



DAP-1325

N300 Wi-Fi Range Extender

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CHAPTER 1. INTRODUCTION

Contents and Audience

This manual describes the extender DAP-1325 and explains how to configure and operate it.

This manual is intended for users familiar with basic networking concepts, who create an in-home local area network, and system administrators, who install and configure networks in offices.

Conventions

Example	Description
text	The body text of the manual.
<i>Before You Begin</i>	A reference to a chapter or section of this manual.
<i>“Quick Installation Guide”</i>	A reference to a document.
Change	A name of a menu, menu item, control (field, checkbox, drop-down list, button, etc.).
192.168.0.50	Data that you should enter in the specified field.
 <u>Information</u>	An important note.

Document Structure

Chapter 1 describes the purpose and structure of the document.

Chapter 2 gives an overview of the extender's hardware and software features, describes its appearance and the package contents.

Chapter 3 explains how to install the extender DAP-1325 and configure a PC in order to access its web-based interface.

Chapter 4 describes all pages of the web-based interface in detail.

Chapter 5 includes safety instructions and tips for networking.

Chapter 6 introduces abbreviations and acronyms used in this manual.

CHAPTER 2. OVERVIEW

General Information

The DAP-1325 device is a wireless extender designed to increase the operational range of your wireless network. The extender supports operation with wireless devices of the standards 802.11b, 802.11g, and 802.11n (at the rate up to 300Mbps).

The device supports multiple functions for the wireless interface: several security standards (WEP, WPA/WPA2), MAC address filtering, different operation modes (repeater, client, access point), WPS, WMM.

The wireless extender is equipped with one Fast Ethernet LAN port, which can be used to connect a wired client to the extender or to connect DAP-1325 to a wired router.

The LED clearly shows the signal level of the wireless network to which DAP-1325 is connected. Due to this, you can easily find the best location for the extender.

You can configure the settings of the DAP-1325 device via the user-friendly web-based interface (the interface is available in two languages – in Russian and in English).

The configuration wizard allows you to quickly switch the extender to the access point, repeater, or client mode and configure all needed settings for the selected mode in several simple steps.

Now you can simply update the firmware: when the Internet access is provided, the extender itself finds approved firmware on D-Link update server and notifies when ready to install it.

Specifications*

Hardware	
Processor	<ul style="list-style-type: none"> MT7628NN (580MHz)
RAM	<ul style="list-style-type: none"> 64MB, DDR2 SDRAM
Flash	<ul style="list-style-type: none"> 8MB, SPI
Interfaces	<ul style="list-style-type: none"> 10/100BASE-TX LAN port
LEDs	<ul style="list-style-type: none"> POWER/WPS Wi-Fi Signal Strength
Buttons	<ul style="list-style-type: none"> WPS button to set up wireless connection RESET button to restore factory default settings
Antenna	<ul style="list-style-type: none"> Two external non-detachable antennas (2 dBi)
MIMO	<ul style="list-style-type: none"> 2 x 2
Power connector	<ul style="list-style-type: none"> CEE 7/16 plug for AC power supply

Software	
Network functions	<ul style="list-style-type: none"> DHCP server DNS relay
Firewall functions	<ul style="list-style-type: none"> MAC filter
Management	<ul style="list-style-type: none"> Local and remote access to settings through TELNET/WEB (HTTP/HTTPS) Bilingual web-based interface for configuration and management (Russian/English) Firmware update via web-based interface Automatic notification on new firmware version Saving/restoring configuration to/from file Support of logging to remote host Automatic synchronization of system time with NTP server and manual time/date setup Ping utility Traceroute utility

Wireless Module Parameters	
Standards	<ul style="list-style-type: none"> IEEE 802.11b/g/n
Frequency range	<ul style="list-style-type: none"> 2400 ~ 2483.5MHz
Wireless connection security	<ul style="list-style-type: none"> WEP WPA/WPA2 (Personal/Enterprise) MAC filter WPS (PBC/PIN)
Advanced functions	<ul style="list-style-type: none"> Support of client mode WMM (Wi-Fi QoS) Information on connected Wi-Fi clients Advanced settings Support of MBSSID
Wireless connection rate	<ul style="list-style-type: none"> IEEE 802.11b: 1, 2, 5.5, and 11Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, and 54Mbps IEEE 802.11n: from 6.5 to 300Mbps (from MCS0 to MCS15)

* The device features are subject to change without notice. For the latest versions of the firmware and relevant documentation, visit www.dlink.ru.

Wireless Module Parameters	
Transmitter output power <i>The maximum value of the transmitter output power depends upon the radio frequency regulations applied in your country</i>	<ul style="list-style-type: none"> 802.11n (typical at room temperature 25 °C) 15dBm (+/-1.5 dB)
Receiver sensitivity	<ul style="list-style-type: none"> 802.11n (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C) HT20 -82dBm at MCS0/8 -79dBm at MCS1/9 -77dBm at MCS2/10 -74dBm at MCS3/11 -70dBm at MCS4/12 -66dBm at MCS5/13 -65dBm at MCS6/14 -64dBm at MCS7/15 HT40 -79dBm at MCS0/8 -76dBm at MCS1/9 -74dBm at MCS2/10 -71dBm at MCS3/11 -67dBm at MCS4/12 -63dBm at MCS5/13 -62dBm at MCS6/14 -61dBm at MCS7/15

Physical Parameters	
Dimensions (L x W x H)	<ul style="list-style-type: none"> 51 x 49 x 98 mm (2 x 1.91 x 3.85 in)
Weight	<ul style="list-style-type: none"> 97 g (0.21 lb)





Operating Environment	
Power	<ul style="list-style-type: none"> Input: 110 to 240 V AC, 50/60 Hz
Temperature	<ul style="list-style-type: none"> Operating: from 0 to 40 °C Storage: from -20 to 70 °C
Humidity	<ul style="list-style-type: none"> Operating: from 10% to 90% (non-condensing) Storage: from 5% to 90% (non-condensing)

Product Appearance

Upper Panel



Figure 1. Upper panel view.

LED	Mode	Description
POWER/WPS	<i>Solid red</i>	The device is being loaded.
	<i>Solid green</i>	The device is ready for use.
	<i>Blinking red</i>	Attempting to add a wireless device via the WPS function.
	<i>No light</i>	The extender is powered off.
Wi-Fi Signal Strength	<i>Solid red</i> 	The device is not connected to a wireless network or the signal strength is poor.
	<i>Solid green</i> 	Fair signal strength.
	<i>Solid green</i> 	Good signal strength.
	<i>Solid green</i> 	Excellent signal strength.
	<i>No light</i>	The extender's WLAN is off.

The **Wi-Fi Signal Strength** LED is a LED scale. It shows the signal strength of the wireless network to which DAP-1325 is connected. The more LEDs are on, the better the signal strength is. To improve the signal strength, move the extender closer to the source of the signal.

The **RESET** and **WPS** buttons are located on the upper panel of the extender.

Button	Description
RESET	A button to restore the factory default settings. To restore the factory defaults, push the button (with the device turned on), hold it for 10 seconds, and then release the button.
WPS	A button to set up a wireless connection (the WPS function). To use the WPS function: with the device turned on, push the button, hold it for 2 seconds, and release. The POWER/WPS LED should start blinking.

The device is also equipped with two external non-detachable Wi-Fi antennas.

Bottom Panel



Figure 2. Bottom panel view.

Port	Description
LAN	An Ethernet port to connect to a computer or a wired router.

Delivery Package

The following should be included:

- Extender DAP-1325
- “***Quick Installation Guide***” (brochure).

The “***User Manual***” and “***Quick Installation Guide***” documents are available on D-Link website (see www.dlink.ru).



Using a power supply with different parameters than those indicated on the device will cause damage and void the warranty for this product.

CHAPTER 3. INSTALLATION AND CONNECTION

Before You Begin

Please, read this manual prior to installing the device. Make sure that you have all the necessary information and equipment.

Operating System

Configuration of the wireless extender DAP-1325 (hereinafter referred to as “the extender”) is performed via the built-in web-based interface. The web-based interface is available from any operating system that supports a web browser.

Web Browser

The following web browsers are recommended:

- Apple Safari 8 and later
- Google Chrome 48 and later
- Microsoft Internet Explorer 10 and later
- Microsoft Edge 20.10240 and later
- Mozilla Firefox 44 and later
- Opera 35 and later.

For successful operation, JavaScript should be enabled on the web browser. Make sure that JavaScript has not been disabled by other software (such as virus protection or web user security packages) running on your computer.

Wired or Wireless NIC (Ethernet or Wi-Fi Adapter)

Any computer that uses the extender should be equipped with an Ethernet or Wi-Fi adapter (NIC). If your computer is not equipped with such a device, install an Ethernet or Wi-Fi adapter prior to using the extender.

Wireless Connection

Wireless workstations from your network should be equipped with a wireless 802.11b, g, or n NIC (Wi-Fi adapter). In addition, you should specify the values of SSID, channel number and security settings defined in the web-based interface of the extender for all these wireless workstations.

Connecting to PC

PC with Ethernet Adapter

1. Connect an Ethernet cable between the Ethernet port of the extender and the Ethernet port of your PC.
2. Plug the device into an electrical outlet or power strip.

Now you need to configure an IP address for the Ethernet adapter of your PC.

Configuring IP Address in OS Windows XP

1. Click the **Start** button and proceed to the **Control Panel > Network and Internet Connections > Network Connections** window.
2. In the **Network Connections** window, right-click the relevant **Local Area Connection** icon and select the **Properties** line in the menu displayed.

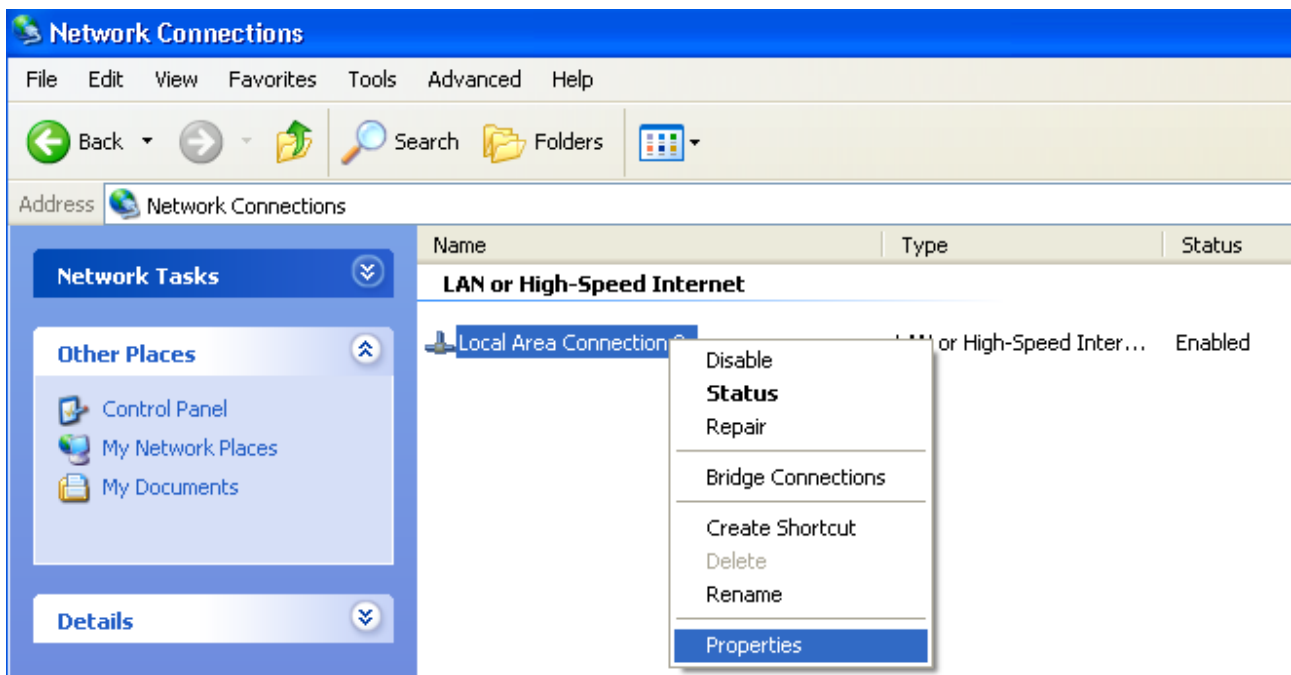


Figure 3. The **Network Connections** window.

3. In the **Local Area Connection Properties** window, on the **General** tab, select the **Internet Protocol (TCP/IP)** line. Click the **Properties** button.

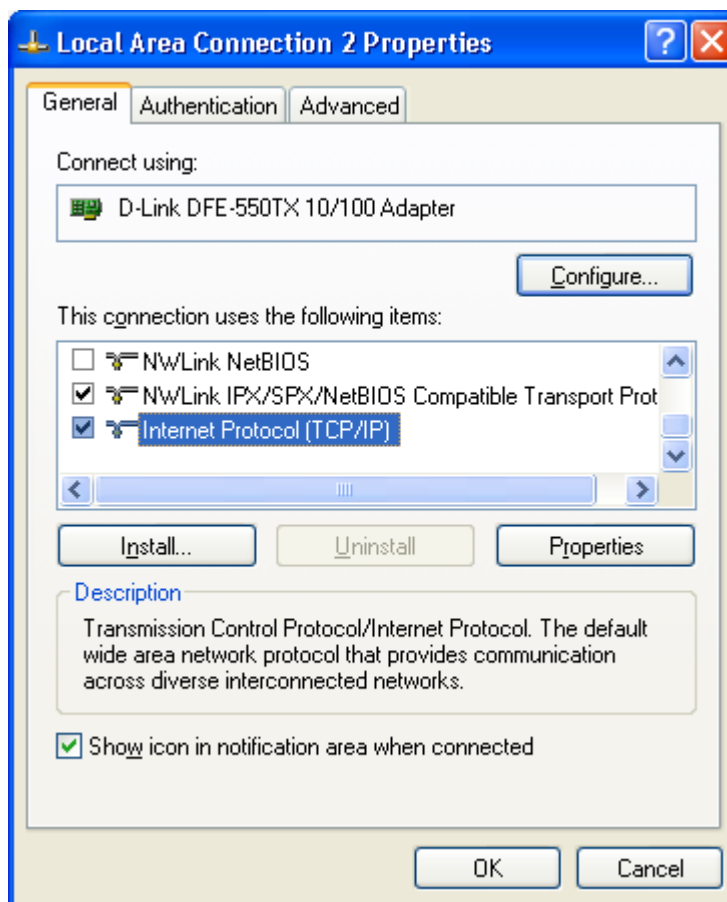


Figure 4. The **Local Area Connection Properties** window.

4. Select the **Use the following IP address** radio button and enter the value **192.168.0.51** in the **IP address** field. The **Subnet mask** field will be filled in automatically. Click the **OK** button.

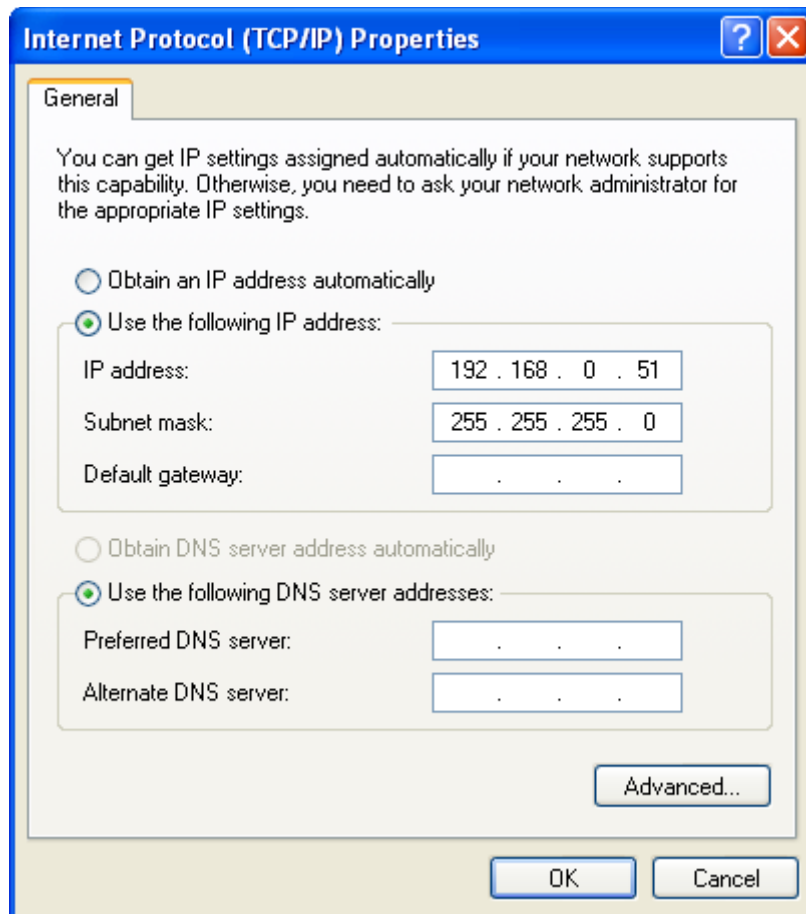


Figure 5. The **Internet Protocol (TCP/IP) Properties** window.

5. Click the **OK** button in the connection properties window.

Now you can connect to the web-based interface of DAP-1325 for configuring all needed parameters. To gain access to an external network (to the Internet), you also need to specify the default gateway and the addresses of DNS servers.

Configuring IP Address in OS Windows 7

1. Click the **Start** button and proceed to the **Control Panel** window.
2. Select the **Network and Sharing Center** section. (If the Control Panel has the category view (the **Category** value is selected from the **View by** drop-down list in the top right corner of the window), choose the **View network status and tasks** line under the **Network and Internet** section.)

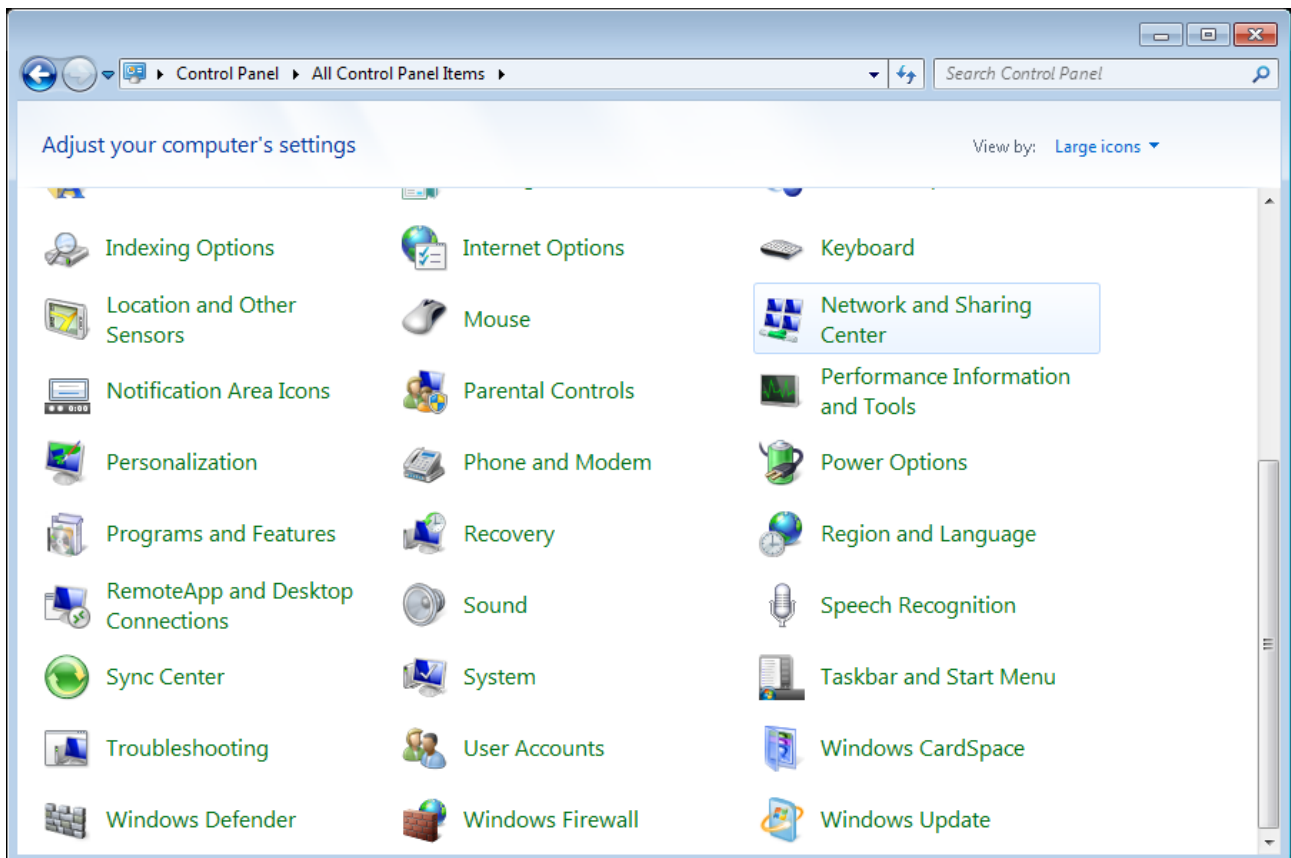


Figure 6. The **Control Panel** window.

