



WS322 300Mbps Wireless Range Extender User Guide

HUAWEI TECHNOLOGIES CO., LTD.





WS322 300Mbps Wireless Range Extender

V100R001

User Guide

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1 Product Overview

1.1 Supported Features

The WS322 300Mbps Wireless Range Extender (WS322 for short) is a high-speed wireless device designed for homes and business travelers. The WS322 can serve as a router that provides a WiFi access point, a repeater used with a wireless router to expand the wireless signal coverage, or a wireless network adapter.

This chapter describes the features supported by the WS322:

Wireless functions

Service set identifier (SSID) configuration

SSID hiding

Channels: channel 1 to 13 or automatic channel selection

Frequency bands: 20 MHz, 40 MHz, or automatic selection

WiFi modes: 802.11b, 802.11g, 802.11n, 802.11b/g, or 802.11b/g/n

WiFi security: encryption using advanced encryption standard (AES), temporary key integrity protocol (TKIP), and 64/128-bit wired equivalent privacy (WEP), certification using WiFi protected access-pre-shared key (WPA-PSK), WPA2-PSK, or WPA-PSK+WPA2-PSK, and wireless MAC address filtering

WPS

Working modes: WiFi router, WiFi repeater, and WiFi client

Automatic signal detection and signal strength display in WiFi client and WiFi repeater modes

Easy Configuration and Management

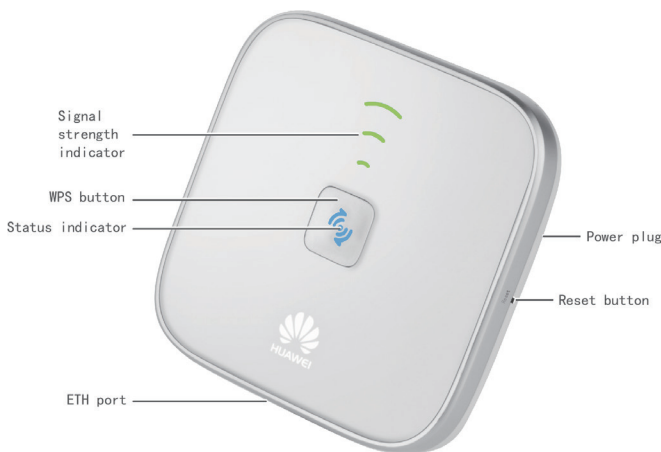
The WS322 provides password-protected web management pages to protect your personal data. Local device configuration, management, and upgrade on the web management page

Remote device management using the TR069

Switch between WiFi router, WiFi repeater, and WiFi client modes on the web management page

1.2 Ports and Buttons

Table 1-1 Lists the WS322's ports, indicators, and buttons, as well as their functions.



NOTE

Pictures shown in this document are only for your reference.

Table 1-1 WS322 ports and buttons






Item	Functions
Power plug	Can be plugged into a power socket.
WPS button	Quickly sets up a wireless connection or changes WS322's working mode.
Reset button	<p>After the WS322 is powered on, press and hold the Reset button for 6s or more to restore the WS322 to its factory settings.</p> <p> NOTE Restoring the WS322 to its factory settings will erase your user-defined data.</p>
Status indicator	Shows the WS322 working status. For details, see section 1.2.2 Indicators.
Signal strength indicator	Shows the network signal strength. For details, see section 1.2.2 Indicators.
ETH port	Connects the WS322 to a network device.

Table 1-2 Using the WPS Button for Quick Configuration

Function	Operation
WPS connection	<p>Press and hold the WPS button more than 1 second and less than 3 seconds, and press the wireless client's WPS button within 2 minutes.</p> <p>When the  status indicator turns from blinking to steady on, the connection is set up.</p>

Function	Operation
Switching the working mode	<p>Press and hold the WPS button until:</p> <ul style="list-style-type: none">  starts blinking to switch to WiFi Router mode.  starts blinking to switch to WiFi Client mode.  starts blinking to switch to WiFi Repeater mode.

**NOTE**

WPS is a computing standard that attempts to automate secure wireless network setup and connection. The WPS function lets you securely add wireless clients to a WLAN without entering the user name and password.

1.3 Indicators

Table 1-3 Lists the WS322 indicators and their meanings.

Table 1-3 WS322 indicators and their meanings

Item	Status	Meaning
Status Indicator	Off	The WS322 is powered off or faulty.
	Blinking	<p>Blinking red: The WS322 is powering on.</p> <p>Blinking blue: The WS322 is connecting to a network.</p>
	Steady on	<p>Steady red: The WS322 is working properly but is not connected to a network.</p> <p>Steady blue: The WS322 is connected to a network.</p>

Signal strength indicator	Off	The WS322 is not connected to a network.
	Blinking	The WS322 is connecting to a network or changing its working mode.
	Steady on	The WS322 is connected to a network. The lightened indicator bars indicate the network signal strength. Three bars mean the network signals are strong, while one bar means the network signals are weak.

**NOTE**

The WS322 signal strength indicator only works in WiFi repeater and WiFi client modes.

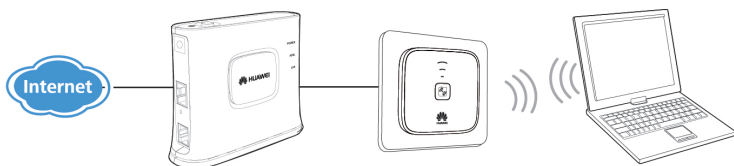
2 Hardware Installation

2.1 Application Modes

2.1.1 WiFi Router Mode

When working in WiFi router mode, the WS322 is connected to the Internet through its Ethernet port and works as a WiFi access point in a home, providing Internet access for wireless clients, such as phones and computers. To set up a wireless connection, all you have to do is pressing the WPS buttons on the WS322 and the wireless client.

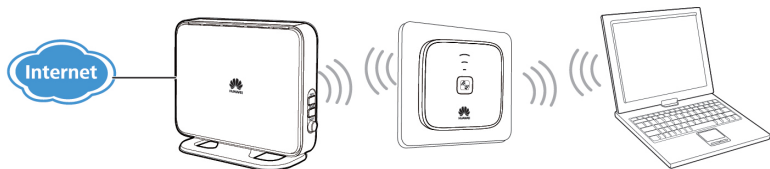
Best used in: one-story houses, apartments, hotels, and similar structures.



2.1.2 WiFi Repeater Mode

When working in WiFi repeater mode, the WS322 is wirelessly connected to the Internet, providing Internet access for wireless clients, such as phones and computers. This mode is used to expand the uplink access point's signal coverage. To quickly connect the WS322 to the Internet, all you have to do is pressing the WPS buttons on the WS322 and access point device.

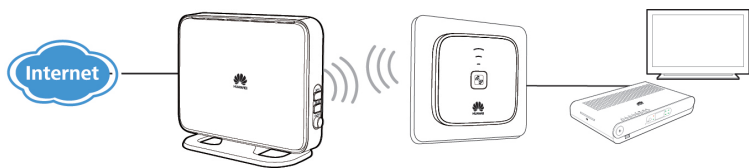
Best used in: villas, duplex house, and other large venues.



2.1.3 WiFi Client Mode

When working in WiFi client mode, the WS322 is connected to a client, such as set-top box (STB) or computer, through its Ethernet port, providing the client with access to a wireless access point. To quickly connect the WS322 to the Internet, all you have to do is pressing the WPS buttons on the WS322 and access point device.

Best used in: devices that require wireless Internet connections. For example, network multimedia players and Internet TV.



2.2 Powering On

Insert WS322's power plug into a power socket. The WS322 is then powered on.

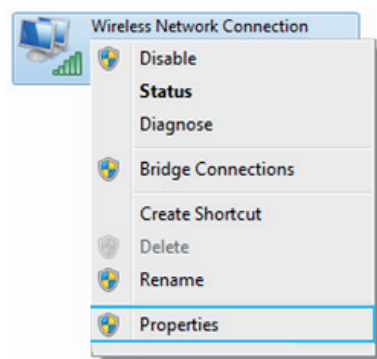


2.3 Setting the Computer IP Address

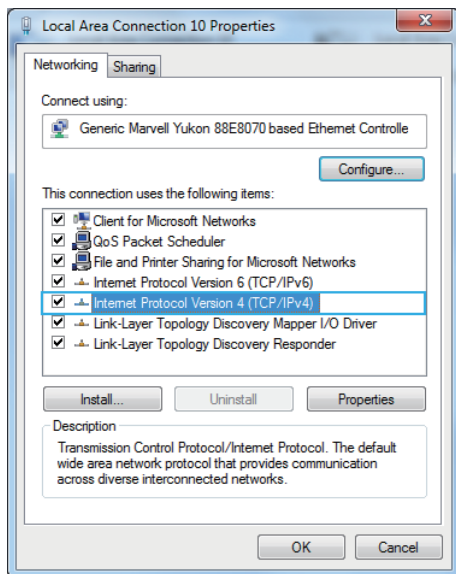
Before logging in to the WS322 web management page, set the IP address of the computer that will be used for the login.

