



## **DIR-820**

### **AC1200 Wave 2 MU-MIMO Wi-Fi Router**

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# CHAPTER 1. INTRODUCTION

## Contents and Audience

This manual describes the router DIR-820 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.  |
| <b>Change</b>  | A name of a menu, menu item, control (field, checkbox, drop-down list, button, etc.). |
| <b>192.168.0.1</b>   | 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 router's hardware and software features, describes its appearance and the package contents.

**Chapter 3** explains how to install the router DIR-820 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 most commonly used in User Manuals for D-Link customer premises equipment.

## CHAPTER 2. OVERVIEW

### **General Information**

The DIR-820 device is a wireless dual band router with a built-in 3-port switch. It provides a fast and simple way to create a wireless and wired network at home or in an office.

You can use any Ethernet port of the router as LAN or WAN port. The new-generation firmware supports assigning several WAN ports, for example, in order to configure the primary and backup WAN connection of different ISPs.

You are able to connect the wireless router DIR-820 to a cable or DSL modem or to a private Ethernet line and use a high-speed Internet connection to successfully fulfill a wide range of professional tasks. The built-in 3-port switch enables you to connect Ethernet-enabled computers, game consoles, and other devices to your network.

Using the DIR-820 device, you are able to quickly create a high-speed wireless network at home or in your office, which lets computers and mobile devices access the Internet virtually anywhere (within the operational range of your wireless network). Simultaneous activity of 2.4GHz band and 5GHz band allows performing a wide range of tasks. The router can operate as a base station for connecting wireless devices of the standards 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac (at the wireless connection rate up to 1167Mbps<sup>1</sup>).

The router supports multiple functions for the wireless interface: several security standards (WEP, WPA/WPA2), MAC address filtering, WPS, WMM.

Multi-user MIMO technology allows to distribute the router's resources to let multiple wireless clients use the Wi-Fi network efficiently, keeping high rates for HD media streaming, lag-free gaming, and fast transfer of large files.

Transmit Beamforming technology allows to flexibly change the antennas' radiation pattern and to redistribute the signal directly to wireless devices connected to the router.

Smart adjustment of Wi-Fi clients is useful for networks based on several D-Link access points or routers – when the smart adjustment function is configured on each of them, a client always connects to the access point (router) with the highest signal level.

Support of guest Wi-Fi network allows you to create a separate wireless network with individual security settings. Devices connected to the guest network will be able to access the Internet, but will be isolated from the devices and resources of the router's LAN.

The wireless router DIR-820 includes a built-in firewall. The advanced security functions minimize threats of hacker attacks, prevent unwanted intrusions to your network, and block access to unwanted websites for users of your LAN.

The SSH protocol support provides more secure remote configuration and management of the router due to encryption of all transmitted traffic, including passwords.

Now the schedules are also implemented; they can be applied to the rules and settings of the firewall and used to reboot the router at the specified time or every specified time period and to enable/disable the wireless network and the Wi-Fi filter.

---

<sup>1</sup> Up to 300Mbps for 2.4GHz and up to 867Mbps for 5GHz.

You can configure the settings of the wireless router DIR-820 via the user-friendly web-based interface (the interface is available in several languages).

The configuration wizard allows you to quickly switch DIR-820 to one of the following modes: router (for connection to a wired or wireless ISP), access point, repeater, or client, and then configure all needed setting for operation in the selected mode in several simple steps.

Also DIR-820 supports configuration and management via mobile application for Android and iPhone smartphones.

You can simply update the firmware: the router itself finds approved firmware on D-Link update server and notifies when ready to install it.

## Specifications\*

| Hardware               |   |
|------------------------|---|
| <b>Processor</b>       | <ul style="list-style-type: none"> <li>MT7628DAN (575MHz)</li> </ul>  |
| <b>RAM</b>             | <ul style="list-style-type: none"> <li>64MB, built in processor</li> </ul>  |
| <b>Flash</b>           | <ul style="list-style-type: none"> <li>16MB, SPI</li> </ul>   |
| <b>Interfaces</b>      | <ul style="list-style-type: none"> <li>10/100BASE-TX WAN port</li> <li>3 10/100BASE-TX LAN ports</li> </ul>                               |
| <b>LEDs</b>            | <ul style="list-style-type: none"> <li>Power</li> <li>WAN</li> <li>3 LAN LEDs</li> <li>WLAN 2.4G</li> <li>WLAN 5G</li> <li>WPS</li> </ul> |
| <b>Buttons</b>         | <ul style="list-style-type: none"> <li>WPS/RST button to restore factory default settings and set up wireless connection</li> </ul>       |
| <b>Antenna</b>         | <ul style="list-style-type: none"> <li>Four external non-detachable antennas (5dBi gain)</li> </ul>                                       |
| <b>MIMO</b>            | <ul style="list-style-type: none"> <li>2 x 2, MU-MIMO</li> </ul>  |
| <b>Power connector</b> | <ul style="list-style-type: none"> <li>Power input connector (DC)</li> </ul>  |

| Software                    |  |
|-----------------------------|--|
| <b>WAN connection types</b> | <ul style="list-style-type: none"> <li>PPPoE</li> <li>IPv6 PPPoE</li> <li>PPPoE Dual Stack</li> <li>Static IPv4 / Dynamic IPv4</li> <li>Static IPv6 / Dynamic IPv6</li> <li>PPPoE + Static IP (PPPoE Dual Access)</li> <li>PPPoE + Dynamic IP (PPPoE Dual Access)</li> <li>PPTP/L2TP + Static IP</li> <li>PPTP/L2TP + Dynamic IP</li> </ul>  |
| <b>Network functions</b>    | <ul style="list-style-type: none"> <li>DHCP server/relay</li> <li>Advanced configuration of built-in DHCP server</li> <li>Stateful/Stateless mode for IPv6 address assignment, IPv6 prefix delegation</li> <li>Automatic obtainment of LAN IP address (for access point/repeater/client modes)</li> <li>DNS relay</li> <li>Dynamic DNS</li> <li>Static IPv4/IPv6 routing</li> <li>IGMP Proxy</li> <li>Support of UPnP IGD</li> <li>Support of VLAN</li> <li>WAN ping respond</li> <li>Support of SIP ALG</li> <li>Support of RTSP</li> <li>WAN failover</li> <li>LAN/WAN conversion</li> <li>Multi-WAN support</li> <li>Autonegotiation of speed, duplex mode, and flow control / Manual speed and duplex mode setup for each Ethernet port</li> <li>Built-in UDPXY application</li> </ul> |

\* The device features are subject to change without notice. For the latest versions of the firmware and relevant documentation, visit [www.dlink.ru](http://www.dlink.ru).

| Software                         |   |
|----------------------------------|---|
| <b>Firewall functions</b>        | <ul style="list-style-type: none"> <li>· Network Address Translation (NAT)</li> <li>· Stateful Packet Inspection (SPI)</li> <li>· IPv4/IPv6 filter</li> <li>· MAC filter</li> <li>· URL filter</li> <li>· DMZ</li> <li>· Virtual servers</li> </ul>   |
| <b>VPN</b>                       | <ul style="list-style-type: none"> <li>· IPsec/PPTP/L2TP/PPPoE pass-through</li> </ul>  |
| <b>Management and monitoring</b> | <ul style="list-style-type: none"> <li>· Local and remote access to settings through SSH/TELNET/WEB (HTTP/HTTPS)</li> <li>· Multilingual web-based interface for configuration and management</li> <li>· Support of D-Link Assistant application for Android and iPhone smartphones</li> <li>· Notification on connection problems and auto redirect to settings</li> <li>· Firmware update via web-based interface</li> <li>· Automatic notification on new firmware version</li> <li>· Saving/restoring configuration to/from file</li> <li>· Support of logging to remote host</li> <li>· Automatic synchronization of system time with NTP server and manual time/date setup</li> <li>· Ping utility</li> <li>· Traceroute utility</li> <li>· TR-069 client</li> <li>· SNMP agent</li> <li>· Schedules for rules and settings of firewall, automatic reboot, and enabling/disabling wireless network and Wi-Fi filter</li> <li>· Automatic upload of configuration file from ISP's server (Auto Provision)</li> </ul> |

| Wireless Module Parameters  |  |
|---|--|
| <b>Standards</b>  | <ul style="list-style-type: none"> <li>· IEEE 802.11ac Wave 2</li> <li>· IEEE 802.11a/b/g/n</li> <li>· IEEE 802.11k/v</li> </ul>   |
| <b>Frequency range</b><br><br><i>The frequency range depends upon the radio frequency regulations applied in your country</i> | <ul style="list-style-type: none"> <li>· 2400 ~ 2483.5MHz</li> <li>· 5150 ~ 5350MHz</li> <li>· 5650 ~ 5850MHz</li> </ul>   |
| <b>Wireless connection security</b>   | <ul style="list-style-type: none"> <li>· WEP</li> <li>· WPA/WPA2 (Personal/Enterprise)</li> <li>· MAC filter</li> <li>· WPS (PBC/PIN)</li> </ul>   |
| <b>Advanced functions</b>   | <ul style="list-style-type: none"> <li>· Support of client mode</li> <li>· WMM (Wi-Fi QoS)</li> <li>· Information on connected Wi-Fi clients</li> <li>· Advanced settings</li> <li>· Smart adjustment of Wi-Fi clients</li> <li>· Guest Wi-Fi / support of MBSSID</li> <li>· Periodic scan of channels, automatic switch to least loaded channel</li> <li>· Support of 2.4GHz TX Beamforming</li> <li>· Autonegotiation of channel bandwidth in accordance with environment conditions (20/40 Coexistence)</li> <li>· Support of STBC</li> </ul> |
| <b>Wireless connection rate</b>   | <ul style="list-style-type: none"> <li>· IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54Mbps</li> <li>· IEEE 802.11b: 1, 2, 5.5, and 11Mbps</li> <li>· IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, and 54Mbps</li> <li>· IEEE 802.11n (2.4GHz/5GHz): from 6.5 to 300Mbps (from MCS0 to MCS15)</li> <li>· IEEE 802.11ac (5GHz): from 6.5 to 867Mbps (from MCS0 to MCS9)</li> </ul>   |

| Wireless Module Parameters  |   |
|---|---|
| <p><b>Transmitter output power</b></p> <p><i>The maximum value of the transmitter output power depends upon the radio frequency regulations applied in your country</i></p> | <ul style="list-style-type: none"> <li>· 802.11a (typical at room temperature 25 °C)<br/>15dBm at 6, 9, 12, 18, 24, 36, 48, 54Mbps</li> <li>· 802.11b (typical at room temperature 25 °C)<br/>15dBm at 1, 2, 5.5, 11Mbps</li> <li>· 802.11g (typical at room temperature 25 °C)<br/>15dBm at 6, 9, 12, 18, 24, 36, 48, 54Mbps</li> <li>· 802.11n (typical at room temperature 25 °C)<br/>2.4GHz, HT20<br/>15dBm at MCS0~7<br/>2.4GHz, HT40<br/>15dBm at MCS0~7<br/>5GHz, HT20<br/>15dBm at MCS0~7<br/>5GHz, HT40<br/>15dBm at MCS0~7</li> <li>· 802.11ac (typical at room temperature 25 °C)<br/>VHT20<br/>15dBm at MCS0~8<br/>VHT40<br/>15dBm at MCS0~9<br/>VHT80<br/>15dBm at MCS0~9</li> </ul>   |
| <p><b>Receiver sensitivity</b></p>  | <ul style="list-style-type: none"> <li>· 802.11a (typical at PER &lt; 10% (1000-byte PDUs) at room temperature 25 °C)<br/>-90dBm at 6Mbps<br/>-88dBm at 9Mbps<br/>-86dBm at 12Mbps<br/>-85dBm at 18Mbps<br/>-82dBm at 24Mbps<br/>-78dBm at 36Mbps<br/>-74dBm at 48Mbps<br/>-73dBm at 54Mbps</li> <li>· 802.11b (typical at PER = 8% (1000-byte PDUs) at room temperature 25 °C)<br/>-93dBm at 1Mbps<br/>-90dBm at 2Mbps<br/>-88dBm at 5.5Mbps<br/>-86dBm at 11Mbps</li> <li>· 802.11g (typical at PER &lt; 10% (1000-byte PDUs) at room temperature 25 °C)<br/>-90dBm at 6Mbps<br/>-84dBm at 9Mbps<br/>-82dBm at 12Mbps<br/>-80dBm at 18Mbps<br/>-77dBm at 24Mbps<br/>-75dBm at 36Mbps<br/>-74dBm at 48Mbps<br/>-73dBm at 54Mbps</li> </ul> |

**Wireless Module Parameters**

- 802.11n (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)
  - 2.4GHz, HT20
  - 90dBm at MCS0
  - 82dBm at MCS1
  - 80dBm at MCS2
  - 77dBm at MCS3
  - 74dBm at MCS4
  - 73dBm at MCS5
  - 72dBm at MCS6
  - 71dBm at MCS7
  - 2.4GHz, HT40
  - 88dBm at MCS0
  - 79dBm at MCS1
  - 77dBm at MCS2
  - 74dBm at MCS3
  - 71dBm at MCS4
  - 70dBm at MCS5
  - 69dBm at MCS6
  - 68dBm at MCS7
  - 5GHz, HT20
  - 90dBm at MCS0
  - 86dBm at MCS1
  - 84dBm at MCS2
  - 81dBm at MCS3
  - 77dBm at MCS4
  - 73dBm at MCS5
  - 72dBm at MCS6
  - 71dBm at MCS7
  - 5GHz, HT40
  - 87dBm at MCS0
  - 84dBm at MCS1
  - 82dBm at MCS2
  - 79dBm at MCS3
  - 75dBm at MCS4
  - 71dBm at MCS5
  - 70dBm at MCS6
  - 69dBm at MCS7
  
- 802.11ac (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)
  - VHT20
  - 90dBm at MCS0
  - 86dBm at MCS1
  - 84dBm at MCS2
  - 81dBm at MCS3
  - 77dBm at MCS4
  - 73dBm at MCS5
  - 72dBm at MCS6
  - 71dBm at MCS7
  - 66dBm at MCS8
  - VHT40
  - 87dBm at MCS0
  - 84dBm at MCS1
  - 82dBm at MCS2
  - 79dBm at MCS3
  - 75dBm at MCS4
  - 71dBm at MCS5
  - 70dBm at MCS6
  - 69dBm at MCS7
  - 64dBm at MCS8
  - 62dBm at MCS9

| Wireless Module Parameters |   |
|----------------------------|---|
|                            | VHT80<br>-83dBm at MCS0<br>-81dBm at MCS1<br>-78dBm at MCS2<br>-75dBm at MCS3<br>-71dBm at MCS4<br>-67dBm at MCS5<br>-66dBm at MCS6<br>-65dBm at MCS7<br>-60dBm at MCS8<br>-58dBm at MCS9   |
| <b>Modulation schemes</b>  | <ul style="list-style-type: none"> <li>· 802.11a: BPSK, QPSK, 16QAM, 64QAM with OFDM</li> <li>· 802.11b: DQPSK, DBPSK, DSSS, CCK</li> <li>· 802.11g: BPSK, QPSK, 16QAM, 64QAM with OFDM</li> <li>· 802.11n: BPSK, QPSK, 16QAM, 64QAM with OFDM</li> <li>· 802.11ac: BPSK, QPSK, 16QAM, 64QAM, up to 256QAM with OFDM</li> </ul> |

| Physical Parameters           |   |
|-------------------------------|---|
| <b>Dimensions (L x W x H)</b> | <ul style="list-style-type: none"> <li>· 190 x 120 x 30 mm (7.48 x 4.72 x 1.18 in)</li> </ul> |

| Operating Environment |   |
|-----------------------|---|
| <b>Power</b>          | <ul style="list-style-type: none"> <li>· Output: 12V DC, 0.5A</li> </ul>  |
| <b>Temperature</b>    | <ul style="list-style-type: none"> <li>· Operating: from 0 to 40 °C</li> <li>· Storage: from -20 to 65 °C</li> </ul>                                |
| <b>Humidity</b>       | <ul style="list-style-type: none"> <li>· Operating: from 10% to 90% (non-condensing)</li> <li>· Storage: from 5% to 95% (non-condensing)</li> </ul> |

## Product Appearance

### Upper Panel



Figure 1. Upper panel view.

| LED   | Mode                  | Description                             |
|-------|-----------------------|---|
| Power | <i>Solid green</i>    | The router is powered on.               |
|       | <i>No light</i>       | The router is powered off.              |
| WAN   | <i>Solid green</i>    | The WAN cable is connected to the port. |
|       | <i>Blinking green</i> | Data transfer through the WAN port.     |
|       | <i>No light</i>       | The WAN cable is not connected.         |

| LED                                | Mode                       | Description  |
|------------------------------------|----------------------------|--|
| <b>LAN 1-3</b>                     | <i>Solid green</i>         | A device (computer) is connected to the relevant port, the connection is on. |
|                                    | <i>Blinking green</i>      | Data transfer through the relevant LAN port.                                 |
|                                    | <i>No light</i>            | The cable is not connected to the relevant port.                             |
| <b>WLAN 2.4G</b><br><b>WLAN 5G</b> | <i>Solid green</i>         | The router's WLAN of the relevant band is on.                                |
|                                    | <i>Blinking green</i>      | Data transfer through the Wi-Fi network of the relevant band.                |
|                                    | <i>No light</i>            | The router's WLAN of the relevant band is off.                               |
| <b>WPS</b>                         | <i>Fast blinking green</i> | Attempting to add a wireless device via the WPS function.                    |
|                                    | <i>Slow blinking green</i> | The firmware is being updated.   |
|                                    | <i>No light</i>            | The WPS function is not in use.  |

In case the **Power** and **WLAN 5G** LEDs are solid green, and the **WAN**, **LAN 1-3**, **WLAN 2.4G**, and **WPS** LEDs are fast blinking green at the same time, the device is in the emergency mode. Power the device off and on. If the device is loaded in the emergency mode again, restore the factory default settings via the hardware **WPS/RST** button.

## Back Panel



Figure 2. Back panel view.

| Port           | Description  |
|----------------|--|
| <b>WPS/RST</b> | A button to set up a wireless connection (the WPS function) and to restore the factory default settings.<br>To use the WPS function: with the device turned on, push the button and release. The <b>WPS</b> LED should start blinking fast.<br>To restore the factory defaults: with the device turned on, push the button, hold it for 10 seconds, and then release the button. |
| <b>LAN 1-3</b> | 3 Ethernet ports to connect computers or network devices.  |
| <b>WAN</b>     | A port to connect to a cable or DSL modem or to a private Ethernet line (it is recommended to use the cable included in the delivery package).   |
| <b>DC-IN</b>   | Power connector.   |

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

## ***Delivery Package***

The following should be included:

- Router DIR-820
- Power adapter DC 12V/0.5A
- Ethernet cable
- “***Quick Installation Guide***” (brochure).

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



Using a power supply with a different voltage rating than the one included 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.

#### **Computer or Mobile Device**

Configuration of the wireless dual band router with a built-in 3-port switch DIR-820 (hereinafter referred to as “the router”) is performed via the built-in web-based interface. The web-based interface is available from any operating system that supports a web browser.

Also you can use D-Link Assistant application for Android or iPhone mobile devices (smartphones or tablets).

#### **PC 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 router 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 router.

#### **Wireless Connection**

Wireless workstations from your network should be equipped with a wireless 802.11a, b, g, n, or ac 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 router for all these wireless workstations.

## Connecting to PC

### PC with Ethernet Adapter

1. Connect an Ethernet cable between any of LAN ports located on the back panel of the router and the Ethernet port of your PC.
2. Connect the power cord to the power connector port on the back panel of the router, then plug the power adapter into an electrical outlet or power strip.

Then make sure that your PC is configured to obtain an IP address automatically (as DHCP client).

### Obtaining IP Address Automatically (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.)

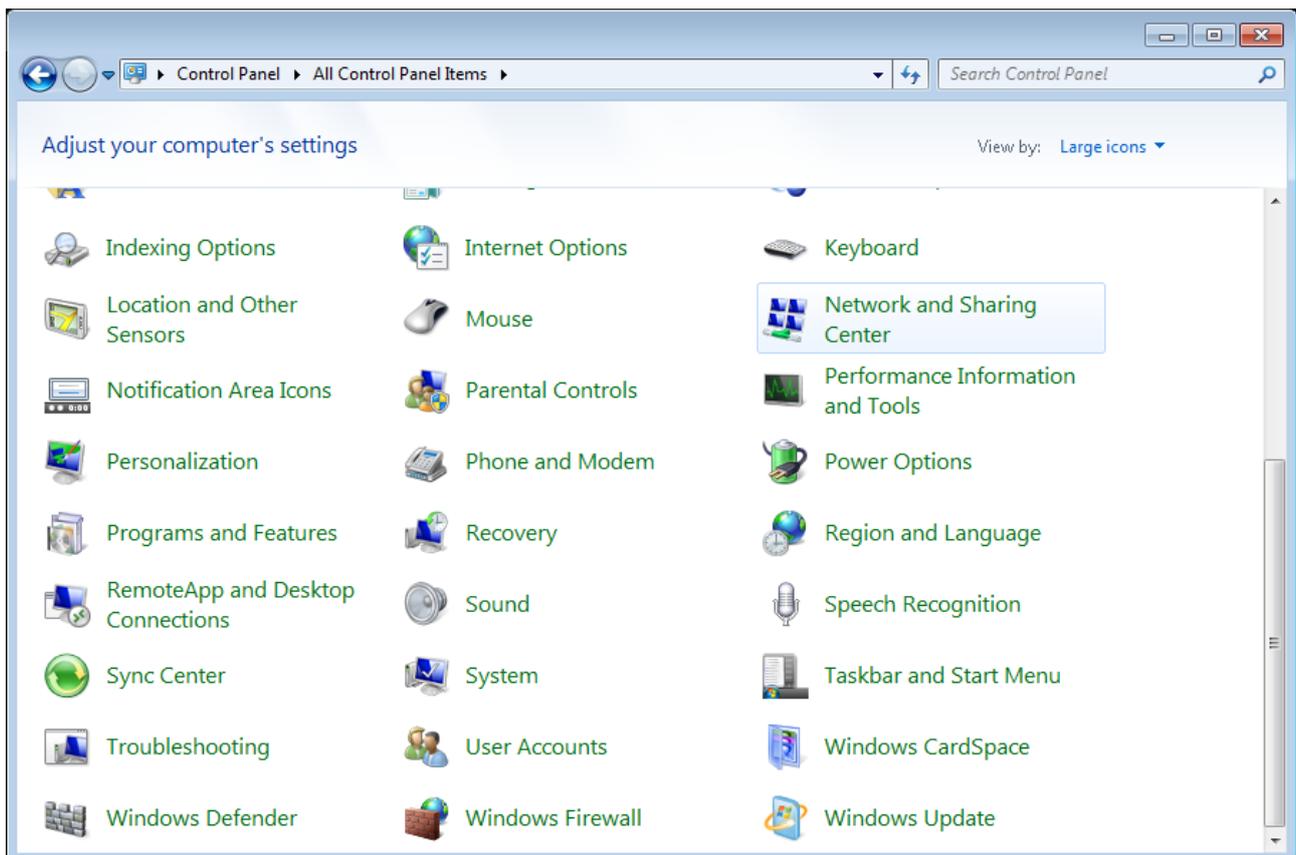


Figure 3. The **Control Panel** window.

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

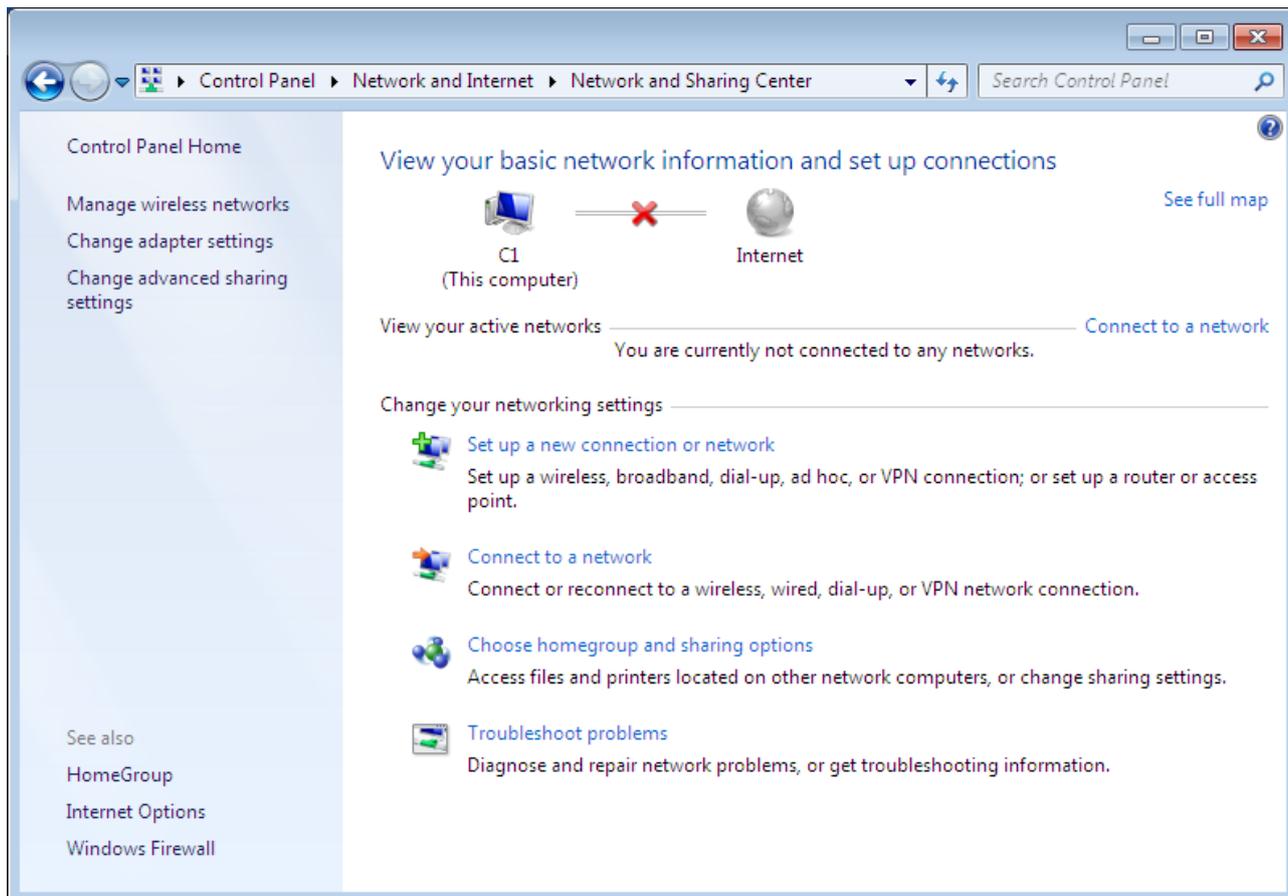


Figure 4. The **Network and Sharing Center** window.

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

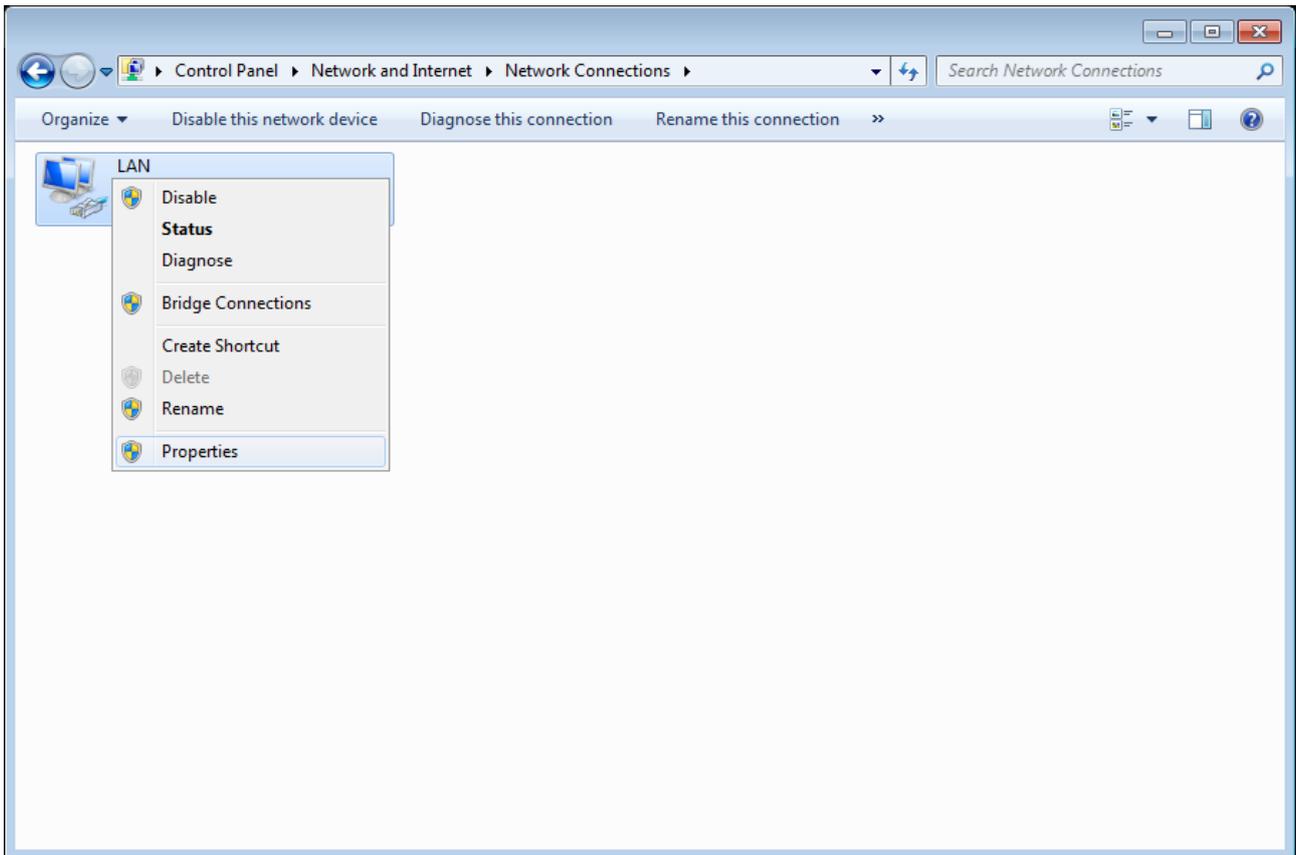


Figure 5. The **Network Connections** window.

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.

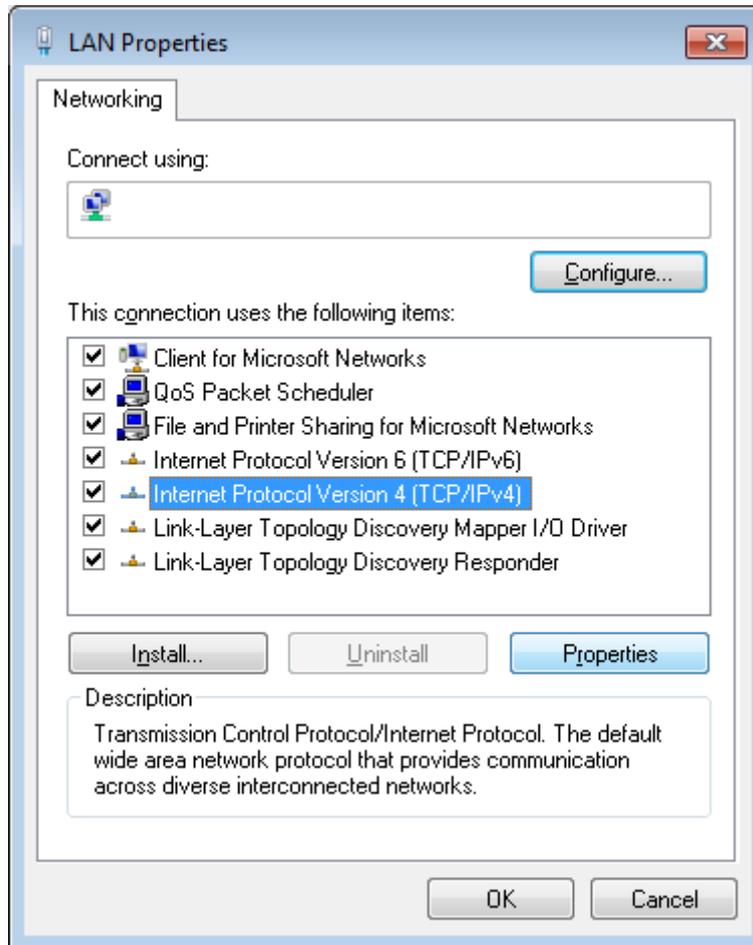


Figure 6. The **Local Area Connection Properties** window.

6. Make sure that the **Obtain an IP address automatically** and **Obtain DNS server address automatically** choices of the radio buttons are selected. Click the **OK** button.

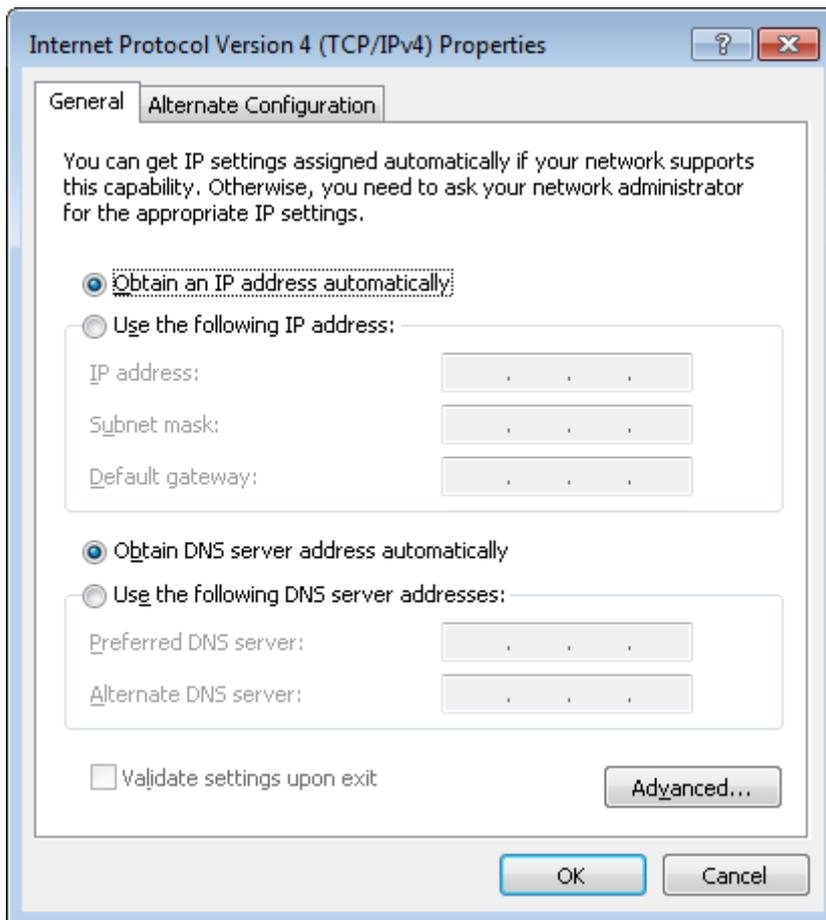
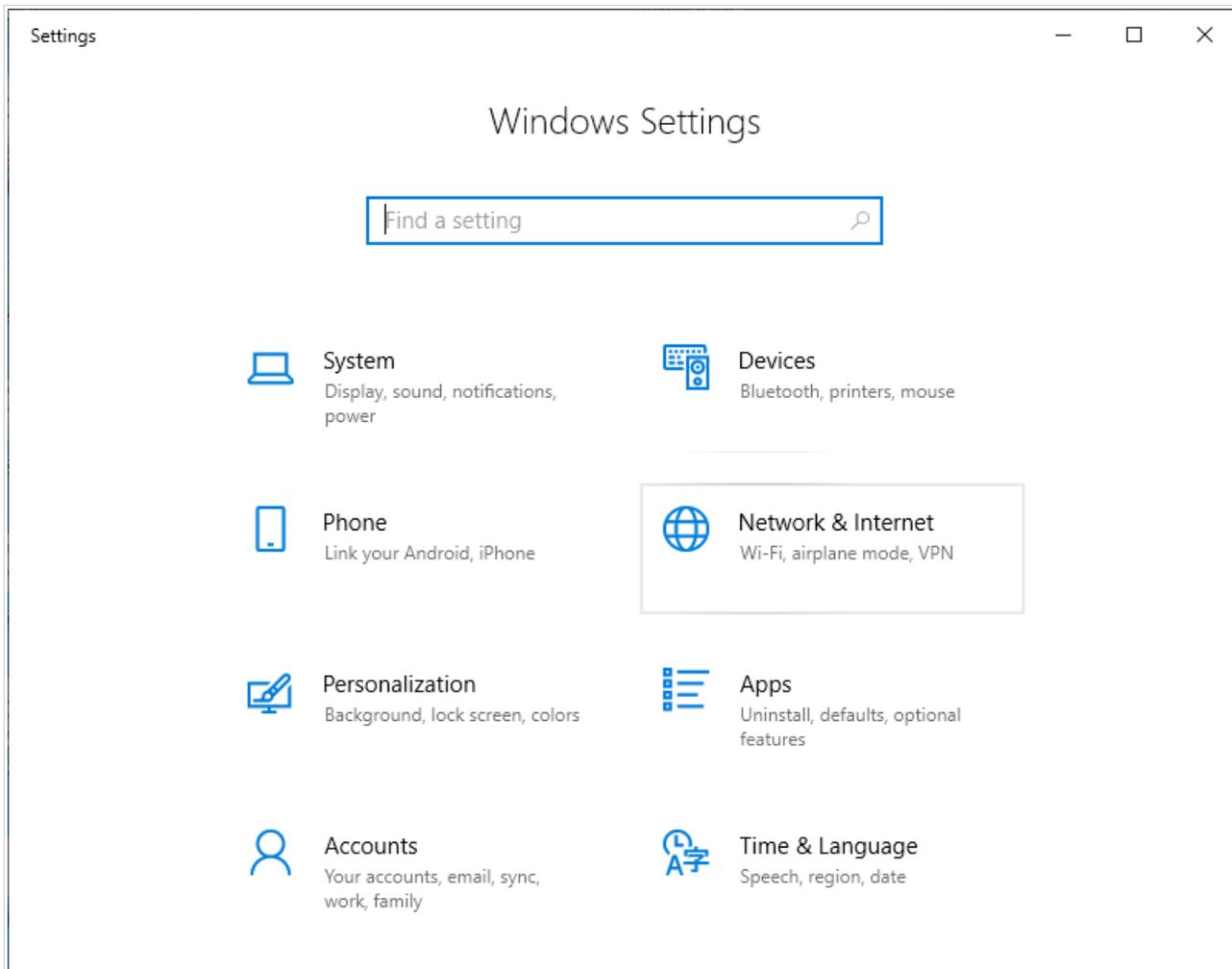


Figure 7. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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

## Obtaining IP Address Automatically (OS Windows 10)

1. Click the **Start** button and proceed to the **Settings** window.
2. Select the **Network & Internet** section.



*Figure 8. The Windows Settings window.*

3. In the **Change your network settings** section, select the **Change adapter options** line.

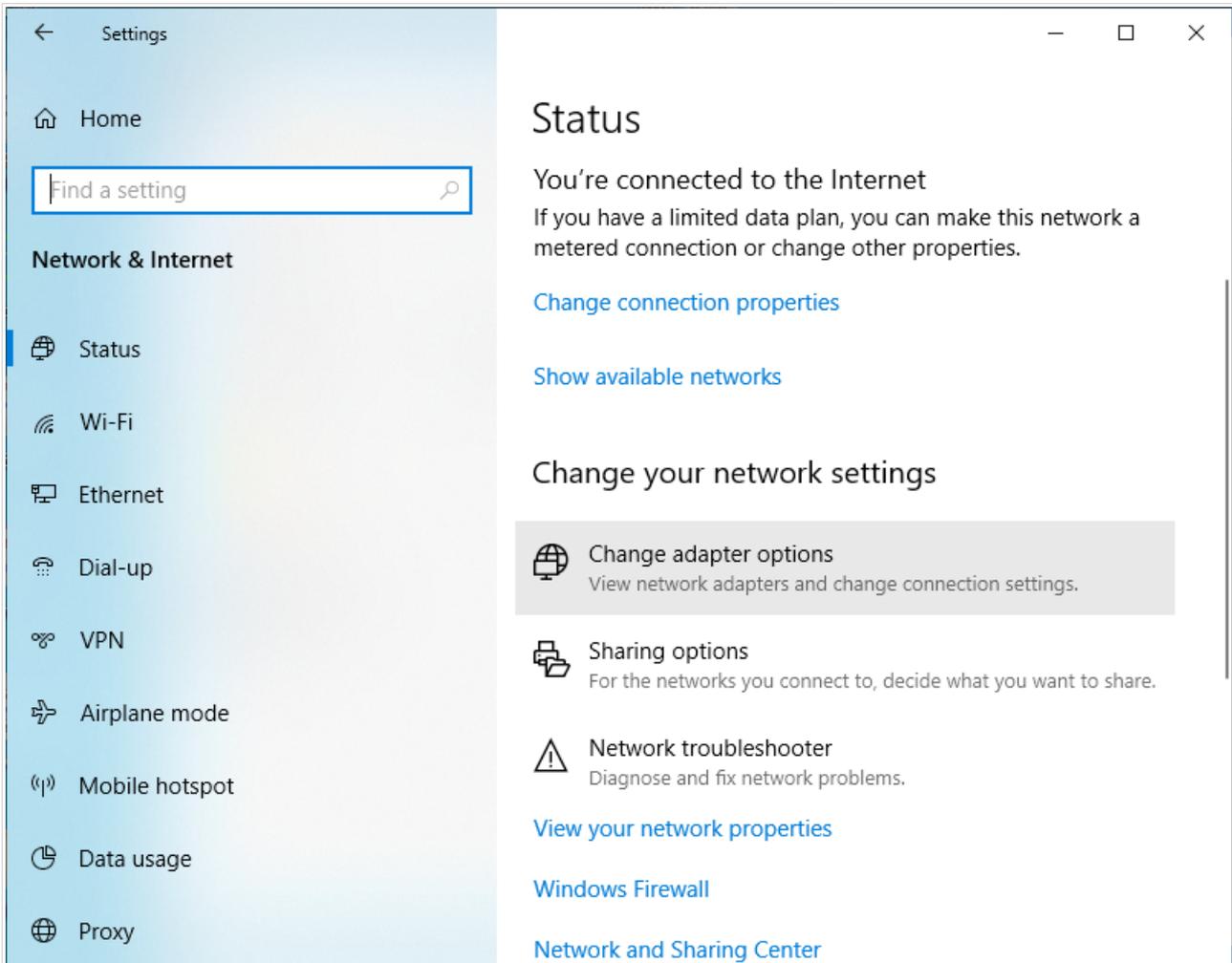


Figure 9. The **Network & Internet** window.

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

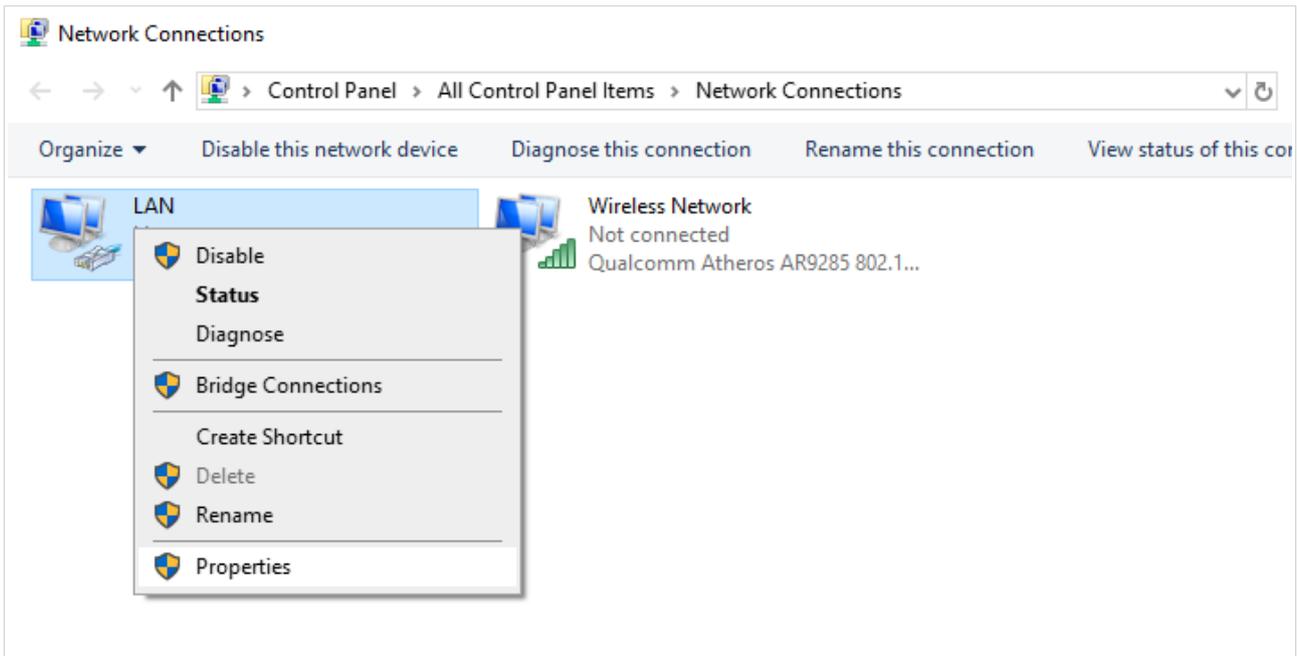


Figure 10. The **Network Connections** window.

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.

