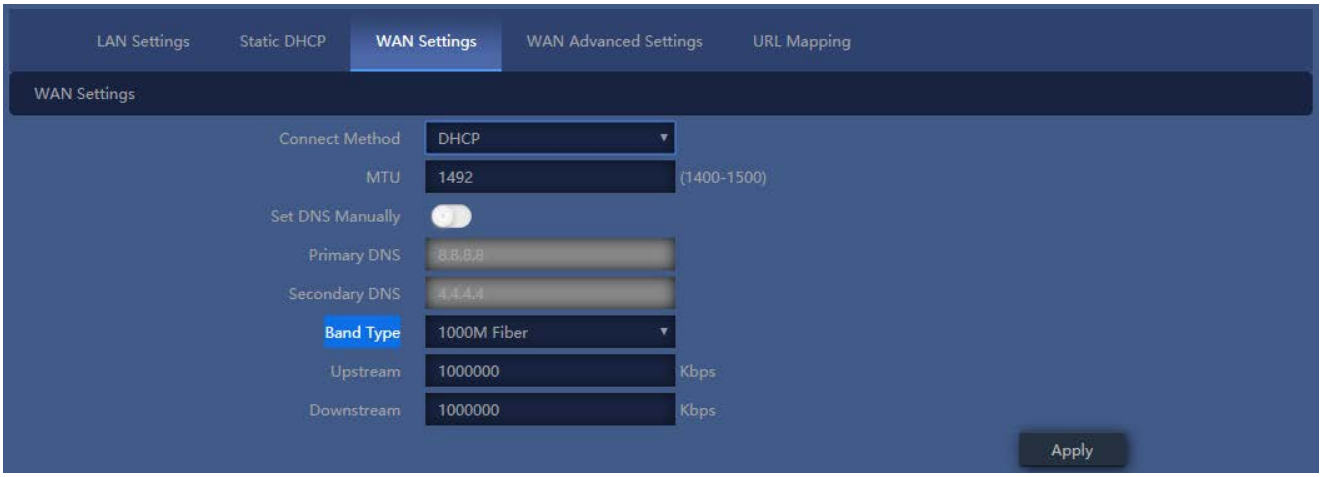


Figure 5-14 DHCP

The page includes the following fields:

Object	Description
MTU	Maximum Transmission Unit. Default is 1452
Set DNS Manually	Enable/Disable DNS Manually
Primary DNS	Enter the necessary DNS address provided by your ISP
Secondary DNS	Enter the secondary DNS address provided by your ISP
Band Type	Select the band type provided by your ISP
Upstream	Enter limited upstream throughput, default is **1000000** Kbps
Downstream	Enter limited downstream throughput, default is **1000000** Kbps

5.7.5.5. WAN advanced settings

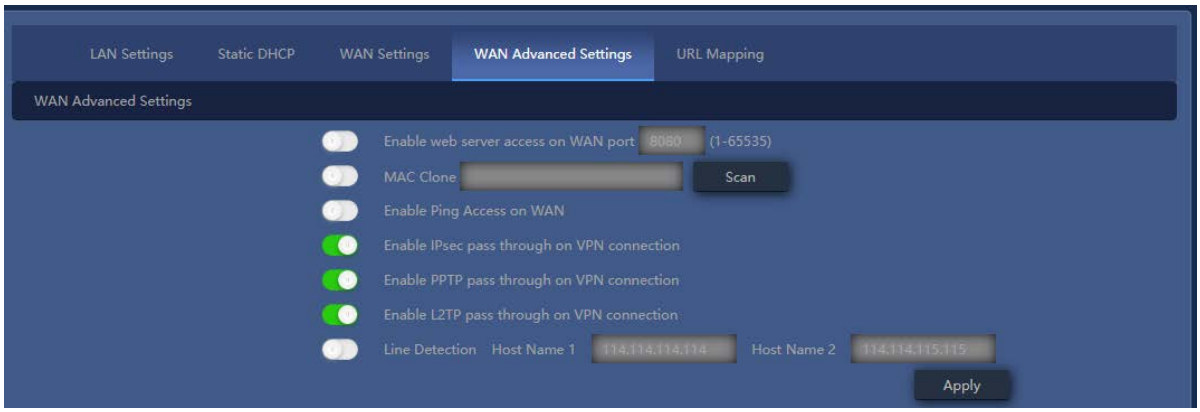


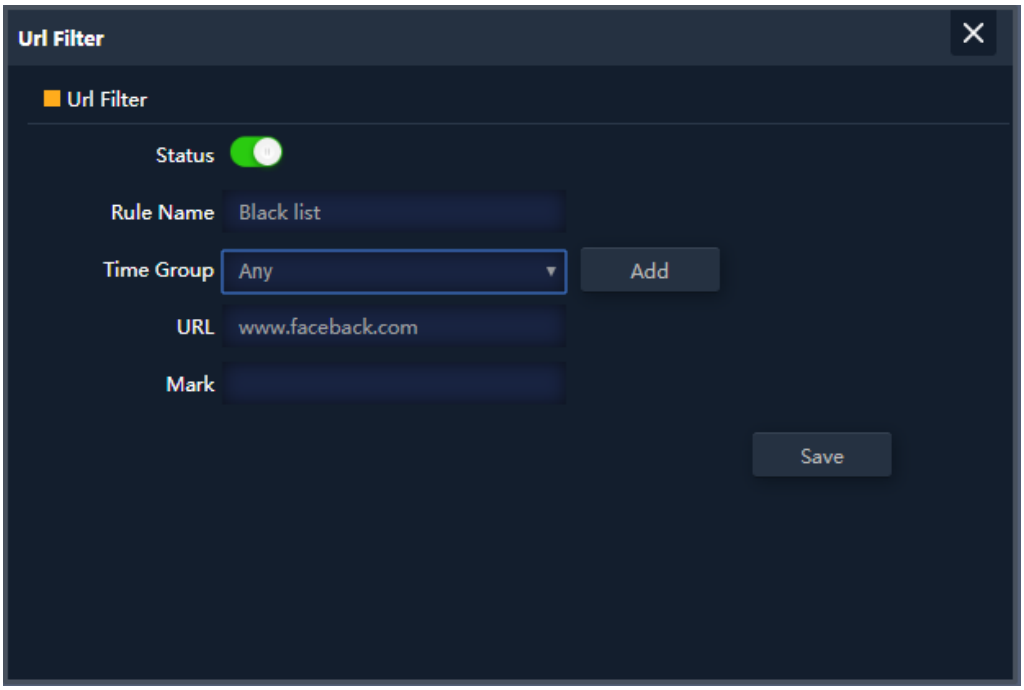
Figure 5-15 WAN advanced settings

The page includes the following fields:

Object	Description
Enable web server access on WAN port	Enable to access from WAN, default port is 8080
MAC clone	Enable and scan to clone the MAC address
Enable Ping Access on WAN	Enable or Disable this function
Enable IPsec passthrough on VPN connection	Enable or disable IPSec to pass through IPSec communication data.
Enable PPTP passthrough on VPN connection	Enable or disable PPTP to pass through PPTP communication data.
Enable L2TP passthrough on VPN connection	Enable or disable L2TP to pass through L2TP communication data.
Line Detection	Enable to ping Host 1 and Host 2 IP. If ping fails, the WAN will be disconnected.

5.7.6 Security

5.7.6.1. URL Filtering



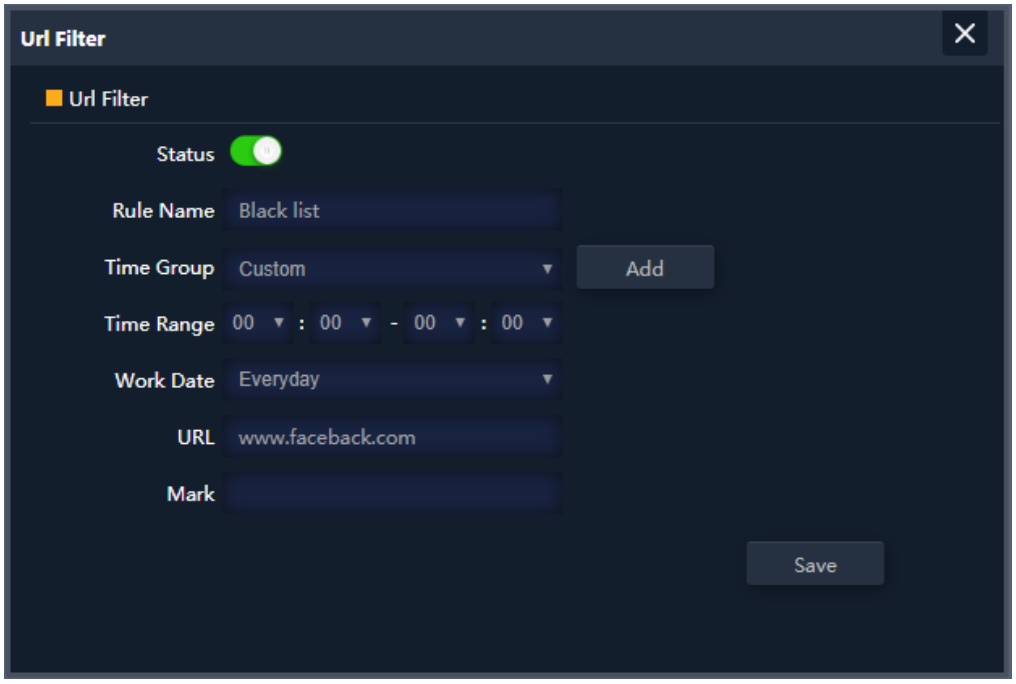


Figure 5-36 URL Filtering

The page includes the following fields:

Object	Description
Add	Press the "**Add**" button to add the rule
Delete	Press the "**Delete**" button to delete the rule
Apply	Press the "**Apply**" button to enable/disable the rule
Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable
Rule Name	Enter the rule name, e.g. Black list
Time Group	Select **Any** or **Customer** to set up time range and work data.
URL	Enter the URL that you need to put in black list
Mark	Enter the mark string, or not

Enable/disable URL filter function

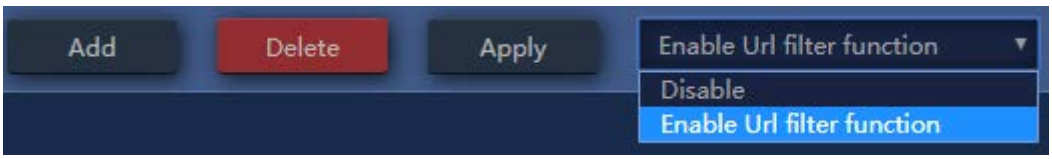


Figure 5-37 URL Filtering

5.7.6.2. IP/Port Filtering

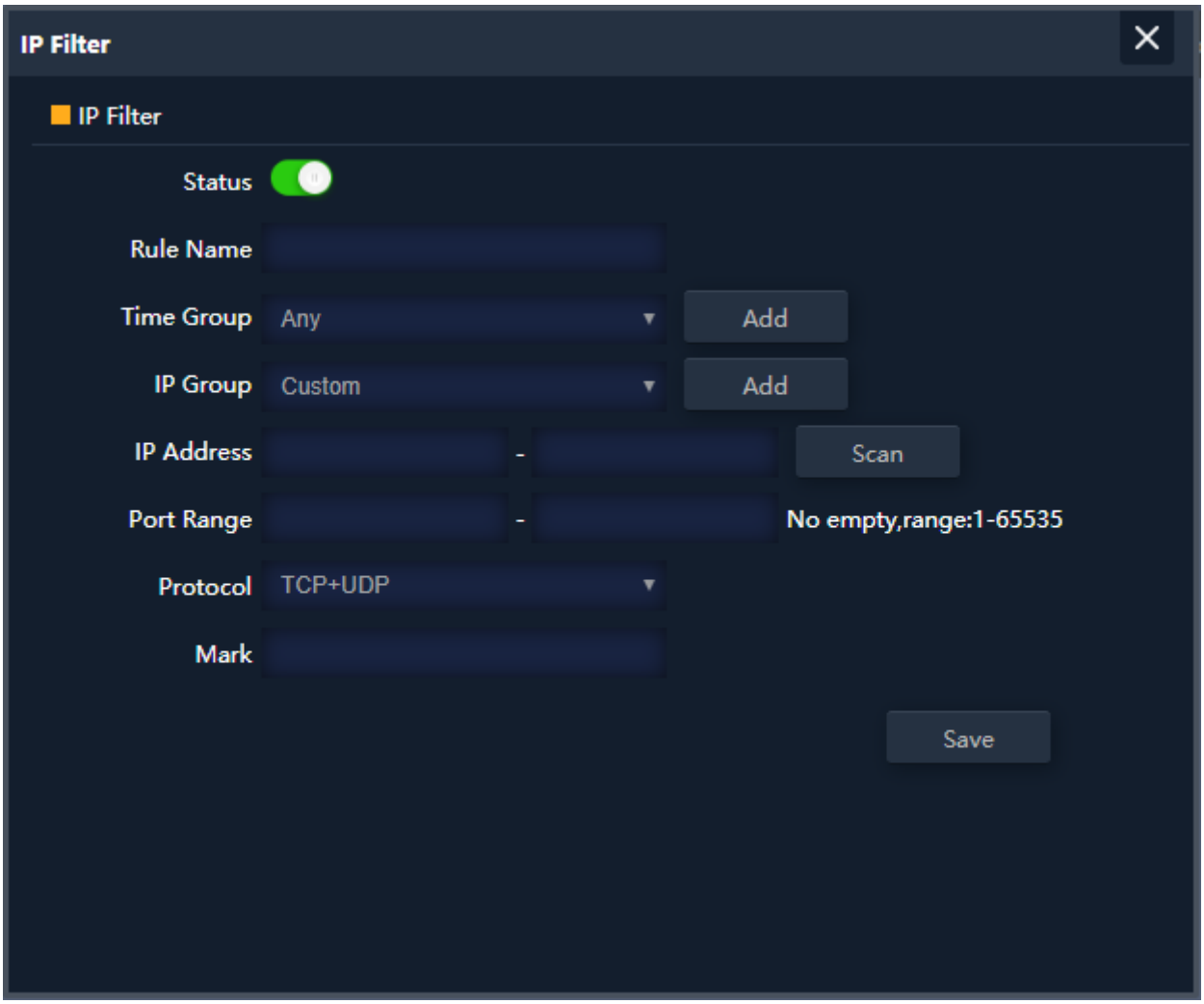


Figure 5-38 IP/Port Filtering

The page includes the following fields:

Object	Description
Add	Press the "**Add**" button to add the rule in the black or white list
Delete	Press the "**Delete**" button to delete the rule
Apply	Press the "**Apply**" button to enable/disable the rule
Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable
Rule Name	Enter the rule name, e.g. Black list
Time Group	Select **Any** or **Customer** to set up time range and work data.
IP Group	Select IP Group for adding IP by entering IP range or by scanning devices
IP Address	Enter the IP that you need to put in black or white list