3. In the menu located on the left part of the window, select the **Change adapter settings** line.

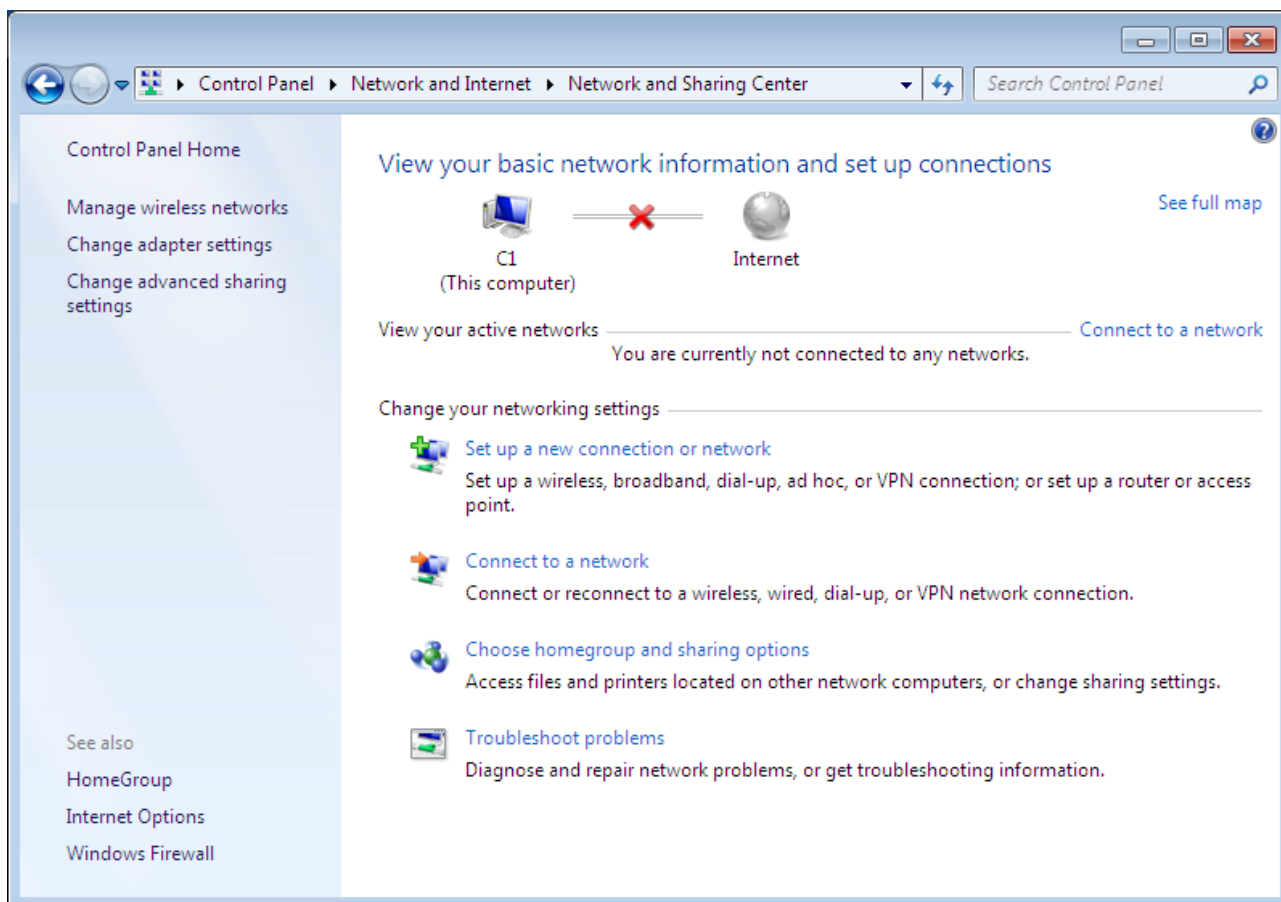


Figure 7. The **Network and Sharing Center** window.

4. In the opened window, right-click the relevant **Local Area Connection** icon and select the **Properties** line in the menu displayed.

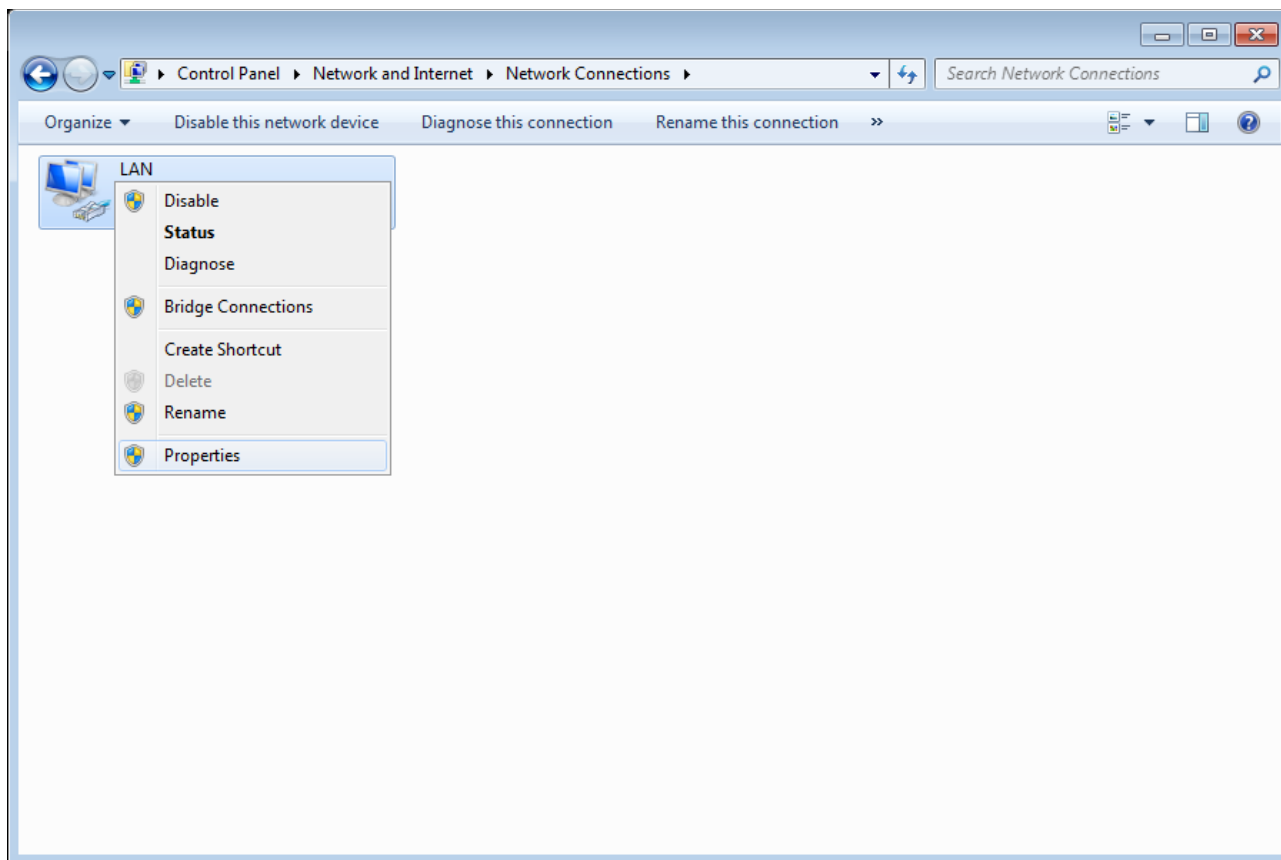


Figure 8. The **Network Connections** window.

5. In the **Local Area Connection Properties** window, on the **Networking** tab, select the **Internet Protocol Version 4 (TCP/IPv4)** line. Click the **Properties** button.

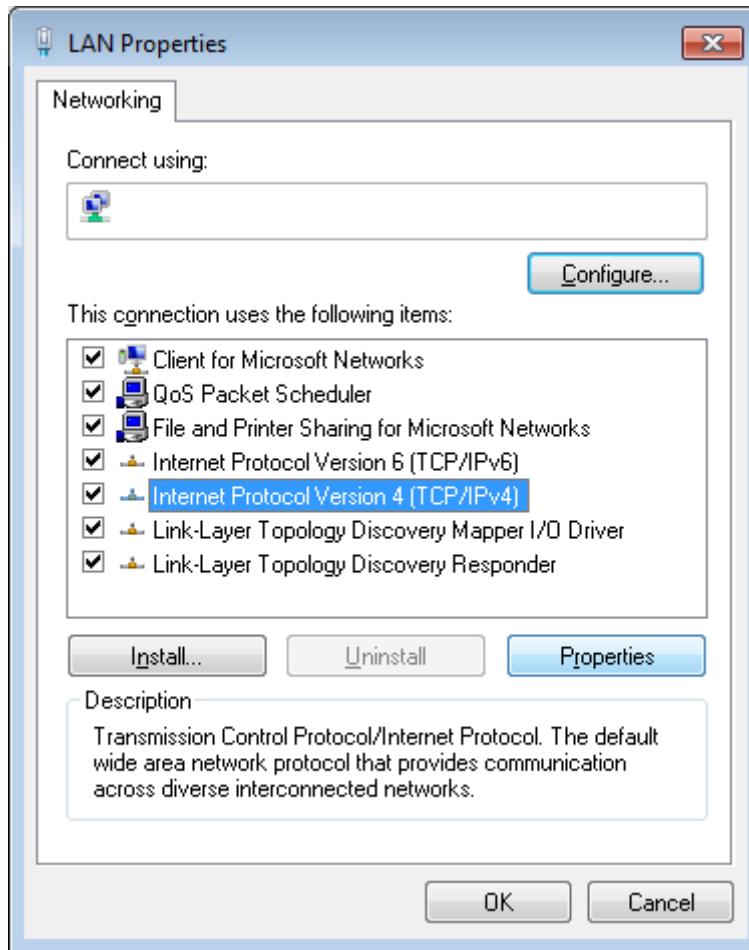


Figure 9. The **Local Area Connection Properties** window.

6. Select the **Use the following IP address** radio button and enter the value **192.168.0.51** in the **IP address** field. The **Subnet mask** field will be filled in automatically. Click the **OK** button.

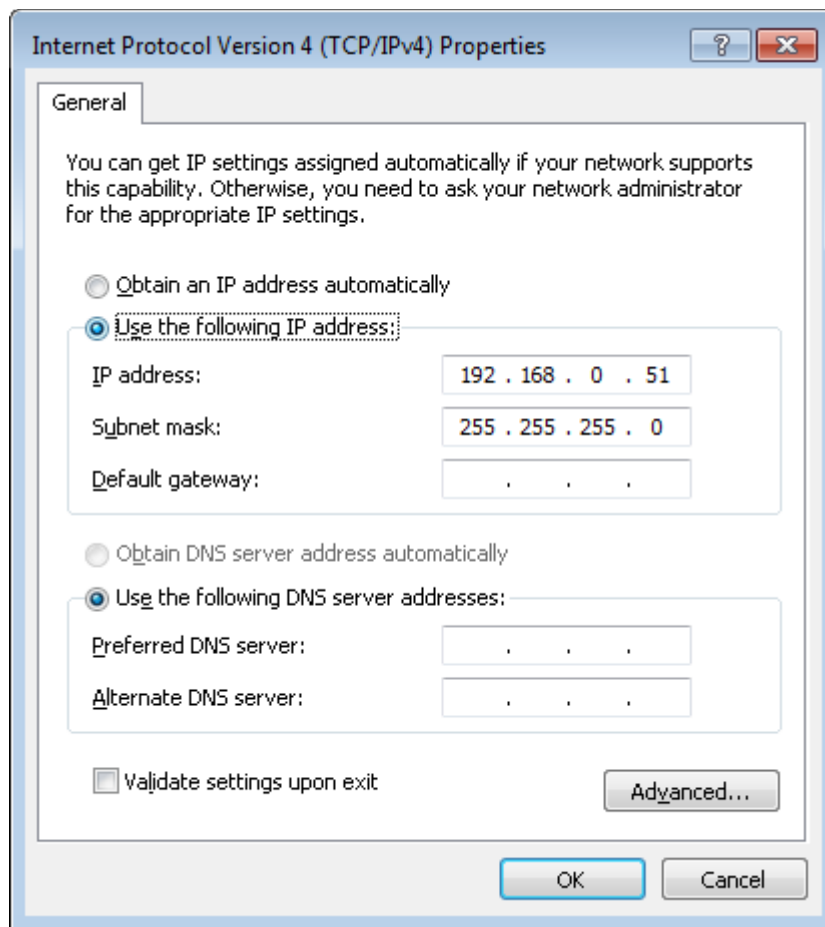


Figure 10. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

7. Click the **OK** button in the connection properties window.

Now you can connect to the web-based interface of DAP-1325 for configuring all needed parameters. To gain access to an external network (to the Internet), you also need to specify the default gateway and the addresses of DNS servers.

PC with Wi-Fi Adapter

1. Plug the device into an electrical outlet or power strip.
2. Turn on your Wi-Fi adapter. As a rule, modern notebooks with built-in wireless NICs are equipped with a button or switch that turns on/off the wireless adapter (refer to your PC documents). If your PC is equipped with a pluggable wireless NIC, install the software provided with your Wi-Fi adapter.

Now you should configure your Wi-Fi adapter.

Configuring Wi-Fi Adapter in OS Windows XP

1. Click the **Start** button and proceed to the **Control Panel > Network and Internet Connections > Network Connections** window.
2. In the **Network Connections** window, right-click the relevant **Wireless Network Connection** icon. Make sure that your Wi-Fi adapter is on, then select the **Properties** line in the menu displayed.
3. In the **Wireless Network Connection Properties** window, on the **General** tab, select the **Internet Protocol (TCP/IP)** line. Click the **Properties** button.
4. Select the **Use the following IP address** radio button and enter the value **192.168.0.51** in the **IP address** field. The **Subnet mask** field will be filled in automatically. Click the **OK** button.

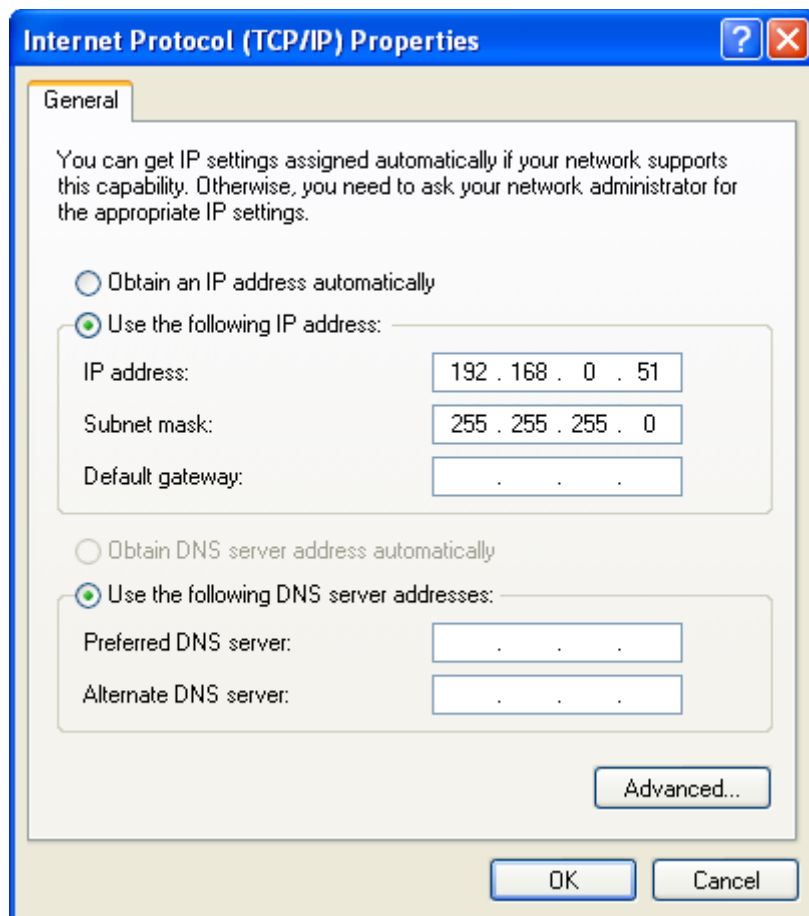


Figure 11. The **Internet Protocol (TCP/IP) Properties** window.

5. Click the **OK** button in the connection properties window.

6. Search for available wireless networks.

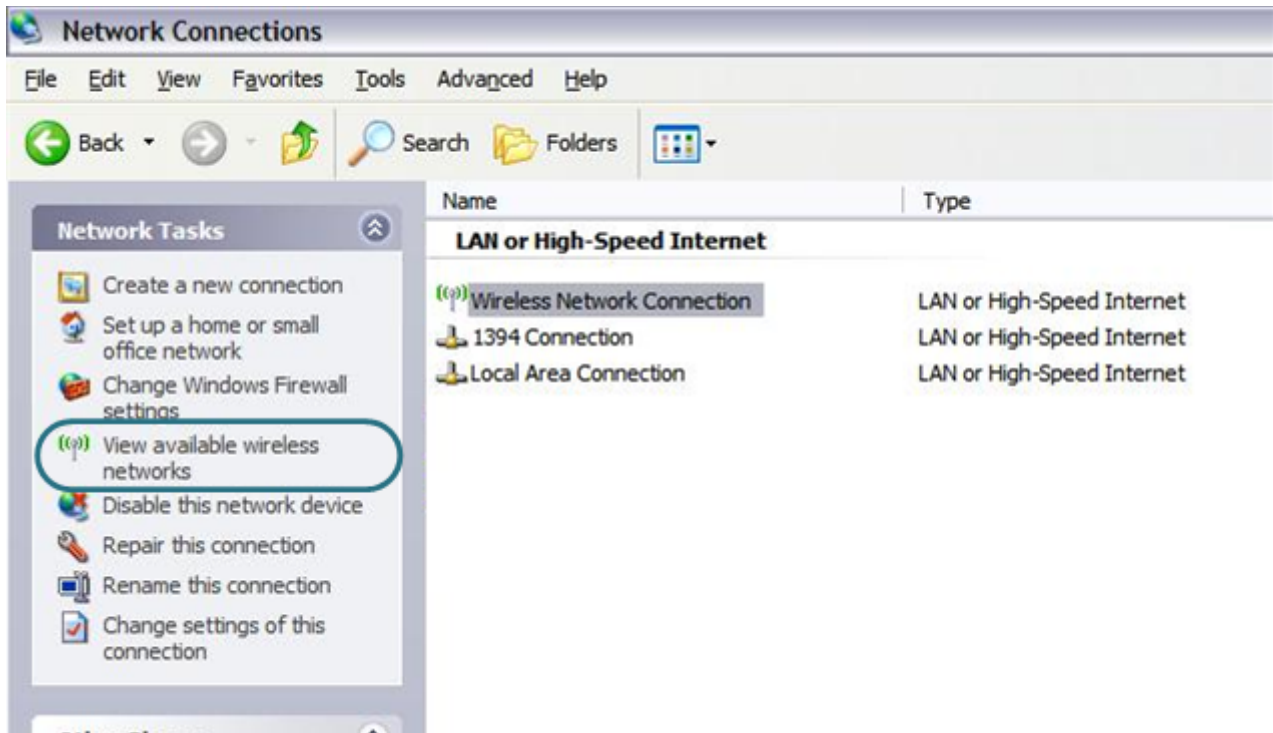


Figure 12. The **Network Connections** window.

7. In the opened **Wireless Network Connection** window, select the wireless network **DAP-1325** and click the **Connect** button.
8. In the opened window, enter the network key (see WPS PIN on the barcode label on the bottom panel of the device) in the **Network key** and **Confirm network key** fields and click the **Connect** button.

After that the **Wireless Network Connection Status** window appears.

Now you can connect to the web-based interface of DAP-1325 for configuring all needed parameters. To gain access to an external network (to the Internet), you also need to specify the default gateway and the addresses of DNS servers.

! If you perform initial configuration of the extender via Wi-Fi connection, note that immediately after changing the wireless default settings of the extender you will need to reconfigure the wireless connection using the newly specified settings.