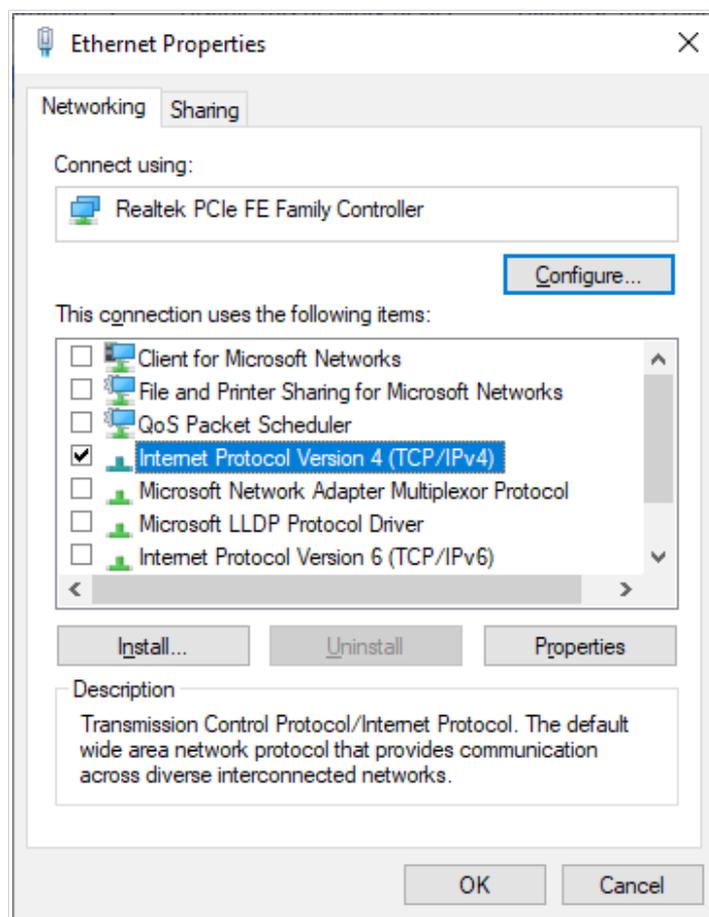


Figure 11. The local area connection properties window.

6. Make sure that the **Obtain an IP address automatically** and **Obtain DNS server address automatically** choices of the radio buttons are selected. Click the **OK** button.

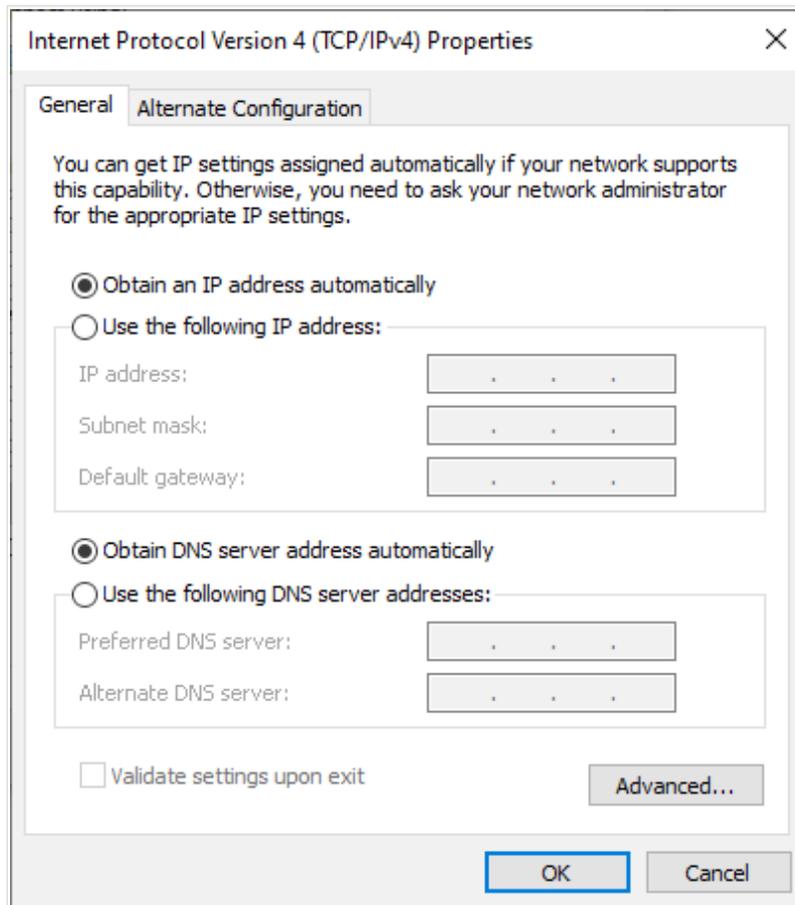


Figure 12. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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

## PC with Wi-Fi Adapter

1. Connect the power cord to the power connector port on the back panel of the router, then plug the power adapter into an electrical outlet or power strip.
2. Make sure that your Wi-Fi adapter is on. 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.

Then make sure that your Wi-Fi adapter is configured to obtain an IP address automatically (as DHCP client).

## Obtaining IP Address Automatically and Connecting to Wireless Network (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.)

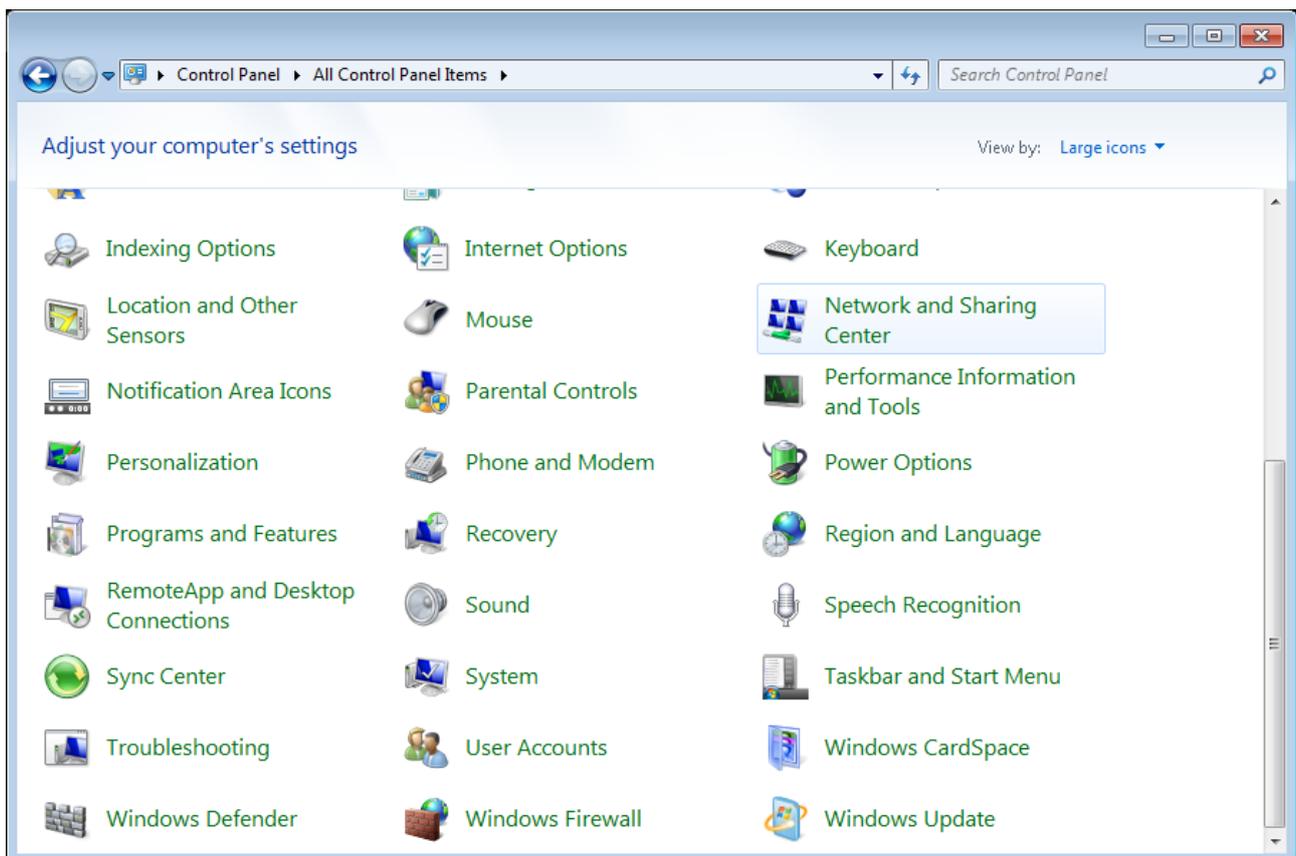


Figure 13. The **Control Panel** window.

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. Make sure that the **Obtain an IP address automatically** and **Obtain DNS server address automatically** choices of the radio buttons are selected. Click the **OK** button.

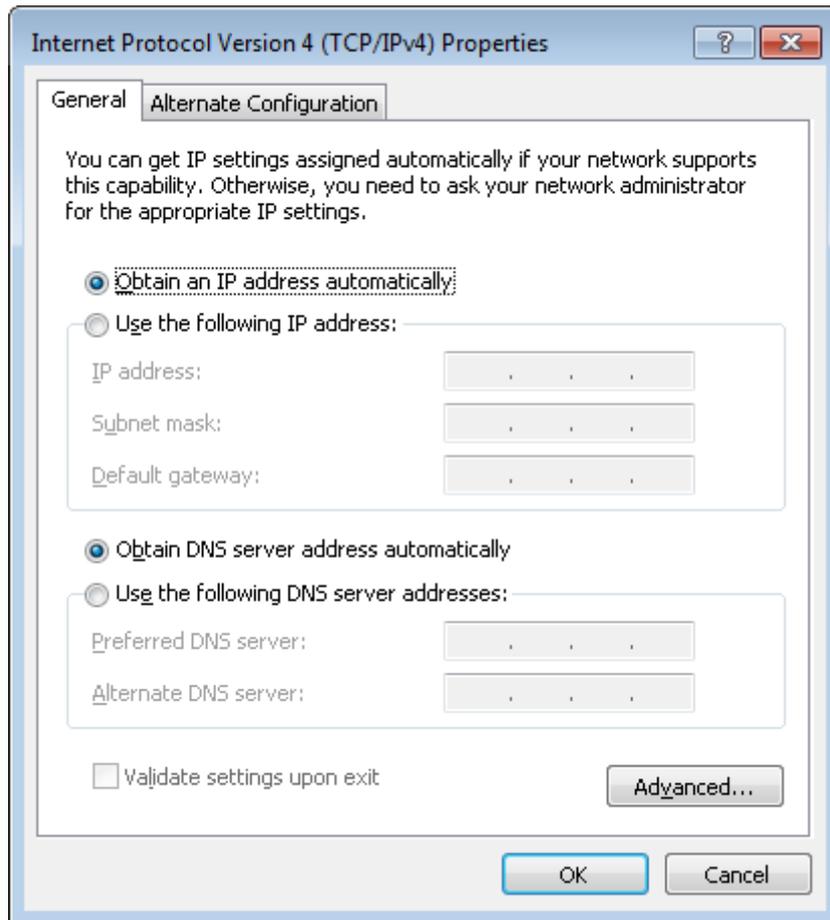


Figure 14. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

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 **Wireless Network Connection** window, select the wireless network **DIR-820** (for operating in the 2.4GHz band) or **DIR-820-5G** (for operating in the 5GHz band) and click the **Connect** button.

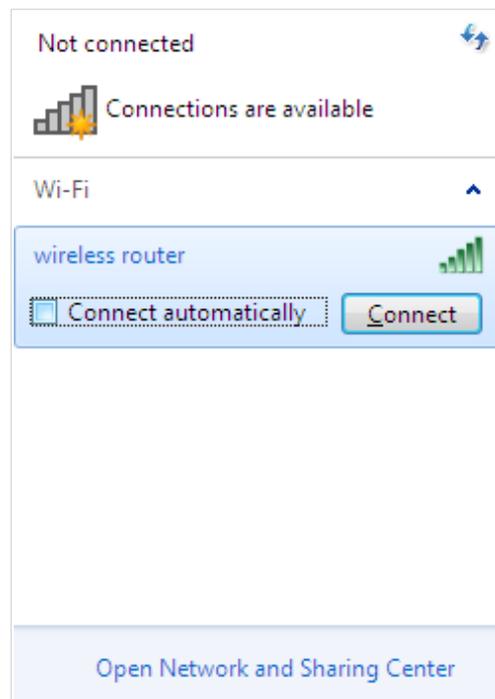


Figure 16. The list of available networks.

- 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.

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

## Obtaining IP Address Automatically and Connecting to Wireless Network (OS Windows 10)

1. Click the **Start** button and proceed to the **Settings** window.
2. Select the **Network & Internet** section.

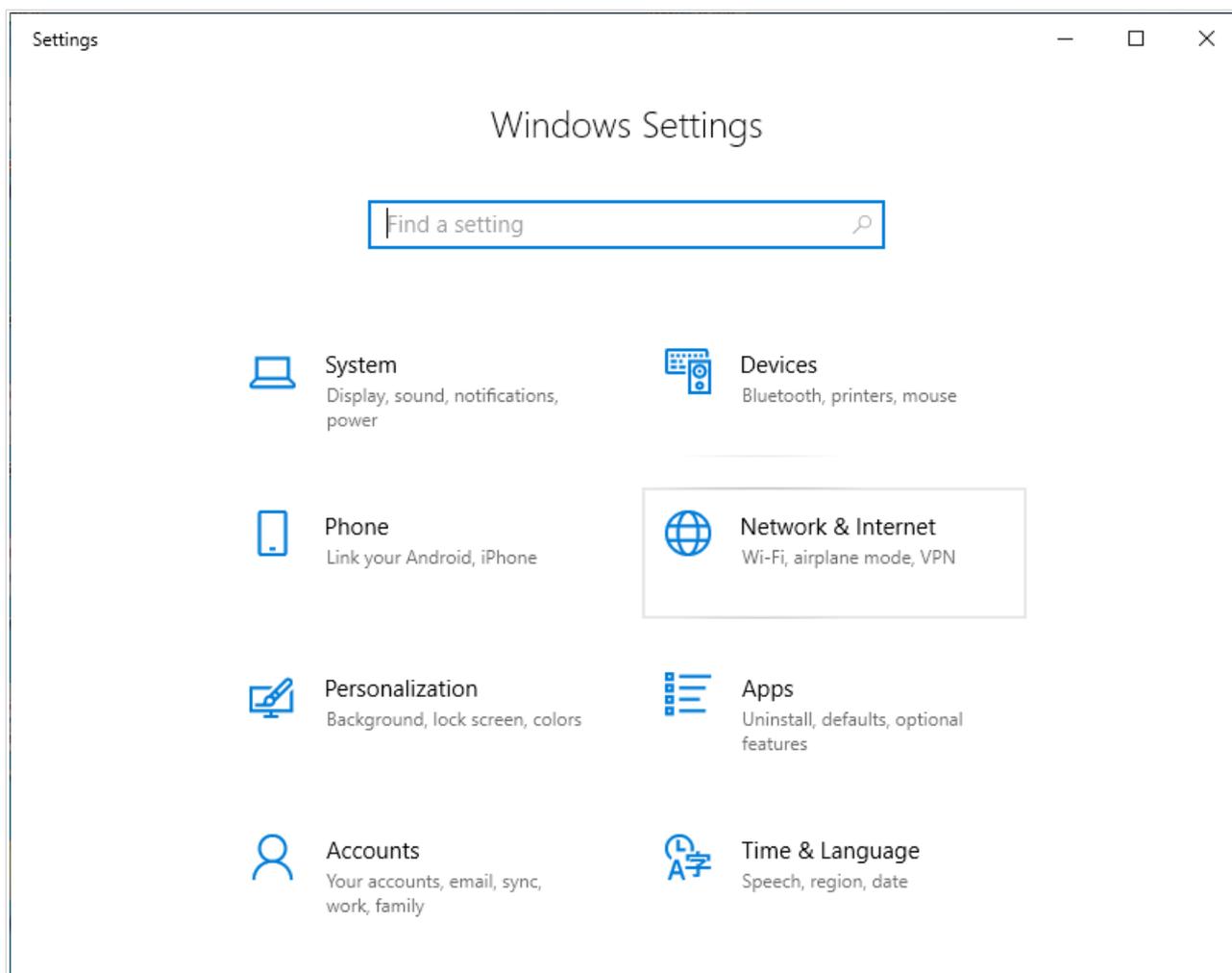


Figure 17. The **Windows Settings** window.

3. In the **Change your network settings** section, select the **Change adapter options** 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. Make sure that the **Obtain an IP address automatically** and **Obtain DNS server address automatically** choices of the radio buttons are selected. Click the **OK** button.

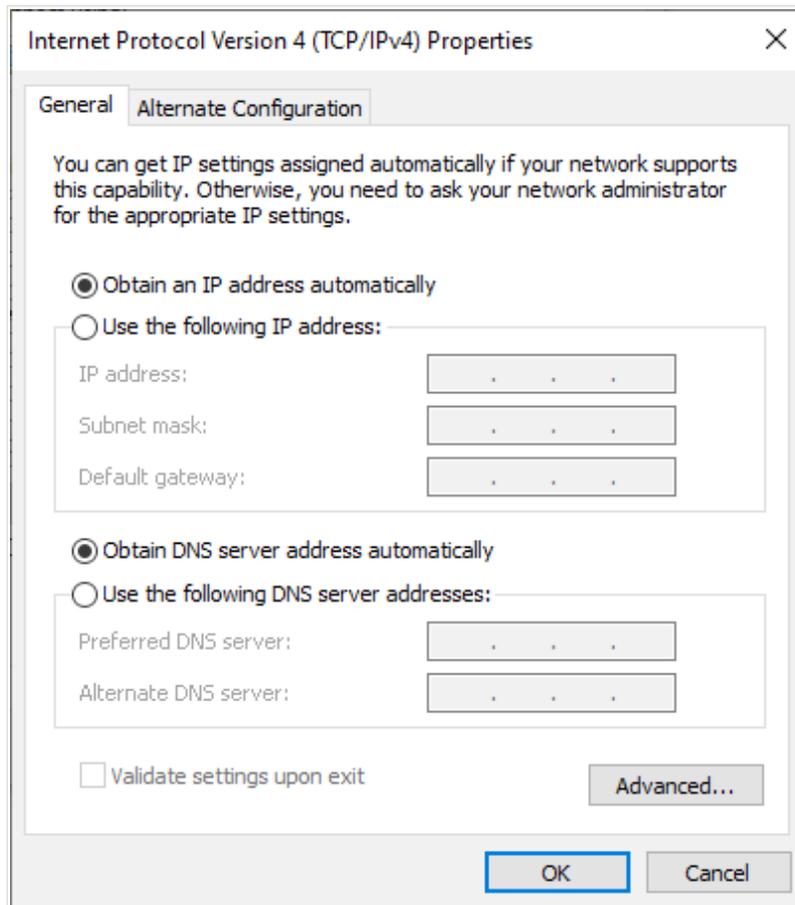


Figure 18. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

7. Click the **Close** 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 19. The notification area of the taskbar.

- In the opened **Wireless Network Connection** window, select the wireless network **DIR-820** (for operating in the 2.4GHz band) or **DIR-820-5G** (for operating in the 5GHz band) and click the **Connect** button.

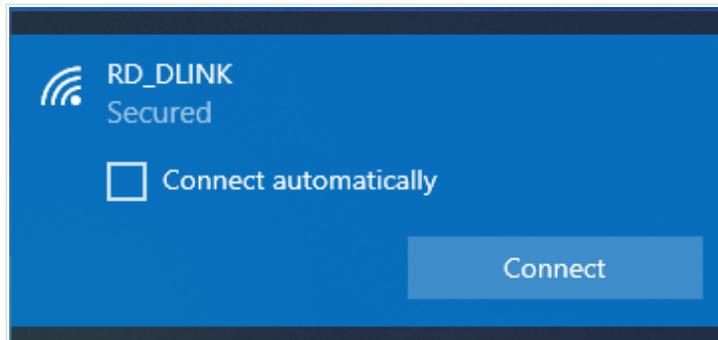


Figure 20. The list of available networks.

- 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 **Next** button.
- Allow or forbid your PC to be discoverable by other devices on this network (**Yes / No**).

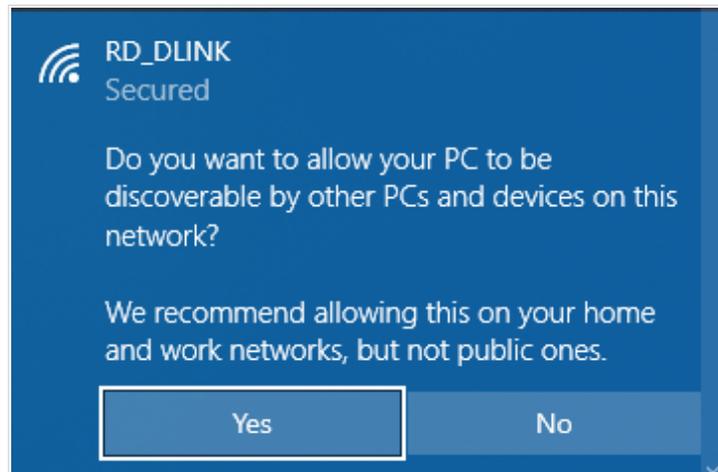


Figure 21. PC discovery settings.

- Wait for about 20-30 seconds. After the connection is established, the network icon will be displayed as a dot with curved lines indicating the signal level.

**!** If you perform initial configuration of the router via Wi-Fi connection, note that immediately after changing the wireless default settings of the router 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 (create a WAN connection, change the parameters of the wireless network, specify the settings of the firewall, etc.).

**!** For security reasons, DIR-820 with default settings cannot connect to the Internet. To get started, please set your own password used to access the web-based interface and, if needed, configure other settings recommended by your ISP.

Start a web browser (see the **Before You Begin** section, page 17). In the address bar of the web browser, enter the domain name of the router (by default, **dlinkrouter.local**) with a dot at the end and press the **Enter** key. Also you can enter the IP address of the device (by default, **192.168.0.1**).



Figure 22. Connecting to the web-based interface of the DIR-820 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 router, make sure that you have properly connected the router 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 40).

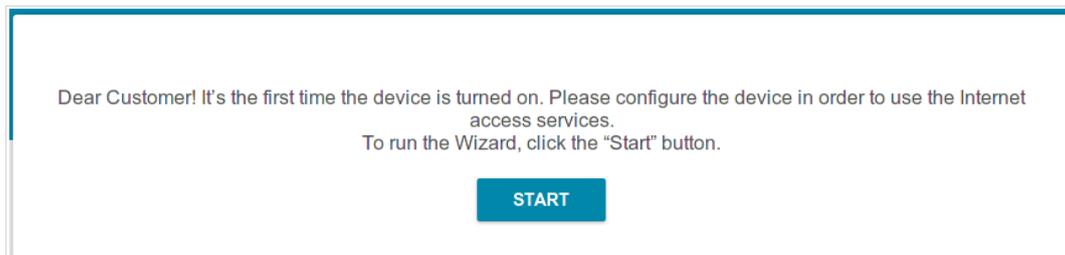


Figure 23. The page for running the Initial Configuration Wizard.

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.

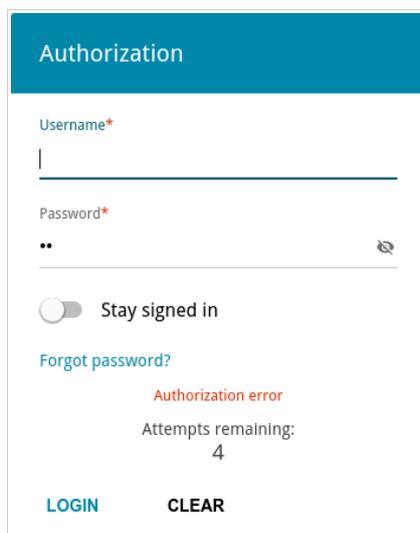


Figure 24. The login page.

In order not to log out, move the **Stay signed in** switch to the right. After closing the web browser or rebooting the device, you need to enter the username and the password again.

If you enter a wrong password several times, the web-based interface will be blocked for a while. Please wait for one minute and reenter the password you specified.

## Web-based Interface Structure

### Summary Page

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

The screenshot displays the 'Summary' page of the web-based interface. The page is organized into several sections:

- Device Information:** Model: DIR-820, Hardware version: A1, Firmware version: 4.0.0, Build time: Tue Aug 3 2021 7:23:12 PM MSK, UI version: 1.26.0.38979ff-embedded, Vendor: D-Link Russia, Serial number: 1234567890123, Support: support@dlink.ru, Summary: Root filesystem image for DIR\_820A\_MT7628, Uptime: 3 min., Device mode: Router.
- Wi-Fi 5 GHz:** Status: On, Broadcasting: On, Additional networks: 0, Network name (SSID): DIR-820-5G-0250, Security: WPA2-PSK.
- WAN IPv4:** Connection type: Dynamic IPv4, Status: Connected, IP address: 192.168.161.220.
- Wi-Fi 2.4 GHz:** Status: On, Broadcasting: On, Additional networks: 0, Network name (SSID): DIR-820-0250, Security: WPA2-PSK.
- LAN:** LAN IPv4: 192.168.0.1, MAC address: 8c:88:2b:02:02:51, Wireless connections: -, Wired connections: -.
- LAN Ports:** LAN3: Off, LAN2: 100M-Full, LAN1: Off.

Figure 25. The summary page.

The **Device Information** section displays the model and hardware version of the router, 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.

To change the operation mode of the device, left-click the name of the mode in the **Device mode** line. In the opened window, click the **Initial Configuration Wizard** link (for the detailed description of the Wizard, see the *Initial Configuration Wizard* section, page 40).

The **Wi-Fi 2.4 GHz** and **Wi-Fi 5 GHz** sections display data on the state of the device's wireless network, its name and the authentication type, and availability of an additional wireless network in the relevant band.

In the **WAN** section, data on the type and status of the existing WAN connection are displayed.

In the **LAN** section, the IPv4 and IPv6 address of the router, the LAN MAC address, 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 ports and data transfer mode of active ports.

## Home Page

The **Home** page displays links to the most frequently used pages with device's settings.

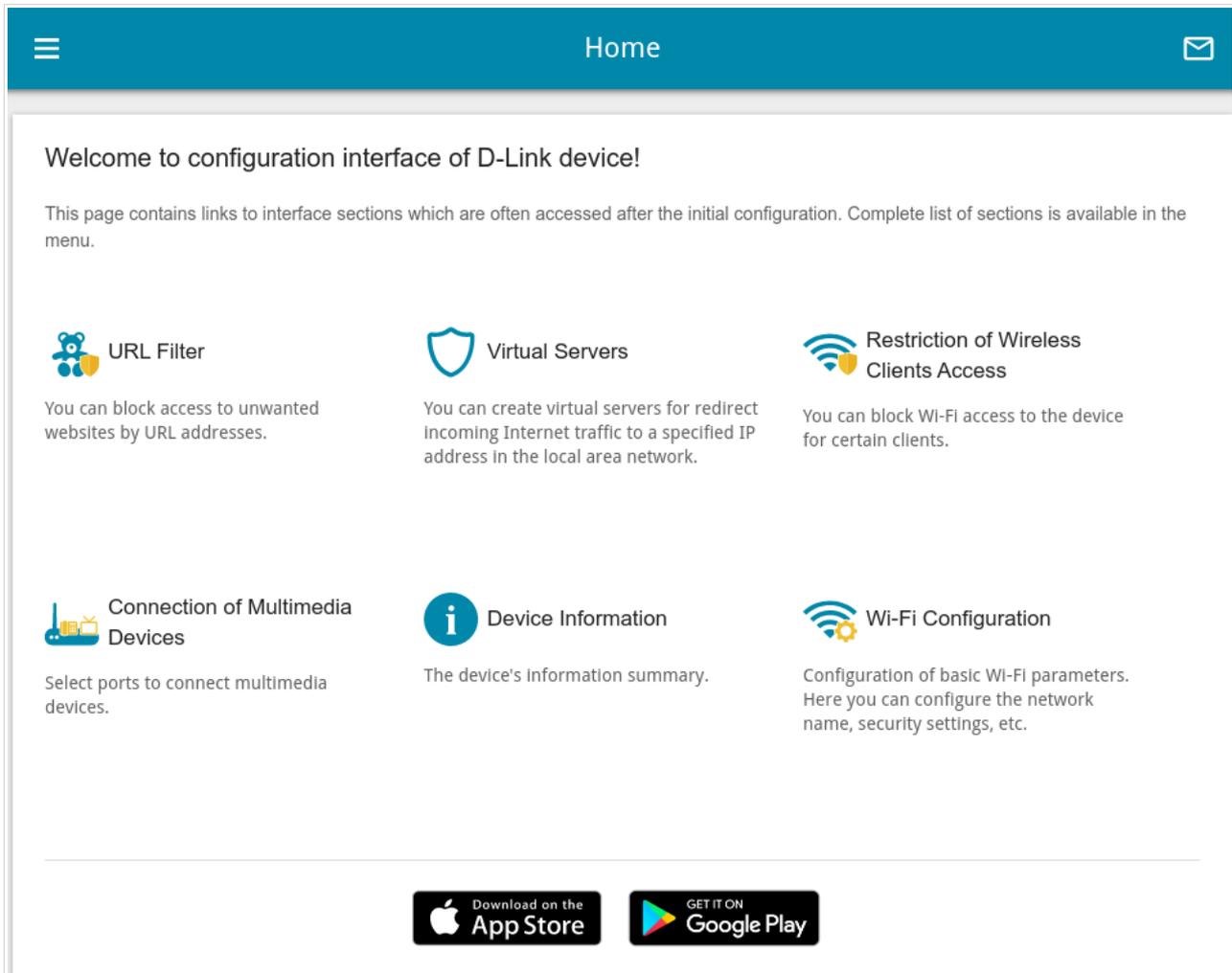


Figure 26. The **Home** page.

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

## Menu Sections

To configure the router 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 router 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 40).

The pages of the **Statistics** section display data on the current state of the router (for the description of the pages, see the *Statistics* section, page 66).

The pages of the **Connections Setup** section are designed for configuring basic parameters of the LAN interface of the router and creating a connection to the Internet (for the description of the pages, see the *Connections Setup* section, page 72).

The pages of the **Wi-Fi** section are designed for specifying all needed settings of the router's wireless network (for the description of the pages, see the *Wi-Fi* section, page 107).

The pages of the **Advanced** section are designed for configuring additional parameters of the router (for the description of the pages, see the *Advanced* section, page 135).

The pages of the **Firewall** section are designed for configuring the firewall of the router (for the description of the pages, see the *Firewall* section, page 162).

The pages of the **System** section provide functions for managing the internal system of the router (for the description of the pages, see the *System* section, page 180).

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

## Notifications

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



*Figure 27. 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.

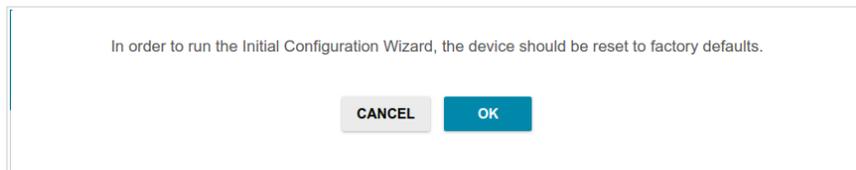


Figure 28. Restoring the default settings in the Wizard.

If you perform initial configuration of the router via Wi-Fi connection, please make sure that you are connected to the wireless network **DIR-820** (for operating in the 2.4GHz band) or **DIR-820-5G** (for operating in the 5GHz band) and click the **NEXT** button.

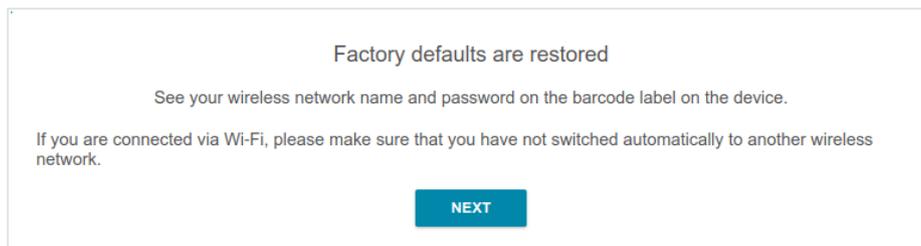


Figure 29. Checking connection to the wireless network.

Click the **START** button.

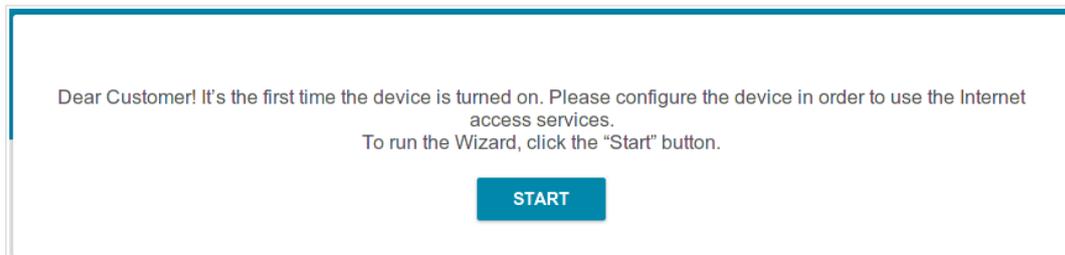


Figure 30. Starting the Wizard.

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

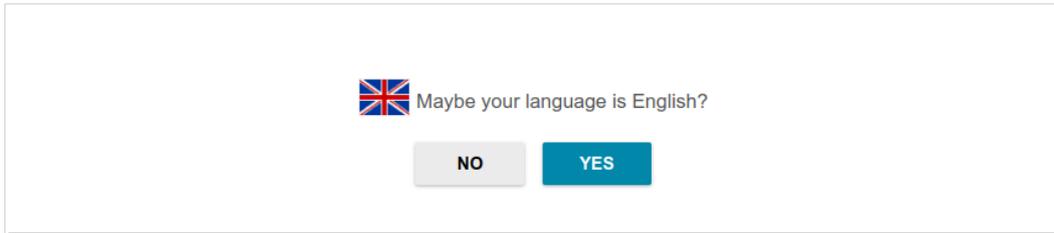


Figure 31. Selecting a language.

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 **User's interface password** and **Password confirmation** and the name of the wireless network in the 2.4GHz and 5GHz bands in the **Network name 2.4 GHz (SSID)** and **Network name 5 GHz (SSID)** fields correspondingly. Then click the **APPLY** button.

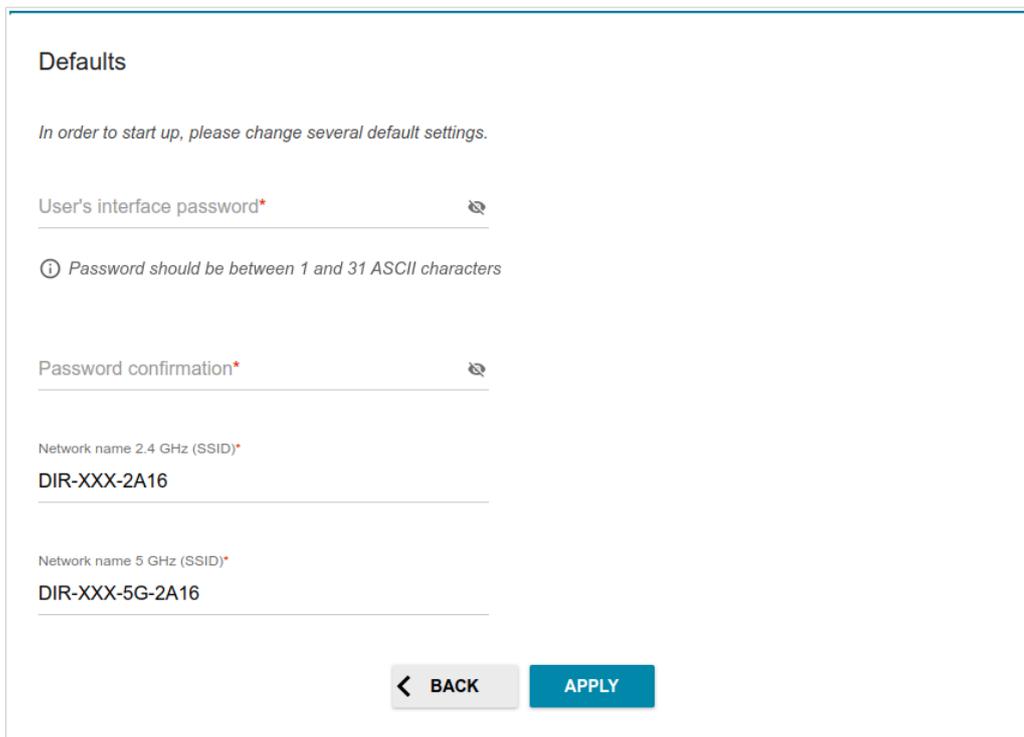


Figure 32. Changing the default settings.

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

## Selecting Operation Mode

Select the needed operation mode and click the **NEXT** button.

### Router

In order to connect your device to a wired ISP, on the **Device mode** page, from the **Connection method** list, select the **Wired connection** value. Then from the **Work mode** list select the **Router** value. In this mode you can configure a WAN connection, set your own settings for the wireless network in the 2.4GHz and 5GHz bands, configure LAN ports to connect an STB or VoIP phone, and set your own password for access to the web-based interface of the device.

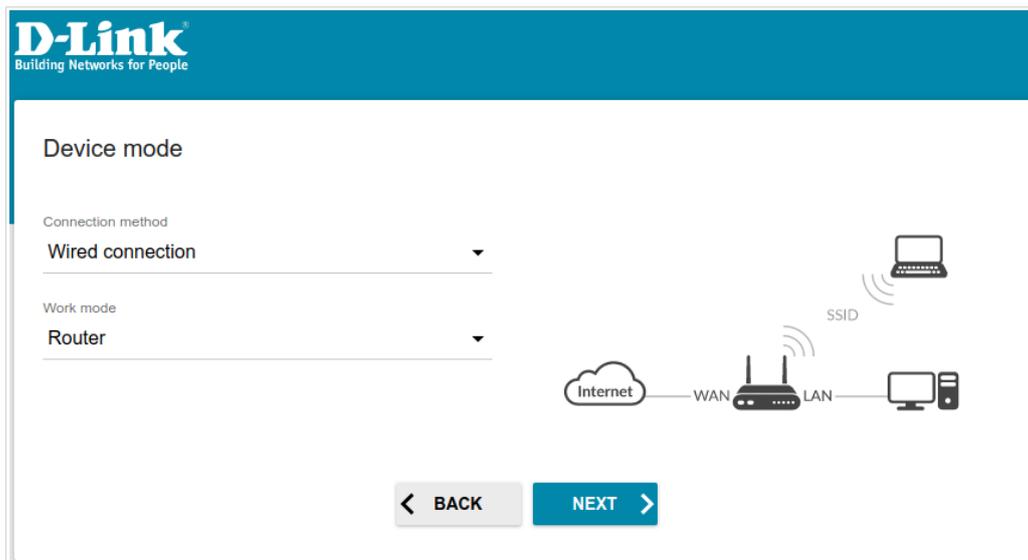


Figure 33. Selecting an operation mode. The **Router** mode.

In order to connect your device to a wireless ISP (WISP), on the **Device mode** page, from the **Connection method** list, select the **Wi-Fi** value. Then from the **Work mode** list select the **WISP Repeater** value. In this mode you can connect your device to another access point, configure a WAN connection, set your own settings for the wireless network in the 2.4GHz and 5GHz bands, and set your own password for access to the web-based interface of the device.

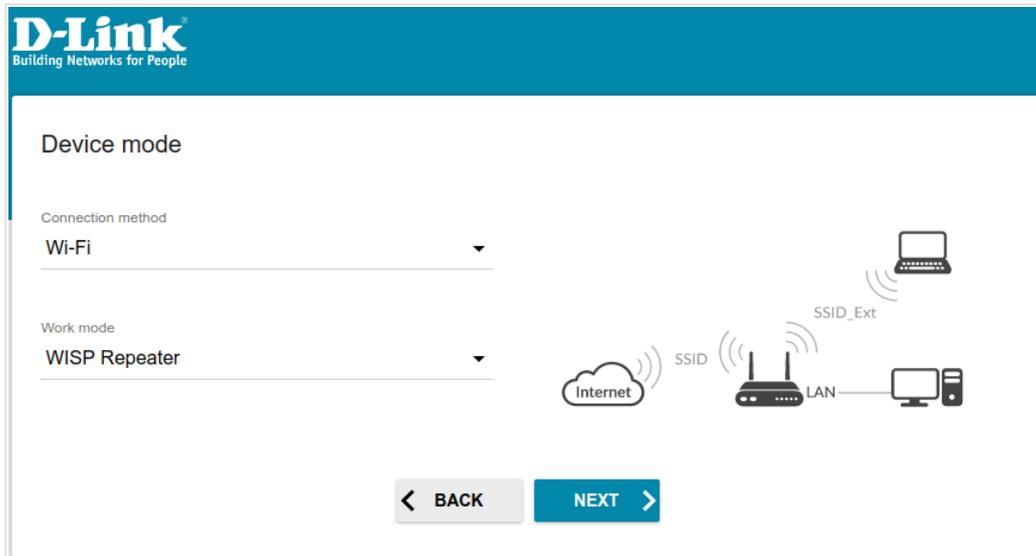


Figure 34. Selecting an operation mode. The **WISP Repeater** mode.

## Access Point or Repeater

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. Then from the **Work mode** list select the **Access point** value. In this mode you can change the LAN IP address, set your own settings for the wireless network in the 2.4GHz and 5GHz bands, and set your own password for access to the web-based interface of the device.

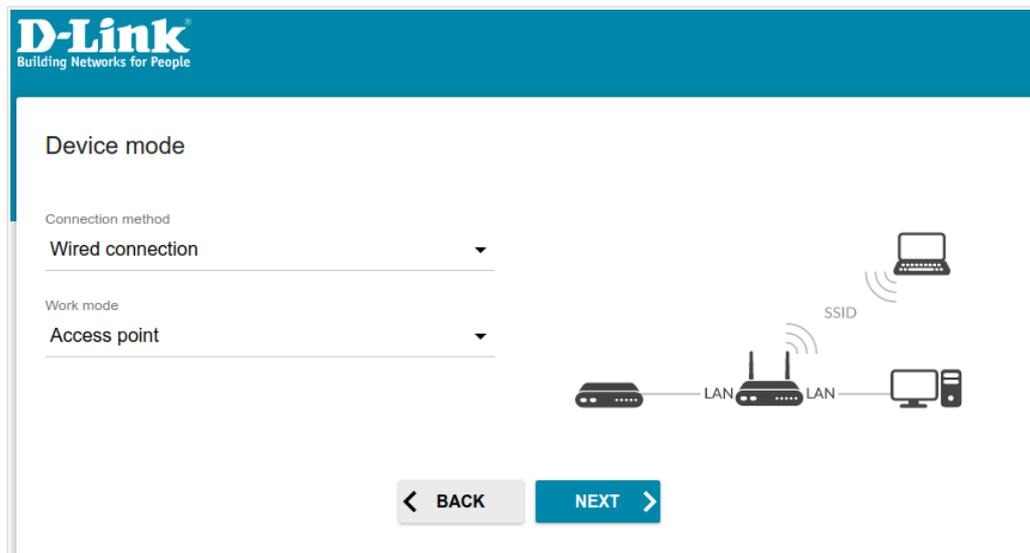


Figure 35. Selecting an operation mode. The **Access point** mode.

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 in the 2.4GHz and 5GHz bands, and set your own password for access to the web-based interface of the device.

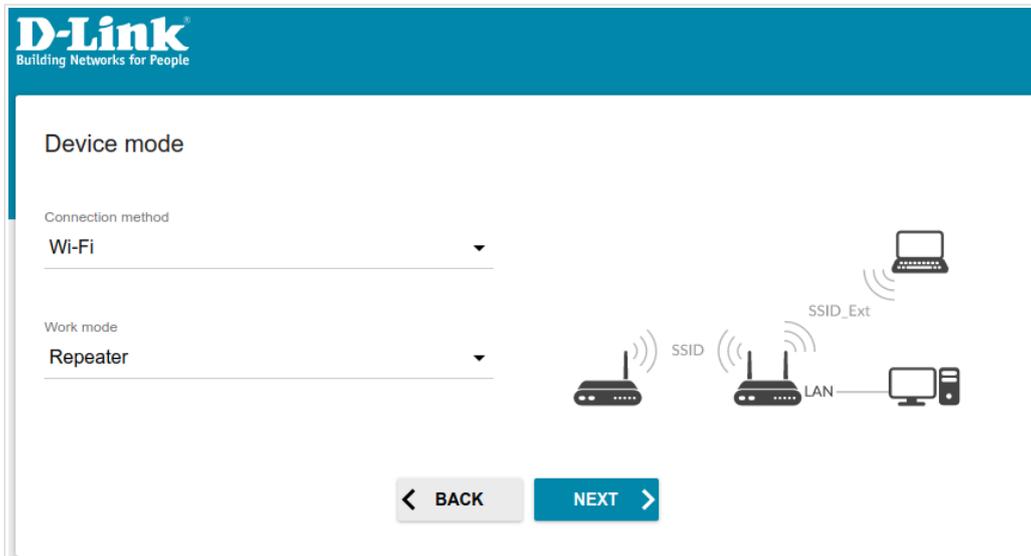


Figure 36. Selecting an operation mode. The **Repeater** mode.

In order to let wired PCs 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.

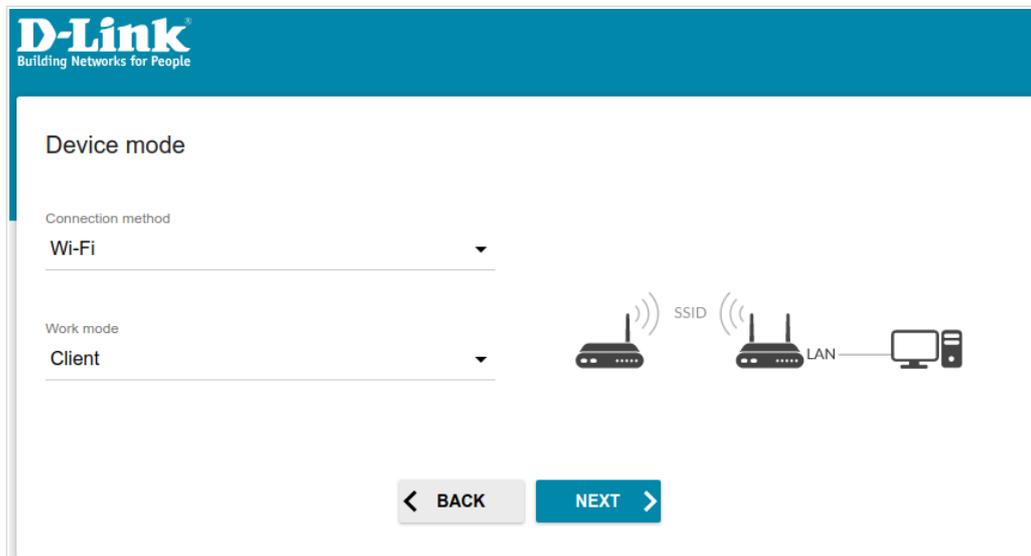


Figure 37. Selecting an operation mode. The **Client** mode.