On Windows 7

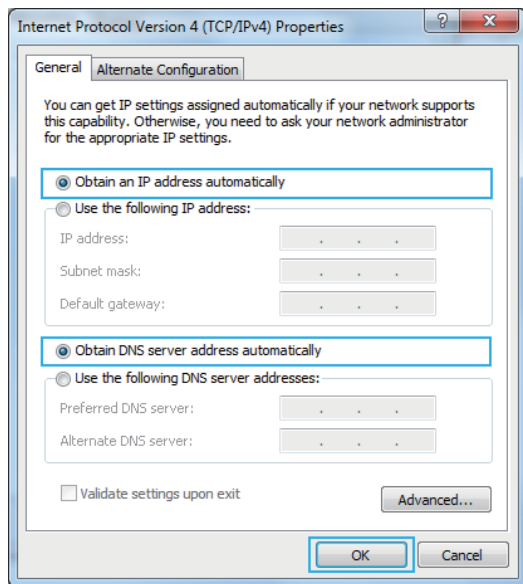
- Step 1** Choose **Start > Control Panel > Network and Internet > Network and Sharing Center**.
- Step 2** Choose **Change adapter settings > Wireless Network Connection**.
Right-click **Wireless Network Connection**, and choose **Properties**.



Step 3 Double-click **Internet Protocol Version 4 (TCP/IPv4)**.



Step 4 Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Click **OK**.

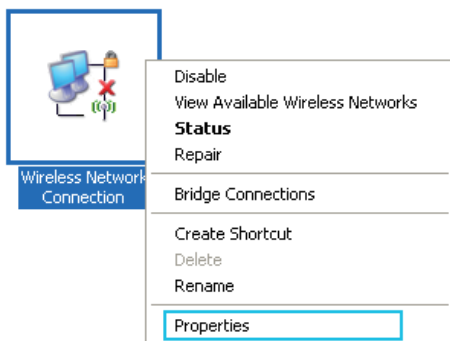


On Windows XP

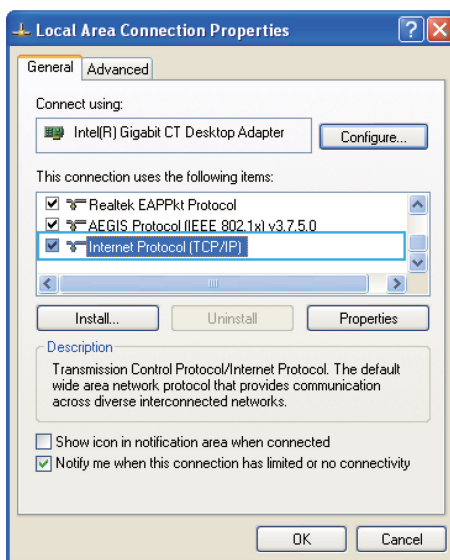
Step 1 Choose **Start > Control Panel > Network and Internet Connections**.

Step 2 Choose **Network Connections > Wireless Network Connection**.

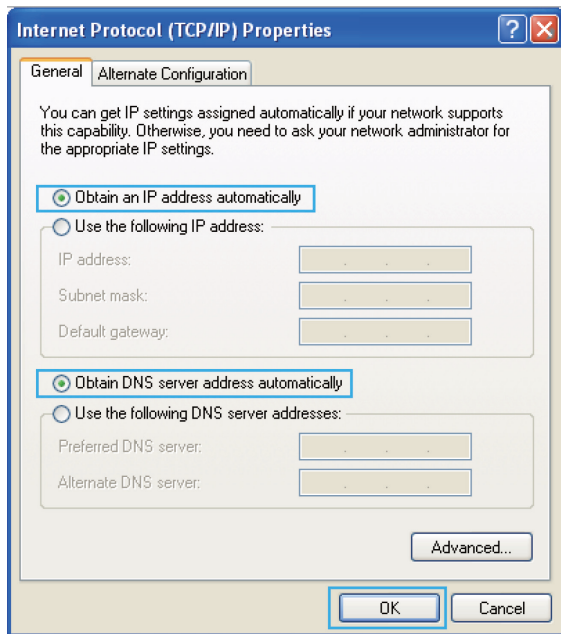
Right-click **Wireless Network Connection**, and choose **Properties** from the shortcut menu.



Step 3 Double-click **Internet Protocol (TCP/IP)**.



Step 4 Select **Obtain an IP address automatically** and **Obtain DNS address automatically**. Click **OK**.



3 Wireless Connection Setup

3.1 Setting Up a Wireless Connection Using the WPS Button

Push the WPS button once to quickly set up a wireless connection between the WS322 and any WPS-capable device. Before you set up a wireless connection using the WPS button, verify the following:

- The wireless network security mode of the WS322 is WPA2-PSK or WPA-PSK/WPA2-PSK.
- The wireless device (laptop, tablet, or mobile phone) to connect to the WS322 is WPS-capable.

Step 1 Press the WPS button on the wireless device to start WPS negotiation.
For details, see the user guide for the wireless device.

Step 2 Within 2 minutes, press and hold the WPS button on the WS322 for 1 second or more. The WPS button indicator blinks.

When the WPS indicator on the WS322 is steady on, a connection between the WS322 and wireless device is set up. The WPS indicator is on for 300 seconds. Then the WPS indicator turns off.

3.2 Manually Setting Up a Wireless Connection

The wireless configuration software provided by Windows is used as an example to describe how to set up a wireless connection.

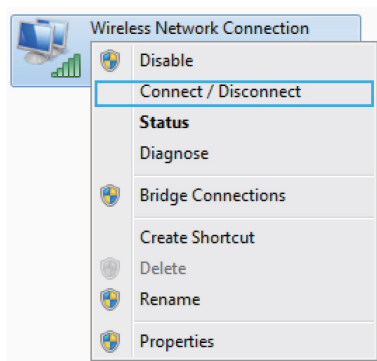
**NOTE**

You can also use the tool built into the network adapter to set up a wireless connection. For details, see the network adapter's user guide.

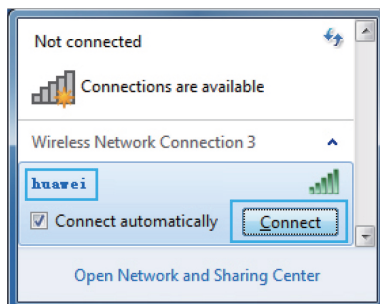
Before setting up a wireless connection, record the WLAN name and password of the WS322. The default WLAN name and password are printed on the WS322 cover label.

On Windows 7

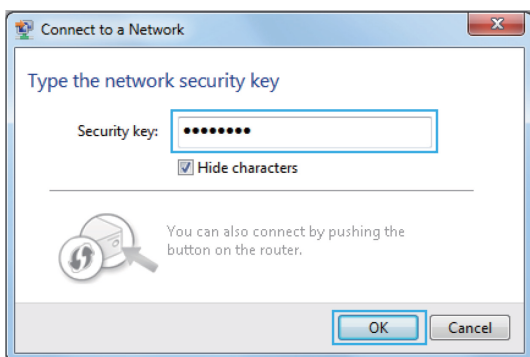
Step 1 Choose **Start > Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings**. Right-click **Wireless Network Connection**, and select **Connect/Disconnect**.



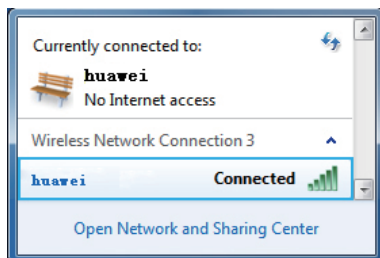
Step 2 From the wireless network list, select the WLAN provided by the wireless device you want to connect. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password and click **OK**.