Configuring Wi-Fi Adapter in OS Windows 7

1. Click the **Start** button and proceed to the **Control Panel** window.
2. Select the **Network and Sharing Center** section. (If the Control Panel has the category view (the **Category** value is selected from the **View by** drop-down list in the top right corner of the window), choose the **View network status and tasks** line under the **Network and Internet** section.)

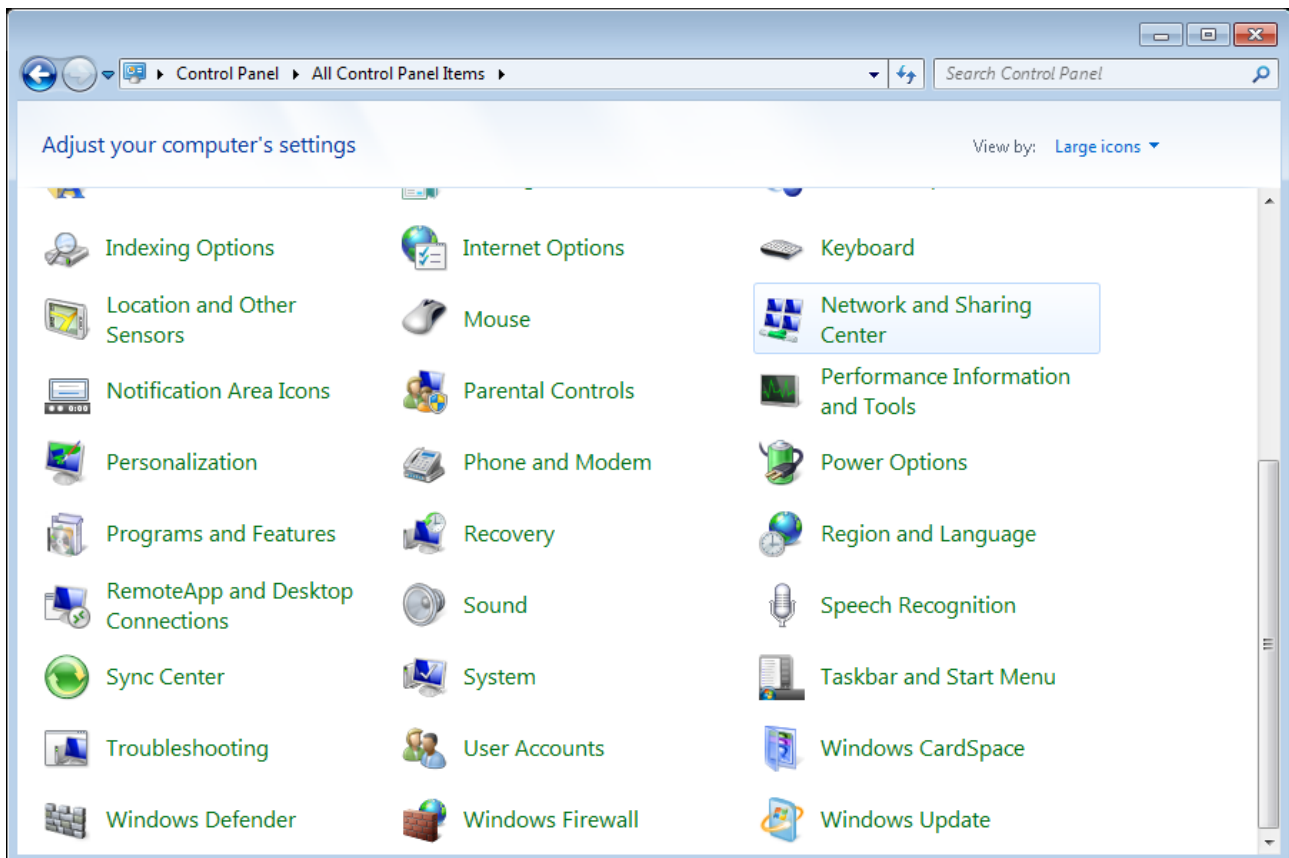


Figure 13. The **Control Panel** window.

3. In the menu located on the left part of the window, select the **Change adapter settings** line.
4. In the opened window, right-click the relevant **Wireless Network Connection** icon. Make sure that your Wi-Fi adapter is on, then select the **Properties** line in the menu displayed.
5. In the **Wireless Network Connection Properties** window, on the **Networking** tab, select the **Internet Protocol Version 4 (TCP/IPv4)** line. Click the **Properties** button.

6. Select the **Use the following IP address** radio button and enter the value **192.168.0.51** in the **IP address** field. The **Subnet mask** field will be filled in automatically. Click the **OK** button.

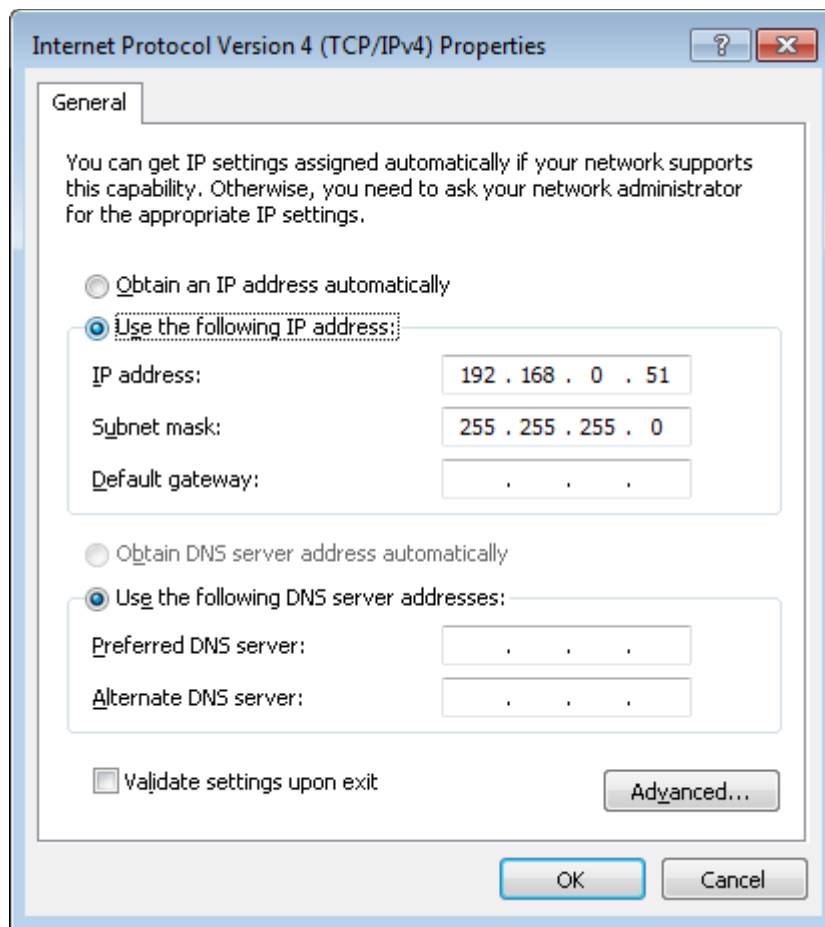


Figure 14. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

7. Click the **OK** button in the connection properties window.
8. To open the list of available wireless networks, select the icon of the wireless network connection and click the **Connect To** button or left-click the network icon in the notification area located on the right side of the taskbar.

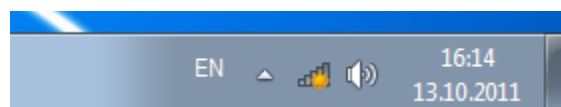


Figure 15. The notification area of the taskbar.

- In the opened window, in the list of available wireless networks, select the wireless network **DAP-1325** and click the **Connect** button.

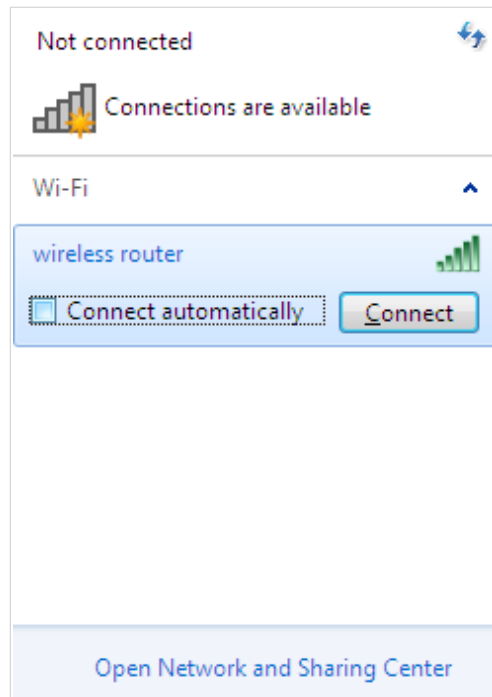


Figure 16. The list of available networks.

- In the opened window, enter the network key (see WPS PIN on the barcode label on the bottom panel of the device) in the **Security key** field and click the **OK** button.
- Wait for about 20-30 seconds. After the connection is established, the network icon will be displayed as the signal level scale.

Now you can connect to the web-based interface of DAP-1325 for configuring all needed parameters. To gain access to an external network (to the Internet), you also need to specify the default gateway and the addresses of DNS servers.

! If you perform initial configuration of the extender via Wi-Fi connection, note that immediately after changing the wireless default settings of the extender you will need to reconfigure the wireless connection using the newly specified settings.

Connecting to Web-based Interface

When you have configured your computer, you can access the web-based interface and configure needed parameters (change the parameters of the wireless network, specify the settings of the firewall, etc.).

Start a web browser (see the *Before You Begin* section, page 11). In the address bar of the web browser, enter the IP address of the extender (by default, the following IP address is specified: **192.168.0.50**). Press the **Enter** key.

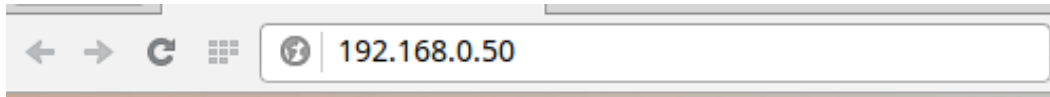


Figure 17. Connecting to the web-based interface of the DAP-1325 device.

! If the error “The page cannot be displayed” (or “Unable to display the page”/“Could not connect to remote server”) occurs upon connecting to the web-based interface of the extender, make sure that you have properly connected the extender to your computer.

If the device has not been configured previously or the default settings have been restored, after access to the web-based interface the Initial Configuration Wizard opens (see the *Initial Configuration Wizard* section, page 32).

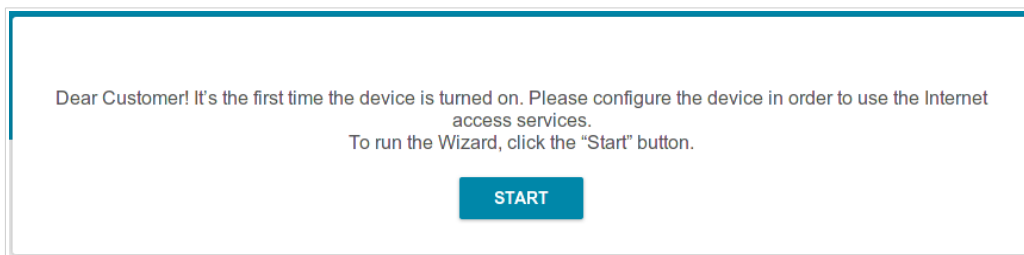
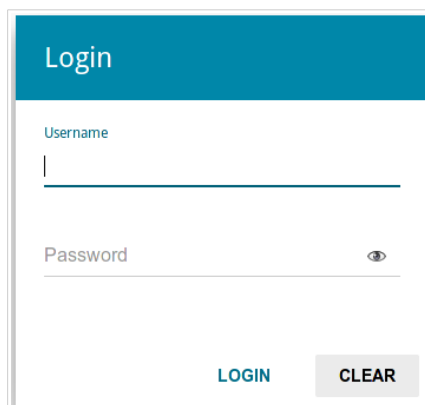


Figure 18. The page for running the Initial Configuration Wizard.

If you configured the device previously, after access to the web-based interface the login page opens. Enter the username (**admin**) in the **Username** field and the password you specified in the **Password** field, then click the **LOGIN** button.



The image shows a web-based login interface. At the top, there is a blue header with the word "Login" in white. Below the header, there are two input fields: "Username" and "Password". The "Username" field has a vertical cursor at the beginning. The "Password" field has a small eye icon to its right, indicating a toggle for password visibility. At the bottom of the form, there are two buttons: "LOGIN" in blue text and "CLEAR" in white text on a grey background.

Figure 19. The login page.

Web-based Interface Structure

Summary Page

On the **Summary** page, detailed information on the device state is displayed.

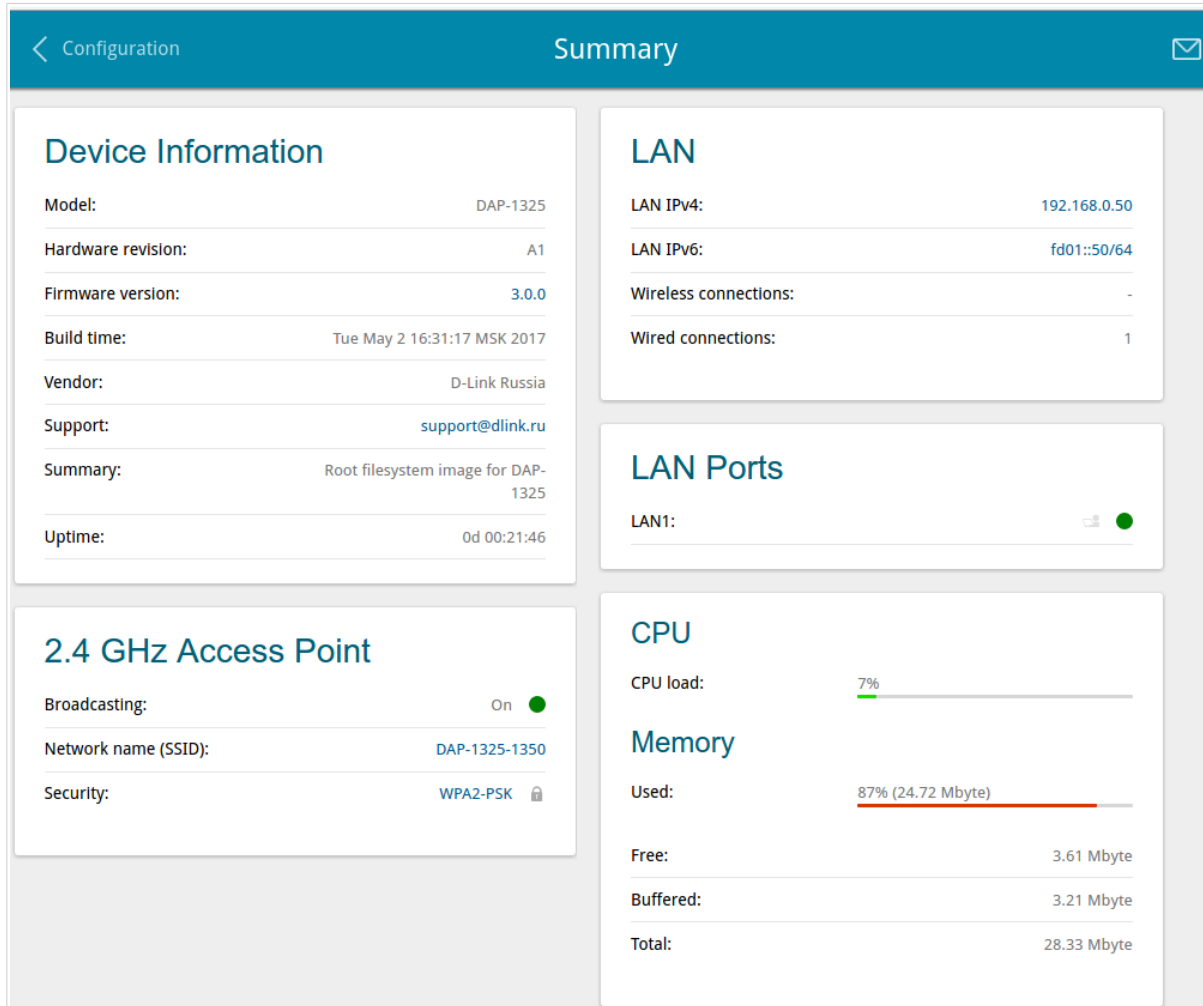


Figure 20. The summary page.

The **Device Information** section displays the model and hardware version of the extender, the firmware version, and other data.

To contact the technical support group (to send an e-mail), left-click the support e-mail address. After clicking the line, the e-mail client window for sending a new letter to the specified address opens.

The **2.4 GHz Access Point** section displays data on the state of the device's wireless network, its name and the authentication type.

In the **LAN** section, the IPv4 and IPv6 address of the extender and the number of wired and wireless clients of the device are displayed.

The **LAN Ports** section displays the state of the device's LAN port.

Other settings of the extender are available in the menu in the left part of the page.

Menu Sections

To configure the extender use the menu in the left part of the page.

In the **Initial Configuration** section you can run the Initial Configuration Wizard. The Wizard allows you to configure the extender for operation in the needed mode and specify all parameters necessary for getting started (for the description of the Wizard, see the *Initial Configuration Wizard* section, page 32).

The pages of the **Statistics** section display data on the current state of the extender (for the description of the pages, see the *Statistics* section, page 40).

The page of the **Connections Setup** section is designed for configuring basic parameters of the LAN interface of the extender (for the description of the page, see the *Connections Setup* section, page 44).

The pages of the **Wi-Fi** section are designed for specifying all needed settings of the extender's wireless network (for the description of the pages, see the *Wi-Fi* section, page 49).

The page of the **Advanced** section is designed for adding DNS servers to the system (for the description of the page, see the *Advanced* section, page 72).

The page of the **Firewall** section is designed for configuring the MAC filter of the extender (for the description of the page, see the *Firewall* section, page 74).

The pages of the **System** section provide functions for managing the internal system of the extender (for the description of the pages, see the *System* section, page 76).

To exit the web-based interface, click the **Logout** line of the menu.

Notifications

The extender's web-based interface displays notifications in the top right part of the page.

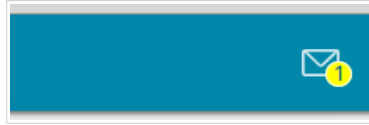


Figure 21. The web-based interface notifications.

Click the icon displaying the number of notifications to view the complete list and click the relevant button.

CHAPTER 4. CONFIGURING VIA WEB-BASED INTERFACE

Initial Configuration Wizard

To start the Initial Configuration Wizard, go to the **Initial Configuration** section. On the opened page, click the **OK** button and wait until the factory default settings are restored.

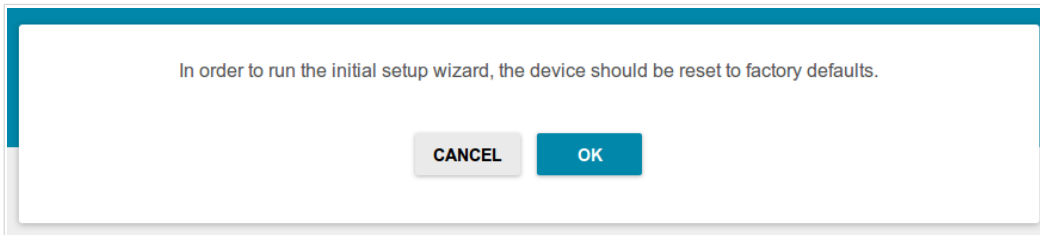


Figure 22. Restoring the default settings in the Wizard.

Click the **START** button.

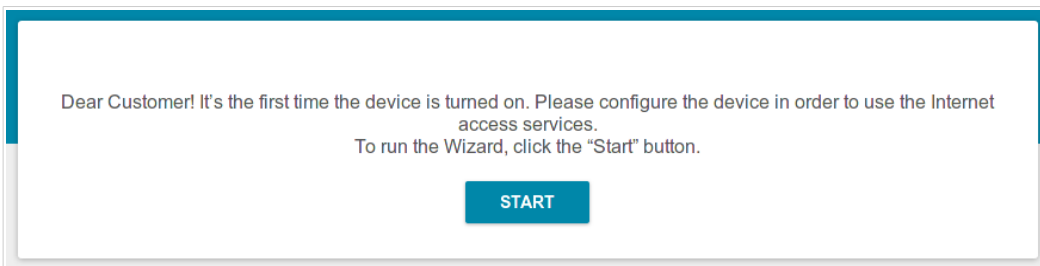


Figure 23. Starting the Wizard.

On the opened page, click **YES** in order to leave the current language of the web-based interface or click **NO** to select the other language.