## Changing LAN IPv4 Address

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

1. Select the **Automatic obtainment of IPv4 address** to let DIR-820 automatically obtain the LAN IPv4 address.
2. In the **Hostname** field, you should specify a domain name of the router using which you can access the web-based interface after finishing the Wizard. Enter a new domain name of the router ending with **.local** or leave the value suggested by the router.

**!** In order to access the web-based interface using the domain name, in the address bar of the web browser, enter the name of the router with a dot at the end.

If you want to manually assign the LAN IPv4 address for DIR-820, do not select the **Automatic obtainment of IPv4 address** checkbox and fill in the **IP address**, **Subnet mask**, **DNS IP address**, **Hostname** fields and, if needed, the **Gateway IP address** field. Make sure that the assigned address does not coincide with the LAN IPv4 address of the router to which your device connects.

LAN

Automatic obtainment of IPv4 address

**!** Automatic obtainment of IPv4 address sufficiently protects against use of the same addresses in one LAN. In order to avoid IPv4 address conflicts, static IPv4 addresses of LAN devices should not coincide with addresses from the address range assigned by an upper-level router (or a local DHCP server).

IP address\*

192.168.0.1

Subnet mask\*

255.255.255.0

Gateway IP address

DNS IP address\*

8.8.8.8

Hostname\*

dlinkap799b.local

**i** Specify a domain name ending with .local. In order to access the web-based interface using the domain name, enter this name with a dot and slash at the end in the address bar of the web browser (for example, dlinkap12ab.local./)

**< BACK** **NEXT >**

Figure 38. The page for changing the LAN IPv4 address.

3. 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 **WISP Repeater**, **Repeater**, and **Client** modes.

1. On the **Wi-Fi Client** page, click the **WIRELESS NETWORKS** button and select the network to which you want to connect in the opened window. 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** icon (  ).

2. If a password is needed to connect to the selected network, fill in the relevant field. Click the **Show** icon (  ) to display the entered password.

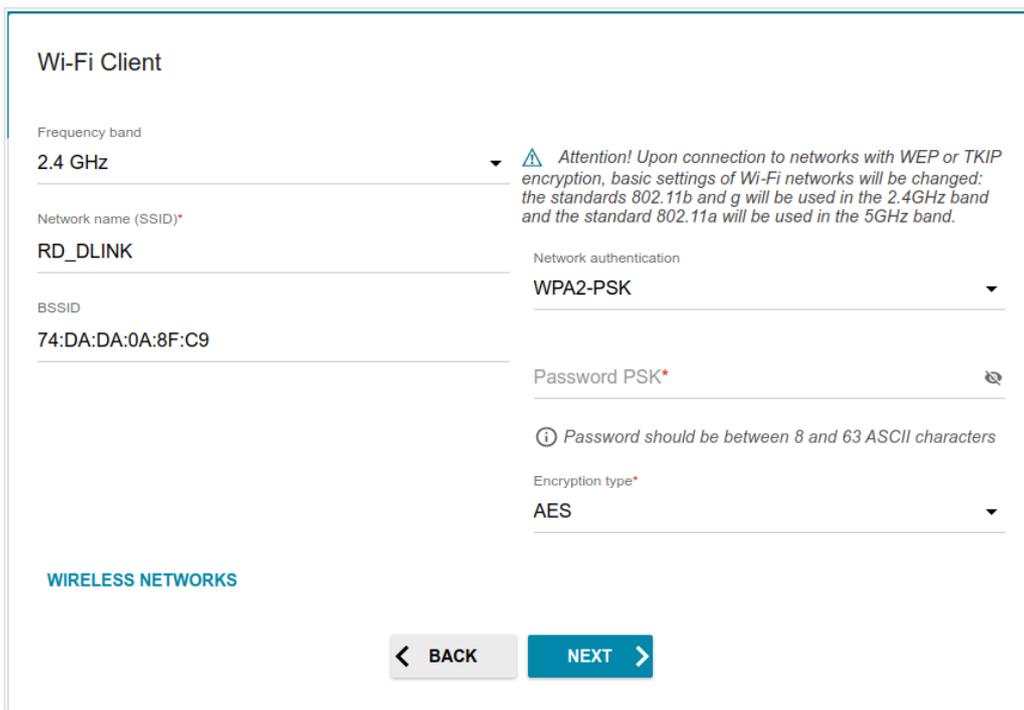


Figure 39. The page for configuring the Wi-Fi client.

If you connect to a hidden network, select the band where the hidden network operates from the **Frequency band** list and enter the network name in 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.

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

| Parameter                    | Description  |
|------------------------------|--|
| <b>Enable encryption WEP</b> | <i>For <b>Open</b> authentication type only.</i><br>The checkbox activating WEP encryption. When the checkbox is selected, the <b>Default key ID</b> drop-down list, the <b>Encryption key WEP as HEX</b> checkbox, and four <b>Encryption key</b> fields are displayed on the page. |
| <b>Default key ID</b>        | The number of the key (from first to fourth) which will be used for WEP encryption.  |

| Parameter                        | Description   |
|----------------------------------|---|
| <b>Encryption key WEP as HEX</b> | Select the checkbox to set a hexadecimal number as a key for encryption.  |
| <b>Encryption key (1-4)</b>      | Keys for WEP encryption. The router uses the key selected from the <b>Default key ID</b> drop-down list. It is required to specify all the fields. Click the <b>Show</b> icon (🔍) to display the entered key. |

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

| Parameter              | Description  |
|------------------------|--|
| <b>Password PSK</b>    | A password for WPA encryption. Click the <b>Show</b> icon (🔍) to display the entered password. |
| <b>Encryption type</b> | An encryption method: <b>TKIP</b> , <b>AES</b> , or <b>TKIP+AES</b> .                          |

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

## Configuring WAN Connection

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

 You should configure your WAN connection in accordance with data provided by your Internet service provider (ISP). Make sure that you have obtained all necessary information prior to configuring your connection. Otherwise contact your ISP.

1. On the **Internet connection type** page, click the **SCAN** button (available for the **Router** mode only) to automatically specify the connection type used by your ISP or manually select the needed value from the **Connection type** list.
2. Specify the settings necessary for the connection of the selected type.
3. If your ISP uses MAC address binding, select the **Clone MAC address of your device** checkbox (available for the **Router** mode only).
4. If the Internet access is provided via a VLAN channel, select the **Use VLAN** checkbox and fill in the **VLAN ID** field (available for the **Router** mode only).
5. Click the **NEXT** button to continue or click the **BACK** button to return to the previous page.

## Static IPv4 Connection

### Internet connection type

Connection type  
Static IPv4

*i* A connection of this type allows you to use a fixed IP address provided by your ISP.

**SCAN** Network scan for connection type and parameters detection

IP address\*

Subnet mask\*

Gateway IP address\*

DNS IP address\*

Clone MAC address of your device  
*i* In some ISP's networks, it is required to register a certain MAC address in order to get access to the Internet.

Use VLAN  
*i* Select the checkbox if the Internet access is provided via a VLAN channel.

Use IGMP  
*i* Internet Group Management Protocol is designed to manage multicast traffic in IP-based networks.

Ping

**< BACK**   **NEXT >**

Figure 40. The page for configuring Static IPv4 WAN connection.

Fill in the following fields: **IP address**, **Subnet mask**, **Gateway IP address**, and **DNS IP address**.

## Static IPv6 Connection

The screenshot shows a configuration page titled "Internet connection type". At the top, there is a dropdown menu labeled "Connection type" with "Static IPv6" selected. Below this is an information icon and a note: "A connection of this type allows you to use a fixed IP address provided by your ISP." A "SCAN" button is present with the text "Network scan for connection type and parameters detection". There are four input fields: "IP address\*", "Prefix\*", "Gateway IP address\*", and "DNS IP address\*", each with a red asterisk indicating it is required. Below these fields are four checkboxes: "Clone MAC address of your device", "Use VLAN", and "Ping", each with an information icon and a note. The "Clone MAC address of your device" note says "In some ISP's networks, it is required to register a certain MAC address in order to get access to the Internet." The "Use VLAN" note says "Select the checkbox if the Internet access is provided via a VLAN channel." At the bottom of the form are two buttons: "BACK" and "NEXT".

Figure 41. The page for configuring Static IPv6 WAN connection.

Fill in the following fields: **IP address**, **Prefix**, **Gateway IP address**, and **DNS IP address**.

## PPPoE, IPv6 PPPoE, PPPoE Dual Stack, PPPoE + Dynamic IP (PPPoE Dual Access) Connections

The screenshot shows a web interface for configuring an Internet connection. The title is "Internet connection type". Below the title is a dropdown menu labeled "Connection type" with "PPPoE" selected. An information icon (i) is followed by the text "A connection of this type requires a user name and password." Below this is a "SCAN" button with the text "Network scan for connection type and parameters detection". There is a checkbox labeled "Without authorization". Below that is a text input field for "Username\*" and a text input field for "Password\*" with a "Show" icon (eye) to its right. Below the password field is a text input field for "Service name". There are three more checkboxes: "Clone MAC address of your device", "Use VLAN", and "Ping". Each checkbox has an information icon (i) and explanatory text. The "Clone MAC address" checkbox has the text "In some ISP's networks, it is required to register a certain MAC address in order to get access to the Internet." The "Use VLAN" checkbox has the text "Select the checkbox if the Internet access is provided via a VLAN channel." At the bottom of the form are two buttons: "BACK" and "NEXT".

Figure 42. The page for configuring PPPoE WAN connection.

In the **Username** field enter the login and in the **Password** field enter the password provided by your ISP. Click the **Show** icon (👁) to display the entered password. If authorization is not required, select the **Without authorization** checkbox.

## PPPoE + Static IP (PPPoE Dual Access) Connection

The screenshot shows a web-based configuration interface for a WAN connection. The title is "Internet connection type". Below it, a dropdown menu is set to "PPPoE + Static IP (PPPoE Dual Access)". An information icon (i) is followed by the text: "A connection of this type requires a user name, password, and a fixed IP address provided by your ISP." There is a "SCAN" button with the text "Network scan for connection type and parameters detection" next to it. Below that is a checkbox labeled "Without authorization". The form contains several input fields: "Username\*", "Password\*" (with a show/hide icon), "Service name", "IP address\*", "Subnet mask\*", "Gateway IP address\*", and "DNS IP address\*".

Figure 43. The page for configuring PPPoE + Static IP (PPPoE Dual Access) WAN connection.

In the **Username** field enter the login and in the **Password** field enter the password provided by your ISP. Click the **Show** icon (👁) to display the entered password. If authorization is not required, select the **Without authorization** checkbox.

Also fill in the following fields: **IP address**, **Subnet mask**, **Gateway IP address**, and **DNS IP address**.

## PPTP + Dynamic IP or L2TP + Dynamic IP Connection

The screenshot shows a configuration page titled "Internet connection type". At the top, there is a dropdown menu labeled "Connection type" with "PPTP + Dynamic IP" selected. Below this is an information icon and the text "PPTP and L2TP are methods for implementing virtual private networks." A "SCAN" button is present, with the text "Network scan for connection type and parameters detection" next to it. There is a checkbox labeled "Without authorization". Below that are three input fields: "Username\*", "Password\*" (with a show/hide icon), and "VPN server address\*". Further down are three checkboxes: "Clone MAC address of your device" (with an information icon and text "In some ISP's networks, it is required to register a certain MAC address in order to get access to the Internet."), "Use VLAN" (with an information icon and text "Select the checkbox if the Internet access is provided via a VLAN channel."), and "Use IGMP" (checked, with an information icon and text "Internet Group Management Protocol is designed to manage multicast traffic in IP-based networks."). At the bottom is a "Ping" checkbox. At the very bottom are two buttons: "BACK" and "NEXT".

Figure 44. The page for configuring PPTP + Dynamic IP WAN connection.

In the **Username** field enter the login and in the **Password** field enter the password provided by your ISP. Click the **Show** icon (👁) to display the entered password. If authorization is not required, select the **Without authorization** checkbox.

In the **VPN server address** field, enter the IP or URL address of the PPTP or L2TP authentication server.

## PPTP + Static IP or L2TP + Static IP Connection

The screenshot shows a web interface for configuring a WAN connection. The title is "Internet connection type". Below it, a dropdown menu is set to "PPTP + Static IP". A help icon and text state: "PPTP and L2TP are methods for implementing virtual private networks." There is a "SCAN" button with the text "Network scan for connection type and parameters detection". Below that is a checkbox labeled "Without authorization". The form contains several input fields, each with a red asterisk indicating it is required: "Username\*", "Password\*" (with a show/hide icon), "VPN server address\*", "IP address\*", "Subnet mask\*", "Gateway IP address\*", and "DNS IP address\*".

Figure 45. The page for configuring PPTP + Static IP WAN connection.

In the **Username** field enter the login and in the **Password** field enter the password provided by your ISP. Click the **Show** icon (👁) to display the entered password. If authorization is not required, select the **Without authorization** checkbox.

In the **VPN server address** field, enter the IP or URL address of the PPTP or L2TP authentication server.

Also fill in the following fields: **IP address**, **Subnet mask**, **Gateway IP address**, and **DNS IP address**.

## Configuring Wireless Network

This configuration step is available for the **Router**, **Access point**, **WISP Repeater**, 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 in the 2.4GHz band or leave the value suggested by the router.
2. In the **Password** field, specify your own password for access to the wireless network or leave the value suggested by the router (WPS PIN of the device, see the barcode label).
3. If the router is used as a Wi-Fi client, you can specify the same parameters of the wireless network as specified for the network to which you are connecting. To do this, click the **USE** button (available for the **WISP Repeater** and **Repeater** modes only).
4. 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\*

my wi-fi

Open network

Password\*

.....

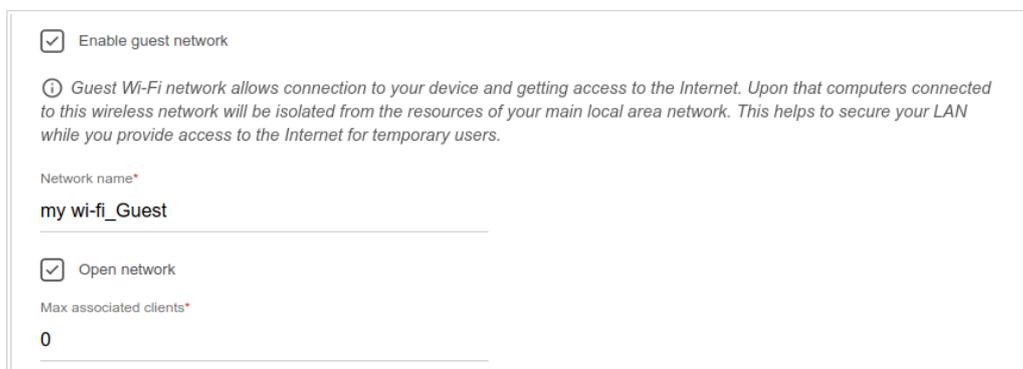
*Password should be between 8 and 63 ASCII characters*

**USE** Use the same parameters as on the root access point.

**RESTORE** You can restore network name and security that was set before applying factory settings.

Figure 46. The page for configuring the wireless network.

5. If you want to create an additional wireless network isolated from your LAN in the 2.4GHz band, select the **Enable guest network** checkbox (available for the **Router** and **WISP Repeater** modes only).



Enable guest network

Guest Wi-Fi network allows connection to your device and getting access to the Internet. Upon that computers connected to this wireless network will be isolated from the resources of your main local area network. This helps to secure your LAN while you provide access to the Internet for temporary users.

Network name\*

my wi-fi\_Guest

Open network

Max associated clients\*

0

Figure 47. The page for configuring the wireless network.

6. In the **Network name** field, specify your own name for the guest wireless network or leave the value suggested by the router.
7. If you want to create a password for access to the guest wireless network, deselect the **Open network** checkbox and fill in the **Password** field.
8. Click the **NEXT** button to continue or click the **BACK** button to specify other settings.
9. On the **Wireless Network 5 GHz** page, specify needed settings for the wireless network in the 5GHz band and click the **NEXT** button.

## Configuring LAN Ports for IPTV/VoIP

This configuration step is available for the **Router** mode.

1. On the **IPTV** page, select the **Is an STB connected to the device** checkbox.

The screenshot shows the D-Link web interface for IPTV configuration. The page has a blue header with the D-Link logo and tagline 'Building Networks for People'. The main content area is white and titled 'IPTV'. It contains the following elements:

- A checked checkbox labeled 'Is an STB connected to the device?'. Below it is an information icon and the text: 'If your ISP provides IPTV service, you can connect an STB directly to the router without additional equipment'.
- A checked checkbox labeled 'Use VLAN ID'.
- A text input field labeled 'VLAN ID\*'.
- Below the input field is an information icon and the text: 'Information about the VLAN ID can be found in the contract.'
- A diagram of the router's ports: LAN3 (with a TV icon), LAN2, LAN1, and WAN.
- At the bottom are 'BACK' and 'NEXT' buttons.

Figure 48. The page for selecting a LAN port to connect an IPTV set-top box.

2. Select a free LAN port for connecting your set-top box.
3. If the IPTV service is provided via a VLAN channel, select the **Use VLAN ID** checkbox and fill in the **VLAN ID** field.
4. Click the **NEXT** button to continue or click the **BACK** button to specify other settings.

5. On the **VoIP** page, select the **Is an IP phone connected to the device** checkbox.

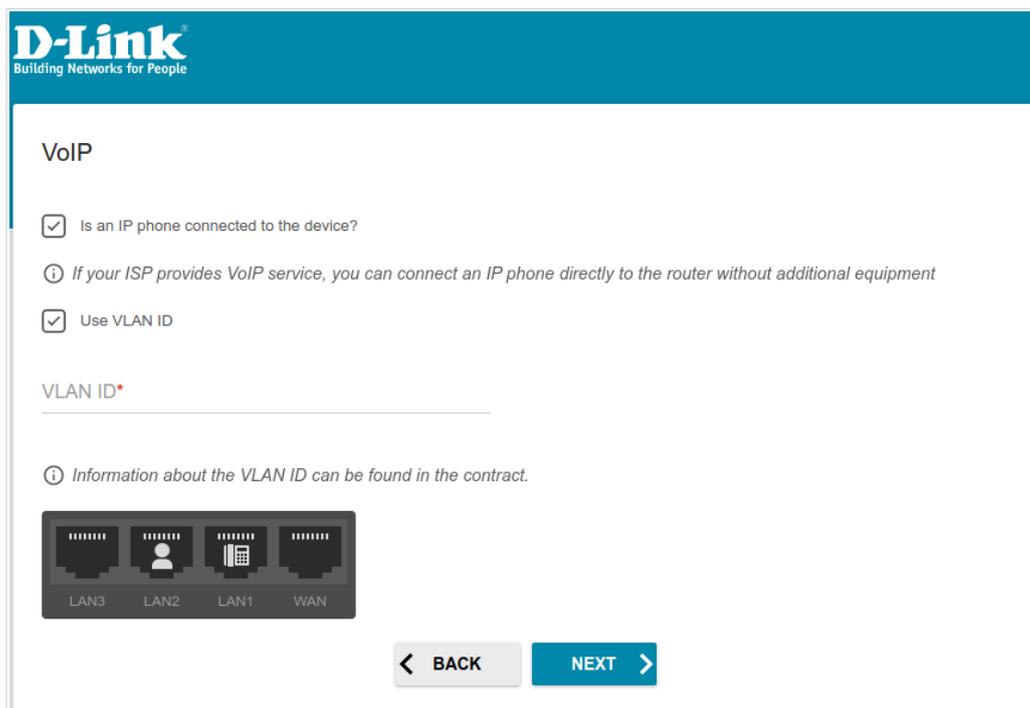


Figure 49. The page for selecting a LAN port to connect a VoIP phone.

6. Select a free LAN port for connecting your IP phone.
7. If the VoIP service is provided via a VLAN channel, select the **Use VLAN ID** checkbox and fill in the **VLAN ID** field.
8. 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. To do this, enter a new password in the **User's interface password** and **Password confirmation** fields. You may set any password except **admin**. Use digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout.<sup>2</sup>

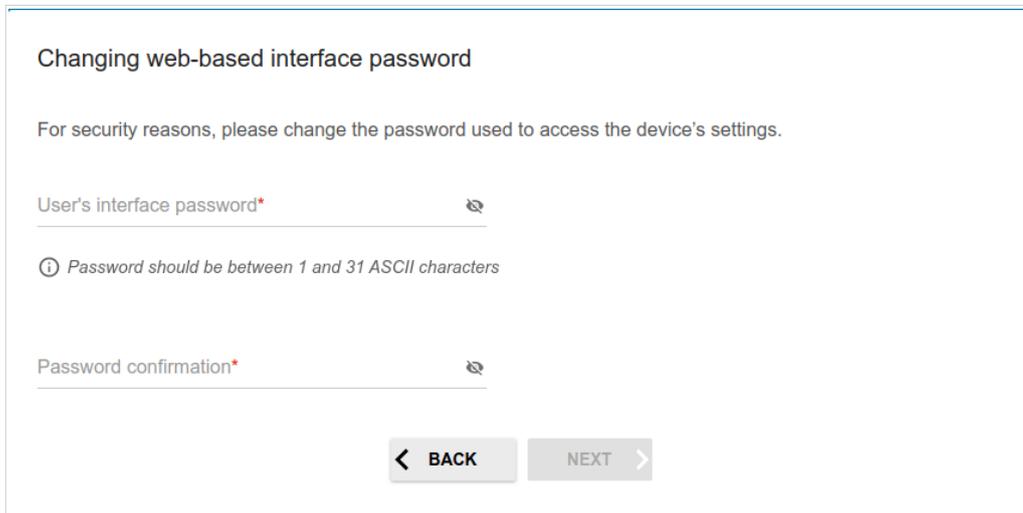


Figure 50. The page for changing the web-based interface password.



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 router only after restoring the factory default settings via the hardware **WPS/RST** button. This procedure wipes out all settings that you have configured for your router.

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

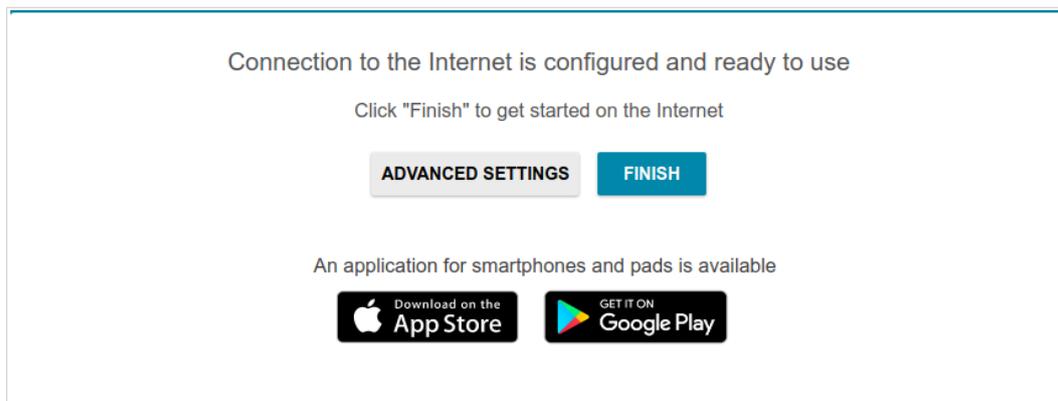
On the next page, check all specified settings.

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 router will apply settings and reboot. Click the **BACK** button to specify other settings.

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

If the Wizard has configured a WAN connection, after clicking the **APPLY** button, the page for checking the Internet availability opens.



*Figure 51. Checking the Internet availability.*

If the router has been successfully connected to the Internet, click the **FINISH** button.

If problems appeared when connecting to the Internet, click the **CHECK AGAIN** button to recheck the state of the WAN connection.

If problems of connection have not been solved, contact the technical support of your ISP (as a rule, the technical support phone is provided with the agreement) or the D-Link technical support (the phone number will be displayed on the page after several attempts of checking the connection).

To specify other settings, click the **ADVANCED SETTINGS** button. After clicking the **ADVANCED SETTINGS** button, the **Home** page opens (see the *Home Page* section, page 37).

## Connection of Multimedia Devices

The Multimedia Devices Connection Wizard helps to configure LAN ports of the router for connecting additional devices, for example, an IPTV set-top box or IP phone. Contact your ISP to clarify if you need to configure DIR-820 in order to use these devices.

To start the Wizard, on the **Home** page, select the **Connection of Multimedia Devices** section. If you need to select a port in order to use an additional device, left-click the relevant element in the **LAN** section (the selected element will be marked with a frame). Then click the **APPLY** button.

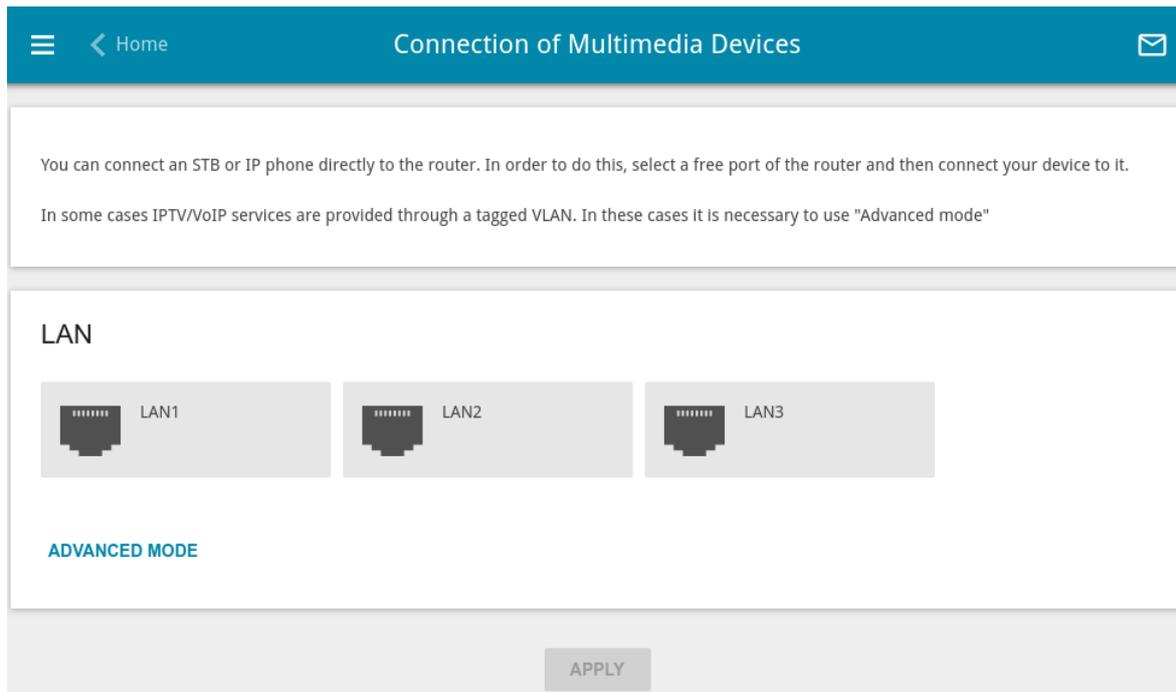


Figure 52. The Multimedia Devices Connection Wizard. The simplified mode.

If you need to configure a connection via VLAN, click the **ADVANCED MODE** button.

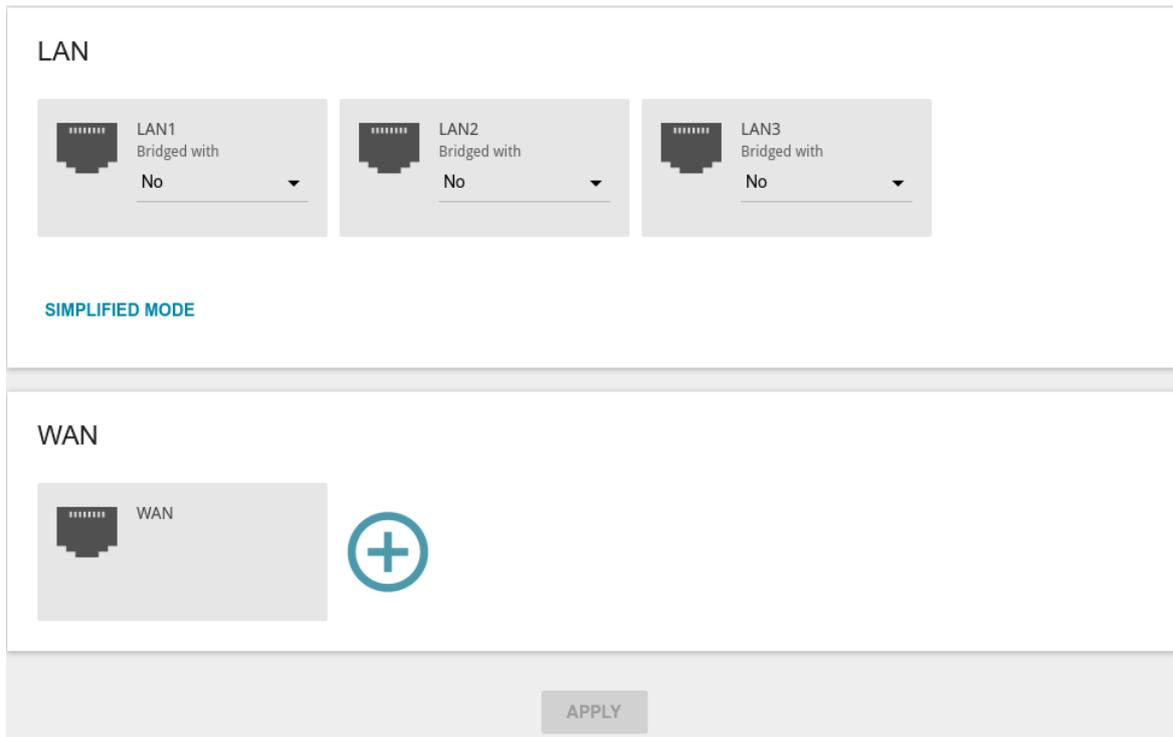


Figure 53. The Multimedia Devices Connection Wizard. The advanced mode.

In the **WAN** section, click the **Add** icon (  ).

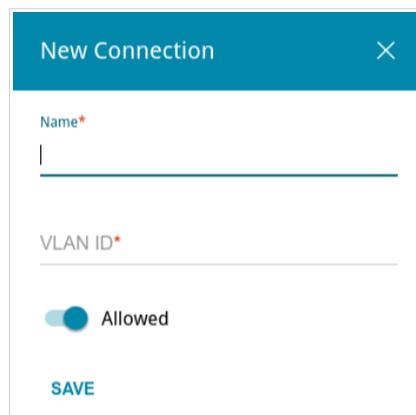


Figure 54. Adding a connection.

In the opened window, specify a name of the connection for easier identification in the **Name** field (you can specify any name). Specify the VLAN ID provided by your ISP and click the **SAVE** button.

Then in the **LAN** section, from the **Bridged with** drop-down list of the element corresponding to the LAN port to which the additional device is connected, select the created connection. Click the **APPLY** button.

 The selected port cannot use the default connection to access the Internet.

To deselect the port in the simplified mode, left-click the selected element (the frame will disappear) and click the **APPLY** button.

To deselect the port in the advanced mode, select the **No** value from the **Bridged with** drop-down list of the element corresponding to the needed LAN port. Then in the **WAN** section, select the connection via VLAN which will not be used any longer and click the **DELETE** button. Then click the **APPLY** button.

## Statistics

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

- network statistics
- IP addresses leased by the DHCP server
- the routing rules and routing tables
- data on devices connected to the router's network and its web-based interface, and information on current sessions of these device
- addresses of active multicast groups.

## Network Statistics

On the **Statistics / Network Statistics** page, you can view statistics for all connections existing in the system (WAN connections, LAN, WLAN). 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, and volume of data received and transmitted (with increase of the volume the units of measurement are changed automatically: byte, Kbyte, Mbyte, Gbyte).

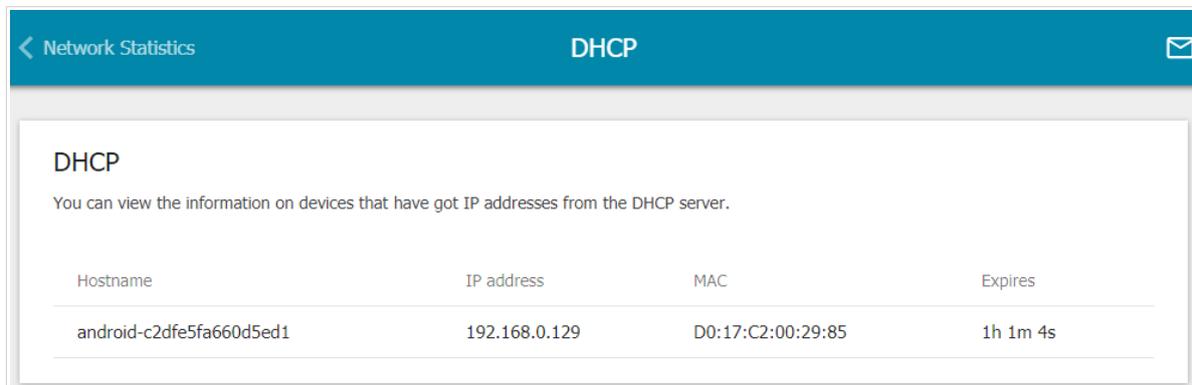
| Name            | IP - Gateway                             | Rx/Tx                     | Rx/Tx errors | Duration |
|-----------------|--|---------------------------|--------------|----------|
| LAN             | IPv4: 192.168.0.1/24 - 192.168.0.1       | 846.40 Kbyte / 6.99 Mbyte | 0 / 0        | -        |
| WAN             | IPv4: 192.168.161.235/24 - 192.168.161.1 | 416.24 Kbyte / 5.01 Kbyte | 0 / 0        | 16 min   |
| DIR-XXX-615F    | -  | - / -                     | 0 / 0        | -        |
| DIR-XXX-5G-615F | -  | - / -                     | 0 / 0        | -        |

Figure 55. The **Statistics / Network Statistics** page.

To view detailed 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.

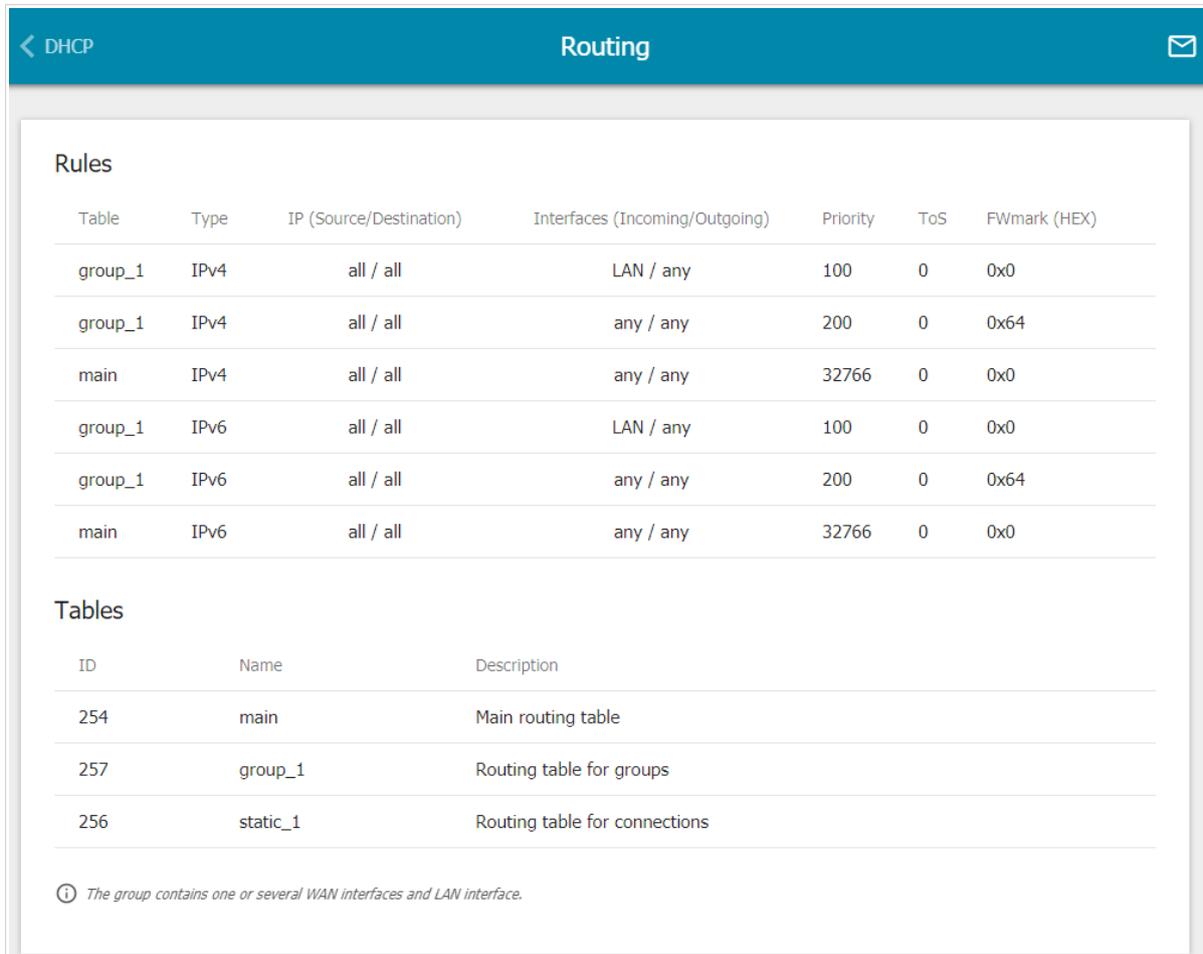


| Hostname                 | IP address    | MAC               | Expires  |
|--------------------------|---------------|-------------------|----------|
| android-c2dfe5fa660d5ed1 | 192.168.0.129 | D0:17:C2:00:29:85 | 1h 1m 4s |

Figure 56. The **Statistics / DHCP** page.

## Routing

The **Statistics / Routing** page displays the routing rules and routing tables.



**Rules**

| Table   | Type | IP (Source/Destination) | Interfaces (Incoming/Outgoing) | Priority | ToS | FWmark (HEX) |
|---------|------|-------------------------|--------------------------------|----------|-----|--------------|
| group_1 | IPv4 | all / all               | LAN / any                      | 100      | 0   | 0x0          |
| group_1 | IPv4 | all / all               | any / any                      | 200      | 0   | 0x64         |
| main    | IPv4 | all / all               | any / any                      | 32766    | 0   | 0x0          |
| group_1 | IPv6 | all / all               | LAN / any                      | 100      | 0   | 0x0          |
| group_1 | IPv6 | all / all               | any / any                      | 200      | 0   | 0x64         |
| main    | IPv6 | all / all               | any / any                      | 32766    | 0   | 0x0          |

**Tables**

| ID  | Name     | Description                   |
|-----|----------|-------------------------------|
| 254 | main     | Main routing table            |
| 257 | group_1  | Routing table for groups      |
| 256 | static_1 | Routing table for connections |

ⓘ The group contains one or several WAN interfaces and LAN interface.

Figure 57. The **Statistics / Routing** page.

The **Rules** section displays routing rules, their corresponding routing tables, incoming and outgoing interfaces, priority levels, and other data.

The **Tables** section displays the list of routing tables stored in the device's memory. To view detailed information on routes, left-click the relevant line in the table.

**Routing Table main**  
You can view the information on routes.

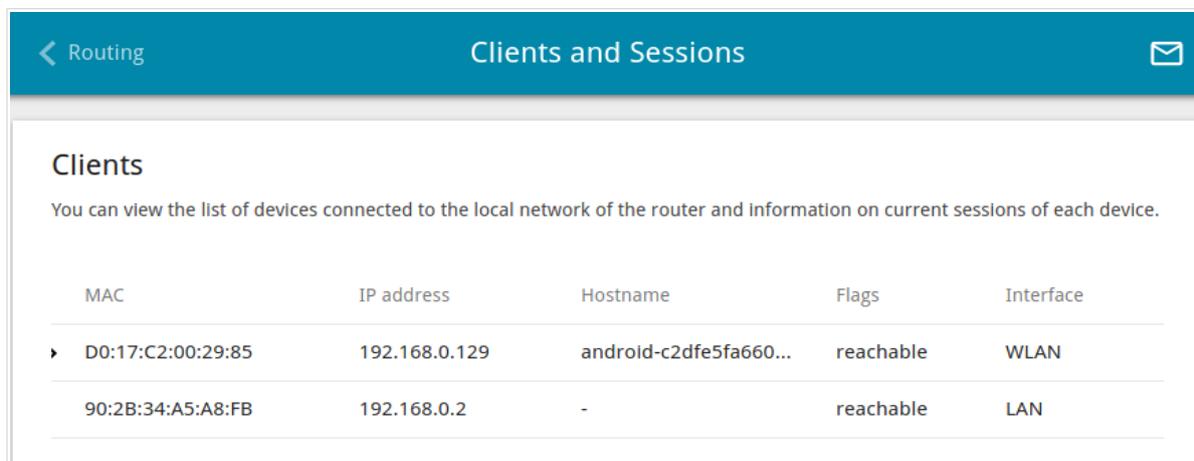
| Interface | Destination   | Subnet mask   | Gateway       | Flags | Metric | Table |
|-----------|---------------|---------------|---------------|-------|--------|-------|
| WAN       | 0.0.0.0       | 0.0.0.0       | 192.168.161.1 | UG    | 410    | 254   |
| WAN       | 1.1.1.1       |               | 192.168.161.1 | UGH   | 0      | 254   |
| LAN       | 192.168.0.0   | 255.255.255.0 |               | U     | 0      | 254   |
| WAN       | 192.168.161.0 | 255.255.255.0 |               | U     | 0      | 254   |

Figure 58. The routing table page.

The opened page displays the information on routes in the selected routing table. The table contains destination IP addresses, gateways, subnet masks, and other data.

## Clients and Sessions

On the **Statistics / Clients and Sessions** page, you can view the list of devices connected to the local network of the router and information on current sessions of each device.



| MAC                 | IP address    | Hostname               | Flags     | Interface |
|---------------------|---------------|------------------------|-----------|-----------|
| ▶ D0:17:C2:00:29:85 | 192.168.0.129 | android-c2dfe5fa660... | reachable | WLAN      |
| 90:2B:34:A5:A8:FB   | 192.168.0.2   | -                      | reachable | LAN       |

Figure 59. The **Statistics / Clients and Sessions** 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.

To view the information on current sessions of a device, select this device in the table. On the opened page, the following data for each session of the selected device will be displayed: the protocol for network packet transmission, the source IP address and port, and the destination IP address and port.

## 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.

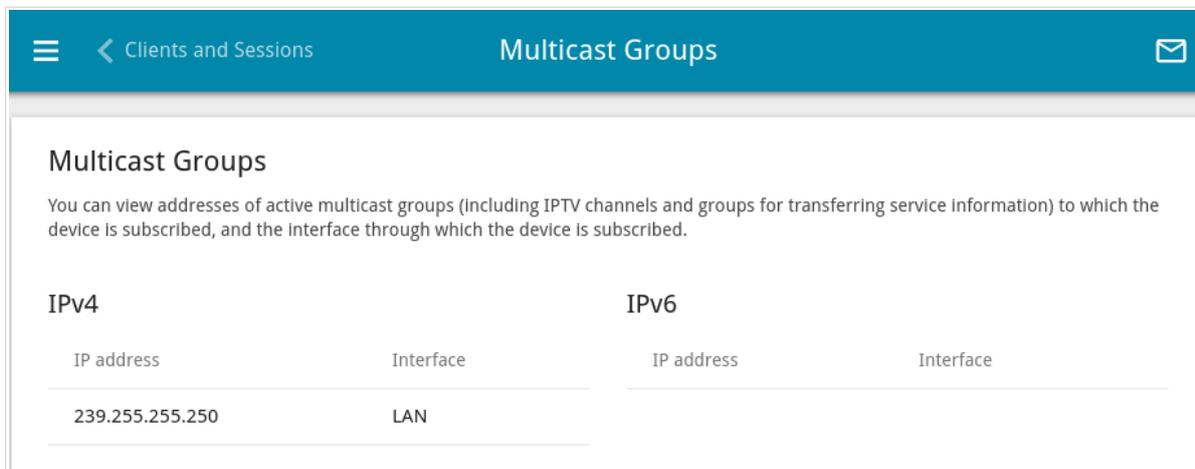


Figure 60. The **Statistics / Multicast Groups** page.

## Connections Setup

In this menu you can configure basic parameters of the router's local area network and configure connection to the Internet (a WAN connection).

### WAN

On the **Connections Setup / WAN** page, you can create and edit connections used by the router. By default, a **Dynamic IPv4** connection is configured in the system. It is assigned to the **WAN** port of the router.

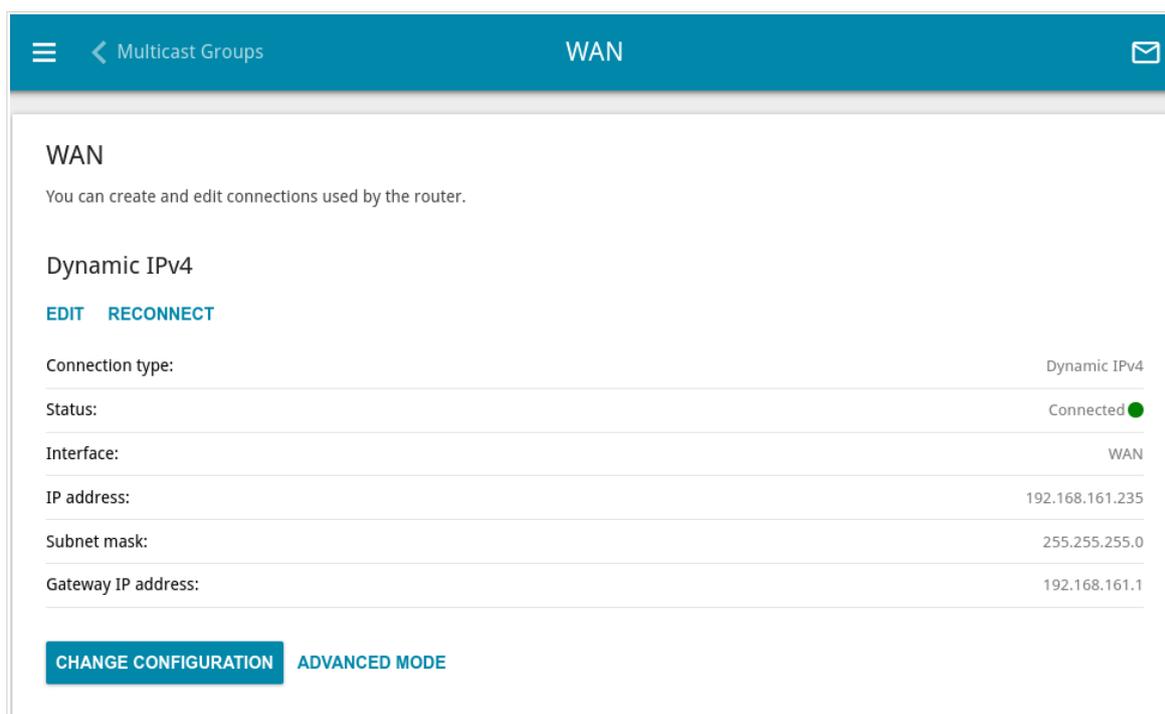


Figure 61. The **Connections Setup / WAN** page. The simplified mode.