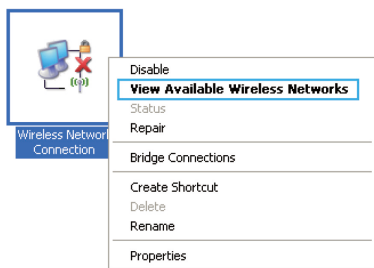


Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.

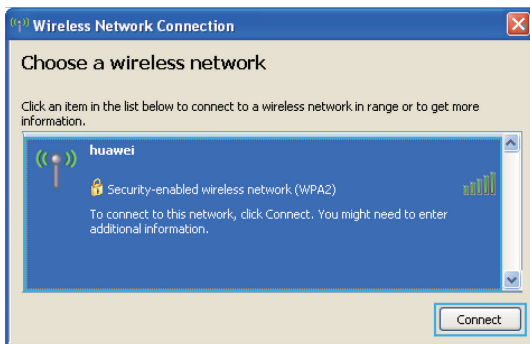


On Windows XP

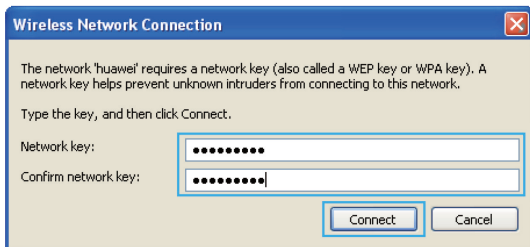
Step 1 Choose **Start > Control Panel > Network and Internet Connections > Network Connections**. Right-click **Wireless Network Connection**, and choose **View Available Wireless Networks** from the shortcut menu.



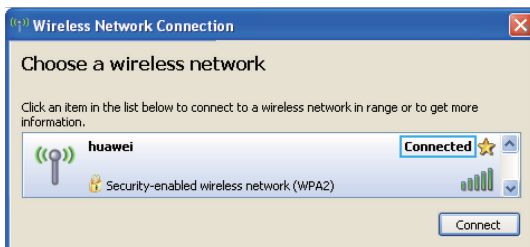
Step 2 From the wireless network list, select the WLAN provided by the wireless device you want to connect. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password, and click **Connect**.



Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.



4

Configuring WiFi Router Mode

The WS322 can work as a wireless router, providing a WiFi access point for homes and business travelers.

To set up a wireless connection, press and hold the WS322's WPS button more than 1 second and less than 3 seconds, and press the wireless client's WPS button within 2 minutes. When the connection is set up, the WS322's status indicator turns from blinking to steady on.

To change the WS322 into WiFi Router mode, press and hold the WS322's WPS button until the longest signal strength indicator blinks. Then the WS322 will restart and change into WiFi Router mode.

4.1 Setting Internet Access Parameters

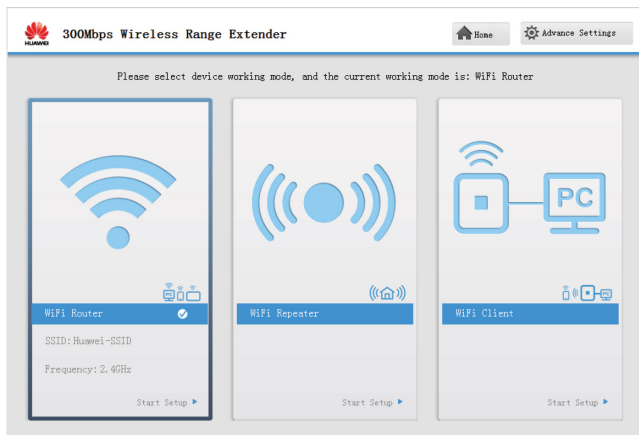
Step 1 Launch a browser, enter **http://192.168.33.1**, and press **Enter**. In the **Login** window, enter **admin** for both the **user name** and **password**, and click **Login**.



NOTE

To protect your router from unauthorized access, change the user name and password after the first login. For details, see chapter 8.1 "Changing the Administrator Password of the Web management page."

Step 2 Click **WiFi Router**.

**NOTE**

Switching between working modes will restart the WS322. The login page will be displayed and you need to enter your user name and password.

Step 3 Click **Next**.

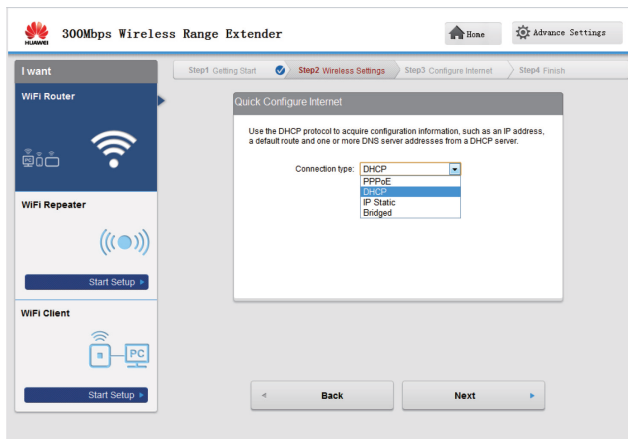


Step 4 Choose the network connection type.

Choose the connection type based on the application scenario. Table 4-1 describes the connection types.

Table 4-1 Configuring the Internet access parameters

Application Scenario	Connection Type
The user name and password are provided by your service provider.	PPPoE
The user name and password are provided by your service provider. Set up a dial-up connection on one computer only.	Bridge
Certain parameters, such as the static IP address and DNS server address, are provided by your service provider.	Static IP
No parameters are provided by your service provider. The IP address is automatically assigned by the service provider.	DHCP



Step 5 Configure the network connection parameters, and click **Next**.



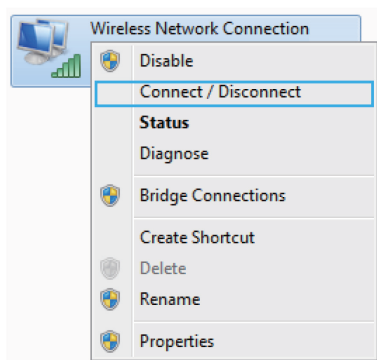
The configuration succeeded.

4.2 Wireless Connection Setup

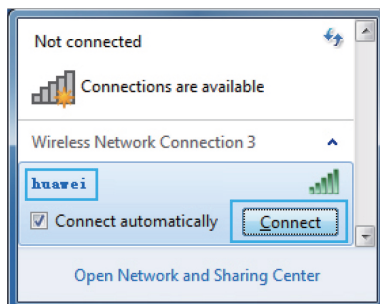
4.2.1 Manually Setting Up a Wireless Connection

On Windows 7

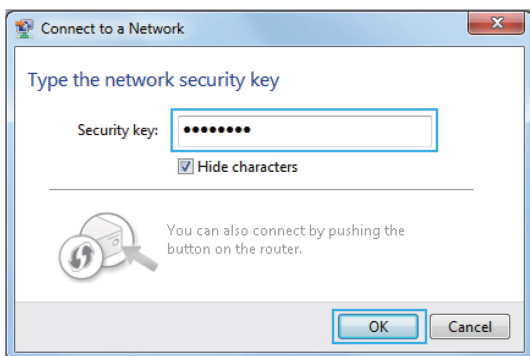
Step 1 Choose **Start > Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings**. Right-click **Wireless Network Connection**, and select **Connect/Disconnect**.



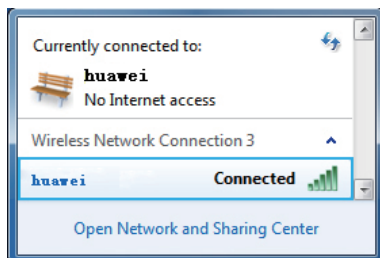
Step 2 From the wireless network list, select the WLAN provided by the WS322. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password and click **OK**.

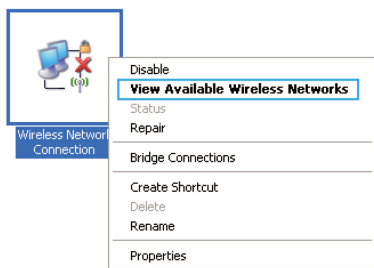


Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.