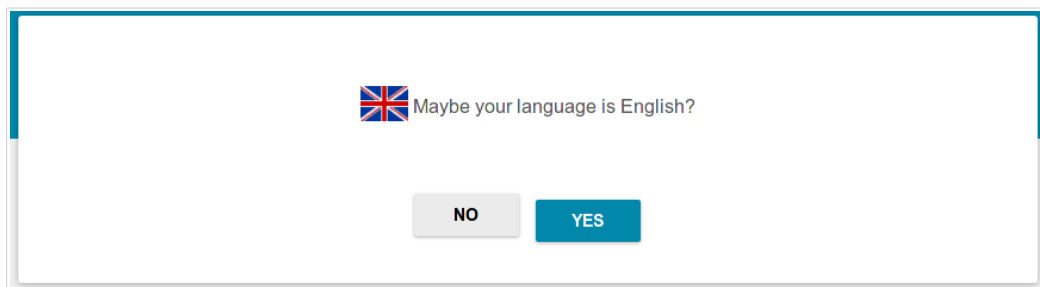
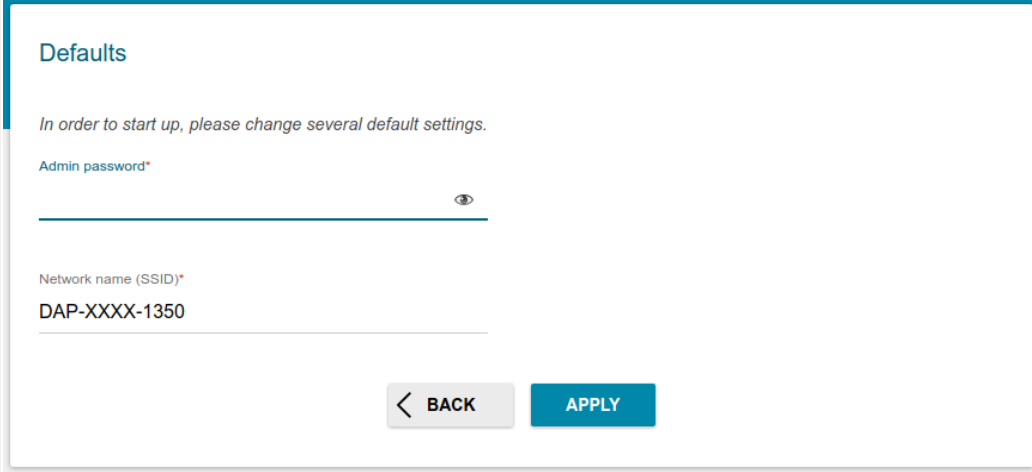


Figure 24. Selecting a language.

You can finish the wizard earlier and go to the menu of the web-based interface. To do this, click the **ADVANCED SETTINGS** button. On the opened page, change the default settings: specify the administrator password in the **Admin password** field and the name of the wireless network in the **Network name (SSID)** field. Then click the **APPLY** button.



Defaults

In order to start up, please change several default settings.

Admin password*

Network name (SSID)*

DAP-XXXX-1350

< BACK APPLY

Figure 25. Changing the default settings.

To continue the configuration of the extender via the Wizard, click the **CONTINUE** button.

Selecting Operation Mode

In order to connect your device to a wired router for adding a wireless network to the existing local network, on the **Device mode** page, from the **Connection method** list, select the **Wired connection** value. In this mode you can change the LAN IP address, set your own settings for the wireless network and set your own password for access to the web-based interface of the device.

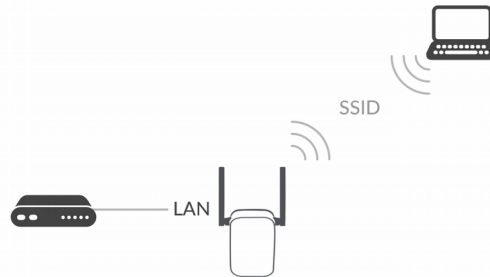


Figure 26. Selecting an operation mode. The **Access point** mode.

In order to connect your device to a wireless router for extending the range of the existing wireless network, on the **Device mode** page, from the **Connection method** list, select the **Wi-Fi** value. Then from the **Work mode** list select the **Repeater** value. In this mode you can change the LAN IP address, connect your device to another access point, set your own settings for the wireless network, and set your own password for access to the web-based interface of the device.

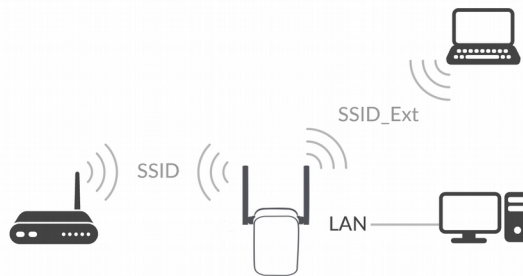


Figure 27. Selecting an operation mode. The **Repeater** mode.

In order to let a wired PC connected to your device access the network of a wireless router, on the **Device mode** page, from the **Connection method** list, select the **Wi-Fi** value. Then from the **Work mode** list select the **Client** value. In this mode you can change the LAN IP address, connect your device to another access point and set your own password for access to the web-based interface of the device.



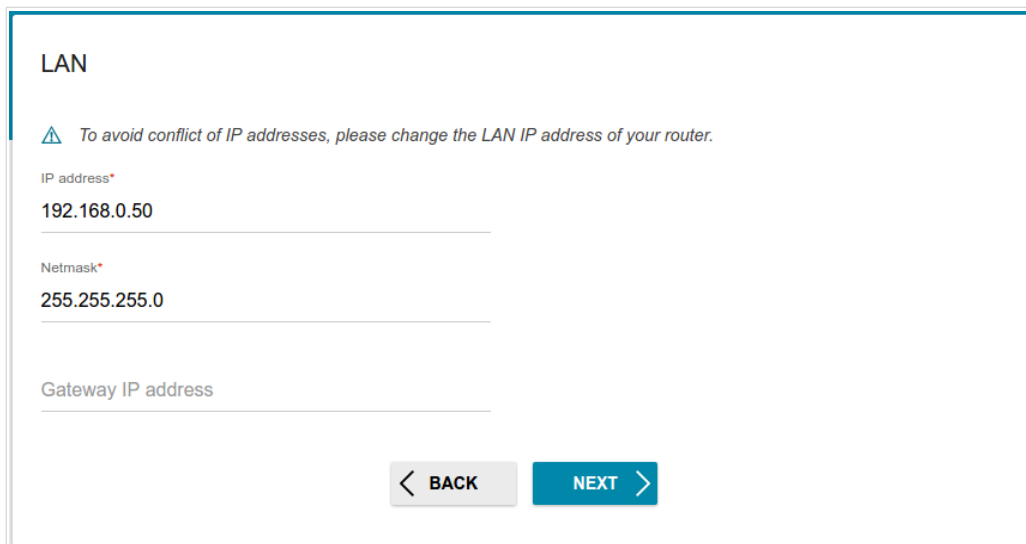
Figure 28. Selecting an operation mode. The **Client** mode.

When the operation mode is selected, click the **NEXT** button.


Changing LAN IPv4 Address

This configuration step is available for the **Access point**, **Repeater**, and **Client** modes.

1. If the LAN IPv4 address of DAP-1325 coincides with the LAN IPv4 address of the router to which it connects, then set another LAN IPv4 address of DAP-1325 in the **IP address** field.



LAN

 To avoid conflict of IP addresses, please change the LAN IP address of your router.

IP address*

192.168.0.50

Netmask*

255.255.255.0

Gateway IP address

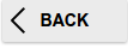

 

Figure 29. The page for changing the LAN IPv4 address.

2. Click the **NEXT** button to continue or click the **BACK** button to return to the previous page.

Wi-Fi Client

This configuration step is available for the **Repeater** and **Client** modes.

1. On the **Wi-Fi client** page, in the **Wireless Networks** section, select the network to which you want to connect. When you select a network, the **Network name (SSID)** and **BSSID** fields are filled in automatically.

If you cannot find the needed network in the list, click the **Update list** button.

2. If a password is needed to connect to the selected network, fill in the relevant field.

Wi-Fi client

Connecting to network

Select network from List

Network name (SSID)

BSSID

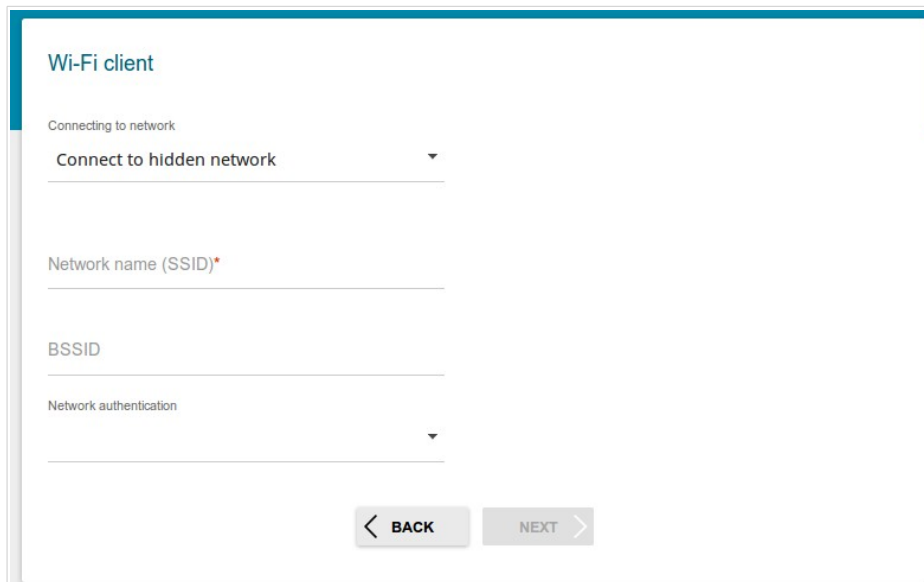
Wireless Networks Update list

Network name (SSID)	BSSID	Channel	Security settings	Signal level ↓	Frequency
DIR-825-ec88	6c:19:8f:56:ec:8b	1	[WPA2-PSK] [AES]	85%	2.4GHz
DIR-300-789a	00:12:34:56:78:9b	9	[WPA2-PSK] [AES]	81%	2.4GHz
RD_DLINK	e4:6f:13:b8:e4:7b	9	[WPA2-PSK] [AES]	81%	2.4GHz
DIR-620-363832.2	00:53:34:45:36:3a	1	[WPA2-PSK] [AES]	78%	2.4GHz
DIR-615	00:90:12:34:56:79	9	[WPA2-PSK] [AES]	74%	2.4GHz
DIR-620-363832	00:53:34:45:36:39	1	[Open]	74%	2.4GHz
GRWork	c8:d3:a3:ee:58:22	6	[WPA-PSK/WPA2-PSK m...]	74%	2.4GHz

< BACK NEXT >

Figure 30. The page for configuring the Wi-Fi client.

If you connect to a hidden network, from the **Connecting to network** list select the **Connect to hidden network** value. Enter the network name to the **Network name (SSID)** field. Then select a needed value from the **Network authentication** list and then, if needed, enter the password in the relevant field.



The screenshot shows a web interface titled "Wi-Fi client". Under the heading "Connecting to network", there is a dropdown menu currently set to "Connect to hidden network". Below this are three input fields: "Network name (SSID)*", "BSSID", and "Network authentication" (which is a dropdown menu). At the bottom of the form are two buttons: a "BACK" button with a left-pointing arrow and a "NEXT" button with a right-pointing arrow.

Figure 31. The page for configuring connection to a hidden network.

3. Click the **NEXT** button to continue or click the **BACK** button to return to the previous page.

Configuring Wireless Network

This configuration step is available for the **Access point** and **Repeater** modes.

1. On the **Wireless Network 2.4 GHz** page, in the **Network name** field, specify your own name for the wireless network or leave the value suggested by the extender.
2. In the **Password** field, specify your own password for access to the wireless network or leave the value suggested by the extender (WPS PIN of the device, see the barcode label).
3. You can restore the parameters of the wireless network specified before resetting to factory defaults. To do this, click the **RESTORE** button.

Wireless Network 2.4 GHz

Enable

Broadcast wireless network 2.4 GHz

Disabling broadcast does not influence the ability to connect to another Wi-Fi network as a client.

Network name*

Open network

Password*

12345670

< BACK NEXT >

Figure 32. The page for configuring the wireless network.

4. Click the **NEXT** button to continue or click the **BACK** button to specify other settings.

Changing Web-based Interface Password

On this page, you should change the default administrator password. You may set any password except **admin**. Use digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout.¹

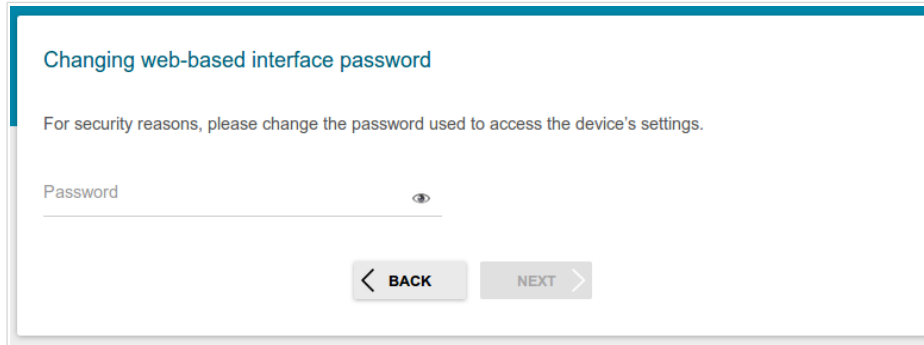


Figure 33. The page for changing the web-based interface password.



Remember or write down the new password for the administrator account. In case of losing the new password, you can access the settings of the extender only after restoring the factory default settings via the hardware **RESET** button. This procedure wipes out all settings that you have configured for your extender.

Click the **NEXT** button to continue or click the **BACK** button to return to the previous page.

On the next page, check all specified settings.

Also you can save a text file with parameters set by the Wizard to your PC. To do this, click the **SAVE CONFIGURATION FILE** button and follow the dialog box appeared.

To finish the Wizard, click the **APPLY** button. The extender will apply settings and reboot. Click the **BACK** button to specify other settings.

¹ 0-9, A-Z, a-z, space, !"#%&'()*+,-./:;<=>@[\\]^_`{|}~.

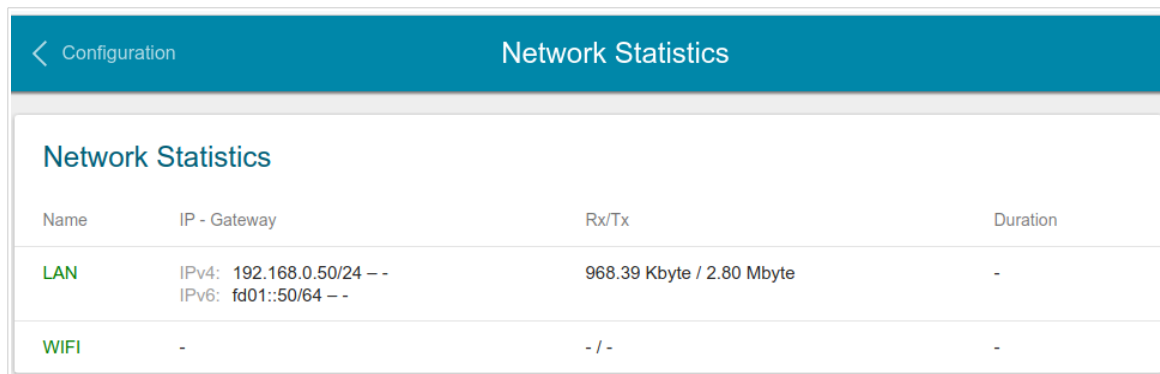
Statistics

The pages of this section display data on the current state of the extender:

- network statistics
- IP addresses leased by the DHCP server
- data on devices connected to the extender's network and its web-based interface
- addresses of active multicast groups.

Network Statistics

On the **Statistics / Network Statistics** page, you can view statistics for all connections existing in the system. For each connection the following data are displayed: name and state (when the connection is on, its name is highlighted in green, when the connection is off, its name is highlighted in red), IP address and subnet mask, gateway (if the connection is established), MAC address, and volume of data received and transmitted (with increase of the volume the units of measurement are changed automatically: byte, Kbyte, Mbyte, Gbyte).



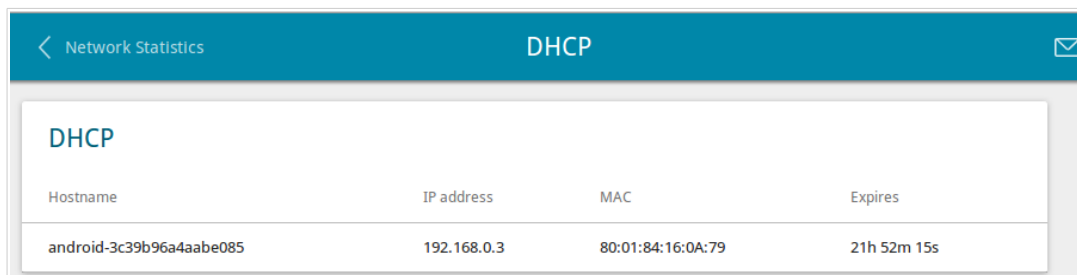
Name	IP - Gateway	Rx/Tx	Duration
LAN	IPv4: 192.168.0.50/24 -- IPv6: fd01::50/64 --	968.39 Kbyte / 2.80 Mbyte	-
WIFI	-	- / -	-

Figure 34. The **Statistics / Network Statistics** page.

To view data on a connection, click the line corresponding to this connection.

DHCP

The **Statistics / DHCP** page displays the information on computers that have been identified by hostnames and MAC addresses and have got IP addresses from the DHCP server of the device, as well as the IP address expiration periods (the lease time).

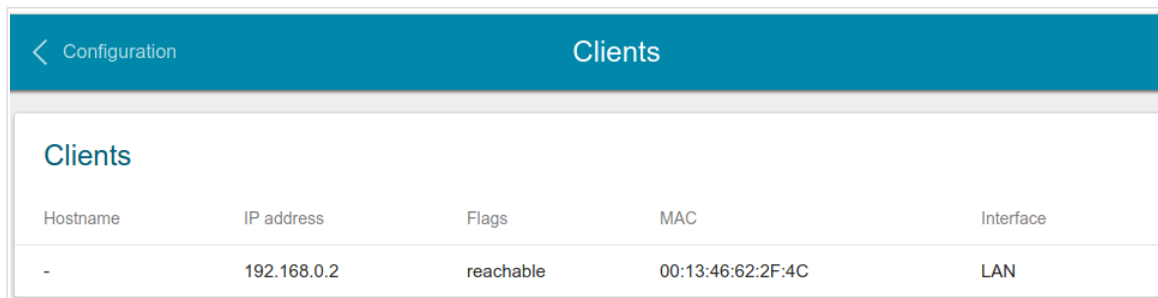


Hostname	IP address	MAC	Expires
android-3c39b96a4aabe085	192.168.0.3	80:01:84:16:0A:79	21h 52m 15s

Figure 35. The **Statistics / DHCP** page.

Clients

On the **Statistics / Clients** page, you can view the list of devices connected to the extender.



Clients				
Hostname	IP address	Flags	MAC	Interface
-	192.168.0.2	reachable	00:13:46:62:2F:4C	LAN

*Figure 36. The **Statistics / Clients** page.*

For each device the following data are displayed: the IP address, the MAC address, and the network interface to which the device is connected.

Multicast Groups

The **Statistics / Multicast Groups** page displays addresses of active multicast groups (including IPTV channels and groups for transferring service information) to which the device is subscribed, and the interface through which the device is subscribed.

IPv4	
IP address	Interface
239.255.255.250	LAN

IPv6	
IP address	Interface

Figure 37. The **Statistics / Multicast Groups** page.

Connections Setup

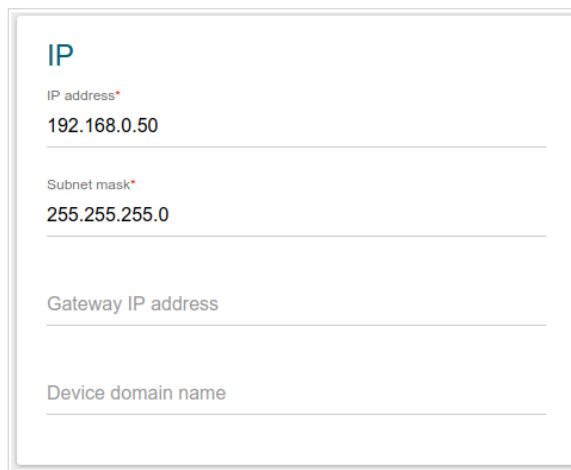
In this menu you can configure basic parameters of the extender for operation in the local network.

LAN

To configure the extender's basic parameters, go to the **Connections Setup / LAN** page.

IPv4

Go to the **IPv4** tab to change IPv4 address and configure the built-in DHCP server.