To edit an existing connection, click the **EDIT** button. On the opened page, change the needed parameters and click the **APPLY** button.

To disconnect a connection and establish it again, click the **RECONNECT** button.

To remove an existing connection and create a new one, click the **CHANGE CONFIGURATION** button. Upon that the connection creation page opens.

To create several WAN connections, go to the advanced mode. To do this, click the **ADVANCED MODE** button.

**!** When connections of some types are created, the **Connections Setup / WAN** page is automatically displayed in the advanced mode.

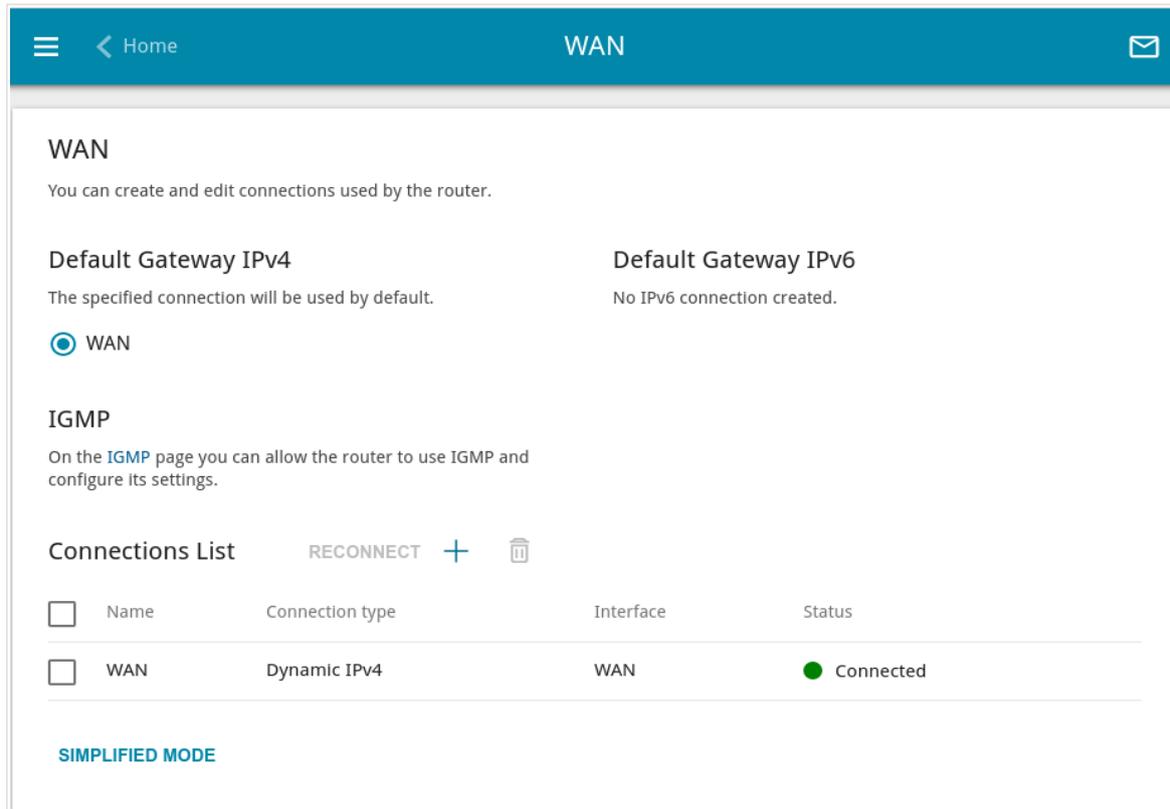


Figure 62. The **Connections Setup / WAN** page. The advanced mode.

To create a new connection, click the **ADD** button (  ) in the **Connections List** section. Upon that the connection creation page opens.

To edit an existing connection, in the **Connections List** section, left-click the relevant line in the table. On the opened page, change the needed parameters and click the **APPLY** button.

To disconnect a connection and establish it again, select the checkbox located to the left of the relevant line in the table and click the **RECONNECT** button.

To remove a connection, in the **Connections List** section, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

To allow multicast traffic (e.g. streaming video) for a connection, click the **IGMP** link (for the description of the page, see the **IGMP** section, page 159).

To use one of existing WAN connections as the default IPv4 or IPv6 connection, in the **Default Gateway** section, select the choice of the radio button which corresponds to this connection.

To return to the simplified mode, click the **SIMPLIFIED MODE** button (the button is unavailable if several WAN connections are created).

## Creating Dynamic IPv4 or Static IPv4 WAN Connection

On the connection creation page, in the **General Settings** section, select the relevant value from the **Connection type** drop-down list and specify the needed values.

The screenshot shows the 'General Settings' section of a web interface. It contains the following elements:

- Connection type:** A dropdown menu with 'Static IPv4' selected.
- Interface:** A dropdown menu with 'WAN' selected.
- Connection name\*:** A text input field containing 'statiip'.
- Enable connection:** A toggle switch that is turned on (blue).
- NAT:** A toggle switch that is turned on (blue).
- Ping:** A toggle switch that is turned off (grey).

Below the NAT and Ping toggles are informational icons and text:

- For NAT: The network address translation function. It is recommended not to disable unless your ISP requires it.
- For Ping: WAN Ping Respond allows the device to respond to ping requests from the external network.

Figure 63. The page for creating a new **Static IPv4** connection. The **General Settings** section.

| Parameter                | Description  |
|--------------------------|--|
| <b>General Settings</b>  |  |
| <b>Interface</b>         | A physical or virtual WAN interface to which the new connection will be assigned.  |
| <b>Connection name</b>   | A name for the connection for easier identification.   |
| <b>Enable connection</b> | Move the switch to the right to enable the connection.<br>Move the switch to the left to disable the connection.   |
| <b>NAT</b>               | If the switch is moved to the right, the network address translation function is enabled. Do not disable the function unless your ISP requires this.   |
| <b>Ping</b>              | If the switch is moved to the right, the router responds to ping requests from the external network through this connection. For security reasons, it is recommended to disable this function. |

**Ethernet**

MAC address\*

BC:0F:9A:6D:36:4C

---

Clone MAC address of your NIC  
(90:2B:34:A5:A8:FB)

**RESTORE DEFAULT MAC ADDRESS**

MTU\*

1500

Figure 64. The page for creating a new **Static IPv4** connection. The **Ethernet** section.

| Parameter          | Description  |
|--------------------|--|
| <b>Ethernet</b>    |  |
| <b>MAC address</b> | <p>A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement.</p> <p>To set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface, move the <b>Clone MAC address of your NIC</b> switch to the right. When the switch is moved to the right, the field is unavailable for editing.</p> <p>To set the router's MAC address, click the <b>RESTORE DEFAULT MAC ADDRESS</b> button (the button is available when the switch is moved to the right).</p> |
| <b>MTU</b>         | The maximum size of units transmitted by the interface.  |

**IPv4**

IP address\*  
192.168.161.224

---

Subnet mask\*  
255.255.255.0

---

Gateway IP address\*  
192.168.161.1

---

Primary DNS\*  
1.1.1.1

---

Secondary DNS  
1.0.0.1

---

ⓘ If the connection is created for the IPTV service only and no data on IP addressing is given by your ISP, then you can set the following values: IP address = 1.0.0.1, Netmask = 255.255.255.252, Gateway IP address = 1.0.0.2, Primary DNS server = 1.0.0.2

Figure 65. The page for creating a new **Static IPv4** connection. The **IPv4** section.

| Parameter  | Description   |
|--|---|
| <b>IPv4</b>                                      |   |
| <i>For Static IPv4 type</i>                      |   |
| <b>IP address</b>                                | Enter an IP address for this WAN connection.  |
| <b>Subnet mask</b>                               | Enter a subnet mask for this WAN connection.  |
| <b>Gateway IP address</b>                        | Enter an IP address of the gateway used by this WAN connection.   |
| <b>Primary DNS /<br/>Secondary DNS</b>           | Enter addresses of the primary and secondary DNS servers in the relevant fields.  |
| <i>For Dynamic IPv4 type</i>                     |   |
| <b>Obtain DNS server addresses automatically</b> | Move the switch to the right to configure automatic assignment of DNS server addresses. Upon that the <b>Primary DNS</b> and <b>Secondary DNS</b> fields are not available for editing. |
| <b>Primary DNS /<br/>Secondary DNS</b>           | Enter addresses of the primary and secondary DNS servers in the relevant fields.  |
| <b>Vendor ID</b>                                 | The identifier of your ISP. <i>Optional.</i>  |
| <b>Hostname</b>                                  | A name of the router specified by your ISP. <i>Optional.</i>  |

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

## Creating Dynamic IPv6 or Static IPv6 WAN Connection

On the connection creation page, in the **General Settings** section, select the relevant value from the **Connection type** drop-down list and specify the needed values.

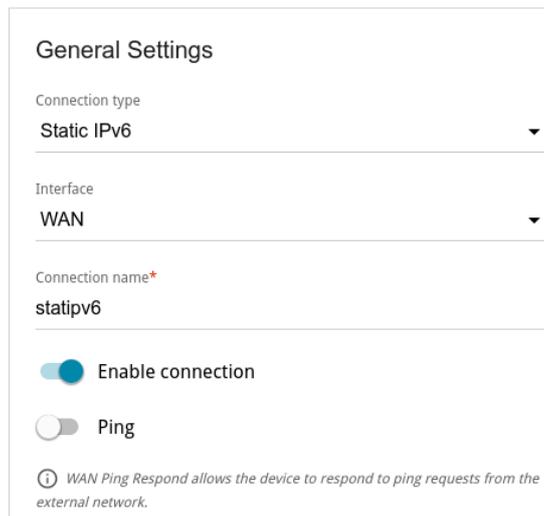


Figure 66. The page for creating a new **Static IPv6** connection. The **General Settings** section.

| Parameter                | Description  |
|--------------------------|--|
| <b>General Settings</b>  |  |
| <b>Interface</b>         | A physical or virtual WAN interface to which the new connection will be assigned.  |
| <b>Connection name</b>   | A name for the connection for easier identification.   |
| <b>Enable connection</b> | Move the switch to the right to enable the connection.<br>Move the switch to the left to disable the connection.   |
| <b>Ping</b>              | If the switch is moved to the right, the router responds to ping requests from the external network through this connection. For security reasons, it is recommended to disable this function. |

**Ethernet**

MAC address\*

BC:0F:9A:6D:36:4C

---

Clone MAC address of your NIC  
(90:2B:34:A5:A8:FB)

**RESTORE DEFAULT MAC ADDRESS**

---

MTU\*

1500

Figure 67. The page for creating a new **Static IPv6** connection. The **Ethernet** section.

| Parameter          | Description  |
|--------------------|--|
| <b>Ethernet</b>    |  |
| <b>MAC address</b> | <p>A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement.</p> <p>To set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface, move the <b>Clone MAC address of your NIC</b> switch to the right. When the switch is moved to the right, the field is unavailable for editing.</p> <p>To set the router's MAC address, click the <b>RESTORE DEFAULT MAC ADDRESS</b> button (the button is available when the switch is moved to the right).</p> |
| <b>MTU</b>         | The maximum size of units transmitted by the interface.  |

**IPv6**

IPv6 address\*

---

Prefix\*

---

Gateway IPv6 address\*

---

Primary IPv6 DNS server\*

---

Secondary IPv6 DNS server

---

Figure 68. The page for creating a new **Static IPv6** connection. The **IPv6** section.

| Parameter  | Description  |
|--|--|
| <b>IPv6</b>  |  |
| <i>For Static IPv6 type</i>                                |  |
| <b>IPv6 address</b>  | Enter an IPv6 address for this WAN connection.   |
| <b>Prefix</b>  | The length of the subnet prefix. The value <b>64</b> is used usually.  |
| <b>Gateway IPv6 address</b>                                | Enter an IPv6 address of the gateway used by this WAN connection.  |
| <b>Primary IPv6 DNS server / Secondary IPv6 DNS server</b> | Enter addresses of the primary and secondary IPv6 DNS servers in the relevant fields.  |
| <i>For Dynamic IPv6 type</i>                               |  |
| <b>Get IPv6</b>  | Select a method for IPv6 address assignment from the drop-down list or leave the <b>Automatically</b> value.   |
| <b>Enable prefix delegation</b>                            | Move the switch to the right if it is necessary that the router requests a prefix to configure IPv6 addresses for the local network from a delegating router.  |
| <b>Obtain DNS server addresses automatically</b>           | Move the switch to the right to configure automatic assignment of IPv6 DNS server addresses. Upon that the <b>Primary IPv6 DNS server</b> and <b>Secondary IPv6 DNS server</b> fields are not available for editing. |
| <b>Primary IPv6 DNS server / Secondary IPv6 DNS server</b> | Enter addresses of the primary and secondary IPv6 DNS servers in the relevant fields.  |

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

## Creating PPPoE WAN Connection

On the connection creation page, in the **General Settings** section, select the relevant value from the **Connection type** drop-down list and specify the needed values.

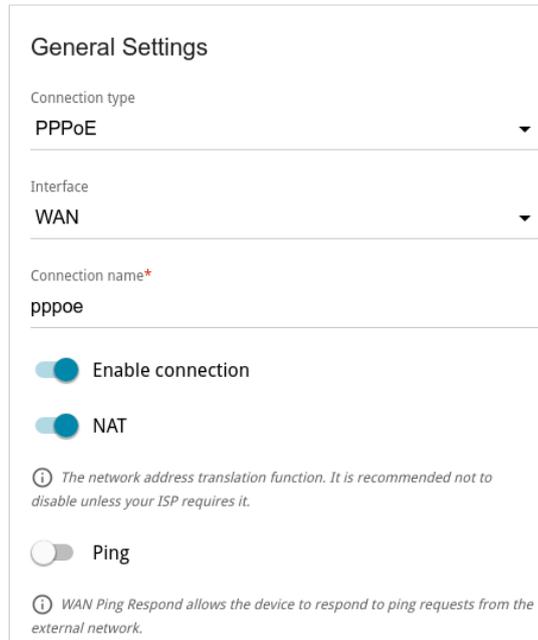


Figure 69. The page for creating a new **PPPoE** connection. The **General Settings** section.

| Parameter                | Description  |
|--------------------------|--|
| <b>General Settings</b>  |  |
| <b>Interface</b>         | A physical or virtual WAN interface to which the new connection will be assigned.  |
| <b>Connection name</b>   | A name for the connection for easier identification.   |
| <b>Enable connection</b> | Move the switch to the right to enable the connection.<br>Move the switch to the left to disable the connection.   |
| <b>NAT</b>               | If the switch is moved to the right, the network address translation function is enabled. Do not disable the function unless your ISP requires this.   |
| <b>Ping</b>              | If the switch is moved to the right, the router responds to ping requests from the external network through this connection. For security reasons, it is recommended to disable this function. |

**Ethernet**

MAC address\*

BC:0F:9A:6D:36:4C

---

Clone MAC address of your NIC  
(90:2B:34:A5:A8:FB)

**RESTORE DEFAULT MAC ADDRESS**

MTU\*

1500

Figure 70. The page for creating a new PPPoE connection. The **Ethernet** section.

| Parameter          | Description  |
|--------------------|--|
| <b>Ethernet</b>    |  |
| <b>MAC address</b> | <p>A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement.</p> <p>To set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface, move the <b>Clone MAC address of your NIC</b> switch to the right. When the switch is moved to the right, the field is unavailable for editing.</p> <p>To set the router's MAC address, click the <b>RESTORE DEFAULT MAC ADDRESS</b> button (the button is available when the switch is moved to the right).</p> |
| <b>MTU</b>         | The maximum size of units transmitted by the interface.  |

**PPP**

Without authorization

Username\*

---

Password\* 🔒

---

Service name

---

MTU\*

1492

---

Encryption protocol

No encryption ▼

---

Authentication protocol

AUTO ▼

---

Keep Alive

LCP interval\*

30

---

LCP fails\*

3

---

Dial on demand

Maximum idle time (in seconds) 🔒

---

Static IP address

---

PPP debug

Figure 71. The page for creating a new **PPPoE** connection. The **PPP** section.

| Parameter                    | Description   |
|------------------------------|---|
| <b>PPP</b>                   |   |
| <b>Without authorization</b> | Move the switch to the right if you don't need to enter a username and password to access the Internet. |
| <b>Username</b>              | A username (login) to access the Internet.  |
| <b>Password</b>              | A password to access the Internet. Click the <b>Show</b> icon (🔒) to display the entered password.      |
| <b>Service name</b>          | The name of the PPPoE authentication server.  |
| <b>MTU</b>                   | The maximum size of units transmitted by the interface.   |

| Parameter                      | Description   |
|--------------------------------|---|
| <b>Encryption protocol</b>     | <p>Select a method of MPPE encryption.</p> <ul style="list-style-type: none"> <li>• <b>No encryption:</b> MPPE encryption is not applied.</li> <li>• <b>MPPE 40 128 bit:</b> MPPE encryption with a 40-bit or 128-bit key is applied.</li> <li>• <b>MPPE 40 bit:</b> MPPE encryption with a 40-bit key is applied.</li> <li>• <b>MPPE 128 bit:</b> MPPE encryption with a 128-bit key is applied.</li> </ul> <p>MPPE encryption can be applied only if the <b>MS-CHAP</b>, <b>MS-CHAPv2</b>, or <b>AUTO</b> value is selected from the <b>Authentication protocol</b> drop-down list.</p> |
| <b>Authentication protocol</b> | <p>Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.</p>  |
| <b>Keep Alive</b>              | <p>Move the switch to the right if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. If the switch is moved to the right, the <b>LCP interval</b> and <b>LCP fails</b> fields are available. Specify the required values.</p>  |
| <b>Dial on demand</b>          | <p>Move the switch to the right if you want the router to establish connection to the Internet on demand. In the <b>Maximum idle time</b> field, specify a period of inactivity (in seconds) after which the connection should be terminated.</p>   |
| <b>Static IP address</b>       | <p>Fill in the field if you want to use a static IP address to access the Internet.</p>   |
| <b>PPP debug</b>               | <p>Move the switch to the right if you want to log all data on PPP connection debugging.</p>  |



Figure 72. The page for creating a new **PPPoE** connection. The **IPv4** section.

| Parameter  | Description   |
|--|---|
| <b>Obtain DNS server addresses automatically</b> | Move the switch to the right to configure automatic assignment of DNS server addresses. Upon that the <b>Primary DNS</b> and <b>Secondary DNS</b> fields are not available for editing. |
| <b>Primary DNS / Secondary DNS</b>               | Enter addresses of the primary and secondary DNS servers in the relevant fields.  |

When all needed settings are configured, click the **APPLY** button. In the simplified mode, after clicking the button, the window for creating an additional connection opens.

If your ISP offers access to local services (e.g. audio and video resources), click the **CREATE CONNECTION** button. On the page displayed, specify the parameters for the connection of the Dynamic IPv4 or Static IPv4 type and click the **APPLY** button.

If you do not need to create an additional connection, click the **SKIP** button. In this case, the **Connections Setup / WAN** page opens.

## Creating PPTP or L2TP WAN Connection

On the connection creation page, in the **General Settings** section, select the relevant value from the **Connection type** drop-down list and specify the needed values.

General Settings

Connection type  
PPTP

Connection name\*  
pptp

Enable connection

NAT

*i* The network address translation function. It is recommended not to disable unless your ISP requires it.

Ping

*i* WAN Ping Respond allows the device to respond to ping requests from the external network.

Figure 73. The page for creating a new **PPTP** connection. The **General Settings** section.

| Parameter                | Description  |
|--------------------------|--|
| <b>General Settings</b>  |  |
| <b>Connection name</b>   | A name for the connection for easier identification.   |
| <b>Enable connection</b> | Move the switch to the right to enable the connection.<br>Move the switch to the left to disable the connection.   |
| <b>NAT</b>               | If the switch is moved to the right, the network address translation function is enabled. Do not disable the function unless your ISP requires this.   |
| <b>Ping</b>              | If the switch is moved to the right, the router responds to ping requests from the external network through this connection. For security reasons, it is recommended to disable this function. |

**PPP**

Without authorization

---

Username\*

---

Password\* 

---

VPN server address\*

---

MTU\*

1456

---

Encryption protocol

No encryption ▼

---

Authentication protocol

AUTO ▼

---

Keep Alive

LCP interval\*

30

---

LCP fails\*

3

---

Dial on demand

---

Maximum idle time (in seconds) 

---

Static IP address

---

PPP debug

Figure 74. The page for creating a new PPTP connection. The PPP section.

| Parameter                    | Description  |
|------------------------------|--|
| <b>PPP</b>                   |  |
| <b>Without authorization</b> | Move the switch to the right if you don't need to enter a username and password to access the Internet.  |
| <b>Username</b>              | A username (login) to access the Internet.   |
| <b>Password</b>              | A password to access the Internet. Click the <b>Show</b> icon (  ) to display the entered password. |
| <b>VPN server address</b>    | The IP or URL address of the PPTP or L2TP authentication server.   |
| <b>MTU</b>                   | The maximum size of units transmitted by the interface.  |

| Parameter                      | Description   |
|--------------------------------|---|
| <b>Encryption protocol</b>     | <p>Select a method of MPPE encryption.</p> <ul style="list-style-type: none"> <li>• <b>No encryption:</b> MPPE encryption is not applied.</li> <li>• <b>MPPE 40 128 bit:</b> MPPE encryption with a 40-bit or 128-bit key is applied.</li> <li>• <b>MPPE 40 bit:</b> MPPE encryption with a 40-bit key is applied.</li> <li>• <b>MPPE 128 bit:</b> MPPE encryption with a 128-bit key is applied.</li> </ul> <p>MPPE encryption can be applied only if the <b>MS-CHAP</b>, <b>MS-CHAPv2</b>, or <b>AUTO</b> value is selected from the <b>Authentication protocol</b> drop-down list.</p> |
| <b>Authentication protocol</b> | <p>Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.</p>  |
| <b>Keep Alive</b>              | <p>Move the switch to the right if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. If the switch is moved to the right, the <b>LCP interval</b> and <b>LCP fails</b> fields are available. Specify the required values.</p>  |
| <b>Dial on demand</b>          | <p>Move the switch to the right if you want the router to establish connection to the Internet on demand. In the <b>Maximum idle time</b> field, specify a period of inactivity (in seconds) after which the connection should be terminated.</p>   |
| <b>Static IP address</b>       | <p>Fill in the field if you want to use a static IP address to access the Internet.</p>   |
| <b>PPP debug</b>               | <p>Move the switch to the right if you want to log all data on PPP connection debugging.</p>  |

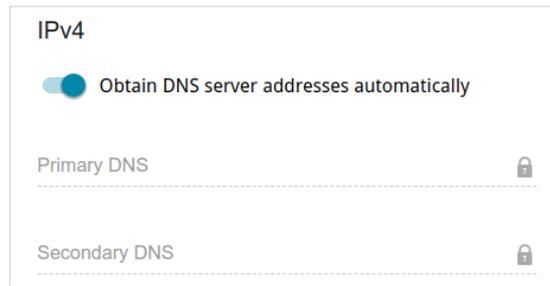


Figure 75. The page for creating a new **PPTP** connection. The **IPv4** section.

| Parameter  | Description   |
|--|---|
| <b>Obtain DNS server addresses automatically</b> | Move the switch to the right to configure automatic assignment of DNS server addresses. Upon that the <b>Primary DNS</b> and <b>Secondary DNS</b> fields are not available for editing. |
| <b>Primary DNS / Secondary DNS</b>               | Enter addresses of the primary and secondary DNS servers in the relevant fields.  |

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

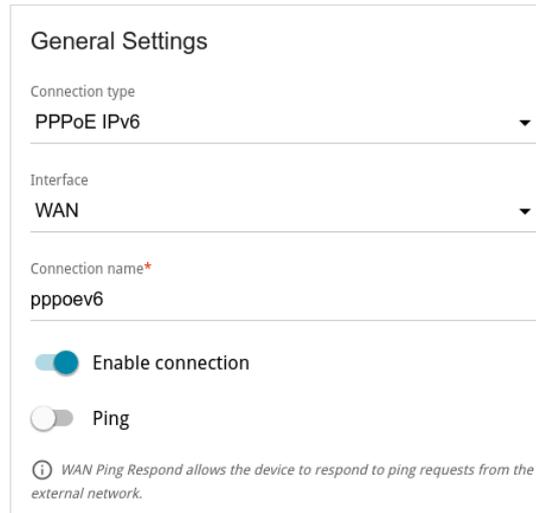
After clicking the button, the window for additional configuration of the connection opens.

If you want to use this WAN connection to access the Internet, select the **to the Internet** choice of the radio button. Then select an existing connection which will be used to access the PPTP/L2TP server and click the **CONTINUE** button; or select the **create a new connection** choice of the radio button and click the **CREATE CONNECTION** button.

If you have already configured the connection to the Internet and you want to use this WAN connection only to connect to the virtual private network, select the **to the virtual private network** choice of the radio button and click the **CONTINUE** button.

## Creating PPPoE IPv6 or PPPoE Dual Stack WAN Connection

On the connection creation page, in the **General Settings** section, select the relevant value from the **Connection type** drop-down list and specify the needed values.



General Settings

Connection type  
PPPoE IPv6

Interface  
WAN

Connection name\*  
pppoev6

Enable connection

Ping

WAN Ping Respond allows the device to respond to ping requests from the external network.

Figure 76. The page for creating a new **PPPoE IPv6** connection. The **General Settings** section.

| Parameter                | Description  |
|--------------------------|--|
| <b>General Settings</b>  |  |
| <b>Interface</b>         | A physical or virtual WAN interface to which the new connection will be assigned.  |
| <b>Connection name</b>   | A name for the connection for easier identification.   |
| <b>Enable connection</b> | Move the switch to the right to enable the connection.<br>Move the switch to the left to disable the connection.   |
| <b>NAT</b>               | <i>For the <b>PPPoE Dual Stack</b> type only.</i><br>If the switch is moved to the right, the network address translation function for IPv4 is enabled. Do not disable the function unless your ISP requires this. |
| <b>Ping</b>              | If the switch is moved to the right, the router responds to ping requests from the external network through this connection. For security reasons, it is recommended to disable this function.                     |

**Ethernet**

MAC address\*  
 BC:0F:9A:6D:36:4C

---

Clone MAC address of your NIC  
 (90:2B:34:A5:A8:FB)

RESTORE DEFAULT MAC ADDRESS

MTU\*  
 1500

Figure 77. The page for creating a new **PPPoE IPv6** connection. The **Ethernet** section.

| Parameter          | Description  |
|--------------------|--|
| <b>Ethernet</b>    |  |
| <b>MAC address</b> | <p>A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement.</p> <p>To set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface, move the <b>Clone MAC address of your NIC</b> switch to the right. When the switch is moved to the right, the field is unavailable for editing.</p> <p>To set the router's MAC address, click the <b>RESTORE DEFAULT MAC ADDRESS</b> button (the button is available when the switch is moved to the right).</p> |
| <b>MTU</b>         | The maximum size of units transmitted by the interface.  |

**PPP**

Without authorization

Username\*

\_\_\_\_\_

Password\* 🔍

\_\_\_\_\_

Service name

\_\_\_\_\_

MTU\*

1492

\_\_\_\_\_

Encryption protocol

No encryption ▼

\_\_\_\_\_

Authentication protocol

AUTO ▼

\_\_\_\_\_

Keep Alive

LCP interval\*

30

\_\_\_\_\_

LCP fails\*

3

\_\_\_\_\_

Static IP address

\_\_\_\_\_

PPP debug

Figure 78. The page for creating a new **PPPoE IPv6** connection. The **PPP** section.

| Parameter                    | Description   |
|------------------------------|---|
| <b>PPP</b>                   |   |
| <b>Without authorization</b> | Move the switch to the right if you don't need to enter a username and password to access the Internet. |
| <b>Username</b>              | A username (login) to access the Internet.  |
| <b>Password</b>              | A password to access the Internet. Click the <b>Show</b> icon (🔍) to display the entered password.      |
| <b>Service name</b>          | The name of the PPPoE authentication server.  |
| <b>MTU</b>                   | The maximum size of units transmitted by the interface.   |

| Parameter                      | Description   |
|--------------------------------|---|
| <b>Encryption protocol</b>     | <p>Select a method of MPPE encryption.</p> <ul style="list-style-type: none"> <li>• <b>No encryption:</b> MPPE encryption is not applied.</li> <li>• <b>MPPE 40 128 bit:</b> MPPE encryption with a 40-bit or 128-bit key is applied.</li> <li>• <b>MPPE 40 bit:</b> MPPE encryption with a 40-bit key is applied.</li> <li>• <b>MPPE 128 bit:</b> MPPE encryption with a 128-bit key is applied.</li> </ul> <p>MPPE encryption can be applied only if the <b>MS-CHAP</b>, <b>MS-CHAPv2</b>, or <b>AUTO</b> value is selected from the <b>Authentication protocol</b> drop-down list.</p> |
| <b>Authentication protocol</b> | <p>Select a required authentication method from the drop-down list or leave the <b>AUTO</b> value.</p>  |
| <b>Keep Alive</b>              | <p>Move the switch to the right if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. If the switch is moved to the right, the <b>LCP interval</b> and <b>LCP fails</b> fields are available. Specify the required values.</p>  |
| <b>Static IP address</b>       | <p>Fill in the field if you want to use a static IP address to access the Internet.</p>   |
| <b>PPP debug</b>               | <p>Move the switch to the right if you want to log all data on PPP connection debugging.</p>  |

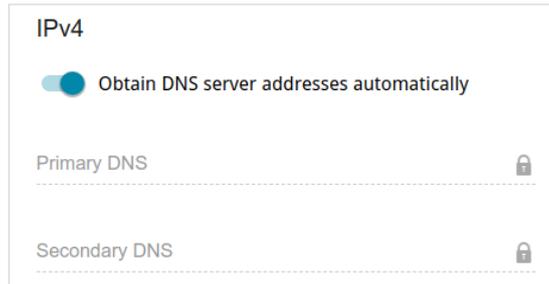


Figure 79. The page for creating a new **PPPoE Dual Stack** connection. The **IPv4** section.

| Parameter  | Description   |
|--|---|
| <b>IPv4 (for the PPPoE Dual Stack type)</b>      |   |
| <b>Obtain DNS server addresses automatically</b> | Move the switch to the right to configure automatic assignment of DNS server addresses. Upon that the <b>Primary DNS</b> and <b>Secondary DNS</b> fields are not available for editing. |
| <b>Primary DNS / Secondary DNS</b>               | Enter addresses of the primary and secondary DNS servers in the relevant fields.  |

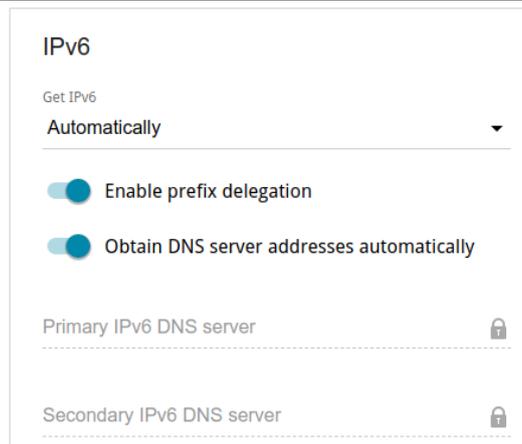


Figure 80. The page for creating a new **PPPoE Pv6** connection. The **IPv6** section.

| Parameter  | Description  |
|--|--|
| <b>IPv6</b>                                      |  |
| <b>Get IPv6</b>                                  | Select a method for IPv6 address assignment from the drop-down list or leave the <b>Automatically</b> value.   |
| <b>Enable prefix delegation</b>                  | Move the switch to the right if it is necessary that the router requests a prefix to configure IPv6 addresses for the local network from a delegating router.  |
| <b>Obtain DNS server addresses automatically</b> | Move the switch to the right to configure automatic assignment of IPv6 DNS server addresses. Upon that the <b>Primary IPv6 DNS server</b> and <b>Secondary IPv6 DNS server</b> fields are not available for editing. |

| Parameter  | Description   |
|--|---|
| <b>Primary IPv6 DNS server / Secondary IPv6 DNS server</b> | Enter addresses of the primary and secondary IPv6 DNS servers in the relevant fields. |

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

## LAN

To configure the router's local interface, go to the **Connections Setup / LAN** page.

### IPv4

Go to the **IPv4** tab to change the IPv4 address of the router, configure the built-in DHCP server, specify MAC address and IPv4 address pairs, or add own DNS records.

Local IP Address

IP address\*  
192.168.0.1

---

Mask\*  
255.255.255.0

---

Hostname  
dlinkrouter.local

---

ⓘ Specify a domain name ending with .local. In order to access the web-based interface using the domain name, enter this name with a dot and slash at the end in the address bar of the web browser (for example, dlinkrouter.local/)

Figure 81. Configuring the local interface. The IPv4 tab. The Local IP Address section.

| Parameter                                  | Description  |
|--|--|
| <b>Local IP Address</b>                    |  |
| <b>Mode of local IP address assignment</b> | <p>Available if the <b>Access point</b>, <b>Repeater</b>, or <b>Client</b> mode was selected in the Initial Configuration Wizard.</p> <p>Select the needed value from the drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Static:</b> The IPv4 address, subnet mask, and the gateway IP address are assigned manually.</li> <li>• <b>Dynamic:</b> The router automatically obtains these parameters from the LAN DHCP server or from the router to which it connects.</li> </ul> |
| <b>IP address</b>                          | The IPv4 address of the router in the local subnet. By default, the following value is specified: <b>192.168.0.1</b> .   |
| <b>Mask</b>                                | The mask of the local subnet. By default, the following value is specified: <b>255.255.255.0</b> .   |

| Parameter                 | Description   |
|---------------------------|---|
| <b>Gateway IP address</b> | Available if the <b>Access point, Repeater, or Client</b> mode was selected in the <i>Initial Configuration Wizard</i> .<br>The gateway IPv4 address which is used by the router to connect to the Internet (e.g., for synchronizing the system time with an NTP server). <i>Optional</i> . |
| <b>Hostname</b>           | The name of the device assigned to its IPv4 address in the local subnet.  |

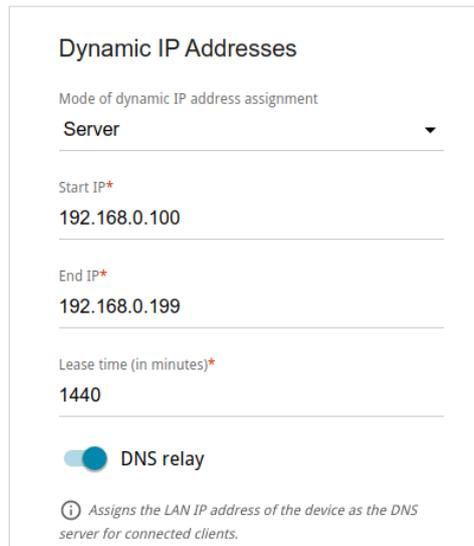


Figure 82. Configuring the local interface. The **IPv4** tab. The **Dynamic IP Addresses** section.

| Parameter                                    | Description  |
|--|--|
| <b>Dynamic IP Addresses</b>                  |  |
| <b>Mode of dynamic IP address assignment</b> | An operating mode of the router's DHCP server. <ul style="list-style-type: none"> <li>• <b>Disable</b>: The router's DHCP server is disabled, clients' IP addresses are assigned manually.</li> <li>• <b>Server</b>: The router assigns IP addresses to clients automatically in accordance with the specified parameters. When this value is selected, the <b>Start IP</b>, <b>End IP</b>, <b>Lease time</b> fields and the <b>DNS relay</b> switch are displayed on the tab. Also when this value is selected, the <b>DHCP Options</b>, <b>Static IP Addresses</b>, and <b>Hosts</b> sections are displayed on the tab.</li> </ul> |

| Parameter   | Description   |
|---|---|
|   | <ul style="list-style-type: none"> <li>• <b>Relay</b>: An external DHCP server is used to assign IP addresses to clients. When this value is selected, the <b>External DHCP server IP</b>, <b>Option 82 Circuit ID</b>, <b>Option 82 Remote ID</b>, and <b>Option 82 Subscriber ID</b> fields are displayed on the tab. <i>Available if the <b>Router</b> or <b>WISP Repeater</b> mode was selected in the Initial Configuration Wizard.</i></li> </ul> |
| <b>Start IP</b>   | The start IP address of the address range used by the DHCP server to distribute IP addresses to clients.  |
| <b>End IP</b>   | The end IP address of the address range used by the DHCP server to distribute IP addresses to clients.  |
| <b>Lease time</b>   | 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.   |
| <b>DNS relay</b>  | <p>Move the switch to the right so that the devices connected to the router obtain the address of the router as the DNS server address.</p> <p>Move the switch to the left so that the devices connected to the router obtain the address transmitted by the ISP or specified on the <b>Advanced / DNS</b> page as the DNS server address.</p>  |
| <b>External DHCP server IP</b>  | The IP address of the external DHCP server which assigns IP addresses to the router's clients.  |
| <b>Option 82 Circuit ID</b><br><b>Option 82 Remote ID</b><br><b>Option 82 Subscriber ID</b> | The value of the relevant field of DHCP option 82. Do not fill in the fields unless your ISP or the administrator of the external DHCP server provided these values.  |

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

In the **DHCP Options** section, you can change default values for some options of DHCP protocol (IP address, subnet mask, DNS servers) or specify additional parameters which the built-in DHCP server should send to clients to configure the local network.



Figure 83. Configuring the local interface. The IPv4 tab. The section for configuring DHCP options.

To do this, click the **ADD** button ( **+** ).

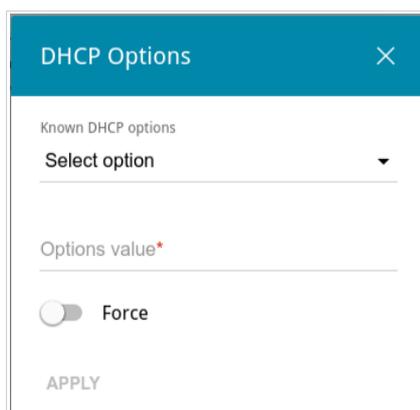


Figure 84. Configuring the local interface. The IPv4 tab. The window for configuring a DHCP option.

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

| Parameter                 | Description   |
|---------------------------|---|
| <b>Known DHCP options</b> | From the drop-down list, select an option which you want to configure.  |
| <b>Options value</b>      | Specify the value for the selected option.  |
| <b>Force</b>              | Move the switch to the right to let the DHCP server send the selected option regardless of the client's request.<br>Move the switch to the left to let the DHCP server send the selected option only when the client requests it. |

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

To edit the parameters of an option, left-click the relevant line in the table. In the opened window, change the needed parameters and click the **APPLY** button.

To remove the value of an option, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ). Then click the **APPLY** button.

In the **Static IP Addresses** section, you can specify MAC address and IPv4 address pairs (set a fixed IPv4 address in the local area network for a device with a certain MAC address). The router assigns IPv4 addresses in accordance with the specified pairs only when the DHCP server is enabled (in the **Dynamic IP Addresses** section, the **Server** value is selected from the **Mode of dynamic IP address assignment** drop-down list).

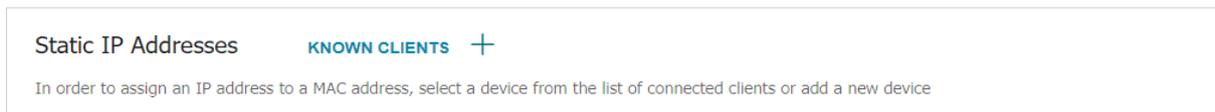


Figure 85. Configuring the local interface. The IPv4 tab. The section for creating MAC-IPv4 pairs.

To create a MAC-IPv4 pair, click the **ADD** button (+). In the opened window, fill in the **MAC address** field. You can choose a device connected to the router's LAN at the moment. To do this, select the relevant MAC address from the drop-down list (the field will be filled in automatically). Then in the **IP address** field, enter an IPv4 address which will be assigned to the device with the specified MAC address. In the **Hostname** field, specify a network name of the device for easier identification (*optional*). Click the **APPLY** button.

To create MAC-IPv4 pairs for the devices connected to the router at the moment, click the **KNOWN CLIENTS** 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 the settings for an existing MAC-IPv4 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-IPv4 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 pair in the editing window.

If needed, you can add your own address resource records. To do this, click the **ADD** button (+) in the **Hosts** section (*available if the Router or WISP Repeater mode was selected in the Initial Configuration Wizard*).

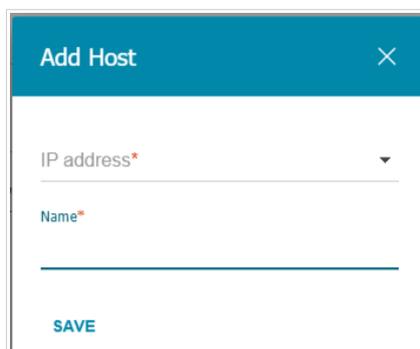


Figure 86. Configuring the local interface. The IPv4 tab. The window for adding a DNS record.

In the **IP address** field, specify a host from the internal or external network. You can choose a device connected to the router's LAN at the moment. To do this, select the relevant IPv4 address from the drop-down list (the field will be filled in automatically). In the **Name** field, specify the domain name to which the specified IPv4 address will correspond. Click the **SAVE** button.

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

To remove a record, in the **Hosts** section, 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.

## IPv6

Go to the **IPv6** tab to change or add the IPv6 address of the router, configure IPv6 addresses assignment settings, specify MAC address and IPv6 address pairs, or add own DNS records.

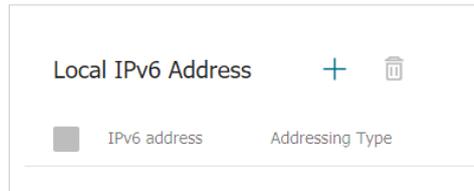


Figure 87. Configuring the local interface. The **IPv6** tab. The **Local IPv6 Address** section.

To add an IPv6 address of the router, click the **ADD** button ( **+** ). To change the IPv6 address of the router, select it in the table.

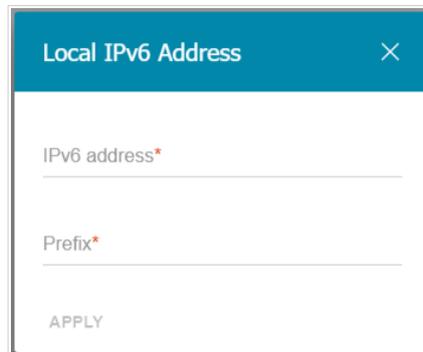


Figure 88. Configuring the local interface. The **IPv6** tab. The window for adding an IPv6 address.

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

| Parameter                   | Description   |
|-----------------------------|---|
| <b>Local IPv6 Address</b>   |   |
| <b>IPv6 address</b>         | The IPv6 address of the router in the local subnet.   |
| <b>Prefix</b>               | The length of the prefix subnet.  |
| <b>Gateway IPv6 address</b> | <i>Available if the <b>Access point, Repeater, or Client</b> mode was selected in the Initial Configuration Wizard.</i><br>The gateway IPv6 address which is used by the router to connect to the Internet (e.g., for synchronizing the system time with an NTP server). <i>Optional.</i> |

Click the **APPLY** button.

To remove the IPv6 address, 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 the IPv6 address in the editing window.

In the **Dynamic IPv6 Addresses** section, you can configure IPv6 addresses assignment settings.

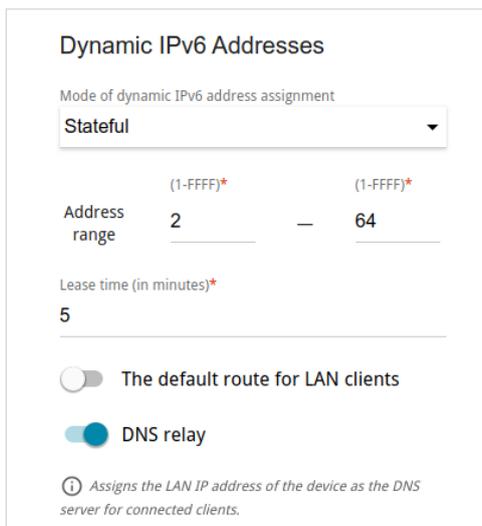


Figure 89. Configuring the local interface. The IPv6 tab. The **Dynamic IPv6 Addresses** section.

| Parameter                                      | Description  |
|--|--|
| <b>Dynamic IPv6 Addresses</b>                  |  |
| <b>Mode of dynamic IPv6 address assignment</b> | <p>Select the needed value from the drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Disable</b>: Clients' IPv6 addresses are assigned manually.</li> <li>• <b>Stateful</b>: The built-in DHCPv6 server of the router allocates addresses from the range specified in the <b>Address range</b> fields. Also when this value is selected, the <b>Static IP Addresses</b> and <b>Hosts</b> sections are displayed on the tab.</li> <li>• <b>Stateless</b>: Clients themselves configure IPv6 addresses using the prefix.</li> </ul> |
| <b>Address range</b>                           | The start and the end values for the latest hextet (16 bit) of the range of IPv6 addresses which the DHCPv6 server distributes to clients.   |
| <b>Lease time</b>                              | The lifetime of IPv6 addresses provided to clients.  |
| <b>The default route for LAN clients</b>       | Move the switch to the right to let the clients, that received IPv6 addresses or configured them using the prefix, use the router as the default IPv6 route.   |
| <b>DNS relay</b>                               | <p>Move the switch to the right so that the devices connected to the router obtain the address of the router as the DNS server address.</p> <p>Move the switch to the left so that the devices connected to the router obtain the address transmitted by the ISP or specified on the <b>Advanced / DNS</b> page as the DNS server address.</p>   |

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

In the **Static IP Addresses** section, you can specify MAC address and IPv6 address pairs (set a fixed IPv6 address in the local area network for a device with a certain MAC address). The router assigns IPv6 addresses in accordance with the specified pairs only when the **Stateful** value is selected from the **Mode of dynamic IPv6 address assignment** drop-down list in the **Dynamic IPv6 Addresses** section.