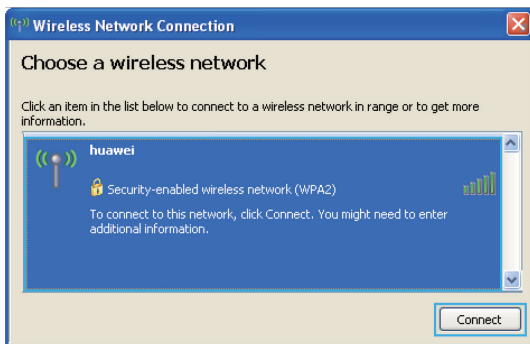


On Windows XP

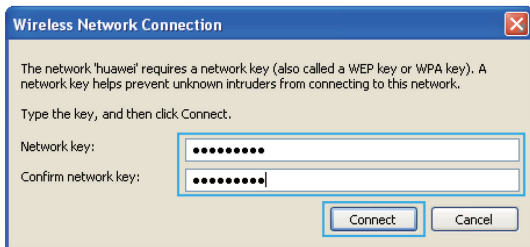
Step 1 Choose **Start > Control Panel > Network and Internet Connections > Network Connections**. Right-click **Wireless Network Connection**, and choose **View Available Wireless Networks** from the shortcut menu.



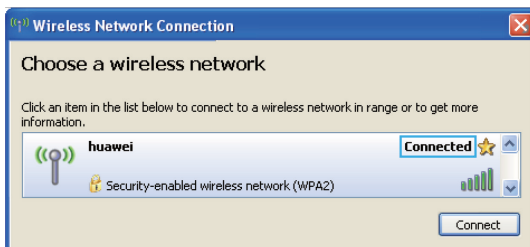
Step 2 From the wireless network list, select the WLAN provided by the WS322. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password and click **Connect**.



Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.



4.2.2 Setting Up a Wireless Connection Using the WPS Button

Push the WPS button once to quickly set up a wireless connection between the WS322 and any WPS-capable device. Before you set up a wireless connection using the WPS button, verify the following:

- The wireless network security mode of the WS322 is WPA2-PSK or WPA-PSK/WPA2-PSK.
- The wireless device (laptop, tablet, or mobile phone) to connect to the WS322 is WPS-capable.

Step 1 Press the WPS button on the wireless device to start WPS negotiation.

For details, see the user guide for the wireless device.

Step 2 Within 2 minutes, press and hold the WPS button on the WS322 for 1 second or more. The WPS button indicator blinks.

When the WPS indicator on the WS322 is steady on, a connection between the WS322 and wireless device is set up. The WPS indicator is on for 300 seconds. Then the WPS indicator turns off.

5

Configuring WiFi Repeater Mode

The WS322 can work as a repeater together with a wireless router to expand the WLAN coverage.

To change the WS322 into WiFi Repeater mode, press and hold the WS322's WPS button until the shortest signal strength indicator blinks. Then the WS322 will restart and change into WiFi Repeater mode.

To set up a wireless connection, press and hold the WS322's WPS button more than 1 second and less than 3 seconds, and press the access point device's WPS button within 2 minutes. When the connection is set up, the WS322's status indicator turns from blinking to steady on.

5.1 Setting Internet Access Parameters

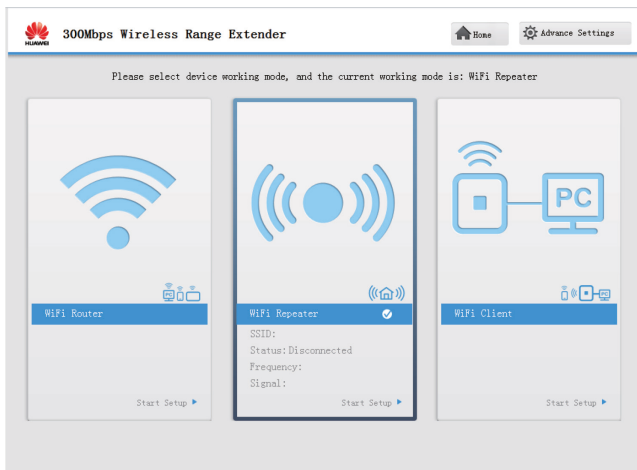
Step 1 Launch a browser, enter **http://192.168.33.1**, and press **Enter**. In the **Login** window, enter **admin** for both the **user name** and **password**, and click **Login**.



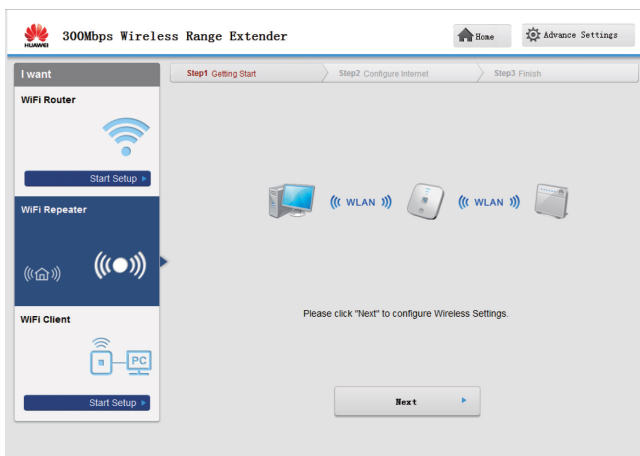
NOTE

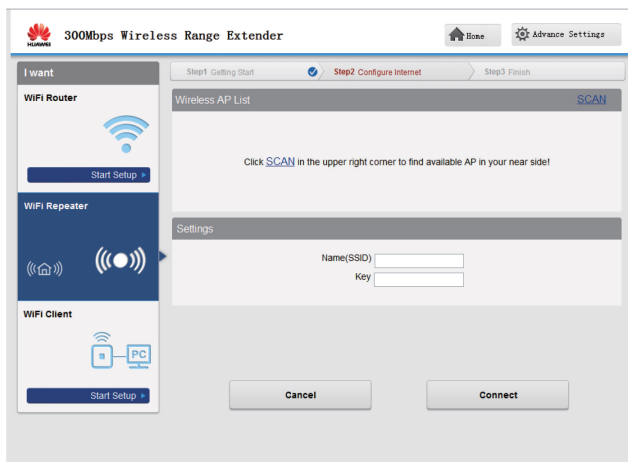
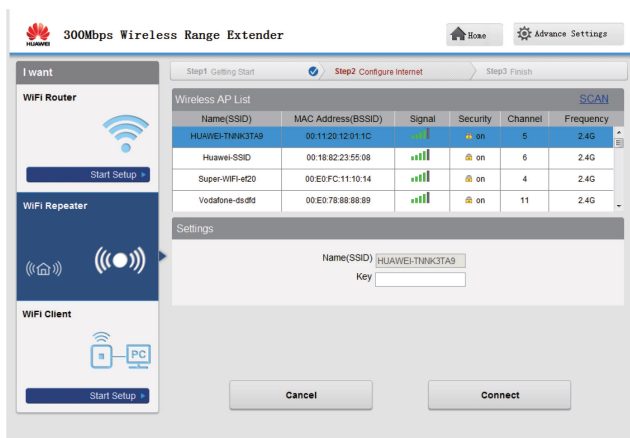
To protect your router from unauthorized access, change the user name and password after the first login. For details, see chapter 8.1 "Changing the Administrator Password of the Web management page"

Step 2 Click **WiFi Repeater**.



Step 3 Click Next.



Step 4 Click **SCAN** to scan the network.**Step 5** Choose the network SSID and configure the network connection parameters.

The configuration succeeded.

**NOTE**

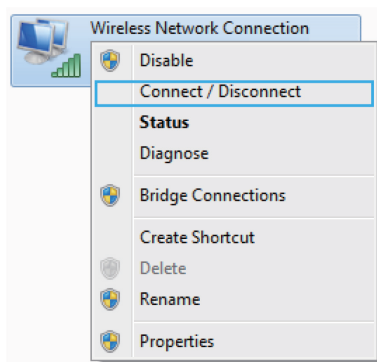
After the configuration, the WS322's SSID and password will be synchronized to those of the connected network. Enter the SSID and password of the WLAN when connecting the WS322 to other devices.