The screenshot shows a web form titled "IP" with four input fields. The first field is "IP address*" with the value "192.168.0.50". The second field is "Subnet mask*" with the value "255.255.255.0". The third field is "Gateway IP address" which is currently empty. The fourth field is "Device domain name" which is also empty.

Figure 38. Configuring local IP addresses. The IPv4 tab. The IP section.

If needed, edit the basic settings.

Parameter	Description
IP	
IP address	The IP address of the extender in the local subnet. By default, the following value is specified: 192 . 168 . 0 . 50 .
Subnet mask	The mask of the local subnet. By default, the following value is specified: 255 . 255 . 255 . 0 .
Gateway IP address	The gateway IP address which is used by the extender to connect to the Internet (e.g., for synchronizing the system time with an NTP server). <i>Optional</i> .
Device domain name	The name of the device attached to its IP address in the local subnet.

When needed settings are configured, click the **APPLY** button.

In the **DHCP** section, you can configure the built-in DHCP server of the extender. The DHCP server is disabled by default.

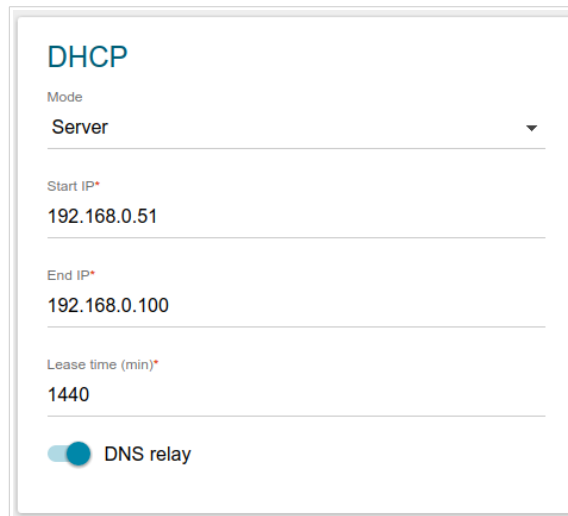


Figure 39. Configuring local IP addresses. The IPv4 tab. The DHCP section.

Parameter	Description
DHCP	
Mode	<p>An operating mode of the extender's DHCP server.</p> <p>Server: the extender assigns IP addresses to clients automatically in accordance with the specified parameters. When this value is selected, the Start IP, End IP, Lease time fields and the DNS Relay switch are displayed on the tab.</p> <p>Disable: the extender's DHCP server is disabled, clients' IP addresses are assigned manually.</p>
Start IP	The start IP address of the address pool used by the DHCP server to distribute IP addresses to clients.
End IP	The end IP address of the address pool used by the DHCP server to distribute IP addresses to clients.
Lease time	The lifetime of IP addresses leased by the DHCP server. At the end of this period the leased IP address is revoked and can be distributed to another device, unless the previous device has confirmed the need to keep the address.
DNS Relay	<p>Move the switch to the right so that the devices connected to the extender obtain the address of the extender as the DNS server address.</p> <p>Move the switch to the left so that the devices connected to the extender obtain the address transmitted by the ISP or specified on the Advanced / DNS page as the DNS server address.</p>

When all needed settings are configured, click the **APPLY** button.

In the **Static DHCP** section, you can specify MAC address and IP address pairs (set a fixed IPv4 address in the local area network for a device with a certain MAC address).

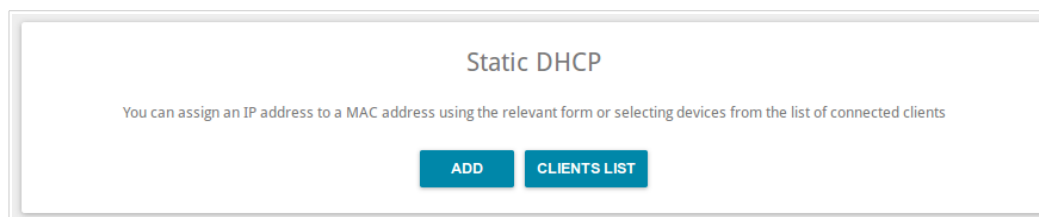


Figure 40. The section for creating MAC-IP pairs.

To create a MAC-IP pair, click the **ADD** button. In the opened window, in the **MAC address** field, enter the MAC address of the device from the LAN, then in the **IP address** field, enter an IPv4 address which will be assigned to it. In the **Host** field, specify a network name of the device for easier identification (*optional*). Click the **APPLY** button.

In order to view MAC addresses of the devices connected to the extender at the moment, click the **CLIENTS LIST** button. In the opened window, select the needed device and click the **OK** button. To view the latest list of the connected devices, click the **REFRESH** button.

To edit an existing MAC-IP pair, left-click the relevant line in the table. In the opened window, change the needed parameters and click the **APPLY** button.

To remove a MAC-IP pair, select the checkbox located to the left of the relevant line in the table and click the **Delete** button. Then click the **APPLY** button. Also you can remove a MAC-IP pair in the editing window.

IPv6

Go to the **IPv6** tab to change IPv6 address of the extender and configure IPv6 addresses assignment settings.

The screenshot shows a web interface for configuring IPv6 settings. At the top, there is a section titled 'IP'. Below this, there is a dropdown menu for 'Addressing Mode' currently set to 'Prefix delegation'. Underneath, there are two input fields: 'IP address' with the value 'fd01::50' and 'Prefix' with the value '64'. Both input fields have a lock icon to their right, indicating they are locked.

Figure 41. Configuring local IP addresses. The IPv6 tab. The IP section.

If needed, edit the basic settings.

Parameter	Description
IP	
Addressing Mode	Select the needed value from the drop-down list. Static: an IPv6 address and a prefix are specified manually. Prefix delegation: the extender requests a prefix to configure an IPv6 address from a delegating router.
IP address	The IPv6 address of the extender in the local subnet. By default, the following value is specified: fd01::50 . The field is available for editing, if the Static value is selected from the Addressing Mode drop-down list.
Prefix	The length of the prefix subnet. By default, the value 64 is specified. The field is available for editing, if the Static value is selected from the Addressing Mode drop-down list.

In the **DHCP** section, you can configure the built-in DHCP server of the extender. The DHCP server is disabled by default.

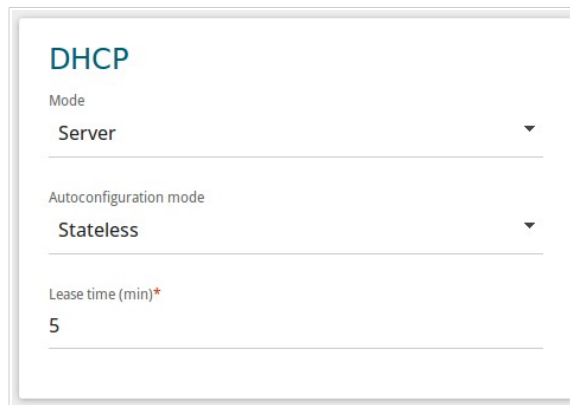


Figure 42. Configuring local IP addresses. The IPv6 tab. The DHCP section.

Parameter	Description
DHCP	
Mode	Select a mode of IPv6 address assignment from the drop-down list. Server: the extender assigns IPv6 addresses to clients automatically in accordance with the specified parameters. When this value is selected, the Autoconfiguration mode drop-down list and the Lease time field are displayed on the tab. Disable: clients' IPv6 addresses are assigned manually.
Autoconfiguration mode	Select a mode from the drop-down list. Stateless: clients themselves configure IPv6 addresses using the prefix. Stateful: the built-in DHCPv6 server of the extender allocates addresses from the range specified in the Start IP and End IP fields.
Start IP	The start IPv6 address of the address pool used by the DHCPv6 server to distribute addresses to clients.
End IP	The end IPv6 address of the address pool used by the DHCPv6 server to distribute addresses to clients.
Lease Time	The lifetime of IPv6 addresses provided to clients. The field is available for editing, if the Static value is selected from the Addressing mode list in the IP section.

When all needed settings are configured, click the **APPLY** button.

Wi-Fi

In this menu you can specify all needed settings for your wireless network.

Basic Settings

In the **Wi-Fi / Basic Settings** section, you can change basic parameters for the wireless interface of the extender and configure the basic and additional wireless networks.

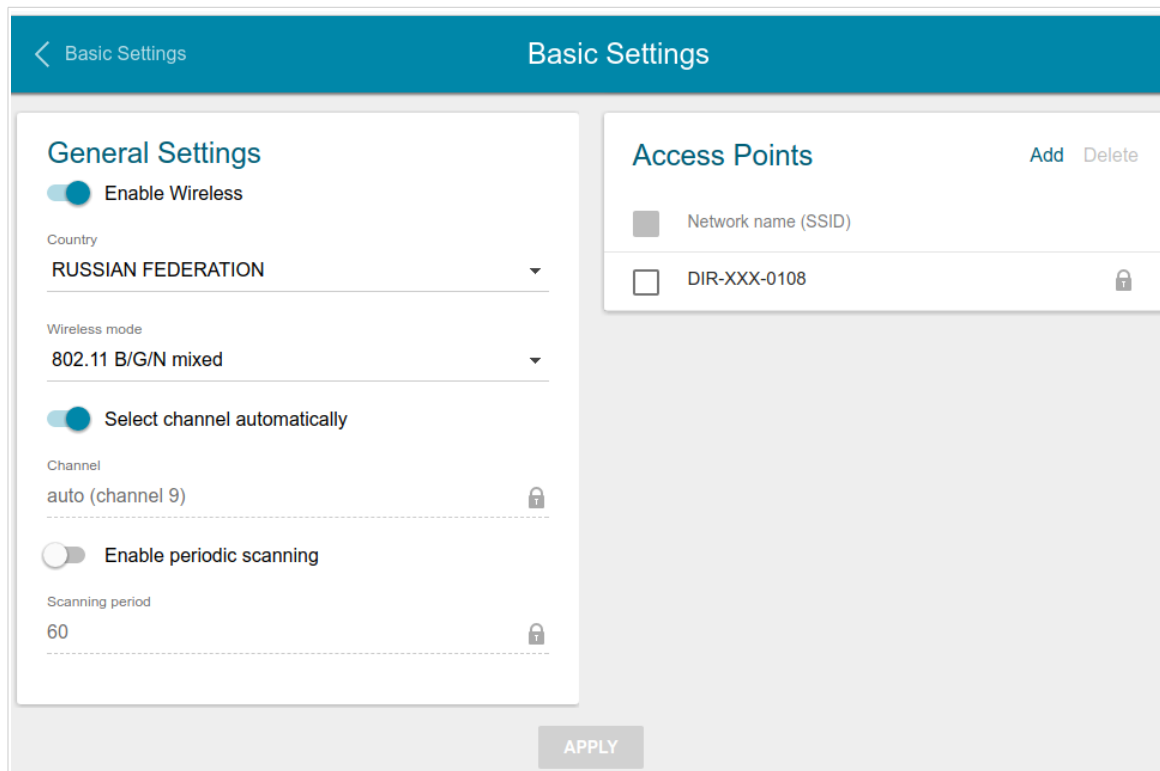


Figure 43. Basic settings of the wireless LAN.

In the **General Settings** section, the following parameters are available:

Parameter	Description
Enable Wireless	To enable Wi-Fi connection, move the switch to the right. To disable Wi-Fi connection, move the switch to the left.
Country	The country you are in. Select a value from the drop-down list.
Wireless mode	Operating mode of the wireless network of the extender. This parameter defines standards of the devices that will be able to use your wireless network. Select a value from the drop-down list.
Select channel automatically	Move the switch to the right to let the extender itself choose the channel with the least interference.
Channel	The wireless channel number. Left-click to open the window for selecting a channel (the action is available, when the Select channel automatically switch is moved to the left).

Parameter	Description
Enable periodic scanning	Move the switch to the right to let the extender search for a free channel in certain periods of time. When the switch is moved to the right, the Scanning period field is available for editing.
Scanning period	Specify a period of time (in seconds) after which the extender rescans channels.

When you have configured the parameters, click the **APPLY** button.

To edit the settings of the basic wireless network, in the **Access Points** section, left-click the needed network. On the opened page, change the needed parameters and click the **APPLY** button.

Also you can create an additional wireless network. To do this, click the **ADD** button in the **Access Points** section. On the opened page, specify the relevant parameters.

The screenshot shows the 'Add Access Point' configuration page. It has a blue header with a back arrow and 'Basic Settings' on the left, and 'Add Access Point' in the center. The main content is divided into two columns: 'Wi-Fi Network' and 'Security Settings'.
Wi-Fi Network section includes:
 - Network name (SSID)*: my wi-fi
 - Hide SSID: A toggle switch is currently turned off.
 - Max associated clients*: 0
 - Broadcast wireless network: A toggle switch is currently turned on.
 - Clients isolation: A toggle switch is currently turned off.
Security Settings section includes:
 - Network authentication: WPA2-PSK (dropdown menu)
 - Password PSK*: ApE3jd1n
 - Encryption type*: AES (dropdown menu)
 - Group key update interval (sec)*: 3600
 At the bottom center, there is a blue button labeled 'APPLY'.

Figure 44. Creating a wireless network.

Parameter	Description
Wi-Fi Network	
Network name (SSID)	A name for the wireless network. The name can consist of digits and Latin characters.
Hide SSID	If the switch is moved to the right, other users cannot see your Wi-Fi network. It is recommended not to hide the network in order to simplify initial configuration of the wireless network.
BSSID	The unique identifier for this wireless network. You cannot change the value of this parameter, it is determined in the device's internal settings. The field is displayed in the settings of the existing wireless network.
Max associated clients	The maximum number of devices connected to the wireless network. When the value 0 is specified, the device does not limit the number of connected clients.
Broadcast wireless network	If the switch is moved to the left, devices cannot connect to the wireless network. Upon that the extender can connect to another access point as a wireless client.
Clients isolation	Move the switch to the right to forbid wireless clients of this wireless network to communicate to each other.

In the **Security Settings** section, you can change security settings of the wireless network. By default, the **WPA2-PSK** network authentication type of the wireless network is specified. WPS PIN from the barcode label is used as the network key.

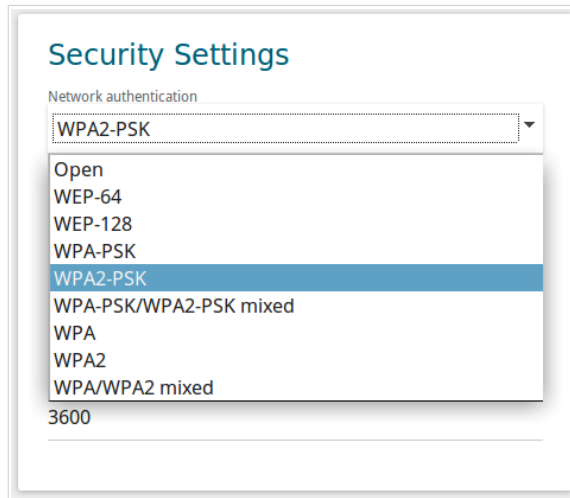


Figure 45. Network authentication types supported by the extender.

The extender supports the following authentication types:

Authentication type	Description
Open	Open authentication (with WEP encryption for wireless network modes not supporting 802.11n devices).
WEP-64	Authentication with a 64-bit shared key with WEP encryption. This authentication type is not available when a mode supporting 802.11n devices is selected from the Wireless mode drop-down list on the Wi-Fi / Basic Settings page.
WEP-128	Authentication with a 128-bit shared key with WEP encryption. This authentication type is not available when a mode supporting 802.11n devices is selected from the Wireless mode drop-down list on the Wi-Fi / Basic Settings page.
WPA	WPA-based authentication using a RADIUS server.
WPA-PSK	WPA-based authentication using a PSK.
WPA2	WPA2-based authentication using a RADIUS server.
WPA2-PSK	WPA2-based authentication using a PSK.
WPA/WPA2 mixed	A mixed type of authentication. When this value is selected, devices using the WPA authentication type and devices using the WPA2 authentication type can connect to the wireless network.

Authentication type	Description
WPA-PSK/WPA2-PSK mixed	A mixed type of authentication. When this value is selected, devices using the WPA-PSK authentication type and devices using the WPA2-PSK authentication type can connect to the wireless network.

! The **WPA**, **WPA2**, and **WPA/WPA2 mixed** authentication types require a RADIUS server.

When the **Open**, **WEP-64**, or **WEP-128** value is selected, the following settings are displayed on the page (unavailable for the wireless network operating modes which support the standard 802.11n):

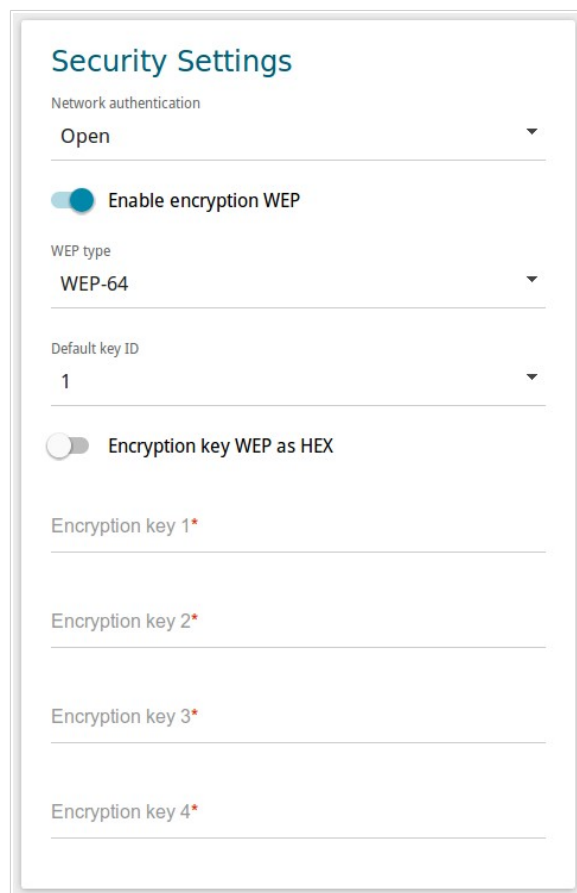


Figure 46. The **Open** value is selected from the **Network authentication** drop-down list.

Parameter	Description
Enable encryption WEP	<p><i>For Open authentication type only.</i></p> <p>To activate WEP encryption, move the switch to the right. Upon that the WEP type and Default key ID drop-down lists, the Encryption key WEP as HEX switch, and four Encryption key fields are displayed on the page.</p>
WEP type	<p><i>For Open authentication type only.</i></p> <p>WEP encryption type with a 64-bit or 128-bit key.</p> <p>Select the WEP-64 value to specify keys containing 5 ASCII symbols or 10 HEX symbols.</p> <p>Select the WEP-128 value to specify keys containing 13 ASCII symbols or 26 HEX symbols.</p>
Default key ID	<p>The number of the key (from first to fourth) which will be used for WEP encryption.</p>
Encryption key WEP as HEX	<p>Move the switch to the right to set a hexadecimal number as a key for encryption.</p>
Encryption key (1-4)	<p>Keys for WEP encryption. The extender uses the key selected from the Default key ID drop-down list. It is required to specify all the fields.</p>

When the **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** value is selected, the following fields are displayed on the page:

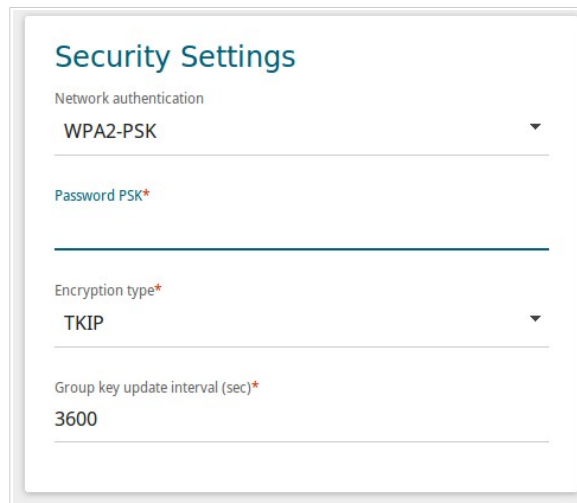


Figure 47. The **WPA2-PSK** value is selected from the **Network authentication** drop-down list.

Parameter	Description
Password PSK	A password for WPA encryption. The password can contain digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout. ²
Encryption type	An encryption method: TKIP , AES , or TKIP+AES .
Group key update interval	The time period (in seconds), at the end of which a new key for WPA encryption is generated. When the value 0 is specified for this field, the key is not renewed.

² 0-9, A-Z, a-z, space, !"#\$%&'()*+,-./:;<=>?@[\\]^_`{|}~.