Port Range	Enter the web port to access
Protocol	Select **TCP**, **UDP** or **TCP+UDP**
Mark	Enter the mark string, or not
IP/Port Filtering Status	Select the rule of IP/Port Filtering, default is **Disable**. Whitelist: **Allow the devices to pass in the rule** Blacklist: **Prohibited rules within the device through**

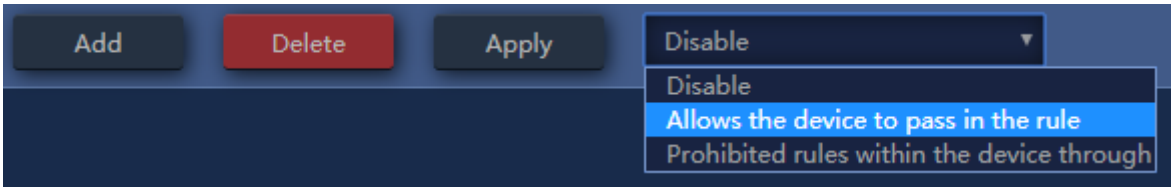
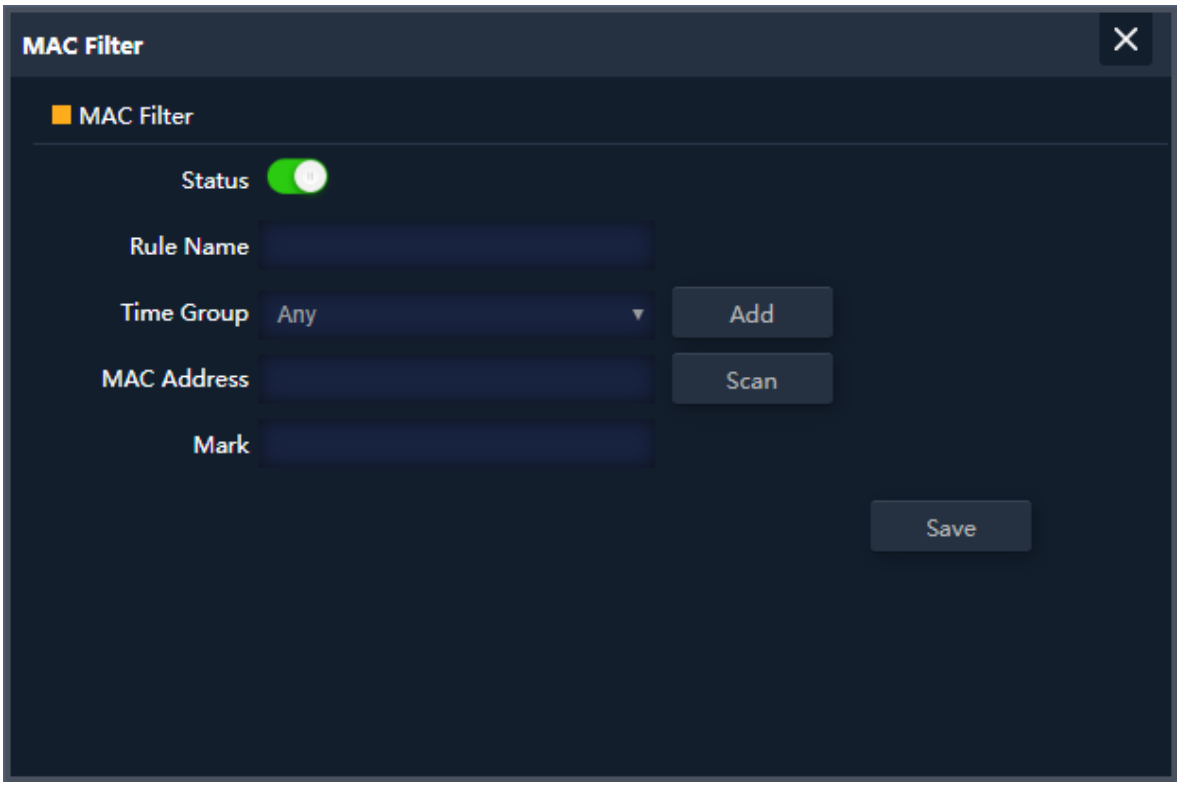


Figure 5-39 IP/Port Filtering

5.7.6.3. MAC Filtering



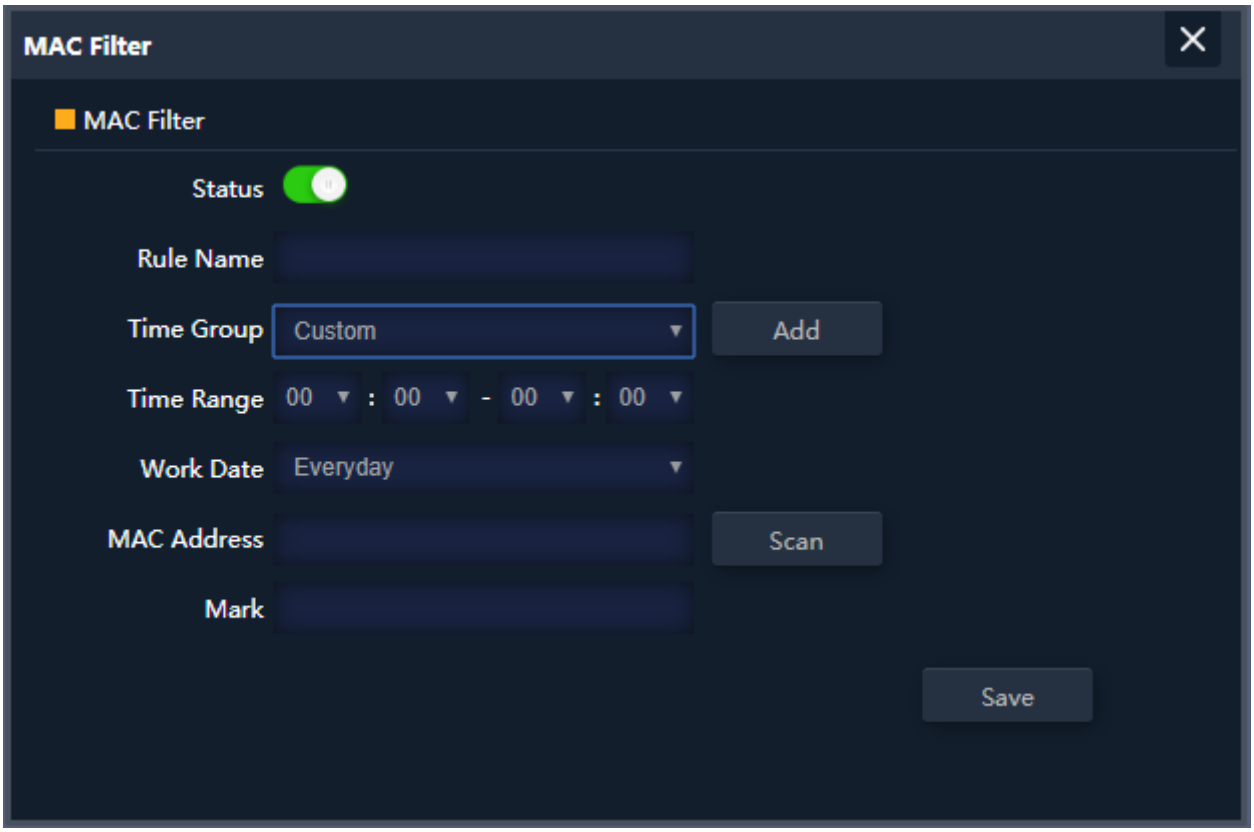


Figure 5-40 MAC Filtering

The page includes the following fields:

Object	Description
Add	Press the "**Add**" button to add the rule in the black or white list
Delete	Press the "**Delete**" button to delete the rule
Apply	Press the "**Apply**" button to enable/disable the rule
Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable
Rule Name	Enter the rule name, e.g. Black list
Time Group	Select **Any** or **Customer** to set up time range and work data.
MAC Address	Enter the MAC address that you need to put in black or white list
Mark	Enter the mark string, or not
MAC Filtering Status	Select the rule of MAC Filtering, default is **Disable**. Whitelist: **Allow the devices to pass in the rule** Blacklist: **Prohibited rules within the device through**

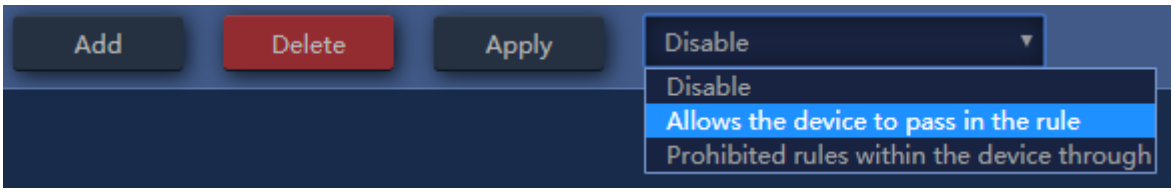


Figure 5-41 IP/Port Filtering

5.7.6.4. Security (Port Mapping/Port Forwarding)

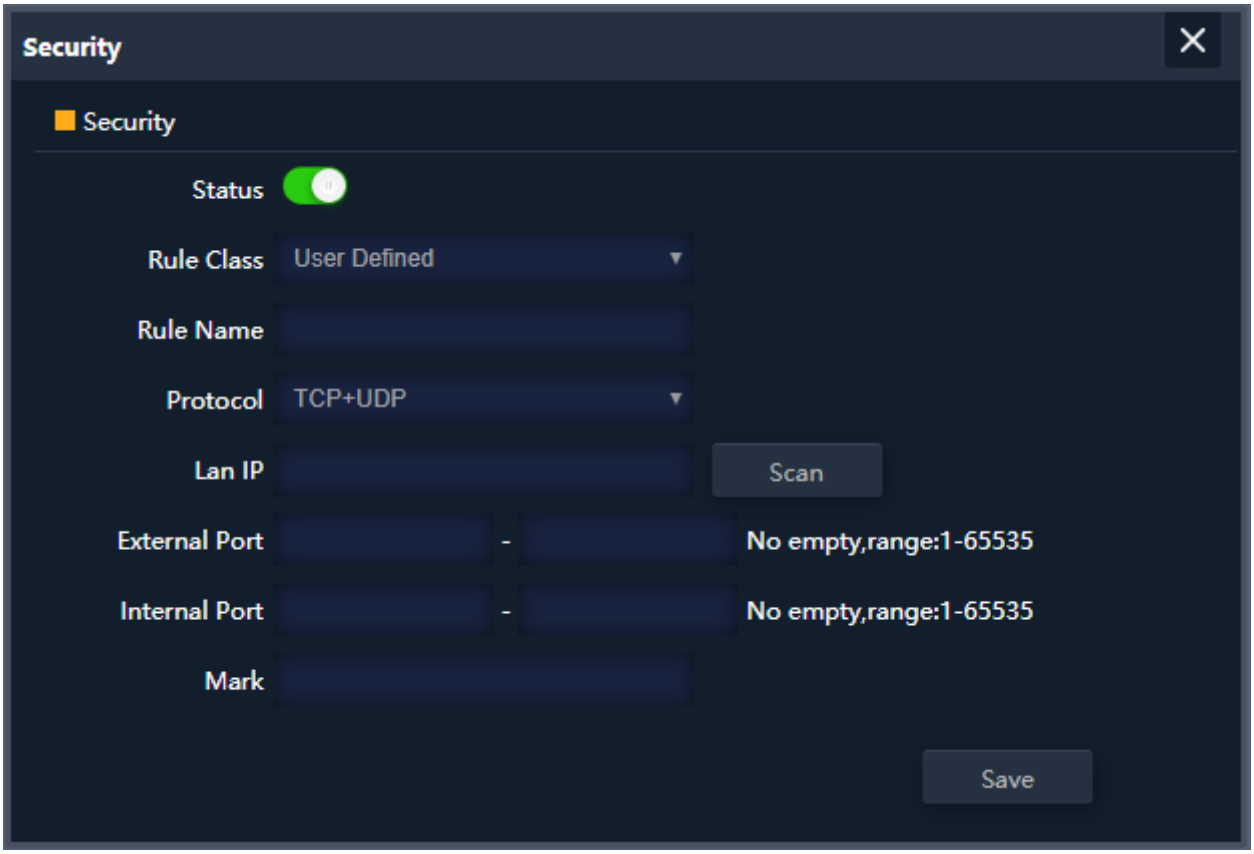


Figure 5-42 Port Mapping

The page includes the following fields:

Object	Description
Add	Press the "**Add**" button to add the rule in the black or white list
Delete	Press the "**Delete**" button to delete the rule
Apply	Press the "**Apply**" button to enable/disable the rule
Status	Select **ON (Green)** or **OFF (Gray)** to enable or disable
Rule Name	Enter the rule name, e.g. Black list
Protocol	Select **TCP**, **UDP** or **TCP+UDP**

LAN IP	Enter the IP address that you need for port forwarding
External Port	Enter the external port range
Internal Port	Enter the internal port range
Mark	Enter the mark string, or not

Enable/disable Port Mapping function

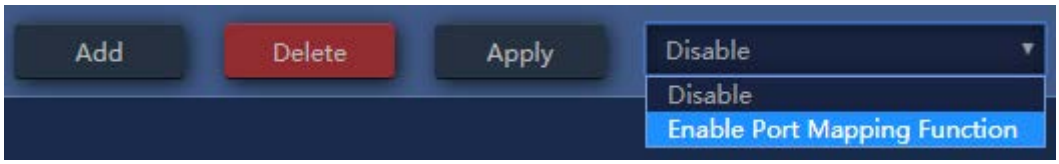


Figure 5-43 Port Mapping

5.7.6.5. DMZ

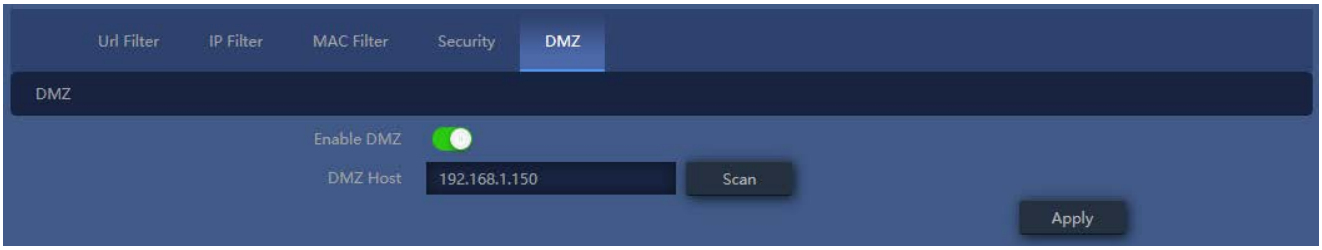


Figure 5-44 DMZ

The page includes the following fields:

Object	Description
Enable DMZ	Select **Enable DMZ Host** or **Disable**
DMZ Host IP	Enter the DMZ LAN IP

Chapter 6. Quick Connection to a Wireless Network

In the following sections, the **default SSID** of the WBS-512AC is configured to "**default**".