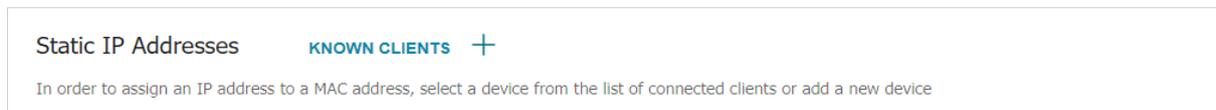


Figure 90. Configuring the local interface. The IPv6 tab. The section for creating MAC-IPv6 pairs.

To create a MAC-IPv6 pair, click the **ADD** button ( + ). In the opened window, fill in the **MAC address** field. You can choose a device connected to the router's LAN at the moment. To do this, select the relevant MAC address from the drop-down list (the field will be filled in automatically). Then in the **IP address** field, enter an IPv6 address which will be assigned to the device with the specified MAC address. In the **Hostname** field, specify a network name of the device for easier identification (*optional*). Click the **APPLY** button.

To create MAC-IPv6 pairs for the devices connected to the router at the moment, click the **KNOWN CLIENTS** 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 the settings for an existing MAC-IPv6 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-IPv6 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 pair in the editing window.

If needed, you can add your own address resource records. To do this, click the **ADD** button ( + ) in the **Hosts** section (*available if the Router or WISP Repeater mode was selected in the Initial Configuration Wizard*).

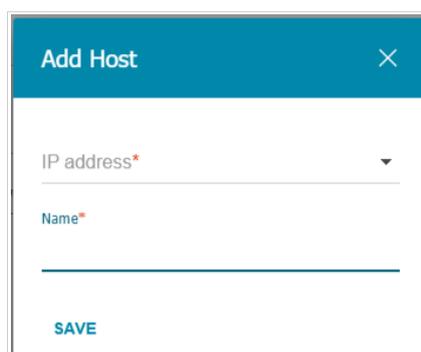


Figure 91. Configuring the local interface. The IPv6 tab. The window for adding a DNS record.

In the **IP address** field, specify a host from the internal or external network. You can choose a device connected to the router's LAN at the moment. To do this, select the relevant IPv6 address from the drop-down list (the field will be filled in automatically). In the **Name** field, specify the domain name to which the specified IPv6 address will correspond. Click the **SAVE** button.

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

To remove a record, in the **Hosts** section, 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.

## WAN Failover

On the **Connections Setup / WAN Failover** page, you can enable the WAN backup function, which provides you with uninterrupted access to the Internet. When your main connection breaks down, the router activates the backup connection; and when the main channel is recovered, the router switches to it and disconnects the reserve one.

**WAN Failover**

You can enable the WAN backup function, which provides you with uninterrupted access to the Internet. When your main connection breaks down, the router activates the backup connection; and when the main channel is recovered, the router switches to it and disconnects the reserve one.

Enable

**Connections IPv4**  
The list of available connections on order of priority.

| Connection      | Check with ping |
|-----------------|-----------------|
| pppoe_28        | On              |
| static_Internet | On              |

**Check with ping**

Interval between checks (in seconds)\*  
30

Waiting for response (in seconds)\*  
1

Number of attempts\*  
3

*Number of ping requests to the specified hosts*

**Hosts**

8.8.8.8 x

77.88.55.55 x

94.100.180.200 x

**ADD HOST**

**APPLY**

Figure 92. The **Connections Setup / WAN Failover** page.

To activate the backup function, create several WAN connections. After that go to the **Connections Setup / WAN Failover** page, move the **Enable** switch to the right.

In the **Connections IPv4** section, the existing IPv4 connections are displayed in order of their priority. The first connection on the list serves as the main connection, the others are backup connections.

To change the priority of a connection, left-click the relevant line in the table.

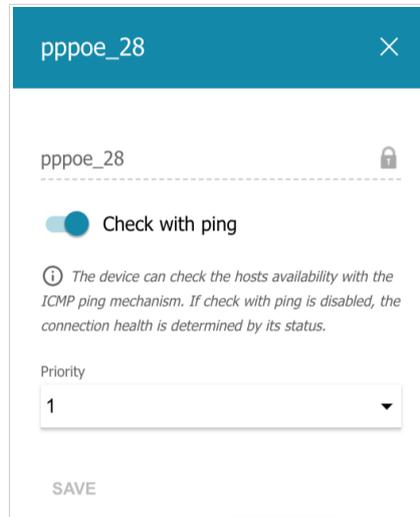


Figure 93. The window for changing the priority of a connection.

In the opened window, specify the needed parameters.

| Parameter              | Description   |
|------------------------|---|
| <b>Check with ping</b> | <p>Move the switch to the right to let the router use ICMP ping mechanism for checking the connection.</p> <p>Move the switch to the left to let the router check only the status of the connection (may be useful for unstable connections).</p> |
| <b>Priority</b>        | <p>The priority level of the connection. Level <b>1</b> is for the main connection, the others are backup connections. Select the required value from the drop-down list.</p>   |

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

In the **Check with ping** section, specify settings of checking the connection using ICMP ping mechanism.

| Parameter                      | Description   |
|--------------------------------|---|
| <b>Check with ping</b>         |   |
| <b>Interval between checks</b> | <p>A time period (in seconds) between regular checks of the hosts' availability. By default, the value <b>30</b> is specified. The value of this field should be higher than product of <b>Waiting for response</b> and <b>Number of attempts</b> fields values.</p> <p>Several ping requests are sent to check the hosts. After a successful attempt the router keeps using the main connection. After several failed attempts the next connection from the list is enabled.</p> |
| <b>Waiting for response</b>    | <p>A time period (in seconds) allocated for a response to one ping request.</p>   |
| <b>Number of attempts</b>      | <p>A number of failed attempts to check the health of a connection after which the next connection from the list is enabled.</p>  |
| <b>Hosts</b>                   | <p>External IP addresses that the router will check for availability via ICMP ping mechanism.</p> <p>Click the <b>ADD HOST</b> button, and in the line displayed, enter an IP address or leave values suggested by the router.</p> <p>To remove an IP address from the list, click the <b>Delete</b> icon (✕) in the line of the address.</p>   |

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 router and configure the basic and additional wireless networks. To configure the 2.4GHz band or 5GHz band, go to the relevant tab.

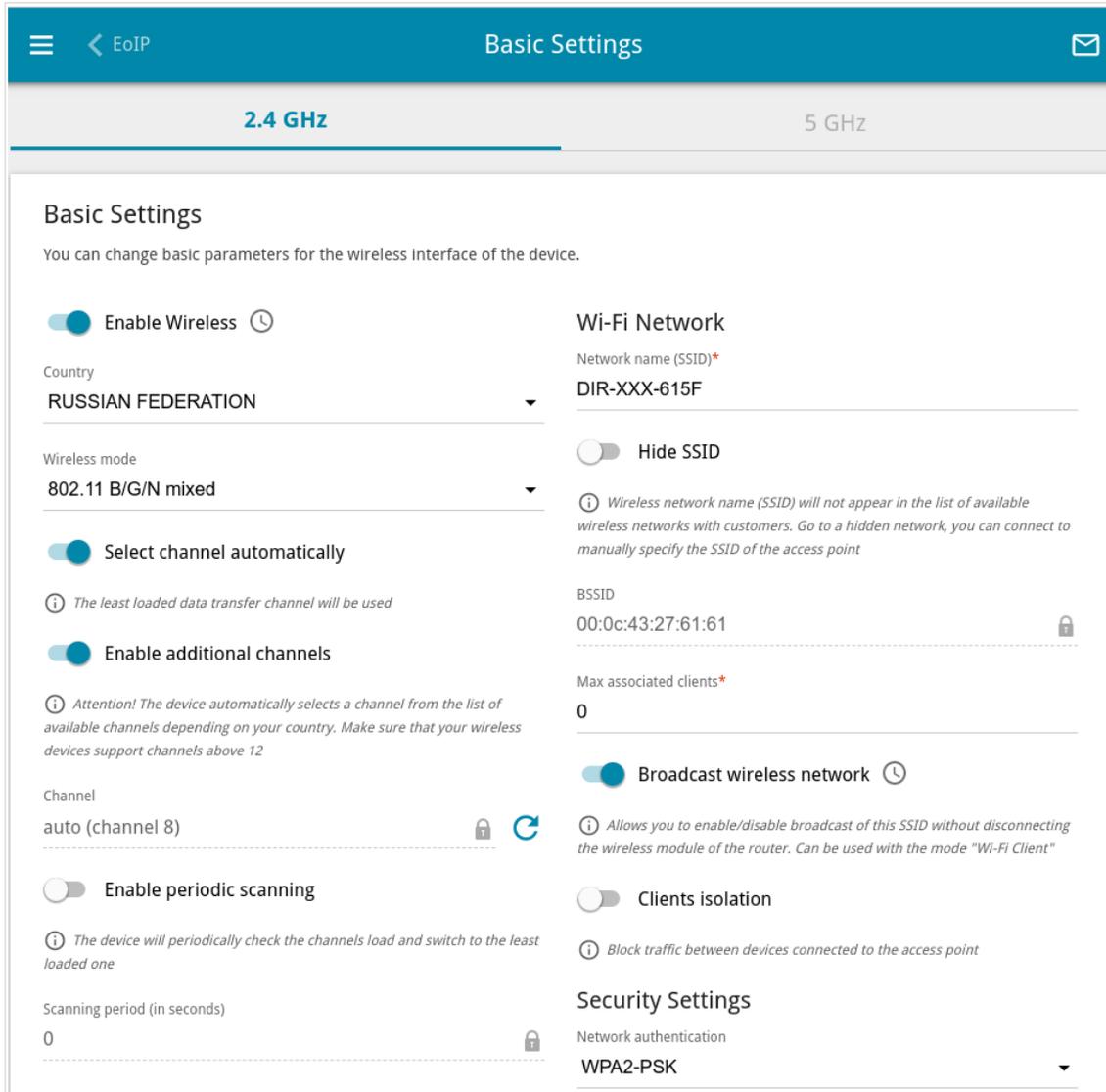


Figure 94. Basic settings of the wireless LAN in the 2.4GHz band.

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

| Parameter                                  | Description  |
|--|--|
| <p><b>Enable Wireless</b></p>              | <p>To enable Wi-Fi connection, move the switch to the right.<br/>To disable Wi-Fi connection, move the switch to the left.</p> <p>To enable/disable Wi-Fi connection on a schedule, click the <b>Set schedule</b> icon (🕒). In the opened window, from the <b>Rule</b> drop-down list, select the <b>Create rule</b> value to create a new schedule (see the <i>Schedule</i> section, page 187) or select the <b>Select an existing one</b> value to use the existing one. Existing schedules are displayed in the <b>Rule name</b> drop-down list.</p> <p>To enable Wi-Fi connection at the time specified in the schedule and disable it at the other time, select the <b>Enable wireless connection</b> value from the <b>Action</b> drop-down list and click the <b>SAVE</b> button.</p> <p>To disable Wi-Fi connection at the time specified in the schedule and enable it at the other time, select the <b>Disable wireless connection</b> value from the <b>Action</b> drop-down list and click the <b>SAVE</b> button.</p> <p>To change or delete the schedule, click the <b>Edit schedule</b> icon (🕒). In the opened window, change the parameters and click the <b>SAVE</b> button or click the <b>DELETE FROM SCHEDULE</b> button.</p> |
| <p><b>Country</b></p>                      | <p>The country you are in. Select a value from the drop-down list.</p>   |
| <p><b>Wireless mode</b></p>                | <p>Operating mode of the wireless network of the router. This parameter defines standards of the devices that will be able to use your wireless network. Select a value from the drop-down list.</p>   |
| <p><b>Select channel automatically</b></p> | <p>Move the switch to the right to let the router itself choose the channel with the least interference.</p>   |
| <p><b>Enable additional channels</b></p>   | <p>If the switch is moved to the left, the device automatically selects one of available standard channels. To use additional channels (the 12th and 13th – in the 2.4 GHz band, the 100th and higher – in the 5 GHz band), move the switch to the right.</p>  |

| Parameter                       | Description  |
|---------------------------------|--|
| <b>Channel</b>                  | <p>The wireless channel number.</p> <p>To select a channel manually, left-click; in the opened window, select a channel and click the <b>SAVE</b> button. The action is available, when the <b>Select channel automatically</b> switch is moved to the left.</p> <p>To make the router select the currently least loaded channel, click the <b>Refresh</b> icon (  ). The icon is displayed, when the <b>Select channel automatically</b> switch is moved to the right.</p> |
| <b>Enable periodic scanning</b> | <p>Move the switch to the right to let the router search for a free channel in certain periods of time. When the switch is moved to the right, the <b>Scanning period</b> field is available for editing.</p>  |
| <b>Scanning period</b>          | <p>Specify a period of time (in seconds) after which the router rescans channels.</p>  |

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

To edit the settings of the basic wireless network, in the **Wi-Fi Network** section, change the needed parameters and click the **APPLY** button.

Also you can create an additional wireless network. To do this, click the **ADD WI-FI NETWORK** button. On the opened page, specify the relevant parameters.

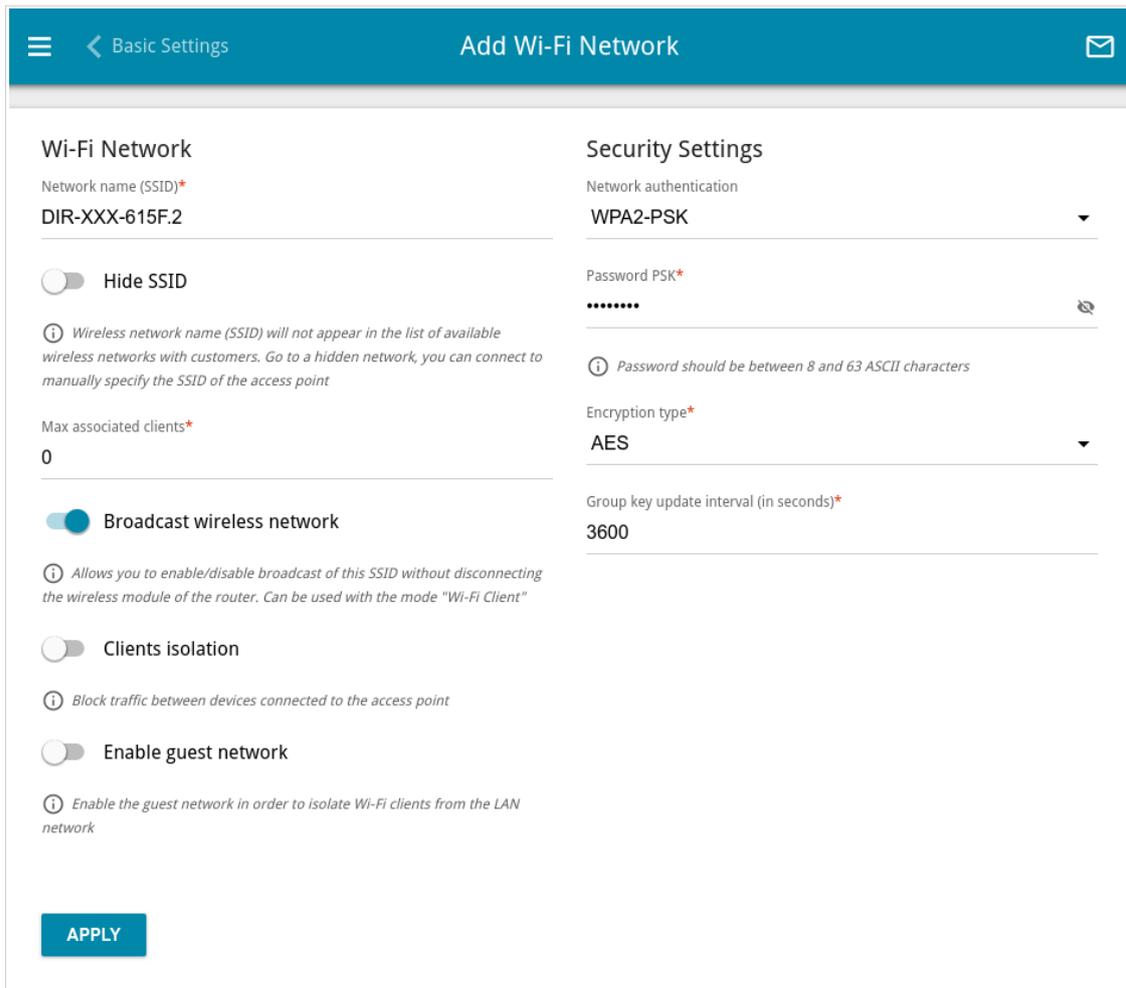


Figure 95. Creating a wireless network.

| Parameter                     | Description  |
|-------------------------------|--|
| <b>Wi-Fi Network</b>          |  |
| <b>Network name (SSID)</b>    | A name for the wireless network.   |
| <b>Hide SSID</b>              | 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.                                |
| <b>BSSID</b>                  | 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. |
| <b>Max associated clients</b> | The maximum number of devices connected to the wireless network. When the value <b>0</b> is specified, the device does not limit the number of connected clients.  |

| Parameter                                | Description  |
|--|--|
| <p><b>Broadcast wireless network</b></p> | <p>If the wireless network broadcasting is disabled, devices cannot connect to the wireless network. Upon that DIR-820 can connect to another access point as a wireless client.</p> <p>To enable/disable broadcasting on a schedule, click the <b>Set schedule</b> icon (🕒). In the opened window, from the <b>Rule</b> drop-down list, select the <b>Create rule</b> value to create a new schedule (see the <i>Schedule</i> section, page 187) or select the <b>Select an existing one</b> value to use the existing one. Existing schedules are displayed in the <b>Rule name</b> drop-down list.</p> <p>To enable broadcasting at the time specified in the schedule and disable it at the other time, select the <b>Enable wireless network broadcasting</b> value from the <b>Action</b> drop-down list and click the <b>SAVE</b> button. When the wireless connection is disabled, the device will not be able to enable broadcasting of this wireless network on schedule.</p> <p>To disable broadcasting at the time specified in the schedule and enable it at the other time, select the <b>Disable wireless network broadcasting</b> value from the <b>Action</b> drop-down list and click the <b>SAVE</b> button.</p> <p>To change or delete the schedule, click the <b>Edit schedule</b> icon (🕒). In the opened window, change the parameters and click the <b>SAVE</b> button or click the <b>DELETE FROM SCHEDULE</b> button.</p> <p>If you created an additional network, you can configure, change or delete a schedule for each network. To do this, click the icon in the line of the network.</p> |
| <p><b>Clients isolation</b></p>          | <p>Move the switch to the right to forbid wireless clients of this wireless network to communicate to each other.</p>  |
| <p><b>Enable guest network</b></p>       | <p>This function is available for the additional network. Move the switch to the right if you want the devices connected to the additional network to be isolated from the devices and resources of the router's LAN.</p>  |

In the **Security Settings** section, you can change security settings of the wireless network.

By default, the **WPA2-PSK** network authentication type of both bands of the wireless network is specified. WPS PIN from the barcode label is used as the network key.

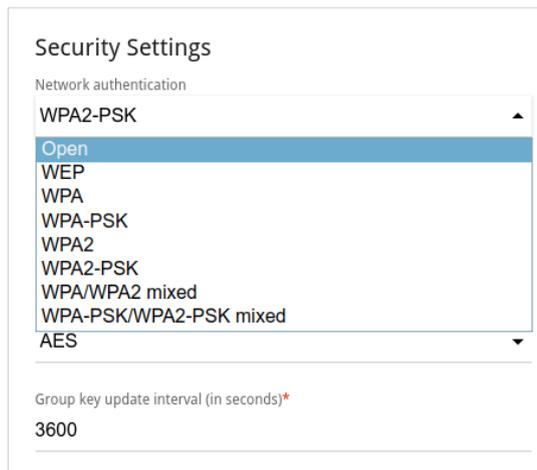


Figure 96. Network authentication types supported by the router.

The router supports the following authentication types:

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

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

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

The screenshot shows the 'Security Settings' section of a web interface. At the top, 'Network authentication' is set to 'Open'. Below this, there is a toggle switch for 'Enable encryption WEP' which is turned on. The 'Default key ID' is set to '1'. A note below states: 'It is recommended to use the first key by default to ensure compatibility with many devices.' There is also a toggle for 'Encryption key WEP as HEX' which is turned off. A note below states: 'Length of WEP key should be 5 or 13 characters.' At the bottom, there are four input fields for 'Encryption key 1\*', 'Encryption key 2\*', 'Encryption key 3\*', and 'Encryption key 4\*', each with a 'Show' icon (an eye with a slash) to its right.

Figure 97. The **Open** value is selected from the **Network authentication** drop-down list.

| Parameter                        | Description   |
|----------------------------------|---|
| <b>Enable encryption WEP</b>     | For <b>Open</b> authentication type only.<br>To activate WEP encryption, move the switch to the right. Upon that the <b>Default key ID</b> drop-down list, the <b>Encryption key WEP as HEX</b> switch, and four <b>Encryption key</b> fields are displayed on the page.                          |
| <b>Default key ID</b>            | The number of the key (from first to fourth) which will be used for WEP encryption.   |
| <b>Encryption key WEP as HEX</b> | Move the switch to the right to set a hexadecimal number as a key for encryption.   |
| <b>Encryption key (1-4)</b>      | Keys for WEP encryption. The router uses the key selected from the <b>Default key ID</b> drop-down list. It is required to specify all the fields. Click the <b>Show</b> icon (  ) to display the entered key. |

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

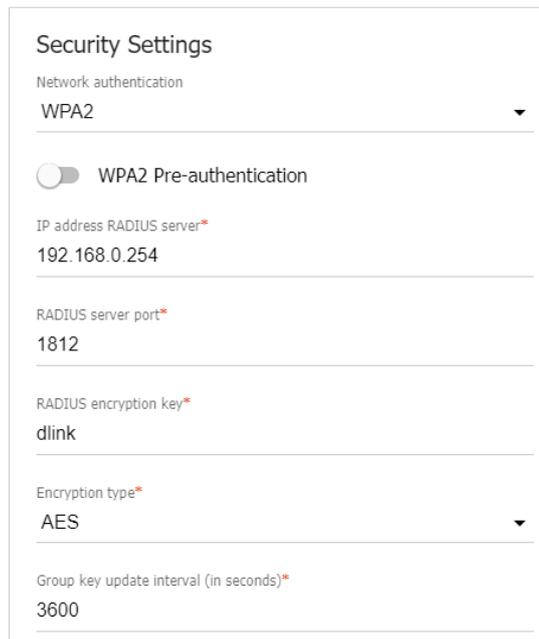
The screenshot shows the 'Security Settings' section of a web interface. It includes a 'Network authentication' dropdown menu with 'WPA2-PSK' selected. Below it is a 'Password PSK\*' field with a masked password and a 'Show' icon. A tooltip indicates the password should be between 8 and 63 ASCII characters. The 'Encryption type\*' dropdown is set to 'AES'. At the bottom, the 'Group key update interval (in seconds)\*' is set to '3600'.

Figure 98. The **WPA2-PSK** value is selected from the **Network authentication** drop-down list.

| Parameter                        | Description  |
|----------------------------------|--|
| <b>Password PSK</b>              | 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. <sup>3</sup> Click the <b>Show</b> icon (🔍) to display the entered password. |
| <b>Encryption type</b>           | An encryption method: <b>TKIP</b> , <b>AES</b> , or <b>TKIP+AES</b> .  |
| <b>Group key update interval</b> | The time period (in seconds), at the end of which a new key for WPA encryption is generated. When the value <b>0</b> is specified for this field, the key is not renewed.  |

<sup>3</sup> 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' section of a web interface. It features a 'Network authentication' dropdown menu with 'WPA2' selected. Below this is a 'WPA2 Pre-authentication' toggle switch. Further down are input fields for 'IP address RADIUS server\*' (192.168.0.254), 'RADIUS server port\*' (1812), 'RADIUS encryption key\*' (dlink), 'Encryption type\*' (AES), and 'Group key update interval (in seconds)\*' (3600).

Figure 99. The **WPA2** value is selected from the **Network authentication** drop-down list.

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

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

To edit the basic or additional wireless network, left-click the relevant line in the table. On the opened page, change the needed parameters and click the **APPLY** button.

To remove the additional network, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ). Then click the **APPLY** button.

## Client Management

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

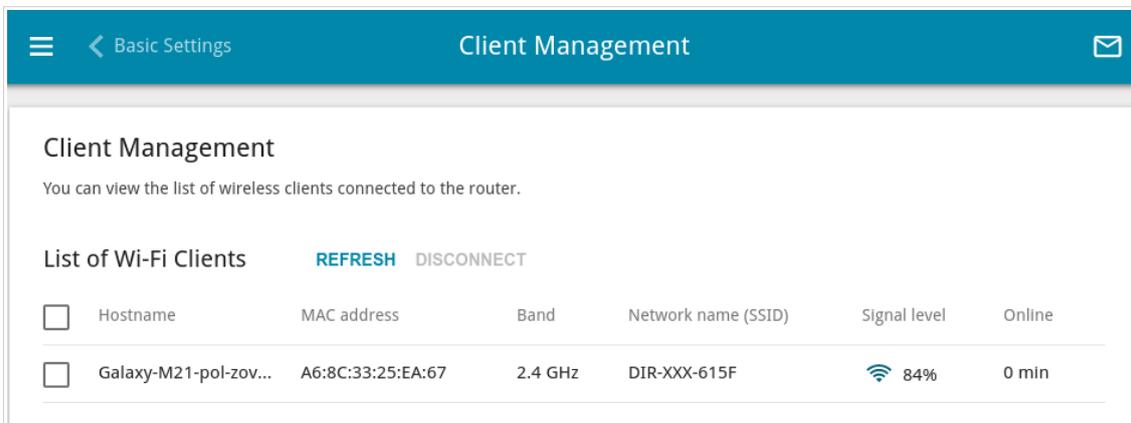


Figure 100. The page for managing the wireless clients.

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.

To view the latest data on a connected device, left-click the line containing the MAC address of this device.

## 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 router.

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

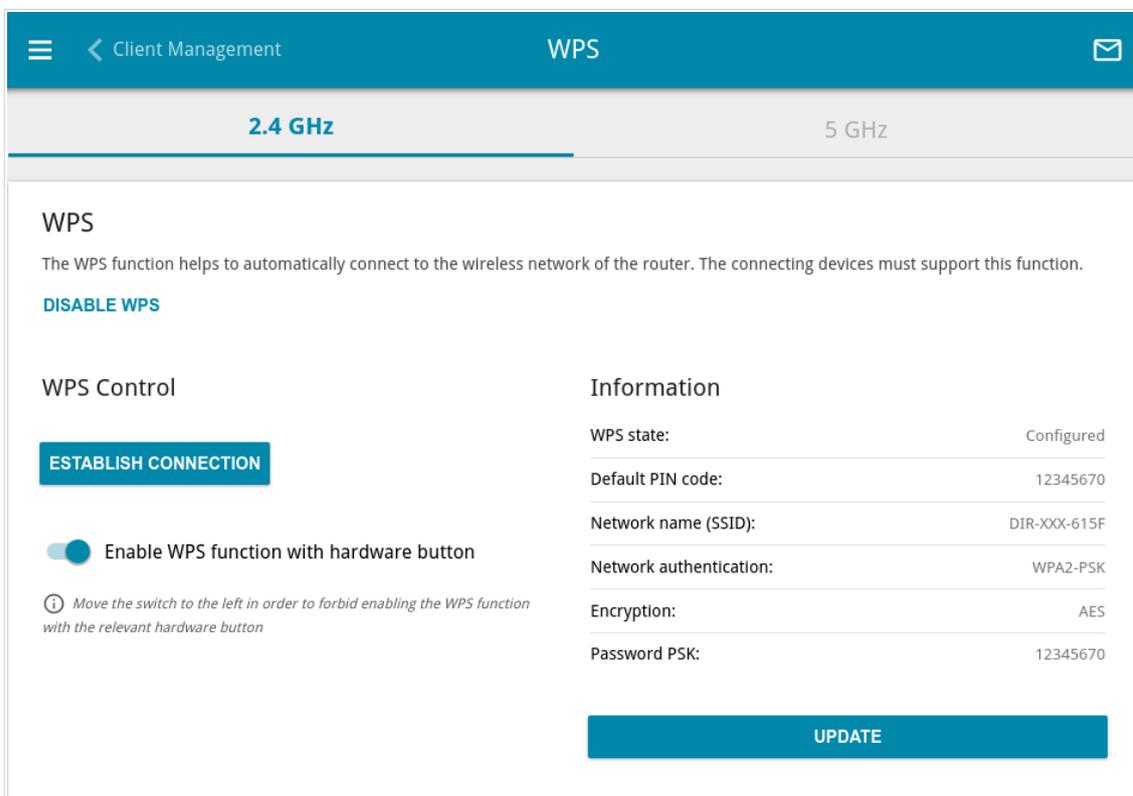


Figure 101. The page for configuring the WPS function.

You can activate the WPS function via the web-based interface or the hardware **WPS/RST** button on the cover of the device.

To activate the WPS function via the hardware button, move the **Enable WPS function with hardware button** switch to the right on the tabs of both bands. Then, with the device turned on, push the **WPS/RST** button and release it. The **WPS** LED should start blinking fast. In addition, upon pressing the button, the wireless interfaces of the device are enabled if they were disabled before.

If you want to disable activating the WPS function via the hardware button, on the tabs of both bands, move the **Enable WPS function with hardware button** switch to the left and make sure that the WPS function is not activated via the web-based interface.

To activate the WPS function via the web-based interface, on the tab of the relevant band, click the **ENABLE WPS** button.

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

| Parameter                     | Description  |
|-------------------------------|--|
| <b>WPS state</b>              | The state of the WPS function: <ul style="list-style-type: none"> <li>• <b>Configured</b> (all needed settings are specified; these settings will be used upon establishing the wireless connection)</li> <li>• <b>Unconfigured</b> (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).</li> </ul> |
| <b>Default PIN code</b>       | The PIN code of the router. This parameter is used when connecting the router to a registrar to set the parameters of the WPS function.  |
| <b>Network name (SSID)</b>    | The name of the router's wireless network.   |
| <b>Network authentication</b> | The network authentication type specified for the wireless network.  |
| <b>Encryption</b>             | The encryption type specified for the wireless network.  |
| <b>Password PSK</b>           | The encryption password specified for the wireless network.  |
| <b>UPDATE</b>                 | Click the button to update the data on the page.   |

## ***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. Click the **ENABLE WPS** button.
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 router'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 router.

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

1. Click the **ENABLE WPS** button.
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 router'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 router.

## ***Using WPS Function without Web-based Interface***

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

1. Specify relevant security settings for the wireless network of the router.
2. Make sure that the **Enable WPS function with hardware button** switch is moved to the right on the tabs of both bands.
3. Click the **ENABLE WPS** button.
4. Close the web-based interface (click the **Logout** line of the menu).

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

1. Select the PBC method in the software of the wireless device that you want to connect to the router'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/RST** button of the router and release. The **WPS** LED should start blinking fast.

## WMM

On the **Wi-Fi / WMM** page, you can enable the Wi-Fi Multimedia function. To configure the 2.4GHz band or 5GHz band, go to the relevant tab.

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.

Select the needed action from the **Work mode** drop-down list to configure the WMM function:

- **Auto:** The settings of the WMM function are configured automatically (the value is specified by default).
- **Manual:** The settings of the WMM function are configured manually. When this value is selected, the **Access Point** and **Station** sections are displayed on the page.

The screenshot shows the WMM configuration page. At the top, there is a navigation bar with a back arrow, 'WPS', the title 'WMM', and a mail icon. Below the navigation bar, there are two tabs: '2.4 GHz' (selected) and '5 GHz'. The main content area is titled 'Wi-Fi Multimedia' and includes a descriptive paragraph: 'The mechanism for improving Wi-Fi network performance. It is recommended for users not to change the specified values'. Below this, there is a 'Work mode' dropdown menu currently set to 'Manual'. Underneath, there are two tables: 'Access Point' and 'Station'. Each table has columns for AC, AIFSN, CWMin, CWMax, TXOP, ACM, and ACK. The 'Access Point' table shows settings for BE, BK, VI, and VO. The 'Station' table shows settings for BE, BK, VI, and VO.

| Access Point |       |       |       |      |     |     | Station |       |       |       |      |     |
|--------------|-------|-------|-------|------|-----|-----|---------|-------|-------|-------|------|-----|
| AC           | AIFSN | CWMin | CWMax | TXOP | ACM | ACK | AC      | AIFSN | CWMin | CWMax | TXOP | ACM |
| BE           | 3     | 15    | 63    | 0    | off | off | BE      | 3     | 15    | 1023  | 0    | off |
| BK           | 7     | 31    | 1023  | 0    | off | off | BK      | 7     | 15    | 1023  | 0    | off |
| VI           | 2     | 7     | 15    | 94   | off | off | VI      | 2     | 7     | 15    | 94   | off |
| VO           | 2     | 3     | 7     | 47   | off | off | VO      | 2     | 3     | 7     | 47   | off |

Figure 102. The page for configuring the WMM function.

**!** All needed settings for the WMM function are specified in the device's system. Changing parameters manually may negatively affect your WLAN!

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 router 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.

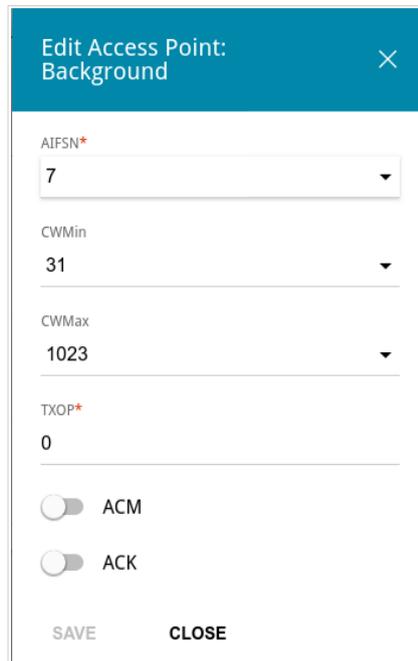


Figure 103. The window for changing parameters of the WMM function.

| Parameter          | Description  |
|--------------------|--|
| <b>AIFSN</b>       | <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.  |
| <b>CWMin/CWMax</b> | <i>Contention Window Minimum/Contention Window Maximum.</i> Both fields influence time delays for the relevant Access Category. The <b>CWMax</b> field value should not be lower, than the <b>CWMin</b> field value. The lower the difference between the <b>CWMax</b> field value and the <b>CWMin</b> field value, the higher is the Access Category priority. |
| <b>TXOP</b>        | <i>Transmission Opportunity.</i> The higher the value, the higher is the Access Category priority.   |
| <b>ACM</b>         | <i>Admission Control Mandatory.</i><br>If the switch is moved to the right, the device cannot use the relevant Access Category.  |

| Parameter  | Description  |
|------------|--|
| <b>ACK</b> | <i>Acknowledgment.</i> Answering response requests while transmitting. Displayed only in the <b>Access Point</b> section.<br>If the switch is moved to the left, the router answers requests.<br>If the switch is moved to the right, the router does not answer requests. |

Click the **SAVE** button.

## Client

On the **Wi-Fi / Client** page, you can configure the router as a client to connect to a wireless access point or to a WISP. To configure the 2.4GHz band or 5GHz band, go to the relevant tab.

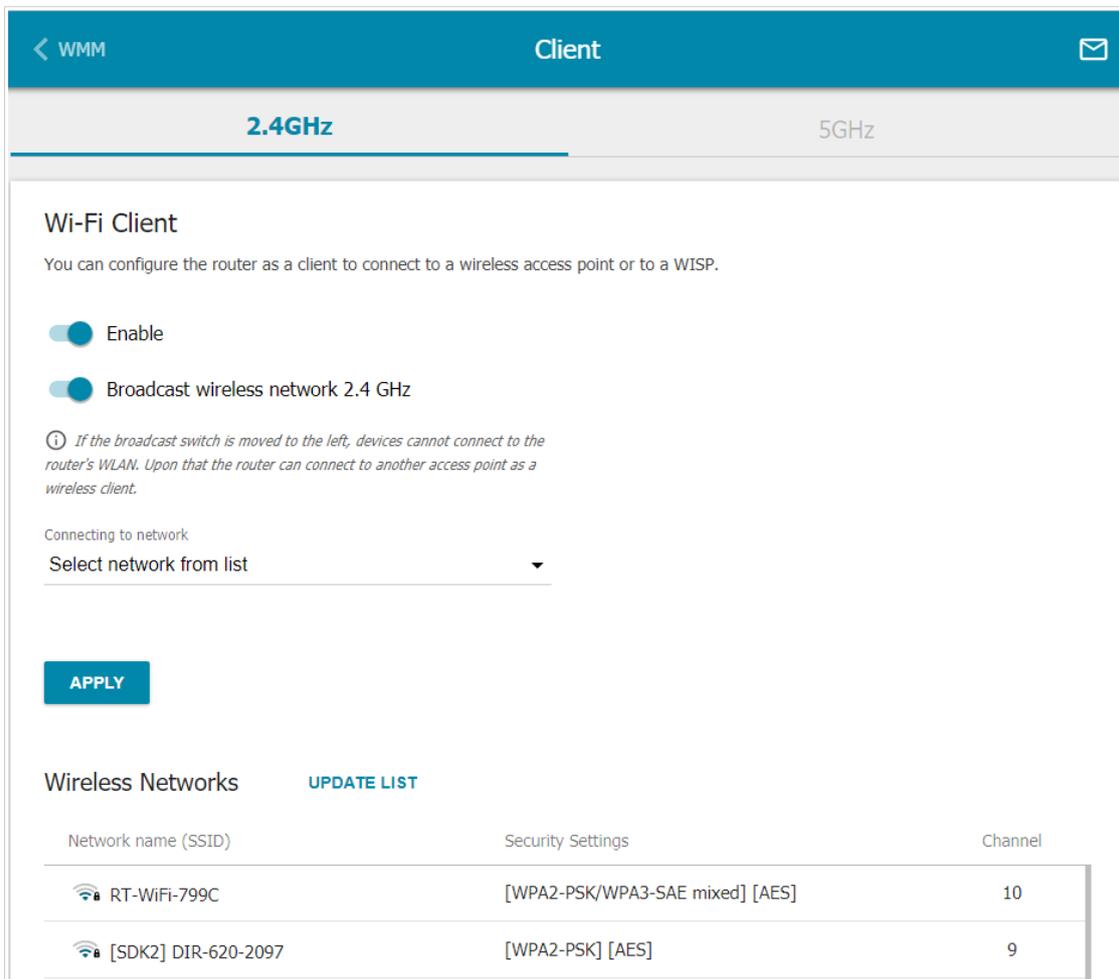


Figure 104. The page for configuring the client mode.

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

| Parameter  | Description   |
|--|---|
| <b>Broadcast wireless network 2.4 GHz / Broadcast wireless network 5 GHz</b> | If the switch is moved to the left, devices cannot connect to the router's WLAN. Upon that the router can connect to another access point as a wireless client. |
| <b>Connecting to network</b>   | 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 router 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** or **WEP** authentication type is selected, the following settings are displayed on the page:

| Parameter                        | Description   |
|----------------------------------|---|
| <b>Enable encryption WEP</b>     | <i>For <b>Open</b> authentication type only.</i><br>To activate WEP encryption, move the switch to the right. Upon that the <b>Default key ID</b> drop-down list, the <b>Encryption key WEP as HEX</b> switch, and four <b>Encryption key</b> fields are displayed on the page. |
| <b>Default key ID</b>            | The number of the key (from first to fourth) which will be used for WEP encryption.   |
| <b>Encryption key WEP as HEX</b> | Move the switch to the right to set a hexadecimal number as a key for encryption.   |
| <b>Encryption key (1-4)</b>      | Keys for WEP encryption. The router uses the key selected from the <b>Default key ID</b> drop-down list. It is required to specify all the fields. Click the <b>Show</b> icon (🔍) to display the entered key.   |

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

| Parameter              | Description   |
|------------------------|---|
| <b>Password PSK</b>    | A password for WPA encryption. Click the <b>Show</b> icon (🔍) to display the entered key. |
| <b>Encryption type</b> | An encryption method: <b>TKIP</b> , <b>AES</b> , or <b>TKIP+AES</b> .                     |

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

When connecting to a wireless access point, the wireless channel of DIR-820 will switch to the channel of the access point to which you have connected.

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

If you want to connect to the WISP network, after configuring the device as a client, you need to create a WAN connection with relevant parameters for the **WiFiClient\_2GHz** interface in the 2.4GHz band or for the **WiFiClient\_5GHz** interface in the 5GHz band.

## Additional

On page of the **Wi-Fi / Additional** section, you can define additional parameters for the WLAN of the router. To configure the 2.4GHz band or 5GHz band, go to the relevant tab.

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

The screenshot shows the 'Additional' settings page for the 2.4 GHz band. The page is titled 'Wi-Fi Additional Settings' and includes a sub-header: 'You can define additional parameters for the WLAN of the router.' The settings are organized into two columns. The left column includes: Bandwidth (Auto), Autonegotiation 20/40 (Coexistence) (disabled), TX power (in percent) (100), Drop multicast (disabled), Enable TX Beamforming (checked), STBC (checked), and Enable 802.11k (disabled). The right column includes: B/G protection (Auto), Short GI (Enable), Beacon period (in milliseconds)\* (100), RTS threshold (in bytes)\* (2347), Frag threshold (in bytes)\* (2346), DTIM period (in beacon frames)\* (1), and Station Keep Alive (in seconds)\* (0). An 'APPLY' button is located at the bottom left of the settings area.

Figure 105. Additional settings of the WLAN.

The following fields are available on the page:

| Parameter                                  | Description   |
|--|---|
| <b>Bandwidth</b>                           | <p>The channel bandwidth for 802.11n standard in the 2.4GHz band (the <b>2.4 GHz</b> tab).</p> <ul style="list-style-type: none"> <li>• <b>20 MHz:</b> 802.11n clients operate at 20MHz channels.</li> <li>• <b>20/40 MHz:</b> 802.11n clients operate at 20MHz or 40MHz channels.</li> <li>• <b>Auto:</b> The router automatically chooses the most suitable channel bandwidth for 802.11n clients.</li> </ul> <p>The channel bandwidth for 802.11n and 802.11ac standards in 5GHz band (the <b>5 GHz</b> tab).</p> <ul style="list-style-type: none"> <li>• <b>20 MHz:</b> 802.11n and 802.11ac clients operate at 20MHz channels.</li> <li>• <b>20/40 MHz:</b> 802.11n and 802.11ac clients operate at 20MHz or 40MHz channels.</li> <li>• <b>20/40/80 MHz:</b> 802.11ac clients operate at 20MHz, 40MHz, or 80MHz channels.</li> <li>• <b>Auto:</b> The router automatically chooses the most suitable channel bandwidth for 802.11n and 802.11ac clients.</li> </ul> |
| <b>Autonegotiation 20/40 (Coexistence)</b> | <p><i>Available on the <b>2.4 GHz</b> tab.</i></p> <p>Move the switch to the right to let the router to automatically choose the most suitable channel bandwidth (20MHz or 40MHz) for the connected devices (this setting can substantially lower the data transfer rate of your wireless network). The switch is displayed when the <b>20/40 MHz</b> or <b>Auto</b> value is selected from the <b>Bandwidth</b> drop-down list.</p>  |
| <b>TX power</b>                            | <p>The transmit power (in percentage terms) of the router.</p>  |
| <b>Enable DFS</b>                          | <p><i>Available on the <b>5 GHz</b> tab.</i></p> <p>Move the switch to the right to enable the DFS (<i>Dynamic Frequency Selection</i>) mechanism. Upon that the router uses the channels at which radars and other mobile or stationary radio systems can operate, but switches to other channels if these devices require this. In order to use the DFS mechanism, the automatic channel selection should be enabled (on the <b>Wi-Fi / Basic Settings</b> page).</p> <p>Move the switch to the left not to let the router use the channels at which radars and other mobile or stationary radio systems can operate.</p>   |

| Parameter                    | Description   |
|------------------------------|---|
| <b>Drop multicast</b>        | <p>Move the switch to the right to disable multicasting for the router's WLAN. Move the switch to the left to enable multicasting from the WAN connection selected on the <b>Advanced / IGMP</b> page. If the switch is moved to the right, the device will not be available by the domain name for Wi-Fi clients.</p>  |
| <b>Enable TX Beamforming</b> | <p><i>Available on the <b>2.4 GHz</b> tab.</i></p> <p>TX Beamforming is the signal processing/directing technique which helps to support a high enough transfer rate in the areas with difficult conditions for the signal propagation.</p> <p>Move the switch to the right to improve the signal quality.</p>  |
| <b>STBC</b>                  | <p>The STBC (<i>Space-time block coding</i>) technique allows increasing data transfer reliability even for portable devices equipped with poor antennas (smartphones, pads, etc.) due to using several data streams and processing several versions or received data.</p> <p>Move the switch to the right if you need to use the STBC technique.</p>   |
| <b>Enable 802.11k</b>        | <p>802.11k standard allows faster roaming of clients between access points within the same network. Clients supporting 802.11k standard can request a list of neighbor access points with their signal levels and Wi-Fi channel numbers. The device does not need to probe all of the available channels, but selects an access point to roam to from the list.</p> <p>Move the switch to the right if you need to use 802.11k standard.</p>  |
| <b>Enable 802.11v</b>        | <p>802.11v roaming allows improving the wireless client load balancing.</p> <p>If the wireless access point supports 802.11v standard, then with a large number of devices connected to this point, a request may be sent to some clients to switch to a less loaded point with the same network parameters or to transfer from a loaded band to a freer band (in case the SSID and security settings are the same in both frequency bands) to improve operation of each client. The request is advisory, upon that the device does not forcibly disconnect clients.</p> <p>Move the switch to the right if you need to use 802.11v standard.</p> <p>The switch is displayed if the <b>Enable 802.11k</b> switch is moved to the right.</p> |

| Parameter                 | Description   |
|---------------------------|---|
| <b>B/G protection</b>     | <p><i>Available on the <b>2.4 GHz</b> tab.</i></p> <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> <ul style="list-style-type: none"> <li>• <b>Auto:</b> 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).</li> <li>• <b>Always On:</b> The protection function is always enabled (this setting can substantially lower the efficiency of your wireless network).</li> <li>• <b>Always Off:</b> The protection function is always disabled.</li> </ul> |
| <b>Short GI</b>           | <p>Guard interval (in nanoseconds). This parameter defines the interval between symbols transmitted when the router is communicating to wireless devices.</p> <ul style="list-style-type: none"> <li>• <b>Enable:</b> The router uses the 400 ns short guard interval. Only for the wireless network operating modes which support 802.11n and 802.11ac standards (see the value of the <b>Wireless mode</b> drop-down list on the <b>Wi-Fi / Basic Settings</b> page).</li> <li>• <b>Disable:</b> The router uses the 800 ns standard guard interval.</li> </ul>   |
| <b>Beacon period</b>      | <p>The time interval (in milliseconds) between packets sent to synchronize the wireless network.</p>  |
| <b>RTS threshold</b>      | <p>The minimum size (in bytes) of a packet for which an RTS frame is transmitted.</p>   |
| <b>Frag threshold</b>     | <p>The maximum size (in bytes) of a non-fragmented packet. Larger packets are fragmented (divided).</p>   |
| <b>DTIM period</b>        | <p>The number of beacon frames between sending DTIM messages (messages notifying on broadcast or multicast transmission).</p>   |
| <b>Station Keep Alive</b> | <p>The time interval (in seconds) between keep alive checks of wireless devices from your WLAN. When the value <b>0</b> 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.