When the **WPA**, **WPA2**, or **WPA/WPA2 mixed** value is selected, the following settings are displayed on the page:

The screenshot shows the 'Security Settings' page. At the top, 'Network authentication' is set to 'WPA2'. Below this, 'WPA2 Pre-authentication' is a checked toggle switch. The 'IP address RADIUS server*' field contains '192.168.0.254'. The 'RADIUS server port*' field contains '1812'. The 'RADIUS encryption key*' field contains 'dlink'. The 'Encryption type*' dropdown is set to 'AES'. The 'Group key update interval (sec)*' field contains '3600'.

Figure 48. The **WPA2** value is selected from the **Network authentication** drop-down list.

Parameter	Description
WPA2 Pre-authentication	Move the switch to the right to activate preliminary authentication (displayed only for the WPA2 and WPA/WPA2 mixed authentication types).
IP address RADIUS server	The IP address of the RADIUS server.
RADIUS server port	A port of the RADIUS server.
RADIUS encryption key	The password which the extender uses for communication with the RADIUS server (the value of this parameter is specified in the RADIUS server settings).
Encryption type	An encryption method: TKIP , AES , or TKIP+AES .
Group key update interval	The time period (in seconds), at the end of which a new key for WPA encryption is generated. When the value 0 is specified for this field, the key is not renewed.

When you have configured the parameters, click the **APPLY** button.

Client Management

On the **Wi-Fi / Client Management** page, you can view the list of wireless clients connected to the extender.

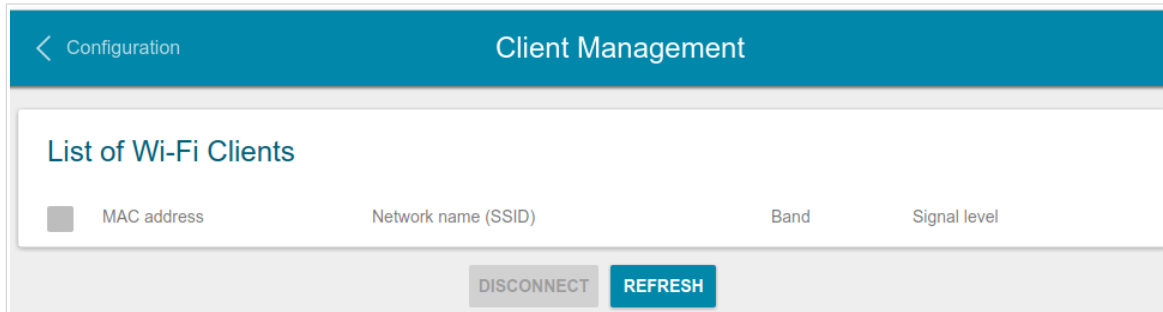


Figure 49. The page for managing the wireless clients.

If you want to disconnect a wireless device from your WLAN, select the checkbox in the line containing the MAC address of this device and click the **DISCONNECT** button.

To view the latest data on the devices connected to the WLAN, click the **REFRESH** button.

WPS

On the **Wi-Fi / WPS** page, you can enable the function for configuration of the WLAN and select a method for connection to the WLAN.

The WPS function helps to configure the protected wireless network automatically. Devices connecting to the wireless network via the WPS function must support the WPS function.

! The WPS function allows adding devices only to the basic wireless network of the extender.

! Before using the function you need to configure one of the following authentication types: **Open** with no encryption, **WPA-PSK** or **WPA2-PSK** with the **AES** encryption method, **WPA-PSK/WPA2-PSK mixed** with the **AES** or **TKIP+AES** encryption method. When other security settings are specified, controls of the **WPS** page are not available.

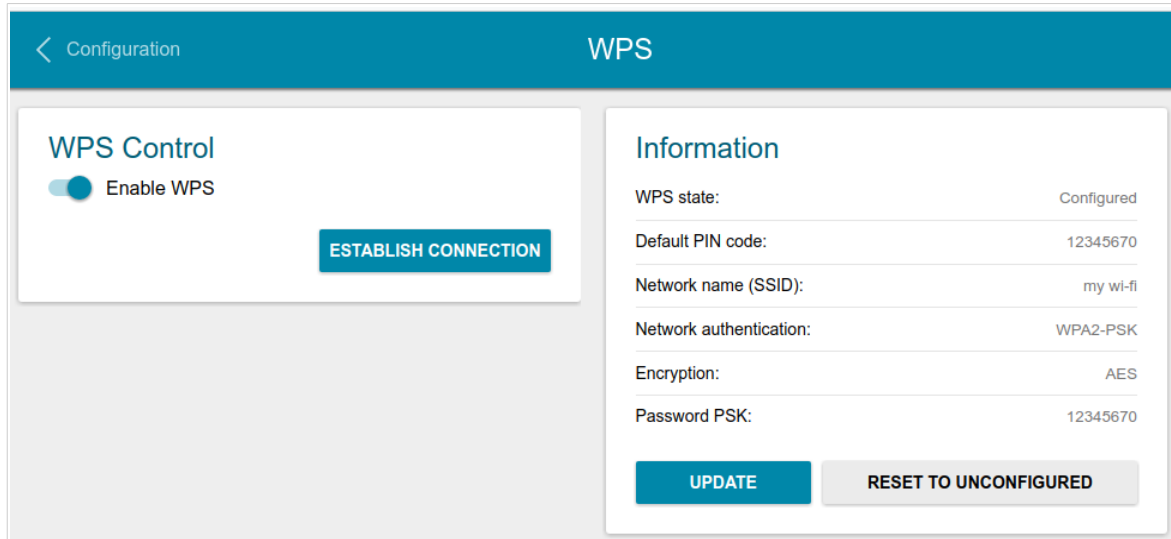


Figure 50. The page for configuring the WPS function.

To activate the WPS function, move the **Enable WPS** switch to the right.

When the WPS function is enabled, the **Information** section is available on the page.

Parameter	Description
WPS state	The state of the WPS function: <ul style="list-style-type: none"> • Configured (all needed settings are specified; these settings will be used upon establishing the wireless connection) • Unconfigured (after activating the WPS function, the SSID and the encryption key will be configured automatically, the network authentication type will be changed to WPA2-PSK).
Default PIN code	The PIN code of the extender. This parameter is used when connecting the extender to a registrar to set the parameters of the WPS function.
Network name (SSID)	The name of the extender's wireless network.
Network Authentication	The network authentication type specified for the wireless network.
Encryption	The encryption type specified for the wireless network.
Password PSK	The encryption password specified for the wireless network.
UPDATE	Click the button to update the data on the page.
RESET TO UNCONFIGURED	Click the button to reset the parameters of the WPS function.

Using WPS Function via Web-based Interface

To connect to the basic wireless network via the PIN method of the WPS function, follow the next steps:

1. Move the **Enable WPS** switch to the right.
2. In the **WPS Control** section, click the **ESTABLISH CONNECTION** button.
3. In the opened window, select the **PIN** value from the **WPS method** drop-down list.
4. Select the PIN method in the software of the wireless device that you want to connect to the extender's WLAN.
5. Click the relevant button in the software of the wireless device that you want to connect to the WLAN.
6. Right after that, enter the PIN code specified on the cover of the wireless device or in its software in the **PIN Code** field.
7. Click the **CONNECT** button in the web-based interface of the extender.

To connect to the basic wireless network via the PBC method of the WPS function, follow the next steps:

1. Move the **Enable WPS** switch to the right.
2. In the **WPS Control** section, click the **ESTABLISH CONNECTION** button.
3. In the opened window, select the **PBC** value from the **WPS method** drop-down list.
4. Select the PBC method in the software of the wireless device that you want to connect to the extender's WLAN.
5. Click the relevant button in the software or press the WPS button on the cover of the wireless device that you want to connect to the WLAN.
6. Right after that, click the **CONNECT** button in the web-based interface of the extender.

Using WPS Function without Web-based Interface

You can use the WPS function without accessing the web-based interface of the extender. To do this, you need to configure the following extender's settings:

1. Specify relevant security settings for the wireless network of the extender.
2. Move the **WPS Enable** switch to the right.
3. Save the settings and close the web-based interface (click the **SAVE** button in the notification and then click the **Logout** line of the menu).

Later you will be able to add wireless devices to the WLAN by pressing the **WPS** button of the extender.

1. Select the PBC method in the software of the wireless device that you want to connect to the extender's WLAN.
2. Click the relevant button in the software or press the WPS button on the cover of the wireless device that you want to connect to the WLAN.
3. Press the **WPS** button of the extender and release. The **POWER/WPS** LED will start blinking.

WMM

On the **Wi-Fi / WMM** page, you can enable the Wi-Fi Multimedia function.

The WMM function implements the QoS features for Wi-Fi networks. It helps to improve the quality of data transfer over Wi-Fi networks by prioritizing different types of traffic.

To enable the function, move the **Enable** switch to the right. Upon that the **Access Point** and **Station** sections are displayed on the page.

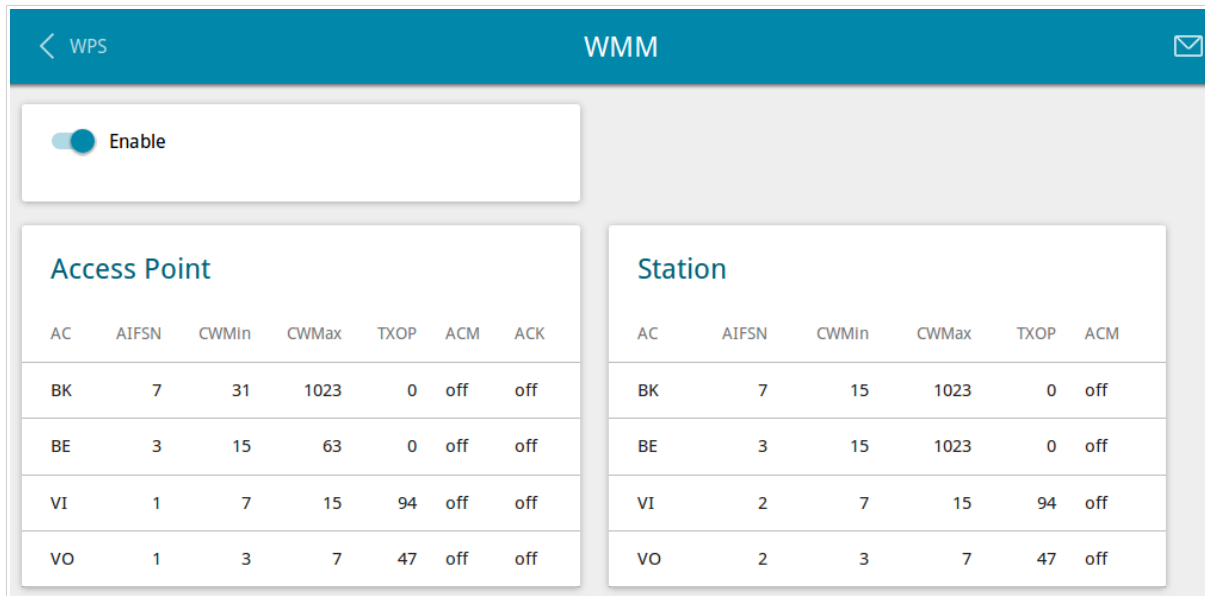


Figure 51. The page for configuring the WMM function.

! All needed settings for the WMM function are specified in the device's system. It is recommended not to change the default values.

The WMM function allows assigning priorities for four Access Categories (AC):

- **BK** (*Background*), low priority traffic (print jobs, file downloads, etc.).
- **BE** (*Best Effort*), traffic from legacy devices or devices/applications that do not support QoS.
- **VI** (*Video*).
- **VO** (*Voice*).

Parameters of the Access Categories are defined for both the extender itself (in the **Access Point** section) and wireless devices connected to it (in the **Station** section).

To edit the parameters of an Access Category, left-click the relevant line. In the opened window, change the needed parameters.

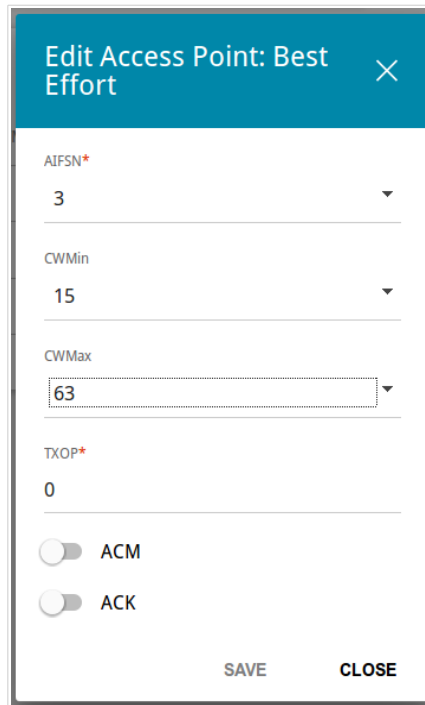


Figure 52. The window for changing parameters of the WMM function.

Parameter	Description
AIFSN	<i>Arbitrary Inter-Frame Space Number.</i> This parameter influences time delays for the relevant Access Category. The lower the value, the higher is the Access Category priority.
CWMin/CWMax	<i>Contention Window Minimum/Contention Window Maximum.</i> Both fields influence time delays for the relevant Access Category. The CWMax field value should not be lower, than the CWMin field value. The lower the difference between the CWMax field value and the CWMin field value, the higher is the Access Category priority.
TXOP	<i>Transmission Opportunity.</i> The higher the value, the higher is the Access Category priority.
ACM	<i>Admission Control Mandatory.</i> If the switch is moved to the right, the device cannot use the relevant Access Category.
ACK	<i>Acknowledgment.</i> Answering response requests while transmitting. Displayed only in the Access Point section. If the switch is moved to the left, the extender answers requests. If the switch is moved to the right, the extender does not answer requests.

Click the **SAVE** button.

To disable the WMM function, move the **Enable** switch to the left.

Client

On the **Wi-Fi / Client** page, you can configure the extender as a client to connect to a wireless access point.

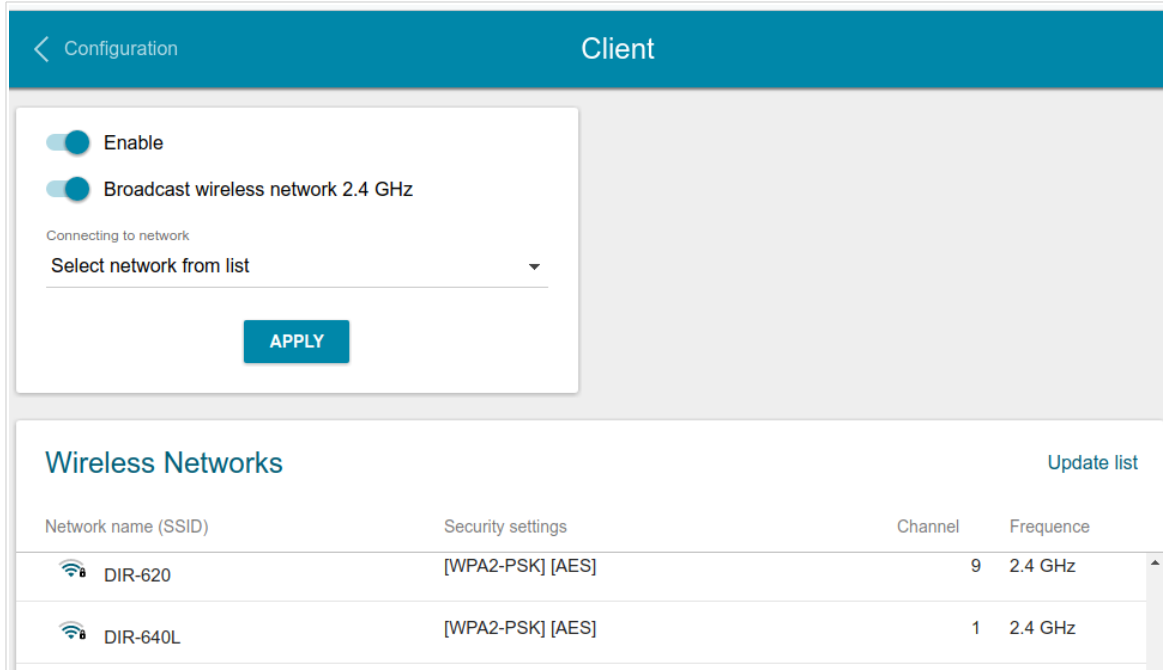


Figure 53. The page for configuring the client mode.

To configure the extender as a client, move the **Enable** switch to the right. Upon that the following fields are displayed on the page:

Parameter	Description
Broadcast wireless network 2.4 GHz	If the switch is moved to the left, devices cannot connect to the extender's WLAN. Upon that the extender can connect to another access point as a wireless client.
Connecting to network	A method for connecting to another access point.

In the **Wireless Networks** section, the list of available wireless networks is displayed. To view the latest data on available wireless networks, click the **Update list** button.

To connect to a wireless network from the list, select the needed network. Move the **Network options** switch to the right to view more detailed information on the network to which the extender connects. If a password is required, enter it in the relevant field. Click the **CONNECT** button.

To connect to a hidden network, select the **Connect to hidden network** value from the **Connecting to network** drop-down list. Enter the name of the network in the **Network name (SSID)** field. If needed, fill in the **BSSID** field. Then select the needed type of authentication from the **Network authentication** drop-down list.

When the **Open**, **WEP-64**, or **WEP-128** authentication type is selected, the following settings are displayed on the page:

Parameter	Description
Enable encryption WEP	<i>For Open authentication type only.</i> To activate WEP encryption, move the switch to the right. Upon that the WEP type and Default key ID drop-down lists, the Encryption key WEP as HEX switch, and four Encryption key fields are displayed on the page.
WEP type	<i>For Open authentication type only.</i> WEP encryption type with a 64-bit or 128-bit key. Select the WEP-64 value to specify keys containing 5 ASCII symbols or 10 HEX symbols. Select the WEP-128 value to specify keys containing 13 ASCII symbols or 26 HEX symbols.
Default key ID	The number of the key (from first to fourth) which will be used for WEP encryption.
Encryption key WEP as HEX	Move the switch to the right to set a hexadecimal number as a key for encryption.
Encryption key (1-4)	Keys for WEP encryption. The extender uses the key selected from the Default key ID drop-down list. It is required to specify all the fields.

When the **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** authentication type is selected, the following fields are displayed:

Parameter	Description
Password PSK	A password for WPA encryption.
Encryption type	An encryption method: TKIP , AES , or TKIP+AES .

When you have configured the parameters, click the **APPLY** button.

When connecting to a wireless access point, the wireless channel of DAP-1325 will switch to the channel of the access point to which you have connected.

If the extender has been successfully connected to the network, the line of the selected network will be highlighted in blue.

In addition, the **Connection Information** section in which you can view the connection status and the network basic parameters is displayed.

Additional

On page of the **Wi-Fi / Additional** section, you can define additional parameters for the WLAN of the extender.

! Changing parameters presented on this page may negatively affect your WLAN!

The screenshot shows a web interface for configuring the WLAN. The title is 'Additional' under 'Configuration'. The settings are as follows:

Parameter	Value
Bandwidth	40MHz
TX power	100
BG protection	Auto
Short GI	Enable
Beacon period*	100
RTS threshold*	2347
Frag threshold*	2346
DTIM period*	1
Station Keep Alive*	0

An 'APPLY' button is located at the bottom center of the configuration area.

Figure 54. Additional settings of the WLAN.

The following fields are available on the page:

Parameter	Description
Bandwidth	The channel bandwidth for 802.11n standard. 20MHz: 802.11n clients operate at 20MHz channels. 40MHz: 802.11n clients operate at 40MHz channels. 20/40MHz -: 802.11n clients operate at 20MHz or 40MHz channels (the channel is combined with the previous adjacent channel). 20/40MHz +: 802.11n clients operate at 20MHz or 40MHz channels (the channel is combined with the next adjacent channel).
TX power	The transmit power (in percentage terms) of the extender.

Parameter	Description
BG protection	<p>The 802.11b and 802.11g protection function is used to minimize collisions between devices of your wireless network.</p> <p>Select a value from the drop-down list.</p> <p>Auto: The protection function is enabled and disabled automatically depending on the state of the network (this value is recommended if your wireless local area network consists of both 802.11b and 802.11g devices).</p> <p>Always On: The protection function is always enabled (this setting can substantially lower the efficiency of your wireless network).</p> <p>Always Off: The protection function is always disabled.</p>
Short GI	<p>Guard interval (in nanoseconds). This parameter defines the interval between symbols transmitted when the extender is communicating to wireless devices.</p> <p>Enable: the extender uses the 400 ns short guard interval. Only for the wireless network operating modes which support 802.11n standard (see the value of the Wireless mode drop-down list on the Wi-Fi / Basic Settings page).</p> <p>Disable: the extender uses the 800 ns standard guard interval.</p>
Beacon period	<p>The time interval (in milliseconds) between packets sent to synchronize the wireless network.</p>
RTS threshold	<p>The minimum size (in bytes) of a packet for which an RTS frame is transmitted.</p>
Frag threshold	<p>The maximum size (in bytes) of a non-fragmented packet. Larger packets are fragmented (divided).</p>
DTIM period	<p>The time period (in seconds) between sending a DTIM (a message notifying on broadcast or multicast transmission) and data transmission.</p>
Station Keep Alive	<p>The time interval (in seconds) between keep alive checks of wireless devices connected to the extender. When the value 0 is specified, the checking is disabled.</p>

When you have configured the parameters, click the **APPLY** button.