6.1 Windows XP (Wireless Zero Configuration)

Step 1: Right-click on the **wireless network icon** displayed in the system tray

Figure 6-1 System Tray – Wireless Network Icon

Step 2: Select [**View Available Wireless Networks**]

Step 3: Highlight and select the wireless network (SSID) to connect

(1) Select SSID [default]

(2) Click the [**Connect**] button

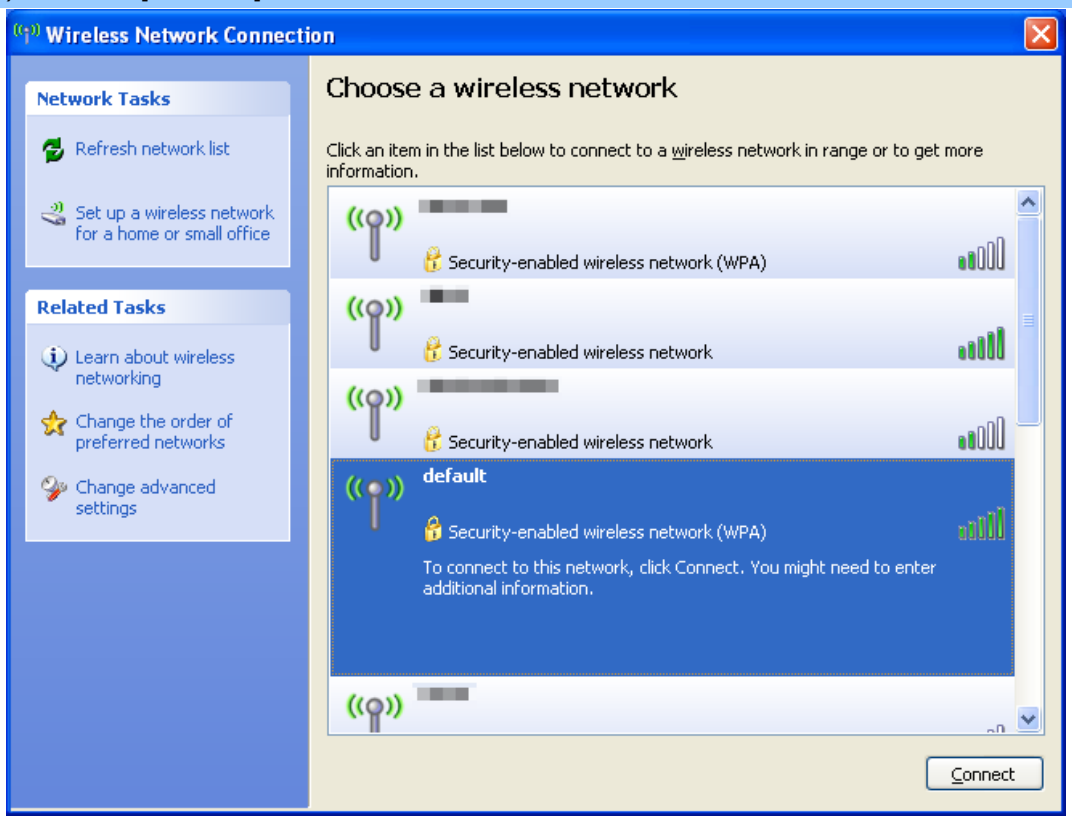


Figure 6-2 Choosing a Wireless Network

Step 4: Enter the **encryption key** of the wireless AP

(1) The Wireless Network Connection box will appear

(2) Enter the encryption key that is configured in section 5.7.1.1

(3) Click the [Connect] button

Figure 6-3 Entering the Network Key

Step 5: Check if "**Connected**" is displayed

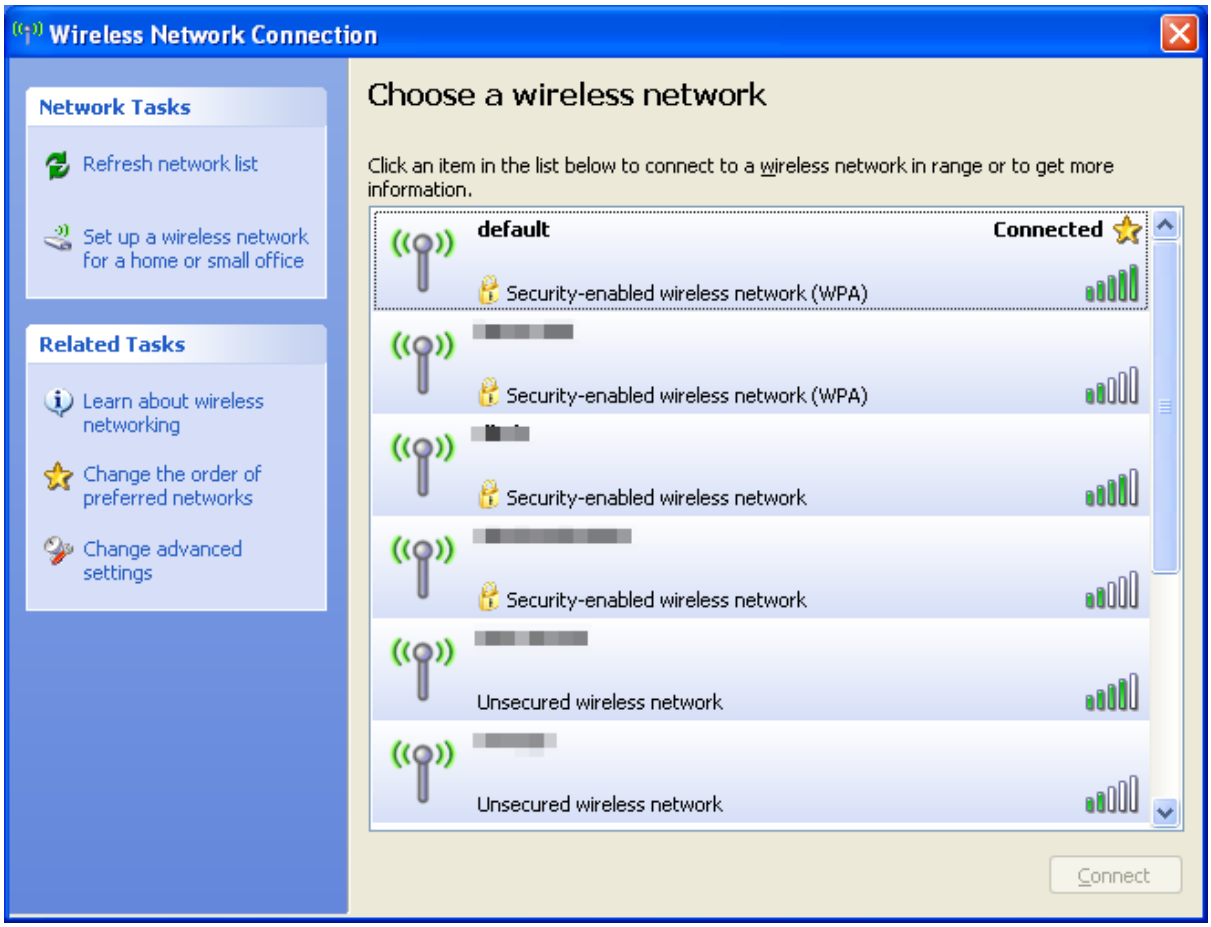


Figure 6-4 Choosing a Wireless Network -- Connected

Some laptops are equipped with a “Wireless ON/OFF” switch for the internal wireless LAN. Make sure the hardware-based wireless switch is switched to “ON” position.

6.2 Windows 7 (WLAN AutoConfig)

WLAN AutoConfig service is built-in in Windows 7 that can be used to detect and connect to wireless network. This built-in wireless network connection tool is similar to wireless zero configuration tool in Windows XP.

Step 1: Right-click on the **network icon** displayed in the system tray

Figure 6-5 Network Icon

Step 2: Highlight and select the wireless network (SSID) to connect

(1) Select SSID [**default**]

(2) Click the [**Connect**] button

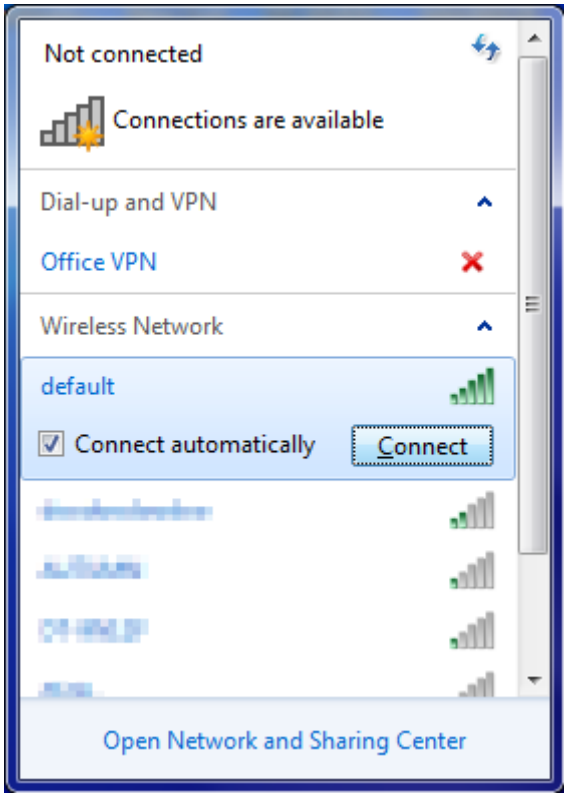


Figure 6-6 WLAN AutoConfig

Note

If you will be connecting to this Wireless AP in the future, check [**Connect automatically**].

Step 4: Enter the **encryption key** of the wireless AP

(1) The Connect to a Network box will appear

(2) Enter the encryption key that is configured in section 5.7.1.1

(3) Click the [OK] button

Figure 6-7 Typing the Network Key

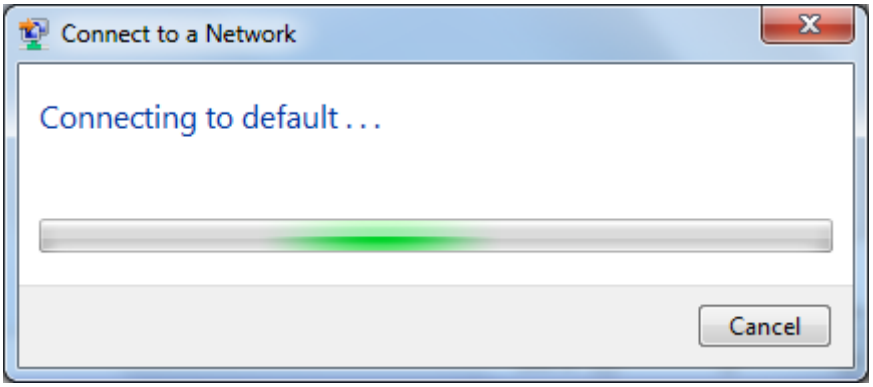


Figure 6-8 Connecting to a Network

Step 5: Check if "**Connected**" is displayed

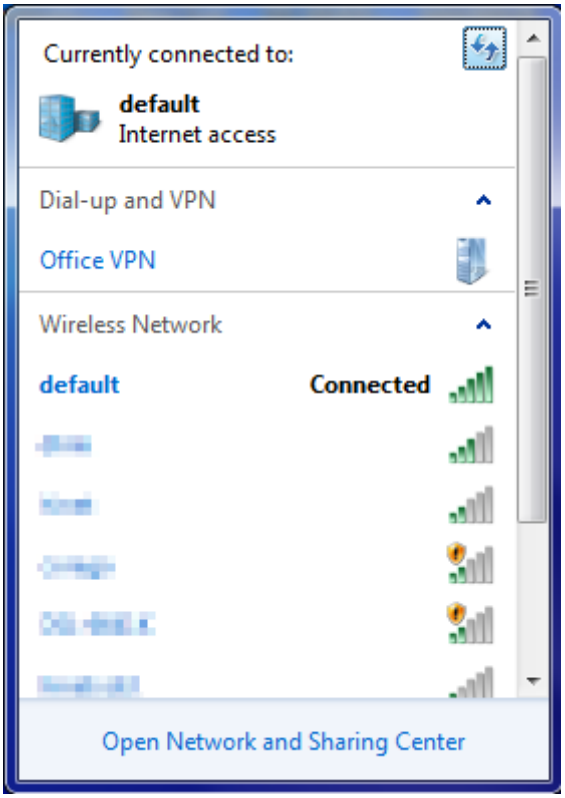


Figure 6-9 Connected to a Network

6.3 Mac OS X 10.x

In the following sections, the default SSID of the WBS-512AC is configured to “default”.

Step 1: Right-click on the **network icon** displayed in the system tray

The AirPort Network Connection menu will appear

Figure 6-10 Mac OS – Network Icon

Step 2: Highlight and select the wireless network (SSID) to connect

(1) Select and SSID [**default**]

(2) Double-click on the selected SSID

Figure 6-11 Highlighting and Selecting the Wireless Network

Step 4: Enter the **encryption key** of the wireless AP

(1) Enter the encryption key that is configured in section 5.7.1.1

(2) Click the [OK] button

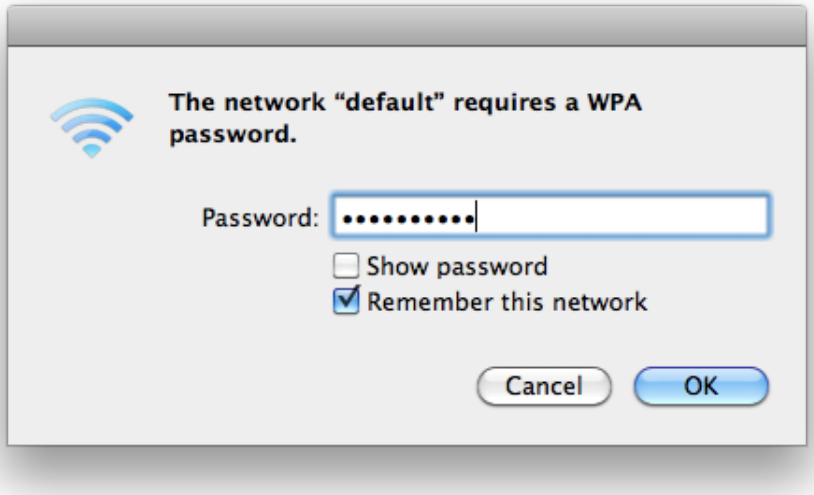


Figure 6-12 Enter the Password

Note

If you will be connecting to this Wireless AP in the future, check [**Remember this network**].

Step 5: Check if the AirPort is connected to the selected wireless network.

If "Yes", then there will be a "check" symbol in front of the SSID.