**!** It is recommended to configure the Wi-Fi MAC filter through a wired connection to DIR-820.

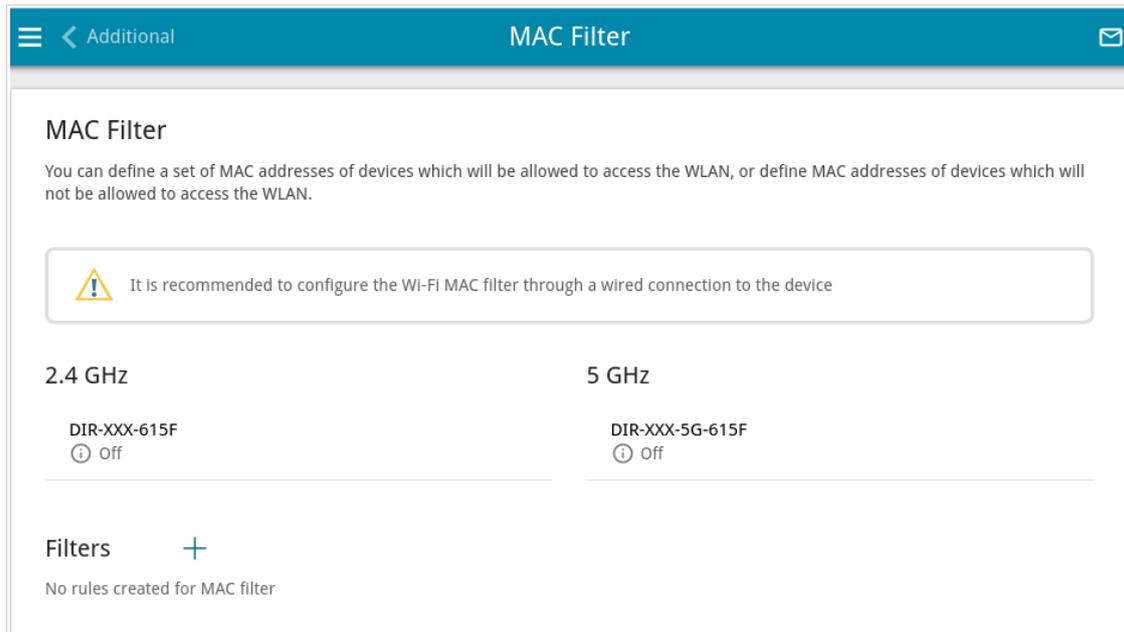


Figure 106. The page for configuring the MAC filter for the wireless network.

By default, the Wi-Fi MAC filter is disabled.

To configure the MAC filter, first you need to create rules (specify MAC addresses of devices for which the specified filtering modes will be applied). To do this, click the **ADD** button ( **+** ).

Figure 107. The window for adding a rule for the MAC filter.

You can specify the following parameters:

| Parameter             | Description  |
|-----------------------|--|
| <b>Frequency band</b> | From the drop-down list, select a band of the wireless network.  |
| <b>SSID</b>           | A wireless network to which the rule will be applied. Select the needed value from the drop-down list.       |
| <b>MAC address</b>    | In the field, enter the MAC address to which the selected filtering mode will be applied.                    |
| <b>Hostname</b>       | The name of the device for easier identification ( <i>optional</i> ). You can specify any name.              |
| <b>Enable</b>         | If the switch is moved to the right, the rule is active.<br>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 (  ).

After creating the rules you need to configure the filtering modes.

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 section corresponding to the band (**2.4 GHz** or **5 GHz**), 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.

To set a schedule for the MAC filter rule, click the **Set schedule** icon (🕒) in the line corresponding to this rule. In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the MAC filter rule at the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the MAC filter rule at the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and click the **SAVE** button.

To change or delete the schedule for a rule, click the **Edit schedule** icon (🕒) in the line corresponding to this rule. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** button.

## Roaming

On the **Wi-Fi / Roaming** page, you can enable the function of smart adjustment of Wi-Fi clients. This function is designed for wireless networks based on several access points or routers. If the function is enabled for all access points (routers) which establish a wireless network, then wireless clients will always connect to the device with the highest signal level.

The screenshot shows the 'Smart Adjustment' configuration page. At the top, there is a navigation bar with a back arrow labeled 'MAC Filter', the title 'Smart Adjustment', and an envelope icon. Below the navigation bar, the page title is 'Smart Adjustment of Wi-Fi Clients'. A descriptive paragraph explains the function: 'Smart adjustment of Wi-Fi clients is designed for wireless networks based on several access points or routers. If the function is enabled for all access points (routers) which establish a wireless network, then wireless clients will always connect to the device with the highest signal level. For proper operation of the function, it is recommended to specify the same parameters of the WLAN (SSID, authentication type, and password) for all devices.' Below this, the status is set to 'DISABLE'. There are two columns of settings. The left column includes: 'Port\*' (7890), '2.4 GHz' settings (Maximum time of storing data: 60, Minimum level of connection quality: 60, Dead zone: 15, Threshold value of connection quality: 40), and an 'APPLY' button. The right column includes: 'Use multicast for service data exchange' (unchecked), a note 'Select the checkbox if APs are located in different subnets', '5 GHz' settings (Maximum time of storing data: 60, Minimum level of connection quality: 60, Dead zone: 15, Threshold value of connection quality: 40).

Figure 108. The **Wi-Fi / Roaming** page.

To enable the function, click the **ENABLE** button. Upon that the following settings are available on the page.

| Parameter                                      | Description  |
|--|--|
| <b>Port</b>                                    | The number of the port used for data exchange between access points (routers).   |
| <b>Use multicast for service data exchange</b> | Move the switch to the right in order to use multicast traffic for service data exchange between access points (routers). This setting is needed if the devices which support the smart adjustment function are located in different subnets. If the switch is moved to the right, the <b>Multicast TTL</b> and <b>Multicast group address</b> fields are displayed on the page.<br><br>If the switch is moved to the left, broadcast traffic is used for service data exchange. |
| <b>Multicast TTL</b>                           | Specify the TTL ( <i>Time to live</i> ) parameter value.   |
| <b>Multicast group address</b>                 | Specify the address of the multicast group (from the subnet 239.255.0.0/16).   |
| <b>2.4 GHz / 5 GHz</b>                         |  |
| <b>Maximum time of storing data</b>            | The maximum time period (in seconds) during which the access point (router) stores data on the signal strength of the client located on its coverage area.   |
| <b>Minimum level of connection quality</b>     | The signal strength upon which the access point (router) starts scanning other devices in order to find a device with a higher signal level.   |
| <b>Dead zone</b>                               | This parameter is used for calculation of the signal strength upon which the smart adjustment function goes off. If the signal strength provided by another device is less than the sum of the <b>Minimum level of connection quality</b> field value and the <b>Dead zone</b> field value, then the client disconnects from the access point (router). You can specify the values from <b>-50%</b> to <b>+50%</b> .   |
| <b>Threshold value of connection quality</b>   | The signal strength upon which the access point (router) disconnects the client from its wireless network regardless of the signal levels of other devices. This value should not be greater than the value specified in the field <b>Minimum level of connection quality</b> .  |

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

To disable the function of smart adjustment of Wi-Fi clients, click the **DISABLE** button.

## ***Advanced***

In this menu you can configure advanced settings of the router:

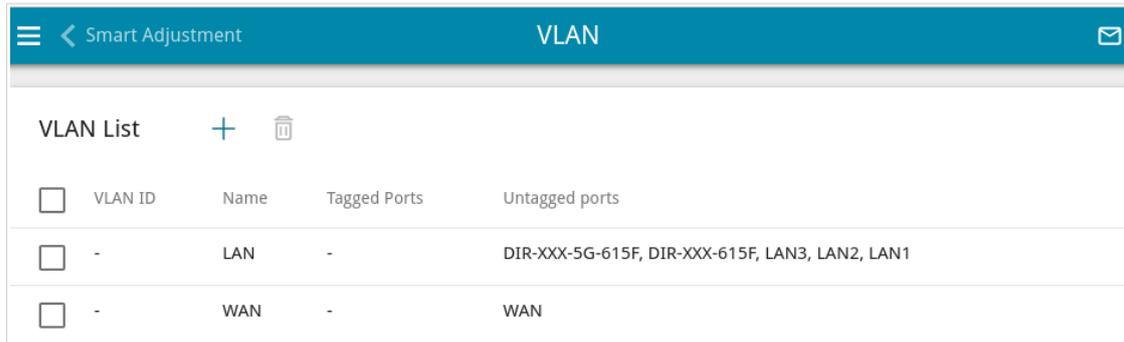
- create or edit VLANs
- use LAN ports of the router as additional WAN ports and also use the WAN port as a LAN port
- enable and configure the SNMP agent of the router
- add name servers
- configure a DDNS service
- configure autonegotiation or manually configure speed and duplex mode for each Ethernet port of the router
- configure notifications on the reason of the Internet connection failure
- define static routes
- configure TR-069 client
- enable the UPnP IGD protocol
- enable the built-in UDPXY application for the router
- allow the router to use IGMP
- allow the router to use RTSP, enable the SIP ALG, the PPPoE/PPTP/L2TP/IPsec pass through functions for the router.

## VLAN

On the **Advanced / VLAN** page, you can edit existing and create new virtual networks (VLAN), e.g., for distinguishing traffic or specifying additional WAN interfaces.

By default, 2 VLANs are created in the router's system.

- **LAN:** For the LAN interface, it includes LAN ports and Wi-Fi networks. You cannot delete this VLAN.
- **WAN:** For the WAN interface; it includes the **WAN** port. You can edit or delete this VLAN.



| <input type="checkbox"/> | VLAN ID | Name | Tagged Ports | Untagged ports                                  |
|--------------------------|---------|------|--------------|---|
| <input type="checkbox"/> | -       | LAN  | -            | DIR-XXX-5G-615F, DIR-XXX-615F, LAN3, LAN2, LAN1 |
| <input type="checkbox"/> | -       | WAN  | -            | WAN   |

Figure 109. The **Advanced / VLAN** page.

In order to add untagged LAN ports or available Wi-Fi networks to an existing or new VLAN, first you need to exclude them from the **LAN** network on this page. To do this, select the **LAN** line. On the opened page, from the **Type** drop-down list of the element corresponding to the relevant LAN port or Wi-Fi network, select the **Excluded** value and click the **APPLY** button.

To create a new VLAN, click the **ADD** button ( ).

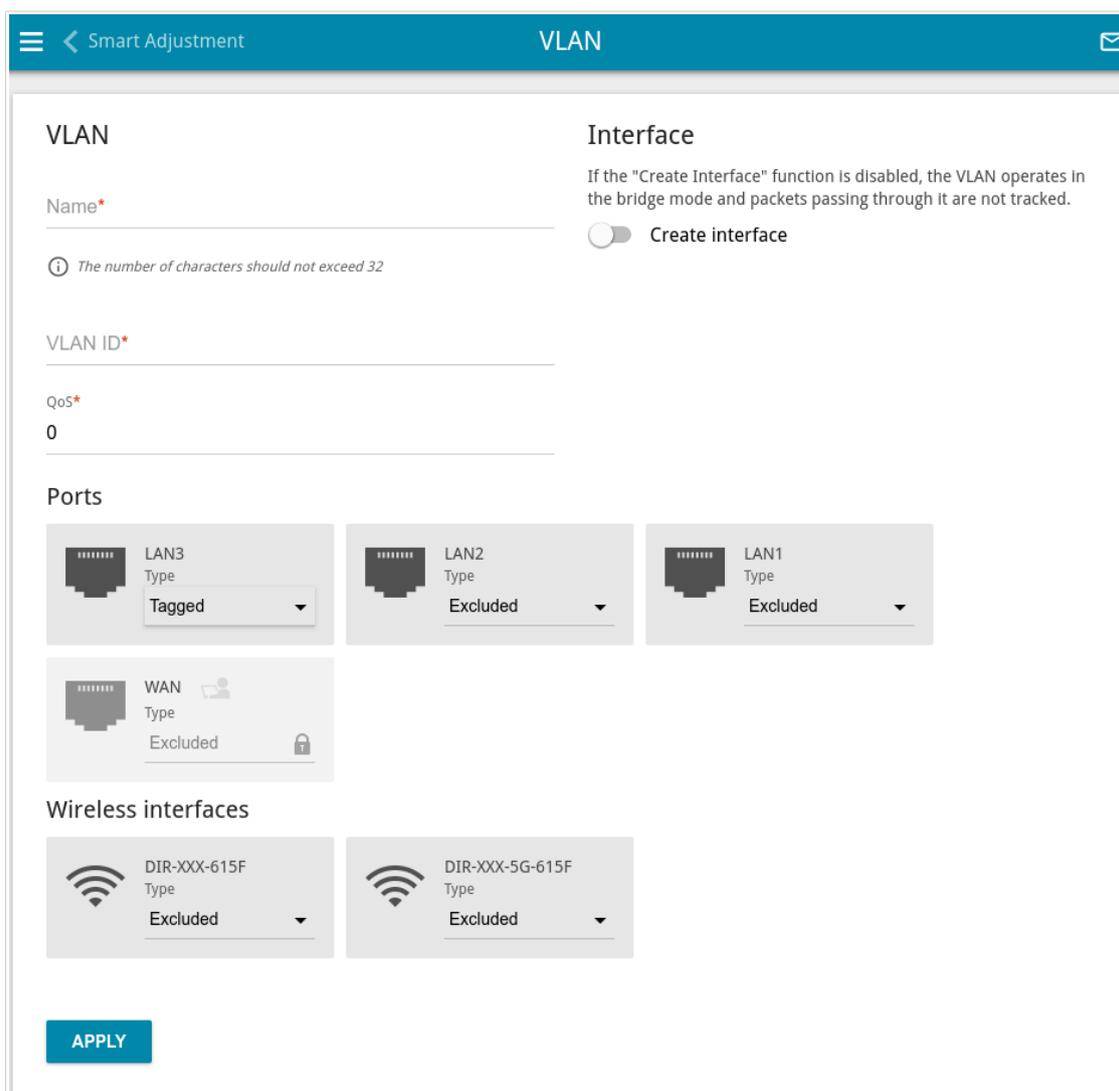


Figure 110. The page for adding a VLAN.

You can specify the following parameters:

| Parameter               | Description   |
|-------------------------|---|
| <b>Name</b>             | A name for the VLAN for easier identification.  |
| <b>VLAN ID</b>          | An identifier of the VLAN.  |
| <b>QoS</b>              | A priority tag for the transmitted traffic.   |
| <b>Create interface</b> | <p>Move the switch to the right to create an interface that can be used for creating WAN connections.</p> <p>Move the switch to the left for the VLAN to work in the bridge mode. This mode is mostly used to connect IPTV set-top boxes.</p> |

| Parameter                  | Description   |
|----------------------------|---|
| <b>Ports</b>               | Select a type for each port included in the VLAN. <ul style="list-style-type: none"> <li>• <b>Untagged</b>: Untagged traffic will be transmitted through the specified port.</li> <li>• <b>Tagged</b>: Tagged traffic will be transmitted through the specified port. If at least one port of this type is included to the VLAN, it is required to fill in the <b>VLAN ID</b> and <b>QoS</b> fields.</li> </ul> Leave the <b>Excluded</b> value for the ports not included in the VLAN. |
| <b>Wireless interfaces</b> | Select the <b>Untagged</b> value for each Wi-Fi interface included in the VLAN.<br>Leave the <b>Excluded</b> value for the Wi-Fi interfaces not included in the VLAN.   |

Click the **APPLY** button.

To edit an existing VLAN, select the relevant line in the table. On the page displayed, change the parameters and click the **APPLY** button.

To remove an existing VLAN, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

## WAN Assignment

On the **Advanced / WAN assignment** page, you can use LAN ports of the router as additional WAN ports and also use the WAN port as a LAN port.

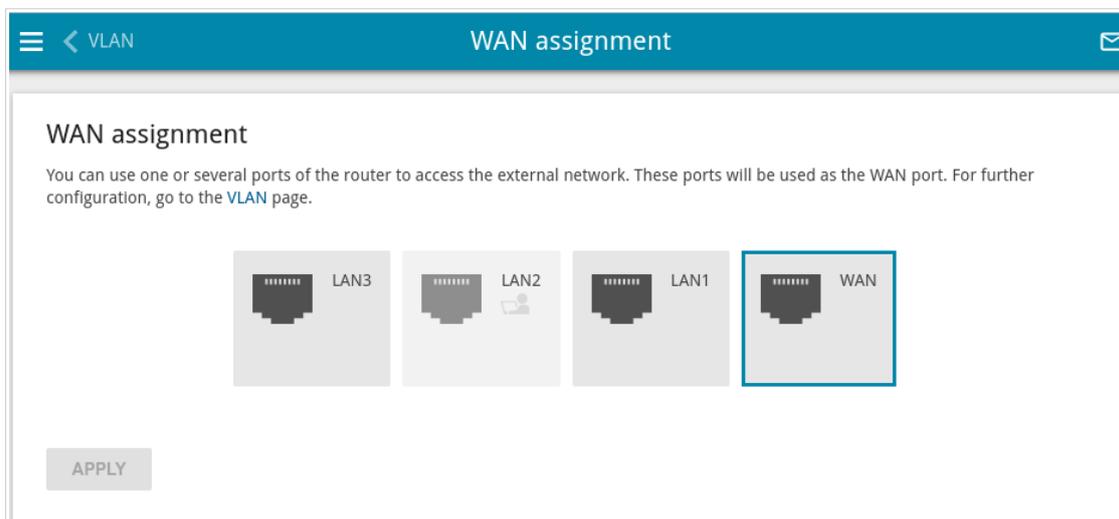


Figure 111. The **Advanced / WAN assignment** page.

### Using LAN Ports as WAN Ports

To configure one or several LAN ports of the router to be used as WAN ports, follow the next steps:

1. On the **Advanced / WAN assignment** page, select LAN ports and click the **APPLY** button.
2. Go to the **Advanced / VLAN** page and create additional VLANs each of which will include one selected LAN port (see the *VLAN* section, page 136).

**!** To create a network interface to which a WAN connection can be assigned upon adding the VLAN, the **Create interface** switch should be moved to the right.

3. Go to the **Connections Setup / WAN** page and create WAN connections which will be assigned to the network interfaces of the corresponding VLANs (see the *WAN* section, page 72).

If you don't want to use a LAN port as a WAN port any longer, follow the next steps:

1. On the **Connections Setup / WAN** page, remove the WAN connection assigned to the network interface of the VLAN which includes the corresponding LAN port (see the *WAN* section, page 72).
2. Go to the **Advanced / VLAN** page and remove the VLAN (see the *VLAN* section, page 136).
3. Go to the **Advanced / WAN assignment** page, deselect the corresponding LAN port, and click the **APPLY** button.

## Using WAN Port as LAN Port

To configure the WAN port of the router to be used as a LAN port, follow the next steps:

1. On the **Connections Setup / WAN** page, remove the WAN connection assigned to the network interface of the VLAN which includes the WAN port (see the *WAN* section, page 72).
2. Go to the **Advanced / VLAN** page and remove the VLAN (see the *VLAN* section, page 136).
3. On the **Advanced / WAN assignment** page, deselect the WAN port and click the **APPLY** button.

If you don't want to use the WAN port as a LAN port any longer, follow the next steps:

1. On the **Advanced / WAN assignment** page, select the WAN port and click the **APPLY** button.
2. Go to the **Advanced / VLAN** page and create a VLAN which will include the WAN port (see the *VLAN* section, page 136).

**!** To create a network interface to which a WAN connection can be assigned upon adding the VLAN, the **Create interface** switch should be moved to the right.

3. Go to the **Connections Setup / WAN** page and create a WAN connection which will be assigned to the network interface of the VLAN (see the *WAN* section, page 72).

## SNMP

On the **Advanced / SNMP** page, you can enable and configure the SNMP agent of the router.

The SNMP agent is a service which sends data on the state and settings of the device where is it enabled to the SNMP manager (the network management system of your ISP or system administrator).

Figure 112. The **Advanced / SNMP** page.

In order to enable the SNMP agent, in the **Configuration** section, move the **Enable SNMP** switch to the right. Then specify the needed parameters.

| Parameter  | Description   |
|--|---|
| <b>Configuration</b>                                 |   |
| <b>Hostname</b>                                      | A name of the router for identification in the SNMP manager.            |
| <b>The contact information for the administrator</b> | Additional information used to contact the administrator of the router. |
| <b>System location</b>                               | Additional information used to locate the router.                       |

If needed, specify an IP address of the remote subnet for which access to the SNMP agent of the router will be allowed. To do this, in the **Remote subnets** section, click the **ADD** button and enter the address of the subnet in the line displayed.

To remove an IP address of the subnet, click the **Delete** icon (✕) in the relevant line.

If the SNMP manager operates over SNMPv2c, create a read-only community which will be used by the SNMP manager to get data on the device. To do this, in the **Communities** section, click the **ADD** button and specify the community name in the line displayed.

To remove a community, click the **Delete** icon (✕) in the relevant line.

If the SNMP manager operates over SNMPv3, create a read-only user which will be used by the SNMP manager to get data on the device. To do this, in the **Users** section, click the **ADD** button (+).

Figure 113. The window for adding a user.

In the opened window, specify the needed parameters:

| Parameter                      | Description   |
|--------------------------------|---|
| <b>Name</b>                    | Specify a username for access from the SNMP manager.  |
| <b>Authentication protocol</b> | Select a required authentication method from the drop-down list or leave the <b>None</b> value if authentication is not required.   |
| <b>Authentication password</b> | Specify a password for user authentication from the SNMP manager. The field is displayed if the <b>MD5</b> or <b>SHA</b> value is selected from the <b>Authentication protocol</b> drop-down list.  |
| <b>Encryption protocol</b>     | Select a required encryption method from the drop-down list or leave the <b>None</b> value if encryption is not required. The list is displayed if the <b>MD5</b> or <b>SHA</b> value is selected from the <b>Authentication protocol</b> drop-down list. |

| Parameter             | Description   |
|-----------------------|---|
| <b>Encryption key</b> | Specify an encryption key for data exchange between the SNMP agent and SNMP manager. The field is displayed if the <b>DES</b> or <b>AES</b> value is selected from the <b>Encryption protocol</b> drop-down list. |
| <b>MIB subtree</b>    | Specify a MIB element which will be available to the SNMP manager.  |

Click the **SAVE** button.

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

To remove a user, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

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

In order to disable the SNMP agent, in the **Configuration** section, move the **Enable SNMP** switch to the left and click the **APPLY** button.

## DNS

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

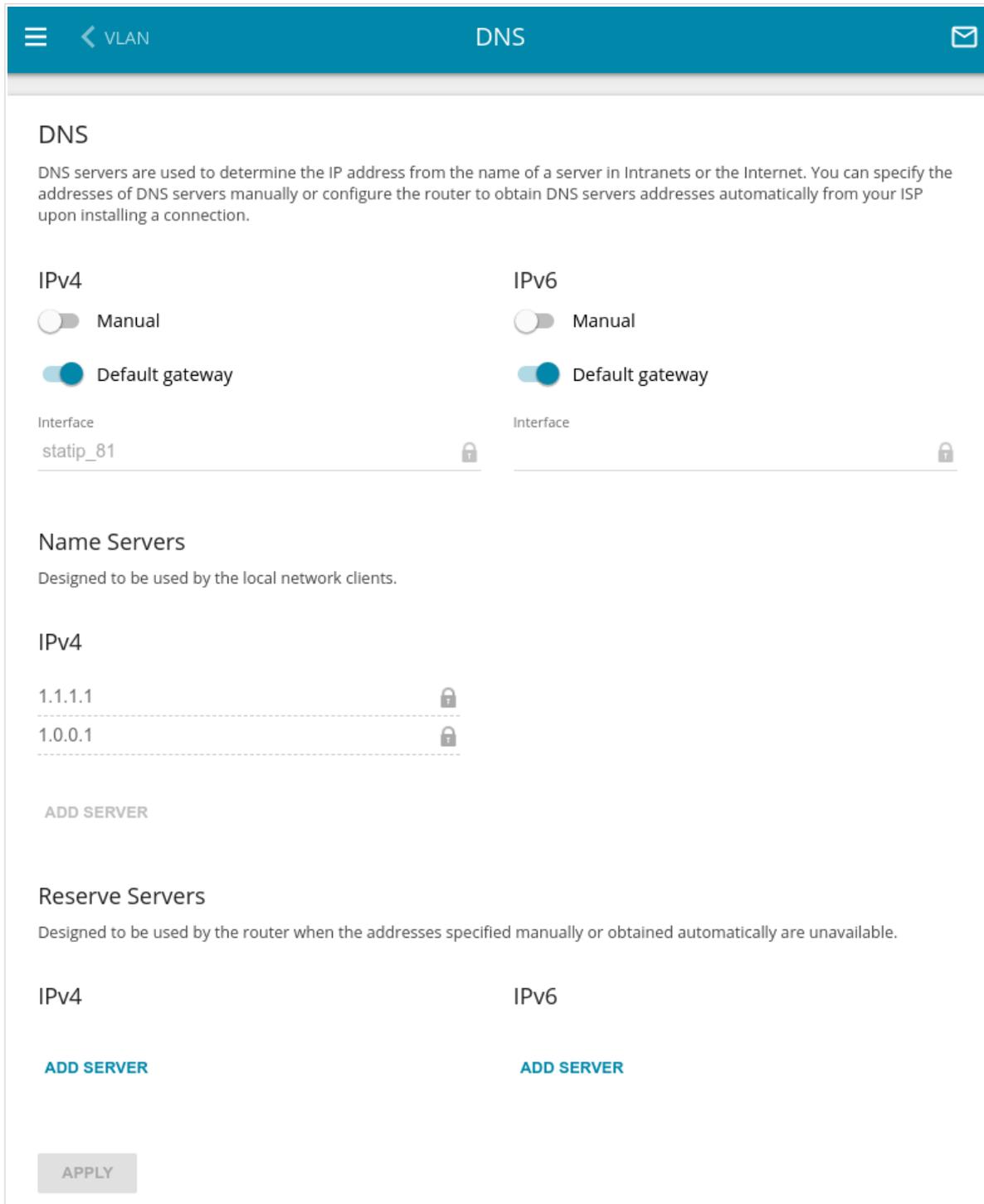


Figure 114. The **Advanced / DNS** page.

DNS servers are used to determine the IP address from the name of a server in Intranets or the Internet (as a rule, they are specified by an ISP or assigned by a network administrator).

You can specify the addresses of DNS servers manually on this page or configure the router to obtain DNS servers addresses automatically from your ISP upon installing a connection. Also here you can specify addresses of reserve DNS servers which the router can use if the addresses specified manually or obtained automatically are unavailable.



When you use the built-in DHCP server, the network parameters (including DNS servers) are distributed to clients automatically.

Specify needed settings for IPv4 in the **IPv4** section and for IPv6 in the **IPv6** section.

If you want to configure automatic obtainment of DNS servers addresses, move the **Manual** switch to the left. Then move the **Default gateway** switch to the left and from the **Interface** drop-down list select a WAN connection which will be used to obtain addresses of DNS servers automatically. If you want the router to use the default WAN connection to obtain addresses of DNS servers, move the **Default gateway** switch to the right.

To specify a DNS server manually, move the **Manual** switch to the right. In the **Name Servers** section of the relevant IP version, click the **ADD SERVER** button, and in the line displayed, enter an IP address of the DNS server.

To specify a reserve DNS server, in the **Reserve Servers** section of the relevant IP version, click the **ADD SERVER** button, and in the line displayed, enter an IP address of the DNS server.

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

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

## DDNS

On the **Advanced / DDNS** page, you can define parameters of the DDNS service, which allows associating a domain name with dynamic IP addresses.

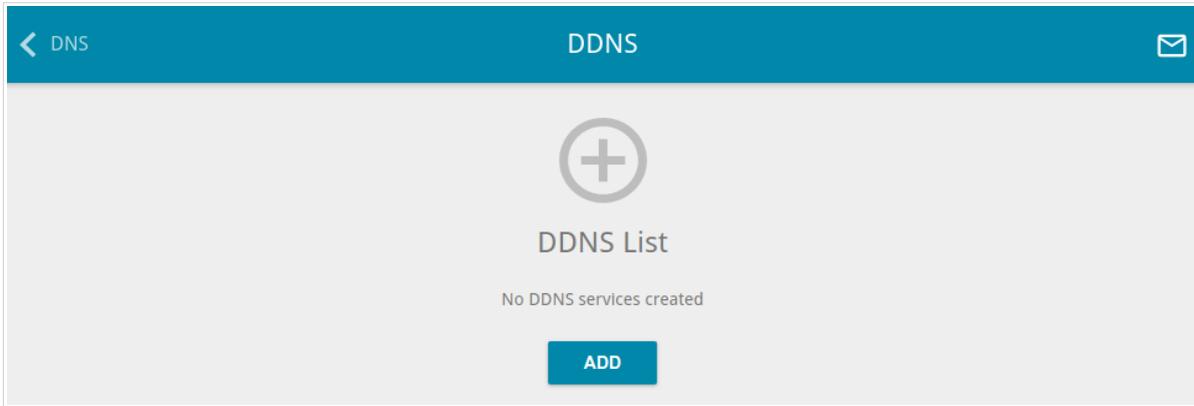


Figure 115. The **Advanced / DDNS** page.

To add a new DDNS service, click the **ADD** button (+).

Figure 116. The page for adding a DDNS service.

On the opened page, you can specify the following parameters:

| Parameter            | Description   |
|----------------------|---|
| <b>Enable</b>        | Move the switch to the right to enable DDNS.<br>Move the switch to the left to disable DDNS.  |
| <b>Hostname</b>      | Enter the full domain name registered at your DDNS provider.<br>If you want to use another domain name of this DDNS provider, click the <b>ADD HOST</b> button, and in the line displayed, enter the needed value.<br>To remove a domain name, click the <b>Delete</b> icon (✕) in the line of the name.  |
| <b>DDNS service</b>  | Select the DDNS provider from the drop-down list. If your provider is not in the list, select the <b>Custom provider</b> value and fill in the fields displayed on the page. Specify the DDNS provider name in the <b>Name</b> field, the domain name of the provider's server in the <b>Server</b> field, and the location of settings in the <b>Path</b> field. |
| <b>Username</b>      | The username to authorize for your DDNS provider.   |
| <b>Password</b>      | The password to authorize for your DDNS provider. Click the <b>Show</b> icon (👁) to display the entered password.   |
| <b>Interface</b>     | From the drop-down list, select a WAN connection which will be used for DDNS, or leave the <b>Default gateway</b> value.  |
| <b>Update period</b> | An interval (in minutes) between sending data on the router's external IP address to the relevant DDNS service.   |

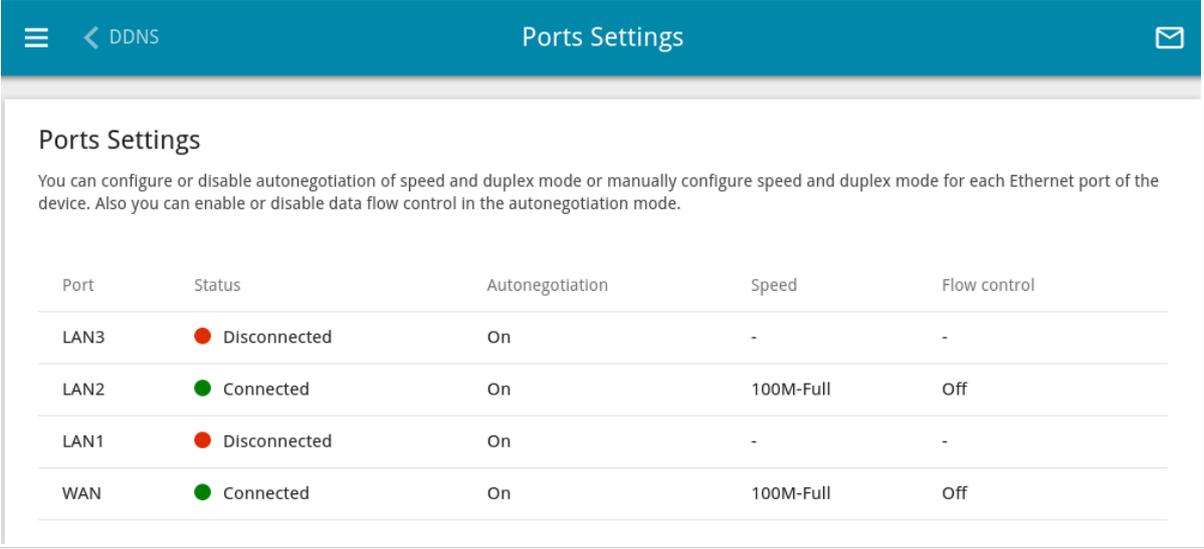
After specifying the needed parameters, click the **SAVE** button.

To edit parameters of the existing DDNS service, select the relevant line in the table. On the opened page, change the needed parameters and click the **SAVE** button.

To remove an existing DDNS service, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (🗑).

## Ports Settings

On the **Advanced / Ports Settings** page, you can configure or disable autonegotiation of speed and duplex mode or manually configure speed and duplex mode for each Ethernet port of the router. Also you can enable or disable data flow control in the autonegotiation mode. This function is used for equal load balancing in ISPs' networks. Contact your ISP to clarify if this function needs to be enabled.



| Port | Status       | Autonegotiation | Speed     | Flow control |
|------|--------------|-----------------|-----------|--------------|
| LAN3 | Disconnected | On              | -         | -            |
| LAN2 | Connected    | On              | 100M-Full | Off          |
| LAN1 | Disconnected | On              | -         | -            |
| WAN  | Connected    | On              | 100M-Full | Off          |

Figure 117. The **Advanced / Ports Settings** page.

In order to configure autonegotiation or configure speed and duplex mode manually for an Ethernet port, select it in the table.



Autonegotiation should be enabled for both devices connected to each other.



When autonegotiation is disabled, speed and duplex mode settings for both devices connected to each other should be the same.

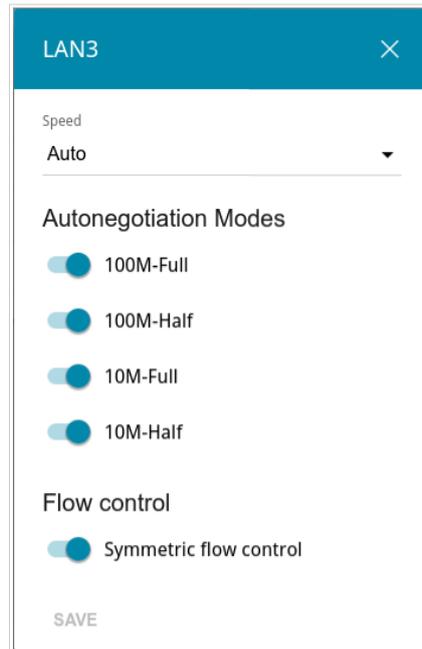


Figure 118. The window for changing the settings of the router's port.

In the opened window, specify the needed parameters:

| Parameter           | Description   |
|---------------------|---|
| <p><b>Speed</b></p> | <p>Data transfer mode.</p> <p>Select the <b>Auto</b> value to enable autonegotiation. When this value is selected, the <b>Autonegotiation Modes</b> and <b>Flow control</b> sections are displayed.</p> <p>Select the <b>10M-Half</b>, <b>10M-Full</b>, <b>100M-Half</b>, or <b>100M-Full</b> value to manually configure speed and duplex mode for the selected port.</p> <ul style="list-style-type: none"> <li>• <b>10M-Half:</b> Data transfer in just one direction at a time (data can be either sent or received) at the maximum possible rate of up to 10Mbps.</li> <li>• <b>10M-Full:</b> Data transfer in two directions simultaneously (data can be sent and received at the same time) at the maximum possible rate of up to 10Mbps.</li> <li>• <b>100M-Half:</b> Data transfer in just one direction at a time (data can be either sent or received) at the maximum possible rate of up to 100Mbps.</li> <li>• <b>100M-Full:</b> Data transfer in two directions simultaneously (data can be sent and received at the same time) at the maximum possible rate of up to 100Mbps.</li> </ul> |

| Parameter  | Description  |
|--|--|
| <b>Autonegotiation Modes</b>   |  |
| To enable the needed data transfer modes, move relevant switches to the right. |  |
| <b>Flow control</b>  |  |
| <b>Symmetric flow control</b>  | Move the switch to the right to enable the flow control function for the port.<br>Move the switch to the left to disable the flow control function for the port. |

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

If in the future you need to edit the parameters of the router's port, select the port in the table. In the opened window, change the needed parameters and click the **SAVE** button.

## Redirect

On the **Advanced / Redirect** page, you can enable notifications on the reason of the Internet connection failure. Notifications will be displayed in the browser window when a user is attempting to open a web site on the Internet.

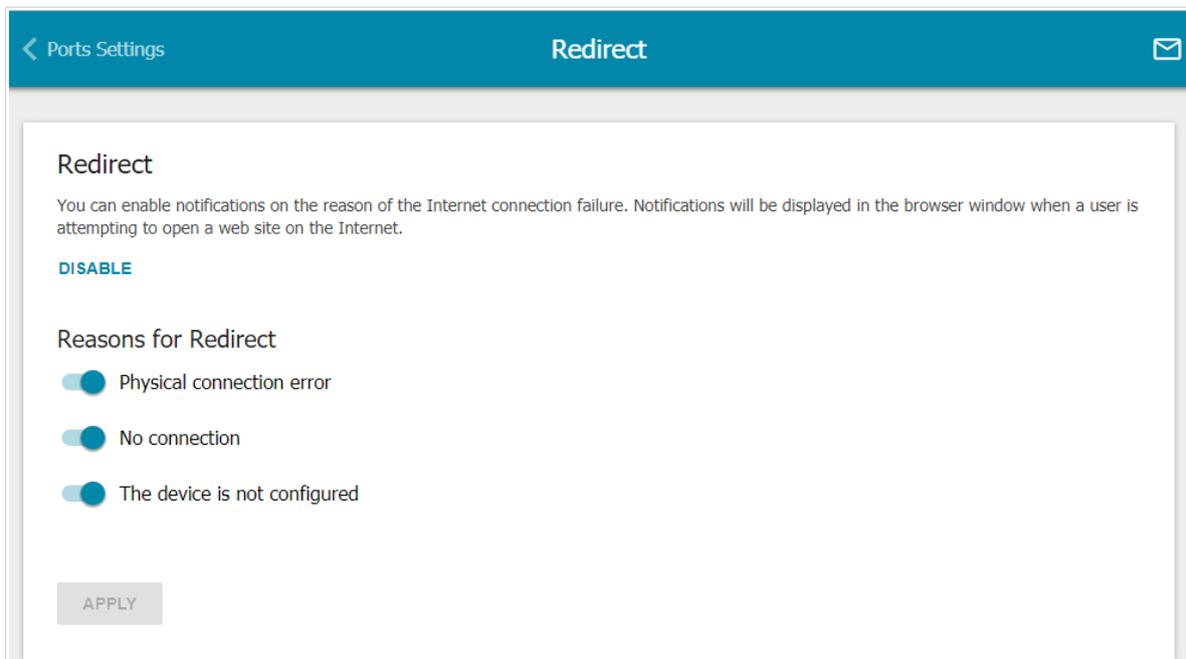


Figure 119. The **Advanced / Redirect** page.

To configure notifications, click the **ENABLE** button. Then, in the **Reasons for Redirect** section, move the needed switches to the right.

| Parameter                           | Description  |
|-------------------------------------|--|
| <b>Reasons for Redirect</b>         |  |
| <b>Physical connection error</b>    | Notifications in case of physical connection problems (the ISP's cable is not connected, an additional device needed to access the Internet is not connected). |
| <b>No connection</b>                | Notifications in case of problems of the default WAN connection (authorization error, the IPS's server does not respond, etc.).                                |
| <b>The device is not configured</b> | Notifications in case when the device works with default settings.   |

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

To disable notifications, click the **DISABLE** button.

## Routing

On the **Advanced / Routing** page, you can specify static (fixed) routes.

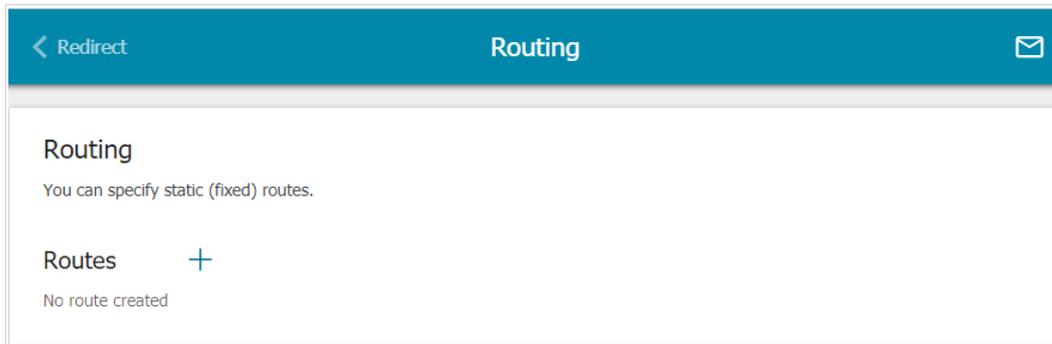


Figure 120. The **Advanced / Routing** page.

To specify a new route, click the **ADD** button ( **+** ).

The screenshot shows the 'Add Route' configuration window. It has a teal header bar with the title 'Add Route' and a close button (X) on the right. The window contains several fields: an 'Enable' toggle switch which is turned on; a 'Protocol\*' dropdown menu set to 'IPv4'; an 'Interface\*' dropdown menu set to 'Auto'; three empty text input fields for 'Destination network\*', 'Destination netmask\*', and 'Gateway\*'; a 'Metric' text input field; and a 'Table\*' dropdown menu set to 'group\_1'. At the bottom left of the window, there is a blue 'SAVE' button.

Figure 121. The window for adding a new route.

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

| Parameter                  | Description  |
|----------------------------|--|
| <b>Enable</b>              | Move the switch to the right to enable the route.<br>Move the switch to the left to disable the route.   |
| <b>Protocol</b>            | An IP version.   |
| <b>Interface</b>           | From the drop-down list, select an interface (connection) through which the device will communicate with the remote network. If you have selected the <b>Auto</b> value, the router itself sets the interface according to the data on the existing dynamic routes.                  |
| <b>Destination network</b> | A remote network which can be accessed with help of this route. You can specify an IPv4 or IPv6 address.<br>The format of a host IPv6 address is <b>2001:db8:1234::1</b> , the format of a subnet IPv6 address is <b>2001:db8:1234::/64</b> .  |
| <b>Destination netmask</b> | <i>For IPv4 protocol only.</i><br>The remote network mask.   |
| <b>Gateway</b>             | An IP address through which the destination network can be accessed.   |
| <b>Metric</b>              | A metric for the route. The lower the value, the higher is the route priority. <i>Optional.</i>  |
| <b>Table</b>               | From the drop-down list, select a routing table for the route. <ul style="list-style-type: none"> <li>• <b>group_1</b> table is used to route user traffic.</li> <li>• <b>main</b> table is used to route management traffic from internal system services of the router.</li> </ul> |

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

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

To remove an existing route, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

## TR-069 Client

On the **Advanced / TR-069 Client** page, you can configure the router for communication with a remote Auto Configuration Server (ACS).

The TR-069 client is used for remote monitoring and management of the device.

Figure 122. The page for configuring the TR-069 client.

You can specify the following parameters:

| Parameter                   | Description  |
|-----------------------------|--|
| <b>TR-069 Client</b>        |  |
| <b>Enable TR-069 client</b> | Move the switch to the right to enable the TR-069 client.  |
| <b>Interface</b>            | The interface which the router uses for communication with the ACS. Leave the <b>Automatic</b> value to let the device select the interface basing on the routing table or select another value if required by your ISP. |

| Parameter                                 | Description   |
|---|---|
| <b>Inform Settings</b>                    |   |
| <b>On</b>                                 | Move the switch to the right so the router may send reports (data on the device and network statistics) to the ACS.   |
| <b>Interval</b>                           | Specify the time period (in seconds) between sending reports.   |
| <b>Auto Configuration Server Settings</b> |   |
| <b>Get URL address via DHCP</b>           | If the switch is moved to the right, the router obtains the URL address of the ACS upon establishing the <b>Dynamic IP</b> type connection.<br>If you need to specify the URL address manually, move the switch to the left and enter the needed value in the <b>URL address</b> field. |
| <b>URL address</b>                        | The URL address of the ACS provided by the ISP.   |
| <b>Username</b>                           | The username to connect to the ACS.   |
| <b>Password</b>                           | The password to connect to the ACS. Click the <b>Show</b> icon (🔍) to display the entered password.   |
| <b>Connection Request Settings</b>        |   |
| <b>Username</b>                           | The username used by the ACS to transfer a connection request to the router.  |
| <b>Password</b>                           | The password used by the ACS. Click the <b>Show</b> icon (🔍) to display the entered password.   |
| <b>Request port</b>                       | The port used by the ACS. By default, the port <b>8999</b> is specified.  |
| <b>Request path</b>                       | The path used by the ACS.   |

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

## UPnP IGD

On the **Advanced / UPnP IGD** page, you can enable the UPnP IGD protocol. The router uses the UPnP IGD protocol for automatic configuration of its parameters for network applications requiring an incoming connection to the router.