MAC Filter

On the **Wi-Fi / MAC Filter** page, you can define a set of MAC addresses of devices which will be allowed to access the WLAN, or define MAC addresses of devices which will not be allowed to access the WLAN.

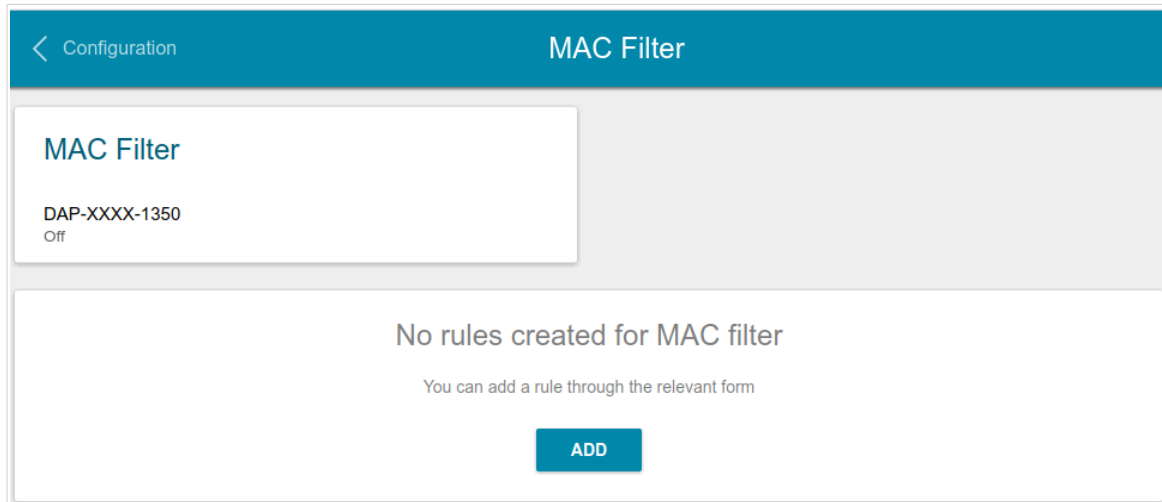


Figure 55. The page for configuring the MAC filter for the wireless network.

By default, MAC filtering is disabled.

To open the basic or additional wireless network for the devices which MAC addresses are specified on this page and to close the wireless network for all other devices, in the **MAC Filter** section, left-click the line of the wireless network. In the opened window, move the **Enable MAC filter** switch to the right. Upon that the **MAC filter restrict mode** drop-down list will be displayed. Select the **Allow** value from the drop-down list and click the **SAVE** button.

To close the wireless network for the devices which MAC addresses are specified on this page, select the **Deny** value from the **MAC filter restrict mode** drop-down list and click the **SAVE** button.

Click the **ADD** button to add a rule for MAC filtering.

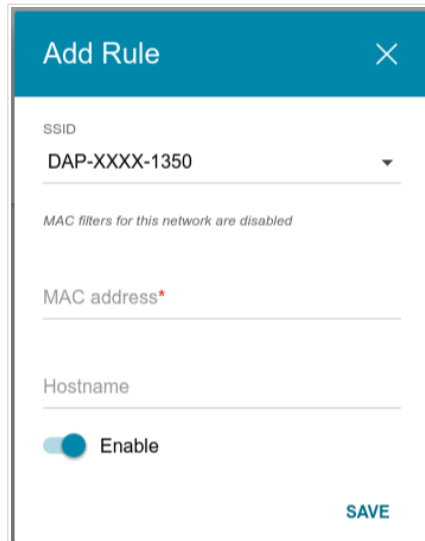


Figure 56. The window for adding a rule for the MAC filter.

You can specify the following parameters:

Parameter	Description
SSID	A wireless network to which the rule will be applied. Select the needed value from the drop-down list.
MAC address	In the field, enter the MAC address to which the selected filtering mode will be applied.
Hostname	The name of the device for easier identification. You can specify any name.
Enable	If the switch is moved to the right, the rule is active. Move the switch to the left to disable the rule.

When you have configured the parameters, click the **SAVE** button.

To edit the parameters of the existing rule, in the **Filters** section, left-click the needed rule. In the opened window, change the settings and click the **SAVE** button.

To remove the rule from the page, in the **Filters** section, select the checkbox located to the left of the relevant rule and click the **DELETE** button.

Advanced

In this menu you can add name servers.

DNS

On the **Advanced / DNS** page, you can add DNS servers to the system.

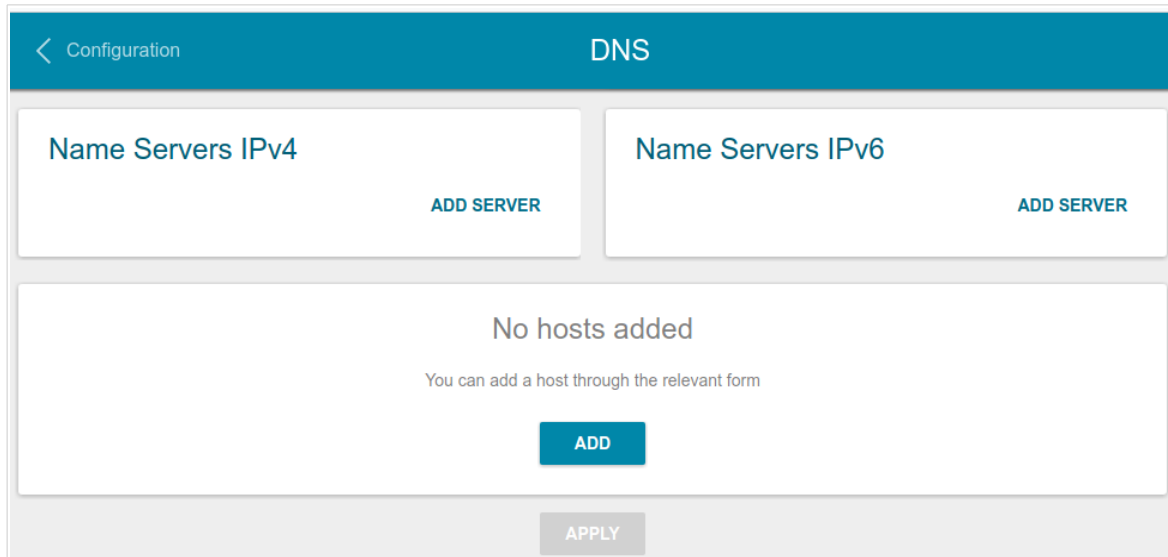


Figure 57. The **Advanced / DNS** page.

DNS servers are used to determine the IP address from the name of a server in Intranets or the Internet.

On this page, you can specify the addresses of DNS servers manually.

If you want to specify the DNS server, click the **ADD SERVER** button (use the **Name Servers IPv4** section for IPv4 and the **Name Servers IPv6** section for IPv6) and enter a DNS server address. Then click the **APPLY** button.

To remove a DNS server from the page, click the **Delete** icon (✕) in the line of the address and then click the **APPLY** button.

If needed, you can add your own address resource record.³ To do this, click the **ADD** button.

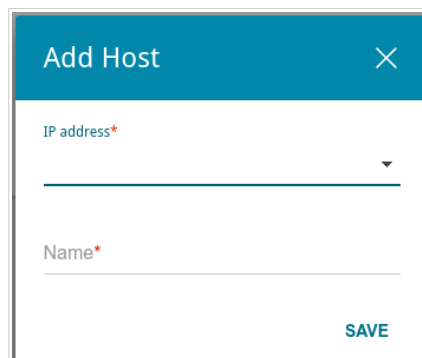


Figure 58. The window for adding a DNS record.

³ You need to specify the IP address of the extender as a DNS server for clients of the DAP-1325 device to allow them to use the records.

In the **IP address** field, specify a host. In the **Name** field, specify the domain name to which the specified IP address will correspond. Click the **SAVE** button.

To edit an existing record, select the relevant line in the table. In the opened window, change the needed parameters and click the **SAVE** button.

To remove a record, select the checkbox located to the left of the relevant line in the table and click the **Delete** button.

After completing the work with records, click the **APPLY** button.

Firewall

In this menu you can configure the MAC filter of the extender.

MAC Filter

On the **Firewall / MAC Filter** page, you can configure MAC-address-based filtering for devices connected to the extender.

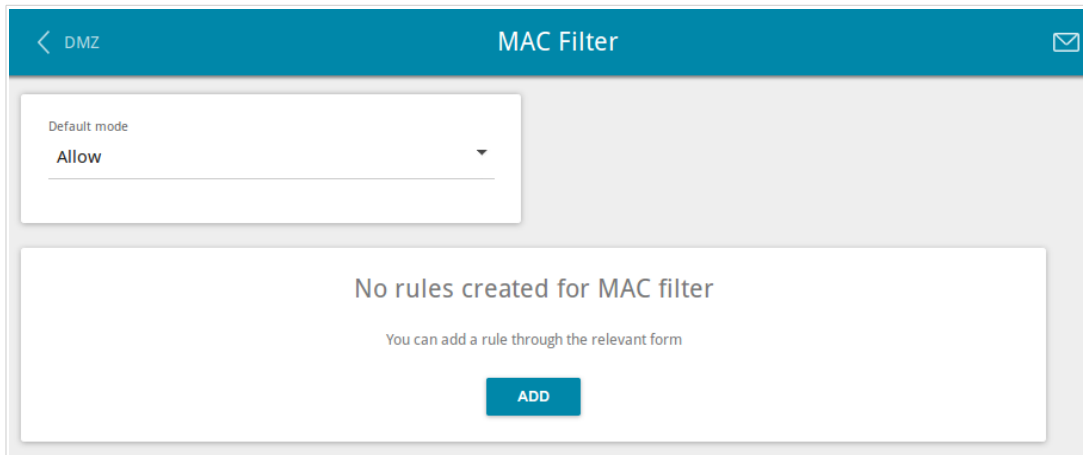


Figure 59. The **Firewall / MAC Filter** page.

To allow or block access to the extender or the upper router's network, select the needed action from the **Default mode** drop-down list.

If you need to specify a filtering mode for each device separately, create a relevant rule. To do this, click the **ADD** button.

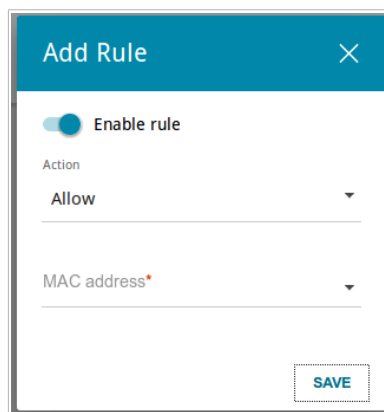


Figure 60. The window for adding a rule for the MAC filter.

In the opened window, you can specify the following parameters:

Parameter	Description
Enable rule	Move the switch to the right to enable the rule. Move the switch to the left to disable the rule.
Action	Select an action for the rule. Deny: Blocks access to the extender or the upper router's network for the device with the specified MAC address if the default mode allows access for all devices. Allow: Allows access to the extender or the upper router's network for the device with the specified MAC address if the default mode denies access for all devices.
MAC address	The MAC address of a device connected to the extender.

After specifying the needed parameters, click the **SAVE** button.

To edit a rule, select the relevant line in the table. In the opened window, change the needed parameters and click the **SAVE** button.

To remove a rule, select the checkbox located to the left of the relevant line of the table and click the **Delete** button. Also you can remove a rule in the editing window.

System

In this menu you can do the following:

- change the password used to access the extender's settings
- restore the factory default settings
- create a backup of the extender's configuration
- restore the extender's configuration from a previously saved file
- save the current settings to the non-volatile memory
- reboot the extender
- change the web-based interface language
- update the firmware of the extender
- configure automatic notification on new firmware version
- view the system log; configure sending the system log to a remote host
- check availability of a host on the Internet through the web-based interface of the extender
- trace the route to a host
- allow or forbid access to the extender via TELNET
- configure automatic synchronization of the system time or manually configure the date and time for the extender.

Configuration

On the **System / Configuration** page, you can change the password for the administrator account used to access the web-based interface of the extender and to access the device settings via TELNET, restore the factory defaults, backup the current configuration, restore the extender's configuration from a previously created file, save the changed settings to the non-volatile memory, reboot the device, or change the web-based interface language.

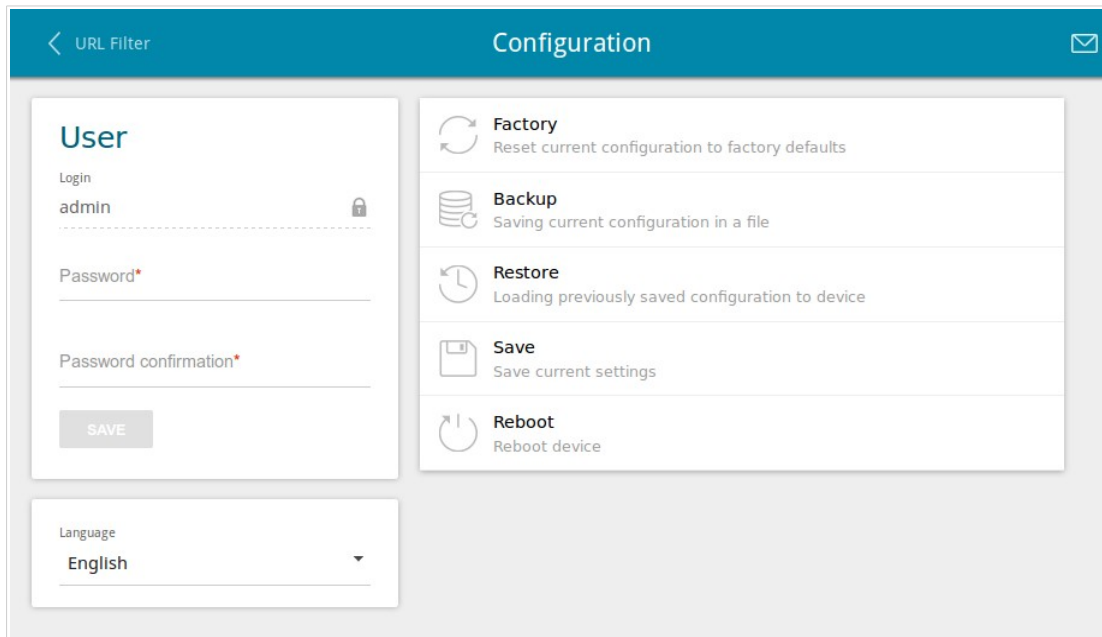


Figure 61. The **System / Configuration** page.

In order to change the password for the administrator account, in the **User** section, enter a new password in the **Password** and **Password confirmation** fields. Use digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout.⁴ Then click the **SAVE** button.

! Remember or write down the new password for the administrator account. In case of losing the new password, you can access the settings of the extender only after restoring the factory default settings via the hardware **RESET** button. This procedure wipes out all settings that you have configured for your extender.

To change the web-based interface language, select the needed value from the **Language** drop-down list.

⁴ 0-9, A-Z, a-z, space, !"#%&'()*+,-./:;<=>?@[\\]^_`{|}~.

The following buttons are also available on the page:

Control	Description
Factory	Click the button to restore the factory default settings. Also you can restore the factory defaults via the hardware RESET button (see the <i>Upper Panel</i> section, page 8).
Backup	Click the button to save the configuration (all settings of the extender) to your PC. The configuration backup will be stored in the download location of your web browser.
Restore	Click the button and follow the dialog box appeared to select a previously saved configuration file (all settings of the extender) located on your PC and upload it.
Save	Click the button to save settings to the non-volatile memory. The extender saves changed settings automatically. If changed settings have not been saved automatically, a notification is displayed in the top right part of the page.
Reboot	Click the button to reboot the device. All unsaved changes will be lost after the device's reboot.

Firmware Update

On the **System / Firmware Update** page, you can update the firmware of the extender and configure the automatic check for updates of the extender's firmware.

! Update the firmware only when the extender is connected to your PC via a wired connection.

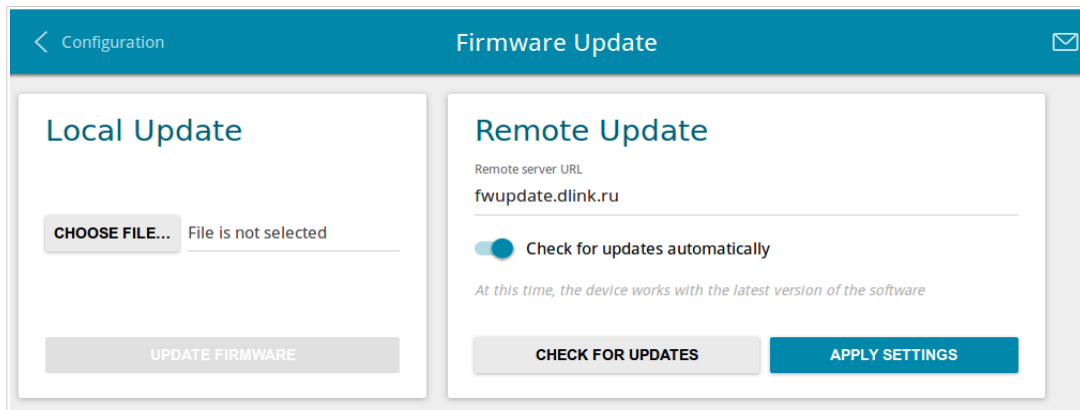


Figure 62. The **System / Firmware Update** page.

You can view the current version of the extender's firmware on the **Summary** page.

By default, the automatic check for the extender's firmware updates is enabled. If a firmware update is available, a notification will be displayed in the top right corner of the page.

To disable the automatic check for firmware updates, in the **Remote update** section, move the **Check for updates automatically** switch to the left and click the **APPLY SETTINGS** button.

To enable the automatic check for firmware updates, in the **Remote update** section, move the **Check for updates automatically** switch to the right and click the **APPLY SETTINGS** button. By default, in the **Remote server URL** field, the D-Link update server address (**fwupdate.dlink.ru**) is specified.

You can update the firmware of the extender locally (from the hard drive of your PC) or remotely (from the update server).

Local Update



Attention! Do not turn off the extender before the firmware update is completed. This may cause the device breakdown.

To update the firmware of the extender locally, follow the next steps:

1. Download a new version of the firmware from www.dlink.ru.
2. Click the **CHOOSE FILE** button in the **Local Update** section on the **System / Firmware Update** page to locate the new firmware file.
3. Click the **UPDATE FIRMWARE** button.
4. Wait until the extender is rebooted (about one and a half or two minutes).
5. Log into the web-based interface using the login (**admin**) and the current password.

If after updating the firmware the extender doesn't work correctly, please restore the factory default settings. To do this, click the **Factory** button on the **System / Configuration** page. Wait until the extender is rebooted.

Remote Update



Attention! Do not turn off the extender before the firmware update is completed. This may cause the device breakdown.

To update the firmware of the extender remotely, follow the next steps:

1. On the **System / Firmware Update** page, in the **Remote Update** section, click the **CHECK FOR UPDATES** button to check if a newer firmware version exists.
2. Click the **UPDATE FIRMWARE** button (the button is displayed if a newer version of the firmware is available).
3. Wait until the extender is rebooted (about one and a half or two minutes).
4. Log into the web-based interface using the login (**admin**) and the current password.

If after updating the firmware the extender doesn't work correctly, please restore the factory default settings. To do this, click the **Factory** button on the **System / Configuration** page. Wait until the extender is rebooted.

Log

On the **System / Log** page, you can set the system log options and configure sending the system log to a remote host.