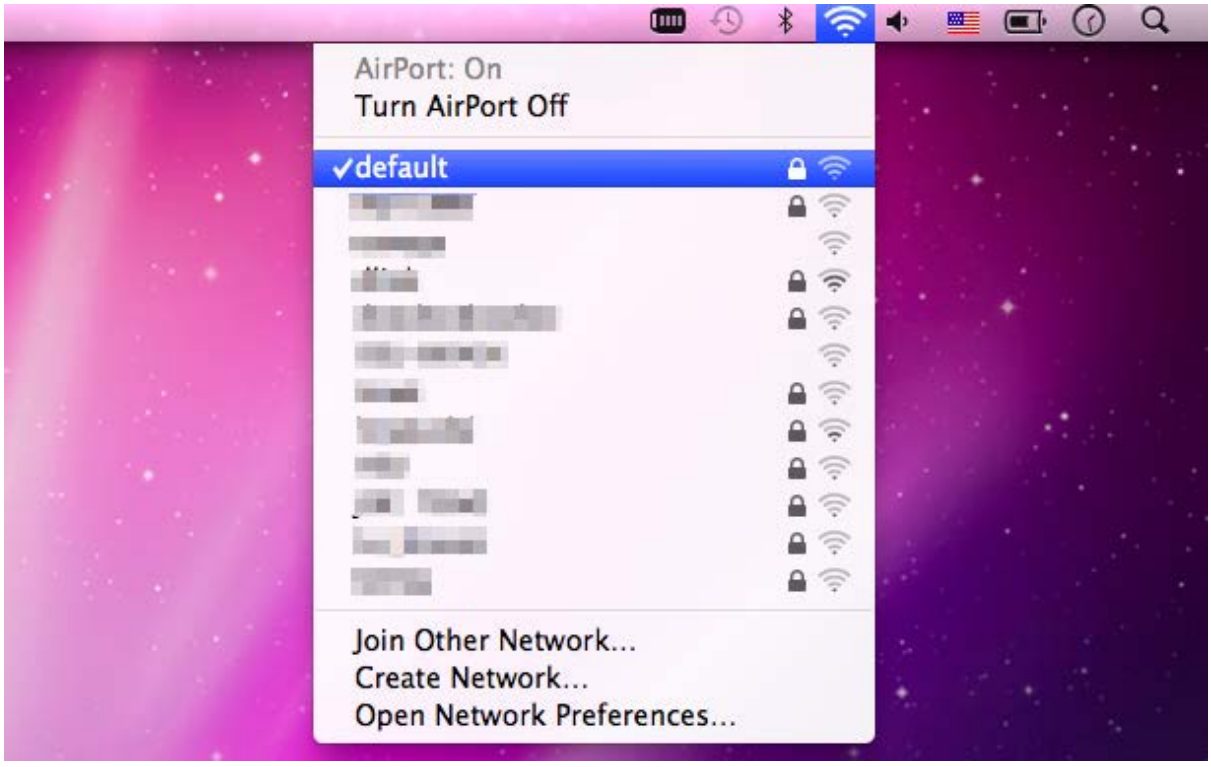


Figure 6-13 Connected to the Network

There is another way to configure the MAC OS X wireless settings:

Step 1: Click and open the [**System Preferences**] by going to **Apple** > **System Preference** or **Applications**

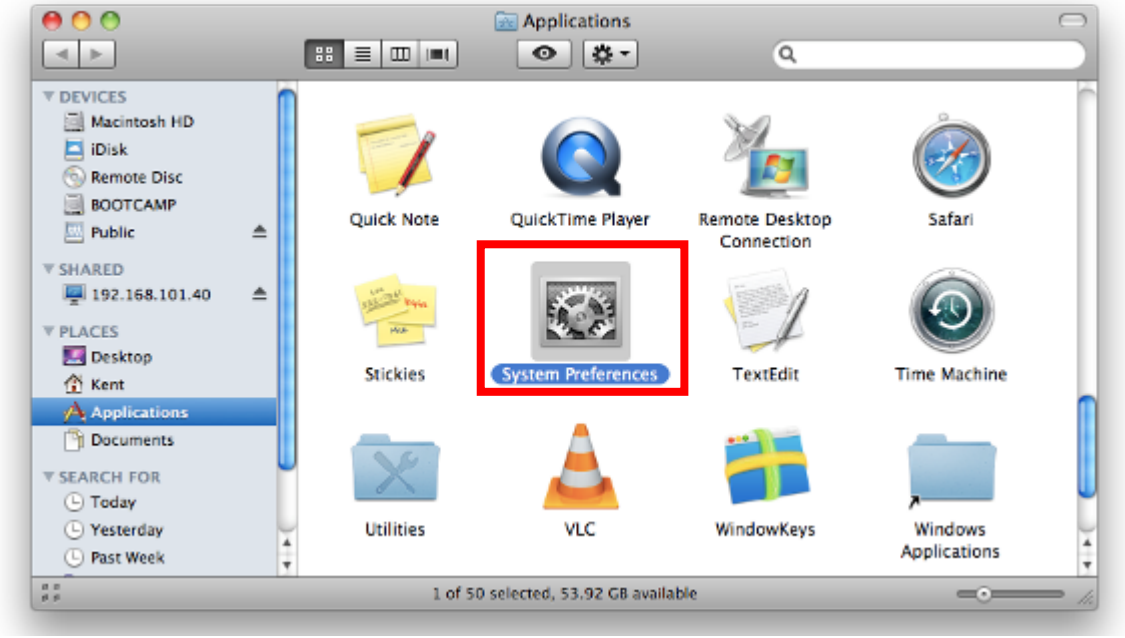


Figure 6-14 System Preferences

Step 2: Open **Network Preference** by clicking on the [**Network**] icon

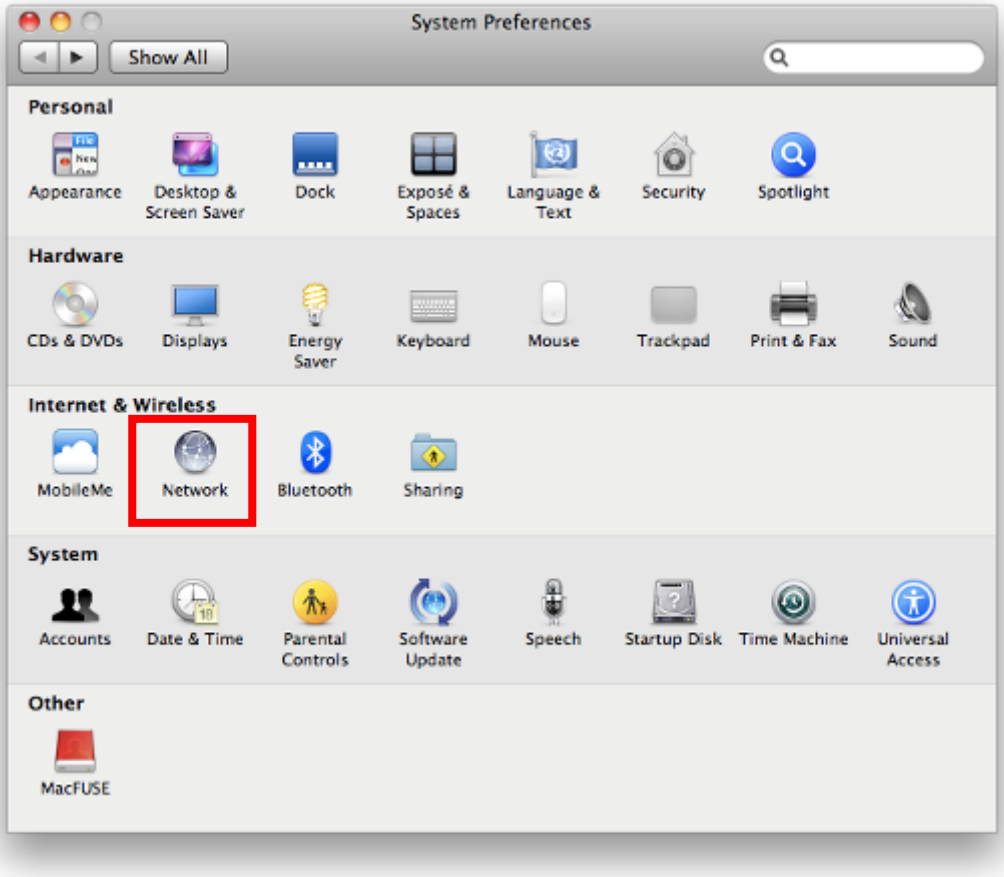


Figure 6-15 System Preferences -- Network

Step 3: Check Wi-Fi setting and select the available wireless network

(1) Choose the **AirPort** on the left-menu (make sure it is ON)

(2) Select Network Name [**default**] here

If this is the first time to connect to the Wireless AP, it should show “No network selected”.

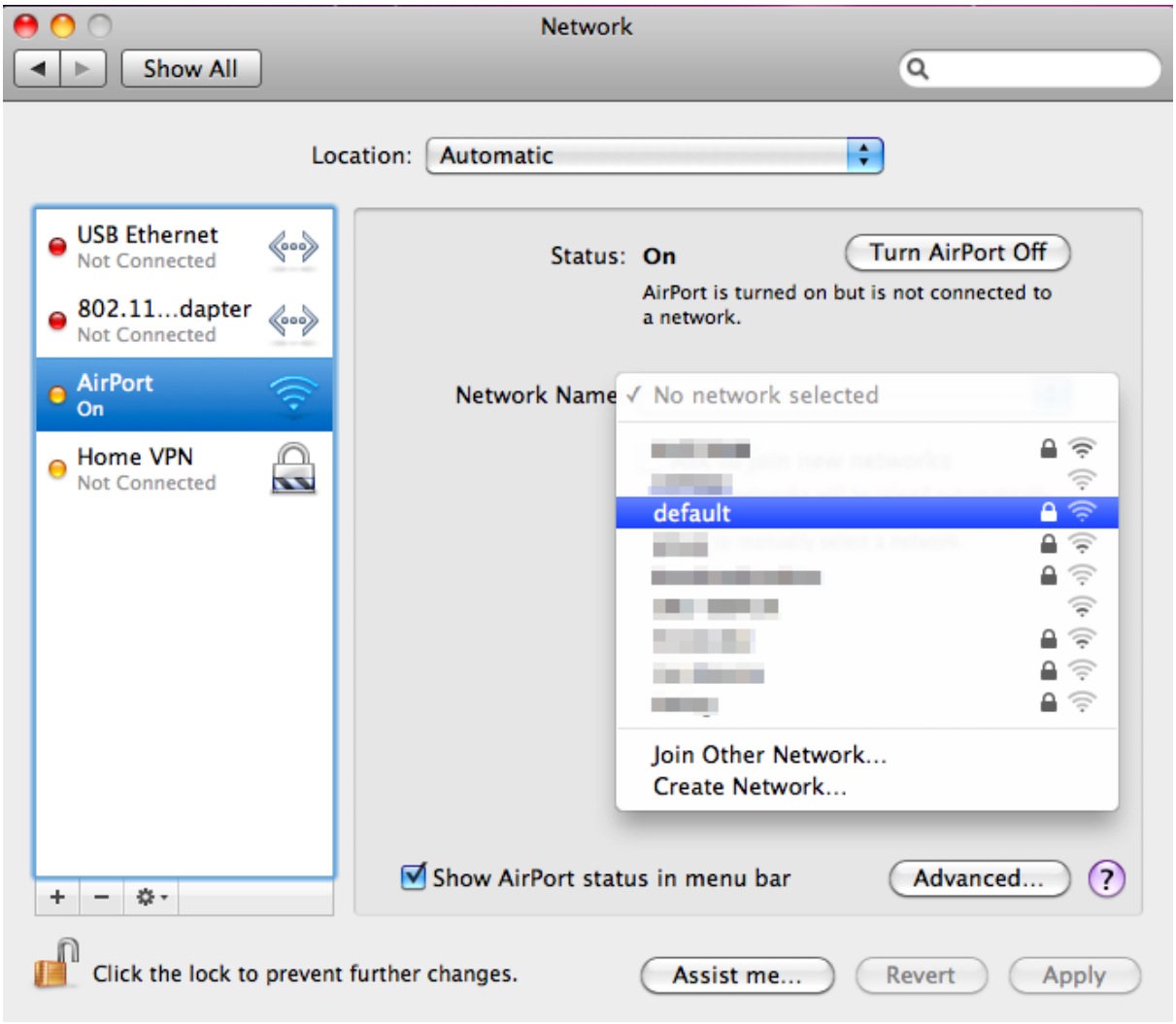


Figure 6-16 Selecting the Wireless Network

6.4 iPhone/iPod Touch/iPad

In the following sections, the **default SSID** of the WBS-512AC is configured to "**default**".

Step 1: Tap the [**Settings**] icon displayed in the home screen

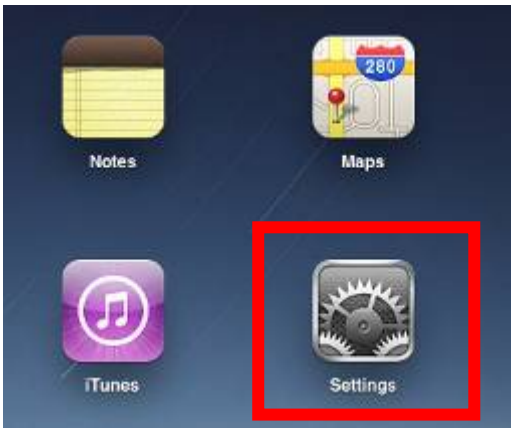


Figure 6-17 iPhone – Settings icon

Step 2: Check Wi-Fi setting and select the available wireless network

(1) Tap [**General**] \ [**Network**]

(2) Tap [**Wi-Fi**]

If this is the first time to connect to the Wireless AP, it should show "Not Connected".

Figure 6-18 Wi-Fi Setting

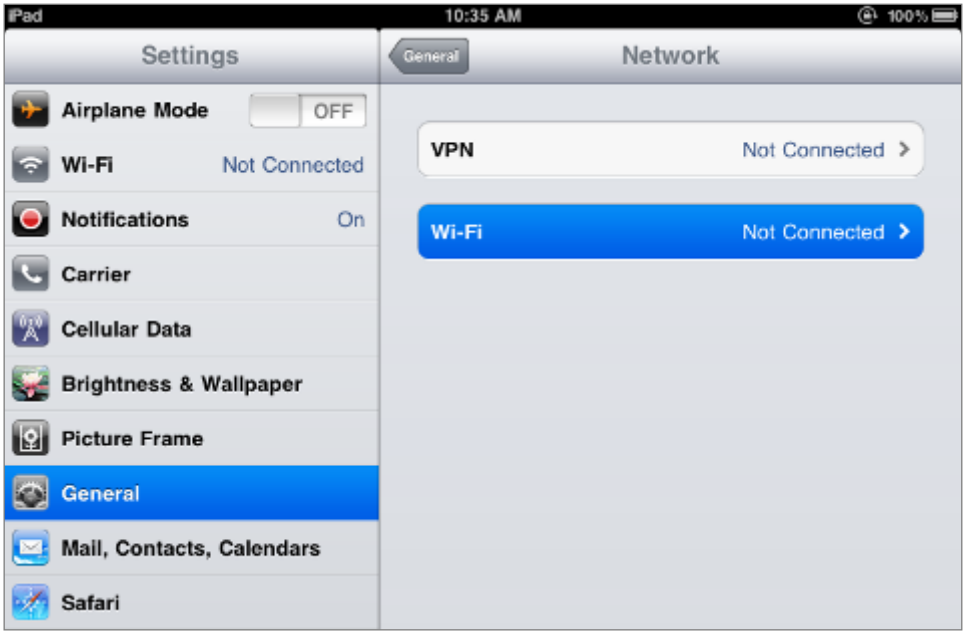


Figure 6-19 Wi-Fi Setting – Not Connected

Step 3: Tap the target wireless network (SSID) in "**Choose a Network…**"

(1) Turn on Wi-Fi by tapping "**Wi-Fi**"

(2) Select SSID [**default**]

Figure 6-20 Turning on Wi-Fi

Step 4: Enter the **encryption key** of the Wireless AP

(1) The password input screen will be displayed

(2) Enter the encryption key that is configured in section 5.7.1.1

(3) Tap the [**Join**] button

Figure 6-21 iPhone -- Entering the Password

Step 5: Check if the device is connected to the selected wireless network.