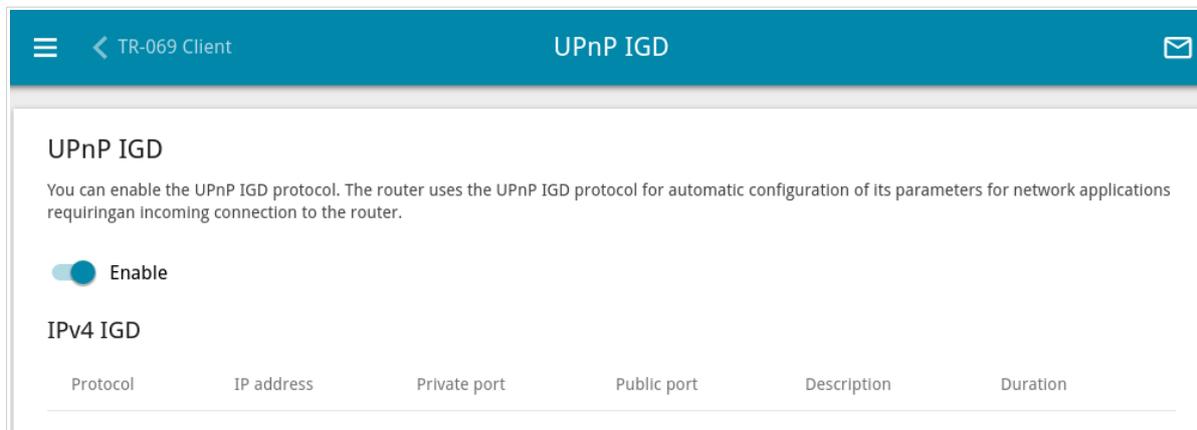


Figure 123. The **Advanced / UPnP IGD** page.

If you want to manually specify all parameters needed for network applications, move the **Enable** switch to the left. Then go to the **Firewall / Virtual Servers** page and specify needed settings. If you want to enable the UPnP IGD protocol in the router, move the **Enable** switch to the right. When the protocol is enabled, the following parameters of the router are displayed on the page:

| Parameter           | Description  |
|---------------------|--|
| <b>Protocol</b>     | A protocol for network packet transmission.  |
| <b>IP address</b>   | The IP address of a client from the local area network.  |
| <b>Private port</b> | A port of a client's IP address to which traffic is directed from a public port of the router. |
| <b>Public port</b>  | A public port of the router from which traffic is directed to a client's IP address.           |
| <b>Description</b>  | Information transmitted by a client's network application.                                     |
| <b>Duration</b>     | The time period during which the UPnP IGD protocol has been used.                              |

## UDPXY

On the **Advanced / UDPXY** page, you can allow the router to use the built-in UDPXY application. The UDPXY application transforms UDP traffic into HTTP traffic. This application allows devices which cannot receive UDP streams to access stream video.

The screenshot shows the 'UDPXY' configuration page. At the top, there is a navigation bar with a menu icon, a back arrow labeled 'UPnP IGD', the title 'UDPXY', and a help icon. Below the navigation bar, the page title 'UDPXY' is displayed. A descriptive paragraph explains that the application transforms UDP traffic into HTTP traffic. An 'Enable' toggle switch is currently turned on. Below the switch are five configuration fields: 'Port\*' (4022), 'Maximum client number\*' (3), 'Buffer size for incoming data\*' (131071), 'Buffer size for data transferred to client\*' (32768), and 'WAN interface\*' (Not selected). An 'APPLY' button is located at the bottom left of the configuration area.

Figure 124. The **Advanced / UDPXY** page.

To enable the application, move the **Enable** switch to the right.

Upon that the following fields are displayed on the page:

| Parameter   | Description   |
|---|---|
| <b>Port</b>                                       | The port of the router which the UDPXY application uses.  |
| <b>Maximum client number</b>                      | Maximum number of devices from the router's LAN which will be served by the application.                    |
| <b>Buffer size for incoming data</b>              | Size of intermediate buffer for received data.<br>By default, the minimum acceptable value is specified.    |
| <b>Buffer size for data transferred to client</b> | Size of intermediate buffer for transmitted data.<br>By default, the minimum acceptable value is specified. |
| <b>WAN interface</b>                              | From the drop-down list, select a WAN connection which will be used for operation with streaming video.     |

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

To access the status page of the application, click the **Status** link.

**udpxy status:**

| Server Process ID | Accepting clients on | Multicast address | Active clients |
|-------------------|----------------------|-------------------|----------------|
| 1447              | 192.168.0.1:4022     | 192.168.161.235   | 0              |

**Available HTTP requests:**

| Request template                                       | Function                                      |
|--|---|
| <code>http://address:port/udp/mcast_addr:mport/</code> | Relay multicast traffic from mcast_addr:mport |
| <code>http://address:port/status/</code>               | Display udpxy status                          |
| <code>http://address:port/restart/</code>              | Restart udpxy                                 |

udpxy v. 1.0 (Build 23) standard - [Mon Dec 16 12:08:29 2019]  
udpxy and udpxrec are Copyright (C) 2008-2013 Pavel V. Cherenkov and licensed under GNU GPLv3

*Figure 125. The UDPXY application status page.*

## IGMP

On the **Advanced / IGMP** page, you can allow the router to use IGMP and specify needed settings.

IGMP is used for managing multicast traffic (transferring data to a group of destinations). This protocol allows using network resources for some applications, e.g., for streaming video, more efficiently.

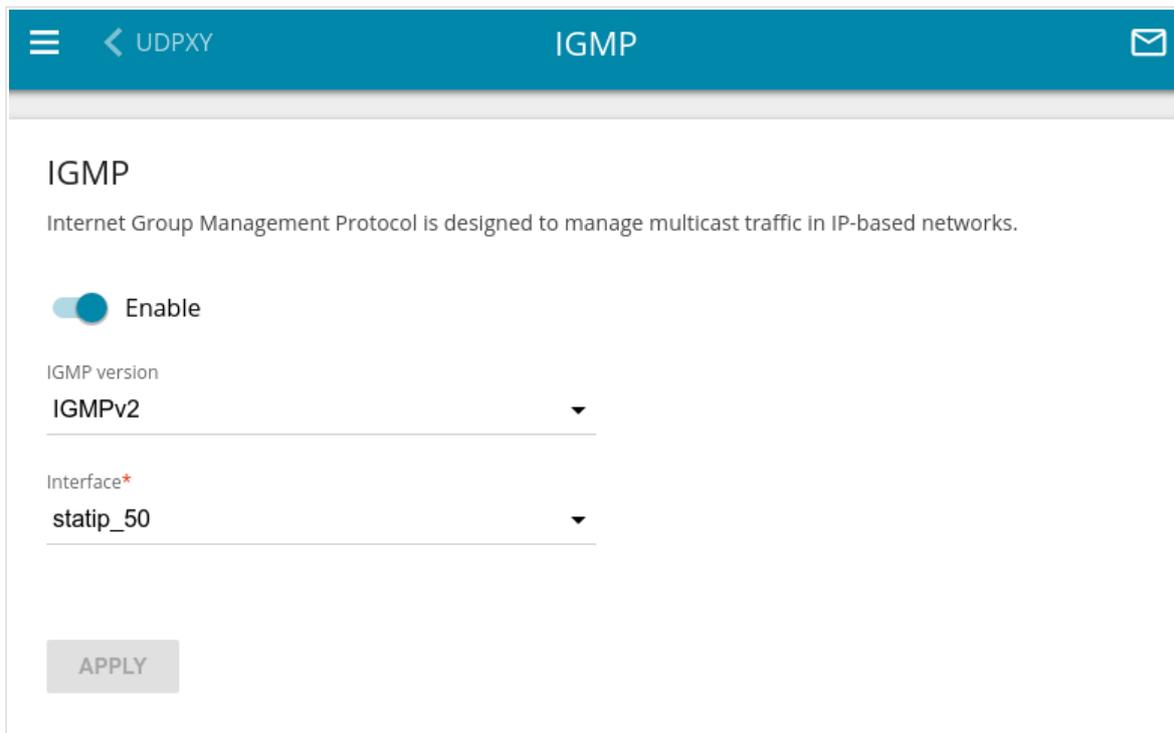


Figure 126. The **Advanced / IGMP** page.

The following elements are available on the page:

| Parameter           | Description  |
|---------------------|--|
| <b>IGMP</b>         |  |
| <b>Enable</b>       | Move the switch to the right to enable IGMP.   |
| <b>IGMP version</b> | Select a version of IGMP from the drop-down list.  |
| <b>Interface</b>    | From the drop-down list, select a connection of the Dynamic IPv4 or Static IPv4 type for which you need to allow multicast traffic (e.g. streaming video). |

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

## ALG/Passthrough

On the **Advanced / ALG/Passthrough** page, you can allow the router to use RTSP, enable the SIP ALG and PPPoE/PPTP/L2TP/IPsec pass through functions.

SIP is used for creating, modifying, and terminating communication sessions. This protocol allows telephone calls via the Internet.

RTSP is used for real-time streaming multimedia data delivery. This protocol allows some applications to receive streaming audio/video from the Internet.

The PPPoE pass through function allows PPPoE clients of computers from your LAN to connect to the Internet through connections of the router.

The PPTP pass through, L2TP pass through and IPsec pass through functions allow VPN PPTP, L2TP and IPsec traffic to pass through the router so that clients from your LAN can establish relevant connections with remote networks.

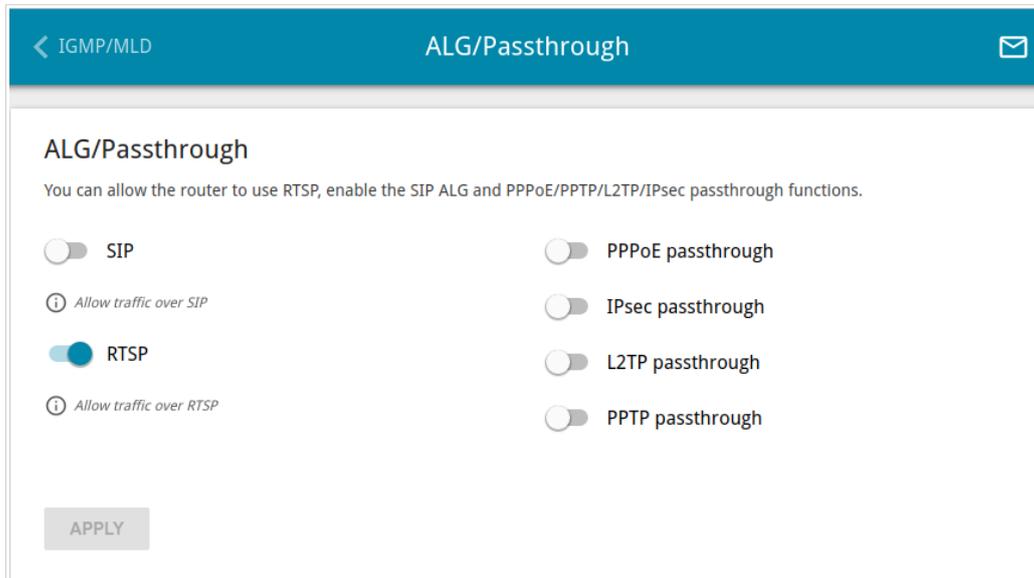


Figure 127. The **Advanced / ALG/Passthrough** page.

The following elements are available on the page:

| Parameter                 | Description  |
|---------------------------|--|
| <b>SIP</b>                | Move the switch to the right to enable SIP. Such a setting allows using the SIP ALG function. This function allows VoIP traffic to pass through the NAT-enabled router. <sup>4</sup> |
| <b>RTSP</b>               | Move the switch to the right to enable RTSP. Such a setting allows managing media stream: fast forward streaming audio/video, pause and start it.                                    |
| <b>PPPoE pass through</b> | Move the switch to the right to enable the PPPoE pass through function.  |
| <b>IPsec pass through</b> | Move the switch to the right to enable the IPsec pass through function.  |
| <b>L2TP pass through</b>  | Move the switch to the right to enable the L2TP pass through function.   |
| <b>PPTP pass through</b>  | Move the switch to the right to enable the PPTP pass through function.   |

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

<sup>4</sup> On the **Connections Setup / WAN** page, create a WAN connection, move the **SIP** switch to the right on the **Advanced / ALG/Passthrough** page, connect an Ethernet cable between a LAN port of the router and the IP phone. Specify SIP parameters on the IP phone and configure it to obtain an IP address automatically (as DHCP client).

## Firewall

In this menu you can configure the firewall of the router:

- add rules for IP filtering
- create virtual servers
- define a DMZ
- configure the MAC filter
- specify restrictions on access to certain web sites
- create rules for remote access to the web-based interface.

## IP Filter

On the **Firewall / IP Filter** page, you can create new rules for filtering IP packets and edit or remove existing rules.

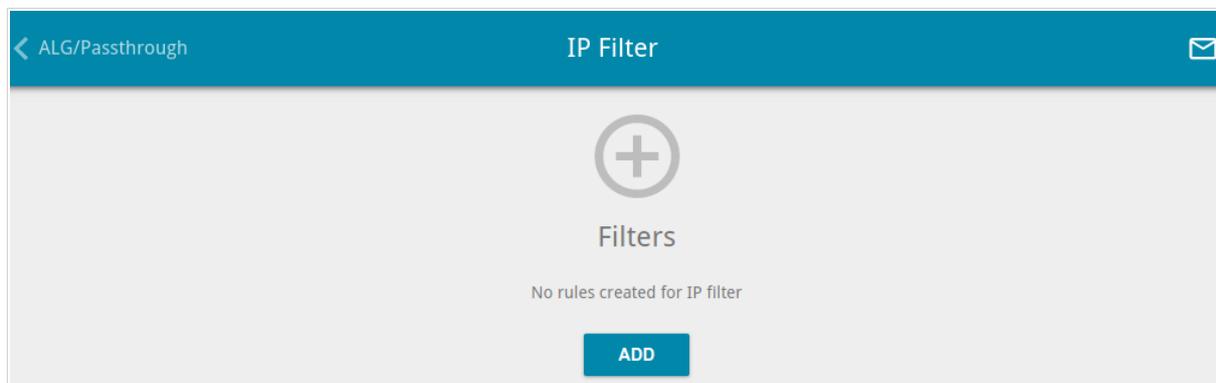


Figure 128. The **Firewall / IP Filter** page.

To create a new rule, click the **ADD** button ( **+** ).

Figure 129. The page for adding a rule for IP filtering.

You can specify the following parameters:

| Parameter               | Description  |
|-------------------------|--|
| <b>General Settings</b> |  |
| <b>Enable rule</b>      | Move the switch to the right to enable the rule.<br>Move the switch to the left to disable the rule. |
| <b>Name</b>             | A name for the rule for easier identification. You can specify any name.                             |

| Parameter                                      | Description  |
|--|--|
| <b>Action</b>                                  | <p>Select an action for the rule.</p> <ul style="list-style-type: none"> <li>• <b>Allow</b>: Allows packet transmission in accordance with the criteria specified by the rule.</li> <li>• <b>Deny</b>: Denies packet transmission in accordance with the criteria specified by the rule.</li> </ul>  |
| <b>Protocol</b>                                | <p>A protocol for network packet transmission. Select a value from the drop-down list.</p>   |
| <b>IP version</b>                              | <p>An IP version to which the rule will be applied. Select the relevant value from the drop-down list.</p>   |
| <b>Direction</b>                               | <p>The direction of network packet transmission to which the rule will be applied. Select the source of the packet direction from the <b>Source</b> drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>WAN</b>: The rule will be applied to the packets transmitted from the external network.</li> <li>• <b>LAN</b>: The rule will be applied to the packets transmitted from the local network.</li> </ul> <p>Select the destination of the packet direction from the <b>Destination</b> drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Router</b>: The rule will be applied to the packets transmitted to DIR-820.</li> <li>• <b>WAN</b>: The rule will be applied to the packets transmitted to the external network.</li> <li>• <b>LAN</b>: The rule will be applied to the packets transmitted to the local network.</li> </ul> <p>From the <b>Source interface</b> and <b>Destination interface</b> drop-down lists, select source and destination interfaces for which the rule will be applied. Leave the <b>Auto</b> values to apply the rule to all created WAN interfaces.</p> |
| <b>Source IP address</b>                       |  |
| <b>Set as</b>                                  | <p>Select the needed value from the drop-down list.</p>  |
| <b>Start IPv4 address / Start IPv6 address</b> | <p>The source host start IPv4 or IPv6 address.</p> <p>If it is necessary to specify a single address, leave the <b>End IPv4 address / End IPv6 address</b> field blank.</p> <p>You can choose a device connected to the router's LAN at the moment. To do this, select the relevant IPv4 or IPv6 address from the drop-down list (the field will be filled in automatically).</p>  |

| Parameter  | Description   |
|--|---|
| <b>End IPv4 address / End IPv6 address</b>       | The source host end IPv4 or IPv6 address.   |
| <b>Subnet IPv4 address / Subnet IPv6 address</b> | The source subnet IPv4 or IPv6 address. The field is displayed when the <b>Subnet</b> value is selected from the <b>Set as</b> drop-down list.  |
| <b>Destination IP address</b>                    |   |
| <b>Set as</b>                                    | Select the needed value from the drop-down list.  |
| <b>Start IPv4 address / Start IPv6 address</b>   | The destination host start IPv4 or IPv6 address.<br>If it is necessary to specify a single address, leave the <b>End IPv4 address / End IPv6 address</b> field blank.<br>You can choose a device connected to the router's LAN at the moment. To do this, select the relevant IPv4 or IPv6 address from the drop-down list (the field will be filled in automatically). |
| <b>End IPv4 address / End IPv6 address</b>       | The destination host end IPv4 or IPv6 address.  |
| <b>Subnet IPv4 address / Subnet IPv6 address</b> | The destination subnet IPv4 or IPv6 address. The field is displayed when the <b>Subnet</b> value is selected from the <b>Set as</b> drop-down list.   |
| <b>Ports</b>                                     |   |
| <b>Destination port</b>                          | A port of the destination IP address. You can specify one port, several ports separated by a comma, or a range of ports separated by a colon.   |
| <b>Set source port manually</b>                  | Move the switch to the right to specify a port of the source IP address manually. Upon that the <b>Source port</b> field is displayed.  |
| <b>Source port</b>                               | A port of the source IP address. You can specify one port, several ports separated by a comma, or a range of ports separated by a colon.  |

Click the **APPLY** button.

To set a schedule for the IP filter rule, click the **Set schedule** icon (🕒) in the line corresponding to this rule. In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the IP filter rule at the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the IP filter rule at the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and 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 **APPLY** button.

To change or delete the schedule for a rule, click the **Edit schedule** icon (  ) in the line corresponding to this rule. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** 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 on the editing page.

## Virtual Servers

On the **Firewall / Virtual Servers** page, you can create virtual servers for redirecting incoming Internet traffic to a specified IP address in the local area network.

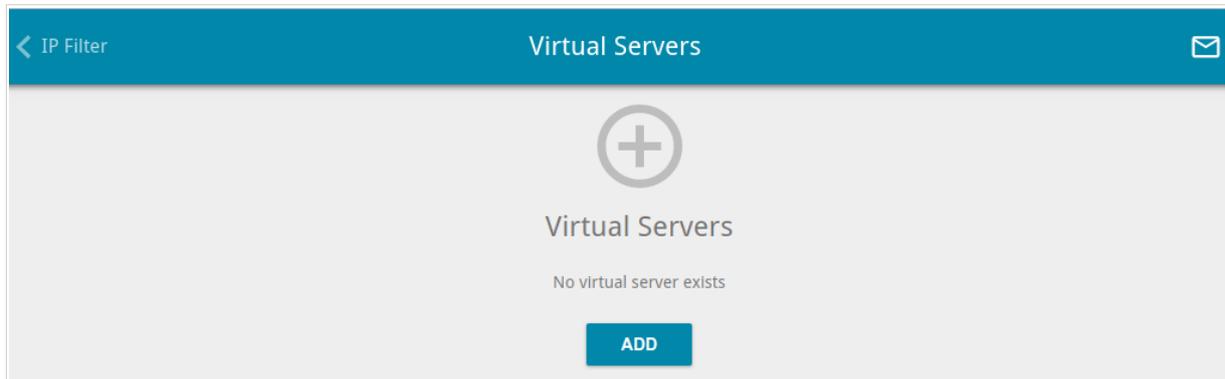


Figure 130. The **Firewall / Virtual Servers** page.

To create a new virtual server, click the **ADD** button (+).

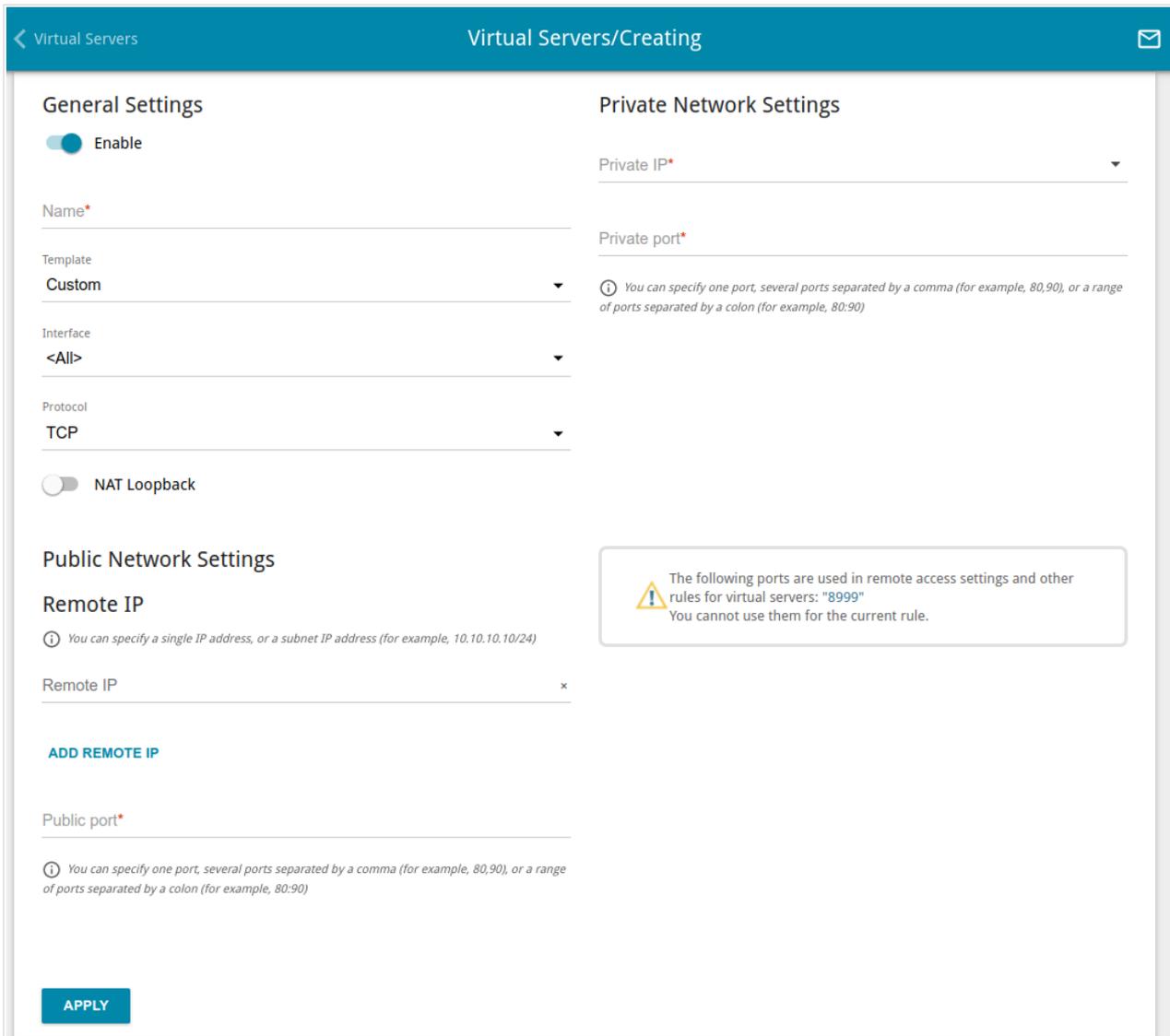


Figure 131. The page for adding a virtual server.

You can specify the following parameters:

| Parameter                       | Description   |
|---------------------------------|---|
| <b>General Settings</b>         |   |
| <b>Enable</b>                   | Move the switch to the right to enable the server.<br>Move the switch to the left to disable the server.  |
| <b>Name</b>                     | A name for the virtual server for easier identification. You can specify any name.  |
| <b>Template</b>                 | Select a virtual server template from the drop-down list, or select <b>Custom</b> to specify all parameters of the new virtual server manually.   |
| <b>Interface</b>                | A WAN connection to which this virtual server will be assigned.   |
| <b>Protocol</b>                 | A protocol that will be used by the new virtual server. Select a value from the drop-down list.   |
| <b>NAT Loopback</b>             | Move the switch to the right in order to let the users of the router's LAN access the local server using the external IP address of the router or its DDNS name (if a DDNS service is configured). Users from the external network access the router using the same address (or DDNS name). |
| <b>Public Network Settings</b>  |   |
| <b>Remote IP</b>                | Enter the IP address of the server from the external network.<br>To add one more IP address, click the <b>ADD REMOTE IP</b> button and enter the address in the displayed line.<br>To remove the IP address, click the <b>Delete</b> icon (✕) in the line of the address.                   |
| <b>Public port</b>              | A port of the router from which traffic is directed to the IP address specified in the <b>Private IP</b> field in the <b>Private Network Settings</b> section. You can specify one port or several ports separated by a comma.  |
| <b>Private Network Settings</b> |   |
| <b>Private IP</b>               | The IP address of the server from the local area network. To choose a device connected to the router's LAN at the moment, select the relevant value from the drop-down list (the field will be filled in automatically).  |
| <b>Private port</b>             | A port of the IP address specified in the <b>Private IP</b> field to which traffic is directed from the <b>Public port</b> . You can specify one port or several ports separated by a comma.  |

Click the **APPLY** button.

To set a schedule for a virtual server, click the **Set schedule** icon (  ) in the line corresponding to this rule. In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the virtual server at the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the virtual server at the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and click the **SAVE** button.

To edit the parameters of an existing server, select the relevant line in the table. On the opened page, change the needed parameters and click the **APPLY** button.

To change or delete the schedule for a server, click the **Edit schedule** icon (  ) in the line corresponding to this rule. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** button.

To remove a server, 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 on the editing page.

## DMZ

A DMZ is a host or network segment located “between” internal (local) and external (global) networks. In the router, the DMZ implements the capability to transfer a request coming to a port of the router from the external network to a specified host of the internal network.

On the **Firewall / DMZ** page, you can specify the IP address of the DMZ host.

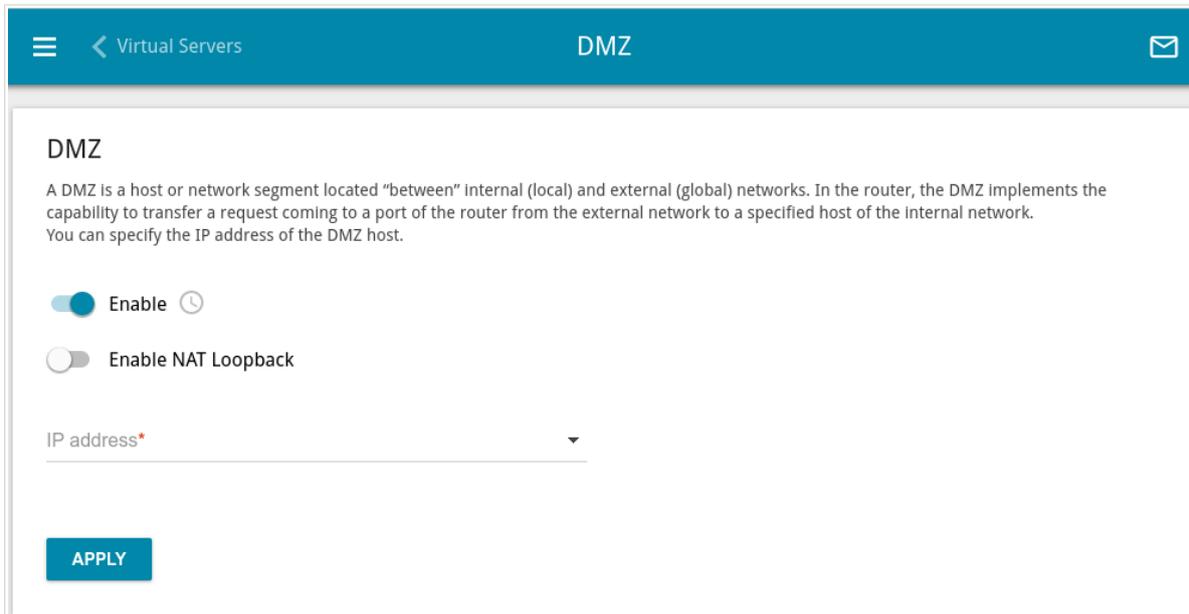


Figure 132. The **Firewall / DMZ** page.

To enable the DMZ, move the **Enable** switch to the right.

Enter the IP address of a host from your network in the **IP address** field. To choose a device connected to the router's LAN at the moment, select the relevant value from the drop-down list (the field will be filled in automatically).

Move the **Enable NAT Loopback** switch to the right in order to let the users of the router's LAN access the DMZ host using the external IP address of the router or its DDNS name (if a DDNS service is configured). Users from the external network access the router using the same address (or DDNS name).

Click the **APPLY** button.

Note that when the DMZ is enabled, all traffic coming to a port of the WAN interface of the router is directed to the same port of the specified IP address. Also note that virtual servers have higher priority than the DMZ host. In other words, if there has been created a virtual server that directs traffic from external port 80 to a port of the device from the router's local network, then entering **http://router\_WAN\_IP** in the address bar, users of the external network are directed to the specified port and IP address configured for the virtual server, but not to port 80 of the device with the IP address specified on the **Firewall / DMZ** page.

To set a schedule for the DMZ, click the **Set schedule** icon (  ). In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the DMZ for the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the DMZ for the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and click the **SAVE** button.

To change or delete the schedule for the DMZ, click the **Edit schedule** icon (  ). In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** button.

To disable the DMZ, move the **Enable** switch to the left and click the **APPLY** button.

## MAC Filter

On the **Firewall / MAC Filter** page, you can configure MAC-address-based filtering for computers of the router's LAN.

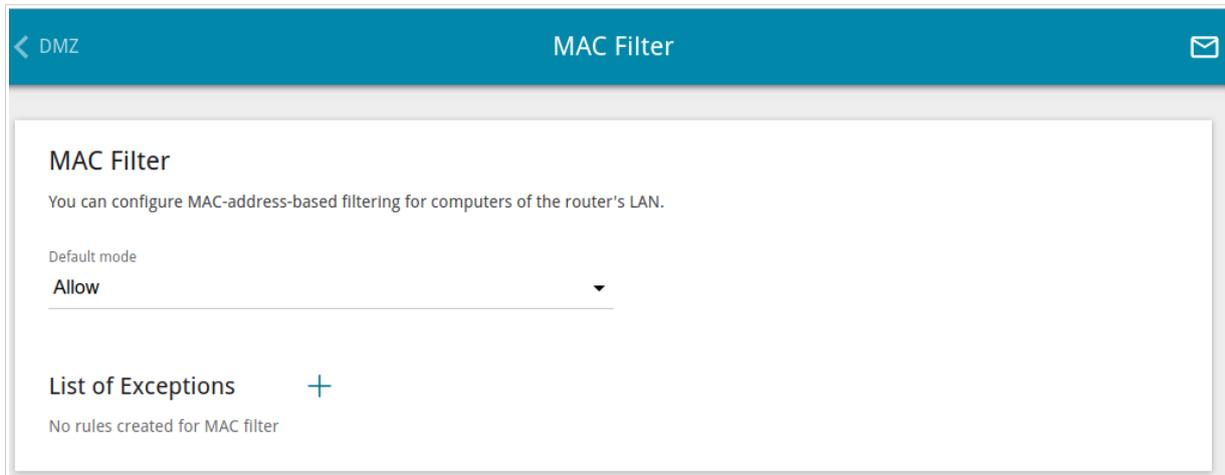


Figure 133. The **Firewall / MAC Filter** page.

Select the needed action from the drop-down list in the **Default mode** section to configure filtering for all devices of the router's network.

- **Allow:** Allows access to the router's network and to the Internet for devices (the value is specified by default);
- **Deny:** Blocks access to the router's network for devices.

**!** You can use the **Deny** mode only if an active rule which allows access to the device's network is created on the page.

To create a rule (specify a MAC address of a device for which the specified filtering mode will be applied), click the **ADD** button ( **+** ).

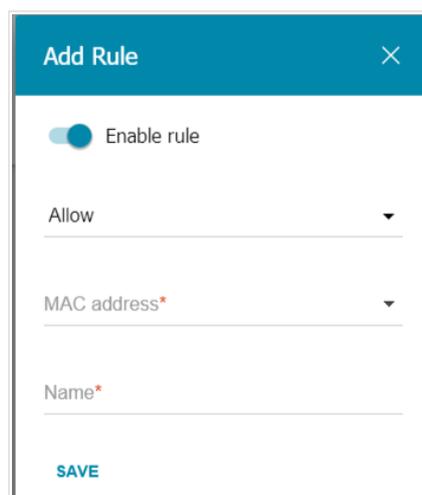


Figure 134. The window for adding a rule for the MAC filter.

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

| Parameter          | Description  |
|--------------------|--|
| <b>Enable rule</b> | Move the switch to the right to enable the rule.<br>Move the switch to the left to disable the rule.   |
| <b>Action</b>      | Select an action for the rule. <ul style="list-style-type: none"> <li>• <b>Deny</b>: Blocks access to the Internet for the device with the specified MAC address even if the default mode allows access for all devices.</li> <li>• <b>Allow</b>: Allows access to the router's network and to the Internet for the device with the specified MAC address even if the default mode denies access for all devices.</li> </ul> |
| <b>MAC address</b> | The MAC address of a device from the router's LAN. You can enter the MAC address of a device connected to the router's LAN at the moment. To do this, select the relevant device from the drop-down list (the field will be filled in automatically).  |
| <b>Name</b>        | The name of the device for easier identification. You can specify any name.  |

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

To set a schedule for the MAC filter rule, click the **Set schedule** icon (🕒) in the line corresponding to this rule. In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the MAC filter rule at the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the MAC filter rule at the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and 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 change or delete the schedule for a rule, click the **Edit schedule** icon (🕒) in the line corresponding to this rule. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** 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.

## URL Filter

On the **Firewall / URL Filter** page, you can specify restrictions on access to certain web sites and define devices to which the specified restrictions will be applied.

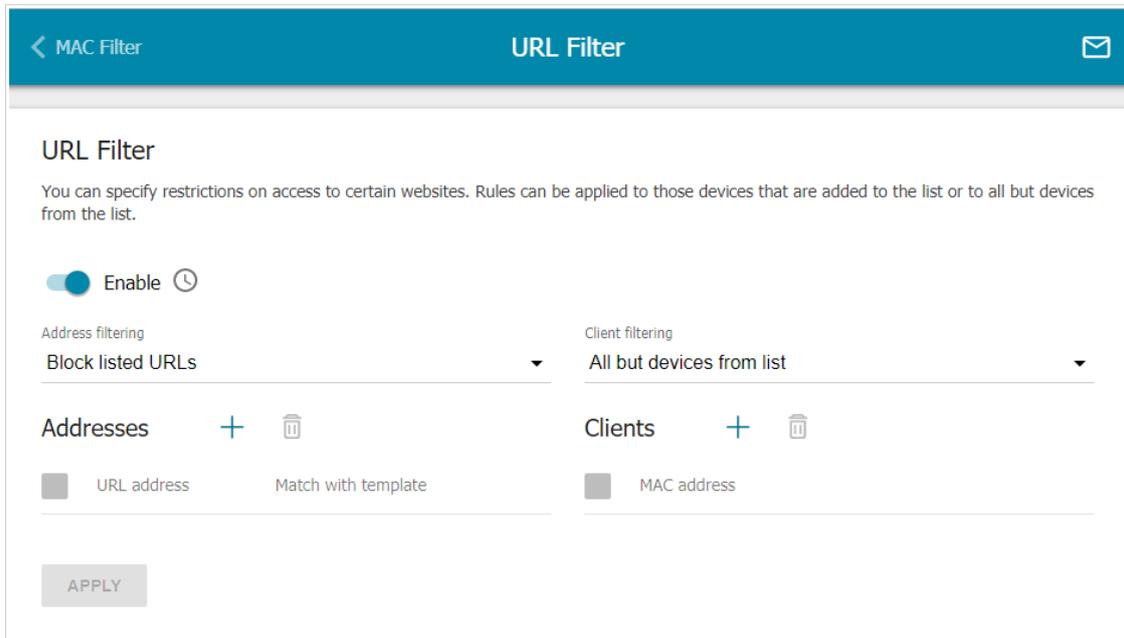


Figure 135. The **Firewall / URL Filter** page.

To enable the URL filter, move the **Enable** switch to the right, then select a mode from the **Address filtering** drop-down list.

- **Block listed URLs:** When this value is selected, the router blocks access to all web sites specified in the **Addresses** section;
- **Block all URLs except listed:** When this value is selected, the router allows access to web sites specified in the **Addresses** section and blocks access to all other web sites.

To specify URL addresses to which the selected filtering mode will be applied, in the **Addresses** section, click the **ADD** button (  ). In the opened window, you can specify the following parameters:

| Parameter                  | Description   |
|----------------------------|---|
| <b>URL address</b>         | A URL address, a part of URL address, or a keyword.   |
| <b>Match with template</b> | <p>Select a value from the drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Full</b>: The request address should exactly match the value specified in the field above.</li> <li>• <b>Begin</b>: The request address should begin with the value specified in the field above.</li> <li>• <b>End</b>: The request address should end with the value specified in the field above.</li> <li>• <b>Partly</b>: The request address should contain the value specified in the field above in any part of it.</li> </ul> |

Click the **SAVE** button.

To remove a URL address from the list, select the checkbox located to the left of the relevant address in the table and click the **DELETE** button (  ). Also you can remove an address in the editing window.

To define devices to which the specified restrictions will be applied, select a needed value from the **Client filtering** drop-down list.

- **Devices from list**: When this value is selected, the router applies restrictions only to the devices specified in the **Clients** section;
- **All but devices from list**: When this value is selected, the router does not apply restrictions to the devices specified in the **Clients** section, but applies restrictions to other devices.

To add a client to the list, in the **Clients** section, click the **ADD** button (  ). In the opened window, in the **MAC address** field, enter the MAC address of the device from the LAN. You can enter the MAC address of a device connected to the router's LAN at the moment. To do this, select the relevant device from the drop-down list (the field will be filled in automatically) and click the **SAVE** button.

To remove a client from the list, select the checkbox located to the left of the relevant rule of the table and click the **DELETE** button (  ). Also you can remove a client in the editing window.

After completing configuration of the URL filter, click the **APPLY** button.

To set a schedule for the URL filter, click the **Set schedule** icon (  ). In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the **Schedule** section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the URL filter for the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the URL filter for the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and click the **SAVE** button.

To change or delete the schedule for URL filter, click the **Edit schedule** icon (  ) in the **URL Filter** section. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** button.

## Remote Access

On the **Firewall / Remote Access** page, you can configure access to the web-based interface of the router. By default, the access from external networks to the router is closed. If you need to allow access to the router from the external network, create relevant rules.

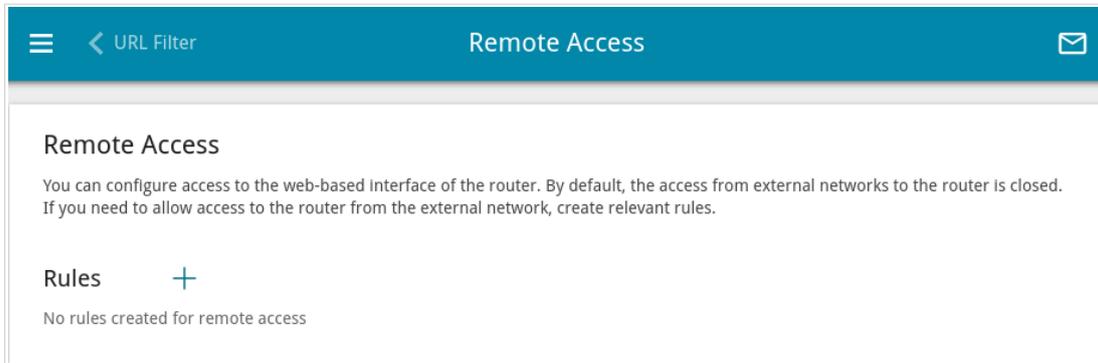


Figure 136. The **Firewall / Remote Access** page.

To create a new rule, click the **ADD** button ( **+** ).

The screenshot shows a modal window titled 'Add Rule' with a close button (X) in the top right corner. The form contains several fields: 'Name\*' (text input), 'Interface' (dropdown menu with 'Automatic' selected), 'IP version' (dropdown menu with 'IPv4' selected), a toggle switch for 'Open access from any external host' (currently off), 'IP address\*' (text input), 'Mask\*' (text input), 'Public port\*' (text input with '80' entered), and 'Protocol' (dropdown menu with 'HTTP' selected). At the bottom of the form is a 'SAVE' button.

Figure 137. The window for adding a rule for remote management.

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

| Parameter                                 | Description   |
|---|---|
| <b>Name</b>                               | A name for the rule for easier identification. You can specify any name.  |
| <b>Interface</b>                          | From the drop-down list, select an interface (WAN connection) through which remote access to the router will operate. Leave the <b>Automatic</b> value to allow remote access to operate through all created WAN connections. |
| <b>IP version</b>                         | An IP version to which the rule will be applied. Select the relevant value from the drop-down list.   |
| <b>Open access from any external host</b> | Move the switch to the right to allow access to the router for any host. Upon that the <b>IP address</b> and <b>Mask</b> fields are not displayed.  |
| <b>IP address</b>                         | A host or a subnet to which the rule is applied. You can specify an IPv4 or IPv6 address.   |
| <b>Mask</b>                               | <i>For the IPv4-based network only.</i><br>The mask of the subnet.  |
| <b>Public port</b>                        | <i>For the IPv4-based network only.</i><br>An external port of the router. You can specify only one port.   |
| <b>Protocol</b>                           | The protocol available for remote management of the router.   |

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

To set a schedule for the remote access rule, click the **Set schedule** icon (🕒) in the line corresponding to this rule. In the opened window, from the **Rule** drop-down list, select the **Create rule** value to create a new schedule (see the *Schedule* section, page 187) or select the **Select an existing one** value to use the existing one. Existing schedules are displayed in the **Rule name** drop-down list.

To enable the rule for remote access at the time specified in the schedule and disable it at the other time, select the **Enable rule** value from the **Action** drop-down list and click the **SAVE** button.

To disable the rule for remote access at the time specified in the schedule and enable it at the other time, select the **Disable rule** value from the **Action** drop-down list and click the **SAVE** button.

To edit a rule for remote access, left-click the relevant rule. In the opened window, change the needed parameters and click the **SAVE** button.

To change or delete the schedule for a rule, click the **Edit schedule** icon (🕒) in the line corresponding to this rule. In the opened window, change the parameters and click the **SAVE** button or click the **DELETE FROM SCHEDULE** button.

To remove a rule for remote access, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

## System

In this menu you can do the following:

- change the password used to access the router's settings
- restore the factory default settings
- create a backup of the router's configuration
- restore the router's configuration from a previously saved file
- save the current settings to the non-volatile memory
- reboot the router
- change the web-based interface language
- update the firmware of the router
- configure automatic notification on new firmware version
- enable/disable Wi-Fi connection and the Wi-Fi filter, configure automatic reboot of the device on a schedule, and set a schedule for different rules and settings of the firewall
- 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 router
- trace the route to a host
- allow or forbid access to the router via TELNET and SSH
- configure automatic synchronization of the system time or manually configure the date and time for the router
- enable the Auto Provision function.

## Configuration

On the **System / Configuration** page, you can change the password for the administrator account used to access the web-based interface of the router and to access the device settings via TELNET and SSH, restore the factory defaults, backup the current configuration, restore the router'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.

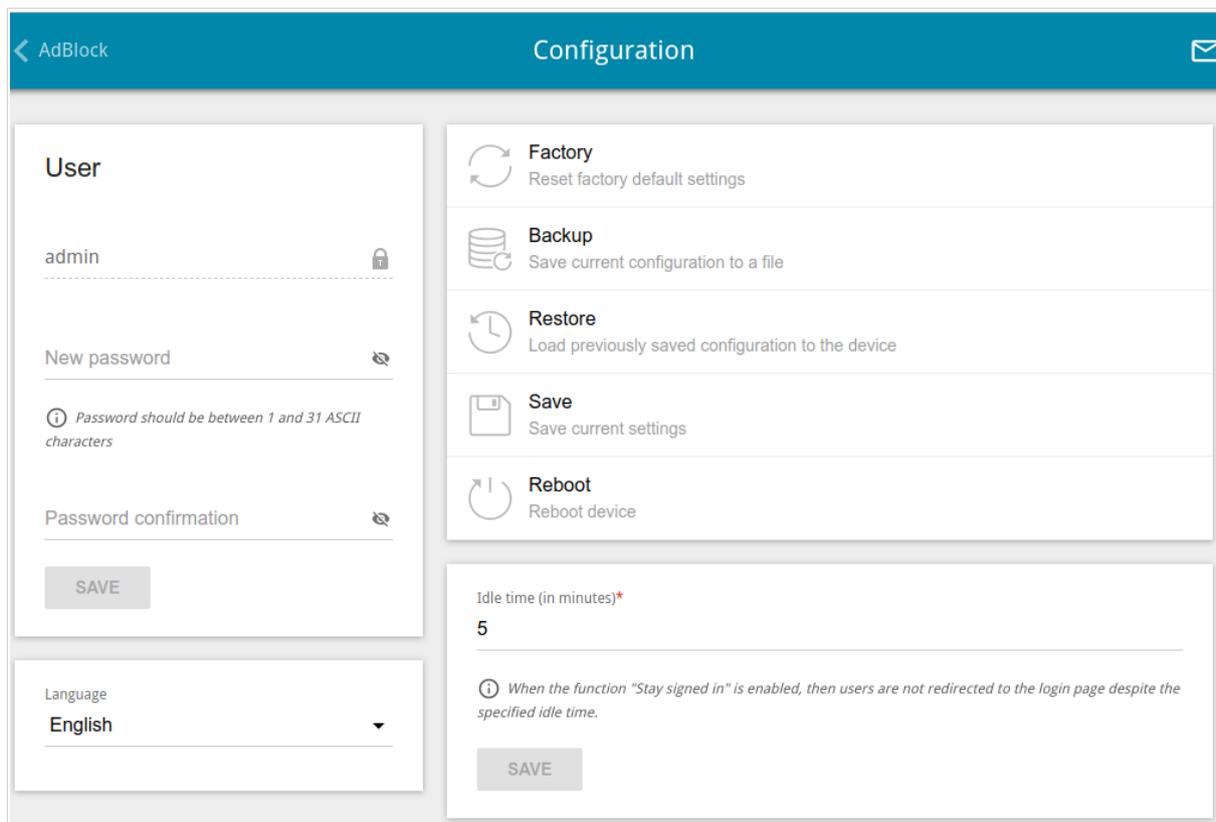


Figure 138. The **System / Configuration** page.