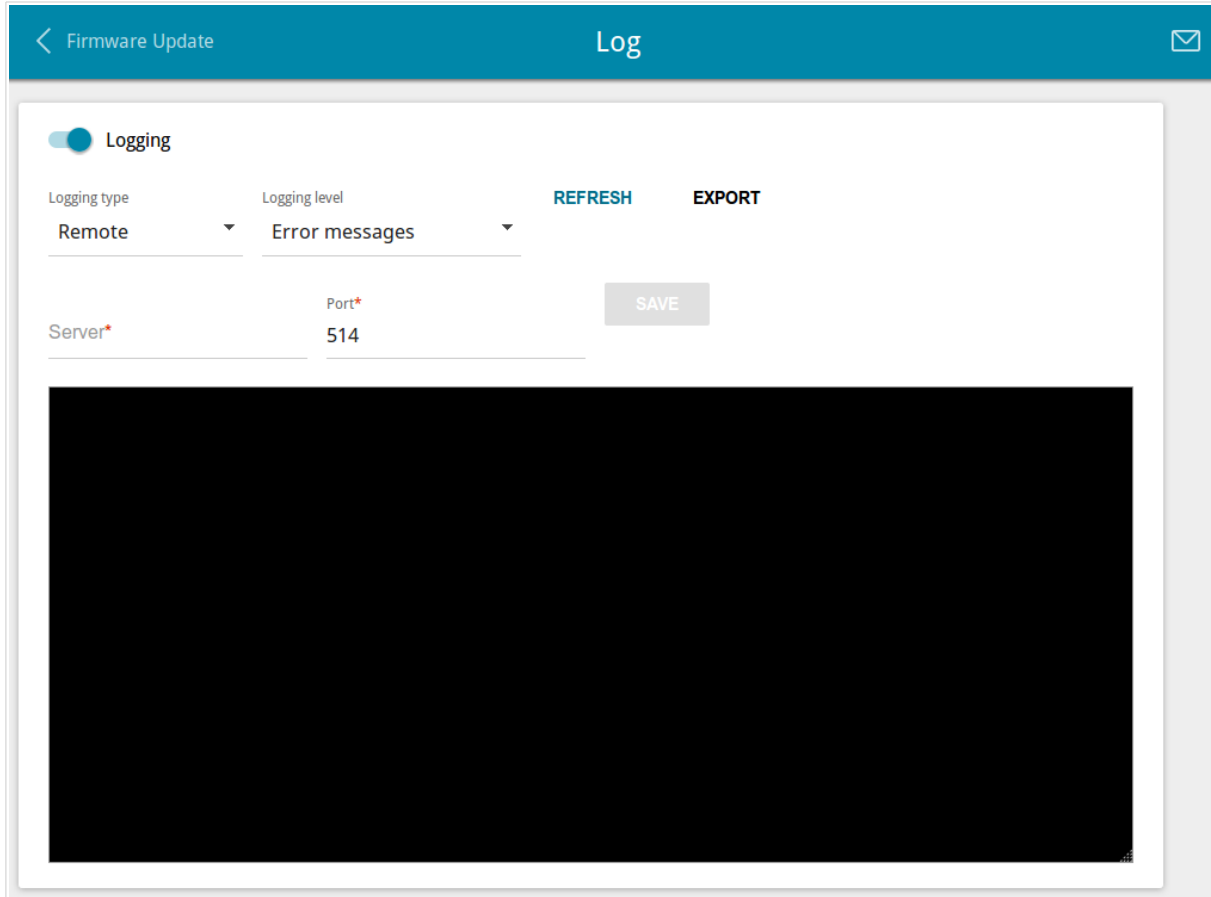


Figure 63. The **System / Log** page.

To enable logging of the system events, move the **Logging** switch to the right. Then specify the needed parameters.

Parameter	Description
Logging type	<p>Select a type of logging from the drop-down list.</p> <ul style="list-style-type: none"> • Local: the system log is stored in the extender's memory. When this value is selected, the Server and Port fields are not displayed. • Remote: the system log is sent to the remote host specified in the Server field. • Local and remote: the system log is stored in the extender's memory and sent to the remote host specified in the Server field.
Logging level	Select a type of messages and alerts/notifications to be logged.

Parameter	Description
Server	The IP or URL address of the host from the local or global network, to which the system log will be sent.
Port	A port of the host specified in the Server field. By default, the value 514 is specified.

After specifying the needed parameters in the **Server** and **Port** fields, click the **SAVE** button.

To disable logging of the system events, move the **Logging** switch to the left.

To view the latest system events, click the **REFRESH** button.

To save the system log to your PC, click the **EXPORT** button. The file will be stored in the download location of your web browser.

Ping

On the **System / Ping** page, you can check availability of a host from the local or global network via the Ping utility.

The Ping utility sends echo requests to a specified host and receives echo replies.

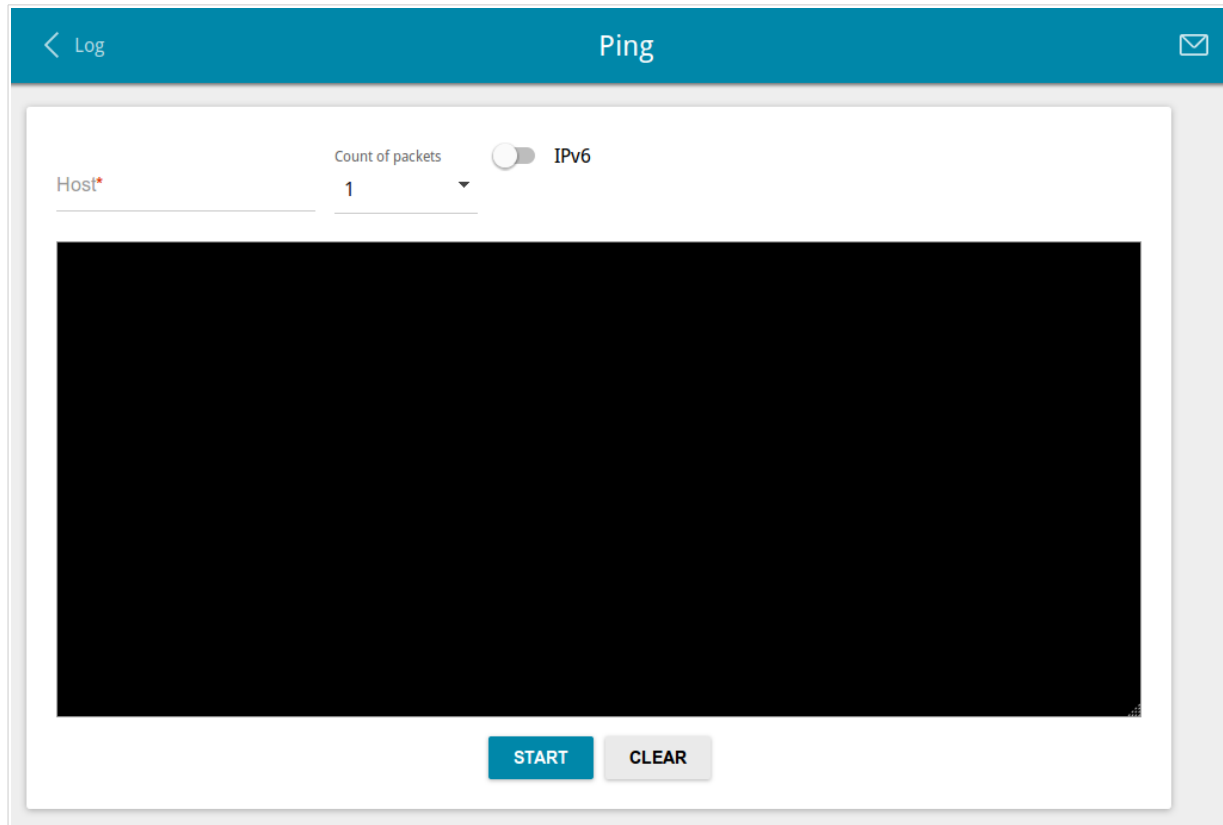


Figure 64. The **System / Ping** page.

To check availability of a host, enter the IP address or name of this host in the **Host** field and select a number of requests that will be sent in order to check its availability from the **Count of packets** drop-down list. If availability check should be performed with IPv6, move the **IPv6** switch to the right. Click the **START** button. After a while, the results will be displayed on the page.

To remove the check result from the page, click the **CLEAR** button.

Traceroute

On the **System / Traceroute** page, you can determine the route of data transfer to a host via the traceroute utility.

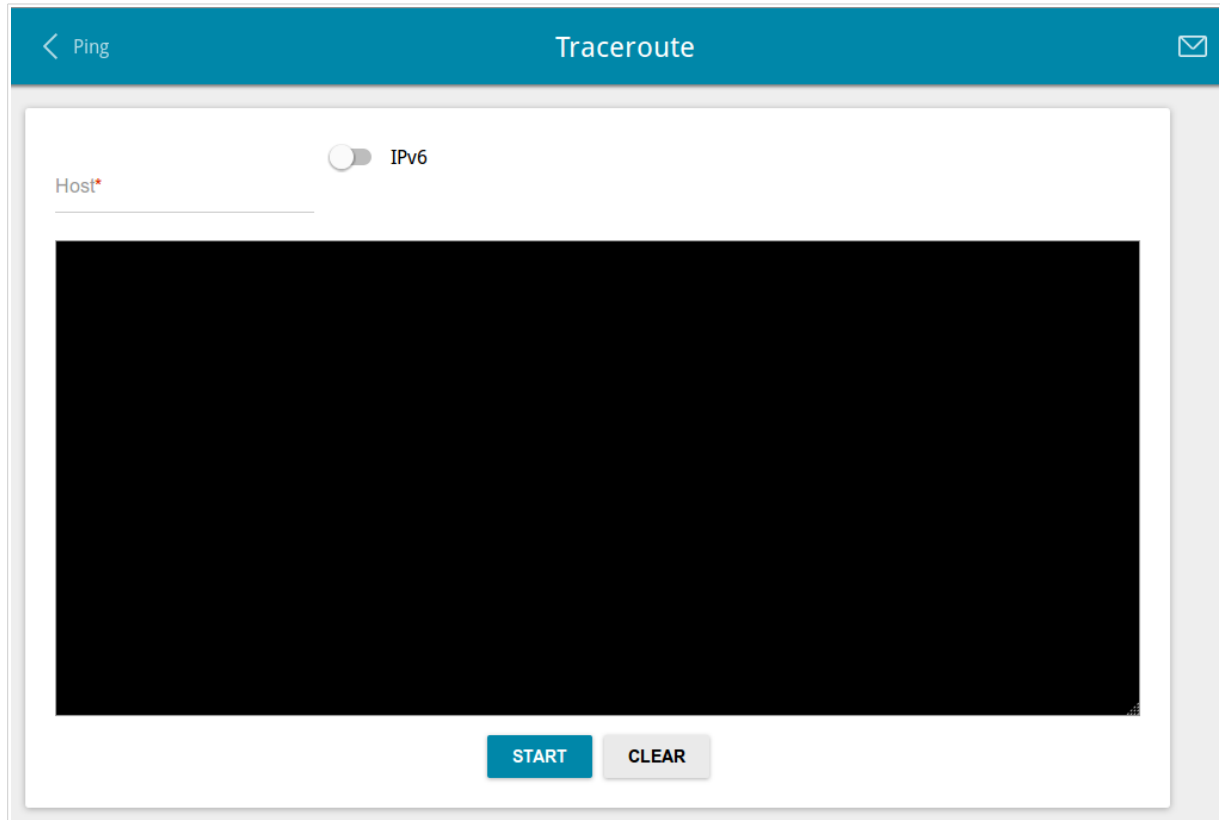


Figure 65. The **System / Traceroute** page.

To determine the route, enter the name or IP address of a host in the **Host** field. If the route should be determined using IPv6, move the **IPv6** switch to the right. Click the **START** button. After a while, the results will be displayed on the page.

To remove the check result from the page, click the **CLEAR** button.

Telnet

On the **System / Telnet** page, you can enable or disable access to the device settings via TELNET from your LAN. By default, access is enabled.

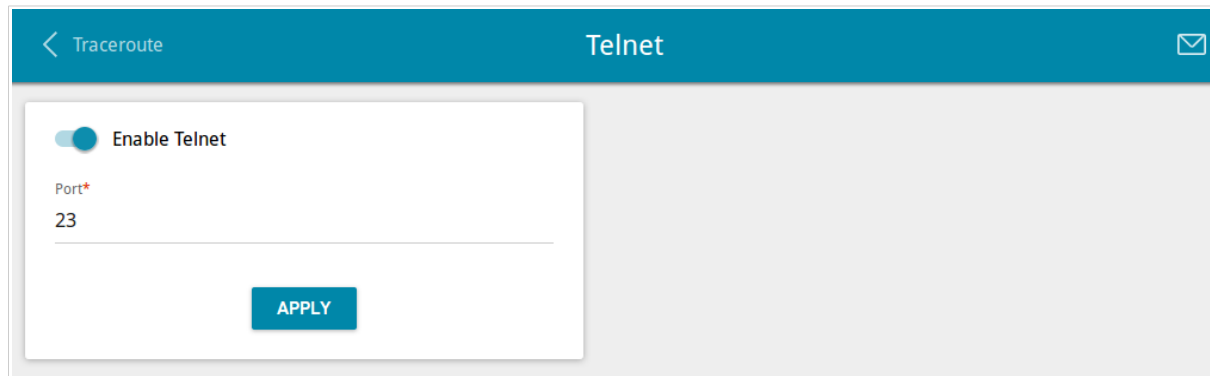


Figure 66. The **System / Telnet** page.

To disable access via TELNET, move the **Enable Telnet** switch to the left and click the **APPLY** button.

To enable access via TELNET again, move the **Enable Telnet** switch to the right. In the **Port** field, enter the number of the extender's port through which access will be allowed (by default, the port **23** is specified). Then click the **APPLY** button.

System Time

On the **System / System Time** page, you can manually set the time and date of the extender or configure automatic synchronization of the system time with a time server on the Internet.

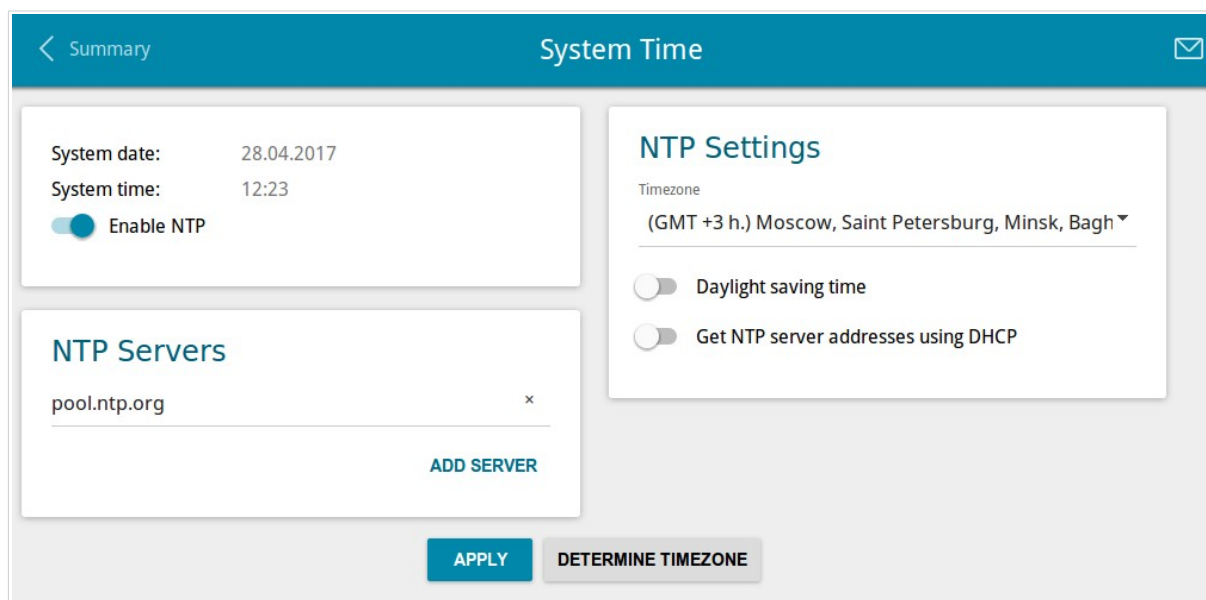


Figure 67. The **System / System Time** page.

To set the system time manually, follow the next steps:

1. Move the **Enable NTP** switch to the left.
2. In the **Time Settings** section, specify needed values. To specify the time set up your PC or portable device, click the **SET LOCAL TIME** button.
3. Click the **APPLY** button. The **System date** and **System time** fields will be filled in automatically.

To enable automatic synchronization with a time server, follow the next steps:

1. Move the **Enable NTP** switch to the right.
2. Specify the needed NTP server or leave the value specified by default in the **NTP Servers** section. If you need to specify several servers, click the **ADD SERVER** button.
3. Select your time zone from the **Timezone** drop-down list in the **NTP Settings** section. To set the time zone in accordance with the settings of your operating system or portable device, click the **DETERMINE TIMEZONE** button.
4. Click the **APPLY** button. The **System date** and **System time** fields will be filled in automatically.

To enable automatic adjustment for daylight saving time of the extender, move the **Daylight saving time** switch to the right in the **NTP Servers** section and click the **APPLY** button.

In some cases NTP servers addresses are provided by your ISP. In this case, you need to move the **Get NTP server addresses using DHCP** switch in the **NTP Servers** section to the right and click the **APPLY** button. Contact your ISP to clarify if this setting needs to be enabled. If the **Get NTP server addresses using DHCP** switch is moved to the right, the **NTP Servers** section is not displayed.



When the extender is powered off or rebooted, the system time is reset to the default value. If you have set automatic synchronization for the system time, the internal clock of the device will be configured after connecting to the Internet. If you have set the system time manually, you need to set the time and date again (see above).

CHAPTER 5. OPERATION GUIDELINES

Safety Rules and Conditions

Please carefully read this section before installation and connection of the device. Make sure that the device is not damaged. The device should be used only as intended in accordance with the documents.

The device is intended for use in dry, clean, dust-free, and well ventilated areas with normal humidity away from strong heat sources. Do not use the device outdoors or in the areas with high humidity. Do not place foreign objects on the device. Do not obstruct the ventilation openings of the device. The environmental temperature near the device and the temperature inside the device's cover should be within the range from 0 °C to +40 °C.

Plug the device only into working electrical outlets with parameters indicated on the device.

Do not open the cover of the device! Unplug the device before dusting and cleaning. Use a damp cloth to clean the device. Do not use liquid/aerosol cleaners or magnetic/static cleaning devices. Prevent moisture getting into the device.

The service life of the device is 2 years.

Wireless Installation Considerations

The DAP-1325 device lets you access your network using a wireless connection from virtually anywhere within the operating range of your wireless network. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF noise in your home or office. To maximize your wireless range, follow the guidelines below.

1. Keep the number of walls and ceilings between the DAP-1325 device and other network devices to a minimum – each wall or ceiling can reduce your wireless network range by 3-90 feet (1-30 meters).
2. Be aware of the direct line between network devices. Place your devices so that the signal travels straight through a wall or ceiling (instead of at an angle) for better reception.
3. Building materials make a difference. A solid metal door or aluminum studs may have a negative effect on your wireless range. Try to position your extender and wireless network devices so that the signal passes through drywalls or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.
4. Keep your extender away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.
5. If you are using 2.4 GHz cordless phones or X-10 equipment (wireless devices such as ceiling fans, lights, and home security systems), your wireless connection may degrade dramatically or drop completely. Make sure your 2.4 GHz phone base is as far away from your wireless devices as possible. Note, that the base transmits a signal even if the phone is not in use.

CHAPTER 6. ABBREVIATIONS AND ACRONYMS

AC	Access Category
AES	Advanced Encryption Standard
ARP	Address Resolution Protocol
BSSID	Basic Service Set Identifier
CRC	Cyclic Redundancy Check
DDNS	Dynamic Domain Name System
DDoS	Distributed Denial of Service
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DTIM	Delivery Traffic Indication Message
GMT	Greenwich Mean Time
IGD	Internet Gateway Device
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPsec	Internet Protocol Security
ISP	Internet Service Provider
L2TP	Layer 2 Tunneling Protocol
LAN	Local Area Network
LCP	Link Control Protocol
MAC	Media Access Control
MTU	Maximum Transmission Unit
NAT	Network Address Translation
NTP	Network Time Protocol
OFDM	Orthogonal Frequency Division Multiplexing
PBC	Push Button Configuration
PIN	Personal Identification Number
PPPoE	Point-to-point protocol over Ethernet

PPTP	Point-to-point tunneling protocol
PSK	Pre-shared key
QoS	Quality of Service
RADIUS	Remote Authentication in Dial-In User Service
RIP	Routing Information Protocol
RTS	Request To Send
RTSP	Real Time Streaming Protocol
SIP	Session Initiation Protocol
SSID	Service Set Identifier
TKIP	Temporal Key Integrity Protocol
UDP	User Datagram Protocol
UPnP	Universal Plug and Play
URL	Uniform Resource Locator
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
WAN	Wide Area Network
WEP	Wired Equivalent Privacy
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
WMM	Wi-Fi Multimedia
WPA	Wi-Fi Protected Access
WPS	Wi-Fi Protected Setup