If “Yes”, then there will be a “check” symbol in front of the SSID.

Figure 6-22 iPhone -- Connected to the Network

Appendix A: Planet Smart Discovery Utility

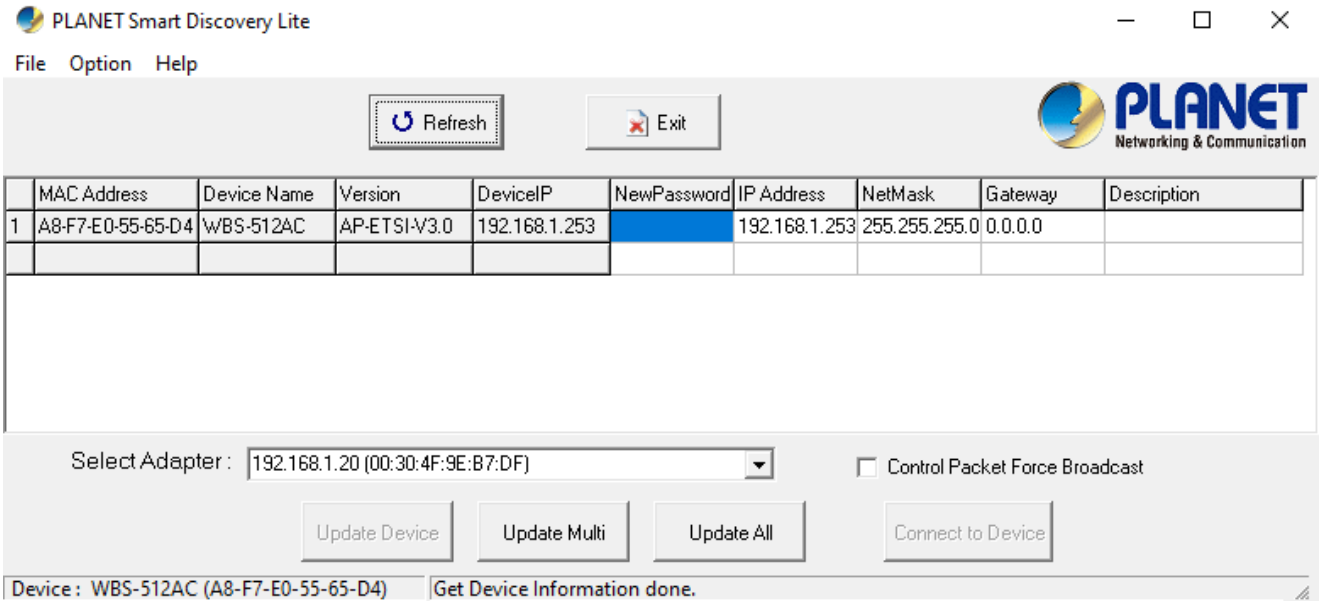
To easily list the WBS-512A in your Ethernet environment, the Planet Smart Discovery Utility is an ideal solution.

The following installation instructions guide you to running the Planet Smart Discovery Utility.

Step 1: Download the **Planet Smart Discovery Utility** from the administrator PC.

Step 2: Run this utility and the following screen appears.

Step 3: Press **"Refresh"** for the current connected devices in the discovery list as shown in the following screen:



Step 3: Press **"Connect to Device"** and then the Web login screen appears.

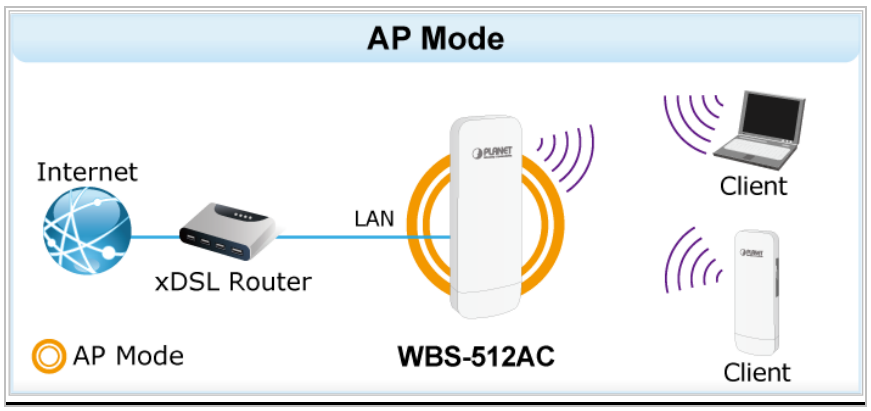
Note

The fields in white background can be modified directly and then you can apply the new setting by clicking "**Update Device**".

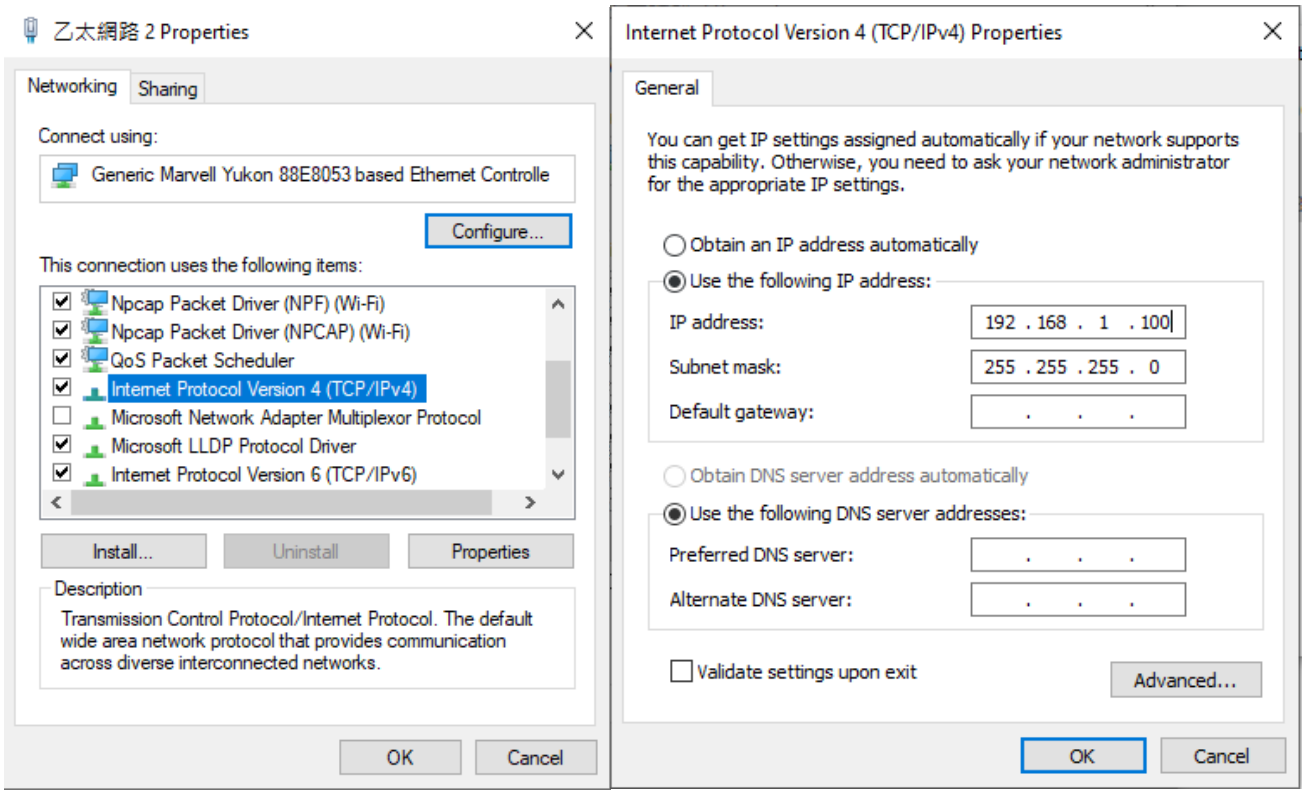
Appendix B: FAQs

Q1: How to set up the AP Client Connection

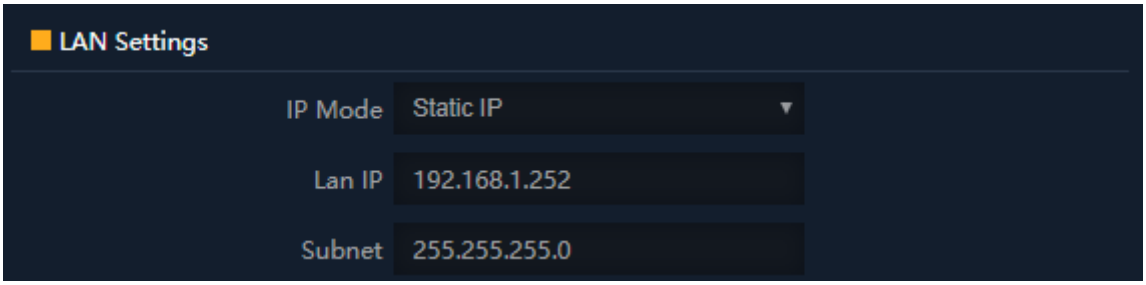
Topology:



Step1. Use static IP in the PCs that are connected with AP-1 (Site-1) and AP-2 (Site-2). In this case, Site-1 is "**192.168.1.100**", and Site-2 is "**192.168.1.200**".

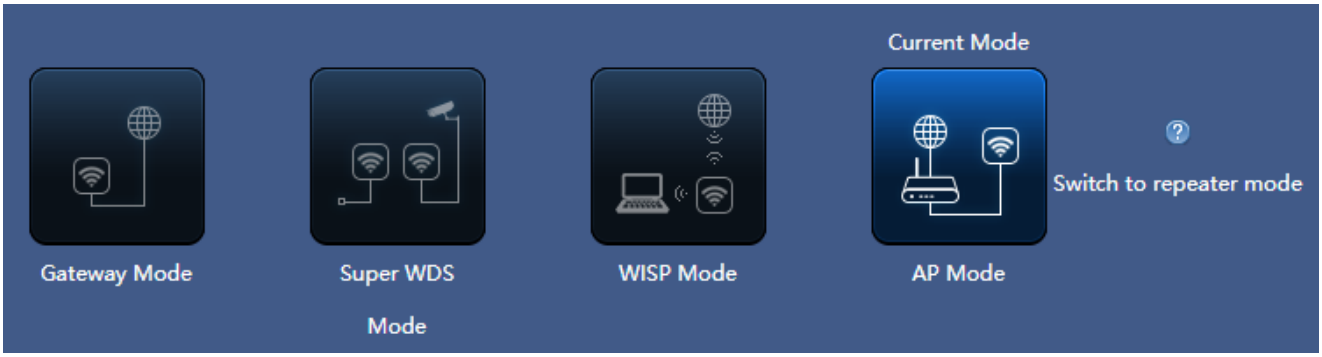


Step2. In AP-2, change the PtP switch to slave, the default IP is **192.168.1.100**.

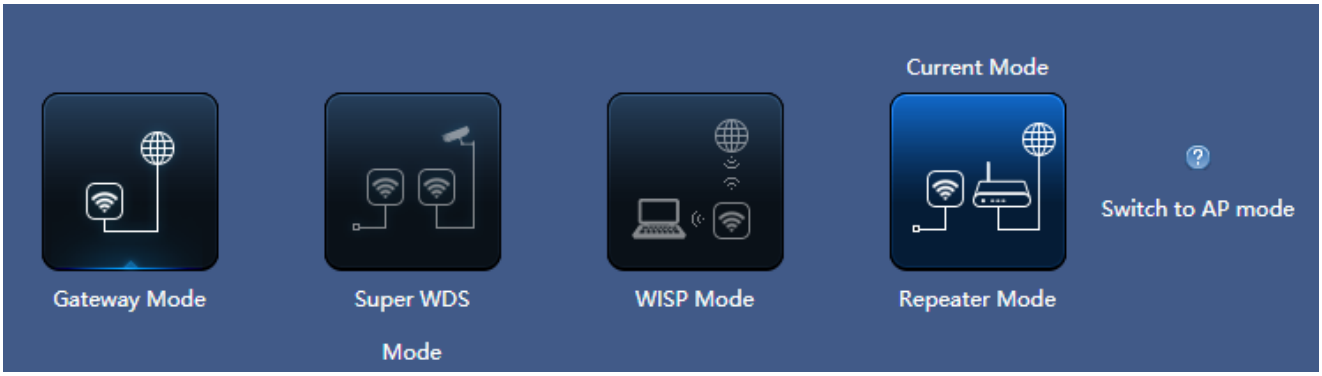


Step 3. In AP-1, go to "**Wizard**" to configure it to **AP Mode**. In AP-2, configure it to **Repeater Mode**.