5.2 Wireless Connection Setup

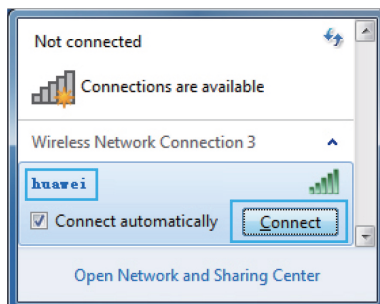
5.2.1 Manually Setting Up a Wireless Connection

On Windows 7

Step 1 Choose **Start > Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings**. Right-click **Local Area Connection**, and select **Connect/Disconnect**.



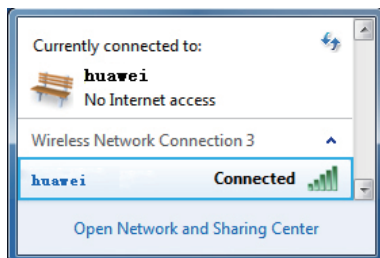
Step 2 From the wireless network list, select the WLAN provided by the wireless device you want to connect. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password and click **OK**.

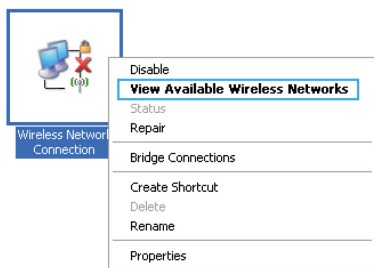


Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.

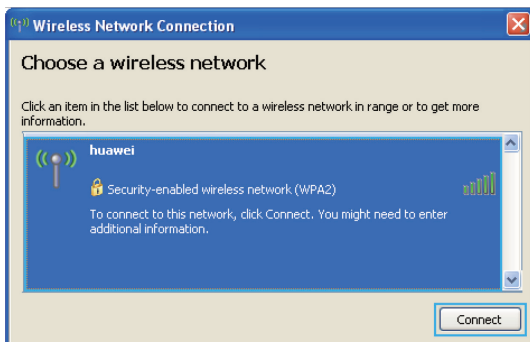


On Windows XP

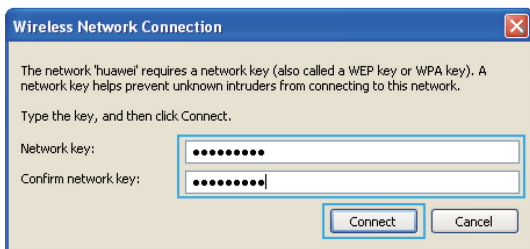
Step 1 Choose **Start > Control Panel > Network and Internet Connections > Network Connections**. Right-click **Wireless Network Connection**, and choose **View Available Wireless Networks** from the shortcut menu.



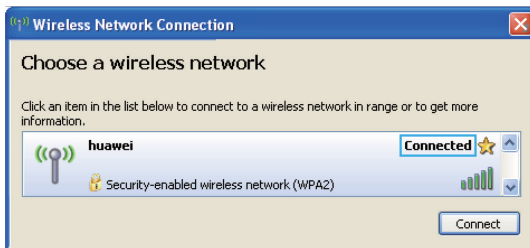
Step 2 From the wireless network list, select the WLAN provided by the wireless device you want to connect. Click **Connect**.



Step 3 In the displayed dialog box, enter the WLAN password and click **Connect**.



Step 4 In the wireless network list, check the WLAN connection status. If the status is **Connected**, the computer is wirelessly connected to the WS322.



5.2.2 Setting Up a Wireless Connection Using the WPS Button

Push the WPS button once to quickly set up a wireless connection between the WS322 and any WPS-capable device. Before you set up a wireless connection using the WPS button, verify the following:

- The wireless network security mode of the WS322 is WPA2-PSK or WPA-PSK/WPA2-PSK.
- The wireless device (laptop, tablet, or mobile phone) to connect to the WS322 is WPS-capable.

Step 1 Press the WPS button on the wireless device to start WPS negotiation.

For details, see the user guide for the wireless device.

Step 2 Within 2 minutes, press and hold the WPS button on the WS322 for 1 second or more. The WPS indicator blinks.

When the WPS indicator on the WS322 is steady on, a connection between the WS322 and wireless device is set up. The WPS indicator is on for 300 seconds. Then the WPS indicator turns off.

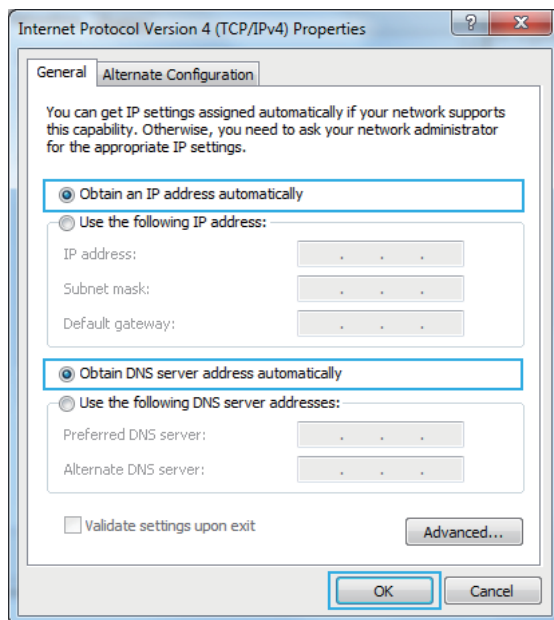
5.2.3 Setting Up a Wireless Connection Using a Network Cable

Step 1 Use a network cable to connect the WS322 to your computer.

Step 2 Set the computer to automatically obtain an IP address. For details, see section 2.3 "Setting the Computer IP Address."

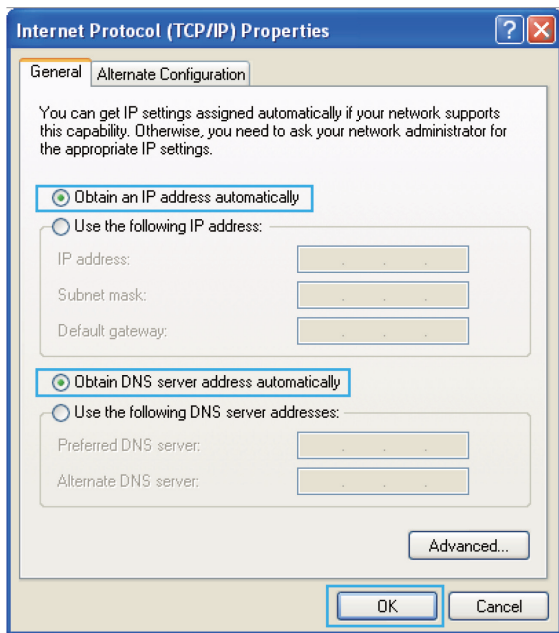
On Windows 7

Select **Obtain an IP address automatically** and **Obtain DNS address automatically**. Click **OK**.



On Windows XP

Select **Obtain an IP address automatically** and **Obtain DNS address automatically**. Click **OK**.



6

Configuring WiFi Client Mode

The WS322 can work as a wireless network adapter to provide Internet access for devices without the WLAN function.

To change the WS322 into WiFi Client mode, press and hold the WS322's WPS button until the middle signal strength indicator blinks. Then the WS322 will restart and change into WiFi Client mode.

To set up a wireless connection, press and hold the WS322's WPS button more than 1 second and less than 3 seconds, and press the access point device's WPS button within 2 minutes. When the connection is set up, the WS322's status indicator turns from blinking to steady on.

6.1 Setting Internet Access Parameters

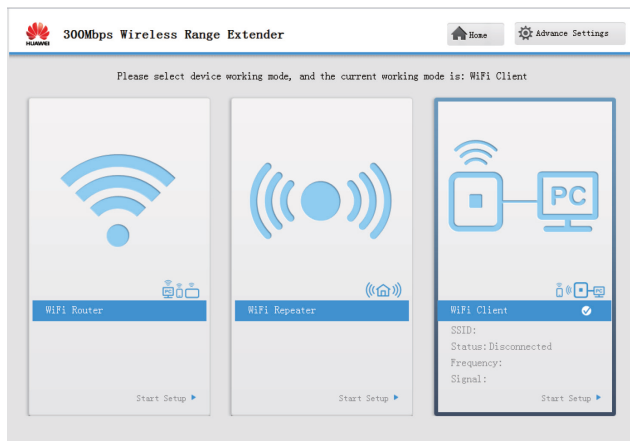
Step 1 Launch a browser, enter **http://192.168.33.1**, and press **Enter**. In the **Login** window, enter **admin** for both the **user name** and **password**, and click **Login**.