In order to change the password for the administrator account, in the **User** section, enter a new password in the **New password** and **Password confirmation** fields. Use digits, Latin letters (uppercase and/or lowercase), and other characters available in the US keyboard layout.<sup>5</sup> Click the **Show** icon (👁) to display the entered values. 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 router only after restoring the factory default settings via the hardware **WPS/RST** button. This procedure wipes out all settings that you have configured for your router.

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

<sup>5</sup> 0-9, A-Z, a-z, space, !"#%&'()\*+,-./:;<=>?@[^\_`{|}~.

The following buttons are also available on the page:

| Control        | Description   |
|----------------|---|
| <b>Factory</b> | Click the button to restore the factory default settings. Also you can restore the factory defaults via the hardware <b>WPS/RST</b> button (see the <i>Back Panel</i> section, page 15).  |
| <b>Backup</b>  | Click the button to save the configuration (all settings of the router) to your PC. The configuration backup will be stored in the download location of your web browser.   |
| <b>Restore</b> | Click the button and follow the dialog box appeared to select a previously saved configuration file (all settings of the router) located on your PC and upload it.  |
| <b>Save</b>    | Click the button to save settings to the non-volatile memory.<br>The router saves changed settings automatically. If changed settings have not been saved automatically, a notification is displayed in the top right part of the page. |
| <b>Reboot</b>  | Click the button to reboot the device. All unsaved changes will be lost after the device's reboot.  |

In the **Idle time** field specify a period of inactivity (in minutes) after which the router completes the session of the interface. By default, the value **5** is specified. Then click the **SAVE** button.

## Firmware Update

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

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

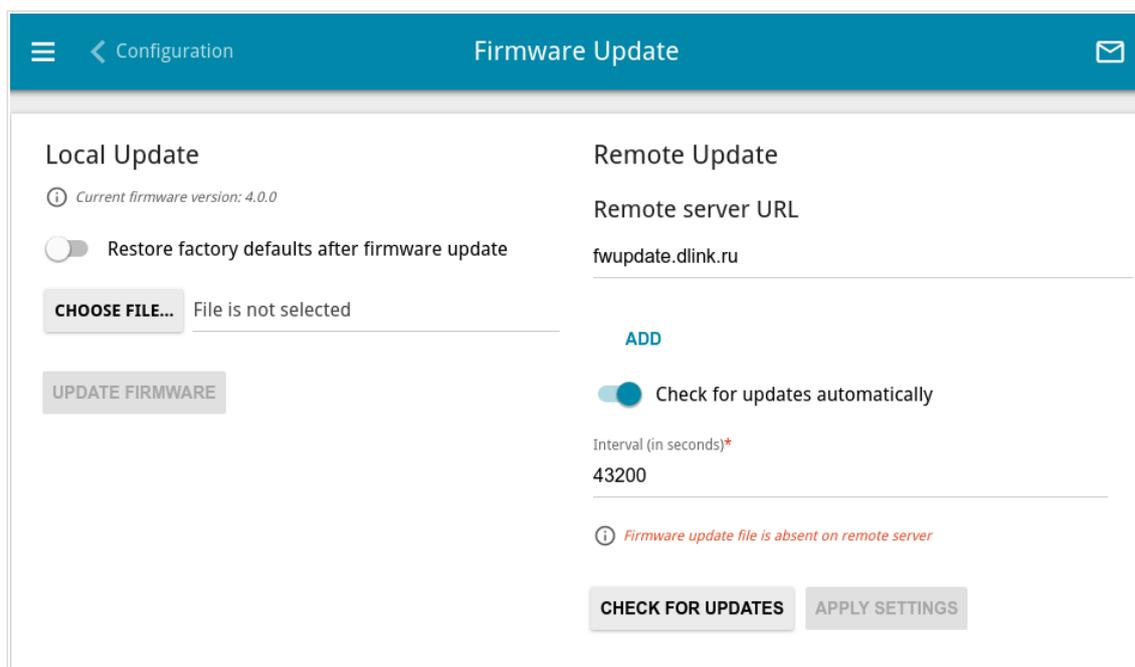


Figure 139. The **System / Firmware Update** page.

The current version of the router's firmware is displayed in the **Current firmware version** field. By default, the automatic check for the router's firmware updates is enabled. If the **Access point, Repeater, or Client** mode was selected in the Initial Configuration Wizard and the **Static** value is selected from the **Mode of local IP address assignment** list on the **Connections Setup / LAN** page, the **Gateway IP address** field should also be filled in on order to realize automatic check.

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. In the **Interval** field, specify the time period (in seconds) between checks or leave the value specified by default (**43200**).

By default, in the **Remote server URL** field, the D-Link update server address (**fwupdate.dlink.ru**) is specified. To add one more address, click the **ADD** button and enter the address in the displayed line. To remove the address, click the **Delete** icon ( **×** ) in the line of the address.

Click the **APPLY SETTINGS** button.

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

## Local Update



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

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

1. Download a new version of the firmware from [www.dlink.ru](http://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. If you want to restore the factory default settings immediately after updating the firmware, move the **Restore factory defaults after firmware update** switch to the right.
4. Click the **UPDATE FIRMWARE** button.
5. Wait until the router is rebooted (about one and a half or two minutes).
6. Log into the web-based interface using the login (**admin**) and the current password.

If after updating the firmware the router 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 router is rebooted.

## Remote Update



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

To update the firmware of the router 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 router 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 router 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 router is rebooted.

## Schedule

On the **System / Schedule** page, you can enable/disable Wi-Fi connection and the Wi-Fi filter, configure automatic reboot of the device on a schedule, and set a schedule for different rules and settings of the firewall.

**!** Before creating a schedule you need to configure automatic synchronization of the system time with a time server on the Internet(see the **System Time** section, page 200).

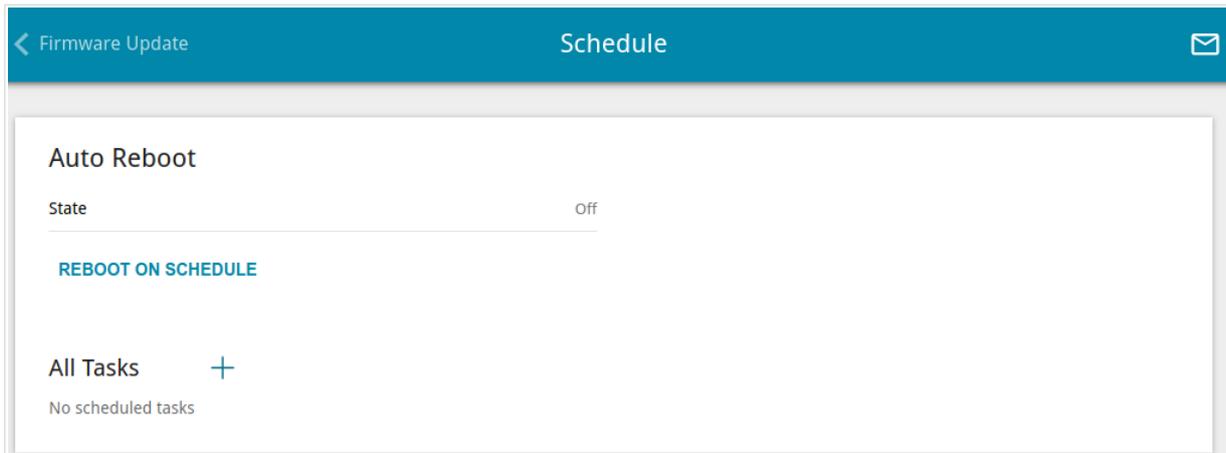


Figure 140. The **System / Schedule** page.

To configure automatic reboot of the device on a schedule, click the **REBOOT ON SCHEDULE** button in the **Auto Reboot** section.

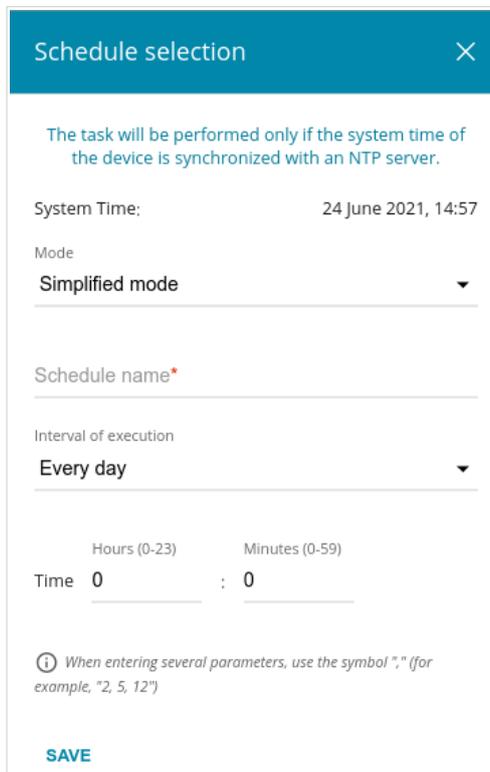


Figure 141. The window for configuring automatic reboot on a schedule.

In the opened window, in the **System Time** field, the system time of the device is displayed. You can select the **Simplified mode** value from the **Mode** drop-down list and specify the following parameters:

| Parameter                    | Description  |
|------------------------------|--|
| <b>Simplified mode</b>       |  |
| <b>Schedule name</b>         | Specify a schedule name for easier identification. You can specify any name.   |
| <b>Interval of execution</b> | Specify the time period for the device's reboot. <ul style="list-style-type: none"> <li>• <b>Every day</b>: When this value is selected, the <b>Time</b> field is displayed in the section.</li> <li>• <b>Every week</b>: When this value is selected, the names of days of the week and the <b>Time</b> field are displayed in the section.</li> <li>• <b>Every month</b>: When this value is selected, the <b>Day of month</b> and <b>Time</b> fields are displayed in the section.</li> </ul> |
| <b>Time</b>                  | Specify the time for the device's reboot.  |
| <b>Days of week</b>          | Select a day or days of the week when the device will be automatically rebooted. To do this, select the checkbox located to the left of the relevant value.  |
| <b>Day of month</b>          | Specify a day of the month. You can specify one value or several values separated by a comma.  |

In the advanced mode, you can specify more parameters for the schedule using a cron expression. To do this, select the **Advanced mode** value from the **Mode** drop-down list and specify the needed values in the fields displayed. You can specify one value or several values separated by a comma. You can use the character \* (asterisk) to specify the entire range of possible values. Upon that the **Schedule** field will be filled in automatically. In the **Schedule name** field, specify a schedule name for easier identification (you can specify any name).

Click the **SAVE** button.

To edit the automatic reboot schedule, click the **EDIT** button in the **Auto Reboot** section. In the opened window, change the needed parameters and click the **SAVE** button.

To disable automatic reboot of the device on a schedule, click the **EDIT** button in the **Auto Reboot** section. In the opened window, click the **DISABLE** button.

To set a schedule for a task which will be applied to a rule or setting of the firewall or will enable/disable Wi-Fi connection or Wi-Fi filter, click the **ADD** button ( **+** ) in the **All Tasks** section.

Figure 142. The window for adding a schedule for a task.

In the opened window, in the **System Time** field, the system time of the device is displayed. You can select the simplified mode of the schedule. To do this, select the **Simplified mode** value from the **Mode** drop-down list and specify the following parameters:

| Parameter                       | Description  |
|---------------------------------|--|
| <b>Perform task on schedule</b> | Move the switch to the right to enable the schedule.<br>Move the switch to the left to disable the schedule. |

| Parameter                    | Description  |
|------------------------------|--|
| <b>Simplified mode</b>       |  |
| <b>Schedule name</b>         | Specify a schedule name for easier identification. You can specify any name.   |
| <b>Interval of execution</b> | Specify the time period for performing a task. <ul style="list-style-type: none"> <li>• <b>Every minute.</b></li> <li>• <b>Every hour:</b> When this value is selected, the <b>Time</b> field is displayed in the section.</li> <li>• <b>Every day:</b> When this value is selected, the <b>Time</b> field is displayed in the section.</li> <li>• <b>Every week:</b> When this value is selected, the names of days of the week and the <b>Time</b> field are displayed in the section.</li> <li>• <b>Every month:</b> When this value is selected, the <b>Day of month</b> and <b>Time</b> fields are displayed in the section.</li> </ul> |
| <b>Duration</b>              | Specify the interval during which the task will be performing.   |
| <b>Time</b>                  | Specify the time when the task should start running.   |
| <b>Days of week</b>          | Select a day or days of the week when the task will be performing. To do this, select the checkbox located to the left of the relevant value.  |
| <b>Day of month</b>          | Specify a day of the month. You can specify one value or several values separated by a comma.  |

In the advanced mode, you can specify more parameters for the schedule using a cron expression. To do this, select the **Advanced mode** value from the **Mode** drop-down list and specify the needed values in the fields displayed. You can specify one value or several values separated by a comma. You can use the character \* (asterisk) to specify the entire range of possible values. Upon that the **Schedule** field will be filled in automatically. In the **Schedule name** field, specify a schedule name for easier identification (you can specify any name).

You can also use the calendar mode to configure the schedule. To do this, select the **Calendar mode** value from the **Mode** drop-down list. In the **Schedule name** field, specify a schedule name for easier identification (you can specify any name). In the table, select cells corresponding to needed hours and days of the week. To deselect a cell, left-click it once again. To deselect all cells and select others, click the **RESET** button and select new cells.

Click the **SAVE** button.

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

To remove a schedule, in the **All Tasks** section, select the checkbox located to the left of the relevant line in the table and click the **DELETE** button (  ).

To assign a created schedule to a task which will be applied to a rule or setting of the firewall or will enable/disable Wi-Fi connection or Wi-Fi filter, go to the relevant page of the web-based interface of the device.

## Log

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

The screenshot shows the 'Log' page in the web interface, specifically the 'Settings' tab. The page has a teal header with a back arrow, 'Schedule', 'Log', and a mail icon. Below the header, there are two tabs: 'Log' and 'Settings', with 'Settings' being the active tab. The main content area is titled 'Logging' and includes the following elements:

- A sub-header: 'Logging' followed by the text 'You can set the system log options.'
- An 'Enable' toggle switch, which is currently turned on (blue).
- Two dropdown menus: 'Type' set to 'Remote and local' and 'Level' set to 'Debugging messages'.
- An information icon (i) with a note: 'The system log is stored in the router's memory and sent to the remote host specified in the "Server" field'.
- A 'Server\*' text input field.
- A 'Port\*' text input field containing the value '514'.
- An 'APPLY' button at the bottom left.

Figure 143. The **System / Log** page. The **Settings** tab.

To enable logging of the system events, go to the **Settings** tab and move the **Enable** switch to the right. Then specify the needed parameters.

| Parameter      | Description  |
|----------------|--|
| <b>Logging</b> |  |
| <b>Type</b>    | <p>Select a type of logging from the drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Local:</b> The system log is stored in the router's memory. When this value is selected, the <b>Server</b> and <b>Port</b> fields are not displayed.</li> <li>• <b>Remote:</b> The system log is sent to the remote host specified in the <b>Server</b> field.</li> <li>• <b>Remote and local:</b> The system log is stored in the router's memory and sent to the remote host specified in the <b>Server</b> field.</li> </ul> |
| <b>Level</b>   | Select a type of messages and alerts/notifications to be logged.   |
| <b>Server</b>  | The IP or URL address of the host from the local or global network, to which the system log will be sent.  |
| <b>Port</b>    | A port of the host specified in the <b>Server</b> field. By default, the value <b>514</b> is specified.  |

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

To disable logging of the system events, move the **Enable** switch to the left and click the **APPLY** button.

To view the system log, go to the **Log** tab.

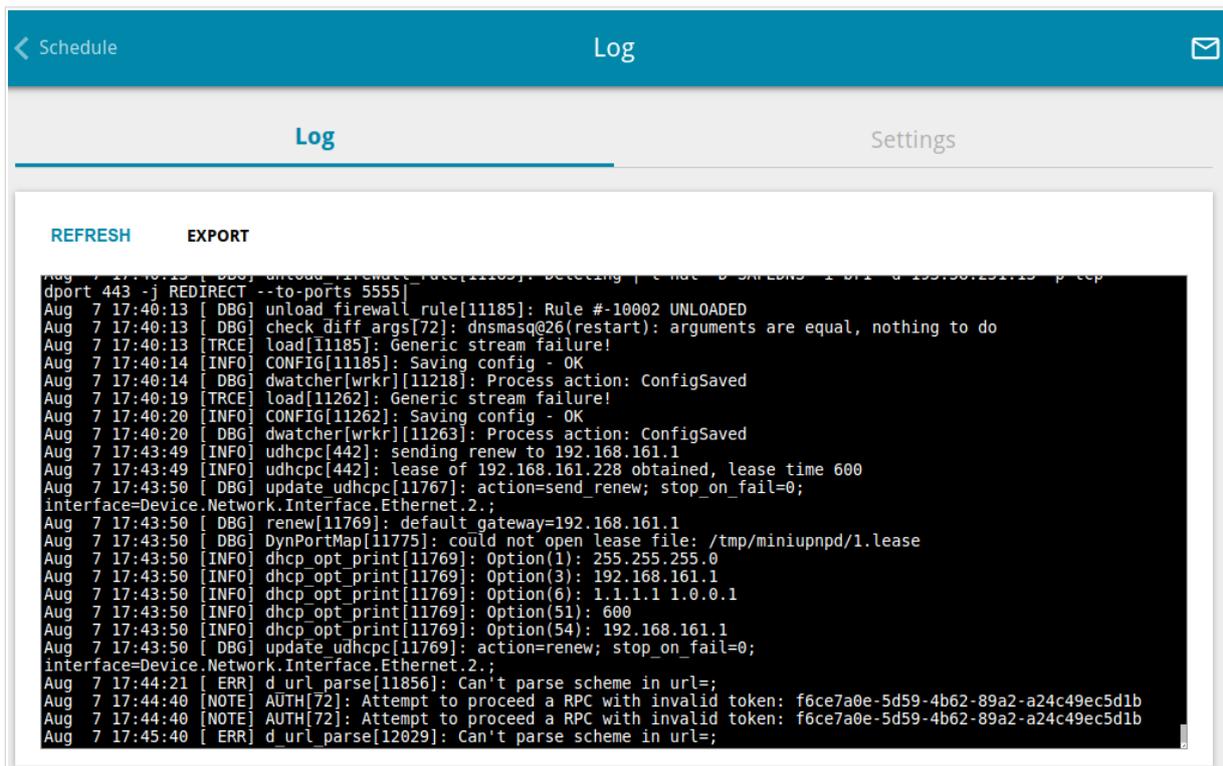


Figure 144. The System / Log page. The Log tab.

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.

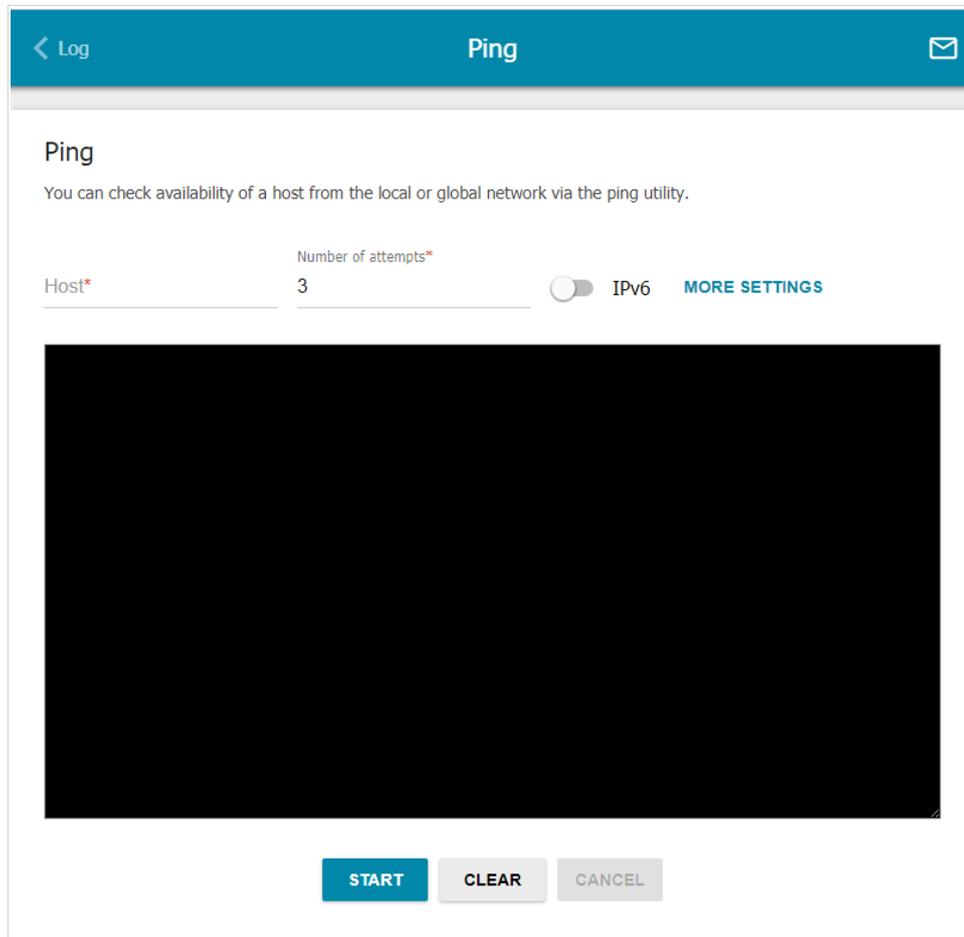
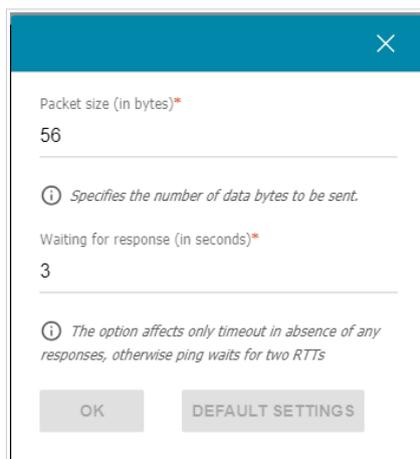


Figure 145. The **System / Ping** page.

To check availability of a host, enter the IP address or name of this host in the **Host** field and specify a number of requests that will be sent in order to check its availability in the **Number of attempts** field. If availability check should be performed with IPv6, move the **IPv6** switch to the right.

To specify additional settings, click the **MORE SETTINGS** button.



Packet size (in bytes)\*  
56

*Specifies the number of data bytes to be sent.*

Waiting for response (in seconds)\*  
3

*The option affects only timeout in absence of any responses, otherwise ping waits for two RTTs*

OK      DEFAULT SETTINGS

Figure 146. The **System / Ping** page. The additional settings window.

In the opened window, in the **Packet size** field, specify the volume of data sent in a request. In the **Waiting for response** field, specify the response waiting period in seconds. To restore the default field values, click the **DEFAULT SETTINGS** button.

After specifying the additional parameters, click the **OK** button.

To run the check, click the **START** button. After a while, the results will be displayed on the page.

If you need to interrupt the check, click the **CANCEL** button (the button is available from the moment the check starts).

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.

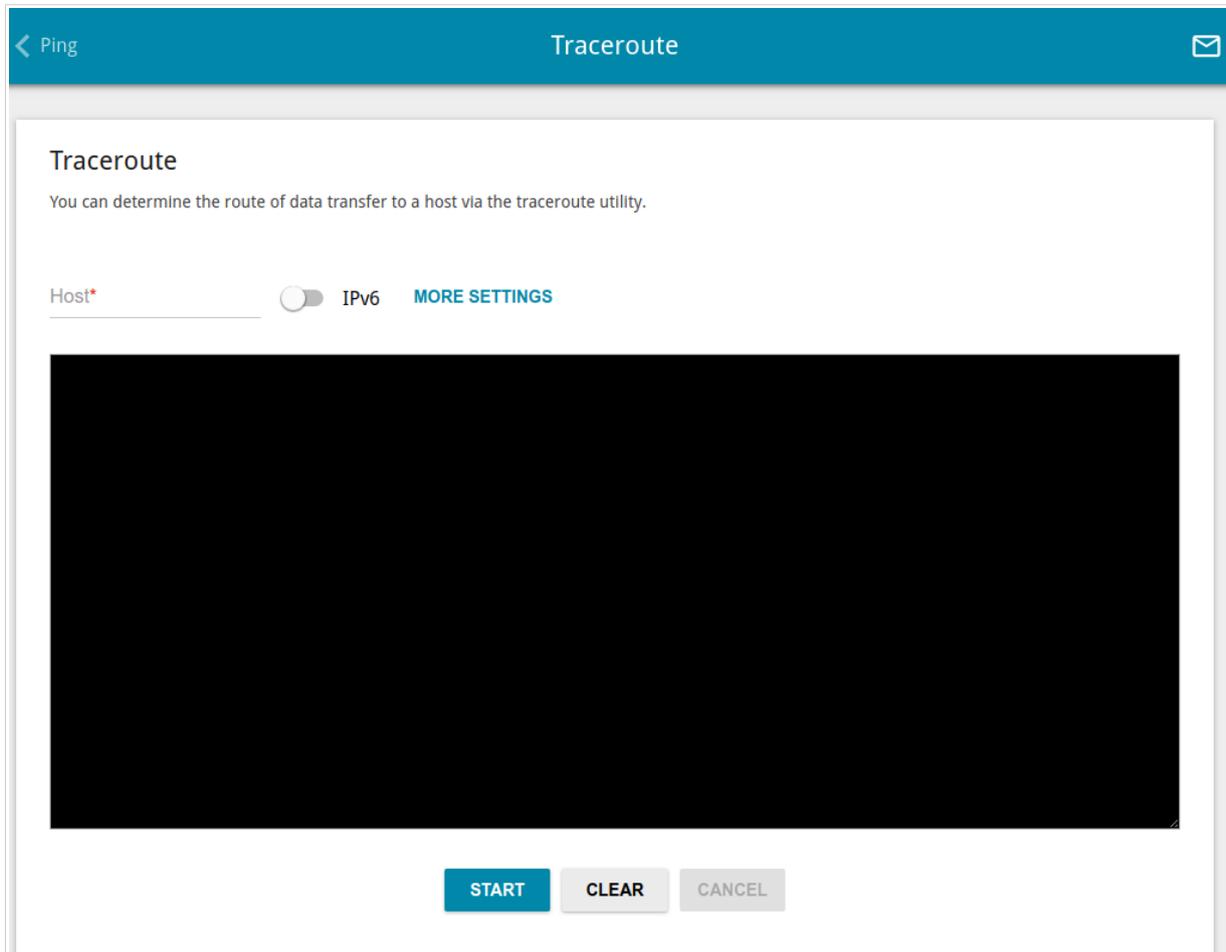


Figure 147. The **System / Traceroute** page.

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.

To specify additional settings, click the **MORE SETTINGS** button.

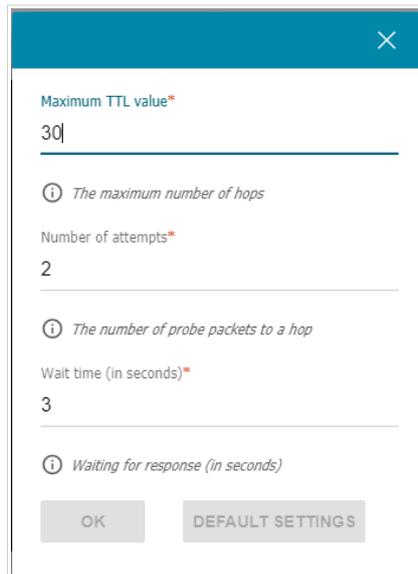


Figure 148. The **System / Traceroute** page. The additional settings window.

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

| Parameter                 | Description   |
|---------------------------|---|
| <b>Maximum TTL value</b>  | Specify the TTL ( <i>Time to live</i> ) parameter value. The default value is <b>30</b> . |
| <b>Number of attempts</b> | The number of attempts to hit an intermediate host.                                       |
| <b>Wait time</b>          | A period of waiting for an intermediate host response.                                    |

To restore the default field values, click the **DEFAULT SETTINGS** button.

After specifying the additional parameters, click the **OK** button.

To run the check, click the **START** button. After a while, the results will be displayed on the page.

If you need to interrupt the check, click the **CANCEL** button (the button is available from the moment the check starts).

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

## Telnet/SSH

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

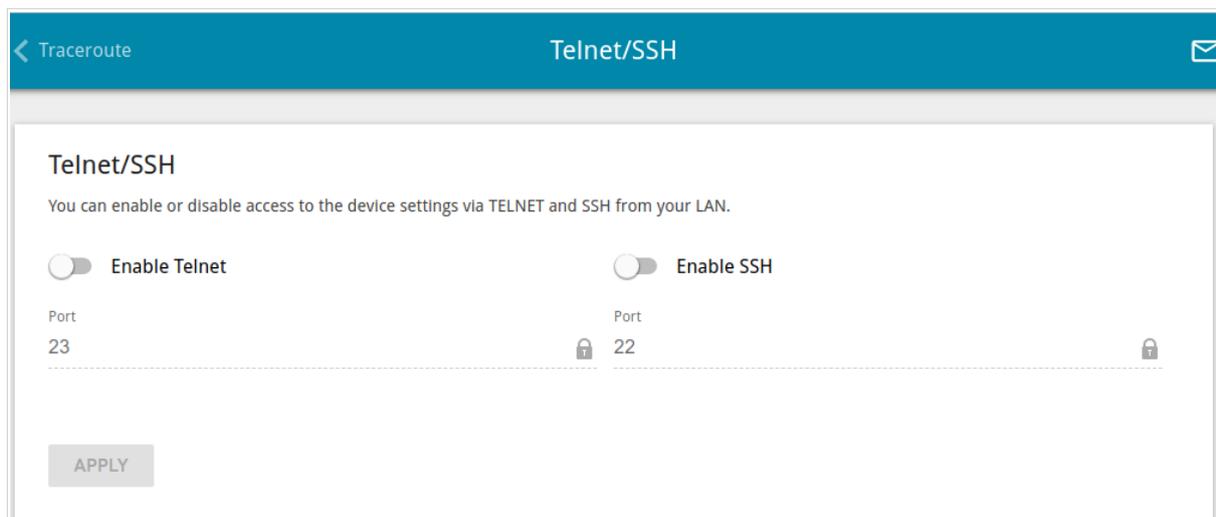


Figure 149. The **System / Telnet/SSH** page.

To enable access via TELNET and/or SSH, move the **Enable Telnet** switch and/or **Enable SSH** switch to the right. In the **Port** field, enter the number of the router's port through which access will be allowed (by default, the port **23** is specified for Telnet and the port **22** is specified for SSH). Then click the **APPLY** button.

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

## System Time

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

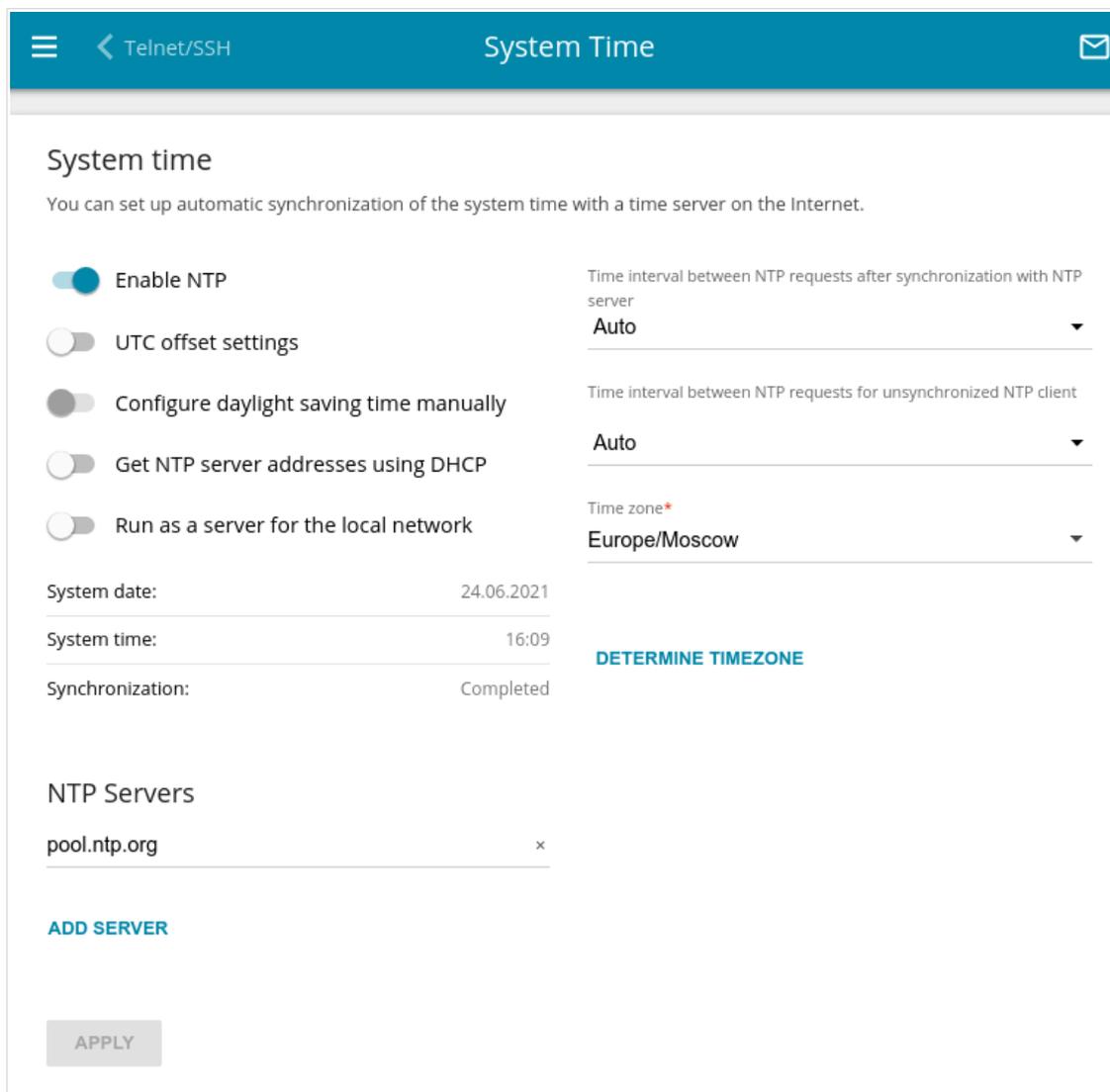


Figure 150. The **System / System Time** page.

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 **Time zone** drop-down list. 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 and the **Completed** value will be displayed in the **Synchronization** field.

Additional settings are also available on the page:

| Parameter   | Description  |
|---|--|
| <b>UTC offset settings</b>  | Move the switch to the right to set the UTC ( <i>Coordinated Universal Time</i> ) offset for the router clock manually. In the <b>UTC offset</b> field displayed, specify the required offset time (in minutes).   |
| <b>Configure daylight saving time manually</b>                                  | Move the switch to the right to configure settings for daylight saving time for the router clock manually. In the <b>Daylight Saving Time</b> section displayed, specify the required offset time for daylight saving time (in minutes), and specify the needed values in the <b>Beginning of daylight saving time</b> and <b>End of daylight saving time</b> sections.  |
| <b>Get NTP server addresses using DHCP</b>                                      | Move the switch to the right if NTP servers addresses are provided by your ISP. Contact your ISP to clarify if this setting needs to be enabled.<br>If the switch is moved to the right, the <b>NTP Servers</b> section is not displayed.  |
| <b>Run as a server for the local network</b>                                    | Move the switch to the right to allow connected devices to use the IP address of the router in the local subnet as a time server.  |
| <b>Time interval between NTP requests after synchronization with NTP server</b> | From the drop-down list, select a time period (in seconds) after which a request to update the system time will be sent to the NTP server or leave the <b>Auto</b> value.  |
| <b>Time interval between NTP requests for unsynchronized NTP client</b>         | A time period (in seconds) after which a request to synchronize the system time will be sent to the NTP server.<br>Select the needed value from the drop-down list. <ul style="list-style-type: none"> <li>• <b>Auto</b>: The time period is defined automatically.</li> <li>• <b>Manual</b>: The time period is defined in accordance with the value specified in the <b>Interval value</b> field.</li> </ul> |
| <b>Interval value</b>   | Specify the time period (in seconds). The minimum acceptable value is 3.   |

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



When the router 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).

## Auto Provision

On the **System / Auto Provision** page, you can enable the Auto Provision function.

The Auto Provision function allows your ISP to manage the device's settings remotely: DIR-820 connects to the ISP's server, compares the current configuration file with the configuration file stored on this server, and updates its settings if the files are different.

Figure 151. The page for configuring the Auto Provision function.

You can specify the following parameters:

| Parameter                               | Description  |
|---|--|
| <b>Enable Auto Provision</b>            | Move the switch to the right to enable the Auto Provision function.<br>Move the switch to the left to disable the Auto Provision function.   |
| <b>Use BOOTP option</b>                 | If the switch is moved to the right, the parameters of your ISP's server (the address, the location of the configuration file, and the protocol) are automatically specified using DHCP options 66 and 67. Upon that a connection of the Dynamic IPv4 type should be configured on the <b>Connections Setup / WAN</b> page.<br>If the switch is moved to the left, the parameters of your ISP's server should be specified manually. |
| <b>Autoconfiguration server address</b> | The IP or URL address of your ISP's server where the configuration file is stored.   |
| <b>File name</b>                        | The location of the configuration file on the ISP's server.  |

| Parameter                | Description  |
|--------------------------|--|
| <b>File check period</b> | A time period (in seconds) between attempts to compare the current configuration file with the configuration file on the ISP's server. |
| <b>Protocol type</b>     | A protocol for communication with the ISP's server where the configuration file is stored.   |

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

If you need to check manually if the current configuration file corresponds to the configuration file on the ISP's server, click the **CHECK STATUS** button. The check result will be displayed in the **Status** field. If the files are different, the device's settings will be updated.

## CHAPTER 5. OPERATION GUIDELINES

### ***Safety Rules and Conditions***

Please carefully read this section before installation and connection of the device. Make sure that the power adapter and cables are 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.

Only use the power adapter supplied with the device. Do not plug in the adapter, if its case or cable are damaged. Plug the adapter only into working electrical outlets with parameters indicated on the adapter.

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 or the power adapter.

The service life of the device is 2 years.

## ***Wireless Installation Considerations***

The DIR-820 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 DIR-820 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 router, access points, and computers 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 router 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

|              |   |
|--------------|---|
| <b>3G</b>    | Third Generation                            |
| <b>AC</b>    | Access Category                             |
| <b>AES</b>   | Advanced Encryption Standard                |
| <b>AP</b>    | Access Point                                |
| <b>ARP</b>   | Address Resolution Protocol                 |
| <b>BPSK</b>  | Binary Phase-shift Keying                   |
| <b>BSSID</b> | Basic Service Set Identifier                |
| <b>CCK</b>   | Complementary Code Keying                   |
| <b>CHAP</b>  | Challenge Handshake Authentication Protocol |
| <b>DBSK</b>  | Differential Binary Phase-shift Keying      |
| <b>DDNS</b>  | Dynamic Domain Name System                  |
| <b>DDoS</b>  | Distributed Denial of Service               |
| <b>DES</b>   | Data Encryption Standard                    |
| <b>DHCP</b>  | Dynamic Host Configuration Protocol         |
| <b>DMZ</b>   | DeMilitarized Zone                          |
| <b>DNS</b>   | Domain Name System                          |
| <b>DPD</b>   | Dead Peer Detection                         |
| <b>DQPSK</b> | Differential Quadrature Phase-shift Keying  |
| <b>DSL</b>   | Digital Subscriber Line                     |
| <b>DSSS</b>  | Direct-sequence Spread Spectrum             |
| <b>DTIM</b>  | Delivery Traffic Indication Message         |
| <b>EoGRE</b> | Ethernet over Generic Routing Encapsulation |
| <b>GMT</b>   | Greenwich Mean Time                         |
| <b>GRE</b>   | Generic Routing Encapsulation               |
| <b>GSM</b>   | Global System for Mobile Communications     |
| <b>HTTP</b>  | Hypertext Transfer Protocol                 |
| <b>HTTPS</b> | Hypertext Transfer Protocol Secure          |

|                |   |
|----------------|---|
| <b>ICMP</b>    | Internet Control Message Protocol                     |
| <b>ID</b>      | Identifier  |
| <b>IGD</b>     | Internet Gateway Device                               |
| <b>IGMP</b>    | Internet Group Management Protocol                    |
| <b>IKE</b>     | Internet Key Exchange                                 |
| <b>IMEI</b>    | International Mobile Equipment Identity               |
| <b>IMSI</b>    | International Mobile Subscriber Identity              |
| <b>IP</b>      | Internet Protocol                                     |
| <b>IPTV</b>    | Internet Protocol Television                          |
| <b>IPsec</b>   | Internet Protocol Security                            |
| <b>ISP</b>     | Internet Service Provider                             |
| <b>L2TP</b>    | Layer 2 Tunneling Protocol                            |
| <b>LAN</b>     | Local Area Network                                    |
| <b>LCP</b>     | Link Control Protocol                                 |
| <b>LED</b>     | Light-emitting diode                                  |
| <b>LTE</b>     | Long Term Evolution                                   |
| <b>MAC</b>     | Media Access Control                                  |
| <b>MBSSID</b>  | Multiple Basic Service Set Identifier                 |
| <b>MIB</b>     | Management Information Base                           |
| <b>MIMO</b>    | Multiple Input Multiple Output                        |
| <b>MPPE</b>    | Microsoft Point-to-Point Encryption                   |
| <b>MS-CHAP</b> | Microsoft Challenge Handshake Authentication Protocol |
| <b>MTU</b>     | Maximum Transmission Unit                             |
| <b>NAT</b>     | Network Address Translation                           |
| <b>NIC</b>     | Network Interface Controller                          |
| <b>NTP</b>     | Network Time Protocol                                 |
| <b>OFDM</b>    | Orthogonal Frequency Division Multiplexing            |
| <b>PAP</b>     | Password Authentication Protocol                      |

|               |   |
|---------------|---|
| <b>PBC</b>    | Push Button Configuration                     |
| <b>PFS</b>    | Perfect Forward Secrecy                       |
| <b>PIN</b>    | Personal Identification Number                |
| <b>PoE</b>    | Power over Ethernet                           |
| <b>PPP</b>    | Point-to-Point Protocol                       |
| <b>pppd</b>   | Point-to-Point Protocol Daemon                |
| <b>PPPoE</b>  | Point-to-point protocol over Ethernet         |
| <b>PPTP</b>   | Point-to-point tunneling protocol             |
| <b>PSK</b>    | Pre-shared key                                |
| <b>PUK</b>    | PIN Unlock Key                                |
| <b>QAM</b>    | Quadrature Amplitude Modulation               |
| <b>QoS</b>    | Quality of Service                            |
| <b>QPSK</b>   | Quadrature Phase-shift Keying                 |
| <b>RADIUS</b> | Remote Authentication in Dial-In User Service |
| <b>RIP</b>    | Routing Information Protocol                  |
| <b>RIPng</b>  | Next Generation Routing Information Protocol  |
| <b>RTS</b>    | Request To Send                               |
| <b>RTSP</b>   | Real Time Streaming Protocol                  |
| <b>SA</b>     | Security Association                          |
| <b>SAE</b>    | Simultaneous Authentication of Equals         |
| <b>SIM</b>    | Subscriber Identification Module              |
| <b>SIP</b>    | Session Initiation Protocol                   |
| <b>SMB</b>    | Server Message Block                          |
| <b>SNMP</b>   | Simple Network Management Protocol            |
| <b>SSH</b>    | Secure Shell                                  |
| <b>SSID</b>   | Service Set Identifier                        |
| <b>STBC</b>   | Space-time block coding                       |
| <b>TCP</b>    | Transmission Control Protocol                 |

|              |                                    |
|--------------|------------------------------------|
| <b>TKIP</b>  | Temporal Key Integrity Protocol    |
| <b>UAM</b>   | Universal Access Method            |
| <b>UDP</b>   | User Datagram Protocol             |
| <b>UPnP</b>  | Universal Plug and Play            |
| <b>URL</b>   | Uniform Resource Locator           |
| <b>USB</b>   | Universal Serial Bus               |
| <b>VLAN</b>  | Virtual Local Area Network         |
| <b>VPN</b>   | Virtual Private Network            |
| <b>VRID</b>  | Virtual Router Identifier          |
| <b>VRRP</b>  | Virtual Router Redundancy Protocol |
| <b>WAN</b>   | Wide Area Network                  |
| <b>WEP</b>   | Wired Equivalent Privacy           |
| <b>Wi-Fi</b> | Wireless Fidelity                  |
| <b>WISP</b>  | Wireless Internet Service Provider |
| <b>WLAN</b>  | Wireless Local Area Network        |
| <b>WMM</b>   | Wi-Fi Multimedia                   |
| <b>WPA</b>   | Wi-Fi Protected Access             |
| <b>WPS</b>   | Wi-Fi Protected Setup              |