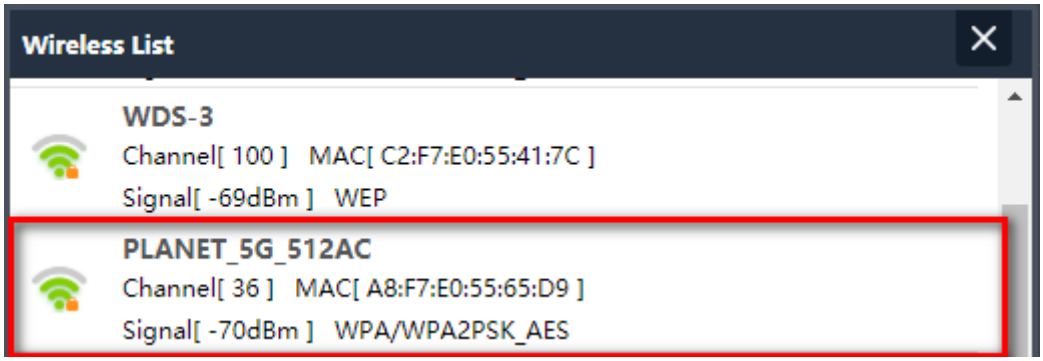
AP-1

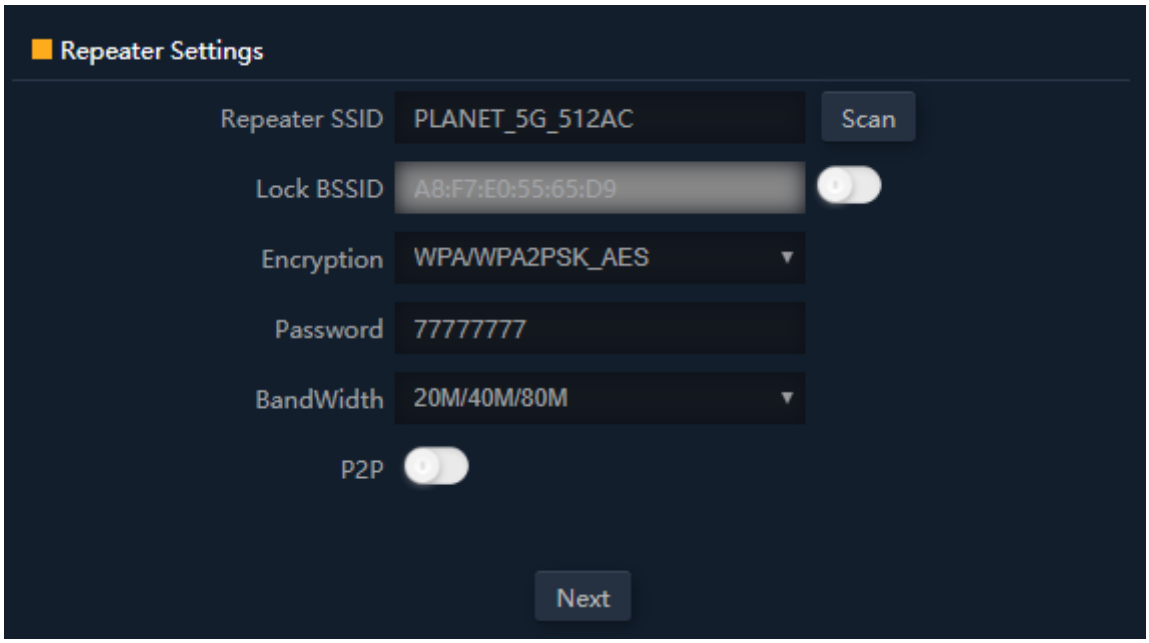


AP-2



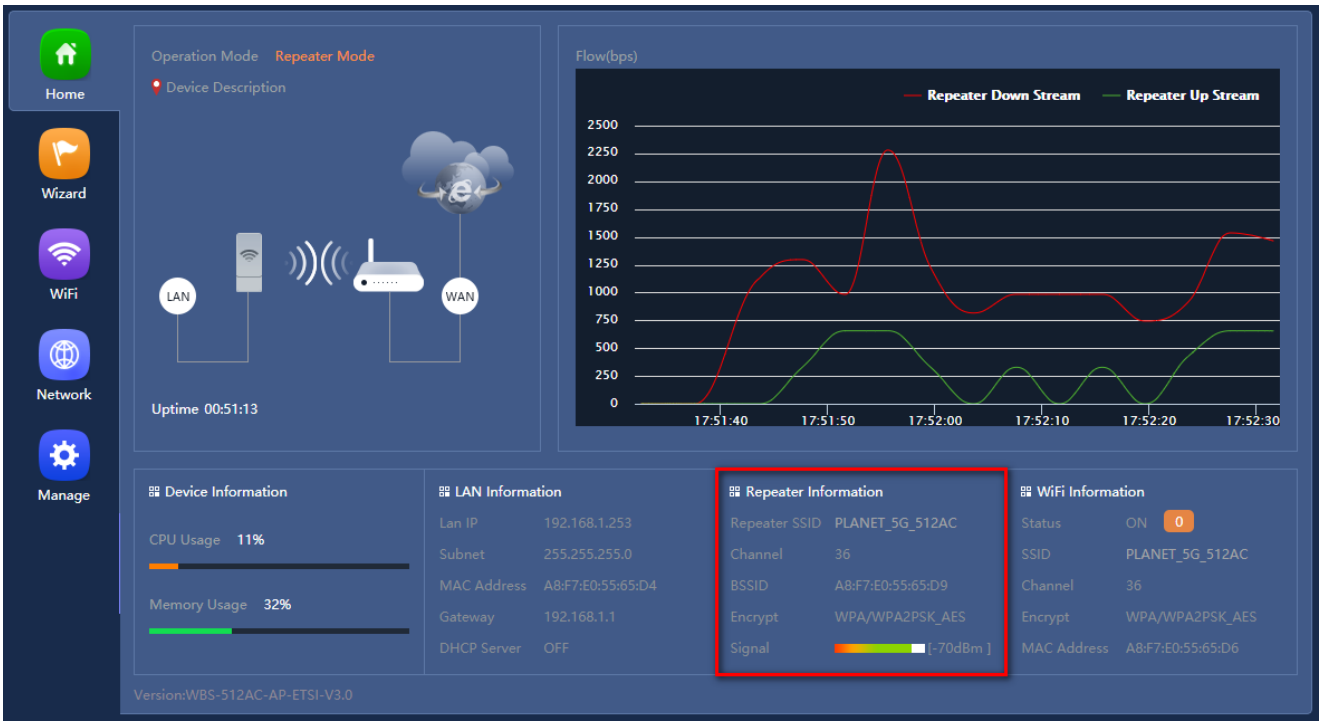
Step 4. In AP-2, press **Scan AP** to search the AP-1. You can also enter the MAC address, SSID, encryption and bandwidth if you know what they are.





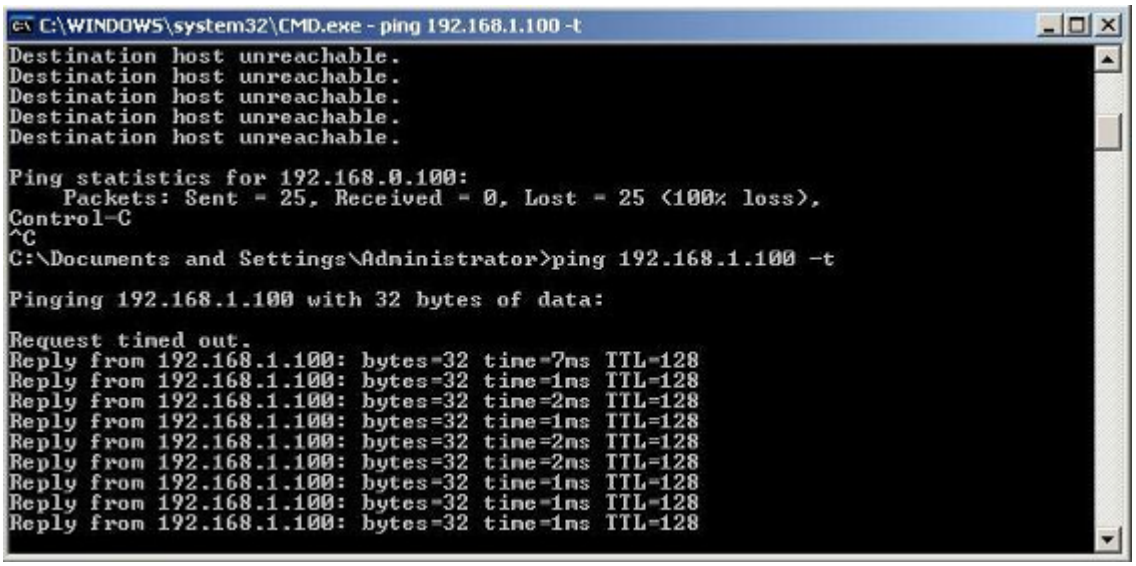
Step 5. Click "**Next**" to finish the setting.

Step 6. Go to "**Repeater Information**" to check connection status.

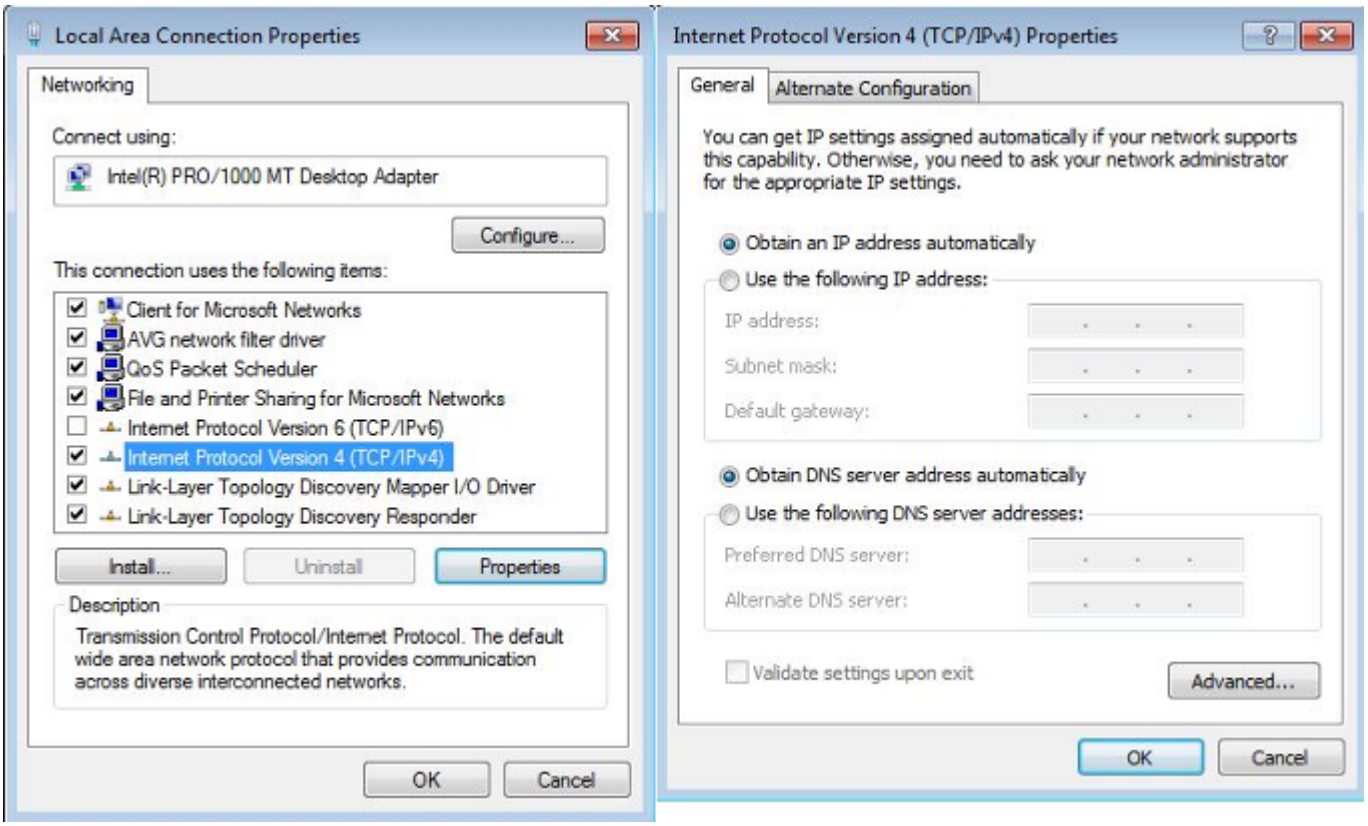


Step 7. Use command line tool to ping each other to ensure the link is successfully established.

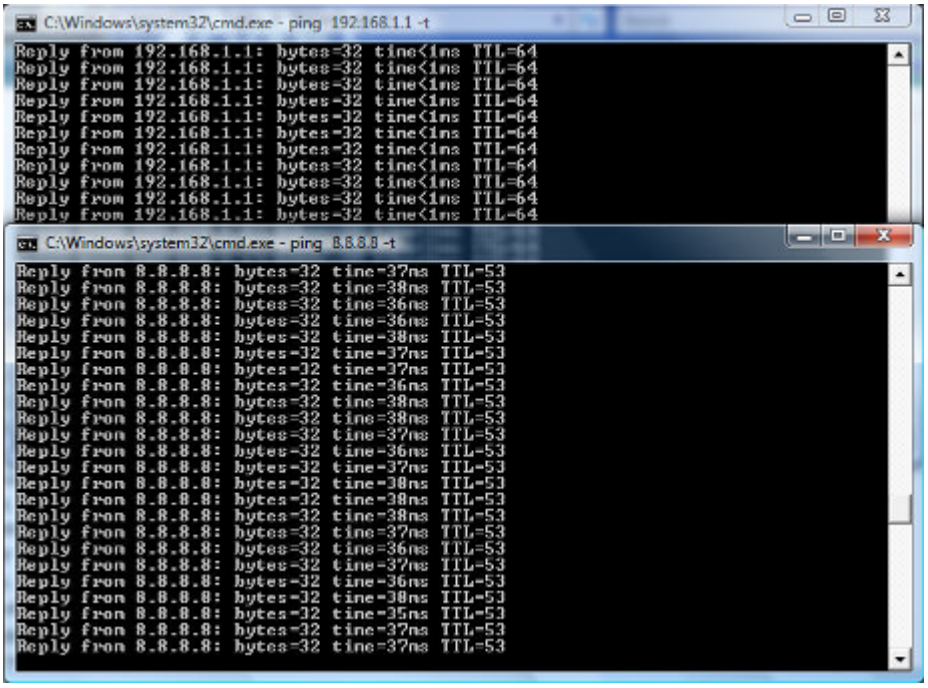
From Site-1, ping 192.168.1.200; and in Site-2, ping 192.168.1.100.



Step 8. Configure the TCP/IP settings of Site-2 to "**Obtain an IP address automatically**".



Step 9. Use command line tool to ping the DNS (e.g., Google) to ensure Site-2 can access internet through the wireless connection.