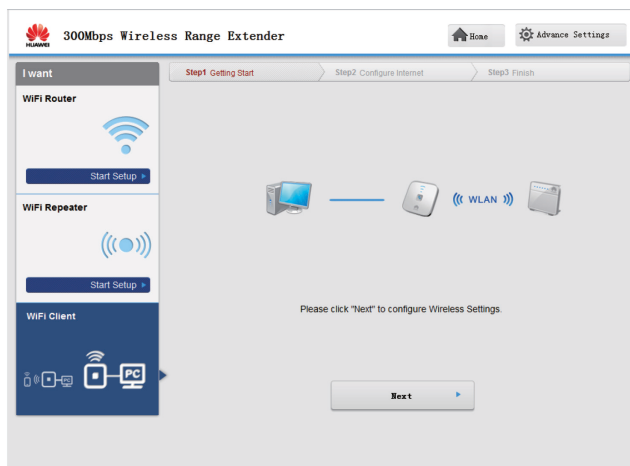
NOTE

To protect your router from unauthorized access, change the user name and password after the first login. For details, see chapter 8.1 "Changing the Administrator Password of the Web management page".

Step 2 Click **WiFi Client**.



Step 3 Click Next.



Step 4 Click **SCAN** to scan the network.**Step 5** Choose the network SSID and configure the network connection parameters.

The configuration succeeded.

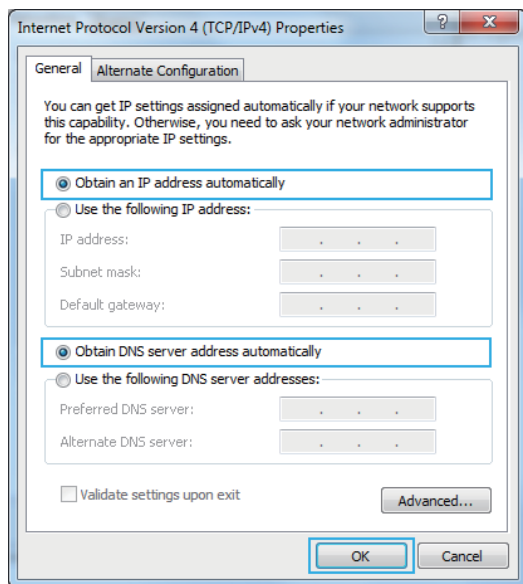
6.2 Setting Up a Connection with a Computer

Step 1 Use a network cable to connect the WS322 to your computer.

Step 2 Set the computer to automatically obtain an IP address. For details, see section 2.3 "Setting the Computer IP Address."

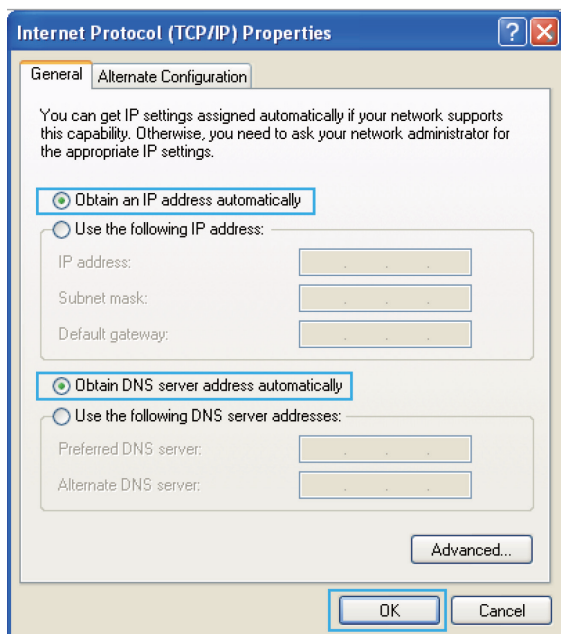
On Windows 7

Select **Obtain an IP address automatically** and **Obtain DNS address automatically**. Click **OK**.



On Windows XP

Select **Obtain an IP address automatically** and **Obtain DNS address automatically**. Click **OK**.



7 Network Security

7.1 Hiding the WLAN Name

After you hide the WLAN name, anyone who wishes to connect to the WLAN must enter the correct WLAN name. This measure helps improve WLAN security.

This function is available in WiFi router and WiFi repeater modes.



NOTE

In WiFi repeater mode, this function applies to the WS322 maintenance SSID only.

- Step 1** Log in to the web management page.
- Step 2** Click **Advance Settings**.
- Step 3** In the navigation tree, choose **Basic > WIFI Router** (WiFi router mode) or **Basic > Management WIFI** (WiFi repeater mode) to display the **WLAN configuration** page.
- Step 4** In **SSID Index**, select the SSID index you want to hide.
- Step 5** Set **SSID** to **Enable**.
- Step 6** Set **Hide broadcast** to **Enable**.
- Step 7** Click **Submit**.

Country code:	UNITED KINGDOM	▼
11N Guard Interval:	long	▼
Transmit power:	100%	▼
SSID index:	SSID1	▼
SSID:	Huawei-SSID *	
SSID:	<input checked="" type="checkbox"/> Enable	
Hide broadcast:	<input type="checkbox"/> Enable	
AP isolation:	<input type="checkbox"/> Enable	
Security:	WPA2-PSK	
WPA pre-shared key:	***** *	
Confirm WPA pre-shared key:	***** *	
WPA encryption:	AES	▼

7.2 Changing your WLAN Name and password

WLAN access requires the WLAN name and password. To improve your WLAN security, regularly change your WLAN name and password.

This function is available in WiFi router and WiFi repeater modes.



NOTE

In WiFi repeater mode, this function applies to the WS322 maintenance SSID only.

- Step 1** Log in to the web management page.
- Step 2** Click **Advance Settings**.
- Step 3** In the navigation tree, choose **Basic > WIFI Router** (WiFi router mode) or **Basic > Management WIFI** (WiFi repeater mode) to display the **WLAN configuration** page.
- Step 4** In **SSID index**, select the SSID index you want to modify.
- Step 5** In **SSID**, enter a new **WLAN name**.

Step 6 In **WPA pre-shared key**, enter a new WLAN password, and re-enter the new password to confirm it.

Step 7 Click **Submit**.

Country code:	UNITED KINGDOM	▼
11N Guard Interval:	long	▼
Transmit power:	100%	▼
SSID index:	SSID1	▼
SSID:	Huawei-SSID	*
SSID:	<input checked="" type="checkbox"/> Enable	
Hide broadcast:	<input type="checkbox"/> Enable	
AP isolation:	<input type="checkbox"/> Enable	
Security:	WPA2-PSK	▼
WPA pre-shared key:	*****	*
Confirm WPA pre-shared key:	*****	*
WPA encryption:	AES	▼

7.2.1 Using High Secure Encryption

This function is available in WiFi router and WiFi repeater modes.



NOTE

In WiFi repeater mode, this function applies to the WS322 maintenance SSID only.

Step 1 Log in to the web management page.

Step 2 Click **Advance Settings**.

Step 3 In the navigation tree, choose **Basic > WIFI Router** (WiFi router mode) or **Basic > Management WIFI** (WiFi repeater mode) to display the **WLAN configuration** page.

Step 4 Click **WLAN**.

Step 5 In **Security**, select **WPA-PSK/WPA2-PSK**.

Step 6 In **WPA pre-shared key**, enter the **WLAN password** you specified.

Step 7 In **WPA Encryption**, select **AES**.

Step 8 Click **Submit**.

Country code:	UNITED KINGDOM	▼
11N Guard Interval:	long	▼
Transmit power:	100%	▼
SSID index:	SSID1	▼
SSID:	Huawei-SSID	*
SSID:	<input checked="" type="checkbox"/> Enable	
Hide broadcast:	<input type="checkbox"/> Enable	
AP isolation:	<input type="checkbox"/> Enable	
Security:	WPA2-PSK	▼
WPA pre-shared key:	*****	*
Confirm WPA pre-shared key:	*****	*
WPA encryption:	AES	▼

7.2.2 Allowing Only Specified Computers to Access your WLAN

To prevent unauthorized access to your WLAN, you can specify which devices are allowed to access your WLAN.

Each network device is assigned with a unique MAC address. After you specify which MAC addresses can be used to access your WLAN, only those devices with the specified MAC addresses can connect to your WLAN.