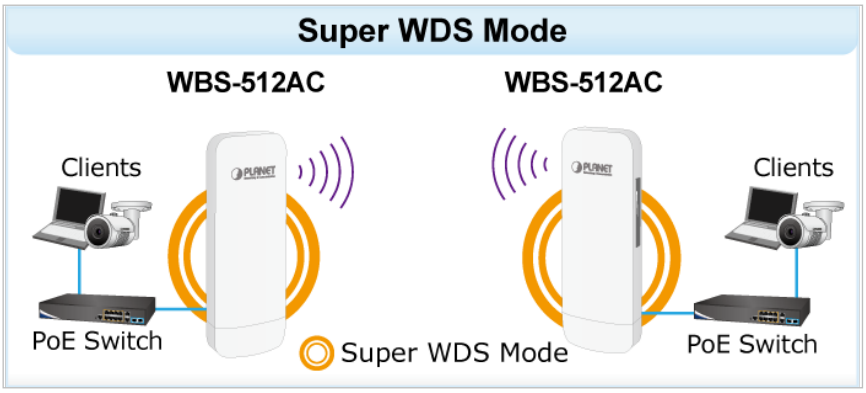
Note

The following hints should be noted:

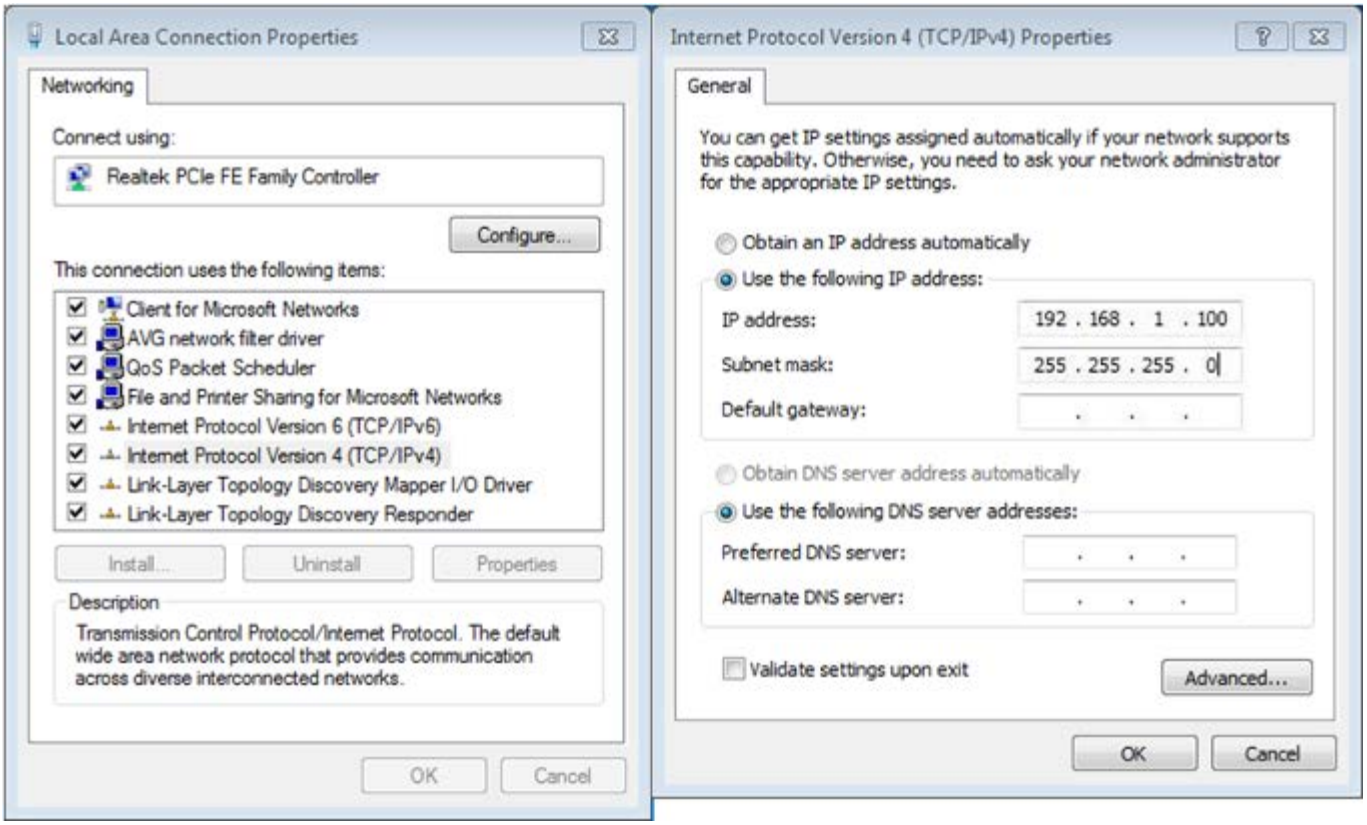
1) The encryption method must be the same as that of both sites if configured.
2) Both sites should be Line-of-Sight.
3) For the short distance connection less than 1km, please reduce the "RF Output Power" of both sites.
4) For the long distance connection over 1km, please adjust the "Distance" to the actual distance or double the actual distance.

Q2: How to set up the WDS Connection

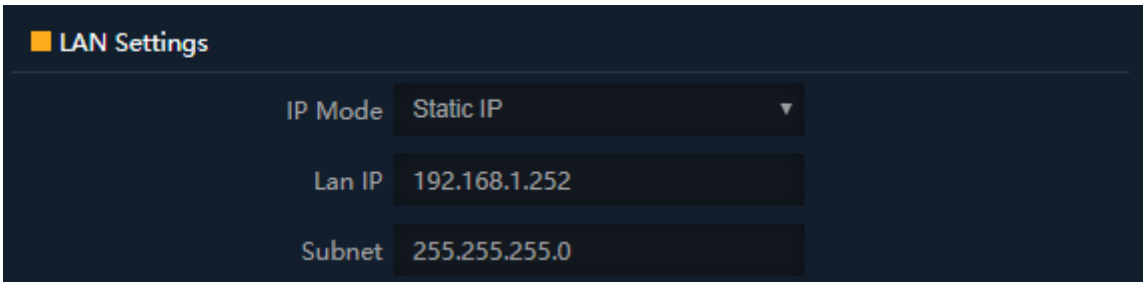
Topology:



Step 1. Use static IP in the PCs that are connected with WBS-512AC-1 (Site-1) and WBS-512AC-2 (Site-2). In this case, Site-1 is "**192.168.1.100**", and Site-2 is "**192.168.1.200**".

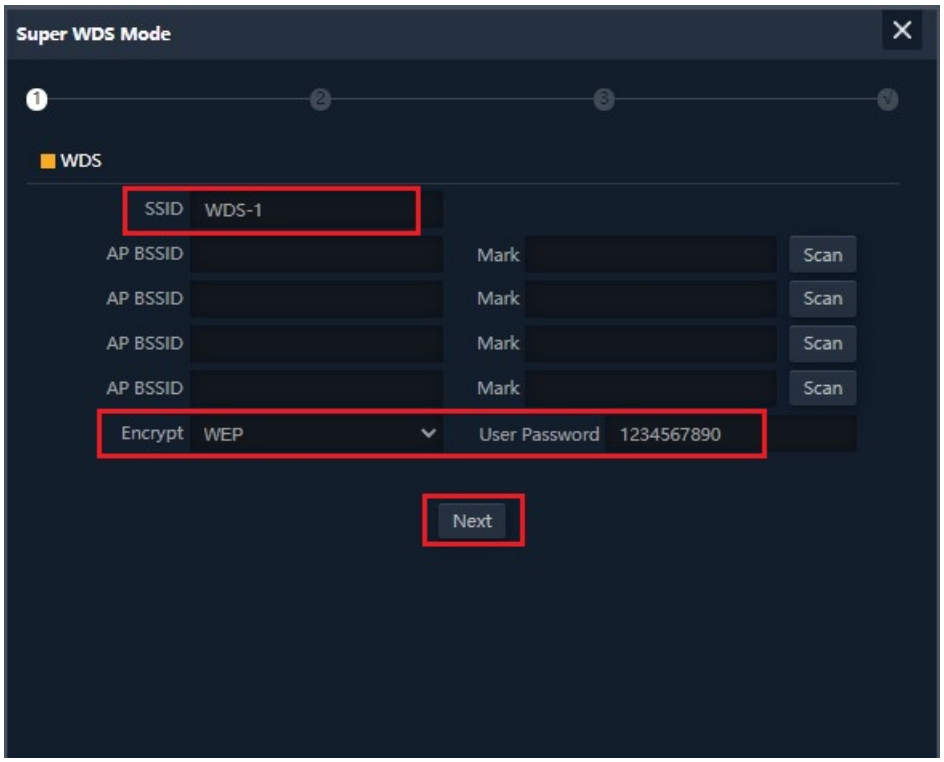


Step 2. In AP-2, change the default IP to the same IP range but different from AP-1. In this case, the IP is changed to **192.168.1.252**.



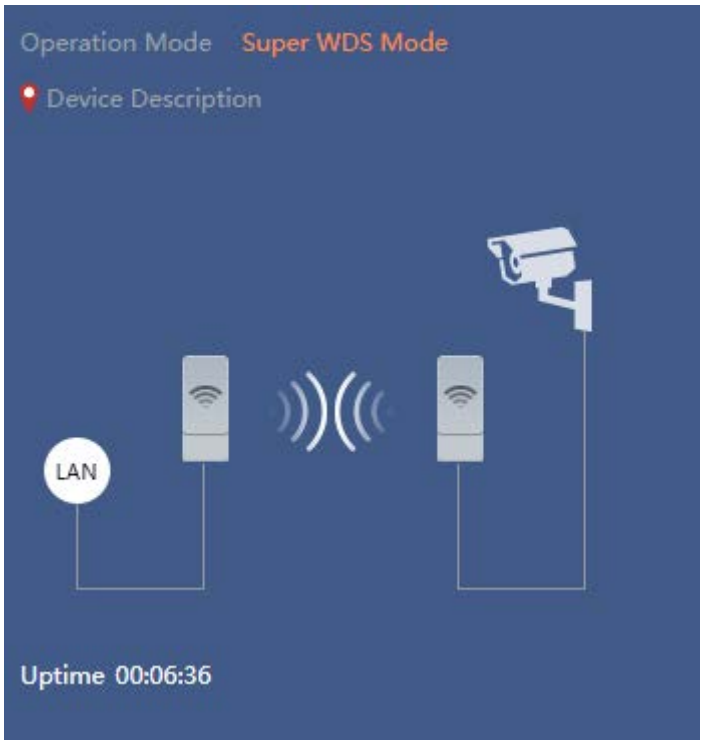
Step 3. In both APs, go to "**Wizard**" to configure it in **Super WDS** Mode.

Step 4. In AP1 set up WDS SSID, for example WDS-1. Select Encrypt for WEP and enter password.

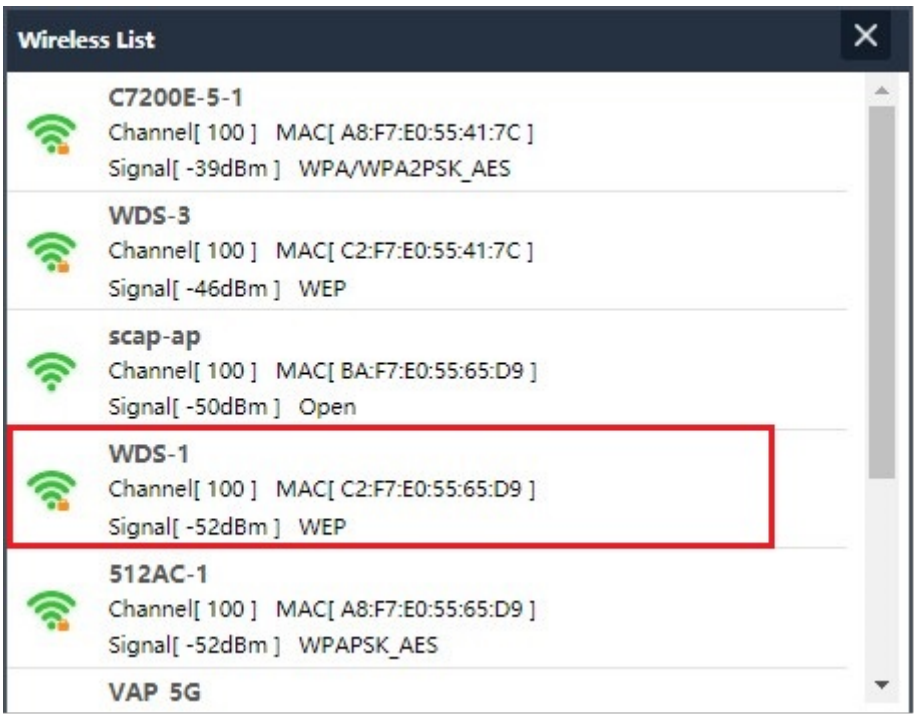


Step 5. Finish the 5G Wi-Fi and LAN setting.

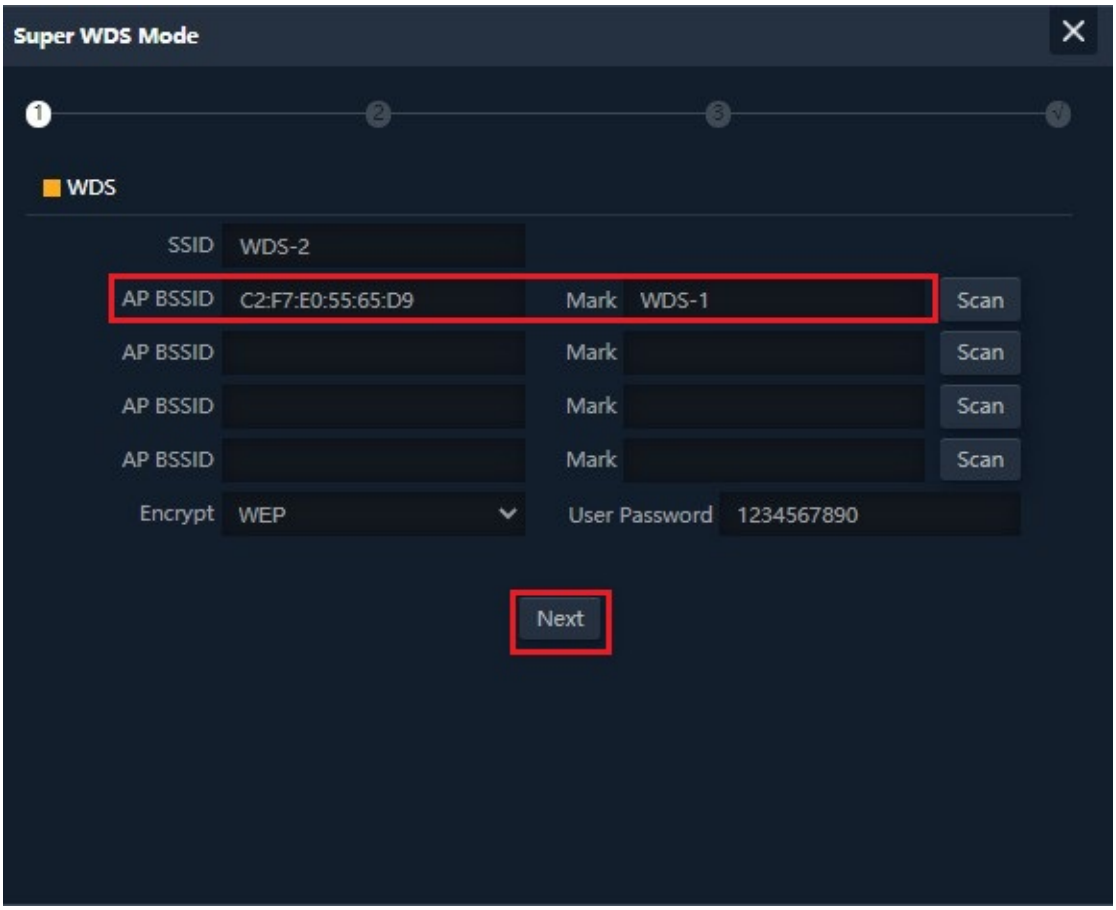
Step 6. Click “**Home**” to check WDS status.



Step 7. In AP2 scan AP1 WDS SSID, for example WDS-1. Select Encrypt for WEP and enter password.

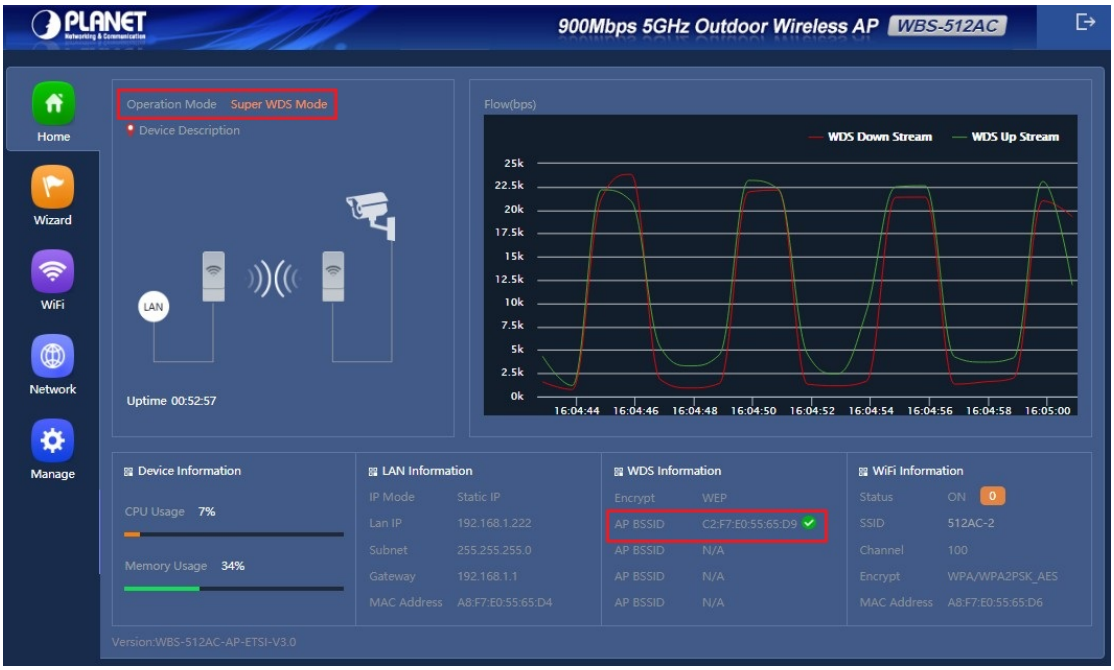


Step 8.Confirm SSID and MAC. Select Encrypt for WEP and enter password.



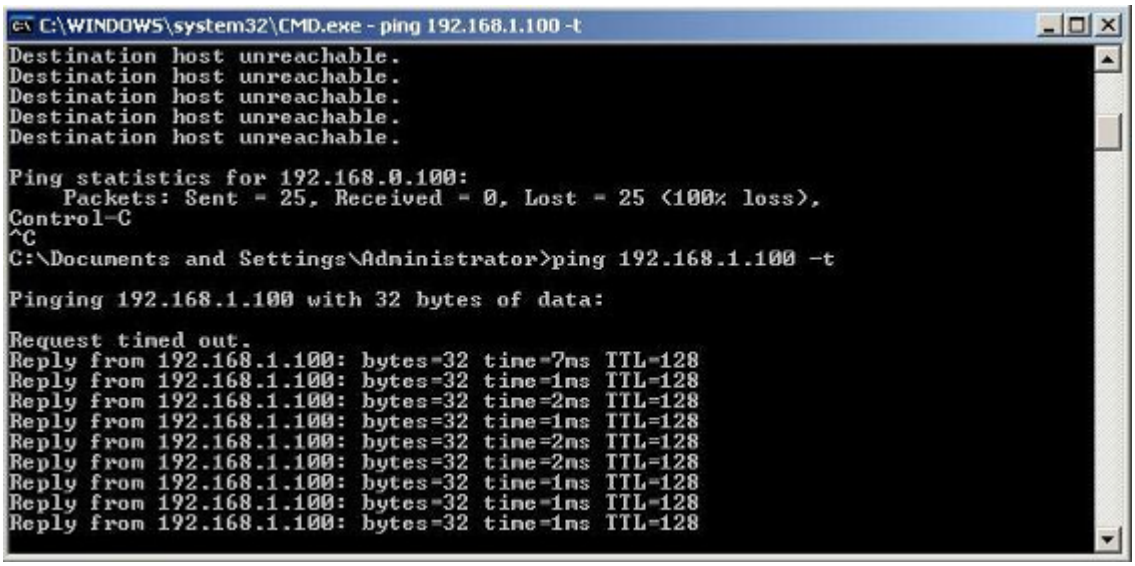
Step 9. Finish the 5G Wi-Fi and LAN setting.

Step 10. Go to "**WDS Information**" to check connection status.



Step 11. Use command line tool to ping each other to ensure the link is successfully established.

From Site-1, ping 192.168.1.200; and in Site-2, ping 192.168.1.100.



Note

The following hints should be noted:

1) The encryption method must be the same as that of both sites if configured.
2) Both sites should be Line-of-Sight.
3) For the short distance connection less than 1km, please reduce the "RF Output Power" of both sites.
4) For the long distance connection over 1km, please adjust the "Distance" to the actual distance or double the actual distance.

Appendix C: Troubleshooting

If you find the AP is working improperly or stops responding to you, please read this troubleshooting first before contacting the dealer for help. Some problems can be solved by yourself within a very short time.

Scenario	Solution
The AP is not responding to me when I want to access it by Web browser.	a. Please check the connection of the power cord and the Ethernet cable of this AP. All cords and cables should be correctly and firmly inserted into the AP. b. If all LEDs on this AP are off, please check the status of power adapter, and make sure it is correctly powered. c. You must use the same IP address section where AP uses. d. Are you using MAC or IP address filter? Try to connect the AP with another computer and see if it works; if not, please reset the AP to the factory default settings by pressing the 'reset' button for over 7 seconds. e. Use the Smart Discovery Tool to see if you can find the AP or not. f. If you did a firmware upgrade and this happens, contact your dealer for help. g. If all the solutions above don't work, contact the dealer for help.
I can't get connected to the Internet.	a. Go to 'Status' -> 'Internet Connection' menu on the router connected to the AP, and check Internet connection status. b. Please be patient, sometimes Internet is just that slow. c. If you've connected a computer to Internet directly before, try to do that again, and check if you can get connected to Internet with your computer directly attached to the device provided by your Internet service provider. d. Check PPPoE / L2TP / PPTP user ID and password entered in the router's settings again. e. Call your Internet service provider and check if there's something wrong with their service. f. If you just can't connect to one or more website, but you can still use other internet services, please check URL/Keyword filter. g. Try to reset the AP and try again later. h. Reset the device provided by your Internet service provider too.

	i. Try to use IP address instead of host name. If you can use IP address to communicate with a remote server, but can't use host name, please check DNS setting.
I can't locate my AP by my wireless device.	a. 'Broadcast ESSID' set to off? b. Both two antennas are properly secured. c. Are you too far from your AP? Try to get closer. d. Please remember that you have to input ESSID on your wireless client manually, if ESSID broadcast is disabled.
File downloading is very slow or breaks frequently.	a. Are you using QoS function? Try to disable it and try again. b. Internet is slow sometimes. Please be patient. c. Try to reset the AP and see if it's better after that. d. Try to know what computers do on your local network. If someone's transferring big files, other people will think Internet is really slow. e. If this never happens before, call you Internet service provider to know if there is something wrong with their network.
I can't log into the web management interface; the password is wrong.	a. Make sure you're connecting to the correct IP address of the AP! b. Password is case-sensitive. Make sure the 'Caps Lock' light is not illuminated. c. If you really forget the password, do a hard reset.
The AP becomes hot	a. This is not a malfunction, if you can keep your hand on the AP's case. b. If you smell something wrong or see the smoke coming out from AP or A/C power adapter, please disconnect the AP and power source from utility power (make sure it's safe before you're doing this!), and call your dealer for help.

Appendix D: Glossary

- **802.11ac** - 802.11ac is a wireless networking standard in the 802.11 family (which is marketed under the brand name Wi-Fi), developed in the IEEE Standards Association process, providing high-throughput wireless local area networks (WLANs) on the 5 GHz band.
- **802.11n -** 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) [3] was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- **802.11a** - 802.11a was an amendment to the IEEE 802.11 wireless local network specifications that defined requirements for an orthogonal frequency division multiplexing (OFDM) communication system. It was originally designed to support wireless communication in the unlicensed national information infrastructure (U-NII) bands (in the 5–6 GHz frequency range) as regulated in the United States by the Code of Federal Regulations, Title 47, Section 15.407.
- **802.11b -** The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- **802.11g -** specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- **DDNS** (**D**ynamic **D**omain **N**ame **S**ystem) **-** The capability of assigning a fixed host and domain name to a dynamic Internet IP Address.
- **DHCP** (**D**ynamic **H**ost **C**onfiguration **P**rotocol) **-** A protocol that automatically configure the TCP/IP parameters for the all the PC(s) that are connected to a DHCP server.
- **DMZ** (**Dem**ilitarized **Z**one) **-** A Demilitarized Zone allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing.
- **DNS** (**D**omain **N**ame **S**ystem) **-** An Internet Service that translates the names of websites into IP addresses.
- **Domain Name -** A descriptive name for an address or group of addresses on the Internet.
- **DSL** (**D**igital **S**ubscriber **L**ine) **-** A technology that allows data to be sent or received over existing traditional phone lines.
- **ISP** (**I**nternet **S**ervice **P**rovider) **-** A company that provides access to the Internet.

- **MTU** (**Maximum Transmission Unit**) **-** The size in bytes of the largest packet that can be transmitted.
- **NAT** (**N**etwork **A**ddress **T**ranslation) **-** NAT technology translates IP addresses of a local area network to a different IP address for the Internet.
- **PPPoE** (**P**oint to **P**oint **P**rotocol **o**ver **E**thernet) **-** PPPoE is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.
- **SSID -** A **S**ervice **S**et **Id**entification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.
- **WEP** (**W**ired **E**quivalent **P**rivacy) **-** A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- **Wi-Fi -** A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.
- **WLAN** (**W**ireless **L**ocal **A**rea **N**etwork) **-** A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.

EC Declaration of Conformity

English	Hereby, **PLANET Technology Corporation,** declares that this **900Mbps 802.11ac Wireless Outdoor CPE** is in compliance with the essential requirements and other relevant provisions of Directive **2014/53/EU**.	**Lietuviškai**	Šiuo **PLANET Technology Corporation,**, skelbia, kad **900Mbps 802.11ac Wireless Outdoor CPE** tenkina visus svarbiausius **2014/53/EU** direktyvos reikalavimus ir kitas svarbias nuostatas.
Česky	Společnost **PLANET Technology Corporation,** tímto prohlašuje, že tato **900Mbps 802.11ac Wireless Outdoor CPE** splňuje základní požadavky a další příslušná ustanovení směrnice **2014/53/EU**.	**Magyar**	A gyártó **PLANET Technology Corporation**, kijelenti, hogy ez a **900Mbps 802.11ac Wireless Outdoor CPE** megfelel az **2014/53/**E**K** irányelv alapkövetelményeinek és a kapcsolódó rendelkezéseknek.
Dansk	**PLANET Technology Corporation,** erklærer herved, at følgende udstyr **900Mbps 802.11ac Wireless Outdoor CPE** overholder de væsentlige krav og øvrige relevante krav i direktiv **2014/53/EU**	**Malti**	Hawnhekk, **PLANET Technology Corporation,** jiddikjara li dan **900Mbps 802.11ac Wireless Outdoor CPE** jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva **2014/53/EU**
Deutsch	Hiermit erklärt **PLANET Technology Corporation,** dass sich dieses Gerät **900Mbps 802.11ac Wireless Outdoor CPE** in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie **2014/53/EU** befindet". (BMWi)	**Nederlands**	Hierbij verklaart , **PLANET Technology orporation,** dat **900Mbps 802.11ac Wireless Outdoor CPE** in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn **2014/53/EU**
Eestikeeles	Käesolevaga kinnitab **PLANET Technology Corporation,** et see **900Mbps 802.11ac Wireless Outdoor CPE** vastab Euroopa Nõukogu direktiivi **2014/53/EU** põhinõuetele ja muudele olulistele tingimustele.	**Polski**	Niniejszym firma **PLANET Technology Corporation,** oświadcza, że 900Mbps 802.11ac Wireless Outdoor CPE spełnia wszystkie istotne wymogi i klauzule zawarte w dokumencie „Directive **2014/53/EU**”.
Ελληνικά	*ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ* , **PLANET Technology Corporation,** *ΔΗΛΩΝΕΙ ΟΤΙ ΑΥΤΟ* 9**00Mbps 802.11ac Wireless Outdoor CPE***ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ* *ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ* **2014/53/EU**	**Português**	**PLANET Technology Corporation**, declara que este **900Mbps 802.11ac Wireless Outdoor CPE** está conforme com os requisitos essenciais e outras disposições da Directiva **2014/53/EU.**
Español	Por medio de la presente, **PLANET Technology Corporation,** declara que **900Mbps 802.11ac Wireless Outdoor CPE** cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva **2014/53/EU**	**Slovensky**	Výrobca **PLANET Technology Corporation,** týmto deklaruje, že táto **900Mbps 802.11ac Wireless Outdoor CPE** je v súlade so základnými požiadavkami a ďalšími relevantnými predpismi smernice **2014/53/EU**.
Français	Par la présente, **PLANET Technology Corporation,** déclare que les appareils du **900Mbps 802.11ac Wireless Outdoor CPE** sont conformes aux exigences essentielles et aux autres dispositions pertinentes de la directive **2014/53/EU**	**Slovensko**	**PLANET Technology Corporation**, **s tem potrjuje,** da je ta **900Mbps 802.11ac Wireless Outdoor CPE** skladen/a z osnovnimi zahtevami in ustreznimi določili Direktive **2014/53/EU.**
Italiano	Con la presente , **PLANET Technology Corporation,** dichiara che questo **900Mbps 802.11ac Wireless Outdoor CPE** è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva **2014/53/EU**.	**Suomi**	**PLANET Technology Corporation,** vakuuttaa täten että **900Mbps 802.11ac Wireless Outdoor CPE** tyyppinen laite on direktiivin **2014/53/EU** oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Latviski	Ar šo **PLANET Technology Corporation,** apliecina, ka šī **900Mbps 802.11ac Wireless Outdoor CPE** atbilst Direktīvas **2014/53/EU** pamatprasībām un citiem atbilstošiem noteikumiem.	**Svenska**	Härmed intygar, **PLANET Technology Corporation,** att denna **900Mbps 802.11ac Wireless Outdoor CPE** står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv **2014/53/EU.**