This function is available in WiFi router and WiFi repeater modes.



NOTE

In WiFi repeater mode, this function applies to the WS322 maintenance SSID only.

Step 1 View and record the MAC address of the laptop.

**NOTE**

For details, see chapter 9.2 “Checking the Computer MAC Address”.

Step 2 Log in to the web management page.

Step 3 Click **Advance Settings**.

Step 4 Choose **Basic > WIFI Router** in WiFi router mode and choose **Basic > Management WIFI** in WiFi repeater mode to display the **WLAN configuration** page.

Step 5 In WiFi router mode, click **MAC Filter**. In WiFi repeater mode, click **WLAN Filtering**.

Step 6 Select **Enable**.

Step 7 In Filtering mode, select Whitelist.

Step 8 Click **New**.

Step 9 In **Select SSID**, select the WLAN name.

Step 10 In **Source MAC address**, enter the MAC address of the laptop.

**NOTE**

The format of the MAC address entered in **Source MAC address** is different from that of the MAC address displayed in the command line window of a Windows XP operating system. The colons (:) replace the hyphens (-).

Step 11 Click **Submit**.

☒ Enable

Filtering mode: ☐ Blacklist ☒ Whitelist

Note: If Whitelist is choosed and MAC filter is empty, WPS will be disabled

WLAN Filtering

MAC Address

New Remove Help

Settings

Selected SSID: SSID1

Source MAC address: (AABB CC DD EE FF)

Submit

7.3 Controlling Computer Internet Access

Your WS322 provides MAC address filtering. With this function, you can confine Internet access to specific computers or deprive specific computers of Internet access. While using this function, you can also set limits on the duration of Internet usage.

This function is available in WiFi router mode.

- Step 1** Log in to the web management page.
- Step 2** Click **Advance Settings**.
- Step 3** In the navigation tree, choose **Advanced > SNTP**.
- Step 4** Select **Enable auto synchronization with network time**.
- Step 5** Select a time service address for **Time server 1**.
- Step 6** In **Time zone**, select your time zone.
- Step 7** Click **Submit**.

Status		Help
Status	Disabled	
Current Time	2012-01-01 13:13:31	
<input checked="" type="checkbox"/> Enable auto synchronization with network time		
Settings		Help
Time server 1:	clock.fmt.he.net	
Time server 2:	clock.nyc.he.net	
Time zone:	(GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi	
Synchronization Interval:	86400	
<input type="checkbox"/> Enable daylight saving time		
<input type="button" value="Submit"/>		

- Step 8** In the navigation tree, choose **Advance > Filter**.
- Step 9** Click **MAC Filter**.
- Step 10** Click **New**.
- Step 11** Set the following parameters based on rule 1.
 - Rule name: Prohibited before 19:00

- Source MAC address: 00:11:09:11:04:DD
- Time control: Enable
- Start time: 00:00
- End time: 18:59
- Effective day: Select from Monday to Sunday.
- Status: Disable

Step 12 Click **Submit**.

MAC Filter Ip Filter Application Filter URL Filter

MAC filtering New Remove Help

Rule Name	Source MAC Address	Bridge destination MAC Address	Time Control	Monday to Sunday	Time	Priority	Status	Remove
Settings								
Rule name:								
Source MAC address:	(AABB:CC:DD:EE:FF)							
Bridge destination MAC address:	(AABB:CC:DD:EE:FF)							
Time control:	<input checked="" type="checkbox"/> Enable							
Start time:	00:00							
End time:	23:59							
Effective day:	<input checked="" type="checkbox"/> Monday <input checked="" type="checkbox"/> Tuesday <input checked="" type="checkbox"/> Wednesday <input checked="" type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday							
Priority:								
Status:	Disable							
								Submit

Step 13 Click **New**.

Step 14 Set the following parameters based on rule 2.

- Rule name: Prohibited after 20:00
- Source MAC address: 00:11:09:11:04:DD
- Time control: Enable
- Start time: 19:59
- End time: 23:59
- Effective day: Select from Monday to Sunday.
- Status: Disable

Step 15 Click **Submit**.

MAC filtering

New Remove Help

Rule Name	Source MAC Address	Bridge destination MAC Address	Time Control	Monday to Sunday	Time	Priority	Status	Remove
Settings								
Rule name:	<input type="text"/>							
Source MAC address:	<input type="text" value="(AA:BB:CC:DD:EE:FF)"/>							
Bridge destination MAC address:	<input type="text" value="(AA:BB:CC:DD:EE:FF)"/>							
Time control:	<input checked="" type="checkbox"/> Enable							
Start time:	<input type="text" value="00:00"/>							
End time:	<input type="text" value="23:59"/>							
Effective day:	<input checked="" type="checkbox"/> Monday <input checked="" type="checkbox"/> Tuesday <input checked="" type="checkbox"/> Wednesday <input checked="" type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday							
Priority:	<input type="text"/>							
Status:	<input type="text" value="Disable"/>							
								<input type="button" value="Submit"/>

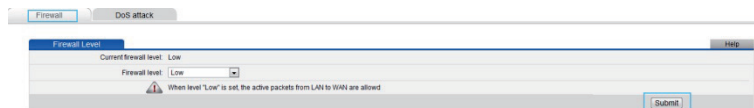
TIP

To delete a rule, select the rule from the rule list. In the **Remove** column, select the rule. Then click **Remove**.

7.4 Configuring the Firewall

The WS322 provides a firewall to help secure its WLAN and any devices connected to it. Set the firewall level based on site requirements to quickly configure the firewall.

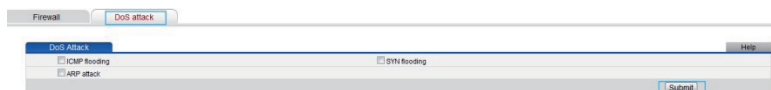
- Step 1** Log in to the web management page.
- Step 2** Click **Advance Settings**.
- Step 3** In the navigation tree, choose **Advanced > Firewall**.
- Step 4** In **Firewall Level**, select the firewall level you specified.
- Step 5** Click **Submit**.



Step 6 Click **DoS Attack**.

Step 7 Under **DoS Attack**, select the **ICMP flooding**, **SYN flooding** and **ARP attack**.

Step 8 Click **Submit**.



7.5 Filtering Out Inappropriate Websites

Use URL filtering to prevent certain websites from being accessed. For example, if `www.***.com` is not suitable for browsing, use URL filtering to create a blacklist rule to block that website.

This function is available in WiFi router mode.

Step 1 Log in to the web management page.

Step 2 Click **Advance Settings**.

Step 3 In the navigation tree, choose **Advance > Filter**.

Step 4 Click **IP Filter**.

Step 5 Click **New**.

Step 6 Select **Protocol**. Then select **TCP** for **Protocol**.

Step 7 Set the following parameters as planned.

- Source start port: 80
- Source end port: 80
- Destination start address: 192.168.33.166
- Destination end address: 192.168.33.166
- Destination start port: 80
- Destination end port: 80
- Priority: 1

Step 8 Click **Submit**.

The screenshot shows the 'IP Filtering' configuration interface. At the top, there are tabs for 'MAC Filter', 'ip Filter' (selected), 'Application Filter', and 'URL Filter'. Below the tabs, there are buttons for 'New', 'Remove', and 'Help'. The main area is titled 'Settings' and contains several input fields: 'Rule name', 'Source start address', 'Source end address', 'Destination start address', 'Destination end address', 'Priority', and 'Status'. The 'Protocol' is set to 'All' and the 'Input interface' is set to 'All'. A 'Submit' button is located at the bottom right of the form.

7.6 Changing WLAN Repeater Mode Settings

In WiFi repeater mode, you can change the WLAN repeater mode settings to let the uplink access point identify the number and information of wireless clients connected to the WS322.

This function is available in WiFi repeater mode.

For example, your WS322 is working in WiFi repeater mode and is connected to an uplink access point, computer 1, and computer 2. The uplink access point uses MAC filtering to block computer 1's signals while keeps computer 2's signals. You want the access point to deem the WS322 as two stations and distinct the signals of computer 1 and 2.

Step 1 Log in to the web management page.

Step 2 Click **Advance Settings**.

Step 3 In the navigation tree, choose **Basic > WIFI Repeater**.

Step 4 Click **AP List**.

Step 5 From the **WLAN Repeater Mode** drop-down list, select **Multi-STA**.

The screenshot displays the web interface of the WS322 300Mbps Wireless Range Extender. At the top, there is a tab labeled "AP List". Below this, the "Repeater Settings" section is visible, containing two dropdown menus: "WLAN Repeater Mode" set to "Single-STA" and "Country code" set to "UNITED KINGDOM". To the right of these settings is a "Help" button. Below the settings is the "Wireless AP List" section, which includes a "SCAN" button and another "Help" button. A message at the bottom of the "Wireless AP List" section reads: "Click [SCAN](#) in the upper right corner to find available AP in your near side!".

8 Maintenance Guide

8.1 Changing the Web Management Page Password

The correct user name and password are required to log in to the web management page. Regular changes to the web management page user name and password can effectively prevent unauthorized users from logging in and modifying important parameters.

- Step 1** Log in to the web management page.
- Step 2** Click **Advance Settings**.
- Step 3** In the navigation tree, choose **Maintenance > Account**.
- Step 4** In **User Name**, select **admin**.
- Step 5** In **Current password**, enter the currently used password.
- Step 6** In **New password**, enter a new password you sepecified. In **Confirm password**, enter the new password again.
- Step 7** Click **Submit**.

The screenshot shows a web interface for account management. At the top, there is a navigation bar with 'Account' on the left and 'Help' on the right. Below this, there is a form with the following fields:

User name:	admin	
Current password:		(Max length of Password is 32*)
New password:		(Max length of Password is 32*)
Confirm password:		(Max length of Password is 32*)

At the bottom right of the form, there is a 'Submit' button.

8.2 Changing the IP Address Used to Log In to the Web management page

The IP address used to log in to the WS322 web management page is the WS322 IP address. For security or other purposes (for instance, if the default WS322 IP address conflicts with that of another device on the same network), you can change the WS322 IP address.

Use the new IP address to log in to the web management page.

Step 1 Log in to the web management page.

Step 2 Click **Advance Settings**.

Step 3 In the navigation tree, choose **Basic > LAN setting**.

Step 4 Click **DHCP Server**.

Step 5 In **IP address** under the **LAN Host Settings** group box, enter the new IP address **192.168.3.88** in **IP address**.

Step 6 Click **Submit**.

The screenshot displays the WS322 web management interface. At the top, there are two tabs: "DHCP Server" (selected) and "Static Address". Below these tabs is a "LAN Host Settings" section with a "Help" button. This section contains two rows of configuration fields: "IP address" with the value "192.168.1.1" and a red asterisk indicating an error, and "Server Subnet mask" with the value "255.255.255.0". Below the "LAN Host Settings" section is a "DHCP Server" section, also with a "Help" button. This section contains several configuration fields: "DHCP server" with a checked "Enable" checkbox, "Start IP address" with the value "192.168.1.2" and a red asterisk, "End IP address" with the value "192.168.1.254" and a red asterisk, "Lease duration" with a "permanent lease" checkbox and a duration of "1 day(s) 0 hour(s) 0 minute(s) 0 second(s)", "Primary DNS server address" with the value "192.168.1.1", and "Secondary DNS server address" which is empty. A "Submit" button is located at the bottom right of the "DHCP Server" section.

8.3 Restoring Default Settings

Using the Configuration Tool

If the WS322 parameter settings were configured incorrectly, log in to the web management page to reload the default configuration file and restore the WS322 to its default settings. Perform this operation with caution. After the WS322 is restored to its default settings, all custom data and settings will be lost, and the password will be restored to **admin**.

Step 1 Log in to the web management page.

Step 2 Click **Advance Settings**.

Step 3 In the navigation tree, choose **Maintenance > Device**.

Step 4 Click **Reset**.

Step 5 Click **Restore Default Settings**.



Step 6 In the displayed dialog box, click **OK**.

Using the Reset Button

If you forget the login password to the web management page or could not access the web management page, use the **Reset** button on the WS322 rear panel to restore the WS322 to its default settings. Perform this operation with caution. After the WS322 is restored to its default settings, all custom data and settings will be lost, and the password will be restored to admin.

Step 1 Press the WS322 **On/Off** button to power the WS322 on.

Step 2 Press and hold the **Reset** button for 6 seconds or more.

The WS322 will restart, which will cause temporary network interruptions.

**NOTE**

After the WS322 is restored to its default settings, change the computer IP address so that it is in the same network segment as the 192.168.33.1 default IP address.

9

Reference Operations

9.1 Enabling Wireless Configuration on Windows

On Windows XP

- Step 1** Right-click My Computer and choose Manage from the shortcut menu.
- Step 2** In the left pane of the Computer Management window, choose Computer Management (Local) > Services and Applications > Services.
- Step 3** In the right pane of the Computer Management window, right-click Wireless Zero Configuration and choose Properties from the shortcut menu.
- Step 4** In the displayed dialog box, check that Service status is Started.
- Step 5** Click OK to close the dialog box. Then close the Computer Management window.

On Windows 7 or Windows Vista

- Step 1** Right-click Computer and choose Manage from the shortcut menu.
- Step 2** In the left pane of the Computer Management window, choose Computer Management (Local) > Services and Applications > Services.
- Step 3** In the right pane of the Computer Management window, right-click WLAN AutoConfig and choose Properties from the shortcut menu.
- Step 4** In the displayed dialog box, check that Service status is Started.

Step 5 Click OK to close the dialog box. Then close the Computer Management window.

9.2 Checking the Computer MAC Address

The MAC address, also known as the physical address, is a unique identifier assigned to a network adapter. A MAC address contains six groups of two hexadecimal digits, such as 2C-41-38-8D-75-8D. This section demonstrates how to check your computer's MAC address.

On Windows 7

Step 1 Choose Start > Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings. Right-click Local Area Connection and choose Status from the shortcut menu.

Step 2 Click Details.

Step 3 In Network Connection Details, find the line similar to Physical Address 70-F3-95-0C-49-4E. The 70-F3-95-0C-49-4E string is your computer's MAC address.

On Windows XP

Step 1 Choose Start > Control Panel > Network and Internet Connections > Network Connections. Right-click Local Area Connection and choose Status from the shortcut menu.

Step 2 Click the Support tab. Under Connection status, click Details.

Step 3 In Network Connection Details, find the line similar to Physical Address 78-AC-C0-B0-DF-A1. The 78-AC-C0-B0-DF-A1 string is your computer's MAC address

10 FAQs

What are the meanings of the WS322 signal indicator?

The WS322 signal indicator only works in WiFi repeater and WiFi client modes.

The number of lightened bars shows the network signal strength. Three bars mean the network signals are strong, two bars mean the network signals are good, and one bar means the network signals are weak. It is recommended that you use the WS322 in a network where the signal strength is strong or good.

What Can I Do If I Cannot Open the Web Management Page?

- Step 1** Open Internet Explorer. Choose Tools > Internet Options > Connection > LAN settings, and ensure that all check boxes are deselected.
- Step 2** Check that the computer IP address is 192.168.33.* (* is any integer from 2 to 254).
- Step 3** Check that the cables are securely connected to the WS322 and that the LAN port's indicator is on.
- Step 4** Ensure that the user name and password are correct.
If the problem persists, restore the WS322 to its default settings.

What Can I Do If the WS322 Cannot Access the Internet through a Wireless Network Adapter Sometimes or If the WLAN Connection Is Unsteady?

This is probably because the WS322 has its cables connected loosely, is placed too close to electronic appliances with intensive interference, or is too far from the computer. Verify that:

Step 1 The power and telephone cables are correctly connected to the WS322.

Step 2 Your computer and the WS322 are far from electric appliances that generate strong magnetic or electric fields, such as microwave ovens, refrigerators, and cordless telephones.

Step 3 The WS322 is in an open area, and there are no obstacles, such as concrete or wooden walls, between the WS322 and computer.

Step 4 The WS322 is close to the computer.

Step 5 The angle between the WS322 and computer is appropriate.

**NOTE**

Do not use the WS322 during thunderstorms, as the signal strength may be unsteady and the WS322 itself may be damaged due to lightning strikes.

What Is the Difference Between Wireless MAC Address Filtering and MAC Address Filtering?

- Wireless MAC address filtering: controls whether a computer can connect to the WS322 over the WLAN.
- MAC address filtering: controls whether a computer connected to the WS322 can access the Internet.